



GREATER DE HOOP COMPLEX

PART OF THE
CAPE FLORAL REGION PROTECTED AREAS WORLD HERITAGE SITE
Western Cape, South Africa

Protected Area Management Plan 2026 – 2036

DATE APPROVED: [Date]
MOST RECENT UPDATE: [Date]

CapeNature

Western Cape Government

forestry, fisheries & the environment
Department: Forestry, Fisheries and the Environment
REPUBLIC OF SOUTH AFRICA

UNESCO
United Nations Educational, Scientific and Cultural Organization

World Heritage Convention

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CITATION
CapeNature. 2026. Greater De Hoop Complex: Protected Area Management Plan 2026-2036. Internal Report. CapeNature. Cape Town.

AUTHORISATIONS

In terms of section 41(4) of the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) the Minister hereby approves part of the Protected Area Management Plan for the GDHC designated as World Heritage Sites, State Land and Marine Protected Area (See Table 2.1 & 2.2).

TITLE	NAME	SIGNATURE	DATE
NATIONAL MINISTER: Environment, Forestry and Fisheries	Dr Dion George		

In terms of section 41(4) of the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) the MEC hereby approves part of the Protected Area Management Plan for the GDHC designated as Provincial Nature Reserves.

TITLE	NAME	SIGNATURE	DATE
PROVINCIAL MINISTER: Department of Environmental Affairs and Development Planning	Mr Anton Bredell		

Recommended:

TITLE	NAME	SIGNATURE	DATE
CHAIRPERSON OF THE BOARD: Western Cape Nature Conservation Board	Ms Marguerite Loubser		
CHIEF EXECUTIVE OFFICER: CapeNature	Dr Ashley Naidoo		

Review Date: 10 years from the date of approval by the MEC and Minister

ACKNOWLEDGEMENTS

CapeNature would like to thank everybody who participated and had input into the formulation of the Greater De Hoop Complex World Heritage Site protected area management plan.

This plan was prepared by the core reserve management planning team consisting of Vicki Hudson, Dr Antoinette Veldtman, Mark Johns, Johan Burger, Mark Williams. The planning team was supported with inputs from various internal and external partners. A special word of thanks to colleagues from Biodiversity Capabilities: Freshwater Ecologist Jeanne Gouws: Fauna Ecologist Dr Marienne de Villiers; and Conservation Operations: Marine and Coast Technical Specialist (Region East) Keith Spencer and GIS Technician (Landscape West) Sheila Henning for their significant contributions and expertise.

Posthumous acknowledgment and thank you to the late David Daniel Davids, field ranger on De Hoop for 41 years, for sharing his extensive historical knowledge to inform the context of this plan.

Furthermore, acknowledgement is given to the many external partners and individuals that contributed to the development of this plan.

Alana Duffell-Canham (CapeNature – Landscape Conservation Intelligence Manager: Central) is thanked for the internal review.

Kevin Shaw (ex-CapeNature – Team Leader: Ecologist: Biodiversity Capabilities) is thanked for the external review.

Cover page images courtesy of Jeanetta Hoekstra and Dr Marienne de Villiers (secondary image).

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GLOSSARY

Derived from: Conservation Measures Partnership (CMP 2020)

Term	Explanation
Adaptive Management	The incorporation of a formal learning process into conservation action to reduce uncertainty in decision-making. Specifically, it is the integration of knowledge, management, and monitoring, to provide a framework to systematically and efficiently test assumptions, promote learning, and supply timely information for management to make decisions and adjust actions based on outcomes of monitoring. The *Conservation Standards* explicitly bring adaptive management principles into conservation practice.
Factor	A generic term for an element of a conceptual model including direct and indirect threats, opportunities, and associated stakeholders. It is often advantageous to use this generic term since many factors – for example tourism – could be both a threat and an opportunity. Also known as root causes or drivers.
Conservation Target	An element of biodiversity (natural value) or heritage (cultural value) of the GDHC, which can be a species, habitat, ecological system, or heritage feature, that management strives to protect, and threats towards which management should strive to minimise. All focal conservation targets at a site should collectively represent the biodiversity and heritage features of concern at the site.
Human Well-being Value	In the context of a conservation project, human well-being values are those components of human well-being affected by the status of conservation targets. All human well-being values at a site should collectively represent the array of human well-being needs and outcomes dependent on the conservation targets.
Goal	A formal statement detailing a desired impact of a project, such as the desired future status of a target. A good goal meets the criteria of being *linked to targets*, *impact oriented*, *measurable*, *time limited*, and *specific*.
Indicator	A measurable entity related to a specific information need such as the status of a value / factor, change in a threat, or progress toward an objective, or association between one or more variables. A good indicator meets the criteria of being *measurable*, *precise*, *consistent*, and *sensitive*.

Term	Explanation
Key (Ecological) Attribute	An aspect of a focal value's biology or ecology that if present, define a healthy focal value and if missing or altered, would lead to the outright loss or extreme degradation of that focal value over time.
Objective	A formal statement detailing a desired outcome of a project such as reducing a critical threat. A good objective meets the criteria of being *results oriented*, *measurable*, *time limited*, *specific*, and *practical*. If the project is well conceptualized and designed, realization of a project's objectives should lead to the fulfilment of the project's goals and ultimately its vision. Compare to vision and goal.
Results Chain	A visual diagram of management's theory of change. A results chain includes core assumptions and the logical sequence linking interventions to one or more values. In scientific terms, it lays out hypothesized relationships or theories of change.
Vision	A description of the desired long-term future or ultimate condition that stakeholders see, and management strives to achieve for the GDHC.
Heritage Resources	Means any place or object of cultural significance as per the National Heritage Resources Act, 1999 (Act No. 25 of 1999).
Situation Analysis	The purpose of a situation analysis is to understand the relationships between the biological environment and the social, economic, political, and institutional systems, associated stakeholders and drivers that affect the focal values of the GDHC.

ACRONYMS

BMP	Biodiversity Management Plan
BRUV	Baited Remote Underwater Video
CDP	Concept Development Plan
CFR	Cape Floristic Region
CFRPA	Cape Floristic Region Protected Area
CMP	Conservation Measures Partnership
CMZ	Cape mountain zebra
CPUE	Catch per Unit Effort
CR	Critically Rare (Endangered)
CWAC	Coordinated Waterbird Count
DDD	Data Deficient - Insufficient Information
DEA	Department of Environmental Affairs
DEA&DP	Department of Environmental Affairs and Development Planning
DEA:O&C	Department of Environmental Affairs: Oceans and Coast
DFFE	Department of Forestry, Fisheries and the Environment

DWA	Department of Water Affairs
DWS	Department of Water and Sanitation
EBSA	Ecologically or biologically significant area
EIS	Ecological Importance and Sensitivity
EMP	Estuary Management Plan
EN	Endangered
EPWP	Expanded Public Works Programme
FBIS	Freshwater Biodiversity Information System
FPA	Fire Protection Association
FEPA	Freshwater Ecosystem Priority Area
GDHC	Greater De Hoop Complex
GG	Government Gazette
GIS	Geographical Information System
IAP	Invasive Alien Plant
IAPO	Integrated Annual Plan of Operations
IAS	Invasive Alien Species
ICM	Integrated Catchment Management
IDP	Integrated Development Plan
IUCN	International Union for Conservation of Nature and Natural Resources
IWP	Integrated Work Plan
LC	Least Concern
METT	Management Effectiveness Tracking Tool
MLRA	Marine Living Resources Act
METT-SA	Management Effectiveness Tracking Tool - South Africa
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
NFEPA	National Freshwater Ecosystem Priority Area
NGO	Non-Governmental Organisation
NPAES	National Protected Area Expansion Strategy
NRM	Natural Resource Management

NT	Near Threatened
OTR	Overberg Test Range
PAAC	Protected Area Advisory Committee
PAMP	Protected Area Management Plan
PE	Possibly Extinct
PES	Present Ecological Scores
PET	Potential Evapotranspiration
PPP	Public Private Partnership
RAMSAR	Ramsar Convention (an international treaty for the conservation and wise use of wetlands)
RSA	Republic of South Africa
SAHRA	South African Heritage Resources Agency
SANBI	South Africa National Biodiversity Institute
SANCCOB	Southern African Foundation for the Conservation of Coastal Birds
SANParks	South African National Parks
SASS 5	South African Scoring System version 5
SDF	Spatial Development Framework
SMA	Special Management Area
SMME	Small, Medium and Macro Enterprises
SOB	State of Biodiversity
SPC	Special Planning Category
TMG	Table Mountain Group
UNESCO	United Nations Educational, Scientific and Cultural Organisation
VU	Vulnerable
WCBSP	Western Cape Biodiversity Spatial Plan
WCG	Western Cape Government
WCPAES	Western Cape Protected Area Expansion Strategy
WHS	World Heritage Site
WMA	Water Management Area
WOF	Working on Fire

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EXECUTIVE SUMMARY

In compliance with the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) and Chapter 4 of the National World Heritage Convention Act, 1999 (Act No. 49 of 1999), the management authority of a protected area is required to develop management plans for each of its protected areas.

The National Minister is authorised under section 25(1) of the National World Heritage Convention Act, 1999 (Act No. 49 of 1999) to approve the management plan for a protected area so nominated or declared under the Act. Both the National Minister and Member of Executive Council (MEC) in a particular province has concurrent jurisdiction to approve a management plan for a protected area submitted under section 39(2) of the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003).

In developing the management plan for the Greater De Hoop Complex (GDHC), CapeNature as the management authority strives to establish biodiversity conservation as a foundation for a sustainable economy, providing ecosystem services and to promote sustainable access and opportunities for all.

Overview.

The GDHC is situated in the Overberg District, Western Cape, South Africa and is approximately 64 569 ha in extent as per CapeNature Geographical Information System (GIS) Reserve Cadastre spatial layer. Several protected areas form the GHDC, namely De Hoop Provincial Nature Reserve, De Mond, Waenhuiskrans, Soetendalsvlei state land and the De Hoop Marine Protected Area (MPA). The MPA stretches along a coastline for about 45 km adjacent to De Hoop and for approximately 12 km further adjacent to the Denel Overberg Test Range. It extends three nautical miles offshore into the Indian Ocean.

The Cape Floral Region Protected Areas WHS comprises of serial property of ten protected areas covering a total area of 187 578 hectares. The De Hoop Provincial Nature Reserve was inscribed as part of the Cape Floral Region Protected Areas (CFRPA) World Heritage Site (WHS) by the World Heritage Convention, United Nations Educational, Scientific and Cultural Organisation in 2004 (UNESCO 2004). Part of the De Mond protected area cluster was included in the extension of the WHS in 2015 and officially inscribed in 2022 in the Government Notice 2816, Government Gazette 47632. A CFRPA WHS buffer zone of approximately 92 295 hectares designed to facilitate functional connectivity and mitigate the effects of global climate change and other anthropogenic influences, has also been identified. The GDHC is supported and buffered by a network of adjacent or surrounding conserved areas ranging from private nature reserves, stewardship sites special management areas and conservancies.

The GDHC represents outstanding examples of significant ongoing ecological and biological processes in the evolution of terrestrial, estuarine and marine ecosystems and their associated floral and faunal communities supporting unique indigenous species assemblages and connectivity for migration, gene flow and dispersal. In addition, the GDHC contains important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value.

Planning, Policy, Implementation and Review

To develop this management plan CapeNature applied the Conservation Standards which is a Strategic Adaptive Management framework that is robust, yet flexible, multi-disciplinary in approach, and inclusive of internal and external stakeholders, as well as the public at large. It enables management teams to develop effective conservation plans, based on the best available traditional, expert and scientific knowledge. Furthermore, it promotes stakeholder and public engagement throughout the planning and implementation phase of the management plan. Key to this process is identifying the focal

conservation targets and human well-being values representative of the protected area, determining what state they are in, and what threats they face. This forms the basis for establishing clear goals, strategies and objectives that are time bound.

This management plan provides the basis for the management, development and operation of the GDHC over a timeframe of 10 years. The implementation of the management plan is subject to legislation, regulations, policies and guidelines to ensure and promote sound financial and biodiversity management, effective compliance, safety, good neighbour relations and to promote sustainable access. The success of implementation of this plan is also subject to sufficient resources to manage the GDHC.

Fundamental to implementation, is pursuing the achievement of conservation outcomes and the regular review thereof. Strategic adaptive management integrates planning, management, and monitoring, and is used to systematically evaluate results, thus enabling management to "change direction" when required. Key to this process is the sharing of results, respectfully, honestly and transparently to facilitate learning through critical appraisal of conservation efforts. CapeNature uses an internationally recognised review system - The Management Effectiveness Tracking Tool for South Africa, adopted by the Department of Forestry, Fisheries and the Environment, to assess the management effectiveness of all its protected areas at a strategic level. Additionally, mechanisms for monitoring and evaluation are built into each aspect highlighted in the strategic plan.

Vision and Desired State

CapeNature manages the GDHC in accordance with its organisational vision, and in agreement with the vision, goals and strategies derived through the planning process.

The vision of the GDHC is:

"The Greater De Hoop World Heritage Site Complex, comprising of the De Hoop Provincial Nature Reserve, De Hoop Marine Protected Area & De Mond Protected Area cluster,

is a resilient and thriving land- and seascape

which conserves biodiversity & heritage, and provides research, education, nature-based livelihood and eco-tourism opportunities

for the benefit of all, through partnerships underpinned by sound management."

Protected area targets and values include healthy ecosystems, providing ecological infrastructure, environmental services and human well-being benefits. Nine focal conservation targets that incorporate several nested aspects have been selected for the GDHC.

These include:

1. **Terrestrial vegetation**
2. **Cave ecosystems**
3. **Coastal ecosystems**
4. **Freshwater ecosystems**
5. **Cape vulture**
6. **Priority game species**
7. **Estuary ecosystems**
8. **Marine ecosystems**

9. Archaeological and cultural heritage features

As the public entity responsible for biodiversity conservation within the Western Cape, CapeNature delivers a suite of core services to the public in support of the following outcomes: resilient ecosystems; the promotion of local economic development; job creation and skills development; growing diversified nature-based revenue streams; access to environmental awareness; advocacy and education; and access to natural and cultural heritage.

Four focal human well-being values have been identified for the GDHC.

These include:

1. **Nature-based livelihoods**
2. **Sense of place and quality of life**
3. **Learning opportunities through environmental awareness and research**
4. **Nature-based tourism activities and access**

Thirteen goals have been formulated to maintain or enhance the focal conservation targets and human well-being values of the GDHC and are listed below.

An asterisk * indicates where further detail and clarity is provided information in section 5.

The goals are:

1. By 2036, the De Hoop cave complex is in an acceptable ecological condition* and managed to minimise unnatural disturbances.

2. By 2036, archaeological and cultural heritage resources both within the marine and terrestrial environments of the GDHC of cultural significance, or other special value, are sustainably enhanced, valued* by and of benefit* to visitors and local inhabitants.

3. By 2036, the groundwater levels on De Hoop are stable.

4. By 2036, the wetlands, inclusive of seeps, springs and tributaries, on De Hoop are maintained in a Good State*.

5. By 2036, the De Hoop Vlei water quality remains in an acceptable range* based on historical data.

6. By 2036, the wetland buffer and riparian zones of De Hoop are in a fair condition with 50% natural vegetation.

7. By 2036, the De Hoop Vlei water bird community diversity falls within acceptable range, and the total number has stabilised*.

8. By 2036, Cape vulture population on De Hoop is stable to growing* with minimal anthropogenic mortalities*.

9. By 2036, the bontebok population on De Hoop is >250 individuals, has been stable or increasing for three consecutive years and has contributed to bontebok metapopulation management through translocations* for genetic bolstering.

10. By 2036, the Cape mountain zebra population on De Hoop is maintained at two family groups and a bachelor herd of 15-30 individuals in total, for tourism purposes and >60% of the at-risk* dispersers have been relocated to contribute to genetic bolstering of other populations.

11. By 2036, the GDHC maintains over 30% natural vegetation cover.

12. By 2036, the Klipdrifsfontein Estuary is maintained in a Category A condition, and the Heuningnes Estuary is in Category B condition.

13. By 2036, key species* populations, distribution and disturbance events within the De Hoop Marine Protected Area are being accurately monitored to measure change in the population dynamics and provide information that can inform conservation management.

14. By 2036, the GDHC provides managed opportunities for accessing nature and nature-based activities in a manner which is not harmful* to the environment and maintains its sense of place.

15. By 2036 the GDHC promotes and enables environmental awareness and research on all ecological targets and human well-being values.

16. By 2036, the CapeNature's tourism infrastructure within the GDHC is well maintained and visitors are satisfied.

17. By 2036, EPWP staff employment is maximized, and training is provided systematically to address GDHC strategies*.

Threats

Threats and contributing factors that degrade or destroy the GDHC focal conservation targets were identified and unpacked in a conceptual model to illustrate the current conservation situation and to guide the formulation of mitigating strategies.

The main threats to the focal targets were identified as:

1) **Invasive alien plants**
2) **Inappropriate fire regime**
3) **Disturbance and destruction (human activities)**
4) **Poaching**
5) **Illegal activities & access**
6) **Pollution**
7) **Developments/ inappropriate infrastructure**
8) **Over abstraction of ground and surface water**
9) **Natural disease**
10) **Reducing human management**

Reducing human management can be a conservation threat, particularly in areas of human-wildlife conflict where reduced management can lead to increased conflict and negative impacts on both humans and wildlife. Climate change was identified as a threat multiplier for the GDHC which falls within the Overberg region. The major climate change threats for this area according to Dr Stephanie Midgeley are significant droughts coupled with extensive fires. However, the negative impact of these can be reduced through forward thinking planning, preparation, and partnerships.

To effectively assist with mitigating and managing the identified threats and their contributing factors, both inside and outside of its boundaries, the GDHC will incorporate spatial planning tools which include the sensitivity analysis, zonation, and zone of influence determination.

Strategic Plan

A thorough analysis of the GDHC's conservation situation, inclusive of the biological, social, economic, cultural and institutional systems that affect the protected area's focal conservation targets and values, formed the basis for developing conservation strategies and action plans. The aim was to identify opportunities and strategic points where intervention is feasible and likely to have the most significant positive impact towards achieving the goals. CapeNature will lead the implementation of the management plan although achieving the GHDC's vision requires coordinated effort between various key external stakeholders. Eleven key strategies have been identified to assist the GDHC.

These are:

Strategy 1: Promote interest and investment with appropriate partners to inspire connection and develop a plan which will guide the responsible usage, access and maintenance of cultural heritage and archaeological sites in the GDHC.

Strategy 2: Reduce invasive alien plants by developing a fire regime management strategy utilising prescribed burns, effective use of biocontrol agents and optimising wildfire opportunities.

Strategy 3: Contribute to bontebok and Cape mountain zebra metapopulation management by maintaining the desired population ranges on De Hoop through appropriate management actions, including translocations aimed at genetic bolstering.

Strategy 4: Maximise the contribution of the Cape vulture population on Potberg to the metapopulation by working with partners to improve awareness and reduce threats on De Hoop and in its zone of influence.

Strategy 5: Protect the cave ecosystems on De Hoop by reducing anthropogenic disturbance through increased awareness, improved access management, and a better understanding of the current status of De Hoop's bat populations through collaboration with partners.

Strategy 6: Through partnership with relevant stakeholders, address water law compliance, in-stream modification, and best practice for the freshwater ecosystems including De Hoop Vlei in the GDHC and its zone of influence.

Strategy 7: Facilitate and responsibly implement sustainable and clearly defined development, access, and activities within the GDHC through innovative collaboration with partners.

Strategy 8: Conduct monitoring and data analysis of selected species according to sound scientific protocols in collaboration with entities with complementary knowledge mandates.

Strategy 9: Promote co-operative governance and legislative compliance by implementing the De Hoop and De Mond Integrated Compliance Plans and enabling inter-governmental and relevant Non-Governmental Organisations relationships that mitigate negative impacts on biodiversity associated with non-compliance with legislation.

Strategy 10: Implement an integrated environmental awareness programme aimed at neighbours, natural resource users, learner groups, and visitors in collaboration with partners, to nurture respect and care for the natural, cultural, and historical values of the GHDC.

Strategy 11: Contribute to economic and social development by providing job and training opportunities, where relevant, to Expanded Public Works Programme (EPWP), contract, and small, medium, and micro-sized enterprise (SMME) staff within the GDHC.

1 INTRODUCTION

Towards CapeNature's vision of conserving nature for resilience and sustainability (CapeNature 2020a), the organisation's protected area management, in accordance with the purpose of the protected area, strives to:

- Conserve and represent natural habitats and indigenous biodiversity including threatened species for their scientific and conservation value in the Western Cape.
- Conserve representative samples of significant ongoing ecological processes in the evolution and development of ecosystems and communities of plants and animals.
- Provide ecosystem services that benefit people of the Western Cape.
- Manage protected areas effectively and efficiently, including the interrelationships between biophysical, social and economic environments.
- Ensure that protected area planning and management is integrated and participatory.
- Provide for sustainable use and equitable access.

The management plan is a strategic adaptive management framework for the protected area, guided by the Open Standards for the Practice of Conservation (hereafter referred to as the Conservation Standards) (CMP 2020) adaptive management paradigm. The Conservation Standards is dependent upon and promotes stakeholder engagement and participatory planning in the development of the plan. The framework further stimulates the incorporation of mechanisms to facilitate stakeholder engagement and participation during operationalisation of the plan.

The GDHC protected area management plan serves as a reference to the management and development of the GDHC in its current and envisaged future state. It directs management at all levels. The management plan addresses:

- The mandate, human capacity and financial resources that are required to meet goals and objectives based on the condition of natural and cultural targets, and core service areas requiring a focused effort.
- The delivery of socio-economic benefits to neighbouring communities.
- Flexibility of service delivery that encourages innovation and involvement by a wide range of government, community and non-government sectors.
- Performance indicators and accountability measures that provide for regular review and adaptive management.

2 LEGAL STATUS AND BACKGROUND

This section provides a record of the legal status of the protected area, as well as its description, location and includes designation by South Africa in terms of international agreements. Furthermore, it provides an overview of the biophysical, biodiversity, heritage and socio-economic context.

2.1 Legal Status

2.1.1 Name and legal designations

The GDHC, in accordance with the terminology as indicated in the declarations of the Western Cape Biodiversity Act, 2021 (Act No. 6 of 2021), Nature Conservation Ordinance, 1974 (Ordinance 19 of 1974), National Forest Act, 1998 (Act No. 84 of 1998), National Environmental Management: Protected Areas Act (NEM: PAA), 2003 (Act No.57 of 2003), and as reflected on the Protected Areas Register held by the Department of Forestry, Fisheries and the Environment (DFFE), is comprised of:

- De Hoop Provincial Nature Reserve (hereafter referred to as De Hoop)
- De Hoop Marine Protected Area (hereafter referred to as the MPA)
- De Mond State Land ex Forest Nature Reserve (hereafter referred to as De Mond)
- Waenhuiskrans State Land (hereafter referred to as Waenhuiskrans)
- Soetendalsvlei State Land (hereafter referred to as Soetendalsvlei)

Urban Erf 252, located at 33 Main Road and Galjoen Street in Arniston, within the Overberg District Municipality – Cape Agulhas Local Municipality, is included in the GDHC PAMP and is hereafter referred to as Waenhuis Villa.

Apart from the declaration as a Cape Floristic Region Protected Areas World Heritage Site (CFRPA WHS), there have not been any further proclamations for the GDHC since the National Environmental Management: Protected Areas Act (NEM: PAA), 2003 (Act No. 57 of 2003) was promulgated, however this Act takes precedence over the former mentioned legislation with regards to protected areas, and all nature reserves, in this context De Hoop, are therefore considered to be nature reserves in terms of NEM: PAA.

The Protected Areas Register held by DFFE reflects the one provincial nature reserve, marine protected area, and forest nature reserve listed above, with the other components indicated on the map, but not assigned a status. The Heuningnes (RAMSAR site) and Klipdrifsfontein Estuary are also reflected (refer to Section 2.1.5 for more detail).

Most land parcels form part of the Cape Floristic Region Protected Area (CFRPA) WHS, inscribed by United Nations Educational, Scientific, and Cultural Organisation (UNESCO), and proclaimed in terms of the World Heritage Convention Act, 1999 (Act No. 49 of 1999) declared in terms of Notice 72 of 2009 as published in Government Gazette (GG) 31832 of 30 January 2009 and in the Government Gazette 47632 Government Notice 2816 on the 2nd of December 2022. According to NEM: PAA, WHSs are deemed to be one of the types of protected areas in South Africa, however WHSs are governed by the World Heritage Convention Act, 1999 (Act No. 49 of 1999).

The outstanding universal value of the CFRPA WHS, including both the existing inscribed WHS and the now inscribed extension can be briefly summarised as follows (IVC 2015): "The Cape Floristic Region (CFR) is a highly distinctive phytogeographic unit which is regarded as one of the six Floral Kingdoms of the world and is by far the smallest and relatively the most diverse. It is also recognised as the worlds "hottest hotspot" for its diversity of endemic plants and contains outstanding examples of significant ongoing ecological, biological, and evolutionary processes. It also has some of the most important natural habitats for in-situ conservation of biological diversity." The criteria for WHS status which the CFRPA extension meets are (IVC 2015):

Criterion (ix): Outstanding examples representing significant on-going ecological and biological processes in the evolutionand development of terrestrial ecosystems and communities of plants and animals; and

Criterion (x): Contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science and conservation.

As the delegated Management Authority, CapeNature manages the De Hoop MPA with funding from the Department of Forestry, Fisheries and the Environment (DFFE). Provision for the declaration and management of the MPA is through the National Environmental Management: Protected Areas Act 57 of 2003 (NEMA: PAA) and the Marine Living Resources Act 18 of 1998 (MLRA).

A full list of the declarations and status of CapeNature managed land appears in Table 2.1 and 2.2.

Discrepancies and errata associated with De Hoop were uncovered during the compilation of these tables and further to those already noted in the previous De Hoop Protected Area Management Plan (CapeNature 2016a). The map to accompany the 1990 GG proclamation notice which indicates which land parcels were proclaimed in this second proclamation cannot be sourced and used for information validation. Appendix 1. Map 2 details the CapeNature managed boundaries of De Hoop with reference to the proclaimed provincial nature reserve boundary.

To rectify and resolve these irregularities and errors, the re-proclamation of the De Hoop Provincial Nature Reserve boundary is a deliverable included under Section 10 of this PAMP. This will enable examples such as bulleted below, as well as any other discrepancies that may be uncovered on further investigation to be rectified.

- Farm De Hoop 74/1 (108.28ha): is privately owned, is not part of the CapeNature management area and must be deproclaimed.
- Farm Melkkamer Homestead RE/75: only a surveyed portion of 245.14ha is part of the CapeNature management area.
- Farm Reimerskraal RE/323: only a surveyed portion of 1530.66ha is part of the CapeNature management area.
- The Potteberg Estates 516/63 (1.05ha) is privately owned by Transnet National Ports Authority, not proclaimed, and not included in the land parcel list.
- The Potteberg Estates 516/70: (566.95ha) is proclaimed in total however 29ha is not part of the CapeNature management area.

Table 2.1: CapeNature managed land & sea parcels in the GDHC that comprise World Heritage Sites inscribed in 2009 and 2022 in terms of the World Heritage Convention Act, 1999 (Act No. 49 of 1999) and the Marine Protected Area (Appendix 1 Map 3)

Title Deed	Farm name	Farm No.	Portion No.	Extent (ha) [8]	Registration Division	SG Code	Landowner	Proclamation date	Proclamation No.	Govt. Gazette	Status
De Hoop											
T14000/1958	Windhoek	78	1	730.9550 [1]	Bredasdorp	C01100000000007800001	RSA – Provincial	10/12/1976 02/04/1990	409/1976 29/1990 [2]	4638	Provincial Nature Reserve
T14000/1958	Windhoek	78	2	473.668 [1]	Bredasdorp	C01100000000007800002	RSA – Provincial	10/12/1976 02/04/1990	409/1976 29/1990 [2]	4638	Provincial Nature Reserve
T10830/1960	Windhoek	78	3	176.1028 [1]	Bredasdorp	C01100000000007800003	RSA – Provincial	10/12/1976 02/04/1990	409/1976 29/1990 [2]	4638	Provincial Nature Reserve
T30589/1975	Farm 74	74	4	80.35	Bredasdorp	C01100000000007400004	RSA – Provincial	10/12/1976 02/04/1990	409/1976 29/1990 [2]	4638	Provincial Nature Reserve
T1169/1978	Farm 74	RE/74	-	3503.989 [1]	Bredasdorp	C01100000000007400000	RSA – Provincial	10/12/1976 02/04/1990	409/1976 29/1990 [2]	4638	Provincial Nature Reserve
T11958/1956	Cupidoskraal	62	7	283.6962 [1]	Bredasdorp	C01100000000006200007	RSA – Provincial	10/12/1976 02/04/1990	409/1976 29/1990 [2]	4638	RSA – Provincial
T1169/1978	Drank Vlei	74	2	5570.028 [1]	Bredasdorp	C01100000000007400002	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve
T32644/1977	Skihaven	337	2	55.17	Bredasdorp	C01100000000033700002	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve
T14577/1978	Cupido's Kraal	62	11	296.012	Bredasdorp	C01100000000006200011	RSA – Provincial	10/12/1976 02/04/1990	409/1976 29/1990 [2]	4638	Provincial Nature Reserve
T18793/1978	Potteberg Mountain Annex	516	15	518.1747 [1]	Swellendam	C07300000000051600015	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve
T18793/1978	Uitvlugt	517	-	1258.368 [1]	Swellendam	C07300000000051700000	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve

Title Deed	Farm name	Farm No.	Portion No.	Extent (ha) [8]	Registration Division	SG Code	Landowner	Proclamation date	Proclamation No.	Govt. Gazette	Status
T18793/1978	The Potteberg Estates (Collies Nek)	516	17	762.3863 [1]	Swellendam	C07300000000051600017	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve
T1188/1979	The Potteberg Estates	516	16	4899.132 [1]	Swellendam	C07300000000051600016	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve
T5375/1971	The Potteberg Estates (Cupido's Kraal)	516	1	1765.559 [1]	Swellendam	C07300000000051600001	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve
T23448/1966	The Potteberg Estates	516	RE/4	752.8264 [1]	Swellendam	C07300000000051600004	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve
T56315/2013	The Potteberg Estates (Eiland's Pad)	516	5	373.4183 [1]	Swellendam	C07300000000051600005	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve
T33349/1985	The Potteberg Estates (a portion of Eiland'sPad)	516	31	364.55 [1]	Swellendam	C07300000000051600031	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve
T33349/1985	The Potteberg Estates	516	RE/6	1179.6418 [1]	Swellendam	C07300000000051600006	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve
T9910/1955	The Potteberg Estates (Papekuils Fontein)	516	9	1018.6163 [1]	Swellendam	C07300000000051600009	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve
T9910/1955	The Potteberg Estates (Wit Water)	516	11	1195.0056 [1]	Swellendam	C07300000000051600011	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve
T50724/1987	The Potteberg Estates	516	RE/14	1375.9459 [1]	Swellendam	C07300000000051600014	RSA – Provincial	Unconfirmed	Unconfirmed [5]	Unconfirmed	Unconfirmed
T50724/1987	The Potteberg Estates	516	27	230.4999 [1]	Swellendam	C07300000000051600027	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve
T50725/1987	The Potteberg Estates	516	18	900.1609 [1]	Swellendam	C07300000000051600018	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve

Title Deed	Farm name	Farm No.	Portion No.	Extent (ha) [8]	Registration Division	SG Code	Landowner	Proclamation date	Proclamation No.	Govt. Gazette	Status
T5400/1958	The Potteberg Estates (Nutsie)	516	20	3.6045 [1]	Swellendam	C07300000000051600020	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve
T5400/1958	The Potteberg Estates (Nutsie West)	516	21	1.9951 [1]	Swellendam	C07300000000051600021	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve
T5400/1958	The Potteberg Estates (Nutsie East)	516	22	10.4557 [1]	Swellendam	C07300000000051600022	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve
T5400/1958	The Potteberg Estates	516	24	43.1687 [1]	Swellendam	C07300000000051600024	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve
T5400/1958	The Potteberg Estates	516	26	3.9428	Swellendam	C07300000000051600026	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve
T50922/1981	The Potteberg Estates (Blou Krans)	516	23	15.2741 [1]	Swellendam	C07300000000051600023	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve
T50922/1981	The Potteberg Estates	516	35	3.5447	Swellendam	C07300000000051600035	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve
T29215/1987	The Potteberg Estates	516	25	10.5912 [1]	Swellendam	C07300000000051600025	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve
T36676/1990	The Potteberg Estates	516	28	839.3177 [1]	Swellendam	C07300000000051600028	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve
T20128/1991	The Potteberg Estates	516	29	557.754 [1]	Swellendam	C07300000000051600029	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve
T5375/1971	The Potteberg Estates	516	30	771.4891 [1]	Swellendam	C07300000000051600030	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve
T22525/1988	The Potteberg Estates	516	37	411.6706 [1]	Swellendam	C07300000000051600037	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve

Title Deed	Farm name	Farm No.	Portion No.	Extent (ha) [8]	Registration Division	SG Code	Landowner	Proclamation date	Proclamation No.	Govt. Gazette	Status
T18278/1991	The Potteberg Estates	516	46	1178.653 [1]	Swellendam	C07300000000051600046	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve
T28818/1974	The Potteberg Estates	516	57	25.4533 [1]	Swellendam	C07300000000051600057	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve
T28819/1974	The Potteberg Estates	516	58	25.3712	Swellendam	C07300000000051600058	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve
T18892/1991	The Potteberg Estates	516	59	25.3201	Swellendam	C07300000000051600059	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve
T51045/1980	The Potteberg Estates	516	60	25.2073	Swellendam	C07300000000051600060	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve
T9576/1988	The Potteberg Estates	516	61	25.4169	Swellendam	C07300000000051600061	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve
T12682/1986	The Potteberg Estates	516	70	537.94 [3]	Swellendam	C07300000000051600070	RSA – Provincial	02/04/1990	29/1990 [2]	4638	Provincial Nature Reserve
T44440/1985	Melkkamer Homestead	RE/75	-	245.14 [4]	Bredasdorp	C01100000000007500000	RSA – Provincial	02/04/1990	29/1990 [6]	4638	Provincial Nature Reserve
T3898/1985	Reimerskraal	RE/323	-	28.07 [4]	Bredasdorp	C01100000000032300000	RSA – Provincial	02/04/1990	29/1990 [6]	4638	Provincial Nature Reserve
De Mond											
T9904/1939	Klipfontein	272	1	151.6340	Bredasdorp	C01100000000027200001	RSA	17/10/1986 declared as State Forest Nature Reserve and 23/09/2005 released from State Forest	2136/1986 and 925/20025	10487 and 28058	State Land released from State Forest Nature Reserve.
T16579/79	Zoetendals Vlei	280	9	335.8196	Bredasdorp	C01100000000028000009	RSA	17/10/1986 declared as	2136/1986 and 925/20025	10487 and 28058	State Land released

Title Deed	Farm name	Farm No.	Portion No.	Extent (ha) [8]	Registration Division	SG Code	Landowner	Proclamation date	Proclamation No.	Govt. Gazette	Status
								State Forest Nature Reserve and 23/09/2005 released from State Forest			from State Forest Nature reserve
T2289/1940	Bushy Park	269	3	145.4994	Bredasdorp	C01100000000026900003	RSA	27/03/1975 and 17/10/1986 declared as State Forest Nature Reserve and 23/09/2005 released from State Forest	2136/1986 and 572/1975	4637 and 10487	State Land released from State Forest Nature Reserve
T15864/1961	Bushy Park	269	4	3.4991	Bredasdorp	C01100000000026900004	RSA	27/03/1975 and 17/10/1986 declared as State Forest Nature Reserve and 23/09/2005 released from State Fores	2136/1986 and 572/1975	4637 and 10487	State Land released from State Forest Nature Reserve
T2565/1981	Bushy Park	269	5	279.5546	Bredasdorp	C01100000000026900005	RSA	17/10/1986 declared as State Forest Nature Reserve and 23/09/2005 released from State Fores	2136/1986	10487	State Land released from State Forest Nature Reserve
Not registered	De Mond	276	0	414.9763	Bredasdorp	C01100000000027600000	RSA	Not registered	Not registered	Not registered	State Land
MPA											
N/A	De Hoop Marine Protected Area	N/A	N/A	28960.82 [7]	N/A	N/A	RSA	29/12/2000	No R. 21948	1429/2000	Marine Protected Area

[1] Discrepancy in >1 hectare across various published sources.

[2] The map referred to in the GG 4638 No 29 of 1990 which details exactly which properties are included in this proclamation could not be sourced and the assumption is made that this land parcel is included in this proclamation.

[3] The total area for 516/70 is 566.94 hectares however 29 hectares in the middle of the land parcel is fenced off and managed by Denel OTR as an instrumental site and this area is thus excluded from the CapeNature managed area.

[4] Only a surveyed portion of the entire cadastre is managed by CapeNature and should be included as part of the De Hoop Provincial Nature Reserve with World Heritage Site status.

[5] This land parcel cannot be assumed as declared provincial nature reserve in the 1990 proclamation due to archive information from CapeNature 2006 GIS Reserve Cadastre attribute table information which indicates that this land parcel was not proclaimed (T Forsyth, personal communication, 2025)

[6] There is no confirmation as to whether the entire cadastre or part thereof was included in the 1990 GG Provincial Nature Reserve proclamation.

[7] The De Hoop MPA declaration in 2000 does not state the area only the coordinates one of which is incorrect. The area in this table is derived from a shapefile which corrected the boundary was adjusted with a realignment of the high-water mark against aerial imagery (T Forsyth, personal communication, 2025).

[8] The area stated in this above table is according to title deed and SG diagram. It may differ from areas calculated in CapeNature spatial layers which are used for the METT assessments.

Table 2.2: CapeNature managed land parcels in the GDHC that comprise of State Land (ex-State Forests) not inscribed as a World Heritage Site

Title Deed	Farm name	Farm No.	Portion No.	Extent (ha) [1]	Registration Division	SG Code	Landowner	Proclamation date	Proclamation No.	Govt. Gazette	Status
De Mond Cluster											
T12540/1964	Arniston	Remainder of Erf 171	n/a	186.3323	Arniston	C01100020000017100000	RSA	07/12/1979 declared as State Forest and 23/09/2005 released from State Forest	Government Notice 2753/1979 and 925/20025	6764 and 28058	State Land released from State Forest
T18334/1975	33 Main Road & Galjoen Street	Erf 252	n/a	0.10195	Arniston	C01100020000025200000	RSA	n/a	n/a	n/a	Residential erf
T9434/1972	Dollas Downs	264	11	37.6529	Bredasdorp	C01100000000026400011	RSA	23/12/1977 declared as State Forest and 23/09/2005 released from State Forest	Government Notice 2579/1977 and 925/20025	5837 and 28058	State Land released from State Forest
T9434/1972	Dollas Downs	264	10	30.3398	Bredasdorp	C01100000000026400010	RSA	23/12/1977 declared as State Forest and 23/09/2005 released from State Forest	Government Notice 2579/1977 and 925/2005	5837 and 28058	State Land released from State Forest

[1] As per Government Gazette notices.

2.1.1.1 Contractual agreements

CapeNature contractual agreements with non-governmental organisations (NGO's) and Government Departments for the GDHC are as follows:

- Memorandum of Agreement (MOA) with the DFFE regarding the management of the De Hoop MPA by CapeNature.
- Memorandum of Understanding (MOU) with the NGO, Southern African Foundation for the Conservation of Coastal Birds (SANCCOB), to support CapeNature with the establishment and monitoring of the African Penguin colony at Infanta.
- The Working on Fire (WoF) MOA with CapeNature was renewed in August 2023. This agreement allows for integrated fire management across the landscape through the planning, supervision and control of firefighting teams and associated resource allocation. It puts suitably trained teams in appropriate working environments in place according to both party's Best Operating Practices, Standard Operating Guidelines, Standard Operating Procedures, policies, standards and procedures.
- Contract with the Government through the Expanded Public Works Programme (EPWP), which is a medium to long-term strategy to reduce unemployment and alleviate poverty through the creation of work opportunities using labour-intensive methods. The new contract period will commence on 01 April 2025 and will be running for a three-year period.
- Handing over Certificate with National Department of Public Works and Infrastructure for the possession and occupation of Erf 252, 33 Main Road & Galjoen Street, Arniston, situated in the Cape Agulhas Municipality within the Overberg District Municipality.
- Public-Private Partnerships with De Hoop Collection (Pty) Ltd., Morukuru Family De Hoop Beach Lodge, Ocean House, and Natural Selection Lekkerwater Beach Lodge regarding the contractual lease and development of tourism facilities within De Hoop.
- Service Level Agreements (woodcutters, tourism, integrated catchment management (ICM).
- Land Use Agreement with Denel Overberg Test Range (OTR) for access and weapons testing.
- Short term MOA (3 years) with Sebastian`s Transport for De Mond.
- Short-term, (1-3 years) Service Level Agreements with suppliers for:
    - The Whale Trail: cleaning & portage
    - De Hoop main entrance gate: access control and security
    - Road maintenance: grading of internal gravel road servicing tourism products
    - Restoration: invasive alien plant control

2.1.2 Location, extent and highest point

The GDHC is situated in the Overberg District, Western Cape, South Africa. It is approximately 64 481 ha in extent and situated between latitudes 34° 28' S and 34° 42' S, and longitudes 20° 52' E and 19° 58' E. The GDHC falls within the quarter degree grid squares 3420 AD Wydgeleé, 3420 BC Malgas, 3420 BD Cape Infanta and 3420 CA & CC Bredasdorp. The highest mountain peak, Potberg trig beacon 28, situated on the Potberg Mountain, is 611 metres above sea level. The highest coastal spot height on De Mond is 40 metres above sea level.

De Hoop

De Hoop covers an area of approximately 34 016 ha (340 km^2), as calculated in the CapeNature GIS Reserve Cadastre spatial layer, between latitudes 34^o 21' 38" S and 34^o 30' 34" S, longitudes 20^o 18' 47" E and 20^o 52' 14" E. The midpoint is at approximate latitude 34^o 25' 40" S and longitude 20^o 35' 22" E.

Adjacent to its western boundary is the Denel OTR which was established for the purpose of missile testing and is still used as such. Farming areas with extensive grain crops as well as small stock and ostriches make up the northern border of De Hoop. To the east are natural areas used for recreation purposes and some farming. The St. Sebastian Private Nature Reserve and Lower Potteberg Conservancy border in the far south-eastern corner of the reserve. The hamlet of Infanta is just east of De Hoop.

The Breede River flows into the sea approximately 2 km east of De Hoop's eastern boundary.

De Mond

De Mond extends over an area of approximately 915.5494 ha (9.15 km²) as calculated in the CapeNature GIS Reserve Cadastre spatial layer, with midpoint is at approximate latitude 34° 42.4' S and longitude 20° 06.3' E.

It is largely covered by dune fields, includes the Heuningnes Estuary and is situated between Arniston in the north-east and Struisbaai in the south-west. The Heuningnes Estuary is the southernmost estuary in Africa. De Mond is accessible by a 23 km tar and gravel road from Bredasdorp. The turn-off onto the gravel road leading to the De Mond is approximately 15 km from Bredasdorp (Hoekstra & Waller 2014).

Waenhuiskrans

Waenhuiskrans covers an area of approximately 254.325 ha (2.53 km²) as calculated in the CapeNature GIS Reserve Cadastre spatial layer, with midpoint at approximate latitude 34° 40.5' S and longitude 20° 13.3' E. This area is also largely dune field and approximately 11 km north-east of De Mond via the R316 and adjacent to the coastal town of Arniston. It can be accessed from the road to Roman Beach on the southern boundary of the town (Hoekstra & Waller 2014).

In February 2025, the National Department of Public Works and Infrastructure formally transferred vacant possession and occupation of Erf 252 measuring 0.08365 hectares (836.5 m²) situated in the town of Arniston to CapeNature for official use, until further notification.

Soetendalsvlei

Soetendalsvlei covers an area of approximately 335.8196 ha (3 km²) as calculated in the CapeNature GIS Reserve Cadastre spatial layer, with midpoint is at approximate latitude 34° 40.5' S and longitude 20° 13.3' E.

This property is west of De Mond and can be reached via the Zoetendalsvlei farm off the R319 between Bredasdorp and Struisbaai. This property lies in the middle of the Soetendalsvlei, and adjacent to the Agulhas National Park. A land transfer of the property to SANParks is currently in process.

De Hoop Marine Protected Area

Adjacent to the reserve's coastal boundary and to a section of the Denel OTR's coastal boundary is the De Hoop MPA. It covers an area of approximately 28 960 ha (289 km²) as calculated in the CapeNature GIS Reserve Cadastre spatial layer, and stretches along a coastline of approximately 45 km adjacent to De Hoop and for a further approximately 12 km adjacent to Denel OTR (from Stilbaai Point in the east to a point between Ryspunt and Skipskop in the west) and extends three nautical miles (5 km) offshore into the Indian Ocean.

The boundary of this MPA is gazetted in Government Notice 1429 dated 20 December 2000 as follows:

It is bounded by the high water mark, a line (1 14° true bearing) drawn from the beacon marked D1-fl, situated near Stilbaai Point (34 °27'.13S; 020° 052' -.25 E), another line (150' true bearing) drawn from the beacon marked DH2, situated between Rys Point and Skipskop (34 °34'.94S; 020°21'.89E), and a seaward boundary, which is a series of straight lines joining the following positions, each three nautical miles from the shore:

34°28'.378 S; 20°55'.653E,

34°28'.385S; 20°55'.397E (incorrect),

34°30'.378S; 20°53'.904E,

34°31'.295S; 20°51'.277E,

34°31'.088S; 20°48'.865E,

34°30'.416S; 20°45'.593E,

34°29'.850S; 20°41'.128E,

34°30'.438S; 20°34'.900E,

34°32' 329S; 20°29'.699E,

34°37'.600S; 20°23'.757E.

The coordinate 34°28'.385S; 20°55'.397E is however erroneous as it does not follow the description and is not three nautical miles from the shore. The correct coordinate could not be sourced. The current CapeNature published boundary is drawn using only the correct coordinates. To fix this, an amendment to the proclamation will have to be done. This action has been included in the Strategic Plan in Section 10. The high-water mark is based on SG diagram descriptions of the properties incorporated into De Hoop.

The MPA is gazetted as a no-take MPA which restricts any extractive use. No fishing (shore or boat based) is allowed between the beacon DH1 at Still Bay Point and the beacon DH2 between Rys Point and Skipskop, extending three nautical miles seawards from the high-water mark. Bait collection is also prohibited.

The location and extent of the GDHC is illustrated in Appendix 1 Map 1.

2.1.3 Municipal jurisdiction

The GDHC is situated within the following district and local municipal boundary:

- Overberg District Municipality:
- Cape Agulhas Municipality

Municipalities within which the GDHC occurs is illustrated in Appendix 1 Map 1.

2.1.4 International, national and provincial listings

UNESCO World Heritage Site:

The Cape Floral Region Protected Areas (CFRPA) was proclaimed as a World Heritage Site based on the outstanding universal value of its significant on-going ecological and biological processes and the presence of some of the world's most important natural habitats for the conservation of biodiversity, meeting criteria (ix) and (x), respectively (DEAT 2003). The widespread and exceptional plant richness and endemism of the Cape Floristic Region (CFR) is related to its biophysical diversity. Carefully considered protected areas, representative of all eight phytogeographic centres of endemism, were selected as the World Heritage Sites representative of this unique and globally significant region (DEAT 2003). The GDHC constitutes one of these, namely the Northwest Phytogeographic Centre of Endemism (Goldblatt & Manning 2000).

Seven of the eight originally inscribed protected area complexes (DEAT 2003) in the CFRPA WHS conserve close to half the number of plant species and selected vertebrate taxa of the region (Lombard 2000). This figure is even higher for endemic plants (69%) and for Proteaceae elements (59%). Preliminary results from Bradshaw & Holness (2013) indicate that 27 vegetation types that are not

conserved anywhere else in the CFR are conserved by the inscribed CFRPA World Heritage Site. A further 48 of the total 119 vegetation types currently recognised in the CFR (Mucina & Rutherford 2006), and that are not protected elsewhere, are protected by the extended CFRPA World Heritage Site bringing the total to 75 of 119 CFR vegetation types, protected nowhere else in the world.

The GDHC is inscribed as part of the Cape Floral Region Protected Areas (CFRPA) WHS. De Hoop was part of the initial inscription with the United National Educational, Scientific and Cultural Organisation (UNESCO) in July 2004, which was inscribed in terms of the World Heritage Convention Act (Act 49 of 1999) on 30 January 2009 (GN 72, GG 31832). De Mond was part of the extension of the World Heritage Site which was inscribed by UNESCO in 2015 (DEA 2015) and declared in terms of the World Heritage Convention Act on 2 December 2022 (GN 2816, GG 47632).

The CFRPA WHS comprises a serial property covering a total area of approximately 1 094 742 ha and includes a buffer zone of 798 514 ha (UNESCO 2024) designed to facilitate functional connectivity and mitigate the effects of global climate change and other anthropogenic influences (IVC 2015).

The criteria for World Heritage Site status which the CFRPA meets are (IVC 2015):

- Criterion (ix): Outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial ecosystems and communities of plants and animals; and
- Criterion (x): Contain the most important and significant natural habitats for *in-situ* conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science and conservation.

The GDHC represents outstanding examples of significant ongoing ecological and biological processes in the evolution of terrestrial ecosystems and plant communities (DEAT 2003) such as a natural fire regime and natural flow of water through the area, supporting indigenous species assemblages and connectivity for species migration, gene flow, dispersal, *etc.* The GDHC contains important and significant natural habitats for *in-situ* conservation of biological diversity, including those containing threatened species of outstanding universal value (DEAT 2003).

Key motivating factors for the GDHC's inclusion are:

- De Hoop is one of the few reserves of a significant size that protects and conserves important lowland fynbos and coastal vegetation, which is at great risk to development elsewhere in the Cape. De Hoop contains unique limestone habitats with localised endemic plant species and is further bounded by a marine protected area representing a zone of confluence of two oceans, creating an area of rich marine biota.
- De Mond and Soetendalsvlei are two components within the Agulhas Complex of the CFRPA WHS. The primary reasons for their inclusion into the CFRPA are to improve representation of vegetation types within the CFRPA, as well as to increase and improve the overall size, connectivity and integrity of the CFRPA, thus ensuring protection of an increased land area. The Agulhas Complex improves connectivity between the inscribed De Hoop Nature Reserve and Boland Complex elements of the CFRPA, thereby increasing resilience in the face of global climate change and optimising both biodiversity pattern and process.

Marine Protected Area:

On 27 July 1990, the area within 3 nautical miles (5.556 km) of the high-water mark of the sea between beacon DH1 near Stilbay Point in the east and beacon DH2 between Ryspunt and Skipskop in the west was proclaimed as the De Hoop Marine Reserve under the Sea Fishery Act (Act No 12 of 1988) (Government Gazette 12667, Government Notice 1810).

The Sea Fishery Act was repealed by the Marine Living Resources Act (Act No 18 of 1998). De Hoop MPA was declared in terms of Section 43 of the Marine Living Resources Act under Government Notice R1429 in Government Gazette 21948 dated 29 December 2000.

The National Environmental Management: Protected Areas Amendment Act (Act 21 of 2014) repealed Section 43 of the Marine Living Resources Act dealing with MPAs. Section 91 of the National Environmental Management: Protected Areas Act (NEM: PAA) (Act 57 of 2003) introduced in Act 21 of 2014 provides for all MPAs declared in terms of the Marine Living Resources Act to be deemed to be MPAs in terms of Section 22A of NEM: PAA.

Ramsar Site:

There are two sites declared according to the Ramsar Convention (Convention on Wetlands of International Importance especially as Waterfowl Habitat) namely the De Hoop Vlei within De Hoop and De Mond inclusive of the Heuningnes Estuary within its boundary.

De Hoop Vlei was designated as a Ramsar Wetland of International Importance site on 13 March 1975. The extent of the Ramsar site is 750 ha and consists of the coastal lake known as the De Hoop Vlei (Ramsar 1998a) within the De Hoop boundary. There is a process underway to investigate including the northern sections of the De Hoop Vlei which are on private property.

De Mond was designated as a Ramsar Wetland of International Importance site on 2 October 1986. The extent of the Ramsar site is 918 ha and consists of the full extent of De Mond (Ramsar 1998b).

De Hoop Vlei and De Mond meet four of the nine criteria to be eligible as a Ramsar site (Ramsar 1998a, Ramsar 1998b). These are depicted in Table 2.3.

Table 2.3: Four of the Ramsar site criteria fulfilled by De Hoop Vlei and De Mond

Criteria	De Hoop Vlei	De Mond
Criterion 1: Representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region.	The De Hoop Vlei is unique in the south-western Cape as it is a coastal lake with no outlet to the sea with widely fluctuating salinities from ±3 ppt to 60 ppt.	The Heuningnes Estuary is the most southerly estuary in Africa and is therefore scientifically important for species distribution extremities. Three tropical species, the ginger prawn (*Penaeus japonicus*), the giant mud crab (*Scylla serrata*), both crustaceans, and a tropical gastropod, *Nerita albicilla*, have been recorded in this estuary. These are the southernmost distribution records for these species.
Criterion 2: Threatened (Critically Endangered (CR), Endangered (EN) or Vulnerable (VU) species or threatened ecological communities.	Wetland dependent bird species that are listed in the South African Red Data Book (Brooke, 1984) for which De Hoop Vlei is a critical habitat include (maximum number recorded): • *Pelecanus onocrotalus*: 60 • *Ixobrychus minutus*: occasional • *Ciconia nigra*: 14 • *Phoenicopterus ruber*: 1473 • *Phoeniconaias minor*: 1715 • *Hydroprogne caspia*: 11 • *Charadrius pallidus*: occasional	The main motivation for registration of this wetland is the importance for the Damara Tern (*Sterna balaenarum*). This species is listed as Rare, (Brooke, 1984) and is possibly the rarest resident sea bird in South Africa (Cooper 1983). It is endemic to southern Africa. Cooper (1983) estimated that about 15 % of the national population of this species can be found in this wetland area. The Caspian Tern (*Hydroprogne caspia*) according to Bickerton (1984) also uses this area as a breeding area. This species is classified as Rare in the SA Red Data Book Aves (Brooke, 1984).

Criteria	De Hoop Vlei	De Mond
Criterion 3: Populations of plant and/or animal species important for maintaining the biological diversity of a particular biogeographic region.	Seventy-five wetland dependent bird species have been recorded on the De Hoop Vlei. The most numerous bird species include: Yellow-billed duck *(Anas undulata)*: Maximum of 4626 recorded, which represents 7,1% of the South African population. Cape shoveler *(Anas smithii)*: Maximum of 3004 recorded, which represents 15,0% of the estimated world population. The maximum of 1216 moulting birds that has been recorded represents more than 6% of the world population. Great while pelican *(Pelecanus onocrotalis)*: Maximum of 60 recorded, which represent 9% of the regional south-western Cape population. Red-knobbed coot *(Fulica cristata)*: Maximum of 24 400 recorded and more than 10 000 regularly present. Large numbers of greater (*Phoenicopterus roseus)* and lesser flamingos (*Phoeniconaias minor*) are also regularly present.	A large colony (± 300 pairs) of Kelp Gulls (*Larus dominicanus*) breed in the reserve, several African Black Oystercatchers (*Haematopus moquini*) and Blue Crane (*Anthropoides paradisea*) nests have also been reported in the area (Bickerton, 1984).
Criterion 4: Plant and/or animal species at a critical stage in their life cycles or provides refuge during adverse conditions.	De Hoop Vlei is of special regional importance as one of a "chain" of wetlands along the southern Cape coast.	The De Mond area is one of the very few confirmed breeding areas of Damara Tern and is one of only two breeding sites in South Africa falling within a Nature Reserve (Cooper 1983). The dune areas and pebble slacks of the beaches to the northeast and southwest of the estuary are suitable for nesting sites while the estuary is a vital foraging ground for the birds and is used as a meeting ground during pair formation.

2.2 Biophysical Description

2.2.1 Climate

The pattern of hot, dry summers and temperate, wet winters experienced in the Western Cape is known as a Mediterranean climate. Maximum temperatures are experienced in January and February, with a mean maximum of 29°C for De Hoop and 26°C for De Mond. The minimum temperatures usually occur in July and August, with a mean daily minimum of 6°C for De Hoop and 8°C for De Mond, as per Figure 2.1 and Figure 2.2.

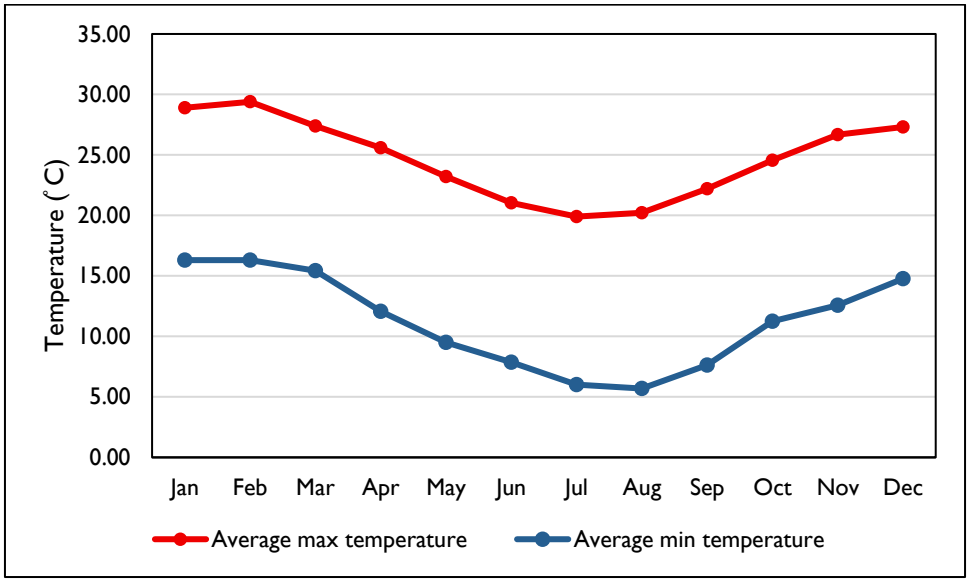


Figure 2.1: Mean annual temperature of De Hoop for the period 2018-2023 (CapeNature unpublished data)

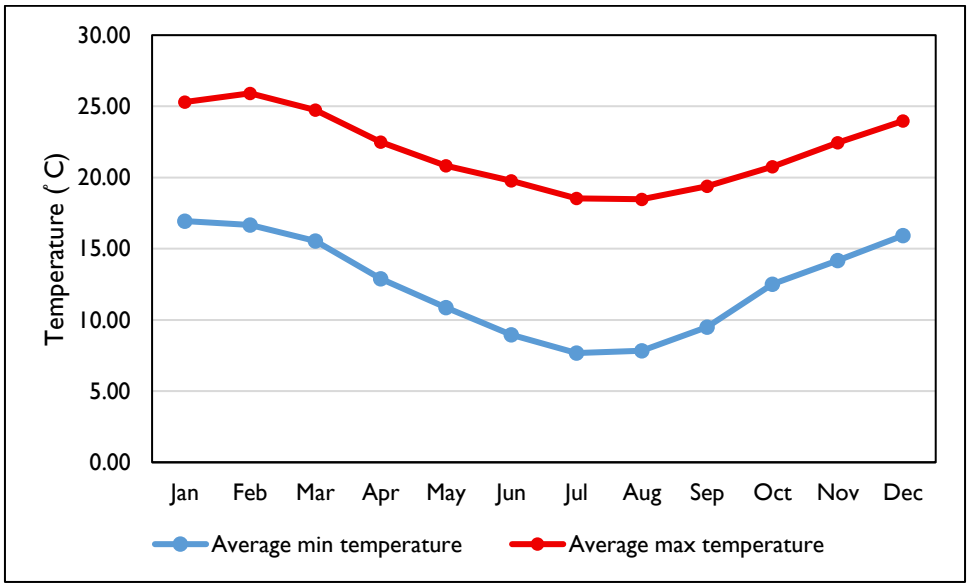


Figure 2.2: Mean annual temperature of Waenhuiskrans, De Mond for the period 2018-2024 (CapeNature unpublished data)

Rainfall has been recorded at De Mond since 1979. The highest rainfall recorded is 762 mm (De Mond 2021) and the lowest rainfall of 280.8 mm (De Mond 1982). The mean annual rainfall is approximately 520 mm for De Hoop and 460 mm for De Mond. The highest rainfall recorded for De Hoop is 802 mm during 2023 (CapeNature unpublished data).

Rainfall has historically occurred primarily during the months of April to late August. Figures 2.3 and 2.4 show a peak in rainfall for both De Hoop and De Mond in April, but De Hoop had another peak in September, which can be linked to the recent tendency of cut-off low systems during the last few years. Average rainfall for De Hoop and De Mond is showed in Figure 2.5 and Figure 2.6.

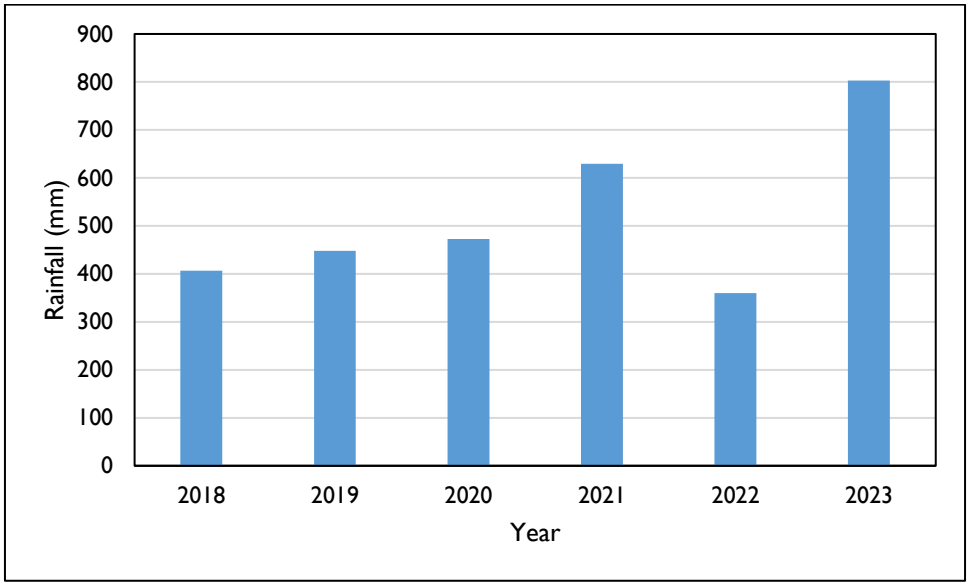


Figure 2.3: Total annual rainfall of De Hoop for the period 2018-2023 (data obtained from Meteostat.net)

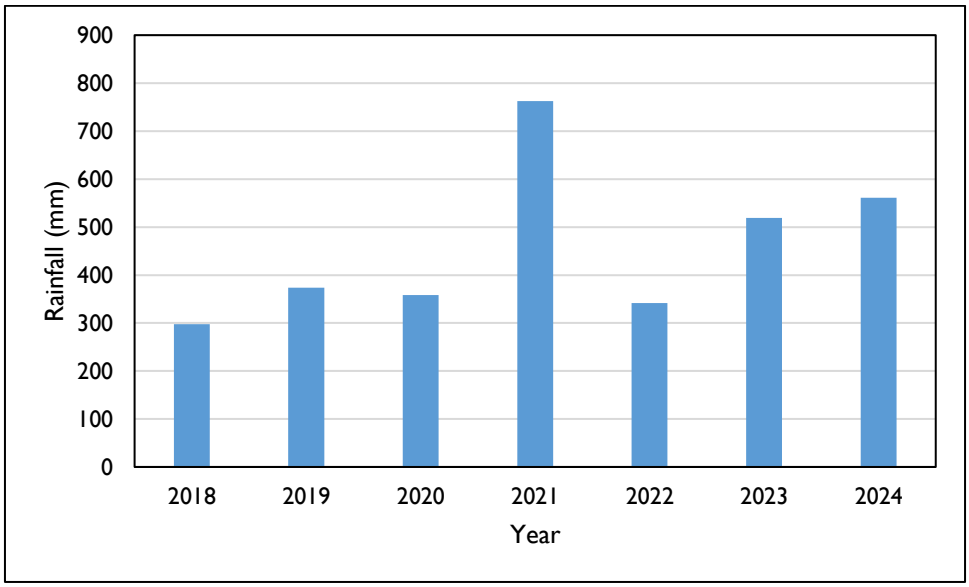


Figure 2.4: Total annual rainfall of De Mond for the period 2018-2024 (CapeNature unpublished data)

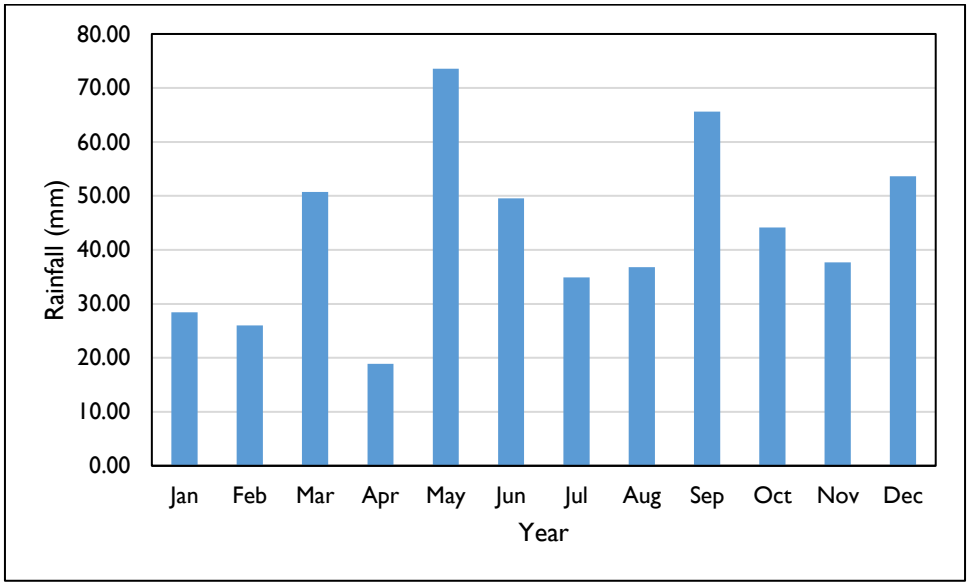


Figure 2.5: Average monthly rainfall of De Hoop for the period 2018-2023 (data obtained from Meteostat.net)

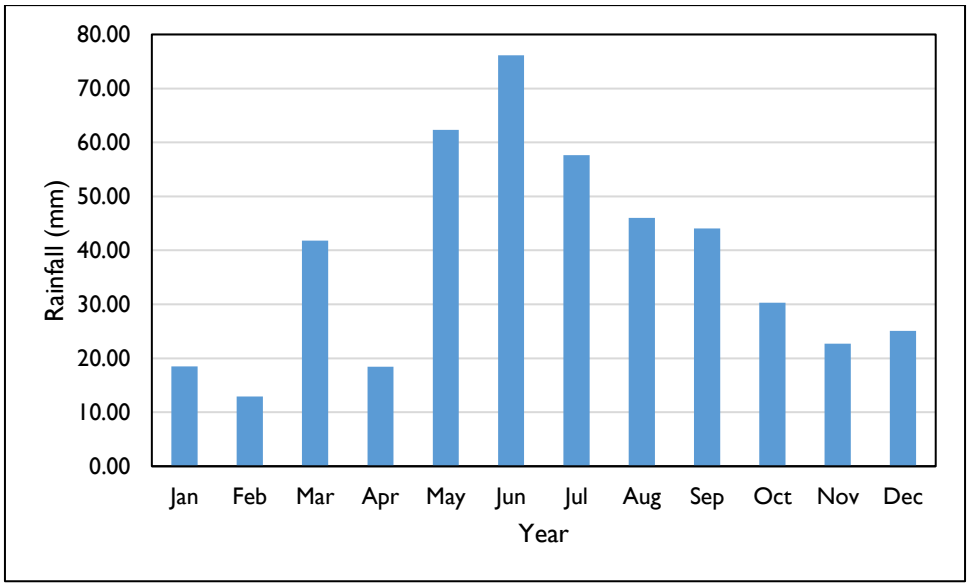


Figure 2.6: Average monthly rainfall of De Mond for the period 2018-2024 (CapeNature unpublished data)

Windy conditions are prevalent, especially in the summer when the prevailing wind direction is south-westerly, with an average speed of 35 km/h. Wind speeds can exceed 60 km/h or higher at times (Data obtained Meteostat.net).

2.2.2 Topography

The GDHC has natural physical features of mountains, lower slopes & sandy foothills, hard dunes, depressions, gorges and mobile dune fields (Fig. 2.7) and is represented spatially in Appendix 1 Map 4.

The description below for De Hoop is summarised from Toens and Associates CC (1994).

The northern boundary of the GDHC is characterised by the high-lying terrain of the Potberg Range and the hard dunes (limestone hills) with a maximum height of 611 m and 224 m above sea level

respectively. The land surface drops to the southwest in a series of four distinct terraces. These terraces, at elevations of 90 to 100 m; 60 m; 30 to 40 m and 15 to 20 m are a result of marine transgressions. Separating the hard dunes from the Potberg Range and the hard dunes from the gentle undulating topography to the north is a border depression which in the northwest contains the Potbergs River. The Sout River has cut a deep, steep sided gorge through the hard dunes and discharges into De Hoop Vlei which is separated from the sea by the Witsand dune field.



Figure 2.7: The topography of the De Hoop Vlei and Sout River with steep sided gorge (Photo: Mark Johns)

The limestone terrain exhibits typical karst topography which is developed to varying degrees on the different terraces. Solutions and subsidence features include dolines and uvalas (circular or oval depressions of moderate depression) and poljes (elongated enclosed depression of large dimensions). Caves occur within the limestone and are particularly extensive beneath the hard dunes. The predominant orientation is east to west (Fig. 2.8).



Figure 2.8: The topography of the coastal limestone cliffs and caves (Photo: Mark Johns)

The Table Mountain Group (TMG) quartzites form steep sided ridges with sharp apices separated by V-shaped valleys. These strata dip northwards, forming steeper slopes on the southern side of the ranges (scarp slopes) and more gentle dipping northerly slopes (dip slopes). Soil cover on the Potberg Mountain is sandy and generally limited in depth (Fig. 2.9). Thick boulder talus deposits and alluvial fans can be expected at the foot of the range. The TMG quartzites form sea cliffs where they are exposed beneath the Bredasdorp limestone between Hamerkop and Infanta. Soil cover on the limestone terrain is generally thin; however, there may be a thick cover of windblown sand in places. A hard calcretized soil horizon generally occurs on the surface.



Figure 2.9: The topography of the Potberg Mountain range the sandy plain foothills of the Potberg Valley (Photo: Mark Johns)

The description below for De Mond is summarised as follows.

De Mond (Fig. 2.10) and Waenhuiskrans dune fields stretch from the high-water mark to a maximum height of 26m and 56m respectively above sea level. Waenhuiskrans consists of hard and mobile dunes.

Soetendalsvlei is a water body at 4 metres above sea level and surrounded by a relatively flat landscape.



Figure 2.10: The Heuningnes River is mostly open to the sea and flanked by dune fields (Photo: Mark Johns)

2.2.3 Geology and soils

The geology and soils of the GDHC are representative of the Overberg coastal region and comprise of hard to weather sandstones, softer weathering shales and mudstones, capped by younger limestones and coastal dunes.

The Potberg Mountain Range, reaching a height of 611 meter above sea level, is comprised of TMG sediments within the Cape Supergroup. Here the light-grey, coarse grained, quartzitic sandstone of the Peninsula Formation and the Nardouw Subgroup form the bulk of the mountain. The shales and tillites of the Cederberg and Pakhuis Formations, exposed as a band along the mid to lower southern aspect, separates the Peninsula Formation from the overlying Nardouw Subgroup (Malan and Viljoen 1994).

The basement geology of the area comprises the sedimentary rocks of the 490 to 415 million years old (Ordovician to Silurian era) TMG, the Devonian Bokkeveld Group (415 to 360 million years old) and the Jurassic Uitenhage Group (180 to 150 million years old). The shales of the Bokkeveld Group are presumed to extend under much of the central and western areas with some exposures within the Sout River Gorge. The Enon Formation of the Uitenhage Group, seen in outcrops along the lower Sout River Gorge, can be traced in boreholes drilled for ground water on De Hoop. Exposures of the Robberg Formation occur at San Sebastian Point (Toens & Associates 1994).

Most of the GDHC is overlayed by the sediments of the younger Bredasdorp Group deposits that can be classified, according to origin, as shallow marine and aeolian. The deposits include the Pliocene (2.6-million-year-old) shallow marine De Hoop Vlei Formation covered by the Late Pliocene to Early Pleistocene (2.6 to 1.8 million years old) aeolian Wankoe and the Late Pleistocene (350 000 and

younger) Waenhuiskrans Formations. The Holocene Strandveld Formation forms the extensive unconsolidated, unvegetated to partially or fully vegetated coastal dune fields (Malan 1990).

The marine and marine-related (aeolian) formations are characterised by calcareous clastics. In a depositional model for the Bredasdorp Group, various facies have been identified based on geometry, lithology, fossil contents, palaeocurrent data, biogenic and sedimentary structures. The facies are related to environments constituting a shoreline setting with offshore, transitional, shoreface, foreshore and backshore zones, followed by back-barrier lagoons, estuaries, backshore dunes and coastal dune fields associated with transgressive (rise in sea-level) and regressive (fall in sea-level) shorelines (Malan 1990).

The coastal fringe Bredasdorp Group deposits, as well as the distinctive geomorphological features, are correlated with the relative sea-level movements because of global warmer (inter ice stages) and colder (ice stages) periods throughout the Cainozoic, which have shaped the areas coastal plain (Malan 1990).

Dominant land type units are classed as rock areas with miscellaneous shallow soils (mainly Mispah or Glenrosa soil forms). The substrate is either calcrete or quartzitic sandstone with a shallow sandy A-horizon. More limited areas of deep relic sands and other soils occur in the valley between Potberg and the hard dunes and unconsolidated calcareous dunes along the coast. Very limited areas of eutrophic red plinthic soils are also present (Macvicar 1984). De Mond soils consist almost entirely of loose, unconsolidated marine shell derived sands, stabilised by dune and salt marsh vegetation in places, with some partly calcified substrates, calcrete lenses and calcrete deposits derived from these sands occurring on the inland boundary of De Mond. The sand and sand-derived deposits overlie the relatively shallow shale and siltstone rocks of the Bokkeveld formation which typically forms an aquiclude, or water-impermeable layer. (Malan & Viljoen 1994; Soltau & Conrad 2011). See Appendix 1 Map 5 for a spatial representation of the geology for the GDHC.

2.3 Biodiversity Context: Ecosystems

2.3.1 Vegetation

The GDHC falls fully within the Core Cape Subregion (Manning & Goldblatt 2012). This Subregion is one of the world's smallest but richest floral kingdoms, encompassing a land area of approximately 90 760 km² (less than 4% of the southern African subcontinent). An estimated 9 383 species of vascular plants (ferns and other spore-bearing vascular plants, gymnosperms, and flowering plants) are known to occur here, of which just over 68% are endemic. Most of these species are flowering plants. The Core Cape Flora of the Greater Cape Floristic Region is characterised by six endemic or near-endemic families and by the conspicuous presence of Asteraceae and Fabaceae (two largest families), and the Iridaceae, Aizoaceae, Ericaceae, Proteaceae, and Restionaceae (Manning & Goldblatt 2012). The Core Cape Subregion is notable for its range of ecosystems ranging from coastal foredunes through strandveld, lowland and mountain fynbos.

According to the latest information a total of eight different terrestrial vegetation and three aquatic units occur within the GDHC (SANBI 2018).

These are listed in Table 2.4 and illustrated in Appendix 1 Map 6.

South Africa recognises that different ecosystems have unique species compositions and to effectively conserve biodiversity, the country has set targets for each ecosystem (see Table 2.4). The biodiversity target is the minimum proportion of each ecosystem type that needs to be kept in a natural or near-natural state over the long term to maintain viable representative samples of all ecosystem types and most species associated with those ecosystems. The biodiversity target is calculated based on species richness, using species–area relationships, and varies between 16% and 36% of the original extent of each ecosystem type (Desmet & Cowling 2004).

Threat status is provided for each ecosystem (see Table 2.4). Ecosystem threat statuses are provided in the most recent National Biodiversity Assessment (NBA) compiled by the South African National Biodiversity Institute (SANBI 2019). Following the completion of the NBA in 2018, the red list of terrestrial ecosystems was updated in 2021 (SANBI 2020) based on updated national and provincial land cover data and updated threatened species data (Skowno & Monyeki 2021; Republic of South Africa (RSA) 2022).

Table 2.4: Vegetation types and status conserved within the GDHC

Vegetation Unit	Extent in the WC Province (ha)	WC Provincial Conservation Target ha (%)	% Target Conserved Inside GDHC	Ha Conserved Inside GDHC	Ecosystem Status (2021)
Albertinia Sand Fynbos	51 767.7	16 565.7 (32)	25.2	4 173.4	EN
De Hoop Limestone Fynbos	69 025.7	22 088.2 (32)	101.3	22 379.9	LC
Potberg Ferricrete Fynbos	4 057.3	1 217.2 (30)	22.3	271.1	CR
Potberg Sandstone Fynbos	10 746.4	3 223.9 (30)	198.7	6 406.1	LC
Western Coastal Shale Band Vegetation	13 452.5	4 035.8 (30)	10.9	438.6	EN
Eastern Ruens Shale Renosterveld	276 269.6	74 592.8 (27)	0.9	701.1	EN
Overberg Dune Strandveld	34 539.4	12 434.2 (36)	35.5	4 086.5	EN
Cape Seashore Vegetation	5 923.3	1 184.7 (20)	132.5	1 569.9	LC
Non-terrestrial (Aquatic)	1 305.9	-	-	901.8	-
Non-terrestrial (Estuarine Functional Zone)	17 719.4	-	-	0.5	-
Non-terrestrial (Estuarine vegetation, salt marsh)	106.0	-	-	27.0	-

2.3.1.1 Vegetation Unit descriptions

The following is a description of the various vegetation units occurring within the GDHC based on the South African vegetation map (SANBI 2018) as shown in Table 2.1 and Appendix 1, Map 6.

Eight terrestrial vegetation units are represented in the GDHC, one of which is classified as Critically Endangered (Potberg Ferricrete Fynbos), four as Endangered (Albertinia Sand Fynbos, Western Coastal Shale Band Vegetation, Eastern Ruens Shale Renosterveld, Overberg Dune Strandveld), and the other three (De Hoop Limestone Fynbos, Potberg Sandstone Fynbos, Cape Seashore Vegetation) as Least Concern (Table 2.1). In addition, there are three non-terrestrial units (Aquatic; Estuarine Functional Zone; Estuarine vegetation containing salt marshes) also present.

Albertinia Sand Fynbos (Endangered): This vegetation unit occurs from De Hoop to Mossel Bay in east-west extended patches, on deep neutral to acid red sands. It is found mainly in depressions, valleys and the lower slopes of the broken hills and dune slacks. A total of 4 173.4 ha of this vegetation unit occurs on De Hoop.

The vegetation consists mainly of proteoid fynbos with restioid fynbos present in water courses and on coastal edges (Rebelo *et al.* 2006).

Important taxa include (Rebelo *et al.* 2006): *Cassine peragua* subsp. *peragua*, *Leucadendron eucalyptifolium*, *Metalasia densa*, *Protea repens*, *P. susannae*, *Muraltia spinosa*, *Passerina corymbosa*, *Psoralea pinnata*, *Chironia baccifera*, *Cliffortia ilicifolia*, *C. stricta*, *Erica imbricata*, *Lachenalia axillaris*, *Agathosma bifida*, *A. scaberula*, *Amphithalea tometosa*, *Anthospermum prostratum*, *Aulax umbellata*, *Carpacoce vaginellata*, *Chrysocoma ciliata*, *Cliffortia drepanoides*, *Diospyros dichrophylla*, *Erica discolor*, *E. purchella*, *E. sessiliflora*, *E. versicolor*, *Euryops ericoides*, *Leucadendron meridianum, L. salignum*, *Muraltia ciliaris*, *Passerina galpinii*, *P. rigida*, *Phylica parviflora*, *Psoralea laxa*, *Senecio ilicifolius*, *Staavia radiata*, *Struthiola ciliata* subsp. *incana*, *Achyranthemum paniculatum*, *Trichocephalus stipularis*, *Trichogyne repens*, *Edmondia aquilinum*, *Bobartia robusta*, *Bulbine frutescens*, *Romulea dichotoma*, *R. gigantea, Calopsis adpressa*, *Elegia stupularis*, *Ischyrolepis leptoclados*, *Mastersiella purpurea*, *Thamnochortus insignis*, *Cynodon dactylon*, *Elegia muirii*, *E. tectorum*, *Mastersiella spathulata*, *Staberoha distachyos*, *Thamnochortus erectus*, *T. fruticosus*, *Willdenowia teres*.

Endemic taxa include: *Leucadendron galpinii*, *Leucospermum fulgens*, *Euchaetis albertiniana*, *Agathosma pallens*, *Aspalathus acutiflora*, *A. dasyantha*, *A. odontoloba*, *A. quadrata*, *A. sanguinea* subsp. *foliosa*, *Diosma sabulosa*, *Erica baueri* subsp. *baueri*, *E. dispar*, E. *viscosissima, Lebeckia fasciculata*, *Leucospermum muirii*, *Lobelia valida*, *Lampranthus anthemeridianus*, *L. creber*, *L. diutinus*, *L. fergusoniae*, *L. multiseriatus*, *Zaluzianshya muirii*, *Thamnochortus muirii*.

This ecosystem is classified as Endangered because of its restricted distribution and threatened processes. Close to 50% has been transformed through agricultural developments, pine plantations and dense infestations by invasive alien plants. Large areas have been converted through the dragging (breaking up) of veld to promote thatch (*Thamnochortus insignis*) for the thatching industry.

De Hoop Limestone Fynbos (Least Concern) occurs as a wide strip along the coast from Struisbaai, Bredasdorp to Infanta. It includes an inland range of hills and moderately undulating plains. This vegetation unit covers the largest part of the GDHC (22 348.3 ha), most of which occurs in De Hoop and a small section in De Mond.

Structurally the vegetation consists mainly of asteraceous and proteoid fynbos, with restioid fynbos in sandy areas, which have been converted to grazing lawns in areas that were formerly ploughed, now having high concentrations of game (Rebelo *et al.* 2006).

Important taxa include (from Rebelo *et al.* 2006): *Leucadendron meridianum*, *L. muirii*, *Leucospermum truncatum*, *Metalasia calcicola*, *Passerina galpinii*, *Acmadenia densifolia*, *Adenandra obtusata*, *Agathosma serpyllacea*, *Aspalathus calcarea*, A. *incurvifolia*, *Asparagus capensis* var. *capensis*, *Erica propinqua*, *E. regia* subsp. *mariae*, *E. spectabilis*, *Euryops ericoides*, *E. hebecarpus*, *Metalasia erectifolia*, *Oedera squarrosa*, *Syncarpha canescens*, *Ursinia dentata*, *Osteospermum moniliferum*, *Euryops linearis*, *Protea obtusifolia*, *P. lanceolata*, *Cotula turbinata*, *Ursinia tenuifolia* subsp. *ciliaris*, *Cyanella lutea*, *Freesia leichtlinii*, *Haemanthus coccineus*, *Lachenalia muirii*, *Ledebouria ovalifolia*, *Neopatersonia uitenhagensis*, *Polyxena ensifolia*, *Strumaria squarrosa*, *Cynodon dactylon*, *Ficinia truncata*, *Thamnochortus paniculatus*, *T. guthrieae*, *T. lucens*, *T. pluristachyus*.

Endemic taxa include: *Acmadenia mundiana*, *Argyrolobium harmsianum*, *Aspalathus pallescens*, *A. prostrata*, *Brachysiphon mundii*, *Cliffortia burgersii*, *Erica scytophylla*, *E. sperata*, *E. uysii*, *Euchaetis intonsa*, *Felicia ebracteata*, *Lobostemon daltonii*, *Pteronia diosmifolia*, *Sutera titanophila*, *Galium bredasdorpense*.

This ecosystem is listed as Least Concern as the target of 32% is met within De Hoop and De Mond. Only 2% has been transformed through cultivation. There is, however, serious concern about dense infestations of invasive alien plant species, particularly *Acacia cyclops* (Rebelo *et al.* 2006).

Potberg Ferricrete Fynbos (Critically Endangered) occurs on the northern and western lower slopes of Potberg Mountain up to Poortsrivier on shallow stony soils and sandy loams derived from shales, with rounded ferricrete stones covering the surface and known as 'koffieklip, due to the brown colour (Rebelo *et al.* 2006). A total of 271.1 ha of this vegetation unit is present in De Hoop.

The vegetation consists of tall evergreen shrubs of predominantly asteraceous and proteoid fynbos with localised stands of restioid fynbos. It has features of fynbos and renosterveld, with renosterbos present but not abundant. It has the largest populations of *Leucadendron coriaceum*, *L. cryptocephalum* and *Protea decurrens*.

Important taxa include (from Rebelo *et al*. 2006): *Protea repens*, *P. neriifolia, Searsia pallens, Dicerothamnus rhinocerotis*, *Erica quadrangularis*, *Leucadendron modestum*, *Amphithalea ciliaris*, *Osteospermum moniliferum*, *Erica imbricata*, *E. puberuliflora*, *E. viscaria* subsp. *longifolia*, *Leucadendron coriaceum*, *L. cryptocephalum, L. salignum*, *L. teretifolium*, *Oedera squarrosa*, *Serruria ludwigii* and graminoids *Cymbopogon pospischilii*, *Ficinia oligantha*, *Ischyrolepis capensis*, *Karoochloa purpurea*, *Tenaxia stricta*.

Bulbine potbergensis is endemic to this vegetation unit.

This ecosystem is listed as Critically Endangered due to its restricted distribution and threatening processes. About 52% of the area has been transformed through agriculture and infestations by invasive alien plants (mainly *Acacia cyclops and A. saligna*).

Potberg Sandstone Fynbos (Least Concern) occurs only on the Potberg, a moderately steep sandstone inselberg in De Hoop (6 406.1 ha). Vegetation consists mainly of proteoid and restioid fynbos, with thicket species (such as *Aloe arborescens*, *Diospyros dichrophylla*, *Euclea polyandra*) in deeper kloofs.

Important taxa include (from Rebelo *et al*. 2006): *Protea neriifolia*, *P. repens*, *Leucadendron eucalyptifolium*, *Euryops linearis*, *Podalyria calyptrata*, *Psoralea aphylla*, *Leucadendron salignum*, *L. xanthoconus*, *Aspalathus aspalathoides*, *A. caledonensis*, *A.ciliaris*, *A. incurvifolia*, *Aulax umbellata*, *Erica coccinea* subsp. *uniflora*, *E. plukenetii* subsp. *bredensis*, *Indigofera angustifolium Leucospermum calligerum*, *L. cuneiforme*, *L. utriculosum* (Potberg form), *Mimetes cucullatus*, *Nebelia paleacea*, *Oedera capensis*, *Paranomus abrotanifollius*,, *Penaea mucronata*, *Phaenocoma prolifera*, *Polygala pottebergensis*, *Protea cynaroides*, *Roella incurva*, *Senecio paniculatus*, *Serruria acrocarpa*, *S .fasciflora,* and geophytic plants including *Acrolophia ustulata*, *Geissorhiza hispidula*, *Ornithogalum dubium*, and the graminoids *Ficinia zeyheri* and *Staberoha cernua*.

Endemic taxa include (from Rebelo 2006): *Protea aurea* subsp. *potbergensis*, *Adenandra gummifera*, *Aspalathus potbergensis*, *Cliffortia incana*, *Muraltia pottebergensis*, *Prismatocarpus spinosus*, *Protea denticulata*, *Selago neglecta*, *Centella pottebergensis*, *Bobartia longicyma* subsp. *microflora*.

This ecosystem is listed as Least Concern as it is well-represented in De Hoop. Only about 6% has been transformed through agricultural developments.

Western Coastal Shale Band Vegetation (Endangered) is a narrow strip of vegetation associated with the shaleband on Potberg (438.6 ha) in De Hoop. It contains diverse renosterveld and fynbos shrubs of all structural types.

Important taxa include (from Rebelo *et al*. 2006): *Widdringtonia nodiflora*, *Leucadendron salicifolium*, *Montinia caryophyllacea*, *Protea neriifolia*, *Protea eximia*, *P. repens*, *Anthospermum aethiopicum*, *Aulax umbellata*, *Berzelia lanuginosa*, *Diastella divaricata* subsp. *montana*, *Dicerothamnus grandulosus*, *Erica equisetifolia*, *E. hipidula*, *E. quadrangularis*, *Leucadendron zanthoconus*, *Protea scabra*, *Agathosma capensis*, *Anthospermum galioides* subsp. *galioides*, *A. prostratum*, *Brunia neglecta*, *B. nodiflora*, *Cliffortia atrata*, *C. eriocephalina*, *C. polygonifolia*, *C. polygonioides*, *Diosma hirsuta*, *Erica filiformis*, *E. plukenetii* subsp. *plukenetii*, *E. viscaria* subsp. *longifolia*, *Euryops pinnatipartitus*, *Helichrysum tomentosulum*, *Leucadendron salignum*, *L. spissifolium* subsp. *spissifolium*, *Leucospermum cordifolium*, *Lonchostoma purpureum*, *Paranomus adiantifolius*, *Phylica spicata*, *Polyarrhena reflexa*, *Pronea acaulos*, *P. cordata*, *P. longifolia*, *Seriphium plumosum*, *Peucedanum ferulaceum*, *P. strictum*, *Aristea racemosa*, *A. capitata*, *Blechnum capense*, *Elaphoglossum angustatum*, *Rumohra adiantiformis*, *Askidiosperma nitidum*, *Elegia* filacea, *E. hookeriana*, *E. mucronata, Ischyrolepis gaudichaudiana, I. monanthos, Pentameris colorata, Tetraria bromoides, T. cuspidata*, *Themeda triandra*, *Elegia junceum*, *E. stipularis*, *Epischoenus quadrangularis*, *Hypodiscus albo-aristatus*, *Ischyrolepis sieberi*, *Platycaulos cascadensis*, *Restio stokoei*, *Tetraria fimbriolata*.

Thicket species *Curtisia dentata*, *Diospyros glabra*, *Maytenus acuminata*, *Rapanea melanophloeos*, *Searsia rosmarinifolia*,

This vegetation unit is currently listed as Endangered due to its restricted distribution and threatened processes (SANBI 2021).

Eastern Ruens Shale Renosterveld (Endangered) occurs between the coastal limestone (and sandstone) belt in the south and the southern foothills of the Langeberg, between Malgas and Heidelberg up to the Goukou River at Riversdale. It is dominated by renosterbos and found on the moderately undulating hills and plains. Very little of this vegetation unit is still intact, 701.1 ha of which occur in De Hoop.

Important taxa include (from Rebelo *et al*. 2006): *Aloe ferox, Searsia pallens with Athanasia trifurcata, Dicerothamnus rhinocerotis, Helichrysum petiolare, Hermannia flammea, H. saccifera, Oedera genistifolia, O. squarrosa, O. uniflora, Seriphium plumosum, Acmadenia macropetala, Anthospermum prostratum, Aspalathus alpestris, A. calcarata, A. campestris, A. millefolia, A. pinguis* subsp. *pinguis, A. zeyheri, Diosma passerinoides, Metalasia pungens, Polhillia pallens, Relhania garnotii, Ursinia discolor, Arctotis acaulis, Peucedanum striatum, Freesia caryophyllacea, Geissorhiza nana, Oxalis purpurea, Romulea minutiflora. Duvalia elegans, Haworthia marginata, Cymbopogon pospischilii, Eragrostis curvula, Tenaxia stricta, Themeda triandra, Ehrharta calycina, E. melicoides, Elegia recta, Festuca scabra, Koeleria capensis, Tribolium hispidum*.

Endemic taxa include: *Agathosma gnidiiflora*, *Aspalathus grobleri*, *A. opaca* subsp. *pappeana*, *Gnidia ericoides*, *Lebeckia bowieana*, *Polhillia brevicalyx*, *Pteronia beckeoides*, *Aspalathus incompta*, *Drosanthemum vandermerwei*, *Trichodiadema pygmaeum*, *Thesium rufescens*, *Hesperantha muirii*, *Haworthia heidelbergensis*, *H. mutica*, *H. serrata* (Rebelo *et al*. 2006).

Eastern Ruens Shale Renosterveld is listed as Endangered as it has a restricted distribution, with continued loss and threatened processes (SANBI 2021). Future predictions anticipate that the decline in extent will continue.

Overberg Dune Strandveld (Endangered) occurs in scattered patches from Rooiels as far east as Cape Infanta at the Breede River mouth on flat or slightly undulating dune fields comprising deep marine calcareous sands. A total of 4 413.7 ha occurs on De Hoop, De Mond and Waenhuiskrans. The vegetation unit consists of evergreen hard-leaved shrublands in moist dune slacks and wind-protected valleys, and up to 1 m tall coastal thicket in many places becoming wind-pruned in exposed areas.

Important taxa include (from Rebelo *et al*. 2006): *Euclea racemosa* subsp. *racemosa*, *Metalasia muricata*, *Searsia crenata*, *S. glauca*, *S. laevigata*, *Chionanthus foveolatus*, *Cussonia thyrsiflora*, *Gymnosporia buxifolia*, *Morella cordifolia*, *Myrsine africana*, *Olea exasperata*, *Passerina corymbosa*, *Searsia lucida*, *S. undulata*, *Sideroxylon inerme*, *Tarchonanthus littoralis*, *Osteospermum moniliferum*, *Passerina paleacea*, *P. rigida*, *Pterocelastrus tricuspidatus*, *Aspalathus forbesii*, *Ballota africana*, *Carissa bispinosa* subsp. *bispinosa*, *Cassine peragua* subsp. *barbara*, *Chironia baccifera*, *Eriocephalus africanus* var. *africanus*, *Felicia amelloides*, *Helichrysum niveum, H. teretifolium*, *Lauridia tetragona*, *Otholobium bracteolatum*, *Phylica axillaris*, *P. ericoides*, *Polygala myrtifolia*, *Psoralea repens*, *Robsonodendron maritinum*, *Crassula nudicaulis*, *Drosanthemum candens*, *Jordaaniella dubia*, *Osteospermum fruticosum*, *Othonna dentata*, *Tetragonia decumbens*, *T. fruticosa*, *T. spicata*, *Asparagus aethiopicus*, *Cissampelos capensis*, *Solanum africanum*, *Thesidium fragile*, *Osyris compressa*, *Helichrysum crispum*, *Senecio elegans*, *Cineraria geifolia*, *Hebenstretia repens*, *Helichrysum littorale*, *Knowltonia capensis*, *Silene crassifolia*, *Stachys aethiopica*, *Brunsvigia orientalis*, *Chasmanthe aethiopica*, *Romulea obscura*, *Carpobrotus acinaciformis*, *C. edulis*, *Crassula expansa* subsp. *expansa*, *Astephanus triflorus*, *Cynanchum africanum*, *Kedrostis nana*, *Ischyrolepis eleocharis*, *Cynodon dactylon*, *Erhartha erecta*, *E. villosa* var. *villosa*, *Ficinia lateralis*, *Thamnochortus erectus*.

Berkeya coriacea, Lampranthus salteri and *Gladiolus carmineus* are south coast endemic species.

Overberg Dune Strandveld is classified as Endangered with close to 35.5% of target protected in the GDHC. More than 5% has been transformed through urban and agricultural developments. Dense

stands of invasive species, such as *Acacia cyclops*, *A. saligna* and *Leptospermum laevigatum* are a serious concern.

Cape Seashore Vegetation (Least Concern) occurs on beaches, coastal dunes, dune slacks and coastal cliffs with open grassy herbaceous and to some extent also dwarf-shrubby (sometimes succulent) vegetation. It is often dominated by a single pioneer species. Extensive dune fields occur on De Hoop, De Mond and Waenhuiskrans (1 585.5 ha) and elsewhere along the coast, most of which are statutorily protected (Mucina *et al.* 2006).

Important taxa include (from Mucina *et al.* 2006): *Drosanthemum cadens*, *Pelargonium capitatum*, *Tetragonia decumbens*, *Didelta carnosa* var. *tomentosa*, *Eucomis microphylla* var. *axyrioides*, *Lycium tetrandrum*, *Scaevola plumieri*, *Hebenstretia cordata*, *Frankenia repens*, *Oncosiphon sabulosum*, *Thesidium fragile*, *Cynanchum ellipticum*, *C. obtusifolium*, *Gazania rigens*, *Senecio littoreus*, *Amellus asteroids*, *Dasispermum suffruticosum*, *Manulea tomentosa*, *Polygonum maritinum*, *Senecio elegans*, *Trachyandra divaricata*, *Arctotheca populifolia*, *Carpobrotus acinaciformis*, *C. edulis*, *Cladoraphis cyperoides*, *Ehrharta villosa* var. *maxima*, *Sporobolus virginicus*, *Stipagrostis zeyheri* subsp. *barbata*, *Disphyma crassifolium*, *Sarcocornia littorea*, *Gazania rigens*.

Endemic taxa include: *Psoralea repens*, *Amphibolia laevis*, *Amellus capensis*, *Gazania maritima*, *G. rigens* var. *leucolaena*, *Silene crassifolia*, *Senecio litorrosus*, *S. maritimus*, *Thinopyrum distichum*, *Eragrostis sabulosa*, *Vellereophyton vellereum*, *Drosanthemum marinum*, *D. stokoei*, *Erepsia steytlerae*, *Prenia vansrensburgii*, *Syncarpha sordescens*, *Limonium* sp. nov., *Lobelia boivinii* (Mucina *et al.* 2006).

Cape Seashore Vegetation is currently not listed as a threatened ecosystem and is classified as Least Concern as almost 140% of the target is conserved in the GDHC.

2.3.1.2 Flora species of conservation concern

Based on the records in the CapeNature State of Biodiversity database a total of 1 691 species (including subspecific taxa) of plants have been recorded for De Hoop, 560 for De Mond, 487 for Waenhuiskrans and two for Soetendalsvlei. This number is by no means complete and is continuously being updated through baseline data collection.

At least 167 species are considered of conservation concern or priority species (Table 2.5; Raimondo *et al.* 2009, http://redlist.sanbi.org) within the GDHC. These include species listed as CR, EN, VU, Near Threatened (NT), LC, Data Deficient - Insufficient Information (DD), Rare and Not Evaluated.

Table 2.5: Plant species of conservation concern recorded within the GDHC (Raimondo *et al.* 2009)

Species	Family	Threat Status	Sector
Braunsia vanrensburgii	Aizoaceae	Rare	De Hoop
Carpobrotus muirii	Aizoaceae	NT	De Hoop
Cephalophyllum diversiphyllum	Aizoaceae	NT	De Hoop
Delosperma mariae	Aizoaceae	VU	De Hoop
Disphyma dunsdonii	Aizoaceae	VU	De Hoop
Drosanthemum lavisii	Aizoaceae	EN	De Hoop
Lampranthus amabilis	Aizoaceae	EN	De Hoop
Lampranthus ceriseus	Aizoaceae	VU	De Hoop
Lampranthus debilis	Aizoaceae	EN	De Hoop
Lampranthus fergusoniae	Aizoaceae	VU	De Hoop
Lampranthus pauciflorus	Aizoaceae	EN	De Hoop

Species	Family	Threat Status	Sector
Lampranthus tenuifolius	Aizoaceae	EN	De Hoop
Trichodiadema occidentale	Aizoaceae	VU	De Hoop
Anginon pumilum	Apiaceae	VU	De Hoop; De Mond
Capnophyllum macrocarpum	Apiaceae	VU	De Hoop
Centella capensis	Apiaceae	NT	De Hoop
Centella pottebergensis	Apiaceae	VU	De Hoop
Notobubon striatum	Apiaceae	NT	De Hoop
Cynanchum zeyheri	Apocynaceae	VU	De Hoop
Asparagus lignosus	Asparagaceae	NT	De Hoop
Aloe brevifolia	Asphodelaceae	EN	De Mond
Gasteria carinata var. *verrucosa*	Asphodelaceae	VU	De Hoop
Trachyandra filiformis	Asphodelaceae	VU	De Hoop
Chrysocoma strigosa	Asteraceae	VU	De Hoop
Cullumia carlinoides	Asteraceae	NT	De Hoop
Cullumia squarrosa	Asteraceae	VU	De Hoop
Dymondia margaretae	Asteraceae	EN	De Hoop
Euryops hebecarpus	Asteraceae	VU	De Hoop
Euryops linearis	Asteraceae	NT	De Hoop
Felicia ebracteata	Asteraceae	VU	De Hoop
Metalasia erectifolia	Asteraceae	NT	De Hoop
Osteospermum elsieae	Asteraceae	CR	De Hoop
Osteospermum potbergense	Asteraceae	CR	De Hoop
Osteospermum subulatum	Asteraceae	VU	De Hoop
Poecilolepis maritima	Asteraceae	VU	De Mond
Pteronia diosmifolia	Asteraceae	VU	De Hoop
Senecio lycopodioides	Asteraceae	VU	De Hoop
Senecio pillansii	Asteraceae	NT	De Hoop; De Mond
Stoebe muirii	Asteraceae	VU	De Hoop
Stoebe rugulosa	Asteraceae	EN	De Hoop
Stoebe schultzii	Asteraceae	VU	De Hoop
Lobostemon lucidus	Boraginaceae	VU	De Hoop
Lobostemon sanguineus	Boraginaceae	VU	De Hoop
Heliophila linearis var. *reticulata*	Brassicaceae	VU	De Hoop
Berzelia cordifolia	Bruniaceae	VU	De Hoop
Prismatocarpus spinosus	Campanulaceae	Rare	De Hoop
Wahlenbergia longifolia	Campanulaceae	NT	De Hoop
Wahlenbergia polyantha	Campanulaceae	VU	De Hoop

Species	Family	Threat Status	Sector
Silene burchellii subsp. *burchellii*	Caryophyllaceae	NT	Waenhuiskrans
Silene mundiana	Caryophyllaceae	DD	De Hoop
Ficinia echinata	Cyperaceae	VU	De Hoop
Ficinia limosa	Cyperaceae	NT	Waenhuiskrans
Schoenus calceolus	Cyperaceae	VU	De Hoop
Erica albertyniae	Ericaceae	VU	De Hoop
Erica dispar	Ericaceae	NT	De Hoop
Erica melanacme	Ericaceae	EN	De Hoop
Erica oblongiflora	Ericaceae	EN	De Hoop; De Mond
Erica sperata	Ericaceae	Rare	De Hoop
Erica uysii	Ericaceae	VU	De Hoop
Amphithalea sericea	Fabaceae	VU	De Hoop
Amphithalea speciosa	Fabaceae	VU	De Hoop
Amphithalea virgata	Fabaceae	VU	De Hoop
Argyrolobium harmsianum	Fabaceae	EN	De Hoop; De Mond
Argyrolobium pachyphyllum	Fabaceae	EN	De Hoop
Aspalathus calcarea	Fabaceae	VU	De Hoop
Aspalathus globulosa	Fabaceae	EN	De Hoop
Aspalathus grobleri	Fabaceae	EN	De Hoop
Aspalathus joubertiana	Fabaceae	EN	De Hoop
Aspalathus lebeckioides	Fabaceae	VU	De Hoop
Aspalathus pallescens	Fabaceae	VU	De Hoop
Aspalathus pinguis subsp. *australis*	Fabaceae	VU	De Hoop
Aspalathus potbergensis	Fabaceae	VU	De Hoop
Aspalathus sanguinea subsp. *sanguinea*	Fabaceae	NT	De Hoop
Aspalathus smithii	Fabaceae	EN	De Hoop
Aspalathus tylodes	Fabaceae	EN	De Hoop
Aspalathus zeyheri	Fabaceae	VU	De Hoop
Cyclopia genistoides	Fabaceae	NT	De Hoop
Indigofera hispida	Fabaceae	NT	De Hoop
Indigofera mundiana	Fabaceae	EN	De Hoop
Lebeckia gracilis	Fabaceae	EN	De Hoop
Lotononis involucrata subsp. *bracteata*	Fabaceae	VU	De Hoop
Otholobium pungens	Fabaceae	EN	De Hoop
Otholobium sabulosum	Fabaceae	VU	De Hoop

Species	Family	Threat Status	Sector
Polhillia pallens	Fabaceae	VU	De Hoop
Wiborgiella sessilifolia	Fabaceae	NT	De Hoop; De Mond
Lachenalia calcicola	Hyacinthaceae	EN	De Hoop
Lachenalia dehoopensis	Hyacinthaceae	VU	De Hoop
Lachenalia sessiliflora	Hyacinthaceae	VU	De Hoop; De Mond; Waenhuiskrans
Massonia setulosa	Hyacinthaceae	NT	De Hoop
Bobartia longicyma subsp. *longicyma*	Iridaceae	NT	De Hoop
Bobartia longicyma subsp. *microflora*	Iridaceae	VU	De Hoop
Cyrtanthus carneus	Iridaceae	VU	De Hoop
Cyrtanthus leucanthus	Iridaceae	EN	De Hoop
Freesia caryophyllacea	Iridaceae	NT	De Hoop
Freesia leichtlinii subsp. *leichtlinii*	Iridaceae	VU	De Hoop
Geissorhiza tenella	Iridaceae	NT	De Hoop
Gladiolus stefaniae	Iridaceae	Rare	De Hoop
Gladiolus vandermerwei	Iridaceae	EN	De Hoop
Ixia micrandra	Iridaceae	NT	De Hoop
Moraea fergusoniae	Iridaceae	NT	De Hoop
Romulea jugicola	Iridaceae	VU	De Hoop
Watsonia fergusoniae	Iridaceae	VU	De Hoop
Triglochin bulbosa subsp. *calcicola*	Juncaginaceae	NT	De Hoop
Kewa arenicola	Kewaceae	DD	De Hoop
Lobelia barkerae	Lobeliaceae	CR Possibly Extinct (PE)	De Hoop
Lobelia valida	Lobeliaceae	VU	De Hoop
Anisodontea dissecta	Malvaceae	CR	De Hoop
Hermannia lavandulifolia	Malvaceae	VU	De Hoop
Acrolophia ustulata	Orchidaceae	VU	De Hoop
Brachysiphon mundii	Penaeaceae	VU	De Hoop
Limonium anthericoides	Plumbaginaceae	EN	De Hoop
Pentameris calcicola var. *hirsuta*	Poaceae	VU	De Hoop
Pentameris scandens	Poaceae	EN	De Hoop
Tribolium ciliare	Poaceae	VU	De Hoop
Muraltia calycina	Polygalaceae	VU	De Hoop
Muraltia lewisiae	Polygalaceae	VU	De Hoop

Species	Family	Threat Status	Sector
Muraltia pottebergensis	Polygalaceae	VU	De Hoop
Muraltia splendens	Polygalaceae	NT	De Hoop
Polygala pottebergensis	Polygalaceae	VU	De Hoop
Leucadendron cryptocephalum	Proteaceae	EN	De Hoop
Leucadendron galpinii	Proteaceae	EN	De Hoop
Leucadendron linifolium	Proteaceae	NT	De Hoop; De Mond
Leucadendron meridianum	Proteaceae	NT	De Hoop; De Mond; Waenhuiskrans
Leucadendron modestum	Proteaceae	NT	De Hoop
Leucadendron muirii	Proteaceae	NT	De Hoop; De Mond; Waenhuiskrans
Leucospermum fulgens	Proteaceae	CR	De Hoop
Leucospermum heterophyllum	Proteaceae	VU	De Hoop
Leucospermum pedunculatum	Proteaceae	NT	Waenhuiskrans
Leucospermum truncatum	Proteaceae	NT	De Hoop; Waenhuiskrans
Paranomus abrotanifolius	Proteaceae	NT	De Hoop
Protea aurea subsp. *potbergensis*	Proteaceae	VU	De Hoop
Protea denticulata	Proteaceae	VU	De Hoop
Protea obtusifolia	Proteaceae	NT	De Hoop; De Mond; Waenhuiskrans
Protea scabra	Proteaceae	VU	De Hoop
Protea susannae	Proteaceae	NT	De Hoop
Elegia fenestrata	Restionaceae	VU	De Hoop
Elegia verreauxii	Restionaceae	VU	De Hoop
Hypodiscus procurrens	Restionaceae	NT	De Hoop
Thamnochortus fraternus	Restionaceae	NT	De Hoop
Thamnochortus pluristachyus	Restionaceae	VU	De Hoop; De Mond
Phylica incurvata	Rhamnaceae	VU	De Mond
Cliffortia burgersii	Rosaceae	EN	De Hoop
Cliffortia curvifolia	Rosaceae	EN	De Hoop
Cliffortia incana	Rosaceae	VU	De Hoop
Cliffortia longifolia	Rosaceae	VU	De Hoop
Galium bredasdorpense	Rubiaceae	VU	De Hoop
Acmadenia mundiana	Rutaceae	Rare	De Hoop
Adenandra gummifera	Rutaceae	VU	De Hoop
Adenandra rotundifolia	Rutaceae	NT	De Hoop
Agathosma collina	Rutaceae	NT	De Mond
Agathosma geniculata	Rutaceae	NT	De Hoop; Waenhuiskrans
Agathosma riversdalensis	Rutaceae	VU	De Hoop; De Mond

Species	Family	Threat Status	Sector
Agathosma sp. nov. (Bean 808 BOL)	Rutaceae	VU	De Hoop
Diosma guthriei	Rutaceae	NT	De Hoop; De Mond
Diosma haelkraalensis	Rutaceae	EN	De Hoop
Diosma parvula	Rutaceae	EN	De Hoop
Diosma passerinoides	Rutaceae	VU	De Hoop
Diosma tenella	Rutaceae	EN	De Hoop
Euchaetis intonsa	Rutaceae	VU	De Hoop
Euchaetis laevigata	Rutaceae	VU	De Hoop
Chaenostoma titanophilum	Scrophulariaceae	VU	De Hoop
Jamesbrittenia calciphila	Scrophulariaceae	NT	De Hoop
Selago diffusa	Scrophulariaceae	VU	De Hoop
Selago glandulosa	Scrophulariaceae	VU	De Hoop
Gnidia chrysophylla	Thymelaeaceae	NT	De Hoop
Lachnaea axillaris	Thymelaeaceae	NT	De Hoop
Roepera fuscata	Zygophyllaceae	VU	De Hoop; De Mond; Waenhuiskrans

2.3.1.3 Fire regime

Fynbos is a fire-driven ecosystem, and all fynbos species require periodic fires to stimulate regeneration and maintain species richness (Van Wilgen & Forsyth 2008; Forsyth *et al.* 2010; Holmes *et al.* 2016). However, in an increasingly fragmented, transformed and risk-averse landscape, natural fire cycles are becoming rare (Holmes *et al.* 2016). Research indicates that globally and within the CFR, many areas have experienced increases in fire frequency and size (Kraaij & van Wilgen 2014). Ecologically sound fire management is thus imperative and involves managing fire regimes, which includes varying the frequency, season, intensity and size of fires, and reconciling ecological and practical requirements.

According to the CapeNature fire management guideline (CapeNature 2016b), fire management practices (such as prescribed burning, adaptive intervention management and natural burning zones) can be collapsed into a single model that simply varies with regards to the degree to which intervention (in the form of fire suppression, containment or prescribed burning) is practiced. Fire management should be adapted more to the circumstances a protected area finds itself in than the eco-zone in which it is situated (Van Wilgen & Forsyth 2008). Van Wilgen and Forsyth (2008) divided the Western Cape into five fire eco-zones based on the fire potential as defined by climate (Van Wilgen 1984). The GDHC falls within the southwestern coastal zone, which is characterized by strong seasonal variation in fire potential and a high mean fire potential in summer (Van Wilgen & Forsyth 2008).

All the Fynbos vegetation types listed and described above are dependent on periodic fires to persist. Exceptions are the patches of Afromontane Forest in the Vulture Kloof and at Weaver Falls in the Potberg, milkwood thicket along De Hoop Vlei and in kloofs, Cape Seashore Vegetation along the coast, and the brackish flats (CapeNature 2016b; Mucina *et al.* 2006).

The local fire regime (i.e., the intervals between successive fires, season of fires, intensity, and fire size) plays a significant role in the species composition of fire dependent habitat units (Vlok & Yeaton 1999, 2000; Esler *et al.* 2014). The probability of fires spreading would be expected to be maximal during the hottest and driest three-month period of the year from December to the end of February. The

summer months from October to March are also the period with the strongest winds, when westerlies, easterlies and south-westerlies dominate.

In addition, the impact of the game on these vegetation types following fires needs to be taken into consideration.

2.3.1.1.1 Fire history

Khoekhoen (Khoi) pastoralists used patch burning from about 2000 years ago. Before then, the San also used fire although the extent to which they changed the pattern and frequency of lightning-caused fires is unknown. Intensive patch burning was also practised by most farmers in the area before the reserve was established. This practice continues on many farms today, particularly in the limestone hills. It is noteworthy that, although certain species of reseeding Proteaceae were severely depleted locally in some areas with particularly frequent patch-burning (such as at Buffelsfontein and Elandspad, where the veld was burnt as frequently as possible at times), the majority of reseeding Proteaceae have survived in large populations in most of the area. Recovery of populations has been rapid within one or two fire cycles of intermediate fire intervals (between 15 – 20 years). These observations suggest that the fynbos of the area is very resilient to frequent burning. This observation is further supported by the fact that even reseeders, that only occur in small, isolated populations because suitable habitat is rare in the area, have survived past patch-burning regimes and are thriving. Examples include *Leucadendron cryptocephalum*, *Protea coronata* and *Protea aurea* subsp. *potbergensis* (CapeNature 2016a).

A total of 44 fires have been captured in the CapeNature fire database for De Hoop from 1990 to 2023, and two fires in De Mond, one of which extended up to Waenhuiskrans. This section will focus mainly on the fire history of De Hoop.

Figure 2.11 illustrates the number and sizes of the fires that occurred in De Hoop per year from 1990 to 2023. During the 1990s up to the early 2000s fires occurred almost annually. Most of these fires were block burns or of unknown origin. Then there was a less frequent fire period from 2004 to up to 2014 when occasional very small fires of less than 10 ha occurred, except for 2007 when there were two block burns (of over 1 000 ha each) and small block burns in 2006 and 2013. However, in 2015 there was a very large fire of 12 278 ha caused by lightning as well as a block burn carried out earlier that year. Since then, there have only been small accidental fires caused by powerlines.

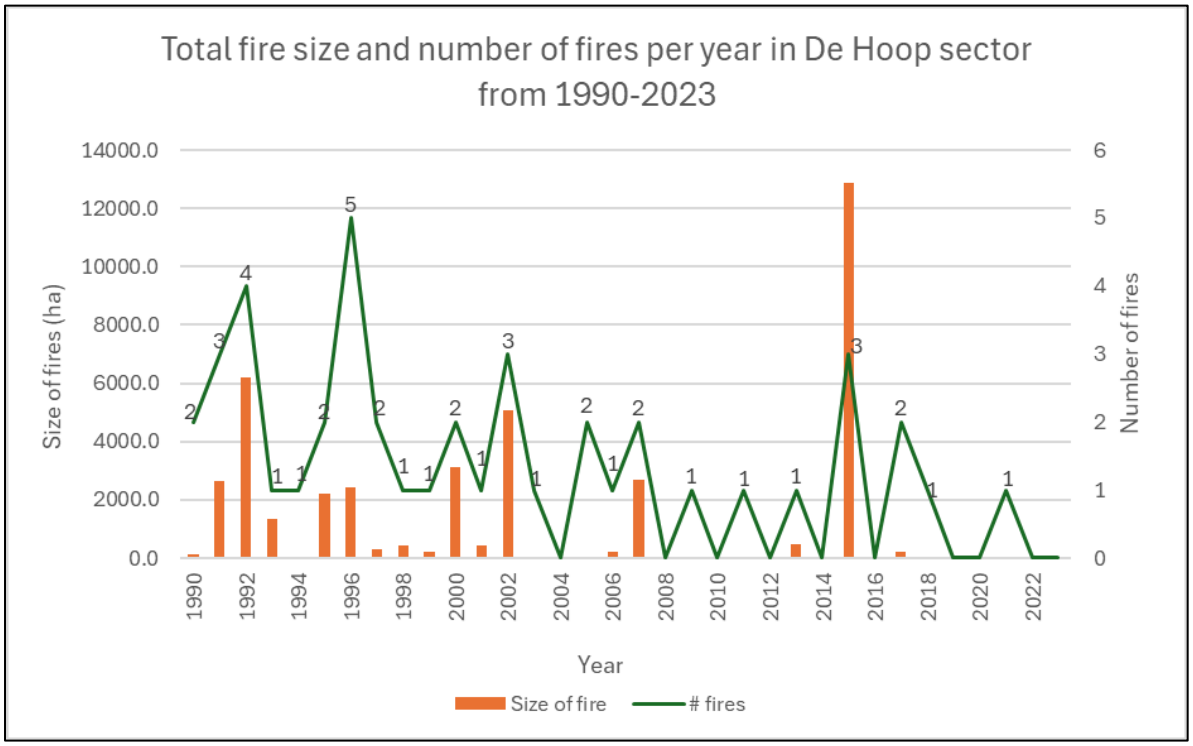


Figure 2.11: Total size and number of fires per year within De Hoop from 1990-2023 (CapeNature unpublished data)

2.3.1.1.2 Fire season, intensity and ignition cause

The results of an analysis of the total sizes and number of fires per month from 1990 to 2023 in De Hoop is illustrated in the graph shown in Figure 2.12. This figure differentiates between fires that have originated through various causes: natural (lightning, rock falls), block burns, accidental (e.g. fires started by farmers that got out of control, mechanical, powerline faults, weapons) and those of unknown origin.

Lightning-induced fires appear to be scarce but have resulted in the largest area (12 278 ha in extent) burning in a single fire during September 2015. Most block burns have been executed during late summer and early autumn, contributing to over 8000 ha burning in February and March. There is also a peak in April where seven fires (mostly accidental) have resulted in almost 5000 ha burning during the period. Accidental or human-induced fires do occur, and most have been of medium size. Fires of unknown origin are however a concern, and every effort needs to be made to determine the true causes of these fires. During winter, fires appear to be absent as no records have been documented.

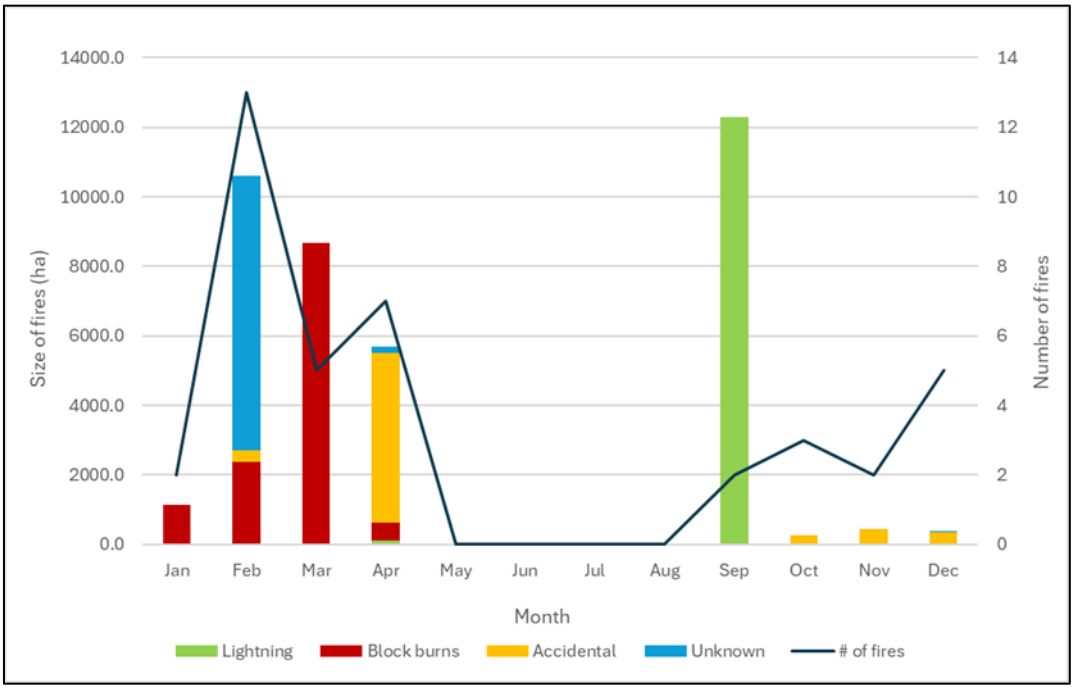


Figure 2.12: Number of fires and total area burnt per month through different causes in De Hoop sector from 1990-2023 (CapeNature unpublished data)

2.3.1.1.3 Fire size

From an analysis of the sizes of fires in De Hoop over the past three decades (1990-2019) it appears that the size of fires has been increasing over the period (Figure 2.13). In the 1990s there were ten medium sized fires burning about 27% of the area, six large fires burning 73% of the area and no very large fires. Block burns contributed to 41% of the area burning and 52% burnt because of fires where the causes were unknown. In the 2000s 9% of the area burnt in four medium-sized fires, and just over 90% burnt in four large fires, (mostly block burns) with no very large fires. However, in the 2010s three medium-sized fires burnt almost 10% of the area, while a single very large lightning fire burnt approximately 35% of the area in 2015.

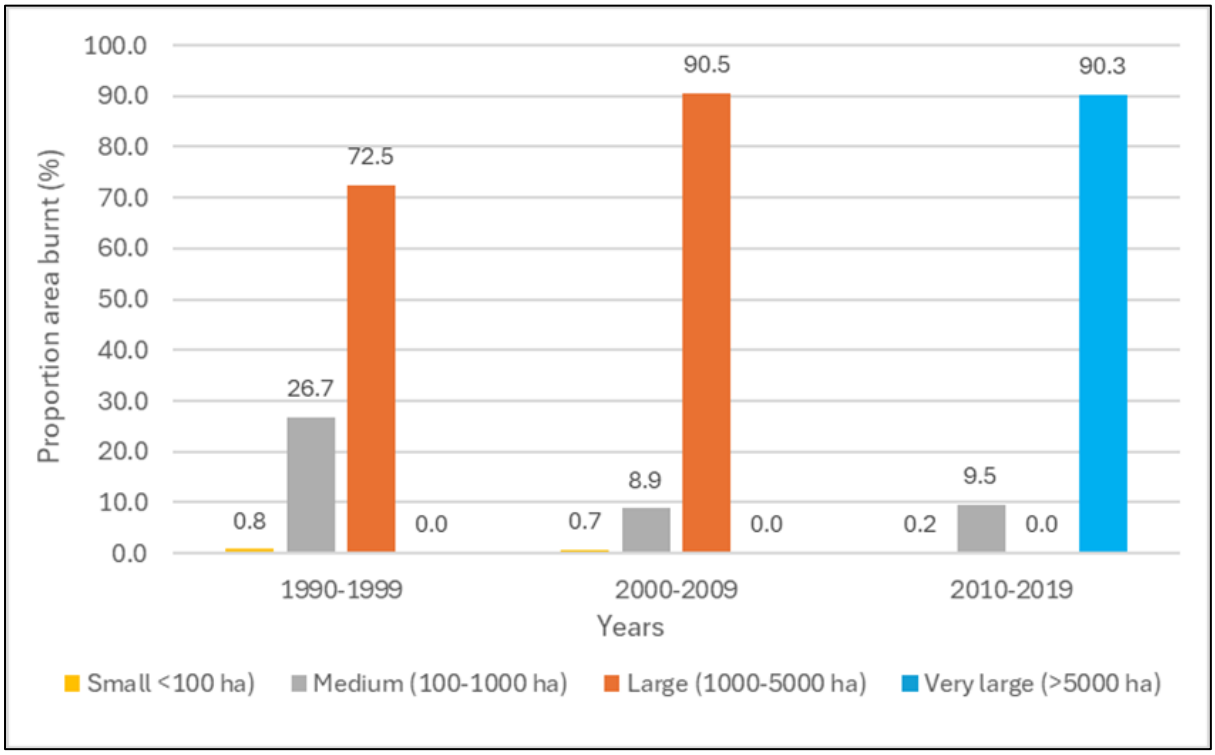


Figure 2.13: Proportion of De Hoop sector burnt per decade in small, medium, large and very large fires from 1990-2019 (CapeNature unpublished data)

This trend of fires becoming larger has also been observed in the Garden Route and Swartberg WHS Complexes (CapeNature 2020c, 2023d), elsewhere in the CFR (Van Wilgen & Forsyth 2008), as well as globally (Kraaij *et al.* 2012; Kraaij & Van Wilgen 2014).

Even though De Hoop is an isolated protected area, abutted mainly by transformed agricultural lands towards the north and the ocean towards the south, relatively small, uncontrollable fires can occur if the vegetation is burnable and extreme weather conditions prevail.

If conditions become hotter and drier as predicted by climate change models, very large fires may become more common.

2.3.1.1.4 Veld age and fire return interval

The 2022-2023 veld age map for the GDHC is shown in Appendix 1, Map 7 and the proportions of veld in different veld age classes in Figure 2.14 and summarised in Table 2.6.

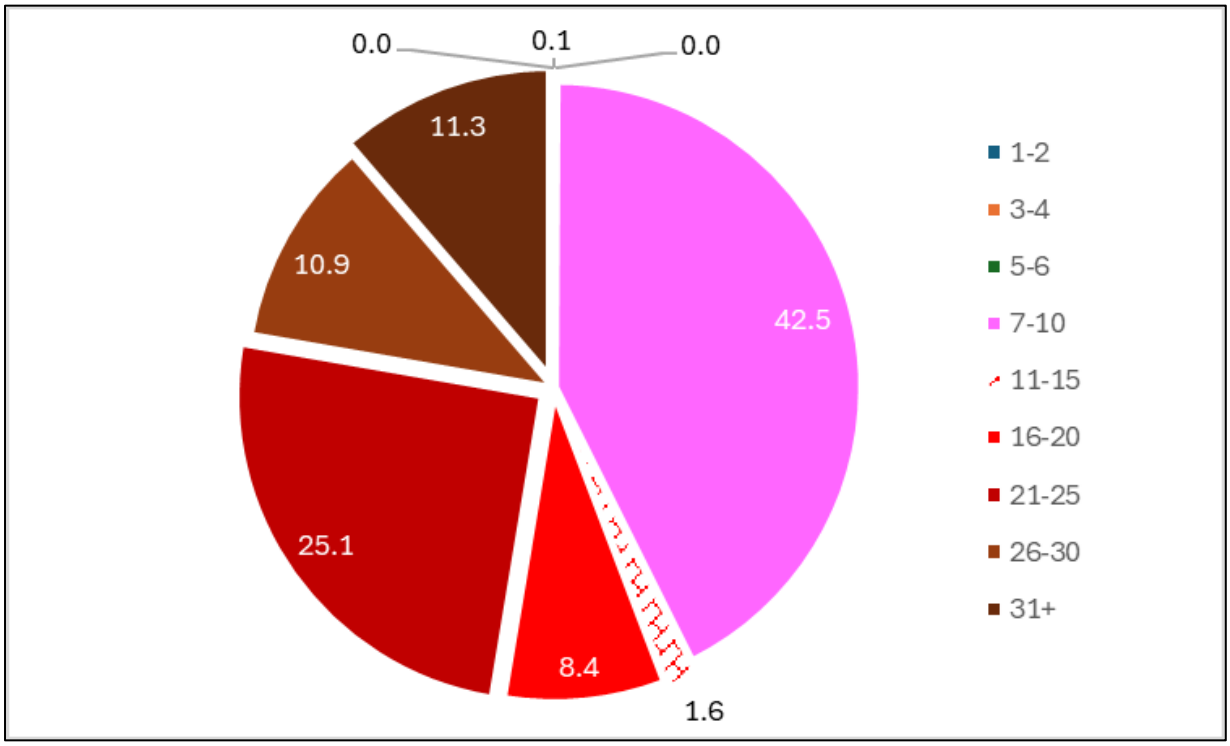


Figure 2.14: Proportion area in De Hoop in each of the veld age classes based on the 2022-2023 veld age map (CapeNature unpublished data)

Table 2.6: Summary of total sizes (ha) and proportions (%) of veld in specific veld age classes within the De Hoop sector based on the 2022-2023 veld age map

Veld age classes	Total size (ha)	Proportion area (%)
1-2	0	0.0
3-4	23	0.1
5-6	2	0.0
7-10	13 106	42.5
11-15	485	1.6
16-20	2 598	8.4
21-25	7 737	25.1
>26	6 859	22.3
	30 809	**100**

A total of 42.6% of the protected area is up to 10 years old and 44.2% is 15 years or less. Only 1.6% is 11-15 years old, while 8.4% is16-20 years and 25.1% is 21-25 years old, which is considered good veld for *Promerops cafer* (Cape sugarbird), the most effective pollinator of *Protea* species.

A study was conducted in De Hoop in 2021 looking at the maturation rates of two *Protea* species (*P. repens* and *P. neriifolia*) and testing the rules of thumb to set fire return interval thresholds (Geerts 2021). Two rules of thumb have been suggested: (i) at least 50% of the individuals in a population of the slowest-maturing non-sprouting *Protea* species need to have flowered for at least three times (Kruger & Lamb 1978); or (ii) at least 90% of the individuals in a population of the slowest-maturing non-sprouting *Protea* species must have flowered and produced seeds at least once (Esler *et al.* 2014). Geerts (2021) found that the '50% individuals need to have flowered at least three times' is the more conservative measure and suggested a minimum of 18 years for fire return interval in De Hoop.

On Potberg Mountain the intervals between successive fires vary between 16-24 years. The Albertinia Sand Fynbos tends to burn at return intervals of 14-19 years, while the Limestone Fynbos burns at 19–24-year intervals, but towards the west there was one fire that occurred at a 7-year return interval.

It is important that permanent protea plot monitoring takes place to ensure that the indicator species flower sufficiently before fires occur and that post-fire monitoring is implemented to determine if recruitment following fires is adequate.

2.3.1.1.5 Invasive alien plants

Invasive alien trees have a major negative impact on our limited water resources, and it is estimated that 6.7% of the water runoff of the entire country is used by these plants (Le Maitre *et al.* 2000; Van Wilgen *et al*. 2008; Van Wilgen & De Lange 2011). Moreover, it has been argued that the future impacts of invasive alien species may be much higher than anticipated, especially on surface water runoff, groundwater recharge and biodiversity (Van Wilgen *et al.* 2008) and will likely continue to spread faster than they can be cleared (Van Wilgen *et al*. 2016). The current level of invasions already reduces the yield by 38 mill. m^3 per year and, in 45 years' time with no clearing, the reductions would increase to 130 mill. m^3 (Le Maitre *et al.* 2019). It has been estimated that the water yield from mountain catchments invaded by invasive alien species may reduce by more than 30% over 20 years of invasion (Van Wilgen *et al.* 2001). It is likely that the percentage will increase over a longer period.

Invasive alien plant species within riparian zones and wetland buffers are a known threat to freshwater ecosystems (Hill *et al.* 2020; Le Maitre *et al.* 2020). Therefore, their removal needs to be prioritised for maintenance of these systems, especially for rivers in high-water yield catchments. Not only will this improve the health of the freshwater ecosystems, but it will also allow for the increased release of good quality water.

Invasive alien plants have been identified as a very high threat to all the ecosystems of the GDHC. A considerable number of the alien plant species in the GDHC have been declared as invaders according to the latest published Alien and Invasive Species Lists, 2020 in terms of sections 66(1), 67(1), 70(1)(a), 71(3) and 71A of the National Environmental Management: Biodiversity Act (NEM:BA), 2004 (Act No. 10 of 2004). These species, their status, category and their distribution are presented in Table 2.7.

Table 2.7: Invasive alien plant species recorded within the GDHC. The most problematic species are highlighted in bold text

Scientific name	Common name	Family	Status	Category (NEM:BA Invasive Alien Species Regulations 2014, 2020)	Sectors
Acacia cyclops	Red eye / Rooikrans	Fabaceae	Declared invader	Category 1b	De Hoop, De Mond, Waenhuiskrans
Acacia dealbata	Silver wattle	Fabaceae	Declared weed	Category 2	De Hoop
Acacia longifolia	Long-leaved wattle	Fabaceae	Declared weed	Category 1b	De Hoop
Acacia mearnsii	Black wattle / Swartwattel	Fabaceae	Declared invader	Category 2	De Hoop

Scientific name	Common name	Family	Status	Category (NEM:BA Invasive Alien Species Regulations 2014, 2020)	Sectors
Acacia pycnantha	Broad-leaf wattle; Gouewattel	Fabaceae	Declared weed	Category 1b	De Hoop
Acacia saligna	Port Jackson / Goudwilger	Fabaceae	Declared invader	Category 1b	De Hoop
Agave americana	American Agave	Asparagaceae	Declared invader	Category 3	De Hoop
Agave sisalana	Sisal hemp, Sisal	Asparagaceae	Declared invader	Category 3	De Hoop
Cortaderia selloana	Pampas grass / Pampasgras	Poaceae	Declared weed	Category 1b	De Mond
Eucalyptus camaldulensis	Red river gum	Myrtaceae	Declared invader	Category 1b	De Hoop
Eucalyptus grandis	Saligna gum, Rose gum	Myrtaceae	Declared invader	Category 1b	De Hoop
Eucalyptus conferruminata	Spider gum	Myrtaceae	Declared invader	Category 1b	De Hoop
Leptospermum laevigatum	Australian myrtle / Mirt	Myrtaceae	Declared invader	Category 1b	De Mond
Myoporum serratum	Common Boobialla	Myoporaceae	Declared invader	Category 3	De Mond, Waenhuiskrans
Pinus halepensis	Aleppo pine	Pinaceae	Declared invader	Category 2	De Hoop
Pinus patula	Patula pine	Pinaceae	Declared invader	Category 2	De Hoop
Pinus pinaster	Cluster pine	Pinaceae	Declared invader	Category 2 and 1b	De Hoop
Pinus taeda	Loblolly pine	Pinaceae	Declared invader	Category 2	De Hoop
Populus canescens	Grey poplar / Vaalpopulier	Salicaceae	Declared invader	Category 2	De Hoop
Hakea sericea	Silky Hakea/ Syerige Hakea	Proteaceae	Declared weed	Category 1b	De Hoop

Invasive alien species monitoring, control and eradication plans have been completed for De Hoop and De Mond addressing not only invasive alien flora, but also invasive alien fauna (CapeNature 2021a, b). The current extent and density classes of invasive alien vegetation in each of sectors along with known biocontrol sites are presented in Appendix 1, Map 8.

Clearing and controlling invasive alien plant species is costly and given the limited funding available, prioritisation of areas to be cleared needs to be undertaken to maximise benefit. Invasive alien vegetation clearing is done by reserve management according to priorities set during the annual Integrated Work Planning (IWP) sessions and is included in the Integrated Annual Plan of Operations (IAPO). Alien clearing is undertaken by CapeNature's EPWP staff and through ICM funding provided for the appointment of external contractor teams. Biological control has been identified as being an important component in reducing invasive alien plants in the GHDC and is the only long-term self-sustaining management method. A biological control campaign began on De Hoop in the late 1980s when the rust fungus, *Uromycladium tepperianum* was released against *Acacia saligna* (Impson 2020). The flower galling midge, *Dasineura dielsi*, arrived on De Hoop as a result of natural spread but the following biocontrol agents were introduced: *Melanterius servulus* (seed-feeding weevil); *Dasineura dielsi* (flower-galling midge); *Uromycladium tepperianum* (rust fungus); *Melanterius compactus* (seed-feeding weevil); *Melanterius maculatus* (seed-feeding weevil); *Dasineura rubiformis* (flower-galling midge); *Trichilogaster signiventris* (bud-galling wasp) and *Melanterius maculatus* (seed-feeding weevil). Despite limited releases into one or two localities, the biocontrol agents have dispersed well within De Hoop (Impson 2020). Prior to implementation of biological control measures, *Acacia cyclops* seed banks of between 2800 and 7800 seeds per square metre were recorded (Holmes 1989) however with biocontrol in the system such counts have declined significantly (Impson 2020) indicating that biocontrol can successfully be used as a tool for the management of invasive plant species.

2.3.1.4. Marine Vegetation

The marine vegetation in the GDHC comprises of 126 species from three taxon, namely Chlorophyta (12); Phaephyta (23 and Rhodophyta (91) as documented by Bolton & Stegenga (1990) and listed in Table 2.8.

Table 2.8: Seaweeds species found at De Hoop from Koppie Alleen to Wyoming (4.5km easterly) described by Bolton & Stegenga (1990)

Chlorophyta	
Acrochaete viridis (a new record for South Africa)	*Codium duthiae*
Bryopsis cf. caespitosa	*Codium extricatum*
Caulerpa filiformis	*Codium lucasii subsp capense*
Cladophora albida	*Codium stephensiae*
Cladophora radiosa	*Enteromorpha prolifera*
Cladophora sericea (a new record for South Africa)	*Ulva cf. fasciata*
Phaeophyta	
Anthophycus longifolius	*Hincksia mitchelliae*
Bachelotia antillarum	*Iyengaria stellata*
Bifurcariopsis capensis	*Myriocladia capensis*
Colpomenia sinuosa	*Phloiocaulon squamulosum*
Cystophora fibrosa	*Ralfsia verrucosa*
Dictyopteris longifolia	*Sargassum elegans*
Dictyola dichotoma	*Sargassum heterophyllum*
Dictyota naevosa	*Sphacelaria sp*
Ecklonia radiata	*Splachnidium rugosum*
Ecklonia radiata f biruncinata	*Zonaria harveyana*
Ectocarpus siliculosus	*Zonaria subarticulata*
Endarachne binghamiae	

Rhodophyta	
Acrochaetium moniliforme	*Acrosorium maculatum*
Acrosorium acrospermum	*Amphiroa cf anceps*
Griffithsia *subbiconica Stegenga* (note: collected in this survey and described as a new species with type specimen from Koppie Alleen.)	*Amphiroa ephedraea*
Gymnothamnion elegans	*Anotrichium tenue*
Haliptilon subulata	*Antithamnion diminuatum*
Helminthocladia papenfussii	*Antithamnionella tasmanica*
Herposiphonia clavata	*Antithamnionella verticillata*
Herposiphonia prorepens	*Arthrocardia spp*
Herposiphonia secunda	*Bornetia repens*
Herposiphonia secunda f. tenella	*Bostrychia intricata*
Heterosiphonia arenaria	*Calliblepharis fimbriata*
Heterosiphonia cf crispa	*Callithamnion stuposum*
Heterosiphonia dubia	*Caulacanthus ustulatus*
Hypnea rosea	*Centroceras clavulatum*
Hypnea spicifera	*Ceramium centroceratiforme*
Hypnea cf tenuis	*Ceramium glanduliferum*
Jania capillacea Harv	*Ceramium obsoletum*
Jania sp.	*Ceramium papenfussianum*
Laurencia flexuosa	*Ceramium tenerrimum*
Laurencia glomerata Klitz Kylin	*Champia compressa*
Laurencia sp	*Cheilosporum cultratum*
Laurencia natalensis	*Chondria capensis*
Laurenciophila minima	*Chylocladia capensis*
Peysonnelia capensis	*Colaconema botryocarpum*
Phacelocarpus tortuosus	*Colaconema daviesii*
Platysiphonia miniata	*Corallina sp*
Pleonosporium caribaeum	*Crouania attenuata*
Pleonosporium filicinum	*Dasyclonium palmatifidum*
Ploenosporium harveyanum	*Delisea flaccida*
Plocamium corallorhiza	*Erythrotrichia weltwitschii*
Plocamium comutum	*Falkenbergia rufolanosa*
Plocamium rigidum	*Falkenbergiella capensis*
Plocamium suhrii	*Galaxaura diesingiana*
Pollexfenia laciniata	*Gelidium amansii*
Polysiphonia incompta	*Gelidium capense*
Polysiphonia urbana	*Gelidium pristoides*
Polysiphonia sp	*Gelidium reptans*
Pterosiphonia cloiophylia	*Gigartina acicularis*
Ptilothamnion polysporum	*Gigartina paxillata*
Rhodophyllis reptans	*Gigartina radula*
Rhodothamniella floridula	*Gracilaria capensis*
Rhodymenia natalensis	*Griffithsia confervoides*
Sarcodia dentata	*Taenioma perpusillum*
Sciania capensis	*Tayloriella tenebrosa*
Spyridia cupressina	*Wrangelia purpurifera*
Spyridia filamentosa	

2.3.2 Freshwater ecosystems

The GDHC falls into the Breede Water Management Area (WMA), which includes the Breede and Overberg catchment areas (BOCMA 2010). This WMA is now managed together with the Berg, Olifants-Doring and Gouritz WMAs, as one WMA through the Breede-Olifants Catchment Management Agency (CMA). The catchments leading into the GDHC are extensively covered in agricultural land use, including cultivated grain fields and livestock farming (see Appendix 1 Map 9). These land use practices have greatly modified both the instream and riparian zones of the Sout River, which flows into the De Hoop Vlei and the Heuningnes and Nuwejaars rivers that flow into the Heuningnes Estuary. The Present Ecological Scores (PES) of the rivers in the catchments surrounding the GDHC, varies from good to moderately modified according to the National Freshwater Ecosystem Priority Areas (NFEPA) and the National Biodiversity Assessment of 2018 inland waters section (Nel *et al.* 2011a, b; van Deventer *et al.* 2019). However, these ecological scores could change in the current national project of the Department of Water Affairs and Sanitation's (DWS) to update the Present Ecological State/Ecological Importance and Sensitivity (PES & EIS) project (WRC 2022) and the PES & EIS project for the Berg-Breede catchments [as part of the provincial Ecological Infrastructure for Water Security project]. Changes in the PES are likely for the river reaches in the agricultural areas upstream of De Hoop and De Mond. For example, the instream habitat integrity and the water quality measured in the past at several sites in the Sout River catchment have been reported to fall in the range of fair to poor conditions (Herdien *et al.* 2006).

Through the NFEPA process, the Sout River sub-catchments directly upstream of the De Hoop boundary have been identified as Rehab-FEPA's, while the Potbergs River catchment and the rest of the upper Sout River has been classified as upstream support areas for the De Hoop Vlei, which serves as a fish sanctuary (or fish FEPA; (CSIR 2010; Nel *et al*. 2011a, b).

The rivers running into De Mond drain the Soetmuis and Bredasdorp mountains. According to the NFEPA project maps, several Freshwater Ecosystem Priority Area (FEPA) rivers and wetlands/estuary systems are included in the sub-quaternary catchment surrounding De Mond (Nel *et al.* 2011a, b). These include the fish sanctuaries associated with the Nuwejaars River, the FEPA sub-quaternary catchments of the Kars and Heuningnes Rivers and the Heuningnes Estuary, together with the wetland systems forming part of the Kars River catchment (Nel *et al.* 2011b). These wetland systems are also underlain by karst systems, which in addition to their many natural values, have important socio-economic values, which include the supply of drinking water, water for grazing animals, tourism and recreation.

2.3.2.1 Groundwater

Most of the groundwater resources of the GDHC fall into the Bredasdorp Coastal Belt Western Cape Groundwater Region, with a section of the eastern part of the De Hoop falling into the Ruensveld Groundwater Region. In addition, most of the aquifer systems underlying the GDHC are minor and are considered to provide a moderate yield of good quality water (Department of Water Affairs DWA 2012). The aquifer system along most of the De Hoop coastline is considered most vulnerable except for a section of moderate vulnerability in the far eastern section. A section of least vulnerable is found around the Heuningnes Estuary system at De Mond (DWA 2013a). These aquifer regions are vulnerable to conservative pollutants over a long time and the most vulnerable indicates an aquifer region that is vulnerable to many pollutants and contaminants. Aquifer classification and vulnerability, feed into the susceptibility status of an aquifer region to be polluted by anthropogenic impacts. The aquifer systems supporting the De Hoop Vlei and surrounding freshwater ecosystems, have susceptibility ranges from low (west) to high (east, including most of De Hoop) (DWA 2013b). Furthermore, according to a sea level rise and flood risk assessment conducted by the Department of Environment and Development Planning (DEA&DP) (2012) the risk of groundwater contamination due to seawater intrusion along the coastline from Pearly Beach to De Hoop Vlei is low to moderate.

The groundwater quality, i.e. electrical conductivity, for the area, including De Mond and De Hoop, ranges from extremely salty in the west (370- >520 mS/m) to a mosaic of slightly salty to a noticeable salty taste (70-370 mS/m) across the eastern parts (Groundwater Quality of South Africa 2012).

Moreover, due to the proximity to the sea and relatively low rainfall of around 350 mm p.a., the aquifer overlying the Bokkeveld shales is likely to be highly saline at and below sea level, with freshwater perched as a shallow lens at a depth of not more than 10 – 15 m even at the highest locations in De Mond, with a great deal of local variability depending on soil depths and local conditions.

Water for domestic use is extracted at De Mond from only one borehole. This water however is too saline for drinking purposes, and a shallower borehole needs to be established that should be able to produce more potable and less saline water.

2.3.2.2 Rivers

The northern section of De Hoop falls into the Sout River catchment, and the eastern side includes a small section of the lower Breede River catchment. The Sout River is the main river feeding the De Hoop Vlei and it flows through agricultural lands before entering the De Hoop. The upper section of the Potbergs River is located within the De Hoop boundary and this is the main tributary of the Sout River (Appendix 1 Map 9). The confluence of these two rivers is situated outside the De Hoop boundary. Furthermore, the Melkhouts, Jacobs and the Ziekenhuis ivers, all tributaries of the Breede River, originate inside De Hoop along the northern slopes of the Potberg Mountain. The Klipdrifsfonteinspruit stream is located near the coastline, in the eastern sector of De Hoop and feeds the Klipdrifsfontein Estuary (Scott & Scott 2001; CapeNature 2023b). In terms of the NFEPA project (Nel *et al.* 2011), the De Hoop catchment (quaternary catchment G50H) is listed as a fish sanctuary. The Heuningnes River catchment, situated off reserve to the west of De Hoop, is also an important area for fish and home to several indigenous and threatened freshwater fish species.

The Heuningnes Estuary has two major tributaries. These are the Kars River and Nuwejaars rivers (quaternary catchments G50E and G50C respectively). The latter flows into Soetendalsvlei, the overflow from which has a confluence with the Kars River (Appendix 1 Map 9). The length of the river from the mouth of the Heuningnes Estuary to the confluence of the Kars River and overflow channel from Soetendalsvlei is 15 km (1:50 000 Sheet 3420 CA and CC Bredasdorp). Based on the latest PES & EIS database the Heuningnes River, downstream of the confluence with the Nuwejaars and Kars Rivers and upstream of the estuary at De Mond, falls into a good PES category (DWS 2014). The Kars and Nuwejaars Rivers are both in a moderately modified condition, with a desired state of good for the upper reaches. The desired state, i.e. good class, for the Nuwejaars system is strongly linked to the system also being important for several threatened indigenous fish species (FEPA fish sanctuary; Nel *et al.* 2011a).

2.3.2.3 Wetlands

The wetlands within GDHC fall into the South Coast Fynbos Bioregion, and at De Hoop they include channelled valley-bottom wetlands - critically endangered and not protected, for this vegetation bioregion), depression and seep wetlands - both critically endangered and poorly protected (van Deventer *et al.* 2019; Skowno *et al.* 2019). At least three known wetland systems occur in De Hoop, including the De Hoop Vlei, the Dronkvlei wetlands and the Buffelsfontein wetlands.

The De Hoop Vlei includes a series of wetland clusters of conservation importance (FEPA wetlands) (Nel *et al.* 2011). These wetland clusters not only include the Vlei itself, but also wetlands in the surrounding catchment, both on and off- reserve (see NFEPA map, Breede WMA 18; Nel *et al.* 2011 and NBA 2018 National Wetlands shown on Map 9). According to the Ramsar information sheet for the De Hoop Vlei, the wetland types present in this wetland cluster system include coastal freshwater lagoon, coastal brackish lagoon and seasonal freshwater marshes. The wetland classification for inland systems (Ollis *et al.* 2013) would classify these wetland clusters as coastal flats.

The De Hoop Vlei is unique in the south-western region as it is closed off from the ocean with varying levels of salinity. Here the inflow of freshwater from the Sout is an important factor in creating the uniqueness of this wetland system. Moreover, the De Hoop Vlei itself and the other wetland clusters, including the FEPA wetlands, supports large communities of vertebrate and invertebrate species, and numerous wetland plants.

The only wetland present in the De Mond cluster is Soetendalsvlei however it is likely that some dune slack wetlands do occur along this coastline. Soetendalsvlei, is the largest open freshwater wetland within this catchment area and is approximately 7.5 km long and 3 km wide. Although it is considered a permanently wet system, the surface water in Soetendalsvlei dried up for approximated 2 years during the 2016-2018 drought experienced in large parts of the Western Cape. The effects of climate change, such as the frequency of future droughts, is of concern for Soetendalsvlei, as it also supports the largest numbers of water bird species on the Agulhas Plain. The property is owned by the State and currently managed by CapeNature as part of this management plan, constitutes only a section of the wetland and is approximately 415 ha in size. The total surface area of the wetland is approximately 1 590 ha and therefore the state land is only 26 % of the total surface area of the wetland. A section of the wetland and the properties on the western and southern perimeters are presently part of the Agulhas National Park, but the largest part is still in private ownership.

The conservation importance of wetlands within the GDHC is also heightened by the extensive system of karst formation caves and subterranean caves. In karst landscapes, surface and subsurface rock dissolution largely overrules mechanical erosion, leading to a distinctive morphology and hydrology (Forti 2015). According to the Ramsar convention, the principal wetland conservation values of karst systems include:

Uniqueness of karst phenomena/functions and functioning include:

- Inter-dependency and fragility of karst systems and their hydrological and hydrogeological characteristics
- Uniqueness of these ecosystems and endemism of their species
- Importance for conserving particular taxa of fauna and flora

2.3.2.4 Marine, estuarine and coastal systems

Marine Ecosystems

The National Biodiversity Assessment 2018 (Sink *et al.* 2019) has categorized the South Africa marine realm to reflect four main shelf ecoregions and two deep ocean ecoregions. These are the Southern Benguela Shelf, Agulhas Shelf, and the Natal Shelf; the Delagoa Shelf; the Southeast Atlantic Deep Ocean, and Southwest Indian Deep Ocean respectively. The MPA and surrounds fall entirely within the Agulhas Shelf Province. The continental shelf is at its widest (260km) south of Cape Infanta, and this ecoregion features the highest South African marine endemism. Numerous commercial fisheries are supported in this ecoregion, namely pelagic, hake and sole trawl, and the shark directed longline fisheries. These fisheries are likely to directly impact on the MPA (Albano 2020). However, if the MPA is well designed and managed effectively, it can reduce local fishery risks, improve biodiversity conservation (Green *et al.* 2014), and provide benefits for threatened, endemic and lesser known chondrichthyan (cartilaginous fish) species (Cortelezzi *et al.* 2022; WildTrust 2022).

According to the MARISMA Project in support of ecosystem based Marine Spatial Planning (Harris *et al.* 2022) the Agulhas Bank Nursery Area has been identified during two planning initiatives as an important ecologically or biologically significant area (EBSA). This EBSA is important for numerous life cycle stages including spawning, larval retention and recruitment, provisioning of nursery and foraging areas and features high connectivity. The MPA falls within the western edge of this EBSA and is an important protected area for some sparids and sciaenids that are relying on the habitats required for these life cycle phases. Reefs in this ecoregion are reported as being low to very high profile, most with low rugosity and they support a variety of wall sponges, corals, red algae, kelp, gorgonians, fish and sharks. The MPA has been successful in actively protecting populations of sought-after reef fishes (Bennett & Attwood 1993), and in providing migrant recruits of over-fished fish species such as red steenbras (*Petrus rupestris*) to other areas.

Three marine turtles, loggerhead (*Caretta caretta)*, hawksbill (*Eretmochelys imbricata*) and green (*Chelonia mydas*) have been recorded, all of which are regionally and globally threatened (listed as vulnerable, critically endangered and endangered respectively). It is unknown to what extent these

species are dependent on the MPA, and no specific management actions are suggested currently other than continued protection of the MPA as a no-take zone. Although turtle species do not breed in the MPA there are annual loggerhead hatchling wash outs along the shoreline.

The MPA coastline is characterized by six main habitat types. It can be described as having narrow, gently sloping sandy beaches backed by low primary dunes which stretch from the western boundary eastwards to Klipkoppie for approximately 13.8km. The shoreline adjacent to this area is a wide, prominent, mostly submerged, low profile aeolianite platform characterized by regular sand inundation and erosion. A 9.2km long wide gently sloping sandy beach then predominates to Koppie Alleen where the shoreline habitat drastically changes to a limestone dominated rocky shore. This shore is best described by Bolton & Stegenga (1990) as rocky aeolianite eroded to cliffs above the highwater mark and fronted by flat wave-cut platforms in the mid to upper intertidal region which ends abruptly at the seaward edge. The platforms feature many deep gullies and pools, and can often be severely undercut, leading to quite extensive cave formations. This section of the coast has intermittent small sandy beaches, but the dominant rocky substratum continues for approximately 12.2km where it gradually disappears under sand creating a narrow sandy beach for 6.5km. This sandy beach abruptly ends at the first outcropping of hard Table Mountain sandstone which forms high cliffs, steep shores with deep prominent fissures and caves, boulder beds and beaches with little sand.

During an iterative mapping exercise by Sink *et al.* (2023) the MPA featured 10 of the 163 mapped ecosystem types (see Table 2.9). The offshore area of the MPA consists of four main ecosystem types, each of which is continuous and together comprise 97% of the MPA. The inshore area of the MPA (for approximately 500m from the high-water mark) constitutes the remaining 3%. This area shows increased variation, mapped portions are not continuous, and variation is pronounced in the eastern two thirds of the coastline from just west of Koppie Alleen.

Table 2.9: Marine ecosystem types of the De Hoop MPA (Sink *et al.* 2023)

Marine Ecosystem Type	Description	NBA 2018 Threat Status	Area (Ha)	Number of portions per ecosystem
Offshore				
Agulhas Sandy Mid Shelf	Sandy seafloor and associated water column on the mid shelf in the Agulhas ecoregion (-40 to -100 m).	Near Threatened	47994.0	1
Agulhas Inner Shelf Mosaic	Mosaic seafloor and associated water column on the inner shelf in the Agulhas ecoregion. Extends from the back of the surf zone to fair weather wave base at -40 m.	Vulnerable	15694.3	1
Agulhas Muddy Mid Shelf	Muddy seafloor and associated turbid pelagic habitat in the Agulhas ecoregion (-40 to -100 m). This ecosystem includes the East Coast sole grounds.	Critically Endangered	3395.8	1
Western Agulhas Bay	Western bays (St Sebastian, Vleesbaai, Mosselbay and Plettenberg Bay) of the Agulhas ecoregion from back of surf zone to outer edge of embayment which ranges between -40 and -70 m.	Endangered	906.7	1
Total Offshore			**67990.8**	
Inshore (app. 500m from high water mark)				
Agulhas Mixed Shore	A shore with both rocky and sandy habitat in the Agulhas ecoregion.	Near Threatened	1101.2	24

Marine Ecosystem Type	Description	NBA 2018 Threat Status	Area (Ha)	Number of portions per ecosystem
Agulhas Exposed Rocky Shore	Rocky shore type in the Agulhas ecoregion exposed to moderate wave intensity.	Vulnerable	467.9	25
Agulhas Dissipative Intermediate Sandy Shore	Fine grained, sloping sandy shore with moderately wide beach and surf zone in the Agulhas ecoregion.	Least Concern	440.8	2
Agulhas Very Exposed Rocky Shore	Rocky shore type in the Agulhas ecoregion that is exposed to high wave intensity.	Vulnerable	44.2	2
Agulhas Intermediate Sandy Shore	Beach with medium grain size and moderate slope in the Agulhas ecoregion. Often with cusps on the shore and sandbars and rips in the surf.	Least Concern	36.3	5
Agulhas Kelp Forest	Kelp forest in the Agulhas ecoregion as mapped from Sentinel 2 satellite imagery. Agulhas kelp forests are more grazer dominated and more diverse than those in the Southern Benguela.	Vulnerable	36.2	133
Warm Temperate Small Temporarily Closed	NA	NA	4.0	1
Total Inshore			**2130.7**	
Grand Total			**70121.5**	**196**

The Agulhas Sandy Mid Shelf is the largest ecosystem type followed by the Agulhas Inner Shelf Mosaic and together constitute 90.8% of the entire MPA. Both these ecosystem types are offshore and support a wide range of species including reef dependent sparid species. The portion of critically endangered Agulhas Muddy Mid Shelf in the extreme southeastern section of the MPA spans 3395.8 hectares. This is equivalent to less than 1% of the entire Agulhas Muddy Mid Shelf ecosystem but is the only protected portion of this habitat within a coastal MPA. The protected portion in the MPA comprises 1.14% of the coastal portion of this habitat and likely plays an important ecotonal role.

Approximately half (51.6%) of the inshore area of De Hoop is dominated by Agulhas Mixed Shores that are often characterized by sand inundation and erosion, creating abundant food availability during this natural scouring process. Many surf zone species are reliant on the latter.

Agulhas Kelp Forest is a relatively new habitat within the MPA, recorded by Bolton *et al.* (2012). It should be noted that the Marine Ecosystem Mapping product may be incorrect as it shows many (133) small habitats all along the inshore area from Koppie Alleen to beyond the eastern boundary and this would need verification.

The intertidal zone of the MPA has faunal elements representing both warm-water east coast species and cold-water west coast species. Invertebrate surveys have been conducted on the rocky shoreline/intertidal area. CapeNature unpublished data indicates that a total of 24 marine invertebrate species have been sampled in MPA since 2002.

In the south coast Agulhas ecoregion, five zones are present within the intertidal area (Littorina, Upper and Lower Balanoid, Cochlear and Infratidal) (Branch & Branch 2018):

Zone 1: The **Littorina Zone** is dominated by the southern periwinkle *Affrolittorina knysnaensis* and the purple laver seaweed *Porphyra capensis*.

Zone 2: The **Upper Balanoid** has a host of dense stands of indigenous barnacles, particularly the toothed barnacle *Chthamalus dentatus* in the top zone, the volcano barnacle *Tetraclita serrata* lower down on more sheltered areas, and the eight-shell barnacle *Octomeris angulosa* on exposed rocky shores that are faced with high wave action (Branch & Branch 2018). The granular limpet *Scutellastra granularis* and the goat's-eye limpet *Cymbula oculus* are abundant on all types of shores. Topshells *Oxystele variegata* and *O. impervia* are common on more sheltered shores.

Zone 3: In sheltered areas, the **Lower Balanoid Zone** supports thick beds of algae, particularly the tongue-weeds *Gigartina polycarpa* and *Sarcothalia stiriata*, and the jelly-weed *Gelidium pristiodes*. Interspersed are smaller numbers of animals, including the long-spined limpet *Scutellastra longicosta* and the topshells *Oxystele sinensis* and *O. tigrina*. On exposed shores in the Lower Balanoid, the brown mussel *Perna perna* takes over most of the lower half of the shore (Branch & Branch 2018). Higher up, the invasive Mediterranean mussel *Mytilus galloprovincialis* can dominate, but appears to have reached a balance of shared habitat with the indigenous brown mussel (Picker & Griffiths 2017).

Zone 4: Within the **Cochlear Zone**, the pear limpet *Scutellastra cochlear* is dominant and Argenville's limpet *Scutellastra argenvillei* is present but not abundant.

Zone 5: The **Infratidal Zone** supports redbait *Pyura stolonifera* and algae such as corallines, the wracks, green tips, species of *Zonaria* and the spiny kelp *Ecklonia radiata*. In sheltered areas, the Cape urchin *Parechinus angulosus* is associated with encrusting corallines (Branch & Branch 2018). A significant population of kelp-bed forming seaweed *Ecklonia maxima* was discovered in the MPA during 2006 (Bolton *et al.* 2012) that is likely due to inshore water temperature cooling along this portion of the Agulhas ecoregion coast. It was confirmed as the only recorded seaweed distributional change to date (DFFE 2023). This change does create a new ecosystem type in this MPA, albeit relatively small in relation to the MPA and negligible in relation to the entire *E. maxima* population. Abalone (*Haliotis midae*) is also present in the reef areas.

As described in the De Hoop Protected Area Management Plan 2017-2022 (CapeNature 2016a) the following paragraphs highlight the link between the MPA and its associated systems. The Breede River mouth and estuary is approximately 4.5 km north of the far eastern boundary of De Hoop. This is one of the larger estuaries in the Western Cape and is extensively used for recreational fishing and other water sport activities. Research conducted on the Breede estuary and the MPA suggests a link between the two systems in protecting important marine fish species. Dusky kob (*Argyrosomus japonicus*) show a high degree of residency with limited movement (Griffiths & Attwood 2005). Fish tagged in the MPA have been recaptured in the Breede estuary and vice versa showing the utilisation of both the MPA and estuary during critical stages in the fish species' life history (Swart 2015, DEA: Oceans & Coasts, pers. comm). Juvenile Dusky kob appear to be resident in their natal estuaries and adjacent surf zones (Griffiths 1996; Griffiths & Attwood 2005).

The study by McCord & Lamberth (2009) has shown the presence of Zambezi sharks (*Carcharhinus leucas*) in the Breede estuary. These sharks showed a high degree of residency before migrating up the South African coastline (McCord *et al.* 2013). Bennett and Attwood (2010) assessed the movement patterns of the estuarine dependent, overexploited, white steenbras (*Lithognathus lithognathus*) in the estuary. They found that high levels of residency within the coastal zone render late juvenile and sub-adult white steenbras vulnerable to localised overexploitation but simultaneously provide the opportunity for effective protection through MPAs. Moreover, white steenbras is following a consistent decrease in catches over a 30-year research period (Swart 2015 DEA: Oceans & Coasts pers. comm.) illustrating a critical need to protect the estuarine nursery areas and existing no-take MPAs.

The western most sector of the Southern Cape commercial oyster fishery falls to the east of the Breede River estuary and within the buffer area of the GDHPA. The exploitation of the Southern Cape oyster fishery is reported as "heavy" (DFFE 2023) and illegal harvesting from subtidal "mother beds" is concerning. It should be noted that the Total Allowable Effort is determined by historical effort patterns and not an assessed stock. There is currently one compliant permit holder, originating

from Slangrivier who actively harvests oysters and sells to three local restaurants in Witsand (Booysen pers obs).

The link between estuaries which serve as nursery areas for overexploited fish species and no-take MPAs cannot be overstated and as such the link between the Breede Estuary and the MPA is a critical one. More research on the relationship between these areas is needed to support the maintenance of De Hoop as a no-take MPA and the protection of the Breede estuary.

Estuarine Ecosystems

Estuaries are difficult to classify because they vary temporally in shape and size and encompass a gradient in conditions from riverine to marine areas (CapeNature 2023e). The classification of estuarine systems underwent a revision with the National Biodiversity Assessment (2018) (van Niekerk *et al.* 2019). Estuaries were classified according to four biogeographical regions namely Cool Temperate, Warm Temperate, Subtropical and Tropical (CapeNature 2023e). The two estuaries within the GDHC fall within the warm temperate region with the Heuningnes being considered the western boundary of the region.

These biogeographical regions were further classified into the nine newly described estuary categories (Estuarine Lake, Estuarine Bay, Estuarine Lagoon, Predominantly Open, Large Temporarily Closed, Small Temporarily Closed, Large Fluvially Dominated, Small Fluvially Dominated and Arid Predominantly Closed). In addition, the estuaries were assigned one of 22 estuarine ecosystem types.

The Heuningnes River estuary, effectively bisects and extends beyond the northwestern boundary of De Mond and is a low-lying predominantly open estuarine system. It must be noted that five of the six estuary processes that define natural estuary type have been compromised by agriculture and developments. These five processes are mouth closure, high water levels, salinity gradient, mixing process and connectivity. As a result, the natural ecosystem type, defined as an Estuarine Lake, has made a functional type shift to a Predominantly Open system. In the early 20th century, the estuary functional zone was targeted by farmers and drained with artificial channels to create dry land for grazing and crop farming. Since the 1940s sand dune stabilisation on either side of the mouth prevented mouth closure and natural inundation of the estuarine floodplain, which could then be farmed. This substantially changed the mouth regime and resulted in fewer mouth closures. When it did close, it was artificially breached as soon as it was considered a threat to existing agriculture practices. The topography and paleolimnology suggest that in its natural state the estuary would have supported a large open water area that would gradually back flood over several years under closed mouth conditions, followed by natural breaching after river flooding and significant sediment scour in the lower reaches (Harris *et al.* 2019). Table 2.10 shows the health classification of the Heuningnes Estuary.

Table 2.10: Heuningnes Estuary classification NBA 2018 (Harris *et al.* 2019)

Estuary name	Heuningnes
Present Ecological State (A = Natural – F = Extremely degraded)	C/D (Moderately modified/Largely modified)
Recommended Ecological Condition	B (Largely natural)
Biodiversity Importance Rating (>80 =High Importance, 60 - 80=Important >60 = Average Importance)	High Importance
Biodiversity priority core set (National and/or CAPE)	SA/CAPE/WC
Biodiversity Priority Rating	Priority
Ramsar status	Yes
IBA	Yes
EBSA	Adjacent
DAFF Important Fish Nurseries (5 =Very High priority, 3= Priority)	High

Very little is known about the hydrology of the Klipdrifsfontein Estuary. It is described as a small temporarily closed estuary that opens during periods of high flows to the sea (van Niekerk *et al.* 2019). The system enters the Indian Ocean in a relatively sheltered bay which, in turn, is expected to result in a relatively slow build-up of sediment at the mouth. The estuary gets overwash from the sea from time-to-time during periods of high seas. The last recorded breaching event was in November 2013 (CapeNature 2016a). Due to the protected status of the surrounding area, the Klipdrifsfontein Estuary has not been altered by anthropogenic impacts, and the estuary is in excellent condition (Table 2.11) The nearest development is the Whale Trail's Noetsie overnight accommodation (CapeNature 2016a), which, other than the occasional swimmer, has little to no impact on this system.

There are no macrophytes recorded for this system and no saltmarsh exists due to the steepness of the valley. The estuary is 0.22 km long from the surf zone to the first distinct narrowing 0.49 km to the 5 m contour line. The total mapped habitat area was classified as channel and measured 0.6 ha.

Table 2.11: The ecological health classification of the Klipdrifsfontein Estuary (van Niekerk 2018)

Estuary name	Klipdrifsfontein
Present Ecological State (A = Natural – F = Extremely degraded)	A (Natural)
Recommended Ecological Condition	A (Natural)
Biodiversity Importance Rating (>80 =High Importance, 60 - 80=Important >60 = Average Importance)	Low to Average Importance
Biodiversity priority core set (National and/or CAPE)	SA/CAPE
Biodiversity Priority Rating (5 =High priority)	Priority
Ramsar status	No
IBA	Yes – situated within the De Hoop IBA
DAFF Important Fish Nurseries (5 =Very High priority, 3= Priority)	Low

Very little information on fish is available for this system. According to unpublished data, the fish fauna of the Klipdrifsfontein Estuary largely comprises of:

- Cape moony *Monodactylus falciformis*
- Flathead mullet *Mugil cephalus*
- Freshwater mullet *Myxus capensis*
- Southern mullet *Liza richardsonii*

No data is readily available on the birds of the Klipdrifsfontein Estuary specifically. However, the estuary falls within the De Hoop Important Bird and Biodiversity Area (IBA), which provides some information on the birds within the area.

The marine and estuarine systems of the GDHC are illustrated in Appendix 1, Map 10.

2.4 Biodiversity Context: Taxa

2.4.1 Invertebrates

The core of the CFR represents a distinct zoogeographic zone, the Cape Faunal Centre (Stuckenberg 1962), which is characterised by the phylogenetic antiquity of much of its invertebrate fauna. The component species of this centre represent what is probably the richest known assemblage of post-Gondwanan relict species. It is a pronounced hotspot for faunal endemism within southern Africa, where high levels of endemism are characterised for virtually all taxa examined.

Invertebrates comprise more than 80% of animal diversity, yet they are grossly under-represented in studies of African diversity. Site biodiversity estimates that do not consider invertebrates omit the greatest component of what they are attempting to measure and ignore groups that are very significant

contributors to ecosystem processes (McGeoch 2002; Samways *et al*. 2010, 2012). These include primary production, nutrient recycling, predation, herbivory and competition.

There is no comprehensive invertebrate species list for the GDHC, but 154 invertebrate taxa, belonging to 13 orders, have been recorded in the GDHC, or within a 10 km buffer around it. Records for the GDHC and surrounds are obtained through baseline data collection by CapeNature personnel, and by members of the public via citizen science platforms such as the online Virtual Museums and iNaturalist.

Some protection might be provided to certain arthropod groups in protected areas, given the fact that there are correlations between insect species richness and biome-related plant diversity in the Western Cape (Procheș & Cowling 2006, 2007; Procheș *et al.* 2009). The attention and protection that the area receives in terms of its floral diversity might thus provide some protection for its insect diversity (Samways *et al*. 2012).

2.4.1.1 Terrestrial Invertebrates

In addition to the vital role invertebrates play in ecosystems (McGeoch 2002; Samways *et al.* 2010, 2012), such as primary production, nutrient recycling, predation, herbivory, competition, the Cape flora is dependent on specialised pollination guilds and insect-driven ecological processes. The primary threat to insect pollinators is habitat destruction or transformation resulting in a decrease in available forage. Other threats include agricultural pesticides such as neonicotinoids, other volatile pollutants, pests, diseases, and climate change. An important pollinator in the GDHC is the Cape honeybee, *Apis mellifera capensis.* Bees are affected by all the above threats. The primary objective of CapeNature's 2020 bee policy (CapeNature 2020b) is to protect wild honeybees on protected areas from genetic, ecological, pathogenic, and parasitic threats. These areas thus serve as refugia for locally adapted bee populations and contribute towards a network of healthy source honeybee populations that can disperse naturally throughout the rest of the province, thereby providing support to apiculture. Because of the risks posed by commercial beekeeping to wild bee populations (e.g., the introduction of pests or diseases), beekeeping, including the use of catch boxes, is not permitted in the GDHC.

In the Fynbos Biome myrmecochory, or seed dispersal by ants, is another important ecological function performed by invertebrates (Le Maitre & Midgley 1992). Approximately 20% of strictly fynbos plant species are dependent on this process (Johnson 1992), with 78 genera containing species that are ant-dispersed (Bond & Slingsby 1983).

Circellium bacchus, a flightless dung beetle and the only species in the genus *Circellium*, occurs in the GDHC and surrounds (Fig. 2.15). The loss of flight allows the beetle to use the empty space below the elytra as a carbon dioxide storage tank, creating a unique breathing mechanism which conserves water, a valuable survival trait in the arid regions it lives in (Chown *et al.* 1998; Santer 2003; Byrne & Duncan 2003). It was originally widespread in Southern Africa, but now its distribution is very restricted due to its habitat being constantly under threat from agriculture and general human encroachment. This qualifies the species as being Vulnerable. Furthermore, this beetle has low fecundity (it produces only one offspring per year) and dispersibility due to it being flightless, and has undergone habitat specialisation and co-evolution with, and dependence on, falling numbers of vertebrates (especially elephant and buffalo) (Chown *et al.* 1998). While this species is not included on the IUCN list of threatened species, it complies with most of the criteria and therefore qualifies as Vulnerable. This is due to its populations being small, restricted, and isolated. The flightless dung beetles mostly feed on elephant or buffalo dung, but they have been recorded to also feed on dung from other species such as rabbits, baboons, antelopes and ostriches.



Figure 2.15: The flightless dung beetle *(Circellium bacchus)* (Photo: Marienne de Villiers)

The butterflies of South Africa were assessed according to IUCN criteria as part of the South African Butterfly Conservation Assessment project (Mecenero *et al.* 2013) and the South African Lepidoptera Conservation Assessment (Mecenero *et al.* 2020). Four of the fifty-five butterfly taxa recorded in or near the GDHC are of conservation concern. All four taxa are Western Cape Endemics.

Chrysoritis brooksi tearei (Angular opal) (Fig. 2.16) was classified as Vulnerable during the South African Butterfly Conservation Assessment project (Mecenero *et al.* 2013) but subsequently reclassified as Endangered (Edge 2018a). The species distribution ranges from Bredasdorp in the west to Stilbaai in the east and it is endemic to the southern coastal region in the Western Cape. This species has 11 subpopulations that are spread over six widely separated locations (17-72 km apart) with no possibility of gene flow between them, or recolonisation following local extinction given that the species' average dispersal distance is 1-2 km. Large scale agro-industry farming, grazing and ranching, as well as invasive alien vegetation has caused the loss of some subpopulations in the past and may do so in the future. Current and future threats are encroachment by alien plants, agricultural activities and grazing by domestic livestock. The continued suppression of fires and the disruption of natural fire regimes may also impact on the viability of remaining habitat patches (Edge 2018a).

Aloeides egerides (Red Hill Russet) (Fig. 2.17) is classified as Vulnerable (Mecenero *et al.* 2013; Selb 2018). This species occurs from Red Hill in Simonstown on the Cape Peninsula in the west to Struisbaai in the east. The main threat to this species is degradation of its habitat due to encroachment by invasive alien vegetation, habitat loss due to inappropriate fires, and urban and informal housing developments.

Aloeides carolynnae aurata (De Hoop copper) (Fig. 2.18) is currently classified as Near Threatened (Pringle 2018) and occurs from De Hoop in the west to Witsand in the East. It is also known from one locality between Riversdale and Still Bay. Subpopulations occurring outside of De Hoop are

threatened by agricultural developments, invasive alien vegetation, poor fire management and coastal housing developments.

Lepidochrysops littoralis (Coastal giant cupid) is classified as Near Threatened (Edge 2018b) and occurs from De Hoop in the west to a few kilometres west of Mossel Bay in the east. The population is severely fragmented due to agricultural activities, coastal developments, industrial complexes, housing estates, plantations, and invasive alien plant infestations. Localities where the species occurs represents isolated, closed subpopulations, some of which are non-viable. The species thus qualifies globally under the IUCN criteria as Endangered (Edge 2018b).



Figure 2.16: Angular opal (*Chrysoritis brooksi tearei*) adult (Photo: Steve Woodhall)



Figure 2.17: Red Hill Russet (*Aloeides egerides*) (Photo: Andrew Morton)



Figure 2.18: De Hoop copper (*Aloeides carolynnae aurata*) (Photo: Andrew Morton)

Another ecologically important invertebrate group is the Arachnida. A total of 11 500 spider species representing 62 families, 334 genera and 960 species have been recorded in the Western Cape (Dippenaar-Schoeman *et al*. 2024). This represents 42.4% of the total spider fauna of South Africa. A total of 269 species (28.0%) is endemic to the Cape Floristic Region, 49 species (5.1%) are of special concern and more than one-third of these are endemic to the province (Dippenaar-Schoeman *et al*. 2024). Surveys by the University of the Free State were carried out between 1999 and 2007 as part of the South African National Spider Atlas and a total of 274 species representing five arachnid orders were recorded, of which spiders were the dominant taxon (252 species, 174 genera, 53 families) (Haddad & Dippenaar-Schoeman 2009). The latter included the Cape copper baboon spider (*Harpactira cafreriana*) (Fig. 2.19) and one of the biggest baboon spider species, *Harpactira dictator*, or dictator baboon spider (Fig. 2.20). Both these species are of Least Concern (Dippenaar-Schoeman *et al*. 2024).



Figure 2.19: Cape copper baboon spider (*Harpactira cafreriana*) (Photo: Gary Kyle Nicolau)



Figure 2.20: Dictator baboon spider (*Harpactira dictator*) (Photo: Gary Kyle Nicolau)

2.4.1.2 Freshwater Macro-invertebrates

Although no focussed surveys for aquatic invertebrates have been conducted in the GDHC, some records are available from other databases on select aquatic and semi-aquatic invertebrate taxa. These databases include South African Scoring System version 5 records, and records lodged online on iNaturalist and the Freshwater Ecosystem Priority Area (FBIS) databases.

Benthic macro-invertebrates can be used to monitor water quality and habitat diversity over the long term, using the South African Scoring System version 5 (SASS 5) methodology following standardised protocols (Dickens & Graham 2002). SASS 5 is a rapid bio-assessment method and is used to assess the water quality, habitat availability, and health of a river system. The method uses the presence/absence of macroinvertebrate families to evaluate water quality, with a sensitivity/tolerance score out of 15 linked to each taxon. The higher the score, the more sensitive the specific taxon is to disturbance. The method also takes invertebrate abundance into account, as well as habitat (or biotope) availability, as different taxa prefer different parts of a river system. The SASS 5 score is linked to an ecological category developed by Dallas (2007) (Table 2.12).

Table 2.12: Ecological categories for interpreting SASS 5 data as adapted from Dallas (2007)

Ecological Category	Category Name	Description
A	Natural	Unmodified, natural
B	Good	Largely natural with few modifications
C	Fair	Moderately modified
D	Poor	Largely modified
E	Seriously modified	Seriously modified
F	Critically modified	Critically or extremely modified

SASS 5 data provide only a snapshot of water quality and biotope/habitat availability at a site. To date, limited sampling has taken place in the GDHC, and baseline surveys are required to determine the current state of the rivers. Seasonal and more in-depth invertebrate surveys are also needed to get a

complete picture of the species that are present, the community structure, as well as to determine the effects of certain impacts (Barber-James & Pereira-da-Conceicoa 2016). An initial baseline survey will only allow for preliminary analysis of the data, and patterns of seasonal, temporal, and impact effect variance will only be detected with long-term monitoring of selected sites. SASS 5 data provides valuable information on water quality at the time of sampling and give an indication of instream habitat availability as depicted by invertebrate taxon diversity and biotopes present.

Seasonal SASS 5 surveys of some rivers that originate or run into the GDHC were conducted for the River Health Programme (now River Eco-status Monitoring Programme). The rivers in the Overberg were assessed from July 2004 to May 2005 and included sites on the Kars, Nuwejaars and Heuningnes rivers (River Health Programme 2011). Several sites were also located along the Sout River, which is the main river feeding into the De Hoop Vlei. Invertebrate families collected during these surveys in the lower reaches of these rivers were mainly tolerant or highly tolerant to pollution. The Heuningnes River contained eight tolerant or highly tolerant families and one highly sensitive family (Amphipoda). These results mainly reflect impaired water quality due to land use practices upstream of De Mond and the De Hoop Vlei, and to some degree also the underlying geology's effect on, for example, the alkalinity (pH) of the water.

Seasonal River Health Programme surveys in the Breede River catchment area from 2007 to 2009 included the Ziekenhuis River, which originates in the Potberg side of De Hoop. The benthic macro-invertebrate taxa present differed seasonally at this site and included two sensitive families out of a total of 18 families collected. Other species observed or collected on De Hoop include Tabanidae (horseflies or deerflies; *Philoliche alternans* or long-tongue horsefly), Syrphidae (hoverflies; *Melanostoma* sp. and *Chrysogaster* sp.), Ephyrodidae (*Scatella* sp.), the Cape River crab (*Pautamonautes perlatus*) and a freshwater Amphipoda species (*Paramelita* sp.) found in a wetland west of De Hoop Vlei (information from the FBIS database).

Another focal taxon for measuring the quality of freshwater are dragonflies and damselflies (Odonata). There is a wide range of sensitivities among South African dragonflies to respond to regional and local events that affect their habitats (Samways & Simaika 2016). A freshwater health index (the Dragonfly Biotic Index) has been developed which places great emphasis on these irreplaceable endemics and is particularly useful for assessing the level of threat to the local dragonfly and damselfly fauna as well as its recovery when these threats are lifted (Samways & Simaika 2016). Invasive alien trees are the biggest threat to Western Cape dragonflies, and their removal has resulted in substantial recovery of these irreplaceable dragonfly species, as well as that of other endemic invertebrates, especially in low-elevation mountain rivers.

Recent work on some of the Western Cape dragonflies and damselflies has indicated that they represent ancient lineages. Species in the genus *Syncordulia* (Corduliidae or Emeralds) for example, diverged some 60 million years ago. These species, along with several others, currently survive in small populations and are more resilient than expected, recovering quickly when invasive alien trees are removed. Invasive alien trees shade out the sunny habitat that the dragonflies require for their life activities.

There are 76 Odonata species in the Western Cape (Underhill *et al.* 2018). Nine of these have been recorded in or adjacent to the GDHC. These species are generally widespread and are classified as Least Concern. Threats to these species include habitat degradation due to invasive alien trees and habitat loss caused by agricultural land use, including grain fields and livestock farming. Over-abstraction of water from rivers and water pollution are increasing threats, especially for the aquatic developmental phases of Odonata species. Alien invasive fish species may also be a problem. A comprehensive survey is needed to augment the aquatic and semi-aquatic species list for the GDHC.

2.4.1.3 Marine Invertebrates

In terms of marine benthic invertebrates, there has been substantial work conducted on collections of species records and distribution since the early 20th century, with a comparative study between distributions being done by Awad (2002).

During Awad's analysis, the coast was divided into 100km length units, species were divided into 11 distinct groups of invertebrates and species presence was used as the definitive factor. The 11 taxa groups (octocorals, chitons, bivalves, gastropods, opisthobranchs, polychaetes, isopods, amphipods, brachyurans, echinoderms and ascidians) were based on the relatively good state of information.

Results of the analysis of the 11 groups of invertebrates can be seen in Figure 2.21 and Figure 2.22 where the coastal unit number 11 included the De Hoop MPA.

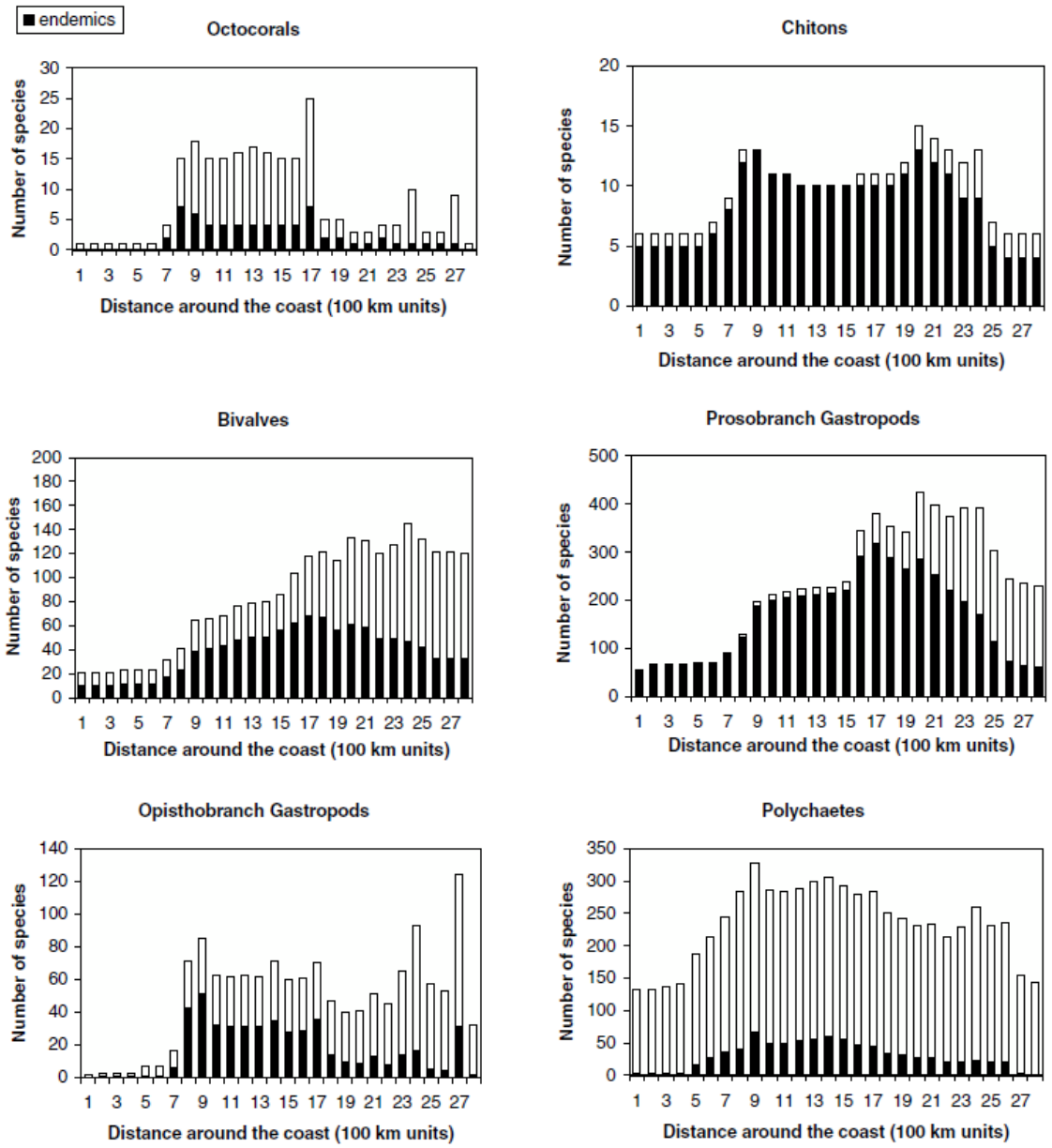


Figure 2.21: Distribution for six invertebrate groups showing species richness and endemicity (the De Hoop MPA is part of Coastal unit 11) (Awad *et al.* 2002)

54 species of Octocorals (sea fans) were analysed. The Agulhas Bank was considered as a centre of radiation for this group and results showed more than 40% endemicity for the De Hoop coastal unit. The smallest of the 11 groups, Chitons, showed high percentages of endemism (100%) within the De Hoop unit and a concentration along the south and south-east coasts. Although bivalve numbers were towards the lower side in terms of distribution eastwards, the endemicity was approximately 60% for the species. Prosobranch gastropods were the largest group studied with the De Hoop unit recording over 200 of the 692 species and a high percentage of endemism (>90%). Approximately 50% of the

Opisthobranch gastropods in the De Hoop unit were endemic and distribution was towards the higher side. Polycheates displayed high distribution and low endemicity for the approximately 270 species in the De Hoop unit. It should be noted that Polychaetes have been well studied globally, possibly explaining the low endemicity results.

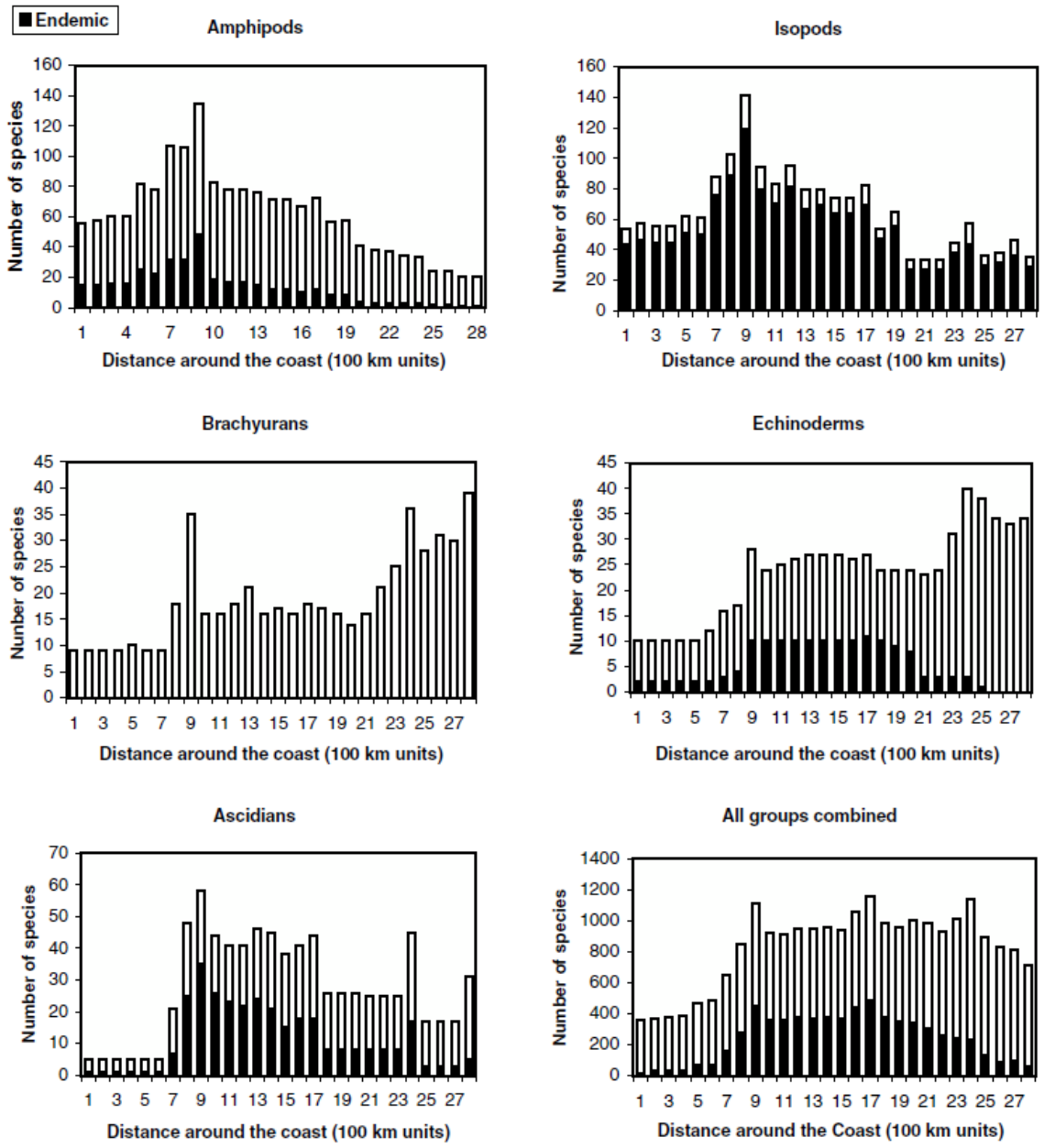


Figure 2.22: Distributions for five invertebrate groups, and all eleven groups combined, showing species richness and endemicity (Awad *et al.* 2002)

Amphipods, which prefer cooler temperate conditions, are reflected by the beginning of the eastward decline in distribution and <25% endemicity. Isopod species distribution was the same as Amphipods but showed a high endemicity of approximately 90%, however taxonomy of these species is limited, and this could explain this high result. Crabs (Brachyurans) featured 16 species with no endemicity data available. Of the 65 Echinoderms species, 25 occurred in the De Hoop unit with endemicity <40%. Available Ascidian data was limited but showed a relatively high distribution with endemicity at over 50%.

From the All-Groups graph (Fig 2.22) the De Hoop coastal unit reflects a high distribution of marine invertebrate species (>900) with a moderate endemicity percentage (>50%). Based on the overall South African coastal distribution and endemicity, the MPA could be considered within the high range of overall distribution and quite far towards the eastern edge of this high range.

2.4.1.4 Estuarine Invertebrates

The estuarine habitat forms an important interface between the freshwater river systems and the saltwater marine environment. Estuaries provide habitat for a variety of fauna and flora, act as nurseries for several fish species, provide a food source for both man and others and are a great source of recreation for people. Due to the vast range of goods and services that an estuary provides, excessive use and mismanagement is a common occurrence. The Heuningnes Estuary is identified as a high sensitivity, special habitat, resulting in high overall biodiversity sensitivity for this and associated habitats. The Klipdrifsfontein Estuary has no data for invertebrates, but the system ranks invertebrates in an A category (van Niekerk *et al.* 2015 as cited in Klipdrifsfontein Estuary Estuarine Management Plan: Situation Assessment Report 2023) (CapeNature 2023f).

The Heuningnes Estuary is the southernmost estuary in Africa and is important for the documentation of the southernmost extremities in the distribution of estuarine species, such as the ginger mud prawn, the giant mud crab, both tropical crustaceans and a tropical gastropod, *Nerita albicilla* (Bickerton 1984).

Water level data for the Heuningnes Estuary shows a clear spring-neap cycle, caused by the dominant semi-diurnal tide (Figure 2.23; Anchor Environmental Consultants 2017). The system shows a significant decrease in tidal range, from the mouth to upstream, with the greatest tidal influence occurring within the first 2 km. De Mond shows a tidal range of 1.0 to 0.7 m, while 15.5 km upstream the tidal range is only about 0.30 m. The tidal range is very similar from 5 – 12 km upstream of the mouth and only about 10 to 20 cm less than at De Mond.

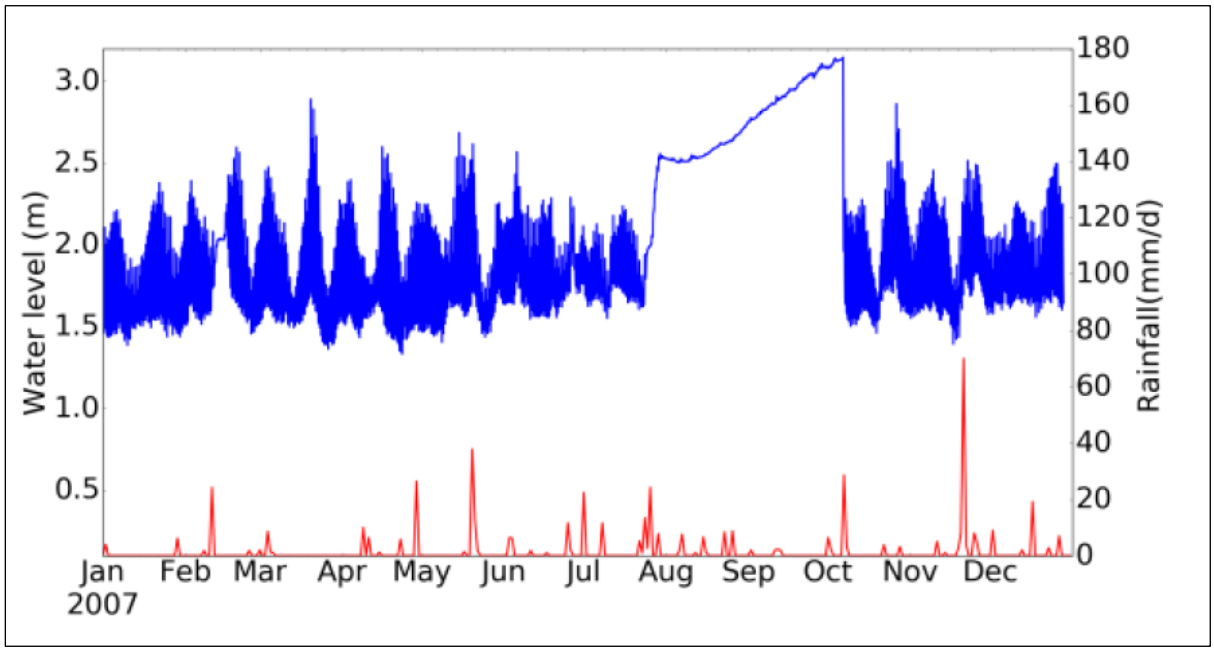


Figure 2.23: Water level recorder data showing the spring-neap tide cycle, except for a closed period during August to October 2007 (Anchor Environmental Consultants 2017)

The relationship between open and closed mouth condition and the back flooding of the ecosystem into Soetendalsvlei provides the invertebrate populations with a diverse set of habitats to colonise. This has resulted in the existence of a relatively diverse community complex. The invertebrate fauna of the Heuningnes Estuary is predominantly composed of marine and typical estuarine species. The occurrence of the hermit crab, *Diogenes brevirostris*, the sea hare, *Notarchus sp.*, the false limpet

Siphonaria oculus and the necklace shell *Natica sp.* up to 3 km upstream of the mouth indicates a strong marine influence as these invertebrates are usually limited to the mouth region in other Cape estuaries of similar size. Additionally, the presence of the cirriped *Chthamalus sp*., bivalves, *Perna perna*, *Mytilus galloprovincialis*, the gastropods *Oxystele antoni* and *Siphonaria serrata* at the De Mond foot bridge as noted in the 2017 Anchor Environmental Consultants survey, further indicate a strong marine influence in the estuary.

To better understand the condition of the soft-bottom benthic invertebrate community, a field survey was conducted (Anchor Environmental Consultants 2017) at the Heuningnes Estuary in February 2017 during which 11 sites were sampled using sediment cores and net tow transects.

The average numbers of invertebrate taxa collected at each site are presented in Figure 2.24. Polychaetes, amphipods, and mysids dominated in terms of raw abundance. The upper reaches of the estuary generally hosted a greater abundance of invertebrates compared to the lower reaches. The biomass in the upper reaches was dominated by polychaetes and mysids with some contribution from brachyurans and amphipods.

A colony of abundant invertebrate fauna was found and consisted of an excess of 1000 alien Australian tubeworms (*Ficopomatus enigmaticus*), over 300 Keiskamma estuarine worms (*Ceratonereis keiskama*), over 500 amphipods (*Corophium* species), and over 20 Melita amphipods (*Melita zeylanica*). The Australian tubeworm is a habitat-forming species which greatly alters the invertebrate composition, abundance, and biomass in estuarine systems (McQuaid & Griffiths 2014). The density and distribution of this invasive alien polychaete should be considered in any future work on this system.

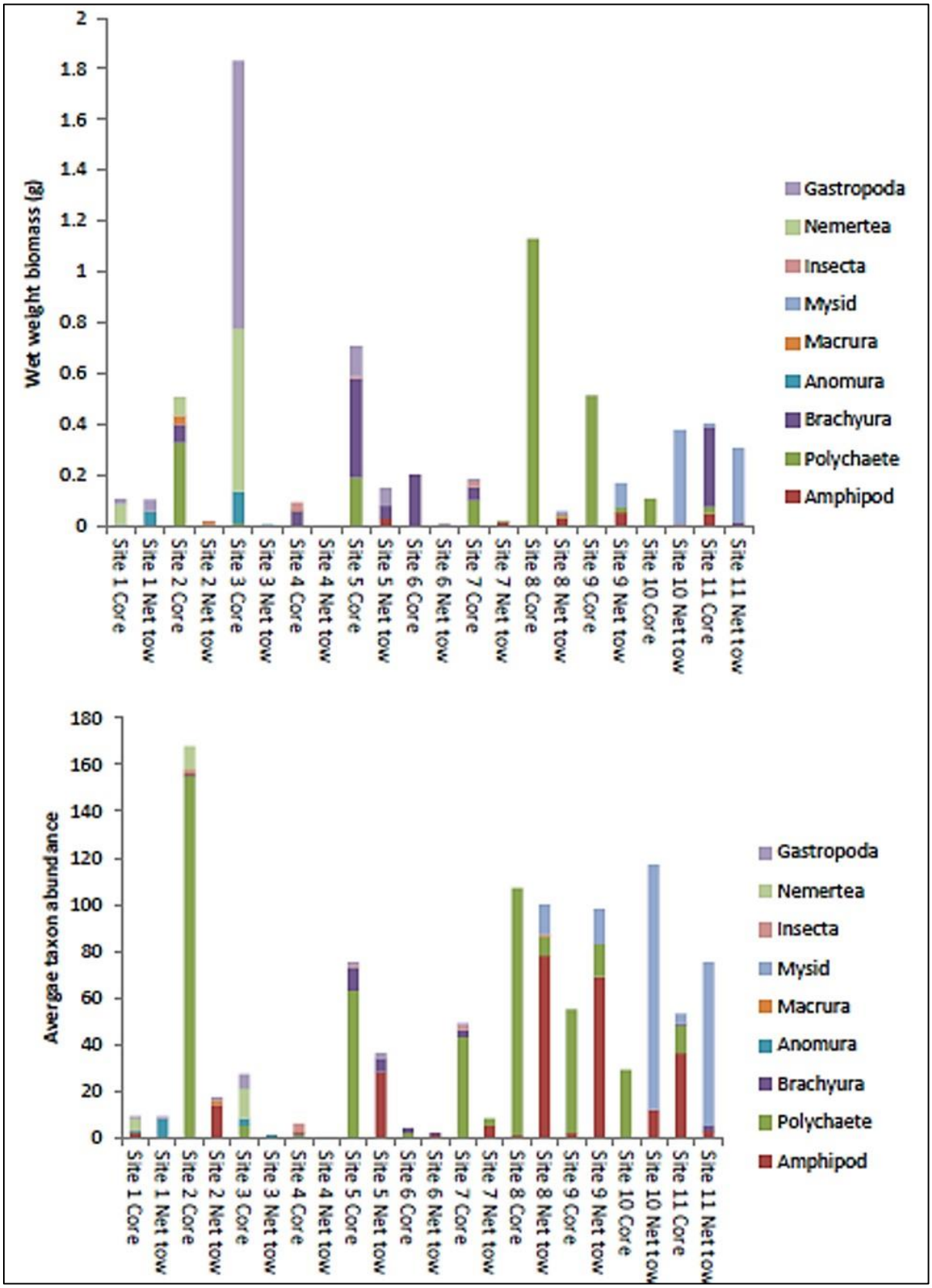


Figure 2.24: Total abundance (top) and biomass (bottom) of invertebrate macrofauna sampled in the Heuningnes Estuary in February 2017 (the fauna has been placed in higher order taxonomic groups) (Anchor Environmental Consultants 2017)

High densities of salt marsh crabs (*Parasesarma catenatum*) were noted at sites 3-6 and seem to have been overlooked in past surveys. Octopus were also seen at the footbridge and in the Zostera beds and one cuttlefish was collected near the mouth and near the middles reaches in the seine nets during the fish sampling.

The spawning of bloodworm, *Arenicola loveni*, was studied in the Heuningnes Estuary from 1968 to 1970 and generally spawning of this species occurred during late summer (Bickerton 1984). Bloodworms disappeared and recolonized the estuary in the period between 1972 and 1977. The disappearance of this species was attributed to bait exploitation for fishing and mouth closure which led to it being absent from the estuary in 1974. Six months after the mouth had opened in 1977, bloodworms had become re-established in the mouth region and had extended its distribution into the estuary by 1979. The source of recruitment has been attributed to a large marine population of bloodworm which occurs on the sheltered Struisbaai beach (Bickerton op. cit.).

Populations of the sand prawn (*Callichirus kraussi*) and the mud prawn (*Upogebia africana*) were surveyed in January 1979. Three areas downstream were sampled, and no mud prawns were found while sand prawn densities ranged from 32 to 83 prawns per 20 cores using a prawn pump (Bickerton 1984). Sand prawn hole densities ranged from 58 to 200 per square metre. Upstream of the De Mond, sand prawns were less abundant and occurred up to 3 km downstream of the Bredasdorp/Struisbaai Bridge (Bickerton op. cit.). Mud prawns were only found in small numbers in the muddy regions of the middle reaches (Bickerton op. cit.). During the field survey in February 2017, burrowing invertebrate species were assessed in terms of abundance and density of burrows. The results are presented in Table 2.13.

Table 2.13: Densities of prawn and pencil bait holes from historical data and at each of the 2017 surveyed sites where burrowing invertebrates were evident (Anchor Environmental Consultants 2017)

	Historical data	**Site 1**	**Site 2**	**Site 3**	**Site 4**	**Site 5**	**Site 6**
Prawn hole density ($*m^{-2}$)	58-200	0	0.8	1.6	4	11.2	0
Pencil bait density ($*m^{-2}$)	NA	4	0.8	11.2	0	2.4	0
Number of invertebrates per 20 cores	32-83 *Callichirus kraussi*	1 *C. kraussi*	1 *Solen* sp.	6 *Solen* sp.	0	1 *Upogebia africana*	0
		1 *Solen* sp.					
		1 *Arenicola loveni*					

Compared to the historical data, there has been a marked decrease in prawn hole density and in the number of prawns collected from cores using a prawn pump. The observed reduction of burrowing prawn density is probably not a result of exploitation, as no harvesting of invertebrates is allowed in the estuary. It is possible that disturbance of prawns occurring from wading fishermen has resulted in the observed decreases in abundance, although this is unlikely. Furthermore, the high densities of pencil bait (*Solen sp.*) indicate that the benthic environment is in good condition, and it is unlikely that prawn species were excluded due to poor environmental conditions or physical habitat. The reduced populations of burrowing prawns are therefore most likely due to natural variation.

2.4.2 Amphibians

The GDHC hosts 12 recorded amphibian species which is likely a complete or near complete list (Table 2.14). None of the frogs recorded are known to be threatened although the Arum lily frog (*Hyperolius horstocki)* has lost much of its former habitat to coastal developments. There are however a few well-developed wetlands (particularly in De Hoop) which are good habitat and breeding sites for the frogs and many other wetland species. These wetlands should be kept functional, free of invasive alien tree species (Angus *et al.* 2023) and the general area managed for an appropriate fire regime. The presence of the full complement of frogs in the GDHC should be an indication of functionality and persistence of species diversity. These wetlands should be classified as sensitive sites within the sensitivity analysis.

Table 2.14: Amphibian species recorded within the GDHC

Scientific name	Common name	Global IUCN Status
Amietia fuscigula	Cape river frog	LC
Breviceps montanus	Mountain rain frog	LC
Breviceps rosei	Rose's rain frog	LC
Cacosternum australis	Southern Caco	LC
Hyperolius horstockii	Arum lily frog	LC
Sclerophrys capensis	Raucous toad	LC
Semnodactylus wealii	Weale's running frog	LC
Strongylopus bonaespei	Banded stream frog	LC
Strongylopus grayii	Gray's stream frog	LC
Tomopterna delalandii	Cape sand frog	LC
Vandijkophrynus angusticeps	Sand toad	LC
Xenopus laevis	African clawed frog	LC

2.4.3 Fish

The complex of habitats and ecosystems of the coastline where the MPA and the Heuningnes Estuary create a wide range of marine ecosystems and habitats, support numerous species assemblages. The MPA has been recognised as important in protected exploited fish stocks, which include endemic species (Turpie 1999).

In addition to the MPA ecosystems, which gives rise to a mosaic of substrates as well as three-dimensional habitat in the form of rocky reefs and kelp forests, the Breede Estuary mouth opens into St. Sebastian Bay, both of which form part of the MPA's zone of influence.

De Hoop MPA

The MPA provides a range of habitats available to varying fish, sharks, and rays from shallow surf zone habitats to deep near shore habitats (Fig 2.25). The MPA bathymetry provides evidence of marine habitat ranging from shallow surf zone to deep near shore habitat up to a depth of 60m (DFFE 2017).



Figure 2.25: Examples of fish and shark species found in the MPA from top left clockwise: galjoen (*Dischistius capensis*), spotted gullyshark (*Triakis megalopterus*); puffadder shyshark (*Haploblepharus edwardsii*), white musselcracker (*Sparodon durbanensis*) and koester (*Acanthistius sebastoides*) (Photos: Lieze Swart)

The species composition differs between zones ranging from surf zone species to near shore resident species to near shore pelagic species. Fish, sharks and rays are found in all these zones. The coastal waters of South Africa are habitat to a diverse composition of sharks that are vulnerable to exploitation, many of which are endemic and/or classified by the International Union for Conservation of Nature (IUCN) Red List as Threatened or Data Deficient (Table 2.15). The South African network of coastal and offshore MPAs form sites of protection for these species with records of valuable commercial species spending 80% – 100% of their time in an MPA (DFFE 2023).

Table 2.15: Marine fish species recorded in the De Hoop MPA that have IUCN threat statuses (IUCN 2023)

Scientific Name	Common Name	IUCN Threat Status
Chrysoblephus cristiceps	Dageraad	Critically Endangered
Galeorhinus galeus	Soupfin shark	Critically Endangered
Argyrosomus japonicus	Dusky kob	Endangered
Carcharhinus obscurus	Dusky shark	Endangered
Haploblepharus edwardsii	Puffadder shyshark	Endangered
Petrus rupestris	Red steenbras	Endangered
Chrysoblephus gibbiceps	Red stumpnose	Endangered
Rostroraja alba	Spearnose skate	Endangered
Lithognathus lithognathus	White Steenbras	Endangered

Scientific Name	Common Name	IUCN Threat Status
Cymatoceps nasutus	Black musselcracker	Vulnerable
Haploblepharus fuscus	Brown shyshark	Vulnerable
Pomatomus saltatrix	Elf	Vulnerable
Carcharodon carcharias	Great white shark	Vulnerable
Acroteriobatus annulatus	Lesser guitar shark	Vulnerable
Squalus acanthias	Spiny dogfish	Vulnerable
Sphyrna zygaena	Smooth hammerhead shark	Vulnerable
Carcharias taurus	Spotted ragged tooth	Vulnerable
Halaelurus natalensis	Tiger catshark	Vulnerable
Epinephelus marginatus	Yellowbelly rockcod	Vulnerable
Trachurus trachurus	Horse mackerel	Vulnerable
Mustelus mustelus	Smooth hound shark	Vulnerable
Arothron inconditus	Bellystriped blaasop	Vulnerable
Rhabdosargus globiceps	White stumpnose	Vulnerable
Pachymetopon grande	Bronze bream	Near Threatened
Carcharhinus brachyurus	Bronze whaler	Near Threatened
Argyrozona argyrozona	Carpenter	Near Threatened
Atractoscion aequidens	Geelbek	Near Threatened
Chrysoblephus laticeps	Roman	Near Threatened
Sparodon durbanensis	White musselcracker	Near Threatened
Dasyatis patinaca	Common stingray	Near Threatened
Epinephelus andersoni	Brown-spotted rockcod	Near Threatened
Epinephelus guaza	Dusky Grouper	Vulnerable
Raja straeleni	Biscuit skate	Near Threatened
Galeorhinus galeus	Tope	Critically Endangered
Carcharhinus brachyurus	Copper shark	Vulnerable

Species that are listed as Least Concern, Data Deficient or have not been assessed were not included in Table 2.15

The benefits of citizen science in the marine environment, despite their challenges, have proved valuable for insights into the surf zone species of the MPA (Potts *et al.* 2021) (Table 2.16). Despite complications in interpreting angler catch data, Bennett & Atwood (1993) showed that MPAs are a viable management tool for protecting fish species vulnerable to exploitation.

Table 2.16: Total catches of rock and surf fish species made during the DFFE CPUE 25-year long term monitoring project on De Hoop and the MPA (DFFE 2010)

	Lekkerwater		Koppie Alleen		Total	
Species	**Number**	**%**	**Number**	**%**	**Number**	**%**
Acanthistuis sebastoides	3	0.008	6	0.020	9	0.013
Amblyrhynchotes honckenii	99	0.248	7	0.023	106	0.151
Argyrosomus japonicus	339	0.851	1464	4.801	1803	2.563
Boopsoidea inornata	25	0.063	23	0.075	48	0.068
Callorhinchus capensis	3	0.008	1	0.003	4	0.006
Carcharhinus brachyurus	54	0.135	225	0.738	279	0.397
Carcharhinus obscurus	3	0.008	2	0.007	5	0.007
Cheilodactylus fasciatus	0	0.000	2	0.007	2	0.003
Chelidonichthys capensis	1	0.003	0	0.000	1	0.001

	Lekkerwater		Koppie Alleen		Total	
Species	**Number**	**%**	**Number**	**%**	**Number**	**%**
Chirodactylus brachydactylus	0	0.000	3	0.010	3	0.004
Chrysoblephus laticeps	89	0.223	13	0.043	102	0.145
Clinus superciliosus	6	0.015	34	0.111	40	0.057
Cymatoceps nasutus	36	0.090	4	0.013	40	0.057
Dasyatis pastinaca	0	0.000	41	0.134	41	0.058
Dasyatis thetidus	0	0.000	1	0.003	1	0.001
Dichistius capensis	21438	53.787	13535	44.386	34973	49.712
Dichistius multufasciatus	7	0.018	24	0.079	31	0.044
Diplodus cervinus	919	2.306	583	1.912	1502	2.135
Diplodus sargus	11422	28.657	7331	24.041	18753	26.656
Epinephelus andersoni	1	0.003	4	0.013	5	0.007
Epinephelus guaza	7	0.018	25	0.082	32	0.045
Eugomphodus taurus		0.000	6	0.020	6	0.009
Galeorhinus galeus	15	0.038	9	0.030	24	0.034
Galeichthyes ater	133	0.330	146	0.366	279	0.700
Galeichthyes feliceps	619	1.554	681	1.708	1300	3.261
Gymnocrotaphus curvidens	59	0.148	47	0.154	106	0.151
Gymnura natalensis		0.000	13	0.043	13	0.018
Halaelurus natalensis	8	0.020	3	0.010	11	0.016
Haploblepharus edwardsii	280	0.703	287	0.941	567	0.806
Haploblepharus fuscus	69	0.173	31	0.102	100	0.142
Lithognathus lithognathus	1244	3.121	638	2.092	1882	2.675
Lithognathus mormyrids'	19	0.048	1	0.003	20	0.028
Liza tricuspidens		0.000	1	0.003	1	0.001
Mustellus mustellus	168	0.422	220	0.721	388	0.552
Myliobatus aquila	32	0.080	63	0.207	95	0.135
Neoscorpis lithophilus	17	0.043	14	0.046	31	0.044
Oplegnathus conwayi	1	0.003		0.000	1	0.001
Pachymetopon auneum	2	0.005		0.000	2	0.003
Pachymetopon blochii	7	0.018		0.000	7	0.010
Pachymetopon grande	155	0.389	8	0.026	163	0.232
Pomadasys commersonnii	1	0.003		0.000	1	0.001
Pomadasys olivaceum	2	0.005	6	0.020	8	0.011
Pomatomus saltatrix	790	1.982	1153	3.781	1943	2.762
Poroderma africanum	110	0.276	77	0.253	187	0.266
Poroderma pantherinum	37	0.093	62	0.203	99	0.141
Pteromyleaus bovinus	7	0.018	13	0.043	20	0.028
Rhabdosargus holubi	397	0.996	204	0.669	601	0.854
Rhinobatus annulatus	224	0.562	1819	5.965	2043	2.904
Sarpa salpa	38	0.095	11	0.036	49	0.070
Sparodon durbanensisis	398	0.999	80	0.262	478	0.679
Sphyrna zygaena	0	0.000	1	0.003	1	0.001
Spondyliosoma emarginatum	1	0.003	0	0.000	1	0.001
Triakis megalopterus	359	0.901	356	1.167	715	1.016
Umbrina robinsoni	213	0.534	1216	3.988	1429	2.031
Total	**39857**		**30494**		**70351**	

Data for the following species lists was sourced from Catch Per Unit Effort (CPUE) studies, Baited Remote Underwater Video (BRUV) studies (Table 2.17 and 2.18), telemetry studies and DFFE small pelagic survey which formed part of the bathymetry survey in 2017.

Table 2.17: Complete list of ray-finned fish species recorded from the stereo-BRUVs data collected at the different locations in the MPA. Numbers in parentheses are the sample size. "n" is the number of detections, "Mean" is the average MaxN and "SD" is the standard deviation of MaxN per species over the entre dataset (Total) and per location (Llewellyn *et al*. 2020)

Family	Species	Total (35)			Infanta Lighthouse (13)			Noetsie (5)			Lekkerwater (6)			Koppie Alleen (3)			Martha's Point (8)		
		n	Mean	SD	n	Mean	SD	n	Mean	SD	n	Mean	SD	n	Mean	SD	n	Mean	SD
Sparidae	*Pagellus bellottii natalensis*	19	4.2	7.77	8	3.92	6.98	2	1.33	1.53	1	0.17	0.41	2	14.67	14.5	6	5.88	8.71
Triglidae	*Chelidonichthys kumu*	18	1.09	1.38	8	1.31	1.38	3	1.33	0.58	5	2.17	1.94						
Sparidae	*Spondyliosoma emarginatum*	15	5.8	9.64	5	6.62	10.08							3	8	6.08	7	11.63	13.11
Sparidae	*Boopsoidea inornata*	13	2.49	4.39	5	3.85	6.14							1	1	1.73	7	4.25	3.28
Ariidae	*Galeichthys ater*	12	0.97	2.15	5	0.69	1.38				1	0.17	0.41	1	0.33	0.58	5	2.88	3.64
Sparidae	*Chrysoblephus laticeps*	12	1.17	2.01	5	1.77	2.83							1	1	1.73	6	1.88	1.25
Carangidae	*Trachurus* spp.	12	14.66	27.35	2	4.15	12.06	2	13.67	15.82	5	62.33	32.83	1	0.67	1.15			
Sparidae	*Argyrozona argyrozona*	11	1.11	3.3	5	0.54	0.88							3	1.67	1.15	3	3.38	6.52
Sparidae	*Pterogymnus laniarius*	11	0.49	0.82	4	0.46	0.88							2	0.67	0.58	5	1.13	0.99
Ariidae	*Galeichthys feliceps*	11	0.6	1.03	4	0.31	0.48	1	1	1.73	2	1	1.55	2	1.67	1.53	1	0.25	0.71
Sparidae	*Cheimerius nufar*	11	0.4	0.65	2	0.23	0.6							1	0.33	0.58	7	1.13	0.64
Sparidae	*Chrysoblephus gibbiceps*	8	0.26	0.51										1	0.33	0.58	7	1	0.53
Sparidae	*Rhabdosargus globiceps*	5	0.14	0.36	3	0.23	0.44							2	0.67	0.58			
Sparidae	*Pachymetopon aeneum*	5	0.17	0.45	3	0.31	0.63										2	0.25	0.46

Family	Species	Total (35)			Infanta Lighthouse (13)			Noetsie (5)			Lekkerwater (6)			Koppie Alleen (3)			Martha's Point (8)		
		n	Mean	SD	n	Mean	SD	n	Mean	SD	n	Mean	SD	n	Mean	SD	n	Mean	SD
Sparidae	*Pachymetopon blochii*	3	0.11	0.4	2	0.23	0.6										1	0.13	0.35
Cheilodactylidae	*Chirodactylus brachydactylus*	1	0.03	0.17	1	0.08	0.28												
Sciaenidae	*Atractoscion aequidens*	1	0.03	0.17													1	0.13	0.35
Sparidae	*Chrysoblephus cristiceps*	1	0.03	0.17	1	0.08	0.28												
Sparidae	*Diplodus capensis*	1	0.03	0.17	1	0.08	0.28												
Serranidae	*Epinephelus marginatus*	1	0.03	0.17	1	0.08	0.28												
Merlucciidae	*Merluccius capensis*	1	0.03	0.17	1	0.08	0.28												

Table 2.18: Complete list of elasmobranch species recorded from the stereo-BRUVs data collected at the different locations in the MPA. Numbers in parentheses are the sample size. "n" is the number of detections, "Mean" is the average MaxN and "SD" is the standard deviation of MaxN per species over the entre dataset (Total) and per location (Llewellyn *et al.* 2020)

Family	Species	Total (35)			Infanta Lighthouse (13)			Noetzie (5)			Lekkerwater (6)			Koppie Alleen (3)			Martha's Point (8)		
		n	Mean	SD	n	Mean	SD	n	Mean	SD	n	Mean	SD	n	Mean	SD	n	Mean	SD
Triakidae	*Mustelus mustelus*	29	1.2	0.83	10	1.15	0.9	3	2.67	0.58	5	0.83	0.41	3	1.33	0.58	6	0.75	0.46
Squalidae	*Squalus* spp.	23	2.11	2.3	6	1.38	1.85	3	5.33	1.53	6	2	1.26	2	1.67	1.53	4	1.75	3.06
Scyliorhinidae	*Poroderma africanum*	10	0.66	1.33	4	1.08	1.89							1	0.67	1.15	5	0.88	0.99
Scyliorhinidae	*Poroderma pantherinum*	8	0.37	0.77	1	0.08	0.28										7	1.5	0.93
Rajidae	*Raja straeleni*	5	0.14	0.36				3	1	0									
Scyliorhinidae	*Haploblepharus edwardsii*	4	0.11	0.32	2	0.15	0.38	1	0.33	0.58				1	0.33	0.58			
Scyliorhinidae	*Haploblepharus fuscus*	4	0.11	0.32	3	0.23	0.44										1	0.13	0.35

Family	Species	Total (35)			Infanta Lighthouse (13)			Noetzie (5)			Lekkerwater (6)			Koppie Alleen (3)			Martha's Point (8)		
		n	Mean	SD	n	Mean	SD	n	Mean	SD	n	Mean	SD	n	Mean	SD	n	Mean	SD
Rajidae	*Rostroraja alba*	3	0.09	0.28	1	0.08	0.28										2	0.25	0.46
Carcharhinidae	*Carcharhinus obscurus*	2	0.09	0.37													2	0.38	0.74
Dasyatidae	*Gymnura natalensis*	2	0.06	0.24	1	0.08	0.28				1	0.17	0.41						
Scyliorhinidae	*Halaelurus natalensis*	2	0.06	0.24	1	0.08	0.28												0.64
Scyliorhinidae	*Haploblepharus pictus*	1	0.03	0.17	1	0.08	0.28												0.53
Triakidae	*Galeorhinus galeus*	1	0.03	0.17				1	0.33	0.58									
Rhinobatidae	*Rhinobatos annulatus*	1	0.03	0.17										1	0.33	0.58			0.46
Carcharhinidae	*Carcharhinus brachyurus*	1	0.03	0.17										1	0.33	0.58			0.35
Sphyrnidae	*Sphyrna zygaena*	1	0.03	0.17	1	0.08	0.28												

Small pelagic species migrate through the MPA and exist in different densities throughout (DFFE 2017) (Fig. 2.26). This varies over time and season. These "bait fish species" are prey for marine fish, birds, and mammals.

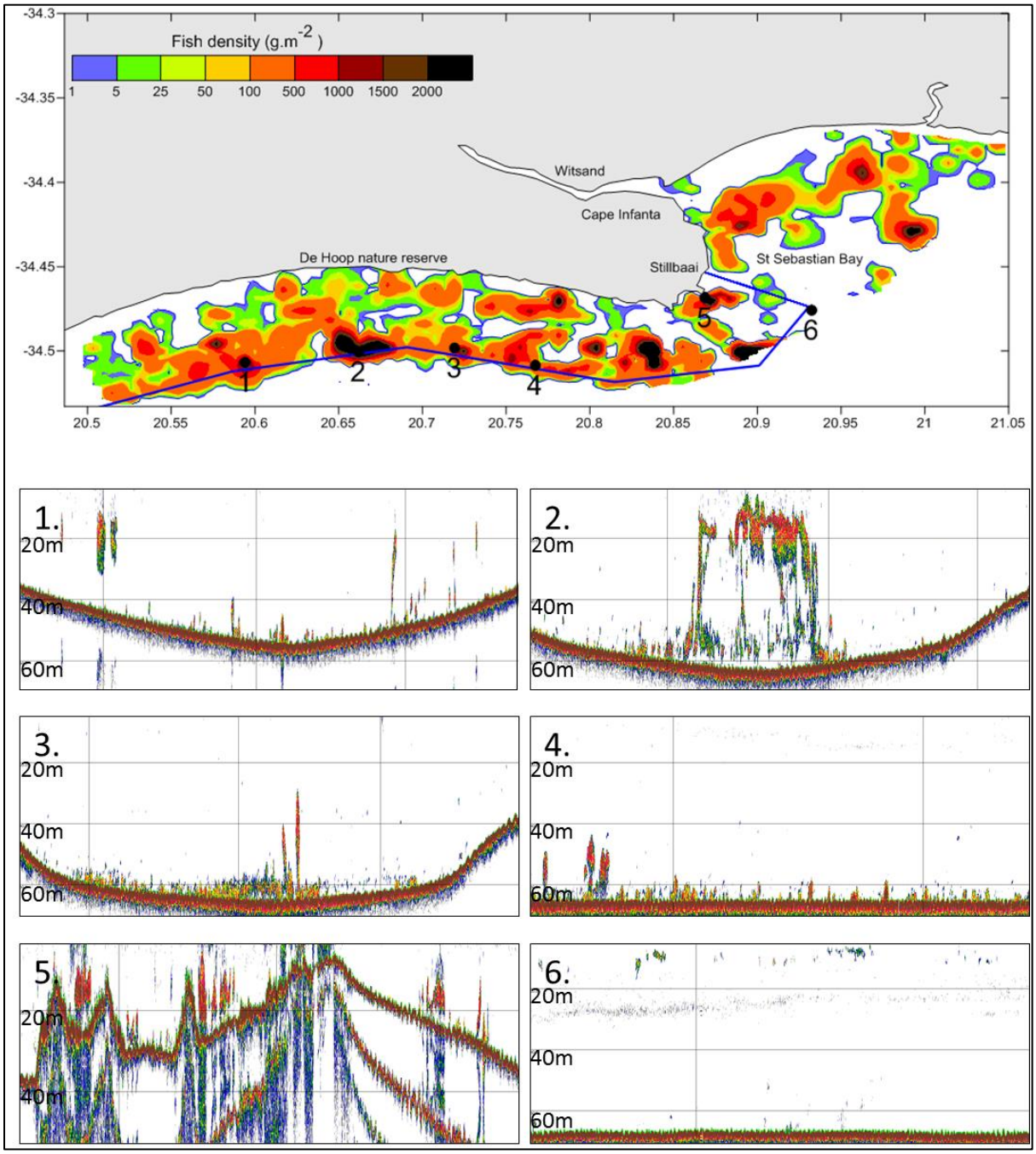


Figure 2.26: Fish density distribution and some echogram results from 6 sites in the MPA showing typical fish concentrations (DFFE 2017)

The MPA has a unique mosaic of benthic substratum existing in a zone characterised by mixing warm and cold ocean currents. The limit of the giant kelp species distribution is also within the MPA. This combination of habitat, surf zone and near shore habitat creates a unique species complex and abundance.

It is critical to maintain the no-take MPA as well as expand this into St. Sebastian Bay and into deeper habitats offshore. The critical link to the Breede Estuary should be investigated and considered for inclusion as well as other estuaries in the Bay and the Bay itself.

Heuningnes Estuary and Soetendalsvlei.

Bickerton (1984) reports on several fish surveys as well as journal records from the Heuningnes River catchment mostly in Soetendalsvlei and some in the estuary from 1937 to 1984. No quantitative data was available from those times. The first available quantitative information is from a once-off seine and gillnet survey in 1994 (CapeNature 2023e). Since then, Lamberth (in press) established a recreational angler catch-card system in 1995 that is still active in the present-day. Angler-effort collected is complemented and able to be validated by the CapeNature De Mond gate permit records kept over the same period. Hutchings & Lamberth (2003) conducted quarterly seine and gillnet surveys in the Heuningnes Estuary and Soetendalsvlei from 1997-1999 and these have been repeated every four years from then until 2017.

In total, 72 species of fish from 34 families have been recorded from the Heuningnes Estuary, Soetendalsvlei and the surf-zone adjacent to the mouth. Resident fish that breed only in estuaries (Category Ia) comprise four species, estuarine round herring (*Gilchristella aestuaria)*, Cape halfbeak (*Hyporamphus capensis)*, kappie blenny (*Omobranchus woodie)* and the yet to be confirmed but unlikely Knysna seahorse (*Hippocampus capensis*). Fish that breed in the marine and estuarine environments (Category Ib) e.g. estuarine pipefish (*Syngnathus temminckii)* and prison goby (*Caffrogobius gilchristi)* are represented by seven species. Obligate estuary-dependent fish that must spend at least the first year of life in estuaries (Category IIa) e.g. dusky kob (*Argyrosomus japonicus*) and white steenbras (*Lithognathus lithognathus*), contributed 10 of the species whereas partially estuary dependent (Category IIb) e.g. blackhand sole (*Solea turbynei*) and marine opportunists that use the best of both worlds (Category IIc) e.g. harder (*Liza richardsonii*) contributed six and seven of the species respectively. Marine vagrants (Category III) e.g. lesser guitarfish (*Acroteriobatus annulatus*) reflected the predominantly open estuary mouth with a relatively high 26 species. Freshwater fish (Category IV) comprised eight species but only three were indigenous e.g. Galaxias zebratus, the rest introduced or translocated e.g. bass *Micropterus spp*.

Three catadromous eels, Anguillidae (Category V) have also been recorded from the Heuningnes catchment and recruit via the estuary. Recruitment and emigration of catadromous eels *Anguilla spp.* are also strongly linked to flow. Juvenile glass eels recruit into natal estuaries and catchments following olfactory cues which they can detect at dilutions >109 in the sea. Most recruitment takes place over dark-moon spring tides, probably a predator avoidance behaviour. They quickly metamorphose into elvers but can retard their own growth, making it easier to move over obstacles on their way upstream. Depending on species, adult eels can spend 8-30 years in freshwater before returning to the sea. Return migration is cued by the first winter spates, whereupon adults move downstream gradually transforming into silver eels, their eyes growing bigger and gut atrophying. Once in the sea, they travel at depth to their abyssal spawning grounds which for southern African (and West Indian Ocean) eels seems to be east of Madagascar, where they spawn and die. All the Anguillidae are very susceptible to poor water quality.

Altogether, including estuarine residents, obligate-dependents and catadromous fish, 17 (24%) of the Heuningnes fish assemblage are completely dependent on estuaries to complete their life cycle, 20 (28%) are partially estuary-dependent and the remainder split between estuary-independent marine (36%) and freshwater (11%) species. The proportion of estuary-associated fish in the Heuningnes Estuary fish assemblage is relatively low compared to the Breede, Gouritz and other south-coast estuaries but is an artefact of the high contribution of marine vagrants there. Absolute values of estuary-associated fish either match or exceed all adjacent and nearby systems on the south-coast.

Of the Heuningnes Estuary fish assemblage, 10 (14%) (e.g. *Hyporamphus capensis*) and 21 (33%) (e.g. *L. lithognathus*) are South African and southern African endemics respectively. Five (7%) (e.g. *Cyprinus carpio*) are introduced alien or translocated species. The remaining 36 (47%) (e.g. *Lichia amia*) are cosmopolitan. The high degree of endemism is typical of Cape south coast systems.

Fish species in categories I, II, and V as defined by Whitfield (1998) are all wholly or largely dependent on estuaries for their survival and are hence the most important from an estuary conservation perspective. These species need to receive most attention from a management perspective.

Seine samples provide the best estimates of small and juvenile fish density and comprise 80 small mesh seine-net hauls from 1998 to the present day. Numerically, estuarine round herring (52%) and harder (25%) dominate the Heuningnes Estuary fish assemblage, providing 77% of sampled catches (Table 2.19). The Cape stumpnose *(Rhabdosargus holubi)* (5%), *Caffrogobius* spp. (5%), Knysna sandgoby *(Psammogobius knysnaensis)* (4%) and 2% each of Dumeril's mullet *(Liza dumerili)*, white stumpnose *(Rhabdosargus globiceps)*, Cape silverside *(Atherina breviceps)* and Cape sole *(Heteromycterus capensis)* were also important. The remaining species all contributed <1% to the catch. However, these species e.g. dusky kob, spotted grunter (*Pomadasys commersonnii)* and leervis (*Lichia amia)* are large exploited species of naturally lower abundance and occurrence and are more prevalent in larger mesh gillnet samples and recreational angler catches. Catches and occurrence of juvenile white steenbras were relatively high compared to those in the Breede and other estuaries in the region and when considering its overexploited status.

Gillnet catches were dominated by harder (62%), striped mullet (12%) and spotted grunter (6%) (Table 2.19). Also important were leervis, Cape stumpnose, flathead mullet and barbel each contributing 3-5% of total catches. Catches of adolescent white steenbras and dusky kob were low, each at 1% of total gillnet catch.

Table 2.19: Data representing the percent catch and occurrence for Seine net sampling per haul (numbers) in the Heuningnes Estuary and percentage occurrence for four different time periods from 1997 to 2017 (Anchor Environmental Consultants 2017) and percentage occurrence for catch during 48mm and 145mm mesh size gillnet sampling compared between 1997-1998 and 2007-2008

	SEINE SAMPLING					GILLNET SAMPLING			
	% Catch	% Occurrence				% Occurrence			
						48 mm	145 mm	48 mm	145 mm
Species name		1997-99	2007	2008	2017	1997-1998		2007-2008	
Gilchristella aestuaria	51.73	56.76	72.73	100.00	45.45				
Liza richardsonii	25.26	97.30	63.64	92.86	90.91	72.22	9.09	75.00	16.67
Rhabdosargus holubi	5.41	43.24		50.00	90.91				
Psammogobius knysnaensis	3.91	70.27	45.45	71.43	36.36				
Caffrogobius spp.	2.96		36.36	71.43	9.09				
Caffrogobius nudiceps	2.26	21.62			45.45				
Liza dumerilii	1.54	2.70	9.09	35.71	72.73	16.67		16.67	
Rhabdosargus globiceps	1.54	51.35		7.14	36.36	33.33		4.17	
Atherina breviceps	1.47	10.81	27.27						
Hetermycterus capensis	1.37	56.76	9.09	7.14	9.09				
Solea turbynei	0.63	48.65		35.71	72.73				
Lithognathus lithognathus	0.52	37.84	36.36	50.00	63.64	25.00	9.09	4.17	
Caffrogobius gilchristi	0.45	13.51			54.55				
Cyprinus carpio	0.24	10.81	9.09	64.29					
Monodactylus falciformis	0.13	16.22		42.86	18.18	5.56			5.56
Galeichthyes feliceps	0.11	8.11		21.43	9.09	13.89	3.03	8.33	11.11

	SEINE SAMPLING					GILLNET SAMPLING			
	% Catch	% Occurrence				% Occurrence			
						48 mm	145 mm	48 mm	145 mm
Species name		1997-99	2007	2008	2017	1997-1998		2007-2008	
Parapeneus rubescens	0.09		45.45						
Hyporamphus capensis	0.06			7.14	45.45				
Argyrosomus japonicus	0.05	8.11			9.09				
Lichia amia	0.05	2.70		7.14	90.91	22.22	12.12		
Myxus capensis	0.05			35.71		2.78		16.67	11.11
Mugil cephalus	0.04	10.81		7.14		19.44	9.09	20.83	
Lithognathus mormyrus	0.03	2.70							
Pomadasys commersonii	0.03	8.11		7.14	9.09	19.44	42.42	4.17	22.22
Sandelia capensis	0.02			21.43					
Lepomis macrochirus	0.02			14.29					
Liza tricuspidens	0.01	8.11		7.14		36.11	24.24	37.50	11.11
Engraulis japonicus	0.01				18.18				
Muraenosox bagio	0.01	2.70							
Syngnathus temminckii	0.01		9.09		9.09				
Ostracion cubicus	0.01				9.09				
Micropterus dolomieu	<0.01		9.09						
Sarpa salpa	<0.01				9.09				
Spondyliosoma emarginatum	<0.01		9.09						
Argyrosomus japonicus						8.33	21.21	12.50	5.56
Cyprinus carpio						5.56	3.03		11.11
Rhinobatos annulatus						2.78	3.03		
Pomatomus saltatrix						2.78	3.03		
Sparodon durbanensis							3.03		
Gymnura natalensis							3.03		
Micropterus dolomieu								4.17	

In respect to recreational fishing, over a 20-year period, angler catches were dominated by spotted grunter and white steenbras which provided 20-45% of the total catch (Table 2.20). Dusky kob, flathead mullet, leervis and lesser guitarfish (*Acroteriobatus annulatus*) each contributed 5-10 %. The contribution of all these species is a function of active targeting, availability and ultimately population status. Throughout the two decades, a consistent 20% of spotted grunter, flathead mullet and dusky kob catches were released, indicating a robust angler-ethic even though catch-per-unit-effort of the main targets had declined over the same period.

Table 2.20: Heuningnes Estuary angler catch-card summary for the periods 1995-2000 and 2011-2017 (Anchor Environmental Consultants 2017)

	1995-2000			2011-2017		
Species	**% Kept**	**% Released**	**% Total**	**% Kept**	**% Released**	**% Total**
Pomadasys commersonii	79	21	43.55	75	25	28.36
Argyrosomus japonicus	82	18	5.20	69	31	21.98
Mugil cephalus	68	32	5.59	67	33	0.34
Lithognathus lithognathus	11	89	20.57	18	82	16.40
Dichistius capensis	90	10	1.45	100	0	0.68
Liza tricuspidens	68	32	1.49	82	18	2.51
Diplodus sargus	44	56	1.97	75	25	2.28
Rhabdosargus holubi	32	68	2.41	64	36	4.10
Liza richardsonii	86	14	0.34	100	0	0.11
Rhabdosargus globiceps	7	93	2.65	100	0	0.46
Umbrina robinsonii	80	20	0.24	100	0	0.46
Cyprinus carpio	30	70	0.48	100	0	0.23
Rhinobatos annulatus	2	98	5.44	0	100	5.81
Sparodon durbanensis	100	0	0.10	100	0	0.11
Lichia amia	1	99	7.71	1	99	9.79
Diplodus cervinus	100	0	0.05	100	0	0.11
Mustelus mustelus	100	0	0.05	20	80	0.57
Galeichthys feliceps	0	100	0.48	100	0	0.11
Sarpa salpa	0	100	0.19	67	33	0.34
Triakis megalopterus	0	100	0.05	0	100	0.11
Acanthopagrus vagus	0	0	0	100	0	0.11
Mugillidae	0	0	0	50	50	2.51
Pteromyleus bovinus	0	0	0	0	100	0.11
Sphyrna zygaena	0	0	0	0	100	0.46
Gymnura natalensis	0	0	0	0	100	0.23
Dasyatis chrysonota	0	0	0	0	100	0.11
Carcharhinus brachyurus	0	0	0	0	100	0.80
Callorhinchus capensis	0	0	0	100	0	0.11
Carcharias taurus	0	0	0	0	100	0.46
Elops machnata	0	0	0	0	100	0.23

Along-stream distribution data collected was largely a reflection of salinity preferences and the estuary dependence category to which the fish belonged (Table 2.21). Numerically, 60% of resident breeders, marine & estuarine breeders and obligate estuary-dependent fish were in the <10 Practical Salinity Units River Estuary Interface (REI) zone, including Soetendalsvlei. High densities (34%) of obligate estuary-dependent fish specifically spotted grunter and white steenbras also occurred in the sandy, clear >30 Practical Salinity Units lower reaches.

Table 2.21: Distribution of estuary-dependence categories according to four salinity ranges (Anchor Environmental Consultants 2017)

Dependence category S‰		**>30**	**20-30**	**10-20**	**<10**
Ia	Resident breeders	14	11	14	61
Ib	Marine & estuarine breeders	16	19	5	60
IIa	Obligate dependents	34	5	1	60
IIb	Partial dependents	66	6	1	27
IIc	Marine opportunists	58	14	2	27
III	Marine vagrants	19	11	19	52
IV	Freshwater				100
V	Catadromous				100

Seasonally, absolute species richness was highest in spring and summer (23-30 species) and lowest in autumn and winter (12-15 species). Yet, sample or catch species diversity was highest in autumn and lowest in summer with 2.4 species per haul and 0.83 species per haul, respectively. Only 10 species, all category I residents and category II estuary-associated fish, occurred in the estuary in all seasons throughout the year. Absolute species richness was uniform at 21-22 species over the four sampling periods, the exception being 13 species in 2007 during an extended period of mouth closure.

Overall, seine (CPUE) in the Heuningnes Estuary has doubled from 354 fish haul in the period 1997-1999 to 714 fish haul in 2017. Most of this happened despite declines in catches of several species, which were nullified by 2–100-fold increases in CPUE of harder, groovy mullet, leervis, and Cape stumpnose. Declines in CPUE occurred with 12 species including spotted grunter and flathead mullet, whereas the numerically dominant fish in the system, estuarine round herring, remained relatively stable over the whole period. Similarly, occurrence of estuarine round herring, harder, spotted grunter, backwater butterfly ray, blacktail, and dusky kob remained stable; that of Turbyne's goby, white steenbras, groovy mullet, and leervis increased substantially, whereas Knysna sand goby and Cape sole declined over the same period. During mouth closure in 2007, occurrence of all species except estuarine round herring, groovy mullet, and Cape silverside declined, some to zero.

No gillnet sampling was undertaken in February 2017. A comparison of 1997-1998 and 2007-2008 gillnet catches showed an even higher degree of stability than the seine samples did. Occurrence of the mullet species — harder, groovy mullet, slender mullet, and flathead mullet — in 48 mm mullet nets was almost identical in the two periods. Exceptions were spotted grunter, white stumpnose, leervis, and white steenbras, all of which underwent a 2–10-fold drop in occurrence between the two time periods. The drop in occurrence of spotted grunter is repeated, whereas those of white steenbras and leervis are the direct opposite of the substantial increase in seine and angler catches.

Angler catches became more diverse with an additional 10 species added to catches from 2000 to the present day (Table 2.20). Seven of these were sharks and rays, which were caught on few occasions and in low numbers, and mostly reflected an apparent increase in anglers fishing in the surf-zone immediately adjacent to the estuary mouth. This is an artefact of the off-road vehicle legislation and an increase in anglers now accessing the beach via the De Mond gate under the added proviso of reporting their catches. With two exceptions, these being the two most targeted species - spotted grunter and dusky kob - angler catch composition remained unchanged between the 1995-2000 and 2011-2017 periods. Spotted grunter halved from 44% to 28%, whereas dusky kob quadrupled from 5% to 22%. The increase in the proportion of dusky kob is more a function of the drop in spotted grunter than a surge in the numbers caught. The real decline in spotted grunter in the Heuningnes Estuary contrasts with the newly established breeding population and increase in numbers and catches on the Cape south coast.

To reiterate earlier observations, there was little change in the high degree of angler ethics in De Mond between the two time periods under review, albeit a subtle increase in the number of fish released. There were, however, considerable changes in catch and effort. Catch diversity increased from 20 to 30 species, for the reasons explained above, whereas CPUE dropped from 0.58 fish angler-hour-1 to 0.11 fish angler-hour-1, a 5-fold decline. Zero catches increased from 20% of outings in 1995-2000 to 60% of outings in 2011-2017. Most of this change is a result of the decline in catches of spotted grunter and despite marginal increases in the catch of some other species. Increases in visitor numbers and a doubling of fishing effort sharing the same pool of fish probably also played a role.

Peaks in larval and juvenile recruitment, emigration of adults and movement of fish between estuaries are often associated with high flow or flood events. In the Heuningnes Estuary, high water levels inundate marginal areas, re-established connectivity between the estuary, Soetendalsvlei and tributaries, allow juveniles of fish such as moony and freshwater mullet to recruit upstream, and for landlocked adults to find their way back to the sea to spawn (e.g. mullet and steenbras). Thus, emphasizing the need to keep the connection between the Soetendalsvlei and the Heuningnes open for as long as possible.

Long term fish data indicate that the Soetendalsvlei remains an important nursery area. Size distributions and age-length keys of these species suggest that many of these fish remain in Soetendalsvlei for 8-10 years and that both recruitment and emigration are linked with 1:10 year flood events. These event-years are often associated with a second late-summer/autumn (as opposed to spring/early summer) spawning peak of harder in the sea, assumedly due to the emigrants becoming reproductively active once they have left the estuary.

The Soetendalsvlei is unfortunately invaded by four alien fish species, unwisely introduced several decades ago for angling purposes. This includes spotted bass (*Micropterus punctalatus*) and largemouth bass (*Micropterus salmoides*), of which 2000 were introduced in 1944 by the Cape Province's Department of Inland Fisheries (Bickerton 1984). Carp (*Cyprinus carpio)* and bluegill sunfish (*Lepomis macrochirus)* are also common in Soetendalsvlei, and their date of introduction is not known. These established populations were confirmed in 2006 (Russel, 2006). The bass and bluegill species are known to have serious predatory impacts on indigenous fishes and are likely negatively impacting the population of Cape kurper and the smaller marine species. Carp are a serious ecological problem in many waters (when they are abundant) because of their bottom feeding habits which are then thought to elevate turbidity levels.

The Heuningnes spotted grunter population was one of the first to become established in the southern Cape and caught in the occasional "grunter runs" in Struisbaai Harbour so spread throughout 10 km of the bay. Data on movements of this species is limited. Of 45 tagged in the Heuningnes Estuary under the Ocean Research Institute Tagging Programme in the 20 years up to 2015, none were recaptured. Dusky kob catches were slightly better, with 34 tagged, four recaptured, two in the Heuningnes and two elsewhere at unknown localities. One dusky kob tagged at Koppie Alleen in the MPA was recaptured in the Heuningnes Estuary 79 days later, verifying links between the estuary and MPA. The one Zambezi shark (*Carcharhinus leucas)* reported is most likely from the same nomadic population moving between the southern Cape, offshore seamounts, and Mozambique.

2.4.4 Reptiles

The GDHC has a variety of reptile species recorded with the known number at 42 species. The lists are considered nearly complete for the GDHC (Table 2.22). There are several species of conservation concern based on their IUCN Threat status. These are the loggerhead turtle (*Caretta caretta*), green turtle (*Chelonia mydas*) and the leatherback turtle (*Dermochelys coriacea*) which are known to utilise the oceans of the MPA. A fourth, the olive Ridley turtle (*Lepidochelys olivacea*) is likely to occasionally utilise the MPA. The warm waters of the Agulhas current facilitate these turtle migrations. However, when less frequent cold-water eddies move into the area, turtle strandings occur. Turtles are stabilised and transported to Two Oceans Aquarium where they are further stabilised, rehabilitated if needed and returned into the warmer waters again. Hence both adults and hatchlings can be found in MPA.

The only Threatened terrestrial species is the Southern adder (*Bitis armata*) which is vulnerable to habitat loss. Within the GDHC a threat to this species is road traffic, and awareness materials and signage for looking out for small, cryptic animals in the road is recommended. Generally, the other threat to terrestrial reptiles is extensive invasion of alien trees which are known to negatively affect reptile microhabitats and thermal regimes (Schreuder & Clusella-Trullas 2016), hydrology (le Maitre *et al.* 2019) and fire behaviour (Kraaij *et al.* 2018).

Table 2.22: Reptile species recorded within the GDHC

Scientific name	English name	Regional IUCN Status	Global IUCN Status
Acontias meleagris	Cape Legless Skink	LC	LC
Afrogecko porphyreus	Marbled Leaf-toed Gecko	LC	LC
Agama atra	Southern Rock Agama	LC	LC
Bitis arietans	Puffadder	LC	LC

Scientific name	English name	Regional IUCN Status	Global IUCN Status
Bitis armata	Southern Adder	Vulnerable	Vulnerable
Bradypodion gutturale	Robertson Dwarf Chameleon	LC	LC
Bradypodion pumilum	Cape Dwarf Chameleon	LC	LC
Caretta caretta	Loggerhead Turtle		Vulnerable
Chamaesaura anguina	Cape Grass Lizard	LC	LC
Chelonia mydas	Green Turtle		Endangered
Chersina angulata	Angulate Tortoise	LC	LC
Cordylus cordylus	Cape Girdled Lizard	LC	LC
Crotaphopeltis hotamboeia	Red-lipped Snake	LC	LC
Dasypeltis scabra	Egg-eating Snake	LC	LC
Dermochelys coriacea	Leatherback Turtle		Vulnerable
Dispholidus typus	Boomslang	LC	LC
Gerrhosaurus flavigularis	Yellow-throated Plated Lizard	LC	LC
Hemachatus haemachatus	Rinkhals	LC	LC
Homopus areolatus	Common Padloper	LC	LC
Homoroselaps lacteus	Spotted harlequin Snake	LC	LC
Lycodonomorphus fuscus	Yellow-bellied House Snake	LC	LC
Lycodonomorphus inornatus	Olive Night Snake	LC	LC
Lycodonomorphus rufulus	Brown Water Snake	LC	LC
Lycophidion capense	Cape Wolf Snake	LC	LC
Meroles knoxii	Knox's Desert Lizard	LC	LC
Naja nivea	Cape Cobra	LC	LC
Nucras lalandii	Delalande's Sandveld Lizard	LC	LC
Pachydactylus geitje	Ocellated Gecko	LC	LC
Pelomedusa galeata	Cape Terrapin	LC	LC
Prosymna sundevallii	Sundeval's Shovel-snout Sanke	LC	LC
Psammophis crucifer	Cross-marked Sand Snake	LC	LC
Psammophis notostictus	Karoo Whip Snake	LC	LC
Psammophylax rhombeatus	Rhombic Skaapsteker	LC	LC
Pseudaspis cana	Mole Snake	LC	LC
Pseudocordylus microlepidotus	Western Cape Crag Lizard	LC	LC
Rhinotyphlops lalandei	Delalande's Beaked Blind Snake	LC	LC
Scelotes bipes	Silvery Dwarf Burrowing Skink	LC	LC
Stigmochelys pardalis	Leopard Tortoise	LC	LC
Tetradactylus seps	Short-legged Seps	LC	LC
Tetradactylus tetradactylus	Longtail Whip Lizard	LC	LC
Trachylepis capensis	Cape Skink	LC	LC
Trachylepis homalocephala	Red-sided Skink	LC	LC

2.4.5 Avifauna

The GHDC has six broad avifaunal habitats: ocean, coastline, estuary, wetland, coastal and lowland fynbos, strandveld, and mountain fynbos. This habitat diversity is reflected by the large number of bird species recorded in the GDHC. Based on the combined data from CapeNature's State of Biodiversity Database, iNaturalist, Coordinated Waterbird Counts and South African Bird Atlas SABAP2, 312 bird

species (including 11 pelagic seabirds) have been recorded. However, this includes seven alien species and 47 species that are vagrant to the GDHC area. Of the remaining 249 species, 36 are listed as nationally and/or internationally threatened (Table 2.23).

Table 2.23: Threatened species recorded within the GDHC as taken from the 2025 Red Data Book of Birds of South Africa, Lesotho and Eswatini (Lee *et al.* 2025)

Taxon Name	English Name	Status IUCN	Status Red Data Book
Afrotis afra	Southern black korhaan	VU	VU
Anarhynchus pecuarius	Kittlitz's Plover	LC	NT
Anas erythrorhyncha	Red-billed teal	LC	NT
Anas undulata	Yellow-billed duck	LC	NT
Anhinga rufa	African darter	LC	NT
Anthropoides paradiseus	Blue crane	VU	VU
Aquila verreauxii	Verreaux's eagle	LC	VU
Arenaria interpres	Ruddy turnstone	NT	NT
Certhilauda brevirostris	Agulhas long-billed lark	N/A*	NT
Chroicocephalus hartlaubii	Hartlaub's gull	LC	VU
Circus maurus	Black harrier	EN	EN
Circus ranivorus	African marsh harrier	LC	VU
Elanus caeruleus	Black-winged kite	LC	NT
Falco biarmicus	Lanner falcon	LC	NT
Gyps coprotheres	Cape vulture	VU	VU
Hydroprogne caspia	Caspian tern	LC	VU
Morus capensis	Cape gannet	EN	VU
Neotis denhami	Denham's bustard	NT	VU
Netta erythrophtalma	Southern pochard	LC	NT
Nycticorax nycticorax	Black-crowned night heron	LC	NT
Oxyura maccoa	Maccoa duck	EN	VU
Pelecanus onocrotalus	Great white pelican	LC	VU
Phalacrocorax capensis	Cape cormorant	EN	EN
Phalacrocorax neglectus	Bank cormorant	EN	EN
Podiceps cristatus	Great crested grebe	LC	VU
Polemaetus bellicosus	Martial eagle	EN	EN
Sagittarius serpentarius	Secretarybird	EN	VU
Scopus umbretta	Hamerkop	LC	NT
Spatula smithii	Cape shoveler	LC	NT
Spheniscus demersus	African penguin	CR	EN
Sternula balaenarum	Damara tern	LC	EN
Thalassarche carteri	Indian yellow-nosed albatross	EN	EN
Thalassornis leuconotus	White-backed duck	LC	NT
Turnix hottentottus	Fynbos buttonquail	LC	NT
Tyto capensis	African grass owl	LC	VU

*No longer considered a unique species internationally.

Terrestrial and freshwater avifauna

Cape Vulture

The Cape Vulture (*Gyps coprotheres*) (Fig. 2.27) is regionally and globally Vulnerable (Lee *et al.* 2025). Threats to the species include intentional and unintentional poisoning (anti-inflammatory products used for livestock, and lead ammunition for hunting), electrocution by and collision with electrical infrastructure, drowning in farm reservoirs, illegal hunting for body parts for traditional medicine and disturbance at breeding sites (Allan 2015). Food shortage and fires at breeding colonies may also be threats but direct evidence for the former is lacking and the latter is likely to be of minor importance (Allan 2015).



Figure 2.27: A Cape vulture (*Gyps coprotheres*) from the Potberg colony (Photo: Kevin Shaw)

Cape vultures are a conservation priority for De Hoop. The Potberg Mountains are the southern-most breeding locality for the species and the Potberg colony is the only extant colony of this species in the Western Cape after a colony in the Little Karoo became unsuitable in the 1980s (Shaw 2019).

The colony has been monitored since the 1950s. Data collection was sporadic until 1977 but thereafter, took place more regularly. Although monitoring effort has not been constant over the years, there has undoubtedly been an increase in the number of breeding pairs and the number of fledglings produced over time (Fig. 2.28). Active banding of Cape Vulture nestlings took place annually from 1999 until 2015 (Shaw 2019). Currently, only rehabilitated and released birds are banded and tagged. Patagial tags are no longer used as they negatively affect flight behaviour (Curk *et al.* 2021). VulPro attached satellite tracking devices to nine fledglings in 2021 (Fig 2.29 and Fig. 2.30), and to two rehabilitated and released adults in 2023. Ten of these birds remain mostly within an approximate radius of 100-120km^2 of Potberg, which is unusual behaviour for the species. Birds from northern colonies tend to travel much further (K. Wolter pers. comm. 2024). The only bird which ventured further was one of the tagged fledglings. In two years, this bird travelled about 9000km, visiting the Eastern and Northern Cape provinces, Lesotho and southern Namibia (K. Wolter pers. comm. 2024).

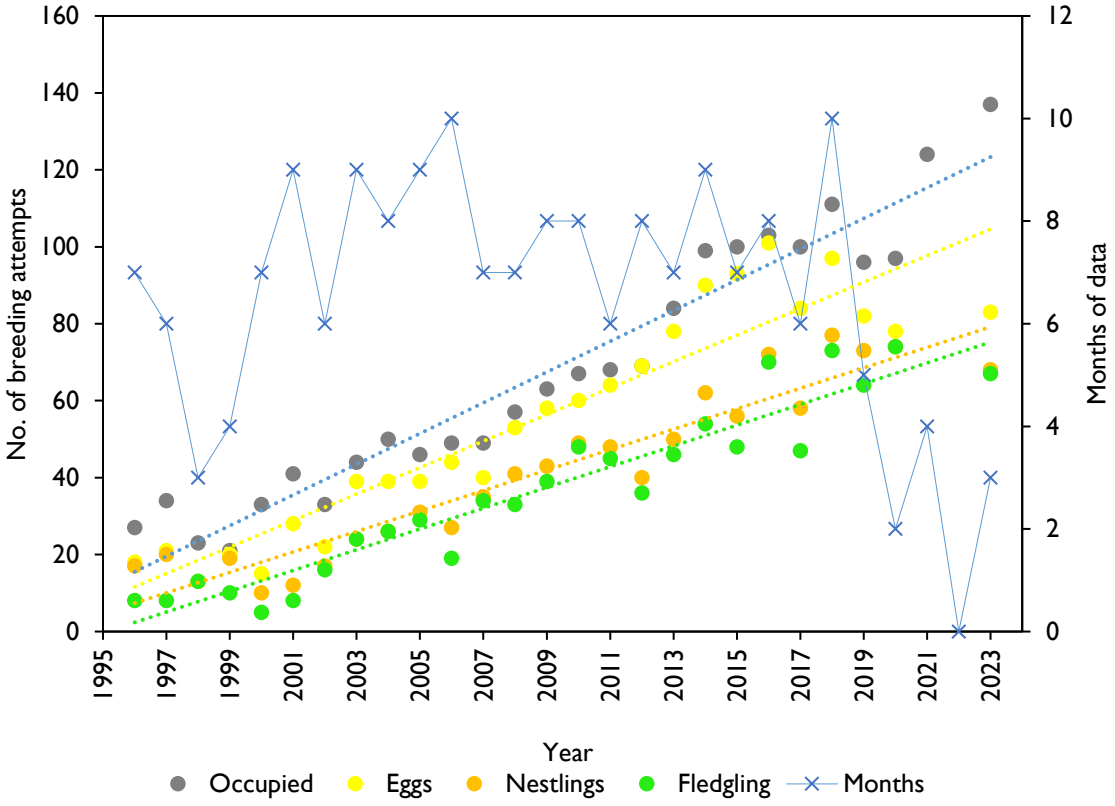


Figure 2.28: Results of the Potberg Cape vulture monitoring programme, 1996-2023 (CapeNature unpublished data)

The graph shows the number of occupied nests and the number of nests in which eggs, nestlings or fledglings were produced. Also illustrated is the number of months per breeding season in which monitoring was conducted.

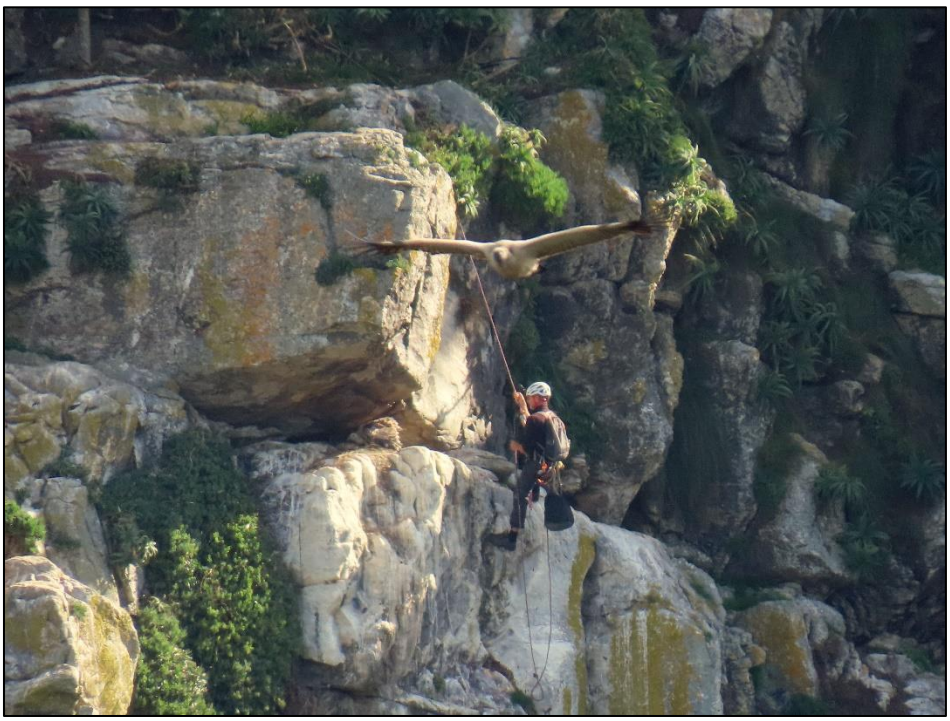
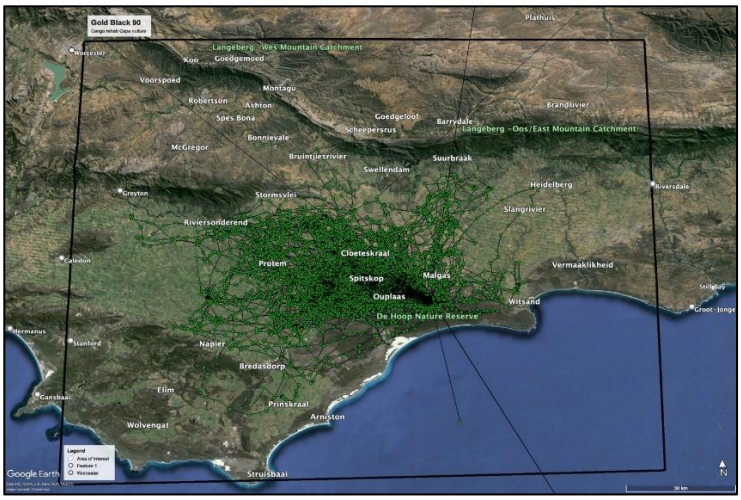
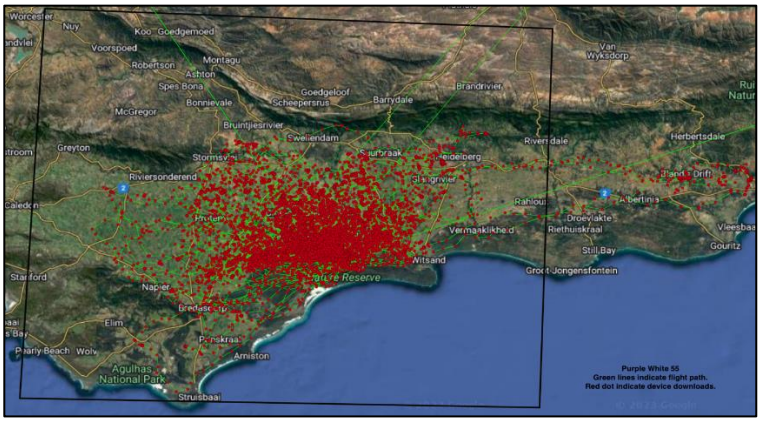


Figure 2.29: Abseiling the Potberg cliffs to fit satellite tracking devices to fledglings



a. Tracks over a seven-month period of a rehabilitated adult (band number Gold Black 90), rescued and released near Potberg



b. Tracks over a seven-month period of Potberg fledgling, band number Purple White 55



c. Tracks over a seven-month period of Potberg fledgling, band number Purple White 54

Figure 2.30: Satellite tracks of three Potberg Cape vultures (VulPro 2024)

There are several management interventions in place on De Hoop to protect the Potberg colony. Disturbance at the Potberg breeding site is kept to a minimum. There is a no-fly zone situated around and above the colony, and the number of visitors to the viewing platform on the eastern side of the breeding site is limited to six guests plus guide from April to September, and 12 guests plus guide the rest of the year.

However, threats are not limited to the colony site. A study of three *Gyps* species found that immature vultures of all species had larger home ranges and used a wider area off protected areas than adults. Although Cape vultures had the smallest home range sizes, they also showed the lowest level of overlap with protected areas (Kane *et al.* 2022). At Potberg, food availability rather than nest site availability is likely to be the limiting factor for further population growth. The Potberg vultures almost never feed on game and the main source of food is thus livestock (mainly sheep) on surrounding farms (K. Shaw, pers. comm.). An important management intervention is therefore awareness-raising amongst communities in the vicinity, e.g. not burying livestock carcasses, not using harmful veterinary products, and using lead-free ammunition. An excellent example has been set by Potteberg Guest Farm, where livestock carcasses are often put out at a designated site for the vultures.

An off-reserve threat to the Potberg vultures is collision with or electrocution by electrical infrastructure. In 2023, for example, a Cape vulture was entangled on a power line near Potberg. Fortunately, this bird could be treated for its injuries and after a period of rehabilitation, was released near the colony (see Fig. 2.30 for post-release satellite tracks). Power lines near the colony and in other areas of high risk to vultures and other birds, especially raptors and large terrestrial birds, are marked with bird flight diverters to mitigate this risk, but an emerging and related risk is the construction of wind energy facilities. A study in the Eastern Cape predicted that in areas where the threat from power lines was high, the Cape vulture population would crash from electrocution mortality alone within a 20 to 35-year period (Boshoff *et al.* 2011). CapeNature comments on all development applications that might affect the Potberg colony, with reference to the BirdLife SA Cape vulture guidelines for impact assessment, monitoring, and mitigation (Pfeiffer & Ralston-Paton 2018). Recommendations are made on factors such as facility location, micro-siting of turbines within development sites, and the marking of power lines to increase their visibility. Pre- and post-construction monitoring must follow the Bird and Wind Energy best practice guidelines (Jenkins *et al.* 2015). The Excelsior wind energy facility is located between Bredasdorp and Swellendam, about 26km from Potberg, and comprises 13 turbines and associated infrastructure (Fig. 2.31). Observers are on duty during the day and can call for shutdown of turbines if vultures or other raptors are seen in the vicinity. Thus far, no vulture strikes have occurred at this facility. Automatic turbine shutdown reduced collision mortalities of griffon vultures (*Gyps fulvus*) by more than 90%, with a minimal decrease in energy production (Ferrer *et al.* 2022).



Figure 2.31: The Excelsior wind farm, seen from the Potberg vulture colony (Photo: Marienne de Villiers)

The apparent isolation of the Potberg vultures from other colonies to the north and east is a cause for concern. Of five colonies sampled, the vultures at Potberg had the highest inbreeding coefficient (Kleinhans & Willows-Munro 2019). The Little Karoo colony, now extinct, might have acted as a stepping stone between Potberg and other colonies in the Karoo. Vulture Safe Zones are large areas that are managed with landowners and local communities as safe spaces for vultures and other wildlife. The Endangered Wildlife Trust is creating a Vulture Safe Zone in the Karoo across an area of 23,000 km² and is investigating the creation of a Southern Cape Vulture Safe Zone which will link the Karoo Safe Zone and Potberg.

Waterbirds

Globally, migratory waterbird numbers are declining. Populations in the African-Eurasian and East Asian – Australasian flyways have decreased by 35% and 42% respectively (Wetlands International 2023). The main cause of these declines is loss of suitable habitat at sites along migration flyways that are used as resting and feeding stops. Species declining most rapidly are ibises, spoonbills, cormorants, stilts, sandpipers and curlews. Wetlands in South Africa are grossly endangered by human pollution, developmental activities and invasive plants, and laws and policies need to be strengthened to prevent wetland damage and extinction (Adeeyo *et al.* 2022). The impacts of these threats on African waterbirds will be exacerbated by climate change (Nagy *et al.* 2022).

As a contracting party to the African-Eurasian Migratory Waterbird Agreement and a signatory to the Ramsar Convention on Wetlands, South Africa is obliged to monitor waterbirds, including waterbirds at Ramsar sites which are wetlands of international importance. CapeNature conducts water bird counts twice a year according to the Coordinated Waterbird Count (CWAC) protocol.

De Hoop Vlei

The De Hoop Vlei (Fig. 2.32) is the oldest Ramsar site in South Africa. The Vlei is landlocked and brackish, fed by the Sout and Potteberg Rivers and several underground springs. It provides critical waterbird feeding and breeding habitat and is especially important during dry periods when ephemeral waterbodies in the surrounding area dry up. On average, De Hoop Vlei supports more than 8000 birds of 97 species, although numbers and species composition fluctuate greatly according to water levels, salinity, and time of year.



Figure 2.32: Aerial view of a section of De Hoop Vlei (Photo: Marienne de Villiers)

The wetland is particularly important for Cape shoveler (*Anas smithii*), great crested grebe (*Podiceps cristatus*), red-knobbed coot (*Fulica cristata*), white-breasted cormorant (*Phalacrocorax lucidus*), black-winged stilt (*Himantopus himantopus*), greater flamingo (*Phoenicopterus roseus*), Caspian tern (*Hydroprogne caspia*), maccoa duck (*Oxyura maccoa*), pied avocet (*Recurvirostra avosetta*), Egyptian goose (*Alopochen aegyptiaca*), lesser flamingo (*Phoenicopterus minor*), South African shelduck (*Tadorna cana*), and spur-winged goose (*Plecopterus gambensis*). According to SANBI's BIRDIE online platform for African wetland and waterbird data, in 2022, numbers of the following species exceeded the Ramsar threshold of 1% of the metapopulation: Cape shoveler, Caspian tern, white-breasted cormorant, great crested grebe, great white pelican (*Pelecanus onocrotalus*), and pied avocet.

The most abundant species on the Vlei is red-knobbed coot (average count 3029 birds, maximum count 12273 birds) (Fig. 2.33). This species feeds on submerged aquatic macrophytic plants and plays an important ecological role in wetlands. In the Bot River estuary for example, it was estimated to consume 9.9-12.5% of macrophyte production in a single year (Stewart & Bally 2010). Winter and summer numbers at De Hoop Vlei have been consistently high over the last three decades (Fig. 2.34).



Figure 2.33: Red-knobbed coots (*Fulica cristata*) on De Hoop Vlei (Photo: Marienne de Villiers)

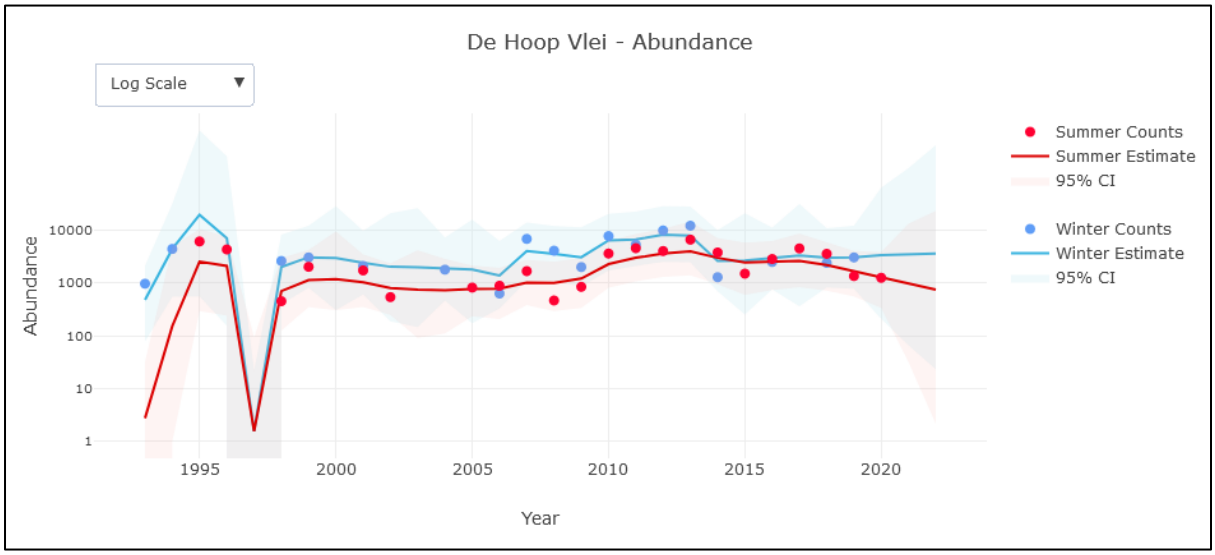


Figure 2.34: Abundance (log scale) of red-knobbed coot at De Hoop Vlei, 1993-2020 (Graph from the BIRDIE online platform for African wetland and waterbird data)

The Great Crested Grebe is highly specific with regards to habitat, preferring deep clear waters with floating vegetation, and is extremely susceptible to disturbance, pollution and eutrophication (Keller 1989; Clinning 1995; Platteeuw & Henkens 1997). A recent analysis indicates a decline in both Area of Occupancy and population size for this species and in 2025, it was uplisted from Least Concern to Vulnerable (K. Shaw & Paul 2025). Of 46 wetlands with at least five years of winter and summer

CWAC data, De Hoop Vlei supported the highest numbers of these grebes in both seasons, indicating the significance of the Vlei for the conservation of this species (K. Shaw, unpublished data, 2024). According to online CWAC data, on average, 190 of these grebes have been counted at De Hoop Vlei, with a maximum of 558 in the winter of 2013 (Fig. 2.35).

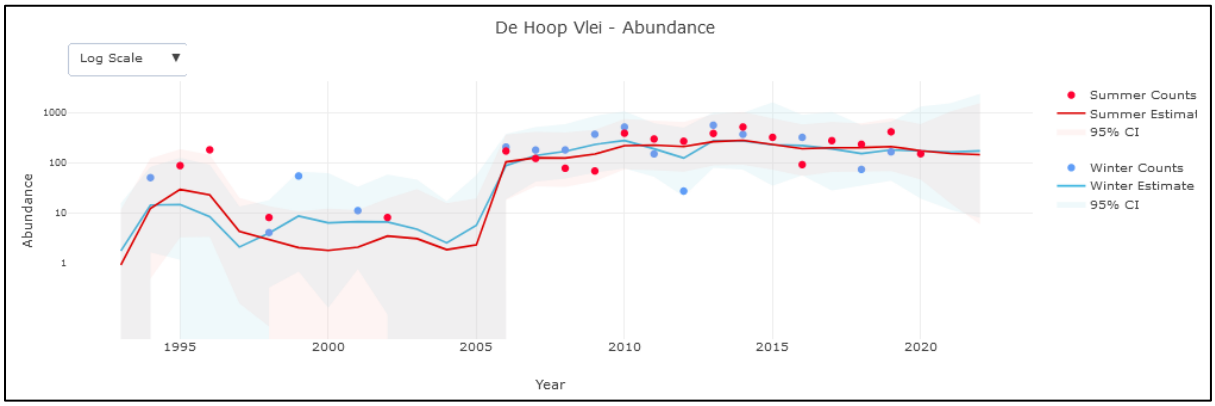


Figure 2.35: Abundance (log scale) of great crested grebe at De Hoop Vlei, 1993-2020 (Graph from the BIRDIE online platform for African wetland and waterbird data)

Maccoa duck (globally Endangered, regionally Vulnerable) have a wide distribution but is a localized, relatively scarce species. It is largely sedentary, dispersing short distances after breeding, presumably in response to changing environmental conditions (Taylor 2015). In South Africa, key threats are the draining of wetlands, pollution, alien vegetation and variable water levels. Only about 20% of the regional population occurs within protected areas (Taylor 2015). Of the 236 wetlands in South Africa which support this species, De Hoop ranks 24th based on average count. On average, the number of these birds recorded at De Hoop Vlei is lower than the 1% Ramsar threshold (75), but the threshold is sometimes exceeded and the highest number recorded on the Vlei was 132 in the winter of 2012 according to online CWAC data. (Fig. 2.36).

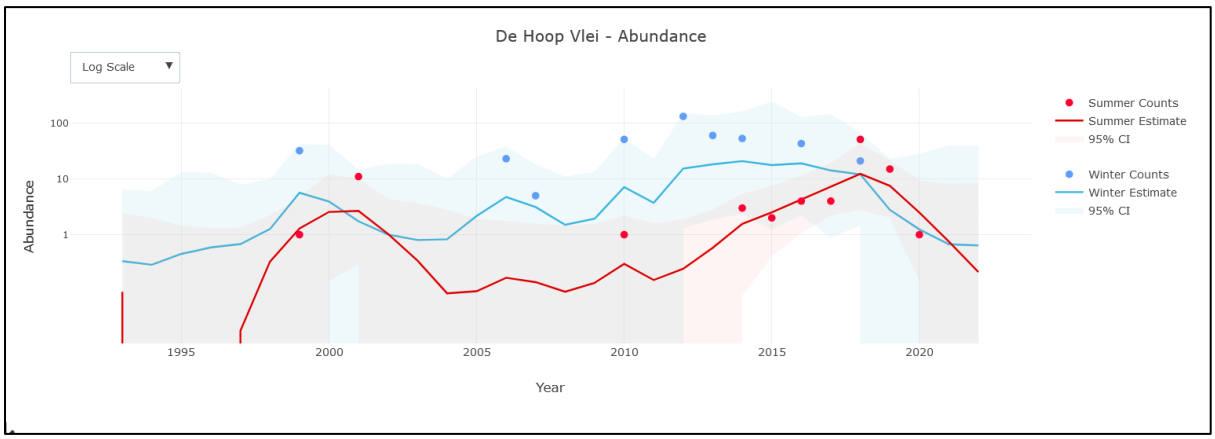


Figure 2.36: Abundance (log scale) of maccoa duck at De Hoop Vlei, 1993-2020 (Graph from the BIRDIE online platform for African wetland and waterbird data)

Several other waterbird species, apart from great crested grebes, are sensitive to anthropogenic disturbance. In response to proposals for motorized boat tours and kayak tours on the Vlei, studies were conducted and found that while kayaks resulted in significant disturbance and should not take place, boat tours did not typically disturb more than 10% of birds and largely avoided disturbing species of conservation concern (de Blocq & van Scheltinga 2017). Two boat routes were designed to avoid sensitive areas, and management recommendations were made to ensure that boat tours would not be too disruptive (de Blocq & van Scheltinga 2017).

Heuningnes Estuary

Eighty-five species of birds have been recorded at the estuary during CWAC surveys, the most abundant of which are common tern (*Sterna hirundo*) and swift tern (*Thalasseus bergii*), highlighting the importance of the estuary mouth as a regularly used roost site. Biomass and total count graphs from the online CWAC data reflect large numbers of small shorebirds in summer and smaller numbers of large birds in winter. In 2022, numbers, according to the BIRDIE online platform for African wetland and waterbird data, of the following species exceeded the Ramsar threshold of 1% of the metapopulation: African black oystercatcher, Caspian tern (Fig. 2.37), white-breasted cormorant, swift tern, kelp gull, and white-fronted plover. The dune areas and pebble slacks are important nesting sites for birds. The estuary is used for breeding by African black oystercatcher, Caspian tern, and kelp gull.



Figure 2.37: Caspian tern (*Hydroprogne caspia*) chick accompanied by an adult in the nesting area in the foredunes to the east of the Heuningnes Estuary mouth (Photo: Keith Spencer)

Other threatened species

A recent study has shown that 88% of African raptors have declined in the last two to four decades and 69% are at risk of extinction, and those species with the sharpest declines were increasingly dependent on protected areas (Shaw *et al.* 2024). Of the raptors recorded in the GDHC, two are regionally Endangered and five is regionally Vulnerable (Table 2.23).

Black harrier (*Circus maurus*, globally and regionally Endangered) breeds on De Hoop, where 12 breeding sites have been recorded (K. Shaw unpublished data), and on De Mond. A comparison of data from SABAP1 and SABAP2 (SAPAB2 2019) shows a decrease in reporting rates in three of the quarter-degree grid cells within which the GDHC falls (-21% and -11% for the De Hoop area and -12% for the Soetendalsvlei area), except for the De Mond area (an increase 6%). In the Overberg, black harriers are completely dependent on natural remnants of renosterveld for breeding, but their foraging range covers a mix of transformed and natural habitats (Overberg Renosterveld Trust 2021). Most satellite-tracked black harriers from south-western South Africa performed an unusual West-East migration from their breeding areas, but routes of all migrating individuals covered the entire southern land area of South Africa and Lesotho, with an average travel distance of 814 ± 324 km (Garcia-Heras *et al.* 2019). Because of the large areas that are covered by these birds, they are exposed to a wide range of threats, and most tagged birds died on migration or during the non-breeding season. Adults frequently returned to the same non-breeding settlement areas, using as many as three

locations an average about 200 km apart (Garcia-Heras *et al.* 2019). An understanding of habitat use throughout the annual cycle is valuable towards identifying sensitive areas and potential risk areas and mitigating threats. Black harriers are at risk from the exceptionally high rate of loss of renosterveld breeding habitat and, like Cape vultures and other large birds, mortalities are caused by collision with electricity infrastructure. From 2021-2024, three black harriers were killed at Excelsior Wind Farm (O. Curtis, pers comm 2024) indicating that although shut-down-on-demand works well for vultures and large raptors such as Verreaux's eagle (which also breeds on De Hoop), it is not as effective for small raptors. Alternative mitigation measures at Excelsior must now be explored. The black harrier wind energy guidelines (Simmons *et al.* 2020) must be considered when assessing development applications.

African grass owl (*Tyto capensis*, regionally Vulnerable) has been sighted in De Mond. However, the Agulhas Plain is at the southern end of the distribution range of this species so sightings in the area are uncommon. Between 1987 and 1992, the South African Bird Atlas did not record any sightings of these owls from the Agulhas Plain area, although there was one unconfirmed record in 1989. The second Southern African Bird Atlas Project does have records of the species north of De Mond (reporting rate = 16.4% from 61 cards for pentad 3435_2005 online data from SABAP2 website). African grass owls do occur in the GHDC, where breeding has been observed (CapeNature unpublished data). However, they are difficult to observe because they are crepuscular and probably occur in low densities, and reserve staff should try to find this species. The last State of Biodiversity record for this species on De Mond is dated 2010.

Other threatened species that occur in relatively substantial numbers on the GDHC are Denham's bustard (*Neotis denhami*, regionally Vulnerable) and Cape cormorant (*Phalacrocorax capensis*, globally and regionally Endangered) (CapeNature unpublished data). Damara tern (*Sternula balaenarum*, regionally Endangered) breeds in low numbers along the De Mond coast and often strays into De Hoop. The breeding success of the small Damara tern colony to the west of the Heuningnes Estuary shows signs of decline with the main threat to nesting birds being sand inundation during the egg incubation phase (A. Saptou pers obs.)

Ostrich

The ostriches (*Struthio camelus*) on De Hoop are not a conservation priority. Further research is needed to understand the genetics of this population. If it is descended from the original subspecies (*S. c. australis*) and is still genetically pure, then it would have high conservation value. However, there have been observations of tagged ostriches in the reserve (Frans Radloff, pers. comm.) suggesting that the population may now be contaminated by domestic stock of mixed origin. Regardless of their genetic value, ostrich may play an ecological role on De Hoop but also negatively impact the veld if numbers are too high. Ostrich chicks are likely a source of food for mesopredators; however, ostrich contribute significantly to the degradation of vegetation and carry high parasite loads. It may be possible to cull ostrich on De Hoop for a meat value rather than live animal value, but realising this value is complicated by stringent veterinary controls around the transport and use of ostrich meat, and the impact of an off take on tourism on the reserve. From aerial game count data, it is estimated that there was a 23% increase in the combined ostrich population on De Hoop and Overberg Test Range. It was recommended that the combined population should be reduced by about 400 (de Villiers & Shaw 2020) however this offtake did not take place. The October 2023 vehicle-based game count recorded a minimum of 171 and a maximum of 228 ostrich on De Hoop – considerably more than the 116 ostrich recorded during the 2019 aerial game survey (CapeNature unpublished data).

Marine and coastal avifauna

Globally seabirds are one of the most threatened groups of birds (Dias *et al.* 2019) with 30% of species considered globally threatened (19 Critically Endangered, 34 Endangered and 58 Vulnerable), a further 11% listed as Near Threatened, and 57% of species known to be in decline (BirdLife 2022). The main

driver of the decline is climate change – 89% of seabirds impacted by climate change are also affected by other threats such as overfishing, bycatch, habitat destruction, and disturbance (Dias *et al*. 2019).

The GDHC consists of numerous marine avifaunal habitats and within these habitats, six threatened marine bird species have been recorded. Two of these species, African Penguin (*Spheniscus demersus*) and Damara tern, breed within the GDHC. The Cape cormorant and Caspian terns have also used the area to the east of the Heuningnes Estuary mouth as a breeding site and there is a small colony of Cape cormorants breeding at Vaalkrans.

African penguin

The African penguin (*Spheniscus demersus*) is endemic to southern Africa, is breeding at 26 localities in Namibia and South Africa (Makhado *et al.* submitted) and is currently listed globally as Critically Endangered (IUCN 2023) and regionally Endangered (Lee *et al.* 2025). The recent population trends have indicated that the Namibian population declined from 12 162 pairs in 1978 (Shelton *et al*. 1984) to ~1,200 pairs in 2023 (Sherley *et al.* 2024) while the South African population decreased from ~70,000 pairs in 1978/79 (Shelton *et al.* 1984) to ~8.750 pairs in 2023 (Sherley *et al.* 2024).

The decline of the African penguin since the 1950s has been attributed to several top-down and bottom-up processes, including historical egg collecting and guano scraping, changes in the abundance and distribution of their main prey (sardine *Sardinops sagax* and anchovy *Engraulis encrasicolus*), pollution, habitat loss and modification, predation on land and sea, competition with commercial fisheries, and climate change (Crawford *et al.,* 2007; Crawford *et al.* 2018; Frost *et al*. 1976; Sherley *et al.* 2017).

In 2003, the first breeding pair of African penguins was recorded on De Hoop (Underhill *et al*. 2006) and the colony increased to 18 breeding pairs in 2006 (Crawford *et al.* 2007). In April 2006, during a routine patrol, 42 African penguin carcasses were discovered, the result of a caracal predation causing the remaining birds to abandon the colony (CapeNature unpublished data).

In 2018, Birdlife SA started a process to re-establish a colony at De Hoop including constructing a predator-proof fence and placing decoys and sound devices to encourage penguins to the site. The first hand-reared juvenile African penguins were released at the site in 2021, totalling 333 penguins up to September 2025. In June 2022, the first breeding pair was discovered with two chicks and a total of four pairs bred in 2023. In March 2024, a predation event occurred which resulted in the death of 11 penguins. However, in 2025 the penguins returned. 10 penguins were subsequently regularly seen at the colony, and two pairs successfully fledged at least one chick each.

Damara tern

The Damara tern (Fig. 2.38) is a southern African near-endemic species, breeding at coastal sites between Algoa Bay, Eastern Cape, and southern Angola. It is currently listed regionally as Endangered (Whittington 2025) with the South African population estimated at 104 mature individuals and showing a decreasing population trend

Damara terns have been recorded breeding at 14 localities between Alexander Bay (Northern Cape) and Woody Cape (Algoa Bay) but six of these sites are no longer used (Martin *et al*. 2023). In the late 1970s, the total population was estimated 150 breeding pairs, predominately on the West Coast (Barnes 2000). In 2010 the population was estimated at a minimum of 65 breeding pairs bred in South Africa (Braby 2011). Surveys conducted for the period 2018-2021 estimate a population size of 52 breeding pairs (Martin *et al*. 2023).



Figure 2.38: Damara tern (*Sternula balaenarum)* incubating an egg on the stoney dune slacks west of the Heuningnes Estuary (Photo: Keith Spencer)



Figure 2.39: Damara tern nest sites threatened by sand inundation on the stoney dune slacks along the De Mond coastline (Photo: Keith Spencer)

The Damara tern breeds between the Heuningnes River and Struisbaai. Surveys done during 2023 indicated a total of 10 breeding pairs (CapeNature unpublished data) contributing to 19% of the total breeding population in South Africa. The breeding habitat of this species is extremely dynamic, and adult birds may choose a different area along the De Mond coastline to breed in a particular year. The presence of this species on De Mond in relatively high numbers was the main reason why the site was declared a Ramsar site in October 1986.

Alien avifauna

Alien bird species seen in the GDHC include mallard (*Anas platyrhynchos*), black swan (*Cygnus atratus*) and Indian peafowl (*Pavo cristatus*). Mallards are of particular concern because they are aggressively invasive. They are likely the alien bird species which poses the biggest threat in South Africa and have devasted waterfowl populations in other countries (McCarthy 2006). Mallards pose a genetic threat to indigenous waterfowl since they can crossbreed with about 40 other species including yellow-billed duck (Fig. 2.40) (De Souza *et al.* 2019), Cape teal, Cape shoveler and possibly African black duck, producing fertile hybrid offspring (McCarthy 2006). They also outcompete indigenous ducks for food, nesting, and roosting sites. Mallards are classified as Category 2 aliens (Government Notice 43726 2020).



Figure 2.40: Yellow-billed ducks (*Anas undulata)* (bottom) and South African shelducks (*Tadorna cana)* (top) in flight over De Hoop Vlei (Photo: Marienne de Villiers)

2.4.6 Mammals

2.4.6.1 Terrestrial mammals

The list of indigenous terrestrial mammals in the GDHC was compiled from data in CapeNature's State of Biodiversity Database, iNaturalist (research-grade records only) and MammalMap. Sixty-six species have been recorded. These range from the tiny pygmy mouse (*Mus minutoides*) to the large eland (*Tragelaphus oryx*). According to the South African Red Data Book (Child *et al.* 2017), three of the 64 species are NT and two are VU, while four are endemic and four near-endemic to the Western Cape Province (Table 2.24). Species of conservation concern are elaborated upon in the subsections below.

Some of the species that occurred historically but are no longer free ranging in the southern lowlands of the southwestern Cape include African elephant (*Loxodonta africana*), black rhinocerus (*Diceros bicornis*), hippopotamus (*Hippopotamus amphibius*), African buffalo (*Syncerus caffer*) (Radloff 2008; Skead 2011), and the extinct blue antelope (*Hippotragus leucophaeus*) (Hempel *et al.* 2024).

Table 2.24: Priority mammal species of the GDHC and their regional conservation status according to the 2016 South African Red Data Book (Child *et al.* 2017)

Scientific name	English name	Regional status	Provincial endemism	Ecotypical
Acomys subspinosus	Cape spiny mouse	Least Concern	Endemic	
Aonyx capensis	African clawless otter	Near Threatened		
Bathyergus suillus	Cape dune molerat	Least Concern	Endemic	
Chrysochloris asiatica	Cape golden mole	Least Concern	Near-endemic	
Damaliscus pygargus pygargus	Bontebok	Vulnerable	Endemic	
Equus zebra zebra	Cape mountain zebra	Least Concern	Near-endemic	
Gerbillus afra	Cape gerbil	Least Concern	Endemic	
Myomyscus verreauxii	Verreaux's mouse	Least Concern	Near-endemic	
Oreotragus oreotragus	Klipspringer	Least Concern		Yes
Panthera pardus	Leopard	Vulnerable		
Pelea capreolus	Grey rhebok	Near Threatened		Yes
Poecilogale albinucha	African striped weasel	Near Threatened		
Raphicerus campestris	Steenbok	Least Concern		Yes
Raphicerus melanotis	Cape grysbok	Least Concern		Yes
Sylvicapra grimmia grimmia	Common duiker	Least Concern		Yes
Tragelaphus sylvaticus sylvaticus	Southern bushbuck	Least Concern		Yes

Bontebok

Bontebok (*Damaliscus pygargus pygargus*) (Fig. 2.41) are endemic to the southern part of the Western Cape. The Natural Distribution Range of the subspecies is a narrow band along the coastal plains of the Overberg region. The main threats are habitat loss and fragmentation. Other concerns include loss of genetic diversity due to a severe historical population bottleneck and genetic contamination through hybridisation with blesbok (*D. p. phillipsi*) (Cowell & Birss 2017). In 2017, CapeNature was assigned as the implementor for the bontebok Biodiversity Management Plan (BMP-Bontebok) in the Western Cape (Cowell & Birss 2017). Although the five-year period of this BMP has elapsed, the actions contained are still valid and should be implemented.



Figure 2.41: Bontebok (*Damaliscus pygargus pygargus*) cow and calf (Photo: Marienne de Villiers)

In the Western Cape, bontebok are present on two CapeNature managed properties (De Hoop and Theewaterskloof), on four national parks (Bontebok, West Coast, Table Mountain and Agulhas National Parks) and on many private properties. The De Hoop founder population comprised three rams which were already on the property when it was purchased in 1956, plus ten juveniles which were introduced from Bontebok National Park (SANParks) in 1960 (Barnard & van der Walt 1961; Scott & Scott 2002). Another important bontebok conservation site is Denel OTR. In 2001, CapeNature and Denel OTR concluded an agreement for the combined management of large game in the Greater De Hoop Conservation Area and environmental compliance was overseen by the Overberg Review Committee until 2019 (de Villiers & Shaw 2020). The committee has since been dissolved. Although CapeNature and Denel do not currently co-manage the greater conservation area, CapeNature assists Denel with advice around game management and assistance with game counts.

Together, De Hoop and Denel OTR support 22% of the bontebok population within the Natural and Extended Natural Distribution Range.

On De Hoop, game counts from vehicles are carried out bi-annually in autumn (May) and spring (October) over a three-day period. During counts, the number of adult males, adult females and juveniles is recorded, and GPS coordinates of herd positions are taken. Game counts are also sometimes carried out at neighbouring Denel OTR. Challenges are coordination of game counts on De Hoop and Denel OTR, and incomplete game counts when De Hoop Vlei is full and parts of the game count route cannot be accessed. Aerial game counts should ideally be carried out every 3-5 years. Aerial surveys in October 2019 and November 2024 respectively recorded 486 and 265 adult bontebok on the two properties combined (de Villiers & Shaw 2020, CapeNature 2025b). October triplicate ground counts also indicate a declining trend in the De Hoop bontebok population since 2017 (Fig. 2.42). A trend for Denel OTR cannot be determined due to inconsistent data collection.

The upper estimate of the De Hoop ratio of rams to ewes (0.9-1.4 rams per ewe) from the October 2023 count is close to the norm (1.5 rams per ewe). Lambing success (0.4 lambs/ewe) is lower than expected of 0.5 lambs/ewe (Furstenberg 2012), but the October game counts upon which these figures were based took place before the peak of the lambing season in November and December and actual lambing success is expected to be considerably higher. A triplicate count in May each year allows for an improved estimate of this parameter.

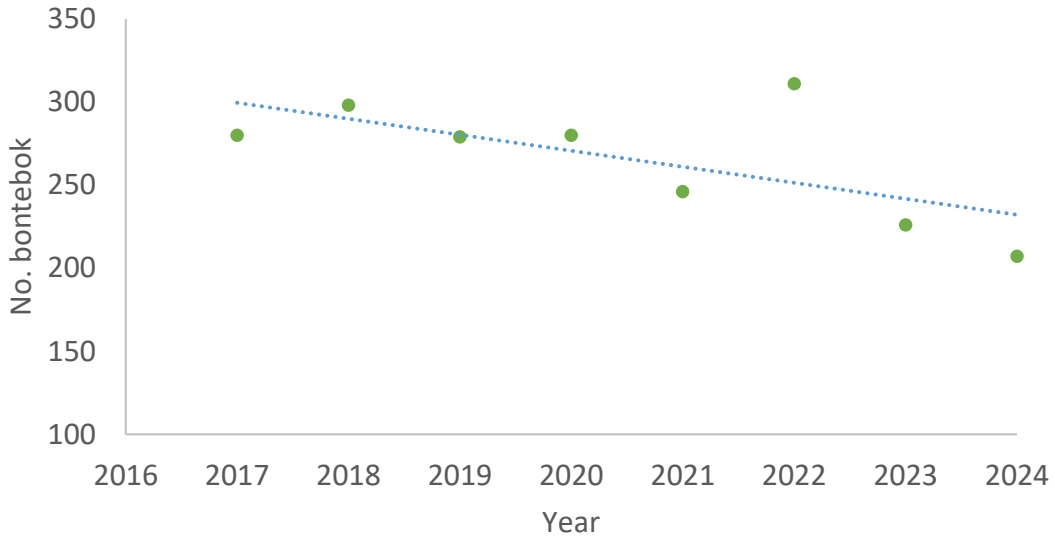


Figure 2.42: Bontebok numbers on De Hoop 2024. Blue line: Linear regression (CapeNature unpublished data)

Note that all De Hoop values were derived from the maximum of the October triplicate counts, but for Denel OTR all except the October 2022 count were based on single counts done at various times of the year.

On De Hoop, bontebok are mostly concentrated on areas of limestone fynbos overlying calcrete, with some herds concentrated on the old fields near Potberg (Fig. 2.43). Veld age on De Hoop and Denel OTR is mostly 6-10 years or older (15-25 years in the areas utilized by bontebok), with a limited area aged <2 years on OTR (CapeNature 2023a). Lack of suitable bontebok habitat on De Hoop remains a concern. Only 12% of the Greater De Hoop Conservation Area is considered to contain suitable bontebok habitat (Radloff 2008), and availability of grazing is further limited through competition with other large game species such as Cape mountain zebra (*Equus zebra zebra*) and eland (*Tragelaphus oryx*) (de Villiers & Shaw 2020). In some areas, habitat quality for bontebok can be improved by fire. On Bontebok National Park, bontebok are attracted to recently burnt fynbos and graze the post-burn growth flush for up to four years after a fire (SANParks 2013). On De Hoop there is no veld younger than five years and much of the veld is much older than this, but this is not necessarily a cause for concern. After controlled burn on De Hoop some years ago, bontebok did not move into recently burnt limestone fynbos areas as expected. The different responses of bontebok to fire on the two protected areas might be related to differences in geology, with Bontebok National Park having more silcrete and higher nutrient richness than De Hoop (Frans Radloff pers comm).

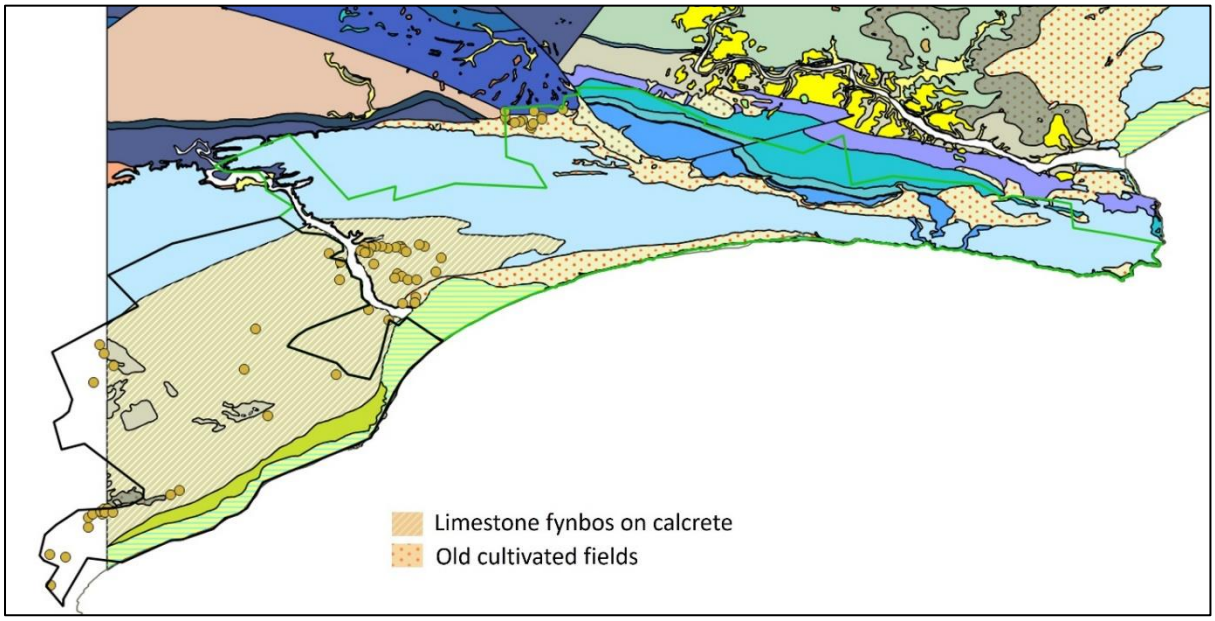


Figure 2.43: Distribution of bontebok on De Hoop and Denel OTR in October 2022 note that the available soil layer does not cover the western edge of Denel OTR (CapeNature 2023a)

A limitation on population growth may be availability of clean drinking water. Bontebok are highly water dependent. On De Hoop, waterpoints are De Hoop Vlei, Dronkvlei spring and the overflow from the tourism effluent treatment plant. The creation of an additional waterpoint, using fresh water from the tourism facility, has been considered but is hampered by budgetary constraints. Poor nutrition and poor water quality is expected to adversely affect animal health, causing increased susceptibility to parasite infections. The watering point in the open area of the airstrip is to be reinstated.

Bontebok are a high conservation priority for the GHDC. No live capture on an economically viable scale should be considered for the De Hoop population at this stage. Instead, consideration must be given to how best to manage the population so that it makes the maximum contribution to the metapopulation through translocations for genetic exchange and the establishment of new populations (Wheeler 2023).

Cape mountain zebra

Cape mountain zebra (CMZ) (*Equus zebra zebra*, Fig. 2.44) are endemic to Fynbos, Grassland and Karoo habitats and their Natural Distribution Range is mainly in the Western and Eastern Cape provinces but extends marginally into the Northern Cape (Hrabar *et al.* 2016). Although no longer considered threatened (Hrabar *et al.* 2016), active metapopulation management is needed to conserve the subspecies. To this end, a CMZ Biodiversity Management Plan (BMP) was developed (Birss *et al.* 2016) with CapeNature as the organ of state responsible for implementation in the Western Cape. As for the bontebok BMP, the five-year period has elapsed, but the actions contained in the plan should continue to be implemented.



Figure 2.44: Cape mountain zebra (*Equus zebra zebra*) near the staff houses on De Hoop (Photo: Marienne de Villiers)

In the Western Cape, CMZ are present on four CapeNature protected areas (Anysberg, De Hoop, Gamkaberg and Kammanassie), five national parks (Bontebok, Karoo, Table Mountain, Tanqwa and West Coast) and various private properties. The main threats to CMZ are habitat loss and fragmentation, loss of genetic diversity due to human-caused isolation and development of three separate genetic stocks, and hybridization with other types of equids (Hrabar *et al.* 2016).

Due to historical anthropogenic isolation of CMZ populations, there are now three genetically distinct stocks: Gamkaberg (G), Kammanassie (K) and Cradock (C) (Moodley & Harley 2005). 90% of CMZ in the Western Cape are C stock animals. The De Hoop founder population comprised three animals (none of which bred) translocated from the Outeniqua Mountains in 1967, two animals from Kammanassie in 1970 and various animals from Mountain Zebra National Park in subsequent years (Moodley 2002). De Hoop and Denel OTR CMZ are significant for metapopulation management of the subspecies because they represent a mixture of two genetic stocks, C-K. In 2016, 28 CMZ were translocated from De Hoop to Sanbona under a custodianship agreement. There has, however, been a substantial loss in heterozygosity at De Hoop in recent years (Kotzé *et al.* 2019). Nevertheless, some of the offspring of the translocated CMZ are now contributing to improving metapopulation genetic diversity through a genetic rescue project on Sanbona. In 2024, this project produced the first ever C-G and C-K-G foals (Fig. 2.45).



Figure 2.45: 2024 products of the Sanbona CMZ genetic rescue project. C-G-K foal (left front) and its C-K half sibling (right) (Photo: Jannie Swanepoel)

On De Hoop, CMZ data is collected through a combination of vehicle or foot patrols, camera trapping and ad hoc observations. There is an over-arching CMZ monitoring protocol (CapeNature 2021a) and a reserve-specific protocol (CapeNature 2021d). Occasionally, aerial game counts supply information on CMZ. Photo-identification files are kept for individual CMZ but the completeness and year of initiation of these varies between protected areas. Detailed information was captured in an Access database during 2005 and 2006, and detailed records were again kept from 2010-2012, but thereafter there was a long gap in data collection until 2019, when photo-identification of individual animals resumed. CMZ surveys at Denel OTR are intermittent and the timing does not always coincide with De Hoop surveys.

CMZ have been shown to concentrate on transformed grasslands and to actively avoid 70% of the reserve (Smith *et al.* 2008). De Hoop is not adequately fenced to contain CMZ, and as a result animals often move onto private land nearby to seek better grazing. In 2023, 20 CMZ on private land were captured and translocated to a game camp on Potberg Sector, but many of these animals simply moved off the reserve once again. It is estimated that there are currently around 13 CMZ on De Hoop. The CMZ population on Denel OTR is about double that on De Hoop. In recent years, the total De Hoop population (on and off reserve) appears to have plateaued and may have reached carrying capacity (Fig. 2.46).

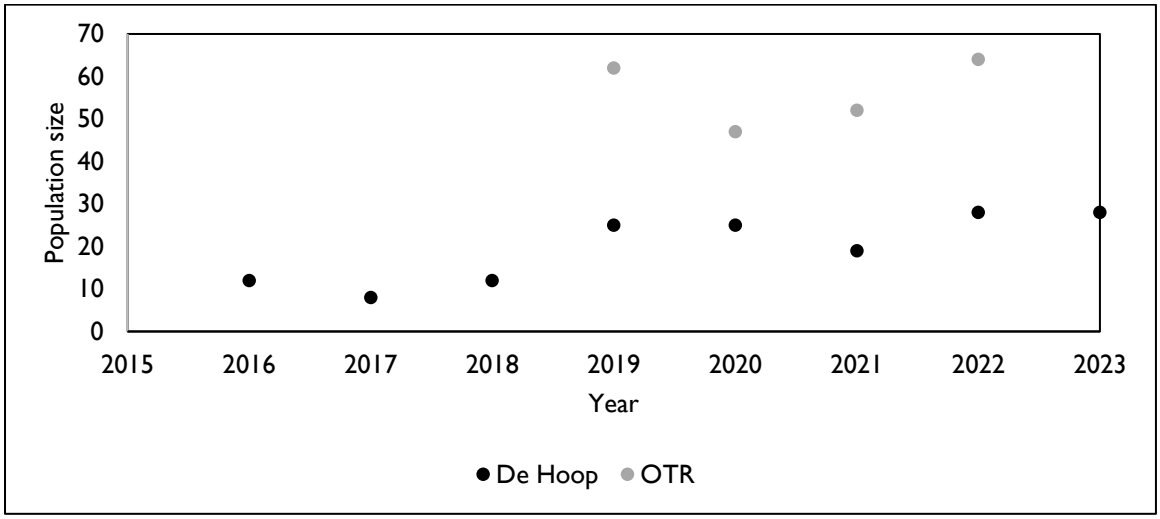


Figure 2.46: Cape mountain zebra numbers on De Hoop and Denel OTR, 2017-2023. De Hoop numbers include both on- and off-reserve animals (CapeNature unpublished data)

Historical information also suggests that the population of the Greater De Hoop Conservation Area has remained stable for some years and might have reached carrying capacity (CapeNature 2023b). As for bontebok population, growth for CMZ could be encouraged by the reduction of numbers of other large game, particularly eland and ostrich (*Struthio camelus*), on the two properties (de Villiers & Shaw 2020). Escapees from the protected area are at risk of causing vehicular collisions and, given that the habitat at De Hoop is not ideal for CMZ, will be an ongoing problem. Hybridization with other equid species is also a threat (Dalton *et al.* 2017) (Fig. 2.47). Consideration is being given as to how best this population can contribute to the metapopulation, either by moving all CMZ to a more suitable site or by making De Hoop more attractive to CMZ, for example, through the irrigation of old lands, supplementary feeding and provision of additional waterpoints.



Figure 2.47: CMZ-donkey cross offspring and CMZ stallion within a horse herd near De Hoop (Photos: Kevin Shaw)

Other game

Ten species of game occur in the GDHC, but significant numbers are only present on De Hoop. Some of these species are ecotypical, i.e. they comprise discrete populations below the level of subspecies that can be recognized on genetic, phenotypic or zoogeographic grounds, and are thus of conservation concern. Some, such as common duiker (*Sylvicapra grimmia*) and klipspringer (*Oreotragus oreotragus*) are important contributors to leopard diets in the Western Cape (Swanepoel *et al.* 2016). Small game species are important indicators of the overall ecological state of the GDHC. Their movement across the broader landscape is generally unimpeded and their persistence suggests resilience against urban edge effects. Another important game species in the GDHC is grey rhebok (*Pelea capreolus*, Near Threatened).

The species which contributes most to the total stocking rate on De Hoop is eland (*Tragelaphus oryx*) (Fig. 2.48 and Fig. 2.49). Radloff (2008) demonstrated that eland and bontebok utilize renosterveld but avoid sandstone fynbos and limestone fynbos, except for grassy microhabitats such as the karstic sinkhole depressions. Consequently, only about 12% of De Hoop is suitable for these species (Radloff 2008). Unlike bontebok, however, eland move freely across the greater landscape. De Hoop serves as an important refuge for the species, allowing eland to breed and disperse into the broader landscape as a form of passive re-wilding and restoration. The game management aim for De Hoop is thus to maintain an open ecological system, with the protected area serving as a source for surrounding sinks (Wheeler 2023). Although De Hoop does not have excess game for live capture offtake on a regular basis, the offtake of eland through professional hunting is a viable economic and ecological option that could be implemented on a regular basis (Wheeler 2023).



Figure 2.48: Herd of eland (*Tragelaphus oryx*) seen on Denel OTR during the 2019 aerial game survey (Photo: Marienne de Villiers)

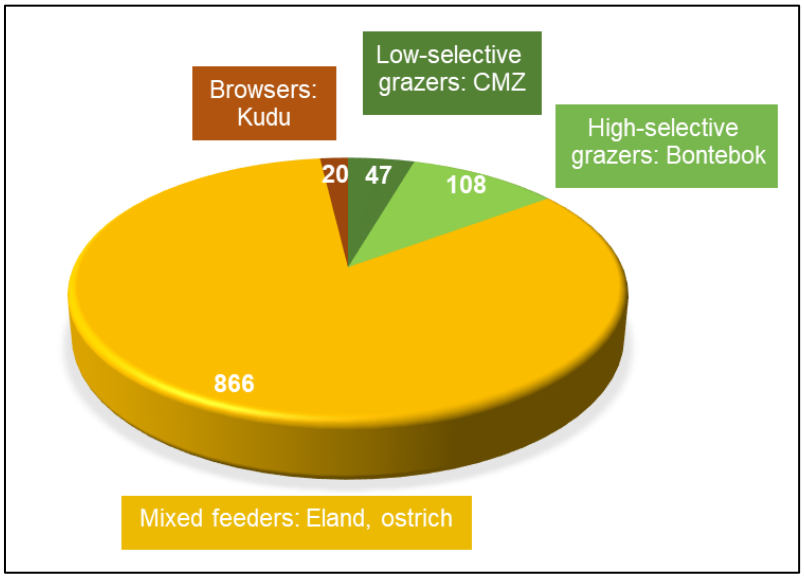


Figure 2.49: Contribution of the four feeding guilds and major contributing species to the total stocking rate (LAU, Large Animal Units) on De Hoop and Denel OTR (de Villiers & Shaw 2020).

Predators

Because of their high trophic level and direct and indirect interaction with other species, the presence of predators – both leopard and mesopredators – is an indicator of healthy, biodiverse ecosystems (Tshabalala *et al.* 2021). The GDHC has a good diversity of small- to medium-sized carnivores which experience similar threats to leopard, e.g. bat-eared fox (*Otocyon megalotis*), caracal (*Caracal caracal*, an important mesopredator) and honey badger (*Mellivora capensis*). The only large predator still present is leopard (*Panthera pardus*) (Vulnerable, Fig. 2.50). This keystone species regulates terrestrial ecosystems through its role as an apex predator. Main threats outside of protected areas are unsustainable levels of persecution and illegal hunting. Other threats are habitat fragmentation and loss (Swanepoel *et al.* 2016). However, leopard genetic variability depends on gene flow (and thus dispersal) between populations over large areas (Swanepoel *et al.* 2016). Mitochondrial DNA analysis suggests that leopards at the southernmost end of their range in Africa have evolved differently to those in the rest of Africa and that the South African population might be genetically unique (Morris *et al.* 2024).

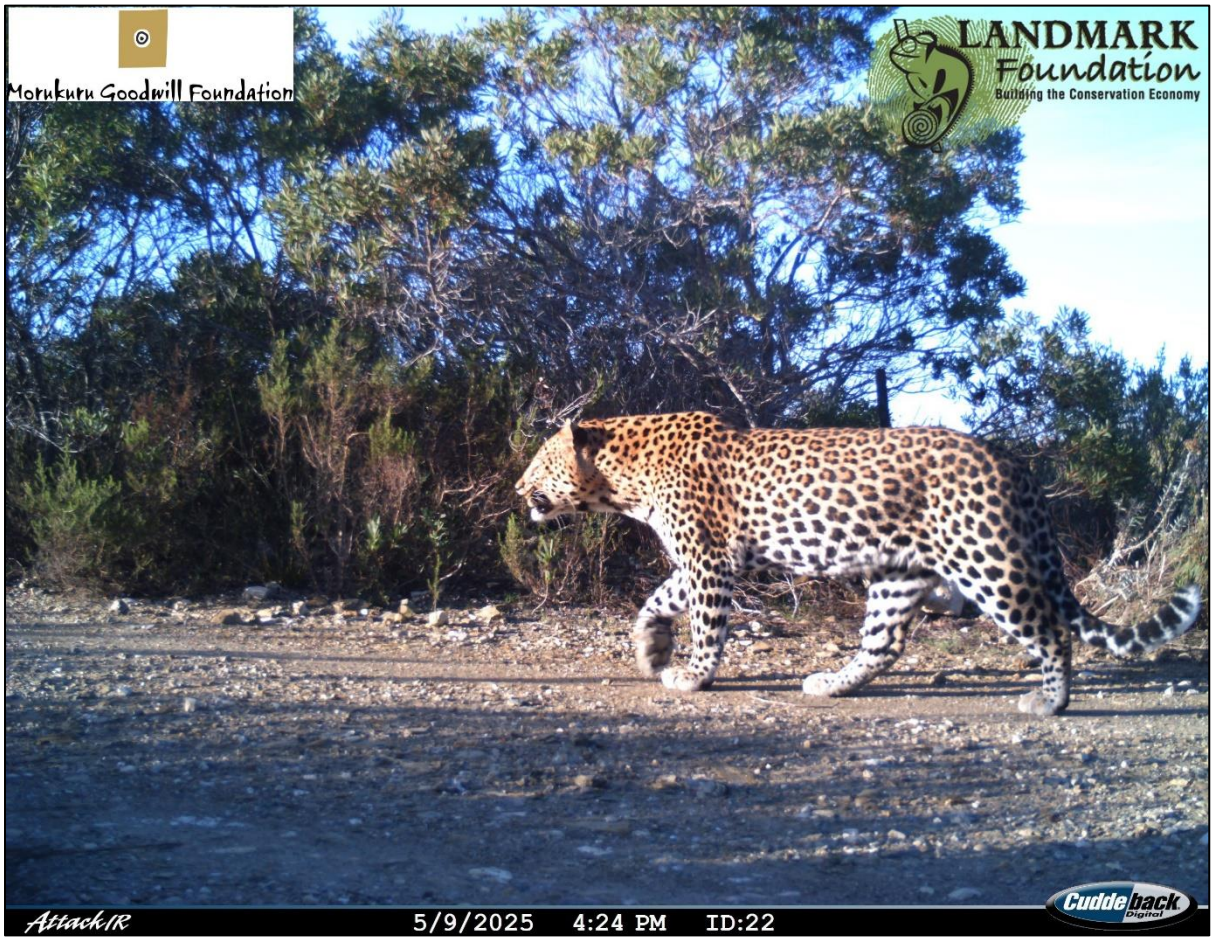


Figure 2.50: Leopard (*Panthera pardus*) captured on camera trap on De Hoop (Photo: Landmark Foundation)

Recent research has shown that protected areas alone cannot achieve long-term conservation of leopards in the Western Cape (Devens *et al.* 2021). An extensive camera trap survey in the Garden Route, Langeberg and Overberg found that most of each area's estimated leopard pixel density occurred on non-protected land, with the highest percentage occurring in the Overberg (Devens *et al.* 2021). The Overberg region has experienced extensive habitat alteration by agriculture (mainly grain production, but also livestock farming) and was found to have the lowest leopard density (0.17 ± 0.10 leopards/100 km^2) (Devens *et al.* 2021). This region, particularly the Hermanus-Agulhas and De Hoop nodes which are occupied by one of three genetically sub-structured leopard populations, has also been shown to have restricted connectivity (McManus *et al.* 2022). This highlights the need for active conservation measures to create wildlife corridors, such as the potential Breede Corridor where leopard presence has been detected (McManus *et al.* 2022). A camera trap survey on De Hoop identified seven individual leopards (six males and one female) and calculated a density estimate of 0.18 ± 0.07 individuals per 100 km^2 (Hargey 2022). This is at least partly attributable to the low productivity of coastal fynbos, which thus supports a relatively low prey biomass. However, persecution of leopard on neighbouring farms was also highlighted as a cause for concern, as was the male-biased sex ratio (Hargey 2022).

Other ecologically important mammals

Some of the common and widespread but ecologically important species recorded in the GDHC include Cape porcupine (*Hystrix africaeaustralis*) and aardvark (*Orycteropus afer*) (ecosystem engineers), rock hyrax (*Procavia capensis*) (food source for raptors such as Verreaux's Eagle *Aquila verreauxii*) and

baboon (*Papio capensis*) (important seed disperser). Wide-ranging species such as aardvark and baboon can serve as indicators of ecosystem health (Cadman 2016).

The watercourses and coasts of the GDHC provide habitat for Cape clawless otter (*Aonyx capensis*) (Near Threatened) and vlei rat (*Otomys irroratus*). Both species will be impacted by upstream loss or deterioration of aquatic habitat.

Micromammals also play important ecological roles and can serve as indicators of ecosystem condition. Micromammals make up just under half (45%) of the species recorded in the GDHC. Although all the species recorded are Least Concern, some are of interest because they are provincial endemics or near-endemics. It is noteworthy that of the 30 species recorded, all State of Biodiversity records are from more than 10 years ago and some from 50 or more years ago (common mole-rat *Cryptomys hottentotus*, grey climbing mouse *Dendromus melanotis* and Mauritian tomb bat *Taphozous mauritianus*).

The Karst geological formation on De Hoop provides numerous roosting sites for large numbers of bats. Of the 30 micromammal species recorded in the GDHC, nine are bats. The De Hoop Guano Cave (or Bat Cave) is the most important bat roost in the Western Cape. It was estimated to be utilized as a breeding site by 260,000 Natal free-tailed bats (*Miniopterus natalensis*) and 1500 Temminck's hairy bats (*Myotis tricolor*), and to serve as a winter hibernaculum for two species of horseshoe bats (19000 *Rhinolophus capensis* and 5000 *R. clivosus*) and Egyptian slit-faced bats (50 *Nycteris thebaica*, Fig. 2.51) (McDonald *et al.* 1990). These bats perform an important ecosystem service, consuming an estimated 100 tons of insects per year in the Overberg wheat belt (McDonald *et al.* 1990).



Figure 2.51: Horseshoe bat (*Rhinolophus* species) (Photo: Marienne de Villiers)

There have been several recent requests to conduct research at De Hoop's Bat Cave, and a proposal to conduct tourism at Klip Drift Cave. Bats are sensitive to disturbance at roost sites.

Recommendations for a policy on the management of De Hoop's caves have been made (Penny & Craven 2011) and developing a Cave Management Plan should be a priority. Wind turbines are known to cause bat fatalities. Even though abundance of bats decreases with distance from the bat cave (Jacobs, 2011) possible fatalities should be considered when assessing windfarm development applications in the vicinity of the GHDC.

Potentially problematic indigenous species

Indigenous species which can become problematic at tourist facilities because of habituation are Chacma baboons (*Papio ursinus*), and genets (*Genetta* spp). Some micromammals, such as the Cape serotine bat and the xeric four-striped mouse (*Rhabdomys pumilio*, Fig. 2.52), can become a nuisance in buildings. Bats can be excluded by sealing gaps in buildings and installing temporary "one-way valves to allow trapped bats to escape and providing bat boxes at locations where they are problematic. Proposed mitigation measures to reduce issues with striped mice and other problematic indigenous species at the De Hoop Whale Trail huts include providing food containers for visitors, erecting educational signage regarding waste management and preventing mouse access, fitting screen doors with spring-loaded closing mechanisms, fitting mesh screens over windows, and cutting back shrubbery around huts (Hudson 2022).



Figure 2.52: Xeric four-striped mice (*Rhabdomys pumilio*) can become a nuisance in buildings (Photo: Marienne de Villiers)

At least five baboon troops exist within the GDHC. Incidences of human baboon interaction have been recorded at De Hoop within all the development nodes e.g. baboons taking food from tents, raiding of kitchens and rubbish bins at the De Hoop tourism nodes and breaking into reserve offices, staff accommodation and raiding the eco venue at Potberg. Additionally, individual baboons have become habituated to human presence in these areas and as a result have lost their fear of humans.

To protect the public, these baboons have had to be euthanized. It is essential that all staff, tourists and researchers behave in a manner that does not encourage baboon-human interactions. Further, management and De Hoop Collection, Lekkerwater and Morukuru Lodges are required to ensure interim waste storage and removal conducted in a manner that prevents access to baboons. Since 2013, CapeNature has employed two baboon monitors through the EPWP. These monitors maintain a perimeter around the tourism node at Opstal by chasing baboons away with the aid of suitable equipment. Monitors are permitted to use certain tools with the utmost discretion, and which are not intended to hurt or harm baboons in any way. This has reduced the number of baboon-human incidences.

Extralimital, alien and domesticated mammals

The original De Hoop was proclaimed in 1957 and initially used as an experimental game breeding farm (CapeNature 2016a). There are later records of two species which are extralimital presumably originated from the breeding farm: impala (*Aepyceros melampus*, De Hoop 1996) and springbok (*Antidorcas marsupialis*, De Hoop 1984-1996).

There is a single, undated State of Biodiversity record of black rat (*Rattus rattus*) on De Hoop. There are also a few records of domesticated animals, namely domestic cat (*Felis catus*, De Hoop 2014) and donkey (*Equus asinus*, De Hoop 2006).

CapeNature's policy regarding the keeping of pets, livestock, poultry and equids (CapeNature 2024b) sets out the rights, responsibilities, and conditions under which such species may be kept on CapeNature Protected Areas.

2.4.6.2 Marine mammals

The MPA and adjacent St. Sebastian Bay form protected bay environments which provide marine mammals, especially the southern right whale (*Eubalaena australis*), with relatively calm waters. In addition to the protected bay environment, the diverse habitats created by the mosaic of benthic substrate as well as kelp forests, result in a diversity of marine mammals inhabiting the area.

During the southern right whale aerial survey in September and October 2023, a range of marine mammals was recorded (Vermeulen, 2023). This included humpback whales (*Megaptera novaeangliae*), Bryde's whales (*Balaenoptera edeni brydei*), Indian Ocean humpback dolphins (*Sousea plumbea*), and large schools of Indo-Pacific bottlenose dolphins (*Tursiops aduncus*) and short-beaked common dolphins (*Delphinus delphis*).

During the same 2023 southern right whale survey, there was a significant increase in cow-calf pairs (568 pairs, 1,136 animals) for the entire survey area from Natures Valley to Muizenberg, but a decrease in the number of unaccompanied adults (40). This impacts the boat-based whale watching industry, as these vessels may only approach single whales without calves. The reason for this inverse relationship is not known. The counts for the survey sections of the De Hoop MPA (Infanta Point to Skipskop) revealed a total of 129 cow-calf pairs and 5 unaccompanied adults. The survey section incorporating the nearshore marine environment of the Heuningnes estuary mouth revealed a count of 43 cow-calf pairs and 4 unaccompanied adults. The spatial results of these counts also showed the importance of the areas between Lekkerwater and Skipskop; shores east of Skipskop and the San Sebastian Bay adjacent to the western boundary of the MPA to southern right whale cow calf pairs. Prior to this survey an additional survey was conducted between Hermanus and Witsand solely to count cow calf pairs. The results show the highest concentration of cow-calf pairs are in the MPA.

A Cape fur seal *(Arctocephalus pusillus*) haul-out of approximately 1600 individuals exists at Cape Infanta point in the eastern part of the MPA (Fig. 2.53).



Figure 2.53: The Cape Fur seal haul out at Cape Infanta point during May 2022 (Photo: Keith Spencer)

2.5 Heritage Context

Section 5 of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) outlines general principles for heritage resources management while section 9 outlines responsibilities of the state and supported bodies. Archaeological and cultural heritage features of the GDHC are spatially depicted in Appendix 1, Map 11.

2.5.1 Heritage resources

Each of the coastal reserves is home to unique heritage resources reflecting both natural and cultural history. At De Mond, the primary heritage feature is the historic shipwreck sites along the coast. Waenhuiskrans is noted for its historic fish traps, ingeniously constructed by early communities for subsistence fishing. De Hoop holds a wider range of cultural assets, including archaeological sites, historic buildings associated with early settlement and farming, as well as extensive shell middens that provide insight into the lives of indigenous coastal dwellers.

The southern Cape is rich in archaeological resources and most of the research on the precolonial history has taken place at the coast and near-coastal zones. Research has taken place in the Overberg coastal plain, and the area is considered to have a rich archaeological heritage with features such as shell middens, open sites, cave sites, and fish traps. De Hoop is one of the richest undisturbed Stone Age archaeological sites in the south-western Cape (Halkett 2000).

Surveys for archaeological sites on De Hoop, resulted in the discovery of a cave complex comprising two locations, Klipdrift Cave and Klipdrift Shelter (Fig. 2.54). Excavations commenced in 2010 with

Later Stone Age deposits initially being recovered at the former site and Middle Stone Age deposits at the latter (Henshilwood 2014).

Fragments of bone, shell, pottery and stone artefacts were found bearing testimony to early occupation.



Figure 2.54: Klipdrift Cave and Klipdrift Shelter near the Klipdrifsfonteinspruit and the Whale Trail Noetsie hut (Photo: Mark Johns)

2.5.1.1 Waenhuiskrans Cave

The Waenhuiskrans Cave (Fig. 2.55) is the best-known natural feature within the area and frequently visited by tourists. This unusual sea cave, formed through wave action in the coastal limestone, has become one of the most iconic landmarks of Waenhuiskrans adding both geological and cultural value to the heritage of the site. The majesty of the massive limestone cave, originally called "Holkrantz" gave reason for the town's original name of Waenhuiskrans literally translating to "wagon house cliff". The name of the cave comes from the legend that the cave is big enough to turn an ox wagon with a full span of oxen around inside.



Figure 2.55: Waenhuiskrans Cave is only accessible during low tide and is believed to be the biggest coastal cave with no supporting pillar (Photo: Mark Johns)

2.5.1.2 Inter-tidal Fish Traps

There are two localities, namely De Hoop MPA and Waenhuiskrans where fish traps can be found within the inter-tidal zone in and adjacent to the GHDC boundaries. These fish traps are made up of low stone walls constructed in semi-circles, which are then filled-up twice a month during spring high-tide, bringing in the fish, after which they are trapped in the pools when the tide recedes (Fig. 5.56). The local Arniston community has, over the years, maintained the traps near Waenhuiskrans, which periodically yield poor catches of fish however a source of protein during the winter months, when bad weather dictates that boats cannot go out to sea.

It is theorised that fish traps were initially constructed and utilised by hunter-gatherer communities, which meant that they would have had a good understanding of the shoreline dynamics (Gribble 2005; Hine *et al*. 2010).

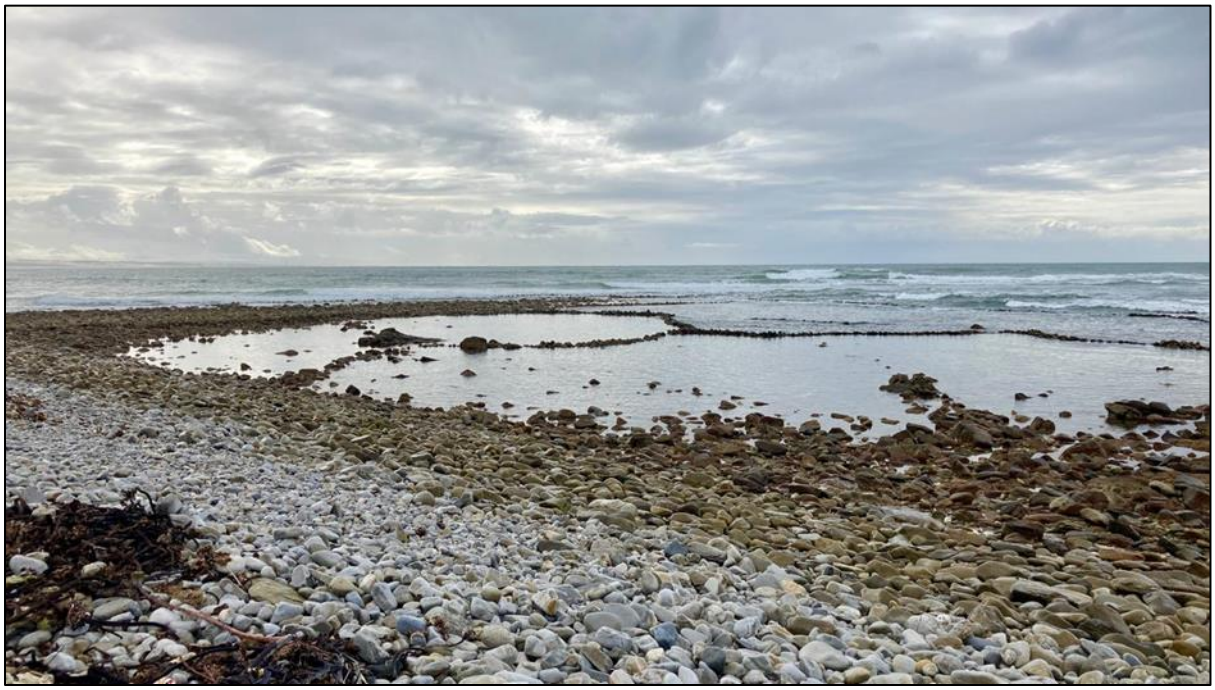


Figure 2.56: Inter-tidal fish traps at Waenhuiskrans (Photo: Mark Johns)

2.5.1.3 Archeological Middens

At De Hoop, numerous archaeological shell middens are found along the coastline, with Noetsie being one of the most prominent locations. These middens, consisting of accumulations of shells, bones, and artefacts, provide valuable evidence of the subsistence practices of indigenous hunter-gatherer and herder communities who occupied the area over thousands of years. As significant heritage resources, they offer critical insights into past diets, settlement patterns, and cultural traditions closely tied to the coastal environment.

Archaeological material of importance is also present near Struispunt in Waenhuiskrans. The Specialist Study on the Current Conservation Status of Archaeological Sites near Struispunt, Waenhuiskrans by Henshilwood, Yates and Winter Heritage Resource Consultants (1999), provides a full description of the archaeological middens and artefacts found in the area. Several stone features occur across the midden surfaces (Figure 2.57). These are clusters of mostly cobbles and boulders. Some of the features, which have not eroded and slumped, are distinct but most are dispersed to varying degrees. In a few instances, ashy and carbonised sediment is visible between and below the stones. Many flaked quartzite cobbles, as well as quartz cores and flakes, lie scattered on the surface. A few un-flaked cobbles show use as hammer stones and grindstones. Ochre (pigment) is present but uncommon. Pottery fragments are also present but infrequent.

The study indicated that most of the artefacts are from the later stone age (300-3 000 years ago) and of medium to important significance. Of important significance is a small area of remains from the colonial period and a much larger volume of material dating to before colonisation. Sites with this combination of evidence are rare and therefore important.

As much of the material has been illegally removed by visitors to the area and damaged by vehicles, the protection of the area needs more attention. Access and visitor control is an important matter that is addressed later in this document.



Figure 2.57: The many found middens provide evidence that the Khoi lived in the area (Photo: Mark Johns)

2.5.1.4 Shipwrecks

According to the South African Heritage Resource Agency (SAHRA), there are potentially eight shipwrecks within the vicinity of the MPA including: Bella Gambi 1974, Debonair 1964, Dirkie Uys 1968, James Shepherd 1851, Maid of the Thames 1848, Mary Ann 1965, Sri Rezeki 1971 and Texanita 1922.

The Struis Bay coastline is equally rich in maritime archaeology. In 1799 the Dutch Hoeker, Meermin went to Madagascar to buy slaves for the Cape. There was a revolt by the slaves, and the sailors cut the anchor cable, and the ship ran ashore near the Heuningnes river mouth. Two wrecks have been found but after identification it was confirmed not to be the Meermin according to J. Boshoff (2012) Iziko SA Museum, pers. comm. Another vessel, the Maggie (Fig. 2.58), was also grounded in 1872 approximately 2 km from the current mouth 34°43'10" S and 20°06'29" E.



Figure 2.58: After heavy storms and high seas the Maggie shipwreck is revealed near De Mond (Photo: Mark Johns)

2.5.1.5 Navigational Beacon

This beacon, which is situated in Waenhuiskrans and erected on 28 September 1871, was built due to the number of ships striking Saxon Reef just off Struis Point (Figure 2.59). It used to have a large copper ball on top that reflected the rays of the sun to the ships at sea. It is of great historical importance as it is the only known one of its kind ever erected. During November 2003 Transnet National Ports Authority installed a light on top of the existing beacon as a navigational tool for sea users.



Figure 2.59: Navigational beacon at Struispunt, Waenhuiskrans (Photo: Mark Johns)

2.5.2 Living heritage

The Overberg region has been occupied by hominids for more than a million years and there is evidence of their occupation in the GHDC from the Early Stone Age right through to the Later Stone Age and beyond, when indigenous people continued using the area after the arrival of European colonists.

During the Later Stone Age, the San people hunted and gathered veld plants and marine animals. The Khoekhoen or Khoikhoi were the first people to have domesticated animals about 2 000 years ago, first sheep and later cattle. The San were nomadic hunter-gatherers who foraged an existence by gathering plant food and hunting smaller animal species, while the Khoikhoi were a herding people with their own livestock feeding in more settled ways of life. The San and the Khoikhoi thus represented different cultures, although both tribes belonged to the same biological group.



Figure 2.60: The San people and their activities (Image: CapeNature archives)

De Hoop

The Overberg was colonised by Europeans in the early 1800s and became a popular agricultural area. Potberg, as it is known today, has a long history that bears the signs of many generations and is testament in the old buildings and remnants of former farming activities on the property. The origin of the name is uncertain, but records of grazing licences issued in1730 refer to "Potteberg". On several occasions in its existence, Potberg was also known as Brakkefontein but in the last 40 years, the name has changed to Potberg.

Historical references show that white farmers settled in the area before 1730, but the first official mention can only be traced back to that year (Fig. 2.61). Potberg has always been primarily a sheep and grain farm (Fig. 2.62 and Fig. 2.63). The De Hoop area was originally used for farming by the Dutch East India Company. Grazing rights were leased to Fredrik de Jager in 1739. The first owner of De Hoop was Pieter Louwrens Cloete. He established a successful horse stud and built the De Hoop homestead.

A comprehensive study on the history of the reserve since early European occupation was published by Scott and Scott (2002):

1851: The original Brakkefontein and large tracts of surrounding land were owned by Gabriel van Dijk who died during a hunting trip and is buried on what is now Potberg. The widow Van Dijk sold the farm to J Du Toit and later married him. Du Toit later sold the farm to horse breeders Henry and William Fletcher.

1895: Gabriel van Dijk, Jr., son of the foreboding owner, bought the farm and farmed it until 1905 when he sold the farm to Anders Ohlsson.

1905: Anders Ohlsson buys Potberg from Van Dijk and consolidates all his farms as the "Potteberg Estates." Anders Ohlsson, a Swede, was born in Oslo (Norwegian) in 1841 and came to the Cape at the age of 23. He was a businessman, parliamentarian, farmer, hunter and the founder of Ohlsson Breweries but most importantly, a conservationist with a love for the land and a philanthropist who campaigned for the welfare of the common man.

1912: Upon Ohlsson's death, his son, Axel, sold the farm to J.D. Albertyn who used it primarily for hunting purposes.

1940: Potberg is sold to Misters Swart and Myburg. Mr Swart's daughter and his son-in-law, Mr Jan du Toit, farmed in Potberg until 1980 when it was sold to the Cape Provincial Administration.

1956: The Provincial Department of Nature Conservation bought the farms De Hoop in 1956 and the adjacent Windhoek in 1957. De Hoop was proclaimed in 1957 to serve mainly as an experimental wildlife farm.



Figure 2.61: Generations of farmers have farmed Potberg since 1730 (Photo: CapeNature archives)

Additions to De Hoop include:

1978: Portions of the Potteberg Estates were added.

1981: The Koppie Alleen Centre was built (later destroyed in a fire).

1983: The barn at Potberg was converted into an environmental awareness centre.

1986: The De Hoop Marine Reserve was proclaimed.

1991: A portion of the farm Melkkamer west of De Hoop and the eastern section of east of Potberg as far as Cape Infante were added.



Figure 2.62: Early 1900's depiction of the Potberg farm, including the homestead, horse stable, bakery and stores and developed agricultural lands surrounded by blue gum tree (Photo: CapeNature archives)



Figure 2.63: The original Potberg farmhouse built by Van Dijk with the extensions under construction as started by Ohlsson in 1906 (Photo: CapeNature archives)



Figure 2.64: The completed Potberg homestead and farming activities in 1906, currently utilised as the management office, stores and staff residence, Kliphuis (Photo: CapeNature archives)

The sandstone farmhouse and outbuildings at Potberg were built by Anders Ohlsson, who purchased the farm at the turn of the century for breeding racehorses and hunting.

De Mond, Waenhuiskrans and Soetendalsvlei

There appears to be some uncertainty regarding the origin of the name Heuningnes. According to Mr G. D. Kilpin, owner of De Mond farm, the name Heuningnes originates from the presence of a beehive in a cave on the bank of the estuary. Alternatively, the name Heuningnes was derived from the large numbers of wild bees and beehives which were found on the ridge Heuningrug which is situated just to the north of Soetendalsvlei.

Arniston, which lies to the north-east of the mouth of the Heuningnes Estuary, was named after a transport ship that was wrecked there in May 1815. It is also known as Waenhuiskrans after the enormous cavern eroded in the limestone cliffs approximately 2 km south of the present town.

The following timeline is taken from Bickerton (1984) capturing the historical interventions and operational management of De Mond:

1937: Major P. van der Byl and Mr M. van Breda (landowners in the district) approached the Minister of Agriculture and Forestry in connection with the drift sand problem at De Mond. Following this, the Secretary for Agriculture and Forestry wrote to the Department of Lands requesting the expropriation of the land adjacent to the mouth of the Heuningnes. Mention was made of the threat posed by the drift sand to the river mouth and the fact that if the river mouth were to become blocked, approximately 24 000 ha of agricultural land would be flooded.

1937 and 1938: Assurance was given by the Minister to the landowners that the Department would not plant rooikrans (*Acacia cyclops*) as part of the proposed dune reclamation programme.

1939: The Department of Agriculture and Forestry began buying up land around the Heuningnes Estuary with a view to stabilising the drift sands.

1942: Dune reclamation work at De Mond was started by the Department of Forestry when a large sand dune moved across the Heuningnes near its mouth. Mostly indigenous vegetation was used at De Mond and Waenhuiskrans contrary to the practise at other similar so-called drift sand areas where exotic *Acacia* species were used. The mouth of the Heuningnes was kept open by the Department of Forestry until 1973 when it closed. The mouth remained closed for a long time with the bar being breached only by high spring tides.

1944: A causeway was constructed approximately 200 m downstream of the bridge, so that vehicles could traverse the river during dune stabilization programmes.

1976: After good rains the mouth was breached by a bulldozer, and the tidal regime was reinstated. This action was strongly supported by the local riparian landowners, who were persistent with their demands that the practice continued, for fear of potentially flooding properties upstream.

1974 and 1975: A simple suspension bridge was installed across the Heuningnes River, approximately 1.5 km from the mouth. This bridge was dismantled at Uilenkraals River near Gansbaai and transported to De Mond. The suspension bridge was later upgraded to a suspended deck (Fig. 2.65).

1977: 335 hectares of the farm Zoetendalsvlei west of the station and 279 hectares of the property Bushy Park east of the station, were expropriated for the purpose of dune stabilization. The station area was then increased to 960 hectares.

1985: The causeway is removed.

1991: De Mond became a satellite station to De Hoop, of Cape Nature Conservation. The dune stabilisation programme was then terminated, as it was against conservation policy to interfere with natural processes except for the ongoing stabilisation of the dunes at the mouth of the river at De Mond and the re-mobilisation of certain dunes (by removing vegetation) behind the beach at Waenhuiskrans. The building up and stabilization of the dunes on both sides of the estuary mouth is seen as a method to keep the mouth open.

2012: Dune stabilization was stopped pending more scientific input towards the mouth management.

2019: Estuary mouth closed.

2020: Estuary mouth is breached.

2022: Estuary management plan is approved with defined monitoring and breaching criteria.



Figure 2.65: The footbridge spanning the Heuningnes River, flanking boardwalks and tidal estuary (Photo: Mark Johns)

Soetendalsvlei, which drains into the Heuningnes River, and the farm Zoetendalsvallei situated around it, was named after the Zoetendal which was wrecked on the adjacent coastline in 1673. Soetendalsvlei is approximately 15 km upstream of De Mond and integral to the functioning of the estuarine system. This property was acquired by the State for the purpose of landing Catalina airplanes during World War II. An Air force Base was situated on a nearby farm according to local knowledge (P. Albertyn pers comm).

2.6 Socio-Economic Context

In terms of the Municipal Systems Act, 2000 (Act No. 32 of 2000), municipalities are required to use integrated development planning to plot future development in their mandated management areas. The relevant municipal Integrated Development Plan (IDP) sets the strategic and budget priorities for development and aims to co-ordinate the work of local and other spheres of government. The IDP should also address how the environment will be managed and protected and is supplemented by a Spatial Development Framework (SDF).

IDPs and SDFs are tools for integrating social, economic, and environmental issues. As biodiversity is a fundamental component of sustainable development, IDPs and SDFs offer an opportunity to ensure that biodiversity priorities are incorporated into municipal planning processes through consultation. In turn, the identification of biodiversity-related projects for the IDP can support local economic development and poverty alleviation. Municipalities within which the GDHC occurs are illustrated in Appendix 1, Map 1.

In terms of the Municipal Systems Act, 2000 (Act No. 32 of 2000), municipalities are required to use integrated development planning to plot future development and prioritize municipal expenditure in their mandated management areas. The municipal IDP sets the strategic and budget priorities for municipal operations and aims to co-ordinate the work of local and other spheres of government. The IDP should also address how the environment will be managed and protected and is supplemented by an SDF.

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In turn, the identification of biodiversity-related projects for the IDP can support local economic development and poverty alleviation. The GDHC falls within the Cape Agulhas Local Municipality and the Overberg District Municipality. Although none of the GDHC falls within the Swellendam Municipality, it borders directly on to De Hoop to the north and east and therefore falls within the zone of influence.

Agriculture is the main economic sector and predominant employer within the Cape Agulhas Municipality and the primary land use in the areas surrounding De Hoop and De Mond (Cape Agulhas Municipality 2024). The agricultural sector is diverse and includes grains (e.g. wheat, barley), canola and livestock (e.g. sheep) which is prevalent inland of both De Hoop and De Mond. In addition to the raw produce from the farms, the food and beverage processing industries are key to driving growth and employment. Water resources within the municipality are insufficient to permit large-scale irrigated agriculture. Agriculture is also a major contributor to the economy of Swellendam Municipality where the agriculture, forestry and fisheries sector contribute the second highest proportion of employment (20.5%) after wholesale and retail trade, catering and accommodation (22.7%). Swellendam is recognised as one of the two hubs for storage and processing of canola in South Africa. (Swellendam Municipality 2022).

Tourism forms an important component of the local economy for both Cape Agulhas and Swellendam Municipalities with the extensive coastline which is relatively undeveloped and pristine forming a major tourist attraction. De Hoop and De Mond both contain extensive stretches of coastline and are in themselves important tourist attractions for the municipalities. The Overberg District is a popular destination among the domestic market for short or weekend getaways, with 80.2% of visitors consisting of South African residents. Within the domestic market, 94.7% of the tourists are from the Western Cape. The top three countries with regards to the number of international tourists to the district are the United Kingdom (40.1%), Germany and France (Swellendam Municipality 2022).

Tourism and second or retirement homes are primary drivers of the local economy of coastal and estuarine settlements adjacent to the GDHC such as Infanta, Malgas, Arniston and Struisbaai. The tourism strategy for the Cape Agulhas Municipality includes various initiatives to encourage tourism and could also benefit tourism to the GDHC. The most popular activities for visitors to the Overberg District include whale watching, hiking, mountain biking and other adventure activities (such as shark-cage diving, ziplining and horse riding), many of which can be experienced within the GDHC (Swellendam Municipality 2022).

The Agulhas Bank located offshore of the municipality has relatively shallow water and results in one of the best fishing grounds in South Africa. As a result, the fishery sector forms an important part of the economy and the livelihoods of the communities living in the surroundings towns such as Arniston and Struisbaai (Cape Agulhas Municipality 2024).

Military testing operations have large landholdings within the Cape Agulhas Municipality, with Denel OTR forming the western boundary of De Hoop. As the military test range does not require extensive habitat transformation for operations, it can have a biodiversity conservation function which supports the objectives of De Hoop e.g. an extension of the home ranges of large mammals such as bontebok and Cape mountain zebra.

The total population of the Cape Agulhas Municipality according to the 2022 census was 49 274 with a lower population density than Overstrand and Theewaterskloof Municipality of ±10 persons/km². The age distribution reveals a slightly higher proportion of people within the working age category and slightly lower proportion of children and elderly people, compared to the average for the Overberg District Municipality. The gender distribution indicates a slightly higher proportion of females. The distribution of racial groups is 60.9 % coloured, 23.4 % white and 12.6 % black.

With regards to service delivery within the Cape Agulhas Municipality, 94.4% of the population live in formal dwellings, 99.9% have access to piped water, 98.8% have access to flush toilets and 99.3% have access to electricity for lighting. The real regional Gross Domestic Product (GDP) per capita for the Cape Agulhas Municipality exceeds the other municipalities in the Overberg District. However, 55.64

% of the population live below the poverty line (cannot afford to purchase adequate levels of food and non-food items) indicating the inequality of income levels. There are 10 schools within the municipality with a teacher to learner ratio of 1 to 28.8. Unemployment rate is currently at 11.4%, with the split of the employed persons as follows: skilled 19.3%; semi-skilled 37.7%; low skilled 27.2% and informal 15.8%.

Table 2.25 shows the key socio-economic indicators for the District and Local Municipalities relevant to the GDHC (Western Cape Government 2023 a-c).

Table 2.25: Key socio-economic indicators for the District and Local Municipalities relevant to the GDHC (Western Cape Government 2023 a-c)

Municipality	No of Residents (2022)	Households (2022)	Unemployment Rate (2022)	Access to Formal Housing (2022)	Summary of Socio-economic Risks (According to SEP 2023)
District Municipality					
Overberg	359 446	134 798	14.9%	87.5%	• Low learner retention • High & increasing crime rate • High poverty levels
Local Municipality					
Cape Agulhas	49 274	16 220	11.4%	94.4%	• Low learner retention • High crime rates • High poverty levels
Swellendam	47 114	16 220	9.4%	90.9%	• Low learner retention • High crime rates • High poverty levels

The proportion of the population living in urban areas is 81.7 % in Cape Agulhas Municipality and 70.7% in Swellendam Municipality, with a trend of an increasing proportion of urban population over time. Bredasdorp is, by far, the largest urban settlement in the Cape Agulhas Municipality with 43.6 % of the population. Similarly, Swellendam is the largest urban settlement within the Swellendam Municipality with 49.4% of the population.

Both Bredasdorp and Swellendam are however relatively far from De Hoop and Bredasdorp is a reasonable distance from De Mond. Therefore, the urban pressures do not have a direct impact on the GDHC. It does however have an impact on access to service providers and the workforce for the GDHC as the other smaller settlements are not able to provide the same services. This results in an increase in costs for these services and other related impacts due to the distance and unfavourable road access. The distance between Potberg and Bredasdorp and the distance between Potberg and Swellendam are both ±51 km. The majority of the EPWP staff and permanent staff for the GDHC are based in these two towns.

3 POLICY FRAMEWORK

CapeNature is subject to the framework of the Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996), national legislation including the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003), National World Heritage Convention Act, 1999 (Act No. 49 of 1999), all associated regulations and norms and standards for the Management of Protected Areas in South Africa and all other relevant requirements as set out in the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) and the National Environmental Management: Integrated Coastal Management Act, 2008 (Act No. 24 of 2008).

3.1 Purpose of Protected Area Management

The declaration of protected areas is part of a strategy to manage and conserve South Africa's biodiversity. Accordingly, the object of the management plan is to ensure the protection, conservation and management of the natural and cultural historic heritage in a manner that is consistent with the objectives of the NEM: PAA, and for the purpose for which protected areas were declared.

3.2 Guiding Principles

The following guiding principles underpin the management plan for the GHDC:

- Articulate desired results in terms of conservation outcomes, not actions.
- Articulate how management responses will lead to desired results.
- Monitor progress towards achieving desired results.
- Consider monitoring programme design at the onset of planning.
- Consider expected outcomes of management at the outset of planning.
- Invest in management response appropriate to the risk.
- Adapt strategies based on lessons learnt understanding that measuring effectiveness alone may not resolve uncertainty; data and analyses are necessary to guide management towards doing more of what works and less of what does not work.
- Share results to facilitate learning, acknowledging that although success is not a given, learning can be, through honest appraisal of efforts.

The GDHC is also subject to the principles and provisions of relevant international treaties and conventions, national and provincial legislation and policy, and any local contractual or co-management agreements.

3.3 Strategic Adaptive Management

Strategic Adaptive Management integrates planning, management and monitoring to provide a framework for:

- testing assumptions.
- learning through monitoring and evaluation.
- adapting strategies or assumptions.

Strategic adaptive management bridges management and decision science by systematically evaluating results and using this information in a community of practice (CMP 2020) enabling management to change course when it becomes evident that it is necessary, rather than waiting until the end of a strategy to determine whether an intervention worked (Conservation Coaches Network 2012).

CapeNature has adopted, and applies, the Conservation Standards for the Practice of Conservation adaptive management framework (CMP 2020) as illustrated in Figure 3.1. The Conservation Standards facilitates strategic adaptive management through systematic evidence based participatory process with stakeholders (CMP 2020). The systematic approach makes explicit the links between goals, focal conservation targets, threats, strategies and actions, enabling management to define and measure success of their actions in the GDHC over time.

The Conservation Standards framework is comprised of five stages (Figure 3.1):

- Conceptualising the protected area (i.e., defining the purpose of the protected area, establishing scope and vision; selecting focal conservation targets and assessing threats, and analysing the conservation situation (i.e., assessing contributing factors in terms of opportunities and challenges).
- Planning actions and monitoring (i.e., drafting the plan based on theories of change using results chains).
- Implementing actions and monitoring (i.e., drafting work plans, doing the work, and monitoring the work).
- Analysing and using results to adapt (i.e., deciding if what was planned is working).
- Capturing results, sharing, and learning (i.e., learning and sharing what is learned).



Figure 3.1: Strategic Adaptive Management Framework adapted from The Open Standards for the Practice of Conservation (CMP 2020)

The framework works on the rationale that effective conservation of carefully selected conservation targets will ensure the conservation of all indigenous biodiversity and cultural historic heritage within the GDHC that in turn contributes to a functional landscape. At the same time, the rationale follows that healthy focal conservation targets deliver ecosystem services essential for human well-being. An assessment of the current condition of focal conservation targets serves as a baseline against which to

measure condition over the next 10 years and guides the formulation goals and conservation strategies with associated objectives, indicators, and work plans.

As such, step one of the adaptive management framework, illustrated in Figure 3.1, is foundational to effective management of the area.

Focal conservation targets are classified as follows:

- Natural targets can be species, habitats, or ecological systems, which collectively represent and encompass the biodiversity of the GDHC. They can include the physical, natural features from which ecosystem services flow, benefitting humans in a variety of ways.
- Cultural historic targets are described in terms of the tangible features that collectively represent and encompass the cultural historic heritage of the GDHC. They can also include the physical, cultural and/or historic features from which human well-being values are derived.
- Human well-being values are the intangible or non-material values derived from tangible values, and which collectively represent the array of human well-being needs dependent on natural and cultural features; they can be defined in terms of the benefits delivered to humans by healthy ecosystems, or by intact cultural or historical features.

3.4 Protected Area Management Effectiveness

Management effectiveness evaluation is the assessment of how well a protected area is being managed, primarily the extent to which management is protecting targets and values and achieving objectives (Hockings *et al.* 2015). The following questions underpin management effectiveness evaluation (Leverington & Hockings 2004):

- Is the protected area effectively conserving the targets and values for which it exists?
- Is management of the area effective and how can it be improved?
- Are specific projects, interventions and management activities achieving their objectives, and how can they be improved?

The monitoring and evaluation framework applied (Figure 3.2) measures compliance and management effectiveness of the GDHC in terms of the NEM: PAA and associated Norms and Standards for Protected Area Management. Management effectiveness is assessed over time using the Management Effectiveness Tracking Tool (METT). METT-SA, adapted for South Africa, is based on the six elements of good management:

- It begins with understanding the **context** of existing targets, values and threats;
- progresses through **planning**;
- and allocation of resources (**inputs**);
- and because of management actions (**processes**);
- eventually produces products and services (**outputs**);
- that result in impacts or **outcomes**.

Management effectiveness is measured at the strategic level as a percentage, drawing upon the results of fine scale monitoring linked to management actions, objectives, goals, and focal conservation targets articulated in this management plan (Figure 3.2). Management effectiveness includes the measurement of administrative processes such as capacity and budgets that, when adequate, are likely to result in positive conservation outcomes.

Mechanisms for monitoring and evaluation are built into each aspect of the Strategic Plan (section 10) through the inclusion of verifiable indicators of progress. The protected area monitoring and evaluation programme, supplementary to the management plan, monitors site level implementation of the plan, status of targets and effectiveness of strategies. Results contribute to the annually reviewed Western Cape State of Conservation report as well as the in-depth Western Cape State of Biodiversity report, produced at five-year intervals.

Furthermore, management reports annually on implementation of the plan through CapeNature's strategic Performance Management System. The Performance Management System ensures that implementation of the management plan is embedded in individual staff performance agreements.

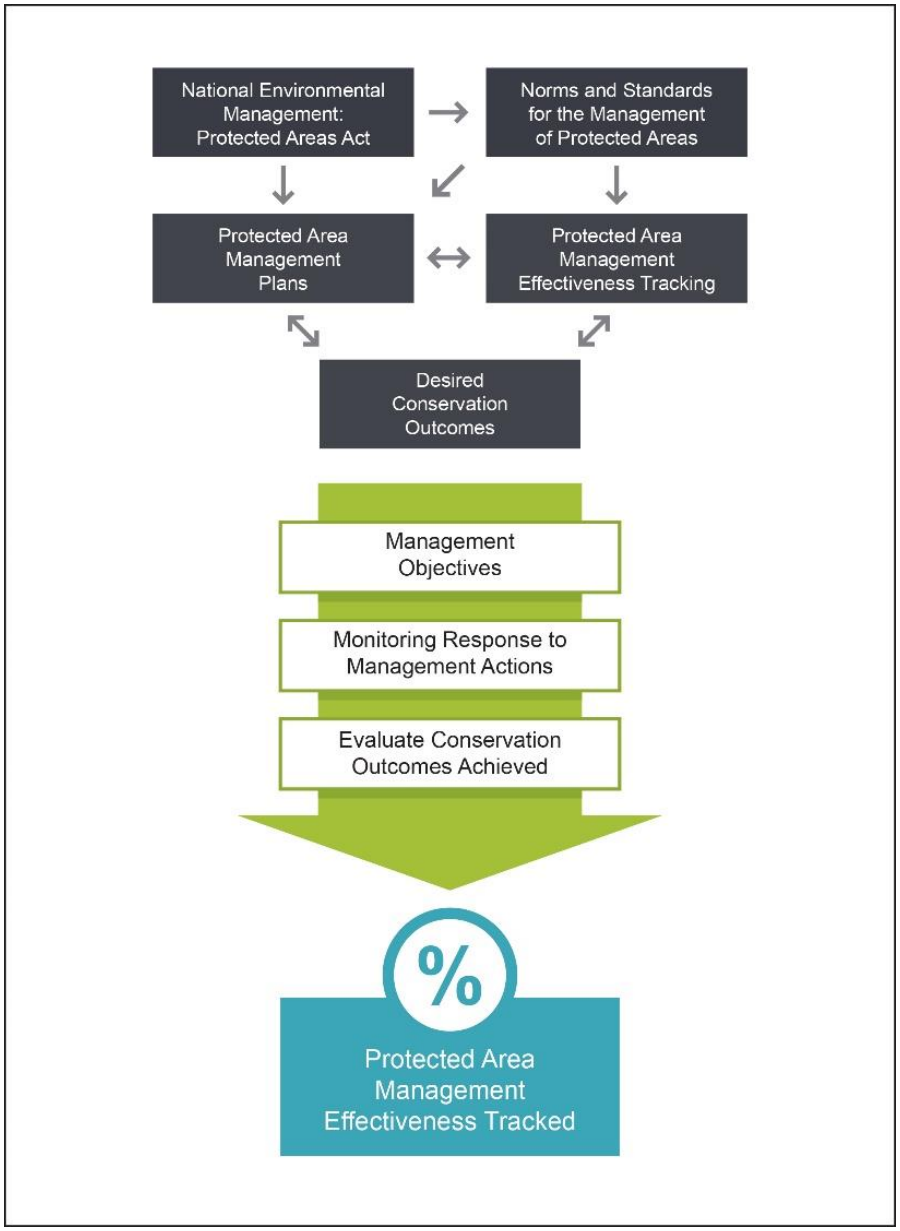


Figure 3.2: Protected Area Monitoring and Evaluation Framework

3.5 Policy Frameworks

Protected area management is guided by CapeNature policies, procedures, and guidelines for use across all its components. Policies, procedures, and guidelines applicable to this management plan are referenced here and in section 10.

3.5.1 Internal rules

In terms of section 52 of NEM: PAA, as amended, the management authority of a nature reserve may, in accordance with the prescribed Norms and Standards, make rules for the proper administration of the protected area.

In addition to the Regulations for the Proper Administration of Nature Reserves, as gazetted on 8 February 2012 in Government Gazette 35021, and the Regulations for the Proper Administration of Special Nature Reserves, National Parks and World Heritage Sites, as gazetted on 28 October 2005 in Government Gazette 28181, the GDHC is also subject to the Nature Conservation Ordinance, 1974 (No.19 of 1974), Provincial Notice 955 of 1975, the latest Western Cape Biodiversity Act, 2021 (Act No. 6 of 2021) and the regulations published under Government Notice 1111 in terms of the Marine Living Resources Act, 1998 (Act No. 18 of 1998).

The Nature Conservation Ordinance of 1974 will be repealed once the regulations in terms of the Western Cape Biodiversity Act, 2021 (Act No. 6 of 2021), which was signed by the premier on 10 November 2022, have been promulgated. The new act indicates that CapeNature, together with DEA&DP, are responsible for nature conservation and the protection, management and sustainable use of biodiversity and ecosystems in the Western Cape.

3.5.2 Financial

CapeNature is a schedule 3C public entity responsible for nature conservation in the Western Cape. CapeNature is the executive arm of the Western Cape Nature Conservation Board, established in terms of the Western Cape Biodiversity Act, 2021 (Act No. 6 of 2021). The objectives of the Board as per the Act shall be:

- To promote and ensure nature conservation and deal proactively with related matters in the province.
- To render services and provide facilities for research and training that would inform and contribute to nature conservation and related matters in the province.
- To generate income, within the framework of the applicable policy framework.

Funding for the entity comprises three main revenue streams. Most funding, which equates to approximately 80%, is received in terms of a provincial allocation received in terms of Vote 9. Secondary funding, the further 20%, is received from external donors and own revenue. Own revenue generation consists mainly of tourism income generated through activities and accommodation available on various nature reserves managed by CapeNature.

CapeNature prides itself on its strong internal controls, sound financial management and practicing of good corporate governance. Corporate governance within the entity embodies sound processes and systems and is guided by the Public Finance Management Act, 1999 (Act No. 1 of 1999) and the principles contained in the King 4 Report of Corporate Governance.

3.5.3 Safety and security

Business Continuity Plan:

The CapeNature Business Continuity Plan (CapeNature 2023c) establishes and provides emergency response procedures and protocols which need to be implemented should an event significantly disrupt the operations of the organisations, or an emergency is declared by management. The plan identifies critical services, how these will be maintained, how to minimise the impact, increase preparedness and initiate effective responses.

Integrated Compliance Plan:

The Integrated Compliance Plans for De Hoop and De Mond detail how compliance and enforcement will be implemented in the GDHC to:

- Prevent biodiversity loss caused by human activities on the GDHC through the implementation of active and passive compliance and enforcement operations.
- Ensure compliance with legislation through the monitoring of activities in the GDHC.
- Address and combat unlawful activities through the institution of criminal proceedings.

- Reports unlawful activities to the delegated authority where activities have a negative impact on the GDHC (*e.g.* listed activities in terms of the NEM: BA).

The Integrated Compliance Plan is a dynamic reference document which is continually updated and improved, using the data that is gathered during the implementation thereof to achieve the management objectives.

Regional Oil Spill Contingency Plan:

The Department of Transport and the South African Maritime Safety Authority established the National Incident Management Organisation which played a role in the review of the National Oil Spill Contingency Plan, under which the National Oiled Wildlife Contingency Plan is drafted. The National Oiled Wildlife Preparedness, Response and Contingency Plan was drafted to ensure that species such as the African penguin, which are highly susceptible to oiling, formed part of the overall oil spill response. Certain members of the African Penguin Working Groups are standing members under the Incident Management Organisation.

Oil spills pose a significant threat to the GDHC by shipping and the petroleum industry to marine and coastal systems. The probability of this occurring is considered low, although the environmental consequences of oil spills can be severe. Participation by protected area management in oil spill contingency planning and implementations is thus crucial. Coordinated rapid response is essential, thus making the development and implementation of integrated disaster management and contingency plans, in the event of oil spills at sea, a critical aspect.

Fire Protection Associations:

CapeNature is obliged, in terms of the National Veld and Forest Fire Act, 1998 (Act No. 101 of 1998), to be a member of their local Fire Protection Association. Within the Western Cape, five large Fire Protection Associations have been established that cover the whole province. The GDHC is a member of the Greater Overberg Fire Protection Agency. Fire Protection Associations are the primary partnership tool in veldfire management and response in South Africa.

Fire Management Plan:

The Fire Management Plan is essentially a derivative and part of the GDHC's management plan. The latter details the objectives of the GDHC, and the Fire Management Plan uses this information to detail how fire will be managed to ensure that the ecological objectives of the GDHC are met. This includes the management of both wild and controlled fires.

Fire Response Plan:

The Fire Response Plan forms part of the fire management plan and serves as an operational document for cooperative wildfire management in the GDHC. This plan is compiled annually at regional level according to the CapeNature fire policy to ensure that there is complete co-operation at a higher level. It includes updated names and telephone numbers of all contact persons, radio frequencies and emergency notifications.

Unlawful Invasion and/or Occupation of Land Plan:

As necessitated and to prevent the unlawful invasion and/or occupation of land within the GDHC, a co-operative agreement with the local authority must be established and reviewed periodically. The aim of the agreement is the optimisation of any combination of resources to expeditiously deal with threats and incidents of unlawful occupation within and adjacent to any CapeNature managed protected area. An Early Detection & Rapid Response Strategy and Protocol was developed for protected areas (CapeNature 2020a).

The objective of such an agreement with local authorities is:

- To regulate and formalise co-operation and the structures, systems, processes, procedures, and responsibilities relating to such co-operation.
- An integrated approach to prevention of unlawful invasion and/or occupation of land.
- Rapid response with regards to the prevention of unlawful invasion and/or occupation of lands and emergency notifications.

3.5.4 Resource use

CapeNature recognises that the primary purpose of protected areas is to protect and conserve biodiversity, ecosystems, ecological process, and serve as benchmarks for conservation. Furthermore, it is recognised that the unsustainable use of natural resources can lead to the loss of biodiversity, resulting in compromised delivery of ecosystem services and reduced benefits for people. Consumptive utilisation of wild flora can, however, provide socio-economic benefits to people.

Resource utilisation is governed by CapeNature's policy on consumptive use of wild flora from CapeNature managed protected areas (CapeNature 2019). The policy provides the principles, objectives, policy statement, and framework to facilitate and process applications for consumptive use of wild flora from CapeNature managed protected areas.

The policy on consumptive use of wild flora indicates that consumptive use of wild flora in CapeNature managed protected areas may only take place within areas that have been zoned for that specific purpose, with the necessary permit.

According to NEM: PAA, section 50, the management authority of a protected area may, subject to the management plan, allow or enter into a written agreement with, or authorise a local community inside or adjacent to the protected area or site, to allow members of the community to use in a sustainable manner biological resources in the protected area. Section 50, however also states that an activity allowed in terms of this section may not negatively affect the survival of any species in or significantly disrupt the integrity of the ecological systems of the protected area.

CapeNature undertakes to build the capacity of natural resource users and other relevant stakeholders on the sustainable utilisation of natural resources and its environmental regulatory framework in and outside protected areas.

A management area has been identified at Waenhuiskrans for the consumptive use of wild flora, specifically sourfigs, (*Carpobrotus acinaciformis*). Seasonal permits are issued on application, reviewed and monitored.

The invasive alien tree, rooikrans, is also harvested as firewood in predetermined areas on De Hoop. Structured in a livelihoods programme, participating beneficiaries from the surrounding towns harvest up to one million pieces of firewood per quarter over a three-year agreement period.

While the wood harvesting contributes to the fuel load reduction in the Acacia thickets, fire management and follow up operations are integral for the systematic eradication of the invasive plant species.

Permits for recreational fishing in the Heuningnes River are available through DFFE. The permit regulates bag limit and size for consumptive use however the 'catch and release' practise of threatened targeted fish species should be encouraged.

3.5.5 Biodiversity management

Catchment to Coast Strategy:

Guided by the Provincial Biodiversity Strategy and Action Plan (2015-2025) (Western Cape Government 2014) and CapeNature's 5-year Strategic Plan (2025-2030) (CapeNature 2025), the Catchment to Coast Strategy (2022-2026) (CapeNature 2022a) aims to guide CapeNature's actions towards improving, maintaining, and restoring ecological infrastructure in priority areas, to ensure ecological resilience and ecosystem functioning to provide benefits to people. The strategy focuses on

key outcomes for terrestrial, freshwater (including rivers, wetlands, and groundwater), estuaries and marine and coastal ecosystems, and is aligned to national and provincial plans. CapeNature's nature conservation mandate is not confined to protected areas alone but applies throughout the province, and the Catchment to Coast Strategy focuses CapeNature resources to address priorities at a provincial scale.

The Catchment to Coast Strategy is aligned to national and provincial priorities and has four strategic goals to guide implementation, namely:

Goal 1: Conserve and restore biodiversity and ecological infrastructure to deliver ecosystem services that improve the quality of life for all people of the Western Cape.

Goal 2: Leverage a collaborative investment into conservation and improved ecosystem functioning.

Goal 3: Enhance biodiversity capability through the implementation of strategic adaptive management to increase ecosystem resilience.

Goal 4: Enable reasonable and sustainable access to benefits and opportunities emanating from biodiversity, ecosystems, ecosystem services and ecological infrastructure.

Biodiversity Management Plans

The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) makes provision for the compilation of a Biodiversity Management Plan (BMP). A BMP is an implementation plan under section 43 of the act for conserving, restoring, and enhancing the biodiversity value of a species or ecosystem. It establishes the objectives and defines the management measures required to achieve the intended results. A BMP can be developed by any person or organ of state who wants to contribute to the management of biodiversity and the achievement of the objectives of the National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004). A BMP can be developed for any indigenous or migratory species, or for any listed or other ecosystem of special concern within South Africa. It must be submitted to the national minister for public comment and approval before it can be implemented. A BMP aims to provide for the long-term survival of a species or an ecosystem in the wild and to provide a platform for monitoring and reporting on the progress of its implementation.

Estuary Management Plans

Estuarine management is the process of planning and implementing actions to protect and restore the ecological, economic, and social values of estuaries. Estuaries are dynamic ecosystems that are influenced by marine, riverine, and terrestrial factors, and they provide many benefits to humans and wildlife. Estuarine management aims to balance the needs of different stakeholders and sectors, such as fisheries, tourism, agriculture, industry, conservation, and recreation. Estuarine management also involves addressing the threats and pressures that estuaries face, such as pollution, habitat loss, overexploitation, invasive species, climate change, and coastal development.

One of the tools for estuarine management is the development and implementation of an Estuary Management Plan (EMP), which is a specific document that outline the vision, objectives, strategies, and actions for a particular estuary. An EMP is based on scientific assessments of an estuary's status, functions, and values, as well as stakeholder participation and consultation. EMPs are guided by national and international policies and protocols that set standards and principles for estuarine management. In South Africa, the National Environmental Management: Integrated Coastal Management Act, 2008 (Act No. 24 of 2008) requires estuaries to be managed in accordance with the national estuarine management protocol. The protocol provides guidance on how to prepare, implement, review and report on EMPs. The Mouth Maintenance Plan is a separate document which is extracted from the EMP and ensures the maintenance of ecological process for a healthy and functional estuary.

Invasive Species Monitoring, Control and Eradication plans:

Invasive Species Monitoring, Control and Eradication Plans for De Hoop and De Mond (CapeNature 2021b, CapeNature 2021c) are compiled according to the requirements of the Invasive Alien Species regulations (Government Gazette No. 43735, 25 September 2020) published under the National Environmental Management: Biodiversity Act (NEM: BA). The plans aim to guide management actions to reduce infestation densities and rates of invasive fauna and flora species through systematic integrated control methods.

Western Cape Protected Area Expansion Strategy:

This strategy (CapeNature 2021e) aims to expand the Western Cape protected area network to encompass a more representative and resilient suite of areas that support biodiversity and ecological infrastructure, especially those threatened species and ecosystems that remain as yet unprotected.

Fencing and Enclosure of Game and Predators in the Western Cape Province Policy:

All protected areas with game species are subject to the management guidelines outlined in the policy (CapeNature 2022c).

The Western Cape Game Translocation and Utilization Policy:

All protected areas with game species are subject to the management guidelines outlined in the policy (CapeNature 2022d).

Management of large game:

The management of all large game species in CapeNature managed protected areas is subject to the following principles:

- All game farms bordering a protected area that have extra-limital or historic alien animals must be enclosed to the standards stipulated in the CapeNature fencing policy. Protected area personnel must do regular fence inspections and escaped animals must be reported and dealt with by the owner immediately.
- If the owner is not in possession of a Certificate of Adequate Enclosure, they must be given reasonable time to remove the escaped animals as soon as possible. Game animals escaping from properties without a valid Certificate of Adequate Enclosure are *res nullius* and must be dealt with accordingly. Management staff must stipulate and regulate the actions to remove the animals (i.e., flying with a helicopter to recapture or to chase back).
- In cases where *res nullius* game animals enter the protected area, management staff must report it immediately and a decision must be taken to either have the animals removed or humanely culled or allow them to remain on the protected area.
- Managers of protected areas who wish to remove surplus game must follow protocol, which includes approval at landscape and directorate level.
- Where alien invasive game (*e.g.,* fallow deer) is observed in protected areas, management staff must take immediate action to remove such animals in a humane manner.

Damage-causing wild animals:

CapeNature aims to ensure coexistence of humans and indigenous wild animals and defines human-wildlife conflict as situations where anthropogenically induced interactions between humans and wildlife lead to situations requiring mitigation of loss, disturbance, or damage. CapeNature requires that human-wildlife conflict is managed; taking into consideration all legal, ethical and welfare implications and that interventions are carried out within an ecologically sound framework, per CapeNature's position statement on human–wildlife conflict (CapeNature 2015a).

CapeNature advocates a five-step approach to holistic wildlife management of damage causing wildlife, namely (1) understanding the origin of the problem; (2) maintaining an unbiased and respectful attitude towards the animal; (3) correctly identifying the responsible species; (4) implementing suitable

mitigation measures; and (5) implementing effective, selective control as per the information contained in "The Landowner's guide: human-wildlife conflict – sensible solutions to living with wildlife". (CapeNature 2015b). This handbook supplies basic and cost-effective mitigation methods to landowners who report damage caused by wildlife. Implementing the suggested interventions and understanding the ecological role of each species will allow management staff to deal appropriately with wildlife conflict situations both on and off protected areas.

The national predation management manual prepared by The Predation Management Forum (TPMF 2016) is also available to give management guidance on dealing with predation problems. CapeNature advocates the following broad best practice guidelines:

- All reports of predators found on protected areas and causing stock losses on neighbouring properties must be reported to and investigated by relevant CapeNature staff who will assist the landowner with mitigation management. All actions against predators must be actioned on the property where the losses occurred and not within the protected area. No hunting or pursuing of predators on any protected area is legally allowed.
- Domestic animals (*e.g.,* donkeys, goats, cattle, sheep, and pigs) that roam onto protected areas from neighbouring properties must be addressed by relevant CapeNature staff in conjunction with the local municipal authority through the draft National Animal Pounds Bill and/or any local authority bylaws.
- All feral animals (domestic animals that have become wild and without an owner) found within a protected area must be removed in a humane manner immediately.
- No confiscated, nuisance, damage-causing wildlife or rehabilitated wild animals may be released onto a protected area unconditionally and applicable CapeNature policies and procedures must be adhered to. The IUCN Guidelines for Reintroductions and Other Conservation Translocations (2013) are used as a basis for informing decision-making regarding wildlife releases.

3.5.6 Cultural resource management

CapeNature acknowledges that access to protected areas for traditional, spiritual, cultural, and historical purposes has major benefits for people and accepts that protected areas have intrinsic and extrinsic use value for the people of the region. CapeNature therefore recognises the need to manage, conserve and promote natural assets for the benefit of all. CapeNature contributes towards the promotion of culture and heritage through the development and conservation of heritage resources as well as the facilitation of access.

3.5.7 Neighbor relations

Firebreak/Landowner Agreements:

The National Veld and Forest Fire Act, 1998 (Act No. 101 of 1998) places a duty on landowners to prepare and maintain firebreaks. Chapter 4, section 12 (7) of the Act states that owners of adjoining land may agree to position a common firebreak away from a boundary. Firebreaks that have been repositioned off common boundaries must be documented in an official firebreak agreement between CapeNature and the relevant landowner. Firebreak agreements bind all parties over a five-year period (unless otherwise stated) and are renewable upon joint agreement by both parties.

As per requirements, binding firebreak agreements are still to be negotiated and drafted with all neighbouring landowners/managers.

Within the operational structure of CapeNature, firebreak registers are used as a management tool to assist with the prioritisation and maintenance schedule of each firebreak. The register is updated annually and indicates whether a firebreak has been realigned to aid with maintenance or fire suppression operations.

The GHDC is a member of the Greater Overberg Fire Protection Association and integrated fire management efforts are effectively coordinated in the localised Fire Management Units of smaller groups of members.

Collaborative Cape vulture conservation measures.

The primary dependence of sheep carcasses for food for the only remaining Western Cape breeding colony of the Cape vulture can directly be attributed to the cooperation and conservation ethic of the neighbouring farmers. The provision of sheep carcasses at 'feeding stations' on Potteberg Farm are regularly maintained for the conservation of the species and reflected in the breeding success of the birds. On other properties farmers are encouraged not to bury carcasses and leave them on the lands for vulture to forage on.

Groundwater abstraction agreement

The registered provision of borehole water to the neighbouring farm is piped from near the Potberg Office to the Verfheuwel farm. Regular maintenance and electricity provision are provided by the parties.

Denel OTR and the Overberg Air Force Base Partnership

A partnership agreement exists between CapeNature, Denel OTR and the Overberg Air Force Base with regards to the conservation management of the missile test range and airfield thus enlarging the total managed conservation area with approximately 30 000 ha.

The Denel OTR adjacent to De Hoop has the right to use the eastern sector of De Hoop for the testing of missiles. The Overberg Air Force Base at Bredasdorp also uses the airspace above the whole of De Hoop and the MPA extensively for weapons testing due to the remoteness of the area. These multimillion-rand operations would not have been possible if the area had not lent itself to these operations. The reserve therefore plays an integral role in the operations of both Denel OTR and the Overberg Air Force Base and in doing so, is part of this significant contributor to the local economy.

3.5.8 Research and development

The National Biodiversity Research Development and Evidence Strategy (2015-2025) (DEA 2016a) highlights the increasing demand for knowledge and evidence to support policy and decision making for the protection of biodiversity and the realisation of benefits from our natural resources. In response to this, CapeNature developed an Ecological Surveillance, Monitoring and Research Framework (2022-2026) (CapeNature 2022b). This provides the foundation for a partnership driven biodiversity surveillance and monitoring system that allows for provincial level reporting on key aspects of the state of biodiversity to inform policies, support decision making, and guide research. This information aids national and international state of biodiversity reporting.

Structured monitoring programmes need to be put in place and carried out consistently over time to track the state of biodiversity and ecosystem functioning. This allows for critical evaluation of management practices and an adaptive management approach. There is a focus on applied scientific research that is driven by management requirements. The framework emphasises the measurement of outcomes to provide evidence of the correlation between management input and biodiversity function.

The guiding principles of the framework are good science, alignment with management requirements, taking an integrated management and ecosystems approach, and employing a full monitoring lifecycle approach to planning, implementation, and review.

Key objectives of the Ecological Surveillance, Monitoring and Research Framework are to:

- Ensure that the province is aligned with South Africa's national and international monitoring and reporting commitments.
- Enable annual State of Conservation and five-yearly State of Biodiversity reporting.

- Ensure that monitoring methods are clearly defined, data produced is of a high quality, and that data analysis is effective and repeatable across the organisation.
- Identify key biodiversity research required to understand ecosystem functioning, better understand the impact of threats, and measure the effectiveness of management interventions.

This framework facilitates surveillance, monitoring and research within the GDHC pertaining but not limited to the following:

- Priority species (invasive alien, threatened, endemic, keystone, and indicator species)
- Damage causing animals (seabird mortality and predation)
- Integrated Catchment Management with reference to fynbos and coastal ecosystems
- Land-use change and associated activities in the GDHC's zone of influence
- Ecosystem services and functioning
- Climate change
- Conservation management effectiveness
- Culture, history, and archaeology
- Social impacts and outcomes

3.5.9 Access

CapeNature strives to establish a differentiated and leading brand of products in outdoor nature-based tourism across the Western Cape for all to enjoy. This is achieved by providing opportunities to the public and interacting in an environmentally responsible and sustainable manner specifically to:

- Optimise income generation for biodiversity conservation.
- Optimise shared growth and economic benefits, to contribute to national and provincial tourism strategies and transform the tourism operations within CapeNature.
- Strengthen existing and develop new products with special attention to the provision of broader access for all people of the Western Cape.

Furthermore, CapeNature strives to increase and improve stakeholder awareness, understanding, and participation in environmental conservation by:

- Developing the capacity of local people to participate in the sustainable management and enjoyment of protected areas.
- Creating awareness around key environmental issues, developing a deeper understanding of environmental principals, and encouraging environmentally conscious values and decision making.

As part of its multi-sectoral approach, CapeNature aims to support the Western Cape Education Department's efforts by presenting curriculum aligned environmental awareness programmes to schools, and by collaborating with like-minded partners in pursuit of environmentally sustainable development goals. Behaviour change efforts will be optimised by targeting specific audiences with innovative, transformative, quality assured programmes and interventions.

3.5.10 Administrative framework

CapeNature's administrative footprint in the Western Cape is divided into two: Region East and Region West. Each Region is further sub-divided into two Landscapes: Landscape West, Landscape Central in Region West and Landscape South and Landscape East in Region East. Each Landscape is further sub-divided into three Landscape Units (Figure 3.3). The GDHC falls within the De Hoop Unit managed under Overberg Landscape Unit within Landscape South

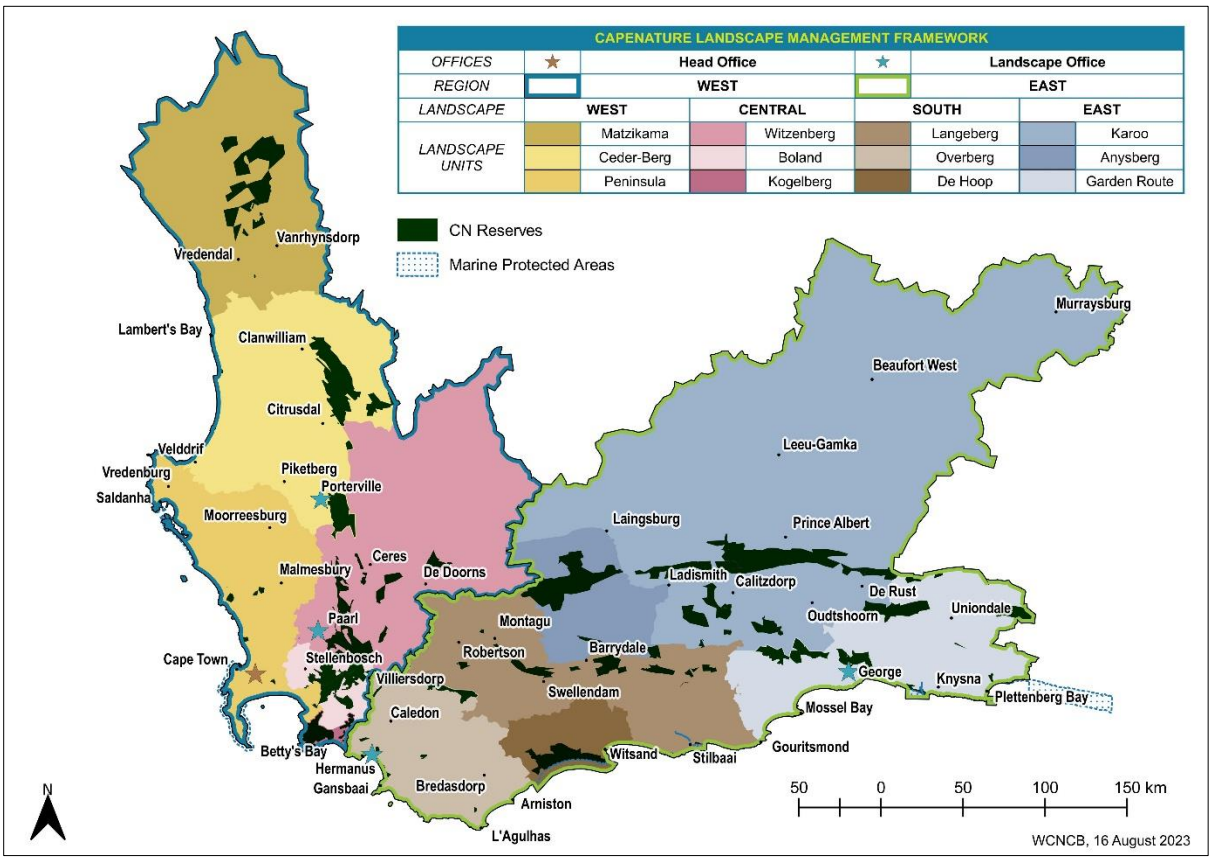


Figure 3.3: CapeNature's landscape management framework

CapeNature's biodiversity functions, both within protected areas and across the province, are supported by staff and systems located at various offices. The Cape Town office provides strategic support services. Protected areas within each Landscape are further supported by a landscape office: Landscape West (Porterville), Landscape Central (Paarl), Landscape South (Vrolijkheid) and Landscape East (George). There are also various smaller satellite and on-reserve offices.

The GDHC is one of six protected area Complexes that occur within the organisation's Region East. It is supported primarily through Cape Town Office, and the Landscape Office located at Vrolijkheid near Robertson.

Conservation Managers report to the Landscape Unit Manager of the Overberg Landscape Unit, based at Hermanus. The staffing structure for the GDHC is depicted in Figure 3.4.

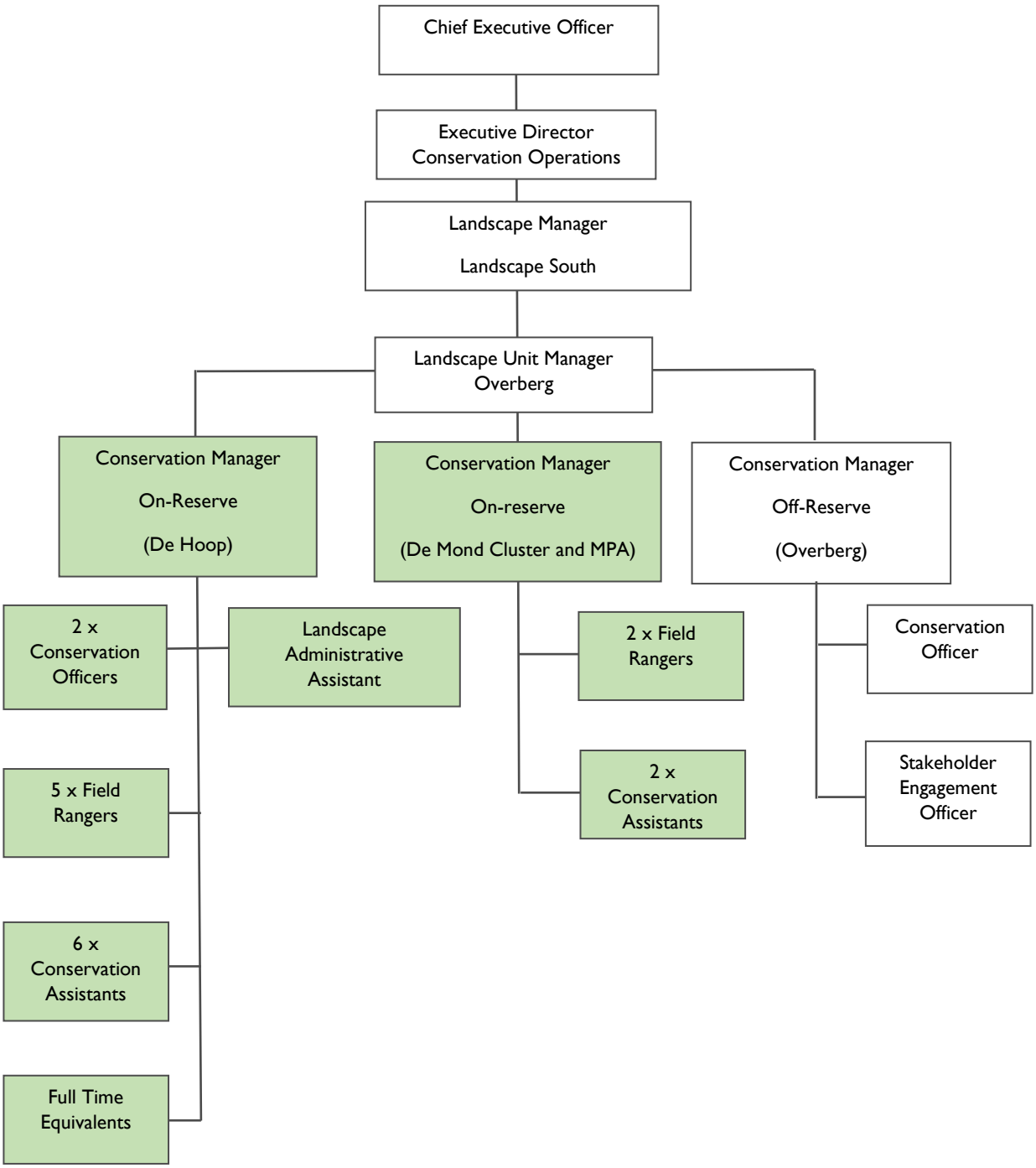


Figure 3.4: Approved organogram for the GDHC

4 CONSULTATION

This section outlines procedures for public participation during the development of this management plan, including formal processes for public comment on the draft plan, and establishes procedures for public participation during the implementation phase of this plan (Figure 4.1).

Stakeholder engagement takes place throughout the adaptive management cycle and enables public participation essential for sustainability, builds capacity and enhances responsibility. It promotes communication and the derivation of new information and/or expertise.

At the outset of the planning process for the GDHC, a stakeholder analysis identified relevant internal and external stakeholders and defined the scope and purpose of engagement.

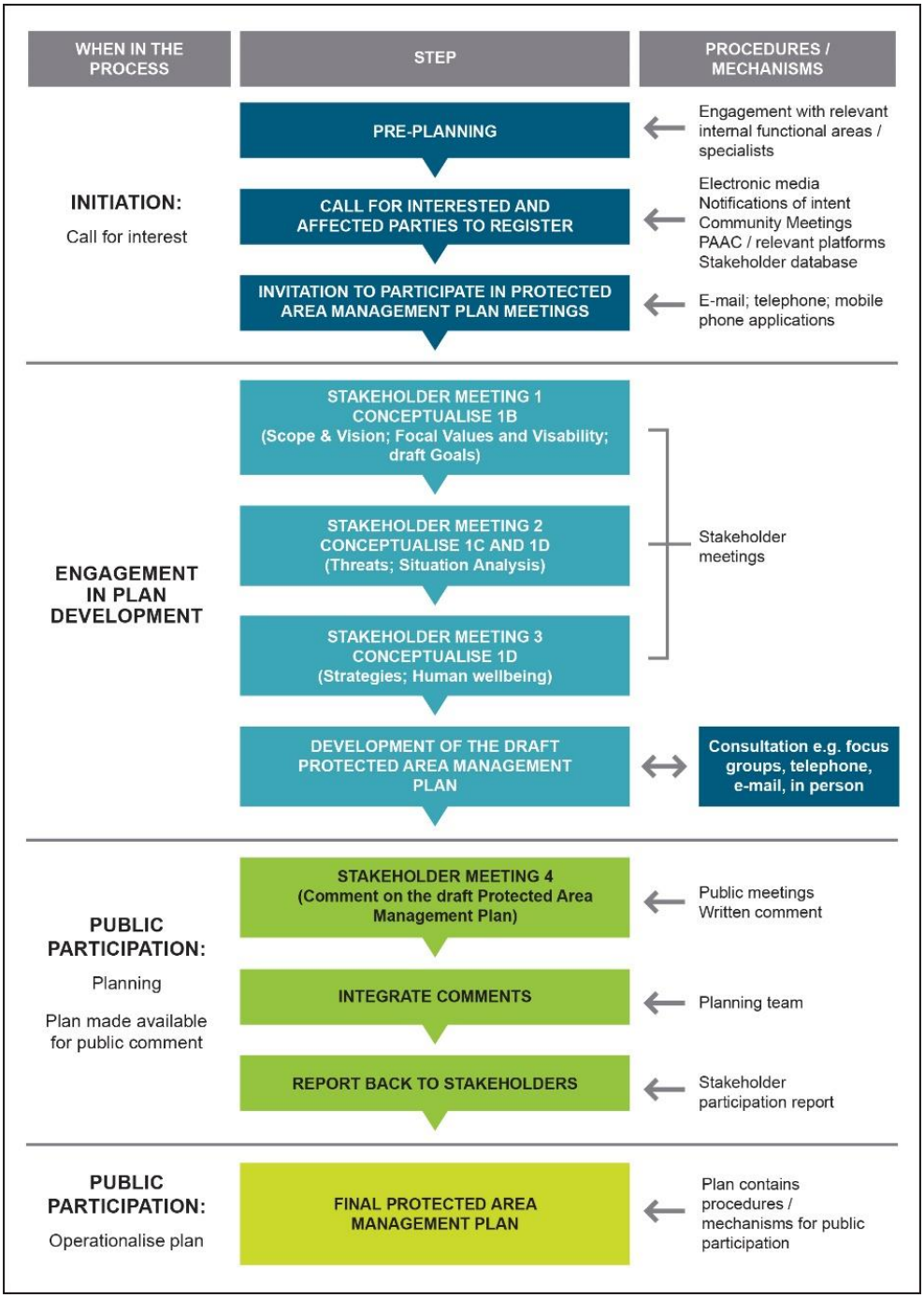


Figure 4.1: Process flow for Protected Area Stakeholder Engagement

4.1 Stakeholder Engagement

4.1.1 Participatory planning

Several approaches to engaging internally and externally with stakeholders were applied, including structured facilitated workshops, meetings, site visits and the provision and circulation of information for input. Stakeholders were engaged using varied approaches during the stages of the planning process, from gathering and sharing information, to consultation, dialogue, working groups, and partnerships. The degree of engagement was guided by the stakeholder analysis and in response to the need (i.e., transparency of process, expert opinion, buy-in and support, *etc.*).

During 2024, a series of stakeholder workshops and engagements were coordinated and facilitated by CapeNature. A range of stakeholders representing individuals or organisations were invited and involved. These stakeholders had an interest in, and/or knowledge/expertise of the GDHC, and/or the capability to support the implementation of the GHDC management plan. Stakeholders included landowners, communities, scientific and relevant land or resource management authorities. Workshops were aimed at developing a strategic framework for the GDHC to help coordinate efforts in the landscape towards a common vision. The desired outcomes were to capacitate stakeholders in the understanding of the natural and cultural conservation targets within the GDHC and its zone of influence, and to identify mechanisms to maintain these targets over time.

The outcomes of the above-mentioned process were precursors to the site-specific management planning process for the GHDC and formed the foundation for smaller working groups and planning deliverables. The development process was facilitated by a core planning team comprised of the Landscape Conservation Intelligence Manager, Landscape Unit Manager, Landscape Ecologist from Landscape Central, and Conservation Managers.

4.1.1.1 Key stakeholder groups engaged

- Communities (Infanta, Bredasdorp, Swellendam, Struisbaai, Arniston)
- Riparian and Agricultural Private landowners
- Resource managers mandated to manage the land for conservation:
    - Greater Overberg Fire Protection Association,
    - SANParks – Agulhas National Park,
    - CapeNature
- Government agencies mandated to support and regulate land and water management and other relevant affairs:
    - Department of Forestry, Fisheries, and the Environment
- Government agencies mandated to support and regulate heritage management:
    - Heritage Western Cape
- Local authorities:
    - Overberg District Municipality
    - Cape Agulhas Municipality
    - Swellendam Municipality
- Non-governmental organisations (NGO):
    - Fynbos Trust
    - Birdlife SA
    - WWF SA
- Other interested and affected parties who support and/or work in the planning domain:
    - Agulhas Biodiversity Initiative
    - Two Oceans Aquarium
    - Waenhuiskrans Rate Payers Association
    - University of Pretoria - Whale Unit
    - South Africa Institute for Aquatic Biodiversity
    - De Hoop Alien Wood harvesters
    - Denel OTR
    - Morukuru Family
    - De Hoop Collection
    - Waenhuiskrans Fisherman Community
    - Infanta Mountain Bike Club
    - Lower Potteberg Conservancy
    - UCT Department of Biological Sciences

To date approximately seven targeted stakeholder engagements have been initiated and facilitated with the above-mentioned stakeholder groupings through the following mechanisms.

4.1.1.2 Workshops and engagements

- **Purpose:** Introducing stakeholders to planning for adaptive management; planning scope and vision; Conservation Standards principles.
- **Assessment:** Capacitating stakeholders in adaptive management planning; selecting focal conservation targets; selecting human well-being values; assessing the condition and status of targets and values; identification of key ecological attributes; threats assessment and conservation situation analysis.
- **Planning:** Identifying strategies; developing theories of change; developing objectives and indicators; developing actions.
- **Internal stakeholder engagement:** Scientific and technical review; executive review; board conservation committee review.
- **External review:** External peer review; formal public review.

4.1.1.3 Working groups and other input opportunities

In instances where specific input was required or stakeholders and/or experts were unable to participate during the initial workshops, smaller teams engaged directly, or stakeholders were engaged on a one-on-one basis to:

- Share workshop outputs and progress.
- Test the rationale of situation analyses, for example meetings with stakeholders related to taxon and habitat specific planning.
- Address relevant knowledge gaps and test rationale to address knowledge gaps.
- Facilitate information sessions and registration of interest with community members.

4.1.2 Procedures for Public comment.

Briefly outline procedures for public comment on the draft management plan: TO BE COMPLETED AFTER PUBLIC PARTICIPATION.

Refer to Appendix 2, Stakeholder Engagement Process Report for the GDHC.

4.1.3 Procedures for Participatory Implementation

4.1.3.1 Protected Area Advisory Committee

Participatory management is facilitated through structures such as Protected Area Advisory Committees (PAAC) and Estuary Advisory Forums with the aim of regular interaction with stakeholders and a mechanism to evaluate stakeholder feedback, to promote good neighbour relations and to influence beyond protected area boundaries.

The GDHC PAAC was established on the 29th of September 2021 and includes both De Hoop and De Mond stakeholders. The PAAC replaced the Overberg Review Committee, established by the Hey Commission, and comprised of De Hoop, Denel OTR and Airforce Base Overberg only. The PAAC model now represents the interest of all registered stakeholders and consists of government departments, local authorities, neighbouring communities and landowners, NGO's, tourism, education, and research partners.

The committee membership is based on a genuine interest demonstrated by the member in respect of the GDHC. Members must be the nominated delegates from the organisations represented and are expected to provide feedback to their respective organisations in terms of meetings and progress.

Key Members of the GDHC PAAC include:

- Overberg District Municipality
- Cape Agulhas Municipality

- South African National Parks
- Greater Overberg Fire Protection Association
- Denel Overberg Test Range
- Overberg Air Force Base
- Farming Community/Neighbours
- Waenhuiskrans Ratepayers Association
- Overberg Renosterveld Conservation Trust
- Department of Forestry, Fisheries and Environment
- BirdLife SA
- Agulhas Biodiversity Initiative
- Southern Overberg Branch of the Botanical Society
- Fynbos Trust
- Breede-Gouritz Catchment Management Agency
- Cape Agulhas Tourism
- De Hoop Collection
- Morukuru Family
- Lekkerwater Beach Lodge

Protected Area Advisory Committees are expected to:

- Provide input into protected area management decisions
- Play a supporting role in educating the community and various interest groups about the importance of conservation, protection and management of natural resources and the objectives of the GDHC management plan that are intended to pursue these goals
- Monitor and evaluate progress on implementation of programmes and actions outlined in the GDHC management plan
- Make recommendations on how CapeNature can improve programmes and policies
- Promote involvement and decision-making around the management of natural and cultural heritage resources within the scope of the GDHC management plan
- Promote the integration of conservation activities within the GDHC with those of surrounding areas
- Identify opportunities and constraints pertaining to natural resource use
- Establish, promote, and maintain beneficial partnerships for the GDHC

4.1.3.2 Other mechanisms for stakeholder engagement

Enhancing engagement and participation by relevant stakeholders throughout the GHDC and its zone of influence is a key focus area. In addition to the existing PAAC platforms, several other mechanisms exist to facilitate and promote partnerships that help to meet the objectives of this management plan. These include but are not limited to:

- The National People and Parks Programme implemented by CapeNature has established a regional structure in the area to enable community engagement. The primary objective is to link communities with relevant government departments that can assist with issues such as access for marine resource utilisation or for spiritual, recreational, educational, traditional, and other purposes. The programme is also designed to capacitate communities about relevant legislation, policies, and regulations.
- Through the Comprehensive Rural Development Programme, CapeNature partners with NGOs, government departments and communities. The Council of Stakeholders is an elected structure of representatives from communities and focus areas include access, job creation opportunities, youth development, and small, medium, and micro-enterprise development.
- CapeNature is a statutory member of the Greater Overberg Fire Protection Association. This FPA which was established in terms of the National Veld and Forest Fire Act, 1998 (Act No. 101 of 1998), helps landowners practice integrated fire management on their land. Through

the FPA, landowners in the Overberg district work strategically with partners to better prevent wildfires, react quicker and more effectively to suppress runaway fires.

- The GDHC is represented at the monthly Local Joint Operation and Cape Agulhas Safety meetings. These are forums where crime related matters in communities and projects towards combating crime in the Overberg district and Cape Agulhas municipal area are discussed between partners and relevant stakeholders.
- Operation Phakisa is a multi-departmental law enforcement collaboration focusing on marine and coastal activities. Regular planning and feedback meetings are held where hotspots are identified for planned compliance interventions.
- Coastal Committee Meetings are chaired by the Overberg district municipality and are attended by CapeNature. These serve as a strategic platform to report to and engage district and other departments operating within the Overberg.
- The Heuningnes Estuary Advisory Forum falls within the GDHC and has been established as per the National Estuary Management Protocol (Government Notice 533, June 18, 2021) to mobilise civil society and empower participation in governance and management. Stakeholder engagement remains critical during the implementation of the EMPs and provides a knowledge sharing platform.
- The Western Cape Stewardship Reference Group, chaired by CapeNature, facilitates engagement between CapeNature and various partners working in the protected area expansion and stewardship space.
- CapeNature, BirdLife SA, SANCCOB and the Department of Environmental Affairs: Oceans and Coast (DFFE: O&C) have a strong mutual working relationship through bi-lateral MOUs to enhance particularly marine and coastal bird species conservation.
- CapeNature entered a Public Private Partnership (PPP) Agreement with De Hoop Opstal (PTY) LTD in 2009. The PPP partners and CapeNature meet quarterly to manage the partnership, performance and risk concerning the tourism facilities and activities undertaken by the partners.

5 PURPOSE AND VISION

This section makes provision for CapeNature to manage the GDHC exclusively for the purpose for which it was declared. It presents the vision, purpose, focal conservation targets, human well-being values and key threats foundational to developing the desired state for the GDHC.

The desired state, articulated as goals in this management plan, defines the outcome of management and directs management within and beyond protected area boundaries. This serves as a foundation for appropriate ongoing monitoring and evaluation to assess management effectiveness.

5.1 Management Intent and Desired State

The GDHC supports diverse and important marine, coastal, and terrestrial habitats which include mountain, limestone and dune fynbos, estuaries, rivers, caves and marine environments for biodiversity and species conservation. The management extent is extensive, extending from Infanta, east of De Hoop to Soetendalsvlei, and northwest of Struisbaai and thus covers a large part of the broader Overberg coastal landscape.

The aims for the GDHC are to strategically, and adaptively, manage biodiversity towards ensuring the persistence of terrestrial, estuarine, freshwater and marine biodiversity of international importance, and its unique cultural heritage through:

- The prioritised strategic management of threats;
- Maximizing and securing breeding habitat for threatened terrestrial and marine species;
- Allowing for cooperative governance across all tiers and sectors of government and associated agencies;

- Facilitating sustainable use of identified natural resources and ensuring effective illegal natural resource use control;
- Providing unique tourism opportunities to augment income and access for visitors;
- Providing valuable research, awareness, and environmental interpretation space along ecological gradients with specific focus on threatened terrestrial and marine species;
- Contributing meaningfully to socio-economic development of the region and its people; and
- Ensuring the conservation and protection of the unique endemic and sensitive biodiversity and ecological processes on, and surrounding the GDHC, as well as the scenic, historical, archaeological, biological, and geological features.

5.2 Purpose

In 1956 and 1957, the Cape Provincial Administration purchased the properties which today make up De Hoop. The original De Hoop was proclaimed in 1957 and used as an experimental game breeding farm. The original historical purposes for establishing De Hoop are no longer valid and have been replaced by those as stipulated in section 17 of NEM: PAA.

According to section 17 of the NEM: PAA each protected area is declared for one or more of the following purposes:

a) to protect ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes in a system of protected areas*
b) to preserve the ecological integrity of those areas*
c) to conserve biodiversity in those areas*
d) to protect areas representative of all ecosystems, habitats and species naturally occurring in South Africa*
e) to protect South Africa's threatened or rare species*
f) to protect an area which is vulnerable or ecologically sensitive*
g) to assist in ensuring the sustained supply of environmental goods and services*
h) to provide for the sustainable use of natural and biological resources
i) to create or augment destinations for nature-based tourism
j) to manage the interrelationship between natural environmental biodiversity, human settlement and economic development
k) generally, to contribute to human, social, cultural, spiritual and economic development; or
l) to rehabilitate and restore degraded ecosystems and promote the recovery of endangered and vulnerable species*

(* indicates those relevant for the GHDC)

The MPA was proclaimed in 1985 after expropriation of private land for the establishment of the missile test range by ARMSCOR in 1984.

In 1939, the then Department of Agriculture and Forestry began buying up land around the Heuningnes Estuary with a view to stabilising the drift sands. In 1975, De Mond was proclaimed as a Nature Reserve under the section 7 of the Forest Act, 1968 (Act 72 of 1968).

CapeNature manages the GDHC in accordance with its organisational vision, and the vision, goals and strategies derived in consultation with stakeholders, as set out in this section.

5.3 Vision

The vision for the GDHC is:

"The Greater De Hoop World Heritage Site Complex, comprising of the De Hoop Provincial Nature Reserve, De Hoop Marine Protected Area & De Mond Protected Area cluster,

is a resilient and thriving land- and seascape

which conserves biodiversity & heritage, and provides research, education, nature-based livelihood and eco-tourism opportunities

for the benefit of all, through partnerships underpinned by sound management."

5.4 Focal Conservation Targets

In consultation with stakeholders, natural and cultural historic focal conservation targets were identified, explicitly defined, and selected for their ability to represent the full suite of biodiversity and cultural historic heritage within the GHDC.

Focal conservation targets are summarised in Table 5.1. Features considered to be nested within or catered for by the conservation target are noted. Key ecological attributes are also included. These are features of conservation targets that can be measured to determine target condition. Key human well-being values derived from the tangible natural and cultural conservation targets are also noted. Since human well-being values are those components of well-being affected by the status of tangible natural or cultural targets, their status or "health" is not assessed separately but seen as contingent upon the status of the natural and cultural conservation targets.

Table 5.1: Summary of the GDHC focal conservation targets and associated viability

Focal Conservation Target	Description, Nested Values, Key Attributes & Associated Human well-being Values	Current Status
Freshwater Ecosystems	**Description:** Comprising of all-natural seasonal rivers and riparian zones, streams, seeps and groundwater, wetlands and buffers. **Nested targets of note:** De Hoop Vlei, Soetendalsvlei, waterfowl, wetlands, amphibians, invertebrates & fish, riparian zone, rivers. **Key indicators:** Wetland ecosystem health, native vegetation structure and species composition within riparian zone (%), intact wetland buffers, river health (instream macro-invertebrate species composition, freshwater fish species composition, and size of characteristic amphibian communities. **Associated human well-being value(s):** Nature-based tourism activities and access; learning opportunities through environmental awareness and research; sense of place and quality of life.	**Fair**
Terrestrial Vegetation	**Description:** Comprising of the fynbos and renosterveld ecosystems that include Potberg Ferricrete Fynbos (CE), Eastern Ruens Shale Renosterveld (EN), Albertinia Sand Fynbos (EN), Western Coastal Shale Band Vegetation (EN), De Hoop Limestone Fynbos (LC) and Potberg Sandstone Fynbos (LC) and the associated flora and fauna species. **Nested targets of note:** 167 plant species of conservation concern and key fauna communities notably southern adder, black harrier, large game species such as eland, predators with emphasis on leopard, honeybees and pollinators.	**Fair**

Focal Conservation Target	Description, Nested Values, Key Attributes & Associated Human well-being Values	Current Status
	Key indicators: Fire regime, indigenous vegetation species composition (%), population size. **Associated human well-being value(s):** Nature-based livelihoods; learning opportunities through environmental awareness and research; nature-based tourism activities and access; sense of place and quality of life.	
Cave Ecosystems	**Description:** Comprising intact biotic and abiotic components such as bats, invertebrates, archaeological artefacts and speleothems. **Nested targets of note:** Bats. **Key indicators:** Stable cave climate, intact cave entrances, intact and appropriate faunal and floral assemblages and richness. **Associated human well-being value(s):** Learning opportunities through environmental awareness and research; sense of place and quality of life.	**Good**
Coastal Ecosystems	**Description:** Comprising of Overberg Dune Strandveld (EN), Cape Seashore Vegetation (LC), extensive dune systems, associated avifauna (e.g. penguins), and all features above the High-Water Mark including beaches and associated fauna. **Nested targets of note:** African penguin, shorebirds, indigenous vegetation. **Key indicators:** Fire regime, indigenous vegetation species composition (%), fauna breeding population size, abundance and assemblages. **Associated human well-being value(s):** Nature-based tourism activities and access; sense of place and quality of life; learning opportunities through environmental awareness and research; nature-based livelihoods.	**Fair**
Cape Vulture	**Description:** Comprising of a breeding population which is unique in that it is the only colony within the winter-rainfall region and the only colony still in existence within the Western Cape. **Nested targets of note:** Potberg mountain. **Key indicators:** Population size (number of breeding pairs) and breeding success. **Associated human well-being value(s):** Nature-based tourism activities and access; learning opportunities through environmental awareness and research; sense of place and quality of life.	**Good**
Priority Game Species	**Description:** Comprising of two species on De Hoop of conservation significance, one with a Red List status of Vulnerable, namely bontebok, and Cape mountain zebra. **Nested targets of note:** Associated habitat. **Key indicators:** Genetic integrity and population size including age and sex composition. **Associated human well-being value(s):** Nature-based tourism activities and access; sense of place and quality of life; learning opportunities through environmental awareness and research.	**Fair**
Estuary Ecosystems.	**Description:** Comprising of the Heuningnes Estuary in De Mond and Klipdrifsfontein Estuary in De Hoop. **Nested targets of note:** Otters, fish, Estuarine Functional Zone, avifaunal roost sites along the banks of the estuary, avifaunal species composition and number, salt marshes, eelgrass, kob, steenbras, and benthic invertebrates.	**Good**

Focal Conservation Target	Description, Nested Values, Key Attributes & Associated Human well-being Values	Current Status
	Key indicators: Water quality, hydrodynamics, fish assemblages, avifaunal roost sites, sediment dynamics, invertebrates, **Associated human well-being value(s):** Nature-based tourism activities and access; sense of place and quality of life; learning opportunities through environmental awareness and research.	
Marine Ecosystems.	**Description:** Comprising of all biotic and abiotic communities within the De Hoop Marine Protected Area. **Nested targets of note:** Southern right whale, sharks, white steenbras, dusky cob, galjoen, rays, pelagic birds, abalone, turtles, kelp, subtidal reefs, rocky shores, Cape fur seals and dolphins. **Key indicators:** Species diversity, richness, relative abundance, size class and population size, undisturbed calving habitat. **Associated human well-being value(s):** Nature-based tourism activities and access; sense of place and quality of life; learning opportunities through environmental awareness and research.	**Fair**
Archaeological and Cultural Heritage Features.	**Description:** Comprising of all heritage assets including pre-colonial heritage and historical structures. **Nested targets of note:** Buildings, living heritage, ammoglyphs. shipwrecks, fish traps. **Key indicators:** Condition. **Associated human well-being value(s):** Nature-based tourism activities and access; sense of place and quality of life; learning opportunities through environmental awareness and research.	**Fair**

As the public entity responsible for biodiversity conservation in the Western Cape, CapeNature delivers a suite of core services to the public, contributing towards the following outcomes:

- Resilient ecosystems that provide water and other ecosystem services
- The promotion of local economic development
- Job creation and skills development
- Diversified and growing nature-based revenue streams
- Access to environmental awareness and research
- Environmental awareness, advocacy, and education
- Access to natural and cultural heritage

Human well-being is articulated as an outcome of conservation and is illustrated in Table 5.2. These focus areas are essential to the effective execution of this management plan and the achievement of the identified goals.

Table 5.2: Human well-being values of the GDHC and associated viability

Human well-being Values	Description and Associated Benefits	Current Status
Nature-based livelihoods	**Description:** Socio-economic development is sustainably facilitated and maintained. Ecosystems are being restored to enable a healthy natural environment and thus add economic value to ecotourism products. Provision is given for access and the consumptive (only applicable to sourfigs on Waenhuiskrans and invasive alien plant species) and non-consumptive utilisation of identified terrestrial natural resources in the	**Good**

Human well-being Values	Description and Associated Benefits	Current Status
	GDHC, underpinned by structures that encourage and enable responsible, sustainable use. **Associated benefits:** Access is reliable and in good condition for tourists to natural area; tourism infrastructure is in good condition, staff resources availability is adequate to manage tourism, access to employment opportunities EPWP FTE's (green jobs), appropriately trained EPWP staff, appointed SMMEs (outside of tourism), permitted utilisation of alien invasive plant species, woodcutter participation in communication platforms e.g. PAAC's.	
Sense of place and quality of life	**Description:** The landscape, seascape, open spaces, historical and archaeological assets and ecological diversity of the GDHC promote a sense of place allowing for physical and spiritual health to be instilled, restored, and refreshed. A healthy and intact environment provides a buffer from natural disasters such as wildfire, drought, and flooding for the benefit of surrounding communities. **Associated benefits:** Protection from wildfires, participation in planning and management via established representative platforms (e.g. PAAC, Heuningnes Estuary Advisory Forum), neighbours experience a sense of place.	**Fair**
Learning opportunities through environmental awareness and research	**Description:** An effective environmental awareness and interpretation programme and eco-venue facility at Potberg that supports the values of the GDHC and promotes respect and care for the natural environment. The GDHC further provides and facilitates monitoring and opportunities for research to increase the natural knowledge base and support human development. **Associated benefits:** Access to environmental awareness and education opportunities, participation in management (e.g. volunteers/honorary nature conservation officers), research application permits approved and conducted which informs conservation management of the GDHC.	**Fair**
Nature-based tourism activities and access	**Description:** The GDHC aims to promote and provide access for recreational activities (e.g. fishing at De Mond) and non-consumptive natural resource use (e.g. hiking, mountain biking, game viewing), underpinned by structures that promote and enable responsible and sustainable use. **Associated benefits:** Access to natural areas and wildlife, access to a clean environment, good condition of infrastructure and natural environment, maintaining sense of place, access to guidelines for responsible and sustainable fishing at De Mond to promote compliancy, participation in planning and management via established representative platforms (e.g. PAAC, Heuningnes Estuary Advisory Forum)	**Fair**

5.5 Threats

CapeNature aims to mitigate threats to conservation targets, either through direct threat mitigation, or through mitigation or management of factors contributing to or driving threats. Threat assessment influences the direction and effectiveness of management actions (Table 5.3).

Rating threats facilitates the allocation of limited resources, simplifies complex scenarios, and provides a systematic decision support method to focus management efforts. Direct threats are those impacting on targets directly and in many instances, such threats are compounded by contributing factors. Direct threats are rated on the following three criteria:

- **Scope:** The proportion of the target that can reasonably be expected to be affected by the threat within ten years given the continuation of current circumstances and trends.
- **Severity:** Within the scope, the level of damage to the target from the threat that can reasonably be expected given the continuation of current circumstances and trends.
- **Irreversibility:** The degree to which the effects of a threat can be reversed, and the target affected by the threat restored, if the threat no longer existed.

In many instances, climate change is not regarded as a direct threat but treated as a "Threat Multiplier", often compounding direct threats and/or contributing factors that already exist. Mitigating climate change impacts directly is not always possible and as such they are rated in a slightly different way, taking an additional criterion into account:

- **Feasibility:** The degree to which the effects of a climate threat on a target can be mitigated, within a given time and the feasibility of mitigation or management measures.

Table 5.3: Summary of the critical threats highlighting the focal conservation targets within the GDHC at greatest risk

Focal Conservation Targets	Critical Threats	Threat Rating
Freshwater Ecosystems	**Direct threats:** Over abstraction of surface and ground water, invasive alien plants, disturbance and destruction from human activities, inappropriate developments and infrastructure, natural disease.	Medium
Terrestrial Vegetation	**Direct threats:** Inappropriate fire regime, invasive alien plants, disturbance and destruction from human activities, reducing human management.	Very High
Archaeological and Cultural Heritage Features	**Direct threats:** Illegal activities and access, reducing human management.	High
Marine Ecosystems	**Direct threats:** Disturbance and destruction from human activities, illegal resource use, pollution.	Medium
Estuary Ecosystems	**Direct threats:** Illegal activities & access, inappropriate development and infrastructure, over abstraction of ground and surface water.	Low
Coastal Ecosystems	**Direct threats:** Invasive alien plants, disturbance and destruction from human activities, illegal resource use, illegal activities & access, natural disease, inappropriate development and infrastructure, pollution.	Medium
Cape Vulture	**Direct threats:** Disturbance and destruction from human activities.	Low
Priority Game Species	**Direct threats:** Reducing human management.	Very High
Cave Ecosystems	**Direct threats:** Disturbance and destruction from human activities.	Very High

Table 5.4 summarises the ratings applied for the direct threats associated with the GDHC.

Table 5.4: Summary rating of key threats for the GDHC

Direct Threats	Associated Targets	Summary Threat rating
Invasive alien plants	Terrestrial Vegetation, Coastal Ecosystems, Freshwater Ecosystems,	Very High
Inappropriate fire regime	Terrestrial Vegetation.	High
Disturbance and destruction from human activities.	Terrestrial Vegetation, Cave Ecosystems, Coastal Ecosystems, Freshwater Ecosystems, Cape Vulture, Marine Ecosystems.	High
Illegal resource use	Coastal Ecosystems, Marine Ecosystems.	Medium
Illegal activities & access	Coastal Ecosystems, Estuary Ecosystems, Archaeological and Cultural Heritage Features.	High
Pollution	Coastal Ecosystems, Marine Ecosystems.	Low
Inappropriate developments and infrastructure.	Coastal Ecosystems, Freshwater Ecosystems, Estuary Ecosystems.	Medium
Over abstraction of ground & surface water	Freshwater Ecosystems, Estuary Ecosystems.	Low
Natural disease	Freshwater Ecosystems, Coastal Ecosystems.	Medium
Reducing human management.	Terrestrial Vegetation, Priority Game Species, Archaeological and Cultural Heritage Features.	High

Most threats and their associated contributing factors within the GDHC are anthropogenic in origin. A direct threat is defined as a human action which results in the direct degradation or loss of an ecosystem or species population while a contributing factor is a human socioeconomic element that leads to a direct threat (Salafsky *et al.* 2024)).

Natural system modifications can result from fire and fire suppression, water management and use, invasive alien species and removing or reducing human management. Human impacts can positively or negatively modify biotic systems. The absence or reduction of current or historical conservation management activities, which are important for maintaining the desired key ecological attributes of identified conservation targets, was identified as a threat for three of the conservation targets in the GDHC.

The high density and vast extent of invasive alien plant species dominate as the highest-ranking terrestrial threat in the GDHC while a lack of compliance emerged as the most prominent threat in the marine environment. Invasive alien plants exacerbate the ability to replicate a natural fire regime which in turn creates the desired mosaic for fynbos, lowland and coastal vegetation.

To maintain healthy populations of important faunal and avifaunal species which contribute to wider metapopulations outside the GDHC, management actions are needed to ensure genetic integrity, optimal habitat, population health, minimal mortalities or die off and breeding success.

While the Cape vulture faces significant threats outside of the GDHC from wind turbine, powerline collisions and electrocutions as well as poisonings, the only threat identified within the GDHC would be from escalating human activities in the vicinity of the colony especially during breeding season.

An imbalance between the value of nature, a sense of place and economic sustainability was put forward as a threat during the first stakeholder engagement workshop at the initiation of this management plan. This is directly related to illegal resource use, inappropriate development and infrastructure as well as anthropogenic disturbance and destruction. For example, the cave ecosystems on De Hoop are all low energy systems, hence highly sensitive to change which is triggered by people entering the caves and artificial light while the Southern right whale relies on an undisturbed

environment when calving within the MPA. Tourism developments and associated services and activities aligned with management interventions need to enhance and preserve the natural beauty and ecosystems, rich cultural and archaeological heritage and sense of place to reduce the human-induced threats as a collective.

5.5.1 Climate change as a threat multiplier

As the planet experiences increased pressure from population growth, economic development, and a warming climate, species, habitats, ecosystems, and ecological infrastructure is stressed to the point where it radically alters, moves, or collapses. Catastrophic weather events and variable climates can wreak havoc with human food and water supplies (Huntjens & Nachbar 2015). Consequently, basic human needs such as water, food, shelter and health are in danger. New patterns of infectious disease outbreaks, and emerging diseases linked to ecosystem changes, are all associated with global warming and pose health risks not only to humans but also plants and animals (Huntjens & Nachbar 2015). The ramifications of not responding adequately are far greater than any earlier threat to humanity in recent history. Research shows climate change is a "Threat Multiplier" for ecosystems, human disaster, security and ultimately conflict (Huntjens & Nachbar 2015; Blamey *et al.* 2015).

The climate projections for the Western Cape not only indicate a general warming trend, but also projected drying in many areas, with increased variability (longer time periods between increasingly intense rainfall events) (WCG 2014; Beck *et al.* 2018; Skowno *et al.* 2019). Drying is of particular concern to a province that is already water stressed. These broad projections raise the risk profile of the Western Cape, which is vulnerable to droughts, floods, and fire. In addition to this, the province has a coastline spanning approximately 900 km, leaving it vulnerable to storm surges and sea level rise (WCG 2014; Skowno *et al.* 2019). The Western Cape is especially vulnerable to climate change, being a winter rainfall area, as opposed to the other provinces in the country that are summer rainfall areas. The vegetation and agricultural conditions are therefore largely unique to this province, resulting in a particular climate vulnerability (WCG 2014).

The Western Cape Climate Change Response Strategy (WCG 2014) highlights the fact that well-managed natural systems reduce climate vulnerability and improve resilience to climate change. This critical climate change adaptation outcome has three biodiversity related focus areas:

- Water security and efficiency.
- Biodiversity and ecosystem goods and services.
- Coastal and estuary management.

It is possible that the southern Cape is one of the least vulnerable areas of South Africa in terms of climate change according to Dr Stephanie Midgely, Specialist Scientist: Climate Change at Department of Agriculture, Western Cape, Further insight provided by Dr Midgely into climate change predictions for the Overberg area surrounding the GDHC in March 2025 are as follows:

- Low to moderate continued warming, likely around 0.5 – 1 ^{0}C by 2040, is expected, with a rising trend in very warm days and record high temperatures could start to become a feature.

- However, the warming will lead to warming of surface waters, which together with warmer air and thus higher potential evapotranspiration (PET) which will lead to a higher rate of evaporation from water bodies (especially shallow ones). Plants also transpire more so that plants and soils dry out faster. Increased water demand by plants is likely around 3-5% by ca. 2040. The Overberg has already seen a significant rise in PET in the period 1902-2020, noticeably in spring and summer.

- Seasonal rainfall has already decreased in autumn but there are no clear trends in the other seasons. Days between rainfall events have increased in autumn and decreased in spring i.e. more frequent rainfall but in smaller amounts.

- Annual rainfall may or may not decrease. There is wide variation between the various climate models, ranging from no change to around 10-15% lower annual rainfall by 2040.
- Even if total annual rainfall does not change, rainfall dynamics will likely change, e.g. lower rainfall per rain day, but in some areas, it could be more heavy rainfall on rain days which can lead to flash flooding. Climate change scientists are also seeing signs of a shift in distribution between the seasons, with more rainfall in summer in the eastern parts of the province including the Overberg. Where more thunderstorms are generated, heavy rainfall becomes a higher risk. There is currently insufficient knowledge about how cut-off lows that often lead to flooding could be affected by climate change.
- Even if rainfall remains unchanged, the environment is drying out faster due the rising temperatures which are much more certain than the rainfall projections.
- In the next decade or two, changes will manifest as increased variability, and changes from one extreme to another e.g. serious multi-year drought followed by 1-2 years of extreme high rainfall as has already been witnessed between 2015 and 2024. This can lead to increased soil erosion and degradation. There will still be wet and dry cycles as previously, but with greater impacts.
- There will be an increased risk of drought: frequency, duration, intensity.
- This in turn will lead to an increased wildfire risk and intensity. It is anticipated that this will result from increased hot days, possibly stronger winds which will lead to a generally drying fuel load however more data is needed to provide greater accuracy here.
- Higher storm surges resulting from sea level rise is anticipated.
- Warming of coastal shallow waters most noticeably a warming of the Agulhas current.
- There are likely many biological shifts that cannot yet be traced, e.g. how honeybee populations are responding. New biological invasions plus changing pest and disease pressures are a high risk hence health monitoring of fauna becomes even more important.

Dr Midgely states that in her opinion the biggest climate change threats in the Overberg are big droughts and big fires which can be managed with forward thinking planning, preparation, and partnerships.

The predicted terrestrial climate change zone shifts for the GDHC are illustrated in Appendix 1, Map 12.

Currently there are no regional oceanographic models at a stage of development that could reliably inform future climate change scenarios for South African marine areas (SANBI 2013) Knowledge gaps and the complex relationships between species distributions, variations in their abundance and the impact of overfishing and other stressors make understanding and projecting climate change responses in the marine ecosystem challenging. Several marine species have already shown a shift in their geographic ranges because of climate variability and change. Scenarios of more extreme rainfall and dry spells, coupled with sea level rise could cause the loss of nursery habitats essential for prawns and estuarine fish. Marine resources are likely to be more robust to the effects of climate change if the compounding stresses from overfishing, habitat degradation, pollution and other anthropogenic factors are reduced. Hence the importance of the role MPAs will play in the future. Focused research is needed to further develop plausible broad forecasts and more specific predictive capacity and credibility, to support early detection of change and to contribute to the development of appropriate adaptation measures (SANBI 2013).

5.6 Goals

Clear and measurable outcome-based goals, strategies and objectives are fundamental for the assessment of protected area management effectiveness and to the whole process of management itself. Based on the viability and threat assessments, a desired future condition was established for focal conservation targets and human well-being values, including associated core service areas, by setting measurable, time-bound goals directly linked to the targets and values and their key attributes.

GHDC Goals:

To maintain and build healthy and resilient ecological infrastructure, that supports the focal conservation targets and human well-being values of the GDHC, management needs to achieve the following:

1. By 2036, the De Hoop cave complex is in an acceptable ecological condition* and managed to minimise unnatural disturbances.
   *Temperature & humidity (feasibility dependant), bat diversity (at least 5 species using Bat Cave and at least 7 recorded across De Hoop), cave access controlled according to Penny's cave classification, and speleothems intact at selected caves

2. By 2036, archaeological and cultural heritage resources both within the marine and terrestrial environments of the GDHC of cultural significance or other special value are sustainably enhanced, valued* by and of benefit** to visitors and local inhabitants.
   *Documented, interpreted, understood and maintained
   **Culturally and / or economically whereby human well-being is derived from healthy, responsibly managed infrastructure and heritage features

3. By 2036, the groundwater levels on De Hoop are stable.
   * Desired state to be determined, dependent on climate and rainfall, the PPP, management and tourism use (groundwater uses)

4. By 2036, the wetlands, inclusive of seeps, springs and tributaries, on De Hoop are maintained in a Good State*.
   * A Good State is near-natural, with minor modifications. It is based on the Present Ecological State (PES) gained from the WetHealth method for wetland condition assessments.

5. By 2036, De Hoop Vlei water quality remains in an acceptable range* based on historical data.
   *TBD

6. By 2036, the wetland buffer and riparian zone of De Hoop are in a fair condition with 50% natural vegetation.

7. By 2036, the De Hoop Vlei water bird community diversity falls within acceptable range, and the total number has stabilised*.
   *51-90% expected species

8. By 2036, the Cape vulture population on De Hoop is stable to growing* with minimal anthropogenic mortalities**.
   *130-150 or more breeding pairs and 45-70% of breeding pairs produce fledglings
   **≤2per year

9. By 2036, the bontebok population on De Hoop is >250 individuals, has been stable or increasing for three consecutive years and has contributed to bontebok metapopulation management through translocations* for genetic bolstering.
   * Population size dependent

10. By 2036, the Cape mountain zebra population on De Hoop is maintained at two family groups and a bachelor herd of 15-30 individuals in total, for tourism purposes and >60% of at-risk* dispersers have been relocated to contribute to genetic bolstering of other populations.
    * Examples of at-risk: risk of hybridization, road accidents, illegal hunting, no reproductive opportunities

11. By 2036, the GDHC maintains over 30% natural vegetation cover.

12. By 2036, the Klipdrifsfontein Estuary is maintained in a Category A condition, and the Heuningnes Estuary is in Category B condition.

13. By 2036, key species* populations, distribution and disturbance events within the De Hoop Marine Protected Area are being accurately monitored to measure change in the population dynamics and provide information that can inform conservation management.
    * Shorebirds, African penguins, southern right whale, Cape fur seals, intertidal invertebrates, fish, rays and shark species

Achieving human well-being, derived from healthy responsibly managed ecological infrastructure and heritage, requires that:

1. By 2036, the GDHC provides managed opportunities for accessing nature and nature-based activities in a manner which is not harmful * to the environment and maintains its sense of place.
   * Linked to sensitivity and zonation
2. By 2036 the GDHC promotes and enables environmental awareness and research on all ecological targets and human well-being values.
3. By 2036, the CapeNature's tourism infrastructure within the GDHC is well maintained and visitors satisfied.
4. By 2036, EPWP staff employment is maximized, and training is provided systematically to address GDHC strategies*.
   * Priorities according to IAPO * based on budget and management capacity

5.7 Sensitivity Analysis

Sensitivity analysis based on the GDHC's biodiversity, heritage and physical environment is a key informant for spatial planning and decision-making in protected areas. Sensitivity analysis aims to:

- Highlight areas containing sensitive biodiversity and heritage features.
- Inform all infrastructure development *e.g.,* location of management and tourism buildings and precincts, roads, trails, firebreaks.
- Facilitate holistic reserve planning and zonation.
- Support conservation management decisions and prioritisation of management actions.

At the regional scale, sensitivity mapping also allows for direct comparison of sites both within and between protected areas to support organisational planning across CapeNature's protected areas network. The process elevates:

- Sites with the highest regional conservation value.
- Areas where human access or disturbance will have a negative impact on biodiversity or heritage, and specific environmental protection is required.
- Areas where physical disturbance or infrastructure development will cause greater environmental impacts, and/or increasing construction and maintenance costs.
- Areas where there is a significant environmental risk to infrastructure.
- Areas that are visually sensitive and need to be protected to preserve the aesthetic quality of the visitor's experience.

Sensitivity analysis provides decision support to ensure that the location, nature and required mitigation for access, utilisation and infrastructure development in the GDHC area are guided by the best possible landscape-level biodiversity and heritage informants. The process is transparent, relying on defensible expert-derived information and scientific data. Sensitivity maps do not replace site-level investigation, although they do allow for rapid assessment of known environmental risks, guiding planning to minimise negative impacts.

Sensitivity analysis uses a hierarchical approach. The method is based on the premise that if a portion of the landscape is demarcated as highly sensitive in one of the categories considered in analysis, then,

regardless of the sensitivity in other categories, that portion is elevated as highly sensitive in the overall scoring. The approach thus allocates the highest allocated sensitivity in any of the input categories as the ultimate sensitivity class for that portion. As new and improved data become available, these can be included.

Biodiversity, heritage, and physical features are rated on a standard scale of one to five, where one represents 'no' or 'minimal sensitivity' and five indicates 'maximum sensitivity' (Figure 5.1). Additional features such as visual sensitivity, fire risk and transport costs can be included. Higher scores represent areas that should be avoided for conventional access and infrastructure development, or where a specific strategy is applicable relative to sensitivity. A score of five typically represents areas where mitigation for conventional access or infrastructure development would be extensive, costly, or impractical enough to be avoided at all costs or contain features so sensitive that they represent a 'no go' area.

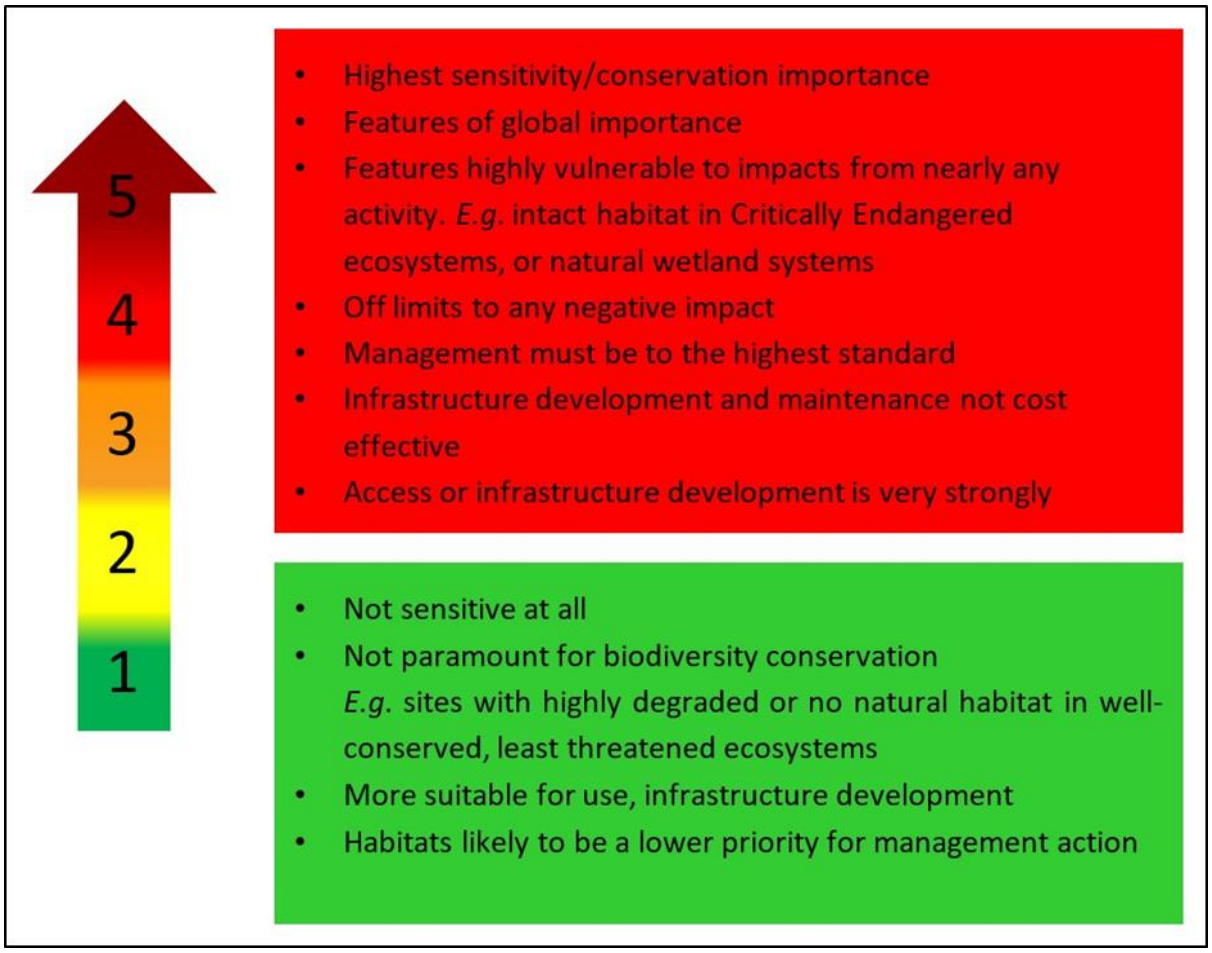


Figure 5.1: CapeNature method for sensitivity scoring and synthesis

Physical, biodiversity and heritage features included in the sensitivity analysis for the GDHC is illustrated in Table 5.5.

Table 5.5: Physical, biodiversity and heritage factors included in the sensitivity analysis of the GDHC

	Category	Dataset	Criteria	Sensitivity score	
Phys.	Slope	Slope calculated from 5m resolution DEM.	> 30° Effectively off-limits for infrastructure development due to extreme risk of erosion and instability,	Highest sensitivity	5

	Category	Dataset	Criteria	Sensitivity score	
		This 5m DEM was generated from 5m contours.	or extreme engineering mitigation and associated construction costs required.		
			20°-30° Strongly avoid for infrastructure development – cut and fill or other difficult and expensive construction method required. Appropriate engineering mitigation essential to prevent erosion and slope instability. Highest initial and on-going cost due to slope stabilization and erosion management required.	High sensitivity	4
			10°-20° Avoid for road, trail and firebreak construction if possible. Severe erosion will develop on exposed and unprotected substrates. Pave roads and tracks and ensure adequate drainage and erosion management is implemented. May provide good views.	Moderate sensitivity	3
			5°-10° Low topographic sensitivity, likely still suitable for built infrastructure. Use of gentle slopes may provide improved views or allow access to higher areas.	Low sensitivity	2
			0°-5° Preferred areas for any built infrastructure, lowest risk of erosion or instability, lowest construction and on-going maintenance costs.	Lowest sensitivity	1
	Soil erodibility / Geology	Soil erodibility categories as per the geological sensitivity layer (Council of GeoScience 2005)	The physical and substrate sensitivity layer (scale 1:50000) for De Hoop compiled in 2005 was used. This layer contains Stapelberg geol sens with dk edits and flood line without coast. This layer does not cover De Mond. The sensitivity scores [SOILSENSC] provided with the DEHP_phys_substrate_sens_gw.shp layer were utilised..	Highest sensitivity	5
				High sensitivity	4
				Moderate sensitivity	3
				Low sensitivity	2
				Lowest sensitivity	1
Biodiversity	Rivers	1: 50 000 NGI Rivers	Within 200m of perennial river.	Highest sensitivity	5
			Within 100m of non-perennial river.	High sensitivity	4
	Wetlands & Seeps	National Wetland Map (NWM) 6 and status from NWM 5 (Van Deventer *et al.* 2018)	Wetlands and seeps, extracted from the NWM 6. The statuses captured for each feature are still those as part of the NWM 5 (NBA 2018), inland aquatic (freshwater) realm. This layer included only natural wetlands.	Highest sensitivity	5
			Within 200m of wetlands and seeps	High sensitivity	4
	Red-Listing Ecosystems (RLE)	Red-Listing Ecosystems as	**Critically Endangered**:	Highest sensitivity	5

	Category	Dataset	Criteria	Sensitivity score	
		done for the RLE 2022 map with RLE 2021 status Marine Ecosystems layer with RLE 2018 status (SANBI 2006-2018)	Terrestrial – Potberg Ferricrete Fynbos Marine – Agulhas Muddy Mid Shelf		
			Endangered: Terrestrial – Albertinia Sand Fynbos, Eastern Ruens Shale Renosterveld, Overberg Dune Strandveld, Warm Temperate Estuarine Lake, Western Coastal Shale Band Vegetation. Marine – Western Agulhas Bay	High sensitivity	4
			Vulnerable: Terrestrial – None. Marine – Agulhas Exposed Rocky Shore, Agulhas Inner Shelf Mosaic, Agulhas Kelp Forest, Agulhas Very Exposed Rocky Shore	Moderate sensitivity	3
			Near Threatened: Terrestrial – None Marine – Agulhas Mixed Shore, Agulhas Sandy Mid Shelf	Low sensitivity	2
			Least Concern: Terrestrial – Cape Seashore Vegetation, De Hoop Limestone Fynbos, Potberg Sandstone Fynbos, Warm Temperate Small Temporarily Closed Marine – Agulhas Dissipative Intermediate Sandy Shore, Agulhas Intermediate Sandy Shore	Lowest sensitivity	1
	Protection levels per Vegetation type	Protection Levels as calculated using RLE 2022 map and Conservation Estate March 2023 Marine Ecosystems layer with PL 2018 status (SANBI 2006-2018)	**Not Protected:** Terrestrial – Eastern Ruens Shale Renosterveld Marine – None	High sensitivity	4
			Poorly Protected: Terrestrial – Albertinia Sand Fynbos, Potberg Ferricrete Fynbos Marine – Western Agulhas Bay, Agulhas Muddy Mid Shelf	Moderate sensitivity	3
			Moderately Protected: Terrestrial – De Hoop Limestone Fynbos, Warm Temperate Estuarine Lake Marine – Agulhas Exposed Rocky Shore, Agulhas Inner Shelf Mosaic, Agulhas Intermediate Sandy Shore, Agulhas Kelp Forest, Agulhas Mixed Shore, Agulhas Sandy Mid Shelf, Agulhas Very Exposed Rocky Shore	Low sensitivity	2

	Category	Dataset	Criteria	Sensitivity score	
			Well Protected: Terrestrial – Cape Seashore Vegetation, Overberg Dune Strandveld, Potberg Sandstone Fynbos, Warm Temperate Small Temporarily Closed, Western Coastal Shale Band Vegetation Marine – Agulhas Dissipative Intermediate Sandy Shore	Lowest sensitivity	1
	Rare and endangered plant species	Rare and endangered plant spp. extracted from • CN Biodiversity DB processed to attach the statuses from the SANBI data, and • All threatened Species (SANBI 2024)	All plant species which were rated as Critically Endangered, Critically Rare, Endangered, Near Threatened, Rare or Vulnerable. Point localities buffered by 5m.	Highest sensitivity	5
	Special Habitats, both terrestrial and aquatic Special management areas layers - De Hoop – Bat cave (buffered), Cape vulture breeding sites and feeding site with 1km disturbance zone, and penguin colonies (breeding and foraging (2015 PAMP). De Hoop Vlei – water bird breeding site De Mond – roosting sites for various threatened bird species, including Cape cormorant, Damara tern, and Oystercatcher as delineated for the 2015 PAMP using vegetation types and buffers. Koppie Alleen – Southern Adder (EN). De Hoop is only one of three subpopulations for this species.	Special habitat from sensitivity analyses (from DEHP 2015 and DEMD 2013 PAMPs) and updated where necessary using SOB records.	Known highly probability areas and known locations (buffered by 30m) used by multiple highly threatened birds and seabird spp. for breeding, roosting, and moulting. Locations of bat caves buffered by 100m.	Highest sensitivity	5
			Known lower probability areas and known locations (buffered by 60m) used by multiple highly threatened birds and seabird spp. for breeding, roosting, and moulting. Locations of bat caves buffered by 500m. Also known sites with high occurrence of other threatened fauna spp., such as Southern adder.	High sensitivity	4
Heritage	Archaeological & cultural sites SARHA declared heritage sites – only the De Hoop homestead (9/2/013/0020/001) Cave layer – archaeological sites layer containing cave locations, buffered by 100m.	Cultural and Heritage Sites (CN Infrastructure register)	Heritage sites GPS locations as provided by the reserve management. The heritage site points include (i) intertidal stonewall fish traps (visvywers), caves, Khoi middens, shell middens and deposits (buffered by 100m), (ii) and shipwrecks, graves (buffered by 50m). The actual footprint of the De Hoop homestead was digitised as indicated on the SAHRA website.	Highest sensitivity	5

	Category	Dataset	Criteria	Sensitivity score	
	De Mond – shipwrecks locations, buffered by 50m (2013 PAMP). Waenhuiskrans – Visvywers (fish traps), buffered by 100m.				

The GDHC has an overall sensitivity score range which is evenly spread across the following categories Lowest (2%), Low (25%), Moderate (25%), High (21%) and Very High (27%).

The key drivers of the Highest sensitivity in the GDHC are the erodibility of soils, ecosystem status, archaeological and cultural heritage. Rivers, wetlands and again, erodibility of soils, are the top three components of the High sensitivity category. While not large in size compared to the overall area of the GDHC, the special habitats for fauna species were classified as Highest and High sensitivity and should not be overlooked. The comprehensive sensitivity for the GDHC is illustrated in Table 5.6 and Appendix 1, Map 13.

Table 5.6: Summary of sensitivity scores for the GDHC

	TOTAL sensitivity score		Slope sensitivity (5m)		Soil erodibility / Geology (only DEHP)		Rivers – Perennial buffer 200m & non-perennial buffer 100m		NBA 2018 wetlands + 200m buffer		Ecosystem status – RLE 2022, NBA 2018 Marine		Protection levels (PL) per ecosystem, NBA Marine		Spp of special concern – TOTAL (buffer 5m)		Special habitats – Fauna		Heritage and culturally sensitive sites	
Sensitivity score	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%
TOTAL	63 395.46 (ha)																			
1 (Lowest)	738.08	1.16	19 756.14	31.16	3 450.36	5.44	0.00	0.00	0.00	0.00	700.64	1.11	446.23	0.70	0.00	0.00	0.00	0.00	0.00	0.00
2 (Low)	15 963.20	25.18	5 850.81	9.23	1 729.49	2.73	0.00	0.00	0.00	0.00	8 006.59	12.63	24 930.14	39.32	0.00	0.00	0.00	0.00	0.00	0.00
3 (Moderate)	16 116.42	25.42	4 942.93	7.80	200.09	0.32	0.00	0.00	0.00	0.00	16 191.74	25.54	4 302.50	6.79	0.00	0.00	0.00	0.00	0.00	0.00
4 (High)	13 551.33	21.38	2 356.56	3.72	8 103.52	12.78	10 853.53	17.12	2 523.35	3.98	1 980.34	3.12	0.00	0.00	0.00	0.00	873.95	1.38	0.00	0.00
5 (Highest)	17 026.44	26.86	1 083.79	1.71	9 021.90	14.23	1 108.34	1.75	1 496.45	2.36	3 395.78	5.36	0.00	0.00	21.01	0.03	415.98	0.66	2 045.25	3.23

6 ZONING PLAN

This section outlines the zoning plan for the GDHC. The GDHC forms part of a planning matrix and locating the GDHC in terms of the municipal IDP is aimed at minimising conflicting development in either the protected area or the neighbouring municipal area.

The primary objective of the zoning plan is to establish a coherent spatial framework within and around the GDHC to guide and co-ordinate conservation, tourism and visitor experience, access and utilisation, and stakeholder and neighbour relations.

Zoning is intended to minimise user conflict by separating potentially conflicting activities such as wildlife viewing, recreational activities and tourism accommodation, whilst ensuring that activities and utilisation continue in appropriate areas and do not conflict with the goals and objectives of the GDHC.

6.1 The GDHC in the Context of Municipal Integrated Development Planning

6.1.1 Overberg District Municipality

Integrated Development Plan (2022/2023 – 2026/2027) and Spatial Development Framework (May 2023)

The Overberg District Municipality Climate Change Response Strategy addresses the response to the reduction in emissions and climate-related risks and impacts. Key aspects of the strategy relevant to the GDHC are disaster management (fires, floods etc), implementation of coastal management lines and ecosystem restoration (including wetlands). The municipality convenes the Climate Change and Biodiversity Forum to mainstream climate change into municipal planning.

The municipality has an Alien Invasive Species Monitoring, Control and Eradication Plan aimed at controlling the alien invasive species on municipal properties. There are no district municipality properties in proximity to any of the components of the GDHC which could influence the level of alien invasives within the GDHC.

The Overberg Fire and Rescue Service services the Swellendam, Cape Agulhas and Theewaterskloof Municipalities and is therefore a key participant in management of fires occurring within the GDHC and surrounding areas. The district office and a full-time operational station are based in Bredasdorp. The District Fire Working Group includes CapeNature. The Disaster Management Advisory Forum is convened by the municipality for the district to address all natural disasters including fires and floods.

The municipality convenes the municipal coastal committee inclusive of CapeNature representation. Key priority areas relevant to the GDHC include:

- The Overberg was selected as the pilot for the Western Cape Coastal Access Strategy. Coastal access also includes access to the coast within protected areas such as De Mond and De Hoop.
- An estuary management forum has been established for the Heuningnes Estuary and there are estuary management plans for the Heuningnes and Klipdrifsfonteinspruit estuaries.
- The coastal management line has been developed for the Overberg District and is ready for implementation.
- The Working for the Coast Initiative is supported.

The District Local Economic Development Tourism Forum promotes tourism within the Overberg District, for which Waenhuiskrans, De Mond and De Hoop are important attractions that add value to the tourism sector.

With regards to the identification of important infrastructure and services projects, most of these will not impact on the GDHC. A Joint District and Metro Approach geohydrological study to identify potential boreholes for water security for the Cape Agulhas and Theewaterskloof Municipalities has however been completed, which could have an impact on ground water resources and associated surface water ecosystems depending on where the proposed boreholes will be located.

A planned project which could benefit the GDHC is the "surface Ouplaas/De Hoop District Municipality" road project to be implemented by the Department of Infrastructure (previously the Department of Transport and Public Works). An improvement in the access road would be of great benefit to De Hoop. Other identified projects are the De Mond Tourism Development and the De Mond Overnight Hiking projects, the latter of which has been implemented.

The SDF for the Overberg Municipality was updated and approved in May 2023. The SDF accurately reflects De Hoop and De Mond as protected areas. The spatial planning categories (SPC) in the SDF are not accurately matched to the Western Cape Biodiversity Spatial Plan (WCBSP) which should be the primary biodiversity informant for spatial planning. The SPCs are however more conservative from a biodiversity conservation perspective in that areas which were designated as Other Natural (i.e. natural areas not required to meet conservation targets) have been incorporated within the protected area (core) SPC, which includes areas directly west of De Hoop. From a biodiversity perspective, the SDF ensures that there is an adequate buffer around the GDHC.

6.1.2 Cape Agulhas Municipality

Integrated Development Plan (2022/2023 – 2026/2027) and Spatial Development Framework (2022 - 2027)

The Cape Agulhas Municipality takes guidance from the district municipality in terms of the climate change response strategy. Resources for the implementation of climate change response are limited, and alternative sources of funding are being investigated. Projects are however being implemented of which the monitoring and maintenance of municipal groundwater resources may be relevant to the GDHC. The water services development plan reporting on water provision to the municipality needs to be developed and a service provider is to be appointed. The previous plan lapsed in 2007/2008. The coastal management lines are proposed as the primary tool for managing development along the coastline although the proposed methodology for implementation is still in process.

The protected areas of the GDHC are accurately reflected. The municipality acknowledges the need to compile and implement an Alien Invasive Species Monitoring, Control and Eradication Plan aimed at controlling the alien invasive species on municipal properties, however there are currently insufficient resources to complete this. The only municipal properties near the GDHC are located directly to the north of Waenhuiskrans. Control of alien invasive species on these properties is required to prevent them invading Waenhuiskrans which currently has very low densities of alien invasive species.

The provincial projects reflected in the IDP are as for the district municipality listed above. The municipal projects are mainly within the settlements. The only settlement near the GDHC is Arniston. The replacement of the stairs to Bikini Beach is listed and was included in the joint CapeNature/Cape Agulhas Municipality coastal erosion project for Waenhuiskrans, encompassing both Waenhuiskrans and the coastal frontage of the town of Arniston. The joint CapeNature/Cape Agulhas Municipality coastal erosion project for Waenhuiskrans, encompasses both Waenhuiskrans and the coastal frontage of the town of Arniston. The replacement of the stairs to Bikini Beach is listed, but the remainder of the coastal erosion project is not reflected in the IDP.

The SDF for the Cape Agulhas Municipality has also been updated recently, dated October 2023. Similarly to the Overberg SDF, the SPCs are not accurately matched to the WCBSP categories, which aligns with the mapping of the Overberg SDF as discussed above. The SDF indicates that water in the Cape Agulhas Municipality is primarily sourced from boreholes, however Bredasdorp water supply is

supplemented by the Sanddrift Dam and the Uitvlucht Spring. The Arniston wastewater treatment works borders on to Waenhuiskrans, and operation is considered below standard.

With regards to the spatial development proposals for each of the settlements and the delineation of the urban edge, the urban edge for Struisbaai has been retracted from its previous position in the north to exclude the Andrewsfield property which borders on to De Mond and therefore removes the threat to it. The Arniston urban edge has however been extended to the northern boundary of the Waenhuiskrans with future residential development proposed. This urban interface will need to be considered for future planning. There are no settlements near De Hoop.

Table 6.1 shows the aspects of the municipal integrated development plans applicable to the GDHC.

Table 6.1: Aspects of the municipal integrated development plans applicable to the GDHC

Municipality	Aspect in IDP to be addressed	Proposed Intervention
Overberg and Cape Agulhas	Provide for protection of important biodiversity areas and identification of natural corridors in forward planning documents.	• Incorporate the WCBSP to inform the spatial planning categories (SPCs) in the SDF. • Provide for adequate development controls for the SPCs.
Overberg and Cape Agulhas	Invasive alien vegetation on both public and private properties.	• Implement a municipal-wide alien clearing plan on all municipal properties. • Budgeting for alien clearing in the IDP. • Facilitate implementation of alien clearing programmes from various funding sources through partnerships. • Encourage and enforce landowner compliance.
Overberg and Cape Agulhas	Integrated fire management across the landscape.	• Co-ordination of fire management across the district. • Ensure municipal properties implement appropriate fire management. • Fire-fighting partnerships, in particular the FPAs and associated strategies.
Overberg and Cape Agulhas	Provide for nature-based tourism development opportunities and associated infrastructure	• Identify nature-based tourism opportunities that benefit the local community and support conservation of biodiversity. • Identify infrastructure needs to support nature-based tourism development.
Overberg and Cape Agulhas	Ensure that natural resources required for service provision are sustainable and minimize ecological impact, in particular water.	• Ensure that water sources are monitored to ensure sustainability and minimise impact on water sources. • Thorough investigation of new water sources to ensure impact of abstraction is minimised.

6.2 Protected Area Zonation

The primary function of the GDHC is to conserve biodiversity. However, other functions such as ensuring access and providing benefits to neighbouring communities and local economies may conflict with this primary function.

The zonation plan is thus a standard framework and set of formal guidelines to balance conservation, access and utilisation within the GDHC, and is informed by the sensitivity analysis.

Zonation:

- Is foundational to planning and development within the GDHC.
- Provides a framework for development of the GDHC.
- Recognises the purpose for which the GDHC is established.
- Ensures ecosystem resilience by limiting human intrusion in the landscape.
- Mitigates user conflict and minimises the impact of utilisation on natural and cultural heritage through access and activity management.
- Accommodates a range of activities ensuring that nature-based recreation and experiences for solitude do not conflict with social and environmental requirements or needs.
- Confines development within the GDHC to areas deemed appropriate to tolerate transformation without detracting from sense of place.

CapeNature's zonation categories, illustrated in Table 6.2, are derived from existing protected area zonation schemes worldwide, to develop a coherent scheme that provides for visitor experiences, access and conservation management needs.

Table 6.2: 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 awareness facilities.
Development – High intensity	Area which is 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.

The following underlying decision-making rules are applied in determining zones:

1. Strike a balance between environmental protection and development of the GDHC to meet broader economic and social objectives of the protected area.
2. Consider existing development footprints and tourism access routes based on:

- The principle that all else being equal, an existing transformed site is preferable to a green fields site from a biodiversity perspective.
- Increase in maintenance cost if the development is not near existing infrastructure.
- The socio-economic benefit of existing tourism nodes and access routes.
- Infrastructure design and services with due consideration for focal conservation targets.

3. Where existing development nodes, tourist sites and access routes occur in areas with high sensitivity-value, associated zonation must aim to confine the development footprint as much as possible and preferably within the existing transformed site.
4. Sites with high biodiversity sensitivity value are put into stronger protection zones and peripheral development is favoured.

A summary of the zonation scheme applicable to the GHDC is outlined in Table 6.3 and illustrated in Appendix 1 Map 14.

Table 6.3: Summary of CapeNature zonation categories applicable to the GDHC

Zonation Category	Explanation
Wilderness	Only two areas are zoned as wilderness, but these are not formally declared wilderness areas. De Hoop – (i) Highly sensitive sand dunes area south of the De Hoop Vlei to the coastline. (ii) Land area at the northern part of De Hoop Vlei, from William-se-Kloof to Sandkraal-se-Kloof. The wildlife in this area is extremely sensitive to disturbance.
Primitive	All the protected areas in the GDHC are zoned as primitive except for the areas zoned for development, nature access, wilderness or special protection. Herewith a breakdown. De Mond – Entire reserve except for areas zoned as nature access, low-intensity development and management development. Also excluded area zones as special habitat for avifauna (especially Tern spp.) breeding. Waenhuiskrans – Entire reserve except for coastal areas zoned as nature access, natural resource access, low-intensity development and management development. De Hoop – Entire reserve except for areas zoned as wilderness, nature access, high and low-intensity development and management development, and areas zoned for special protection and resource access. De Hoop MPA – Entire MPA with restrictions set out in proclamation.
Nature Access	The following areas within the GDHC were zoned as nature access. De Mond – Several roads and tracks in this area. All the roads were buffered by 2.5m. strip (approximately 30m) along the coastline and zoned nature access including the Damara Trail area along the coast and up to hut at the end of the trail. Waenhuiskrans – Area along coastline. Buffered road along inland boundary by 2.5m. Excluded area zones as special habitat for Cape cormorant breeding. De Hoop – PPP concession area leading to the Opstal (no structures allowed), Old lands at Opstal that is suitable for high usage, but not suitable for any buildings. Main roads leading to various tourist facilities (Koppie Alleen, Die Mond, Melkkamer, Noetsie), buffered by 2.5m. The road to Potberg and then from Potberg to Lekkerwater parking area, buffered by 2.5m. Road to Bloukranz (proposed PPP concession), buffered by 2.5m. Green spaces and access roads (buffered by 2.5m)

Zonation Category	Explanation
	between Koppie Alleen facilities.
Development – Low intensity	Following areas were digitized: De Mond – Area with all infrastructure (office, staff house, cottages, picnic site) and the Damara trail overnight hut. Waenhuiskrans – Digitized parking area and road leading to it. De Hoop –Various areas including infrastructure outside of the high intensity footprint at Die Opstal, Melkkamer footprint as per the PPP Concession contract 2009 (including proposed wedding venue and conference centre), Lekkerwater footprint and Koppie Alleen footprint as per PPP Concession that includes Koppie Alleen Beach Lodge and Parking, Morukuru Ocean House and staff housing footprints, and proposed amenities and chalets as part of Koppie Alleen Coastal Lodge. The area mapped as part of the PPP Concession called De Mond, adjacent to the Koppie Alleen sand dunes restricted to one building and limited overnight guests, proposed upgrade for overnight lodging at Wyoming, Bloukrans footprint as per proposed PPP Concession 2025 and area for the Mosselbank as per PPP Concession. De Hoop - Roads providing access to tourist facilities, buffered by 2.5m. De Hoop Whale Trail – Existing huts and planned expansions plus Cupidoskraal staff quarters.
Development – High intensity	De Hoop – Opstal footprint mapped as per the PPP Concession contract 2009. The area for the proposed boutique spa was also mapped.
Development – Management	The following areas were digitized or extracted from the infrastructure layers after confirming the recent Google imagery. Waenhuiskrans – Area around municipal water reservoir and management road leading to it, buffered by 2.5m. De Hoop – Various areas mapped as follows: the Potberg complex (reserve management), Infanta instrumentation site - delineated zone along outer fence and buffer access road by 2.5m, Lekkerwater power generation plant footprint. Noetsie and Vaalkrans water reservoirs, Koppie Alleen proposed bulk water storage, Cape Infanta Lighthouse, Witwater staff house and stores, De Hoop main gate house and parking area at main entrance and the Potberg gate house area. – Various management roads, buffered by 2.5m.
Species / Habitat / Cultural Protection	The following areas were digitized for special protection. Soetendalsvlei – Entire area which is hydrological and ecological linked to greater estuary system. Waenhuiskrans – Cape cormorant roosting site. De Mond – High probability sensitive avifauna breeding sites, especially Tern spp. De Hoop – Caves, shell middens, deposit and scatter sites buffered by 100m, and mapped De Hoop registered heritage site. – The African penguin colony fenced area and Cape vulture colony gorge near Potberg. – the De Hoop Vlei area declared as Ramsar site mapped against digital imagery, except for area zone for tourist access, which are zoned as "natural resource access".
Cultural Species / Habitat Visual	Waenhuiskrans – Coastal strip along southern boundary used for sour fig harvesting. De Hoop – Location of sandboarding sites in wilderness area mapped out in Activity Plan. Two sites, Big Dunes and Small Dunes. Digitized

Zonation Category	Explanation
Natural Resource Access	dune area as well as path leading to dunes. – De Hoop Vlei area identified for tourist boating access however because of the dynamic nature of the vlei system in terms of water levels, salinity, species presence, species life history, habitat availability and ecology, static boundaries are not practical, and eco-boat routes must be determined taking this variation over time into consideration. – Borrow pits at Elandspad and Cupidioskraal.

6.3 Protected Area Zone of Influence

CapeNature seeks to maximise positive influences and/or minimise direct and indirect negative pressures on protected area conservation targets, with the aim of ensuring the persistence of species and biodiversity in general. Activities managed include those that might have direct impacts on targets, and those that have only indirect effects, often at considerable distance from the location where the activity takes place.

The zone of influence is a mechanism that recognises and activates the abovementioned principle. Three key informants (Figure 6.1) used to delineate the zone include:

- Viability of focal conservation targets.
- Threats assessment.
- Protected area sensitivity and zonation.

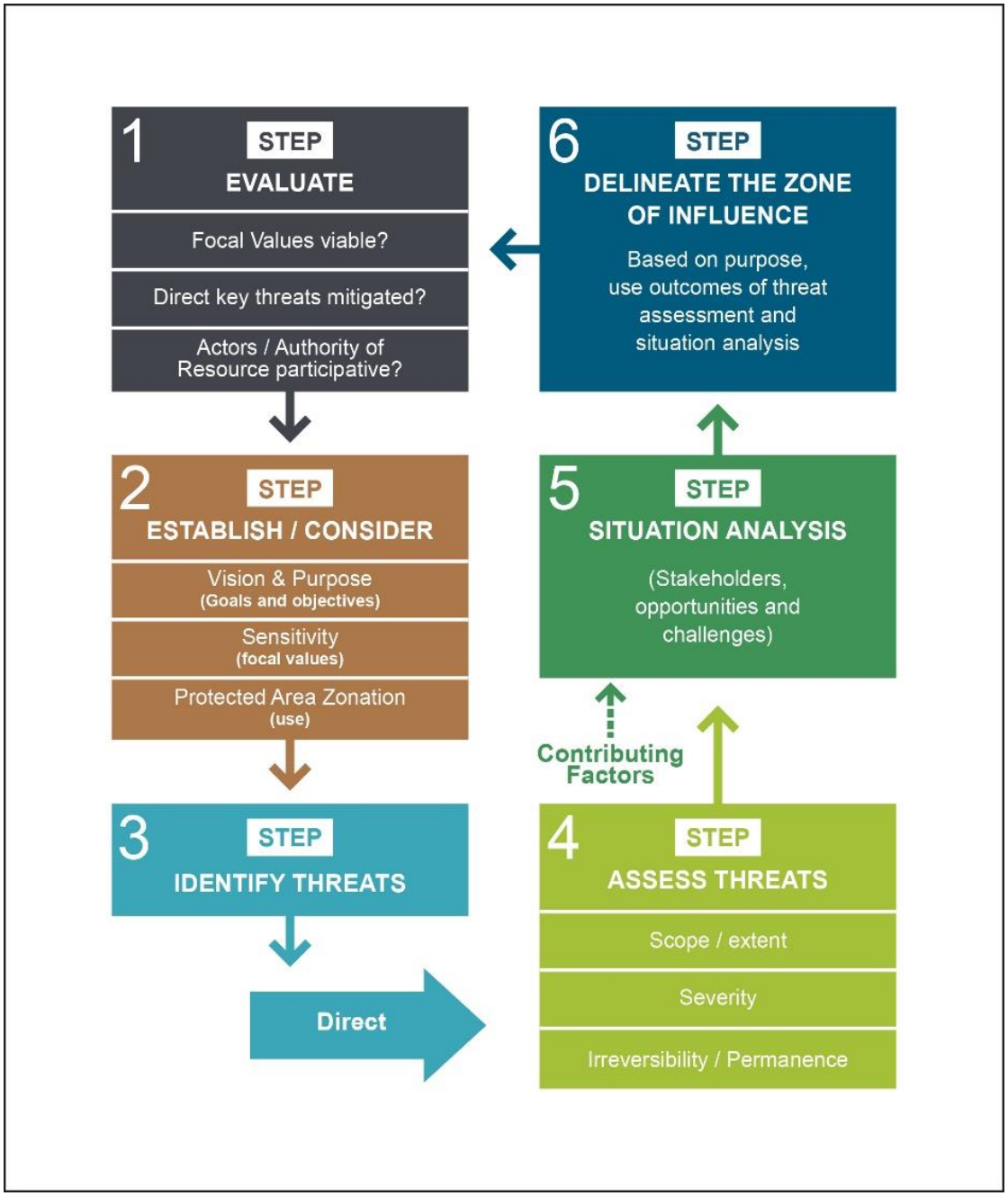


Figure 6.1: Process flow for the delineation of the zone of influence

The zone of influence is a non-legislated area spatially depicted around the GDHC. The zone ultimately aims to facilitate strategic stakeholder engagement by linking key stakeholders to prioritised influences to promote an ecologically functional landscape that supports goals and objectives of the GDHC, and enhances the benefits derived from the GDHC. The process of delineation helps to identify:

1. Actions to directly restore a value or mitigate a threat.
2. Actions designed for people to continue positive behaviours or halt direct threats.
3. Actions to address enabling conditions.

The zone of influence is thus:

- A tool to guide resource allocation and investment outside of the GDHC.
- A tool to marry stakeholder engagement/authorities of resource to activities.

- A spatial prioritisation of where to support compatible land and water use, and positive behaviours.
- A spatial prioritisation of where to collaborate and with whom.
- A mechanism to prioritise support to landowners or managers of priority landscapes.
- All-encompassing mechanism that includes all or part of a buffer zone as prescribed in terms of legislative frameworks and conventions.

The spatial features used in the zone of influence calculation are rated on a standard scale of one to four: Low (1), Medium (2), High (3), and Very high (4). These ratings are assigned to each input feature within the zone of influence. Higher scores represent areas where many features overlap, elevating the necessity to engage stakeholders and positively influence neighbour relations and/or activities.

Table 6.4 lists the features, criteria and ratings applied to delineate the zone of influence of the GDHC. Appendix 1, Map 15 illustrates the zone of influence for the GDHC.

Table 6.4: Criteria used for defining the zone of influence of the GDHC

Feature	Criteria	Rating	Zone area (ha)	% of zone
Fire hazards (high fire frequency)	Inappropriate fire frequency due to anthropogenic fires. Irrespective of the fire hazards (ignition sources), the flammability of the vegetation is what determines the fire hazard for fires moving from outside the reserve into the reserve. In the case of the GDHC, the biggest issue is the age of the veld, unnatural fire sources and dense invasive alien plants. The veld age within half of De Hoop is between 8 and 15 years, which is not ideal for burning again. The recognized TPC for De Hoop is 18 years (Geerts 2021). The other half is very old. Veld age around reserves is older than 8 years, which poses the risk of veld fires entering reserves from private land. Therefore, remnants of natural fire prone vegetation are considered as a source that can lead to uncontrolled fire events.	Medium (2)	50 480.8	7.30
Invasive alien plants	Stands of IAPs within a radius of the GDHC is a source of re-infestation of IAP cleared from reserve. This product includes the extent of 14 of the most widespread & abundant, terrestrial IAP taxa in South Africa. This layer excludes invasions in modified areas, i.e. cultivated, built-up & planted forest (Wannenburgh 2024). IAPs invading from properties surrounding De Hoop are not a significant threat unlike other reserves (threat = medium). De Hoop neighbours have less IAPs compared to De Hoop itself. This threat is more relevant for De Mond (threat = high).			

Feature	Criteria	Rating	Zone area (ha)	% of zone
		Medium (2) High (3)	6 726.3 4 914.5	0.71 0.97
Prolonged inappropriate water levels	Prolonged inappropriate water levels pose a direct impact on salt marshes and is most relevant to the Heuningnes Estuary in De Mond. Prolonged flooding of salt marshes can have an impact. The mouth of the Heuningnes Estuary alternates between open and closed and is actively managed. Elevated water levels of the Heuningnes Estuary when closed, results in impacts on adjacent agricultural lands. Higher water levels are also due to the removal of natural vegetation. The mouth is managed in terms of a mouth maintenance management plan.	Low (1)	17 730.6	2.56
Estuaries (water quality)	Poor water quality (excluding nutrient loads), monitoring of ecological health of estuaries and monitoring impacts from various threats. The Heuningnes and Breede are major estuaries falling within the zone. The boundary was extracted from layer Estuarine Ecosystem Map, National Biodiversity Assessment (NBA) 2018.	Low (1)	12 750.3	1.84
Excessive Nutrient Load	Areas where there is possible water pollution due to agricultural activities near rivers and estuaries. Mainly affected include the following critically endangered river systems; (i) the Sout River joining to De Hoop Vlei, (ii) the Heuningnes River joining to De Mond, and (iii) the Nuwejaars River flowing into Soetendalsvlei. These river systems were buffered as delineated in the NBA 2018 rivers layer by 50m.	Low (1)	1 413.4	0.20
Human Activities & Disturbances	Terrestrial human activities and disturbances through illegal resource use and recreational access and activities such as hiking, off road vehicles, etc. Illegal resource use includes various unregulated human activities such as illegal harvesting of fauna and flora (sour figs), mainly on Waenhuiskrans and possibly also on the Infanta side. There is little illegal harvesting of terrestrial natural resources within the GDHC. Activities emanate from human settlements in proximity of the reserves.	Low (1)	4 322.2	0.62

Feature	Criteria	Rating	Zone area (ha)	% of zone
	The layer was generated by buffering human settlements by 1500m.			
Climate change	Climate change exacerbates most direct threats. The BSP climate adaptation corridors were delineated as identified in the Table Mountain Fund project done for the Cape Floristic Region. The corridors include important landscape features that provide climate change resilience. Three of these corridors occur within the area; Klein River to De Mond and Agulhas, Ruens silcrete to De Hoop Vlei, Swellendam Mountains to Potberg.	Low (1)	49 633.0	7.18
Illegal fish and marine resources harvesting (poaching)	Areas were identified where illegal fishing and poaching occur, mainly along the various coastlines. Over-fishing through illegal fish and shark line fishing in surf zone, offshore line fishing using long line / trawling / ski boats, poaching abalone, poaching invertebrates along rocky shore, marine mammals poaching, and disturbance of sea birds. The main sources of harvesting of marine resources come from boats drifting deliberately or unintentionally into the MPA. The areas particularly susceptible (hotspots) are Infanta (around coast) and between Arniston and Spitskop. Hotspots are derived using a 3km buffer along the coastline bordering the towns.	High (3) Low (1)	8 485.7 20 270.5	1.23 2.93
Renewable energy	Expansion of renewable energy REDZ, both wind and solar, adjacent to protected areas within the 10km buffer zone were included. Renewable energy infrastructure such as wind turbines can have an impact on bats and Cape vulture. Based on satellite tracking studies it is considered that a buffer of 50 km around Cape vulture colonies (including Potberg) to be of high to very high sensitivity (Pfeiffer & Ralson-Paton 2015). An area of 50km radius from the colony is used for foraging by fledglings from the Potberg colony. Any development of renewable energy plants within this buffer poses a major threat to the Cape vulture colony. There are currently 2 layers available for the renewable energy development zones from eGIS; Phase 1 and Phase 2. Phase 1 has gone through the EIA process and has been approved. None of the sites in Phase 2 plots are near the GDHC.	Very high (4)	492 673.9	71.23

Feature	Criteria	Rating	Zone area (ha)	% of zone
Corridors for fauna movement	As part of research, leopard movements were tracked. The main corridors within the area of the GDHC are the (i) De Hoop corridor that runs from Infanta at the Breede River mouth to Bredasdorp, and (ii) Hermanus Agulhas corridor that runs from Struisbaai to Bredasdorp to Hermanus. The corridors based on the modelled functional leopard corridors (McManus *et al.* 2022) and vegetation remnants were digitized.	Low (1)	45 652.7	6.60
Threats to cave system and bats	Disturbance and destruction of the cave ecosystems & integrity due to poor access control (mainly on reserve). Various threats along bat migration and forages routes. This includes the use of agrochemicals / insecticides and collisions with windfarms. Guidelines indicate a buffer of 20km around large bat cave near the Vlei (MacEwan *et al.* 2020). This will cover some of their migration routes. The bat cave next to De Hoop Vlei is considered an extra-large roost site of bats with conservation status and are at high risk. Therefore, a buffer of 20km from this location was generated.	Very high (4)	96 352.2	13.93
Threats to Cape vulture	There are various threats to Cape vultures including power lines and habitat transformation. Power line threat is through collision and electrocution. Land use changes that include livestock agricultural practices can attract vultures to areas previously not monitored. To determine areas around powerlines that should be monitored for bird collisions, buffered powerlines by 200m within 50km of the colony. This will determine where new or additional powerline markers need to be fitted. Livestock agricultural practices were mapped using the census conducted between 2019 and 2021 by the Western Cape Department of Agriculture that indicated density in number of animals per square kilometre.	Medium (2)	27 890.9	4.03
Threat to southern right whale	Various external factors pose a threat to the southern right whales. These threats include disturbances such as noise pollution (Denel tests), chemical and plastic pollution, seismic exploration surveys, collisions, and entanglements. Part of the Agulhas Bank Nursery Area (EBSAs) plots within this area.	Medium (2)	117 105.0	16.93
National Parks	All the adjacent national parks have a positive influence and were included in the zone of influence. Agulhas National Park is adjacent to De Mond.	Low (1)	18 102.6	2.62

Feature	Criteria	Rating	Zone area (ha)	% of zone
Stewardship sites and Private nature reserves	Stewardship sites and verified private nature reserves (6 sites) that have direct land- and/or water management responsibilities and that contribute to protected area values and appropriate protected area design (connectivity and extent) were selected.	Low (1)	7 310.0	1.06
Areas identified in PAES	Areas identified for the protected area expansion were included.	Low (1)	23 944.3	3.46
Conservancies and Special Management Areas.	One conservancy and one Special Management Area were established within the buffer area of the GDHC. These areas include Nuwejaars Wetlands SMA, and Lower Breede River conservancy.	Low (1)	79 788.0	11.53
Coastal areas and MPAs	MPAs have a direct aquatic fauna and coastal ecosystems management responsibility and contribute to the overall PA value and design. The proposed MPA of 3km (minimum 1.5 nautical mile) for Heuningnes (De Mond) and 1km (minimum 0.5 nautical mile) for Waenhuiskrans haven't yet been declared or notice submitted but are included for completeness. The aim is to start discussion that could result in fishery closures for inshore trawlers for instance around the mouth of the Heuningnes and protection of the reef off Waenhuiskrans.	Medium (2)	3 013.7	0.44

The zone of influence for the GDHC has a total extent of 691 706.9 hectares (Appendix 1, Map 15). Ratings that featured of high to highest threat to the GDHC from a terrestrial aspect include the potential effect from renewable energy developments, notably, windfarms in the surrounding Overberg on the bat populations and Cape vulture colony on De Hoop when they fly and forage outside the protected area. In addition, the rating for overhead linear infrastructure i.e. powerlines are also high due to the direct mortalities they cause of Cape vulture outside of De Hoop. Infestation by IAPs surrounding the protected area was only on concern for De Mond but was considered high in rating due to the significant of the impact. As most of the fires originate on De Hoop itself and the De Hoop Vlei forms a barrier to fires from the west, the fire hazard in the zone of influence was considered of medium effect to the GDHC.

From a marine aspect, illegal resource use is having the greatest negative effect on the MPA, with a high level of activity concentrated on the eastern- and westernmost boundaries.

Approximately 15% of the zone of influence is positively impacted by national parks, a conservancy, a special management area, stewardship sites, climate change corridors and private nature reserves.

7 ACCESS AND FACILITIES

This section describes infrastructure and procedures necessary for management of the GDHC, inclusive of operations and visitors. It provides information on access facilities, operational facilities, control measures as well as commercial and community use.

7.1 Public Access and Management

The De Hoop Main Gate (Fig. 7.1) and the Potberg Gate serve as the entry points for the public to access De Hoop.



Figure 7.1: De Hoop Main Gate entrance (Photo: Mark Williams)

Unauthorized entry occurs in the eastern sector via Sandhoogte and Infanta. Boats are allowed to traverse the MPA, but all fishing gear must be stowed, due to the declaration of the MPA as a no-take zone. Sandhoogte, Witklip and the Denel OTR gates are management entries.

De Mond has one controlled access gate at De Mond public entrance (Fig. 7.2) and Waenhuiskrans has uncontrolled access.



Figure 7.2: De Mond entrance (Photo: Mark Williams)

Access gates are manned by CapeNature officials, except the De Hoop Main Gate, which is manned by De Hoop Collection as per the service level agreement. All visitors are required to adhere to the designated tourist roads. Accommodation facilities are solely for overnight guests, and management tracks are indicated with no entry signs. Public access points to the GDHC are listed in Table 7.1 and illustrated in Appendix 1, Map 16 (De Hoop) and Map 17 (De Mond and Waenhuiskrans).

Table 7.1: Managed public access points to the GDHC

Locality	Name	Type of Access	Activity
De Hoop	De Hoop Main Gate	Vehicle access with control gate	Hikers, tourists, researchers, management and filming.

De Hoop	Potberg Gate	Vehicle access with control gate	Hikers, tourists, researchers, management and filming.
De Hoop	De Hoop Opstal airstrip	Light aircraft and helicopters. Unpaved rough landing strip. Uncontrolled.	Visitor access and management activities
De Hoop	De Hoop Opstal helipad	Helicopters	Visitor access and management activities such as aerial game counts,
De Mond	De Mond Gate	Vehicle access with control gate	Hikers, tourists, researchers, management and filming.

Demarcated coastal access points are listed in Table 7.2 and illustrated in Appendix 1, Map 17.

Table 7.2: Demarcated coastal access points within the GDHC

Locality	Name	Type of Access	Activity
De Mond	Waenhuiskrans	Vehicular and Pedestrian uncontrolled access	Low key recreation (birding, hiking, swimming, diving, marine resource utilisation)

7.2 Airfields and Flight Corridors

Section 47 of the NEM: PAA stipulates prescriptions for the use of aircraft in a world heritage site. A legal no fly-zone restriction of 2 500 feet (762 m) exists above all special nature reserves, national parks, and world heritage sites. No flights without authorisation from the management authority (CapeNature), except emergency and management flights, are allowed over the GHDC. One unpaved airstrip for light aircraft is located at De Hoop Opstal. All flights are conducted in accordance with civil aviation regulations and the requirements of FAR 147 Overberg, which is a military airspace controlled by Air Force Base Overberg. A helicopter landing pad is located at De Hoop Opstal, which is utilised by visitors, tourists, and management. The airstrip and helicopter landing pad are illustrated in Appendix 1, Map 16.

7.3 Facilities for Vessels

Vessel storage facilities are located at the offices of both De Mond and De Hoop. The boat store at De Hoop houses the 8.6-metre vessel named Carcharodon, and the boat store at De Mond houses a 2-metre inflatable vessel for estuary monitoring. The De Hoop vessel is primarily launched from the slipway at Mudlark, though Struisbaai harbour has been utilised occasionally.

7.4 Administrative and Other Facilities

Existing infrastructure within the GDHC includes jeep tracks, hiking trails, fences, firebreaks, signage, operational and visitor facilities, water reticulation, and electrical systems. Infrastructure will require periodic maintenance and/or upgrades during the time span of this management plan. This infrastructure maintenance list is not exhaustive. Infrastructure for the GDHC is illustrated in Appendix 1, Map 18 (De Mond and Waenhuiskrans), Map 20 (infrastructure of the PPP and Denel OTR within De Hoop) and Map 21 (CapeNature managed infrastructure on De Hoop including the Whale Trail).

Infrastructure and associated building maintenance requirements are captured and managed in the GDHC's infrastructure registers for implementation. The CapeNature User Asset Management Plan, administered in collaboration with the Department of Transport and Public Works is updated annually.

De Hoop and De Mond clusters are currently managed as two separate reserves. The management works closely together and tasks such as coastal CWAC, game counts, etc. are conducted using staff from both components.

The Concept Development Plan (CDP) outlined in Section 9, along with the related zonation scheme and strategic framework, provide guidance for the proposed infrastructure development throughout the planning period. Key areas of focus encompass infrastructure assessment, environmental scoping, and land use recommendations aimed at defining environmentally sustainable development alternatives.

7.4.1 Roads and Jeep Tracks

The variety of access roads in the GDHC range from tarred, gravel, and unsurfaced 2x4 and 4x4 tracks, as well as tracks with concrete strips or double Armour flex. Redirecting roads that are in seasonally wet areas should be considered whenever possible and the redundant roads rehabilitated.

Road maintenance in De Hoop remains the responsibility of CapeNature. Road maintenance outside of concession areas is not covered by agreements pertaining to PPP, unlike that for the management of tourism amenities.

A suitable gravel or tar surface and proper maintenance are essential for De Hoop's roads that are frequently utilised by visitors. The development of the Lekkerwater Lodge and future development plans of Whale Trail necessitates road upgrades to allow access to 2x4 vehicles for management and visitors. It is therefore recommended to invest in surfacing roads with gravel and the use of Armorflex concrete blocks or concrete strips. Erosion control in the form of drainage pipes and channels must be installed and regularly serviced to prevent water from causing excessive damage.

The 40 km/h speed restriction on internal roads will be enforced using signs and speed-calming techniques. Gate hours for visitor entry are from 07:00 to 18:00 at the De Hoop Main Gate and 07:30 to 16:00 at Potberg. The De Mond gate entry for visitors is from 07:30 to 16:00 during weekdays and 07:30 to 17:00 on weekends.

A short section of the De Mond entrance is paved, with plans to extend the paving for approximately 280 metres. This will aid in the servicing of management areas that are occasionally flooded due to poor drainage. The entrance to Waenhuiskrans, including the public parking area of Roman Beach, is partially gravelled. A further 1.1 km of proclaimed public road forms part of the entrance, but it is in a dire state due to the lack of maintenance by the district municipality. The remaining jeep tracks within De Mond and Waenhuiskrans can only be accessed by 4x4 vehicles due to their sandy characteristics. These are intended for management purposes only, but illegal use is common in the Waenhuiskrans section due to uncontrolled access.

7.4.2 Hiking trails

De Hoop is home to the world renowned five-day, 57-kilometre Whale Trail (Fig. 7.3) and the 4.5-kilometre Klipspringer Trail. Visitors to Potberg can hike approximately one hour to the Cape vulture viewing deck or it can be arranged as a guided hike by De Hoop Collection. Mountain biking routes are available at Opstal and are listed as permitted activities on the PPP Activity Plan.

De Mond has two hiking trails namely Sterna Trail, which is a 7-kilometre circular trail and the two-day Damara trail, with a total distance of 16.5-kilometres. The Sterna Trail is in the western sector of the reserve, where hikers enjoy access to the western banks of the Heuningnes Estuary, the beach and dunes. Sensitive vegetation is protected by boardwalks adjacent to the estuary for both trails. Damara Trail takes hikers along the eastern sector of the reserve and concludes in the Waenhuiskrans section. Hikers spend their first evening at the overnight beach shelter inside De Mond and continue with a 11.5-kilometre hike to Waenhuiskrans on day two.



Figure 7.3: Various sections of the De Hoop Whale Trail (Photo: Mark Williams)

7.4.3 Buildings

Buildings of the GHDC are designed and utilised for operations, tourism and staff accommodation. and maintained by CapeNature.

Various buildings are located on De Hoop and include the following: the Potberg section has a gatehouse, the management building, various ablution facilities for visitors and staff, Potberg eco-venue, Kliphuis, Whale Trail accommodation from Potberg to Vaalkrans, and staff accommodation.

The De Hoop Opstal section has two research houses utilised by CapeNature, including a garage section that will be converted into staff standby quarters. All other buildings, including the De Mond house and Melkkamer homestead are managed and maintained by De Hoop Collection. Management of these facilities is encompassed in the PPP Agreement

Koppie Alleen boasts two luxury guesthouses namely Ocean House and Beach Lodge, one restaurant and ablution facilities. Similarly, Lekkerwater Beach Lodge has seven visitor accommodation units, one restaurant exclusive to their guests and staff accommodation. Both these facilities are managed by De Hoop Lodges (Pty) Ltd as per PPP Agreement.

The facilities at De Mond include a gatehouse, a management office, one guest cottage, one overnight beach shelter, manager house, picnic sites, public toilets and numerous storerooms for management purposes.

Waenhuiskrans' infrastructure consists of a navigational beacon, concrete steps which provide access to the beach, an unofficial parking lot, and restrooms near the Roman Beach parking area and the structures on Erf 252 in Arniston. Waenhuiskrans is home to a reservoir that supplies water to the town. For maintenance and site access, a servitude in the name of the Cape Agulhas Municipality is registered. Numerous memorial benches have been installed without environmental authorization or CapeNature's consent.

7.4.4 Fences

De Hoop is partially fenced along its boundaries. This is evident along the eastern sector, north and east of Potberg Mountain. The fences that are present are outdated and in disrepair, resulting in certain animals such as Cape mountain zebra and eland escaping and entering private property.

The security requirements of Denel OTR necessitated fencing the boundary between Denel OTR and CapeNature west of the De Hoop Vlei during the year 2014. Game such as eland and Cape mountain zebra is still able to move around the fenced area via the dune field to the south, increasing the natural game movement area. Also, there is no boundary fence across the top end of the De Hoop Vlei, which allows domestic stock onto De Hoop and game animals to move off the reserves when the Vlei is low.

The boundary fences surrounding De Mond are well-maintained. Adjacent landowners who have reintroduced game to their properties ensure that the fences are kept in good condition. Sections towards the highwater mark are not fenced. Fence maintenance for both De Mond and De Hoop clusters are conducted in accordance with the yearly maintenance schedule and integrated into the annual operational plan.

7.4.5 High sites

The summit of Potberg Mountain is utilized as a prime location for a CapeNature radio repeater and the equipment of a private company. In 2015, Vodacom constructed a cellular transmission station on the site. Denel OTR utilizes and oversees two additional locations within Hamerkop and Infanta, which are fully enclosed. CapeNature monitors all high sites for negative environmental impacts and illegal structures on an annual basis. High sites impact on the scenic landscape and on rare and threatened plant species found only in high altitude areas. A decision has been taken that no new sites will be considered for communication masts or structures.

7.4.6 Signage

Signage is positioned at primary vehicle and hiking entryways to the GDHC (Fig. 7.4 and Fig. 7.5 below), meeting the regulatory and safety criteria set by CapeNature and health and safety guidelines. Interpretation boards are on display in the Whale Trail huts and other tourism and visitor gathering points, such as Koppie Alleen. Further signage will be installed where needed in accordance with CapeNature standards. A comprehensive register is maintained to document all signage.



Figure 7.4: MPA signage at the De Hoop Main Gate and Potberg entrances (Photos: Mark Williams)



Figure 7.5: De Hoop Vlei signage depicting Ramsar status and permitted activities (Photo: Mark Williams)

7.4.7 Utilities

7.4.7.1 Water supply

De Hoop relies primarily on boreholes to supply water for infrastructure across various sites. To prevent wastage, it is important to implement water-saving measures. While Noetsie, Hamerkop, and Cupidoskraal sites have access to natural streams, Potberg location treats water through chlorination and filtration processes. Regular maintenance of water systems is crucial for optimal performance. Water usage at tourism facilities is regulated based on the PPP management plan, which monitors consumption to ensure sustainability. Caution must be exercised when extracting water from boreholes near the coast to prevent over-abstraction and seawater intrusion.

There are ten functional boreholes on De Hoop. Two boreholes can be found in the Potberg section, one for agricultural use by Niel Neethling, one for Potberg infrastructure; and one borehole is at the Vaalkrans hut for use by the Whale Trail and seven boreholes are located within the PPP concessionaire area (De Hoop Collection x 5, Lekkerwater x 1 and Morukuru x 1). The Cupidoskraal, Noetsie and Hamerkop accommodation on the Whale Trail abstract surface water for use.

De Mond obtains water from one borehole, which is not safe for human consumption. It is imperative to explore and implement suitable filtration and treatment measures. The management office, manager house and storerooms harvest rainwater. Water is supplemented with borehole water during warmer months, when water supply runs low.

7.4.7.2 Electricity supply

The main energy source on GDHC is electricity from Eskom. Solar panels are installed at the Whale Trail huts to generate electricity for lighting and operating the Clarus Fusion sewerage treatment facilities. Morukuru and Lekkerwater, two of the PPP operations, rely solely on solar energy, with only De Hoop Collection making use of the Eskom electricity supply. Diesel generators are used as backup power supply, in the event of power outages or limited energy supply.

7.4.7.3 Waste management

There are no waste disposal facilities located within the GDHC. All waste generated is transported and properly disposed of at the municipal refuse site in Bredasdorp. Primate proof dustbins are mandatory at all camping and picnic areas within De Hoop. Open dustbins are strictly prohibited. Household garbage is stored indoors until it can be taken to a designated refuse collection area.

In 2002, a biolytic sewerage system was constructed at the De Hoop Opstal to manage all sewerage produced at the site. The wetland was replanted, and the system is enclosed. The sewerage systems at Potberg, Melkkamer, Koppie Alleen, and De Mond consist of old septic tank and soak away systems.

In 2020, upgrades were made to the sewerage systems of the three coastal huts, Noetsie, Hamerkop, and Vaalkrans along the Whale Trail. Clarus fusion systems were installed and are serviced every six months as per the service level agreement with the supplier.

7.4.7.4 Visitor facilities

CapeNature has formed PPP agreements to enhance and improve tourism offerings at De Hoop. These agreements have led to the establishment of concessions to oversee Opstal, Koppie Alleen Ocean House and Beach Lodge, Vlei Spa and Lodge, Melkkamer Weddings and Conferences, Melkkamer Manor, and Whale Watch Café. Future development plans are in place for Whale Trail 2 and Wyoming.

Potberg has an eco-venue with the capacity to cater for 65 overnighting guests, and the Whale Trail accommodates 12 guest per hut.

De Mond currently has one overnight beach shelter and one guest cottage. Future development plans include additional overnight units to accommodate approximately 24 guests, new staff quarters, relocation of the current office and parking for overnight guests as per the CDP.

7.5 Commercial Activities

Outdoor enthusiasts are drawn to the GDHC because of its scenic beauty. The PPP offers basic to luxury accommodation, and a variety of activities such as guided marine walks, mountain biking, whale watching, sunset boat cruises on the Vlei, birding, and game drives. Additionally, the annual Whale of a Trail running event attracts participants from across the country to complete the challenging 57 km run in a single day.

A service level agreement with De Hoop Collection is currently in effect for gate guarding at the main gate. Top N Nos has established a service level agreement with CapeNature to clean the Whale Trail huts. Sebastian`s Transport entered into a memorandum of agreement with CapeNature for a three-year period, to provide transportation for Damara Trail hikers from Waenhuiskrans to De Mond.

Table 7.3 lists the commercial activities and management agreements applicable to the GDHC.

Table 7.3: Commercial activities and management agreements applicable to the GDHC

Date of Agreement	Type of Agreement	Partner	Duration of Agreement (years)	Area Affected	Conditions of use
02/12/2009	Public Private Partnership	De Hoop Opstal (Pty)Ltd.	45 Years	Opstal	All terms and conditions as set out in the PPP Agreement
02/12/2009	Public Private Partnership	Vlei Lodge and Spa (Pty)Ltd	45 Years	Opstal	All terms and conditions as set out in the PPP Agreement
02/12/2009	Public Private Partnership	Melkkamer Weddings and Conferences (Pty)Ltd	45 Years	Melkkamer	All terms and conditions as set out in the PPP Agreement
02/12/2009	Public Private Partnership	Melkkamer Manor (Pty)Ltd	45 Years	Melkkamer	All terms and conditions as set out in the PPP Agreement
02/12/2009	Public Private Partnership	Koppie Alleen Coastal Lodge (Pty)Ltd	45 Years	Koppie Alleen	All terms and conditions as set out in the PPP Agreement

Date of Agreement	Type of Agreement	Partner	Duration of Agreement (years)	Area Affected	Conditions of use
02/12/2009	Public Private Partnership	Koppie Alleen Cottage (Pty)Ltd	45 Years	Koppie Alleen	All terms and conditions as set out in the PPP Agreement
02/12/2009	Public Private Partnership	Whale Watch Cafe	45 Years	Koppie Alleen	All terms and conditions as set out in the PPP Agreement
26/09/2016	Public Private Partnership	Beach Lodge at De Hoop (Pty)Ltd	45 Years	Lekkerwater	All terms and conditions as set out in the PPP Agreement
16/10/2023	Service Level Agreement	Top N Nos CC	5 years	Whale Trail huts	Service Level Agreement
27/09/2024	MOA	Sebastian`s Transport	3 years	De Mond	As per MOA
01/04/2024	Service Level Agreement	De Hoop Opstal (Pty)Ltd.	2 Years	De Hoop main gate	All terms and conditions as stated in the Service Level Agreement

7.6 Community Use

One community activity currently exists for natural resource utilisation on De Hoop, namely invasive alien plant harvesting for wood. It should be noted that agreements were entered into between CapeNature and five independent contractors. The five woodcutters MOUs are valid and have been extended to 31 March 2028. The contractors are eligible to sell the harvested wood and are entitled to the proceeds of such sale. This livelihoods project will be expanded to include another three new contractors in the future.

Rooikrans (*Acacia cyclops*) is currently the species with the highest market value and therefore independent contractors tend to be interested in compartments with higher levels of infestation. Although CapeNature does not profit monetarily from the MOUs with the contractors, each contractor is required to provide CapeNature with a predetermined quantity of wood each month, which is used by the eco-venue and tourism facilities (Fig. 7.6).



Figure 7.6: One of the independent contractors supplying the monthly wood allocation to the CapeNature (Photo: by Mark Williams)

Women from the Waenhuiskrans community have traditionally harvested sour figs to make jam. Since the local community finds cultural and historical significance in the harvesting of sour figs, the activity is intended to preserve heritage rather than the pursuit of commercial profit. This access is granted in line with CapeNature's Sustainable Utilization policy, when the interested parties apply for a sour fig harvesting permit.

Community management agreements are listed in Table 7.4.

Table 7.4: Community activities and management agreements applicable to the GDHC

Date of Agreement	Type of Agreement	Community	Duration of Agreement (years)	Resource utilised	Conditions of use
Original agreements were signed on 15/06/2022 with a 3-year extension granted in 2025	MOU	Bredasdorp	3	Rooikrans (*Acacia cyclops*)	Refer to MOU
	MOU	Bredasdorp	3	Rooikrans (*Acacia cyclops*)	Refer to MOU
	MOU	Swellendam	3	Rooikrans (*Acacia cyclops*)	Refer to MOU
	MOU	Bredasdorp	3	Rooikrans (*Acacia cyclops*)	Refer to MOU
	MOU	Bredasdorp	3	Rooikrans (*Acacia cyclops*)	Refer to MOU

7.7 Servitudes

Several servitude and management agreements are registered on properties in the GDHC. Conditional access regulated through servitudes includes agreements with the municipalities, neighbouring landowners for water user-rights, pipelines, powerlines, and access for infrastructure maintenance.

Informal servitudes have been identified on investigation and facilitation processes are currently underway to bring these servitudes into legislative alignment. Pipelines, boreholes and telecommunication structures have been identified which would require a servitude/agreement, but do not have the necessary supporting documentation.

All registered and known servitudes are listed in Table 7.5. below.

Table 7.5: Servitudes and formal agreements applicable to the GDHC

Date of Agreement	Type of Agreement	Partner	Duration of Agreement (years)	Area Affected	Conditions of use
Agreement revoked 02/08/2022	Fixed term conditional permit to traverse De Mond by vehicle on track from the office to the beach to access the sea for fishing.	Mrs A Scholtz	Ended 31 October 2018.	De Mond on route as described in agreement.	Agreement revoked.
06/12/2009	Private conditional access to the reserve.	Let's Go Farming CC (Vogelgesang Farm).	In perpetuity	De Mond	Footpath access
13/03/1940	The property may not be leased or disposed of without the consent of the owners of the remainder nor shall any building be erected thereon for business or trade except with the consent of the said owner	Let's Go Farming CC (Vogelgesang Farm). (Successors in title of the remainder of Farm 269)	In perpetuity	De Mond Portion 3 of the farm 269. This does not include the development zone, portion 4.	Future development consent
Unknown	Servitude to build and maintain a water reservoir for water provision to the residential area of Waenhuiskrans.	Cape Agulhas Municipality	In perpetuity	De Mond: Waenhuiskrans	Municipal water reservoir
Unknown	Public road for entering the Waenhuiskrans by vehicle or by foot.	General public	In perpetuity unless de-proclaimed by the minister	De Mond: Waenhuiskrans	Public road
29/6/1962	Title deed condition: The strip of ground between the	General public	In perpetuity	Waenhuiskrans (Erf 171 portion of erf 115 Arniston)	Public access to coast

Date of Agreement	Type of Agreement	Partner	Duration of Agreement (years)	Area Affected	Conditions of use
	high-water mark and the brown line (indicated on the original diagram) is 200ft (appr. 63 m.) and is open to the use of the public.				
Unknown	Lighthouse and access Servitude	Transnet National Ports Authority	In perpetuity	De Hoop: Uiterstepunt and access from San Sebastian	Road and lighthouse access
09/10/2009	Tourism PPP	De Hoop Collection (Pty) Ltd.	45 years.	De Hoop Opstal, Koppie Alleen, Melkkamer and Die Mond	As per concession agreement
09/10/2009	Tourism PPP	De Hoop Collection (Pty) Ltd.	45 years.	De Hoop: Whale Trail 2	As per concession agreement
09/10/2009	Tourism PPP	De Hoop Collection (Pty) Ltd.	45 years.	De Hoop: Lekkerwater Lodge	As per concession agreement
Unknown.	Powerlines Servitudes	Eskom	In perpetuity	De Hoop: 1. Infanta instrumentation site to Lighthouse. 2. Game camp boundary to Potberg management area 3. Main Gate to De Hoop Opstal	Road access and powerlines (11Kva)
20/08/1991	Land Use Agreement Inter departmental agreement for weapons testing	Denel OTR	10-year with subsequent renewals	De Hoop: Eastern sector of the reserve	Operational Management Agreement
13/10/2003	Protocol for Weapons Tests Affecting Dual Use Areas of De Hoop	Denel OTR	Dependant on validity of the Land Use Agreement	De Hoop: Eastern sector of the reserve as well as Melkkamer and the De Hoop Vlei area	Operational Management Agreement
30/06/2009	Addendum to the Land Use Agreement.	Denel OTR	Dependant on validity of the Land Use Agreement	Melkkamer	Operational Management Agreement
18/06/2002	Memorandum of agreement. Booking	Green Family	In perpetuity	Lekkerwater	Preferential reservations agreement

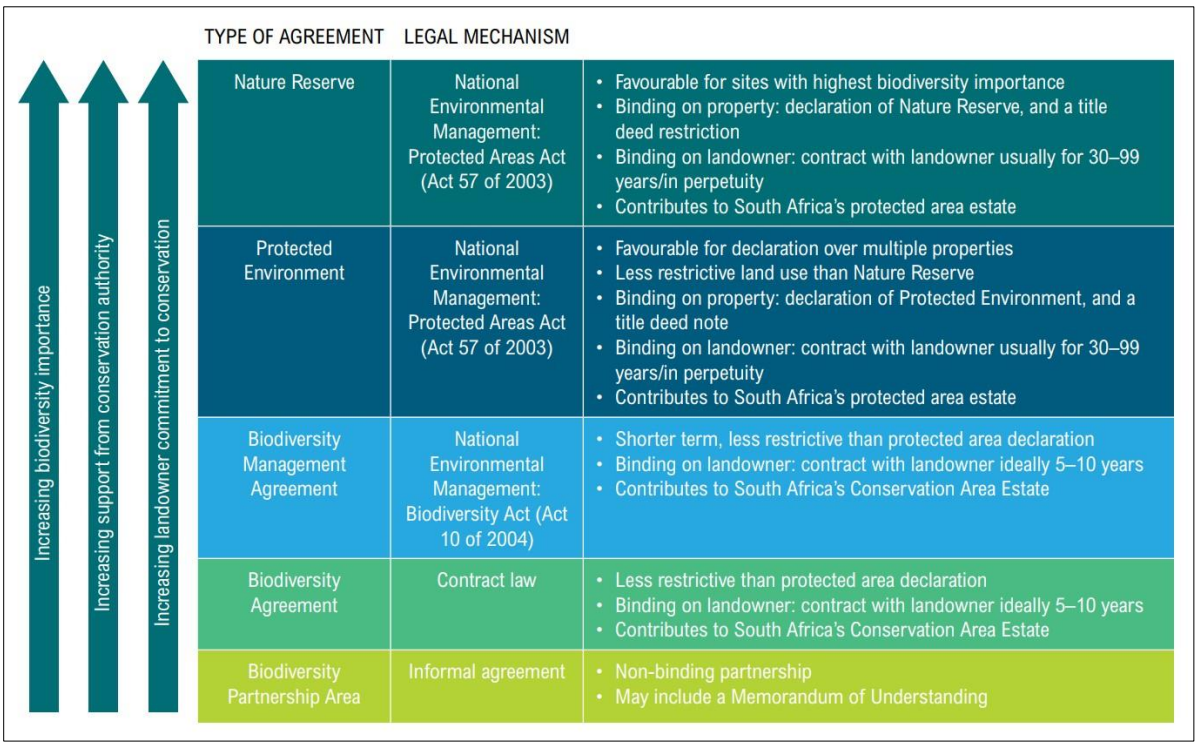
Date of Agreement	Type of Agreement	Partner	Duration of Agreement (years)	Area Affected	Conditions of use
	preference for Lekkerwater				
09/07/2013	License to use high site for communication equipment	Vodacom	Annually renewable	Potberg high site and road to highest point	Operational Management Agreement

8 EXPANSION STRATEGY

Within South Africa, the expansion of protected areas is informed by the National Protected Area Expansion Strategy (NPAES) (DEA 2016b). This strategy provides a broad national framework for protected area expansion in South Africa by identifying large areas which should be targeted for formal declaration and by introducing a suite of mechanisms which could aid in achieving this.

In response to the NPAES, CapeNature has produced a Western Cape Protected Area Expansion Strategy (WCPAES) and Implementation Plan 2021-2025 (CapeNature 2021c). This strategy addresses the formal declaration of priority natural terrestrial, freshwater, and estuarine habitats in the Western Cape as protected areas to secure biodiversity and ecosystem services for future generations. The Conservation Action Priority map is a spatial representation of the WCPAES. Priority expansion areas have been identified through a process of systematic conservation planning as part of the WCBSP (Pool-Stanvliet *et al.* 2017) and include sites that contain CBAs (Pence 2017). Protected area expansion within the GDHC's zone of influence will be guided by the WCPAES and the associated CAP map.

Stewardship refers to the wise use, management, and protection of that which has been entrusted to someone or that is rightfully theirs. Within the context of biodiversity conservation, stewardship means protecting important ecosystems, effectively managing natural veld, removing invasive alien species, managing fires to promote species diversity, and using water resources sustainably and equitably. There is a selection of stewardship options available that range from informal agreements to full legal protection (Pence 2017) (Figure 8.1).



TYPE OF AGREEMENT	LEGAL MECHANISM	
Nature Reserve	National Environmental Management: Protected Areas Act (Act 57 of 2003)	• Favourable for sites with highest biodiversity importance • Binding on property: declaration of Nature Reserve, and a title deed restriction • Binding on landowner: contract with landowner usually for 30–99 years/in perpetuity • Contributes to South Africa's protected area estate
Protected Environment	National Environmental Management: Protected Areas Act (Act 57 of 2003)	• Favourable for declaration over multiple properties • Less restrictive land use than Nature Reserve • Binding on property: declaration of Protected Environment, and a title deed note • Binding on landowner: contract with landowner usually for 30–99 years/in perpetuity • Contributes to South Africa's protected area estate
Biodiversity Management Agreement	National Environmental Management: Biodiversity Act (Act 10 of 2004)	• Shorter term, less restrictive than protected area declaration • Binding on landowner: contract with landowner ideally 5–10 years • Contributes to South Africa's Conservation Area Estate
Biodiversity Agreement	Contract law	• Less restrictive than protected area declaration • Binding on landowner: contract with landowner ideally 5–10 years • Contributes to South Africa's Conservation Area Estate
Biodiversity Partnership Area	Informal agreement	• Non-binding partnership • May include a Memorandum of Understanding

Figure 8.1: Stewardship options available to private landowners

Due to limited expertise and resources, the current WCPAES and implementation plan does not highlight priority marine areas for expansion, nor does it address appropriate mechanisms to be applied in marine environments. The NPAES, however, does provide guidance when considering areas for MPA expansion. This will be addressed in future iterations of the WCPAES and WCBSP.

The priority conservation habitat map (Appendix 1, Map 22) depicts the GDHC in relation to protected areas, including contractual stewardship sites, and aquatic and terrestrial CBAs in the area. Table 8.1 provides a summary of existing and potential protected area expansion initiatives within the GDHC's zone of influence.

Table 8.1: Stewardship sites and other protected area expansion initiatives located within the GDHC zone of influence

Site Name	Hectares	Protection Status
Haarwegskloof	544	Contract Nature Reserve - Active
Kleiheuwel	2 725	Contract Nature Reserve - Active
Agulhas National Park	26 075	National Park – Active
Nuwejaars Special Management Area (SMA)	42 009	SMA with all landowners having signed title deed restrictions which commit to conservation and sustainable farming.
San Sebastian Private Nature Reserve	1 163	Private Nature Reserve – Landowner not interested in taking part in the verification and validation project for PNR's.
Heuningnes River Private Nature Reserve	292	Private Nature Reserve – Landowner not interested in taking part in the verification and validation project for PNR's.
Andrews Field Private Nature Reserve	979	Private Nature Reserve – Landowner was not interested in taking part in the verification and validation project for PNR's.
Bosbokstrand Private Nature Reserve	963	Private Nature Reserve – Property falls within the Nuwejaars Special Management Area.
Brandfontein/Rietfontein Private Nature Reserve	697	Private Nature Reserve – Property now falls within the Agulhas National Park boundary.
De Walle Private Nature Reserve	4	Private Nature Reserve – Property now falls within the Agulhas National Park boundary.
Lower Breede River Conservancy	32 794	Conservation Area – Not active

The GDHC is part of a network of conservation areas. The conserved areas range from a national park, provincial nature reserves, local authority nature reserves, private nature reserves, stewardship sites, and conservancies. The four main terrestrial land parcels and MPA managed by CapeNature that make up the GDHC are separate from each other in the landscape except for the MPA adjoining De Hoop. De Mond, Soetendalsvlei, Waenhuiskrans, De Hoop and MPA are buffered to an extent by the private nature reserves, Nuwejaars SMA, Denel OTR and the Lower Breede River conservancy. The GDHC has further potential to form part of various landscape and seascape corridors through stewardship and other conservation mechanisms. Corridors help mitigate the effects of climatic changes providing opportunities for species movement and adaptation in the long-term.

The GDHC is part of the landscape-based Agulhas Biodiversity Initiative being supported and implemented through various communities, landowners, NGO's, agri-industries and CapeNature. This initiative presents an opportunity to link with role players and expand the conservation estate by building on the conservation gains of the various roll players using stewardship or other conservation mechanisms. Important biotic and abiotic corridors can collectively be managed for biodiversity conservation and ecosystem goods and services from both the terrestrial and marine environments.

The Table Mountain Fund identified three climate change adaptation corridors (Pence 2009) within the Overberg landscape directly linked to the land parcels that make up the GDHC namely, the Ruens silcrete hills to De Hoop Vlei is the first corridor. Swellendam mountains to Potberg which follows

the Breede River and connects with Bontebok National Park, is the second corridor. The third corridor is from the Klein River mountains via the Salmonsdam mountains to De Mond and Agulhas national park.

A further connection between the four terrestrial GDHC land parcels is partly established through the Denel OTR property bringing De Hoop closer to Waenhuiskrans, with the Nuwejaars SMA linking De Mond and Soetendalsvlei. The Agulhas National Park has expanded and now partially surrounds Soetendalsvlei. Private nature reserves are scattered in between that further assist in establishing links including Andrewsfield towards Soetendalsvlei and Heuningnes river private nature reserve north of De Mond along the river. The Heuningnes river originating partially from Soetendalsvlei links the Vlei to the Heuningnes Estuary and forms an important corridor. The Heuningnes Estuary divides De Mond in two sections. San Sebastian private nature reserve is adjacent to the eastern boundary of De Hoop.

Connectivity between the MPA, the Breede River Estuary, San Sebastian Bay, Duiwenhoks and Gouritz Estuaries has been shown to exist based on the results of marine species telemetry work being carried out by South African Institute for Aquatic Biodiversity and DFFE. The proposed expansion of the MPA into these areas is a process which will be driven by DFFE, with the support from CapeNature plus partners and is in line with the White Paper on Conservation and Sustainable Use of South Africa's Biodiversity Implementation Plan for Target 3 (30x30) of the Global Biodiversity Framework.

The focus areas for future expansion for the GDCH include:

1. Supporting the establishment of stewardship sites within the three Table Mountain Fund corridors linked to the GDHC.
    a. Ruens silcrete hills to De Hoop Vlei (referred to as the Sout River corridor in the annual Landscape South Protected Area Expansion Implementation plan (CapeNature 2024a).
    b. Swellendam mountains to Potberg (referred to as the De Hoop to Bontebok National Park corridor in the Landscape South Protected Area Expansion Implementation plan).
    c. Klein River mountains to De Mond and Agulhas.
2. The securing of priority areas that are located between De Mond and Waenhuiskrans through formal stewardship or other conservation mechanisms.
3. That Denel OTR follow conservation principles and is managed largely as a conservation area. The property is situated on the western boundary of De Hoop and forms an important buffer and extension of shared larger game populations and consideration should be given to explore formal stewardship status for the Denel OTR properties.
4. Working towards incorporating a piece of unregistered state land in the middle of the Heuningnes River and just north of De Mond as part of the GDHC. This property needs to be vested with CapeNature and proclaimed as part of the De Mond section of the GHDC.
5. Future working with DFFE to pursue appropriate mechanisms for enhanced protection and management of the MPA by including the Breede River mouth area and San Sebastian Bay for shark and ray conservation.

9 CONCEPT DEVELOPMENT PLAN

The concept development plan sets out the long-term plan for the development of the GDHC in keeping with its purpose and with due consideration for its sensitivity and zonation (sections 5.7 and 6.3).

Tourism products and related infrastructure developments in CapeNature are considered investments and are intended to:

- Harness and enhance the income generation potential of protected areas with a view to achieving long term business sustainability.
- Provide safe, informative and purpose-built access to protected areas.

- Enhance the operational efficiency and management of protected areas.

9.1 Project Selection

Organisationally, potential tourism product developments are selected based on internal consultation and approval where factors such as appropriateness, environmental authorisation, financial feasibility, and the apparent return on investment are considered. Where external approvals for developments are required, these are sought from the relevant authorities prior to the commencement of any development activities (Figure 9.1).

CapeNature may elect to operate tourism products and services internally, or via other mechanisms described in the Public Finance Management Act, 1999 (Act No.1 of 1999) such as concessions or public private partnerships.



Figure 9.1: CapeNature's Concept Development Plan Framework

9.2 Methodology

Tourism products and infrastructure within CapeNature protected areas are designed to be sensitive to their locations and are intended as prime examples of responsible and sustainable commercial developments. Examples include off-grid bulk water and energy services, passive design efficiencies and enhanced resource utilisation and resource-saving features. Tourism developments aim to comply with prevailing zonation schemes and sensitivity analysis unless approval to the contrary has been obtained.

Wherever possible, tourism products, developments and services are intended to provide training and employment opportunities to communities within and surrounding the protected area.

The Concept Development Plan for the GDHC is illustrated in Appendix 1, Map 23 (De Hoop) and Map 24 (De Mond).

9.3 Infrastructure Management and Development

De Hoop has well established existing tourism and operational management infrastructure. The tourism infrastructure is primarily being managed by private partners in terms of the PPP agreement. The current overnight accommodation is being managed by the PPP and is located mainly in the western sector of De Hoop, specifically Die Opstal precinct and the developments at Koppie Alleen. In addition to this, the Lekkerwater facility is managed as a separate agreement.

Future proposals for tourism development consist mainly of the consolidation of existing tourism development at Die Opstal, Koppie Alleen and Whale Trail 2 which are part of the PPP agreements. The new sites for Whale Trail 2 are located at Hamerkop, Mosselbank and Bloukrans. The partners continue to identify potential development of activities for guests at the overnight accommodation, including overnight hiking facilities. The Whale Trail 2 PPP Agreement makes possible the construction of new structures in Bloukrans, Mosselbank, and Hamerkop to accommodate 12 bed nights for tourists at each location.

The administration office for the management of De Hoop is located at Potberg. The well-known 5-day Whale Trail, which begins at Potberg, is the primary CapeNature tourism product on De Hoop. Additional capacity to the existing Whale Trail is proposed to enhance visitor experiences and increase revenue generation for the entity. Due to the large size of De Hoop, there is an extensive road network and related infrastructure which requires upgrades and maintenance on a continuous basis.

De Mond has existing development and tourism accommodation which is proposed to be upgraded to new tourism accommodation. The proposal was included in the previous protected area management plan however it has not yet been implemented. As with De Hoop, there is existing infrastructure which requires upgrades and maintenance.

Waenhuiskrans currently does not offer tourism accommodation with the existing facilities consisting of hiking trails. The reserve is managed from De Mond. There are however proposals for upgrading the facilities at the entrance as a partnership between CapeNature and the Cape Agulhas Municipality. The Waenhuis Villa in Arniston is set to undergo restoration for tourism purposes.

Soetendalsvlei is fully encompassed by the Soetendalsvlei waterbody and therefore there is no current or planned infrastructure while under the management of CapeNature.

9.3.1 Development nodes

The existing tourism nodes managed by the PPP are Die Opstal & Koppie Alleen located in the western sector and Lekkerwater in the eastern sector.

Die Opstal is located on the eastern shore of the De Hoop Vlei and was built through alterations to the original homestead. It was then developed into tourism and administration facilities by CapeNature before the management was taken over by De Hoop Collection in terms of the PPP agreement. Die Opstal forms the primary node for tourism accommodation and facilities for De Hoop Collection, with additional overnight accommodation at Melkkamer on the opposite side of the Vlei and at Die Mond house at the southern end of the Vlei. Both are also historical homesteads which have been redeveloped for tourism accommodation. De Hoop Collection is in the process of assessing the expansion of the existing facilities at Melkkamer in line with the development parameters within the PPP agreement.

Koppie Alleen is located along the coastline in the western sector. It is managed by the Morukuru Family and consists of two separate lodges, staff accommodation and one additional lodge included in the existing environmental authorisation for Koppie Alleen which has not yet been built. Lekkerwater which is located further east along the coastline, is accessed via Potberg and managed by Natural Selections. No expansion is proposed at Lekkerwater. Maintenance and upgrades of existing service

infrastructure are proposed within the timeframes e.g. the proposed sewage upgrade for the restaurant at Koppie Alleen.

The only proposed tourism infrastructure development project for the PPP is the Wyoming tourism accommodation which consists of the upgrade of an existing historical homestead and potentially eco-pods. Wyoming is located along the coastline between Koppie Alleen and Vaalkrans on the Whale Trail.

The primary node for CapeNature management and administration is at Potberg in the eastern sector. Apart from management and administration buildings, there is an eco-venue and staff housing located at this development node. Upgrades and regular maintenance are required for these buildings and infrastructure; however no new buildings or structures are proposed within the PAMP timeframe. The upgrade of the existing gatehouse is proposed to enhance efficiencies in the management of guests for CapeNature and the PPP at Lekkerwater.

The Whale Trail extends from Potberg administrative centre along the Potberg mountain to the coastline and then turns west and ends at Koppie Alleen. As discussed in Section 7.4.2, the Whale Trail is a world class product showcasing spectacular mountain and coastal scenery and generates the highest income of CapeNature tourism products. There are five overnight huts, namely Potberg, Cupidoskraal, Noetsie, Hamerkop and Vaalkrans.

The Whale Trail Extension is a new CapeNature tourism product which is proposed to provide additional accommodation at each of the existing overnight huts for the Whale Trail. The Whale Trail Extension will therefore allow for two separate groups of overnight hikers to use the trail simultaneously.

In addition to the Whale Trail Extension, Whale Trail 2 is proposed to be implemented by a private partner. The proposal is located to the east of the existing Whale Trail with a section of overlap. Three overnight huts are proposed, namely Hamerkop, Bloukrans and Mosselbank. A Basic Assessment process was initiated for this proposal but stalled due to the COVID 19 pandemic. The private parties have secured investors and a new process for environmental authorisation will be initiated as per the PPP agreements.

The De Hoop penguin colony, which was established as a new mainland breeding site as described in Section 2.4.5, is located at Witklippunt near to Cape Infanta. An electrified fence was built around the rocky peninsula to exclude access for potential terrestrial predators. Birdlife South Africa is the main implementer of this donor-funded project. Upgrading the existing dilapidated building at this location for conservation management use may be considered if the funds become available. There is also a proposal in progress by Birdlife for submission to CapeNature to erect a second fence around the colony to further mitigate against predation of penguins at the colony site.

Therefore, no new development nodes are proposed within the 10-year timeframe apart from overnight hiking facilities at Wyoming and Whale Trail 2.

Map 19 and Map 23 in Appendix 1. illustrate a spatial representation overview of the infrastructure developmental nodes and the Concept Development Plan for De Hoop.

The development node at De Mond is currently in existence. The proposal for the tourism accommodation was included in the previous PAMP and was updated and refined between 2020 and 2022 and presented to the DFFE in January 2023. The development footprint was however very similar to the proposal in the previous protected area management plan.

The restoration of the Waenhuis Villa, which is set to be completed in 2026, represents the most recent enhancement to the development initiatives for De Mond. On Waenhuiskrans there are

proposals to upgrade the parking area at the entrance which also functions as the parking area for Roman Beach. This includes a shop/kiosk associated with a gatehouse at the entrance.

Map 24 in Appendix 1. illustrates an overview of the infrastructure developmental nodes on De Mond.

9.3.2 Communication routes

The communication infrastructure on De Hoop and De Mond is currently in-situ, and no additional infrastructure is proposed. External service providers and entities also have communication infrastructure on De Hoop such as Denel OTR. The maintenance and upgrading of the existing infrastructure may be required, such as the road to access the Vodacom telecommunication tower on Potberg.

9.3.3 Service supply routes

Services are currently in place to serve the existing buildings and infrastructure. New services will need to be installed for new structures such as the Wyoming tourism accommodation. The proposed sewage provision for this unit is still to be finalized in consultation with CapeNature, however it will most likely consist of a self-contained mini-package plant, like those used for the Whale Trail, as the location is not suitable for serviced conservancy tanks.

The sewage tank serving the interpretation centre and restaurant at Koppie Alleen ("Bites") is currently unable to handle the sewage volumes produced by the facility. This requires more frequent servicing of the tank on a weekly basis with the trucks travelling approximately 70 km one way from Bredasdorp. If not serviced, the tank overflows resulting in negative impacts on the surrounding environment. The proposal is to either replace the existing facility with a larger capacity tank or to install a self-contained mini package plant which treats the sewage and produces small volumes of effluent which is of suitable quality for grey water or irrigation purposes. Pumping of the solid waste is only required approximately once every 10 years. The latter option has been recommended by CapeNature.

De Hoop Collection is currently investigating installation of off grid solar panels to supply electricity for their tourism products and operations. This will reduce the cost of Eskom electricity supply and in the long term be more sustainable with regards to greenhouse gas emissions and eliminate the impacts associated with electricity distribution i.e. overhead or underground power lines. The location still needs to be identified in consultation with CapeNature and should preferably be located within an existing development node.

The water provision for De Mond is currently sourced from a borehole located in proximity to the site. The water quality from the boreholes is however not up to standard. A contract has therefore been commissioned to connect to the municipal water reticulation through laying of a pipeline. Relevant environmental and other approvals will be obtained.

Apart from this, maintenance of services is ongoing, and provision needs to be made for this within this protected area management plan's timeframes.

9.3.4 Infrastructure development proposals

As referred to above, the only new tourism development proposed for De Hoop is the Wyoming Lodge. The initial proposal for Wyoming was for a double-story 7-bedroom dwelling which can sleep 14 people. This proposal may be refined and amended to a single-story upgrade of the existing building with additional eco-pods. The overnight accommodation in Wyoming forms a component of the luxury hiking trails which are being proposed by De Hoop Collection and the other tourism partners. The detailed designs are subject to approval and environmental authorisation may be necessary.

The Whale Trail 2 proposal consists of providing an additional overnight hut at each of the current overnight huts on the existing Whale Trail to increase the capacity of the number of guests where

two hiking groups can concurrently hike the trail with a total maximum of 24 hikers as opposed to 12. The additional overnight huts will provide for a different experience to the existing huts using low impact modular structures which can be assembled on site and green technology, thereby broadening the market. The location of the new huts will be in close proximity but not directly adjacent to the existing huts. This project will require environmental authorisation.

The Whale Trail 2 proposal has been revised from that which was included in the previous protected area management plan. The current proposal consists of the development of three upmarket lodge facilities at Hamerkop, Bloukrans and Mosselbank in the eastern sector. The Hamerkop location is near to an existing overnight hut for the Whale Trail, while Bloukrans and Mosselbank are located east of the Whale Trail alignment along the coast. There is an existing approval for the previous proposal. The Mosselbank and Hamerkop Lodges will each consist of six chalets with seven chalets at Bloukrans. Electricity will be supplied by solar panels and potable water will be sourced from boreholes. Sewage provision will be through a small-scale package plant system that will produce greywater to the highest standard possible. A closed fusion plant system is being considered. The Basic Assessment process for environmental authorisation will re-commence.

De Hoop is currently only partially fenced. As there are large game mammals present, they occasionally move off the nature reserve on to surrounding properties. This can be problematic as the animals periodically result in crop damage e.g. eland and results in difficulty in managing the populations of threatened mammal species in accordance with the Biodiversity Management Plan (BMP) e.g. Cape mountain zebra. Fencing of the entire De Hoop is likely to however be prohibitively expensive, but solutions for managing the movement of game are being investigated, which may include fencing of sections.

The De Hoop road network includes several sections which are prone to flooding and in some instances erosion. Apart from general road maintenance it may be necessary to upgrade or reroute sections of the roads. An example is the access road to Die Mond house and Melkkamer which is frequently inaccessible after heavy rains and associated high levels of De Hoop Vlei and compromises the accessibility of the PPP tourism products. Road upgrades and maintenance is however dependent on budget availability, which no longer falls under the responsibility of the provincial road department. The current gatehouse at the Potberg entrance to De Hoop is located approximately 800 m from the entrance and is proposed to be upgraded.

The upgrade of the De Mond tourism and administration facilities was included in the previous protected area management plan. The proposal has however been refined with the most recent development proposal dated 14 October 2022. The proposal consists of a relocation of the uses of the buildings on site which, will all be upgraded, in addition to the construction of new tourism units. The development proposal has taken into consideration the location adjacent to the Heuningnes Estuary, the associated flood lines and the height above sea level. The proposal includes:

- Demolition of the existing office and relocation to the current manager's house which will be upgraded to new offices and will also accommodate storage facilities and other management related uses which will be relocated to this location
- The manager's house will be relocated to another existing house on site which will be upgraded
- Upgrade of the existing gatehouse
- Development of five tourism accommodation cabins, four of which are on the footprint of existing buildings. The number of beds will be twenty-two in total to increase the revenue generation potential at De Mond
- Development of a dune camp on the dune to the south consisting of two four-sleeper sleeping pods, a kitchen and an ablution block
- A viewing deck
- A floating bird hide

- An environmental awareness centre
- A picnic and recreational area including children's play area

The current development proposal requires environmental authorisation for which the process will be reinitiated. The development is currently proposed for implementation in 2025/2026 dependent on funds. The setback from the Heuningnes Estuary will be determined in accordance with CapeNature's approach to the implementation of coastal setbacks.

The existing bridge over the estuary mouth at De Mond has been affected by the severe storms over the past few years, including the 1 in 100-year flood which took place in September 2023. The bridge therefore needs to be replaced. Replacement will be a like for like replacement with the same dimensions and specification.

The Waenhuiskrans upgrade project is aimed at addressing both the coastal erosion which has affected the beaches and improving the visitor infrastructure, while considering coastal processes (Alternative Services Technologies 2021). The existing paths leading to the Waenhuiskrans Cave and elsewhere along the coastline are becoming degraded due to their popularity and the associated visitor impact on the sensitive coastal environment. It is therefore proposed to upgrade these paths to boardwalks and reduce the total number of paths.

The parking lot precinct is proposed to be upgraded and includes the relocation of the existing ablution block further back from the coastline. This will reduce the risk of erosion, storm damage and sewerage spillage and include the development of a gatehouse with kiosk. The timeframes for this project may be beyond those of this management plan.

Proposed improvements for the Waenhuis Villa include the expansion of the living room, the addition of a bathroom, the installation of electrical fencing, and the inclusion of an extra sliding gate. All proposed enhancements will be confined to the existing footprint of the current infrastructure.

9.3.5 Administration and other facilities

Administration and management buildings are mainly concentrated in the Potberg and De Mond nodes. General maintenance will be ongoing, as required and may include rectification of damage due to unforeseen natural disasters. The upgrades to the administration and management facilities for De Mond will be undertaken concurrently with the tourism accommodation upgrades as previously described.

9.3.6 Visitor facilities

The De Hoop PPP Activity Plan as required by the De Hoop PPP agreement outlines all the permitted visitor activities on De Hoop as offered by the PPP tourism partners.

The activities listed include:

1. Hiking
2. Vlei to Whales trail
3. De Hoop Camino
4. Vulture experience
5. Trail running
6. Mountain biking
7. Land based whale watching
8. Beach walks
9. Snorkeling
10. Swimming
11. Interpretive marine walks
12. Guided eco-boat trips
13. 4x4 nature and game drives

14. Star gazing trips
15. Sandboarding
16. Nine-hole executive course golf
17. Beach braai
18. Fly in

No activities additional to those already provided by CapeNature at De Hoop are envisaged.

No new hiking trails are proposed for the De Mond cluster within this PAMP timeline. The only new visitor facilities for De Mond and Waenhuiskrans are associated with the upgrades described above, namely the De Mond bird hide and picnic area and the boardwalks at Waenhuiskrans.

9.3.7 Commercial facilities and activities

The tourism facilities at De Hoop are provided by the PPP and CapeNature, with no additional service providers envisaged currently.

De Mond does not envisage that they will include any commercial facilities with the proposed upgrade to the tourism and administration node. The possibility of having a shop or kiosk at the gatehouse at Waenhuiskrans is included but will require further investigation before this can be finalized.

9.3.8 Environmental authorisations

Environmental Authorisations have been issued for the following developments:

- Koppie Alleen Coastal Lodge Development, De Hoop, Overberg District Municipality, 2 January 2013 (DEA ref. no.: 14/12/16/3/105/8/2)
- Upgrade of the Existing Potbergs River Crossing and Repair and Maintenance Activities on the Existing Roads within the Potberg Section of De Hoop, located on Portions 1, RE/4, 5, RE/14, 16, 20, 27, 29, 30, 31, 46, 57, 58, 59, 60, 61 of Farm 516 The Potteberg Estates, Bredasdorp, 21 April 2021 (DFFE ref. no.: 14/12/16/3/3/1/2245)

10 STRATEGIC PLAN

This section presents the strategic plan for the GDHC. This plan was derived from an assessment of the conservation situation, inclusive of the biological environment and the social, economic, cultural, and institutional systems, that influence focal conservation targets and human well-being values. Strategic intervention points formed the basis for developing strategies, using results chains to test theories of change and establish short to medium term objectives. From these, detailed actions with timeframes were developed to guide implementation, monitoring, and evaluation.

Strategies are aimed at:

- Focal conservation target restoration/stress reduction
- Behavioural change/threat reduction
- Establishing/promoting enabling conditions

The selected strategies and objectives for the GDHC are provided in Table 10.1. This table details the actions and associated timeframes for each separate strategy.

CapeNature will lead the implementation of the management plan, although achieving the vision requires coordinated effort. Stakeholder groups and organisations identified in this strategic plan are key role players in the successful delivery of this management plan.

Table 10.1: Strategic Plan for the GDHC

STRATEGY 1	**Promote interest and investment with appropriate partners to inspire connection and develop a plan which will guide the responsible usage, access and maintenance of cultural and archaeological sites in the GDHC**				
LINKED GOALS:	1, 2				
THREATS:	Disturbance and destruction from human activities, illegal activities & access, reducing human management				
TARGET / VALUE:	Archaeological & cultural heritage features, cave ecosystem, marine ecosystem, coastal ecosystem; nature-based tourism activities and access; sense of place and quality of life; learning opportunities through environmental awareness and research				
Objectives	**Actions**	**Responsibility**	**Time-frame**	**Measurable Indicators / Outputs**	**References / Existing Procedures**
<u>Objective 1.1:</u> By 2036 and beyond, a heritage management plan for the GDHC has been developed and implemented.	In partnership with Heritage Western Cape and stakeholders, develop and implement an approved all-encompassing Heritage Management Plan (including maintenance, monitoring) inclusive of relevant marine, coastal and cave sites.	**Lead:** Conservation Manager On-Reserve. **Enablers:** Conservation Officer On-Reserve, Stakeholder Engagement Officer, Landscape Unit Manager; Landscape Conservation Intelligence Manager, Senior Manager: Marine and Coasts.	Year 1-10	Approved GDHC Heritage Management Plan; Number of monitoring or management interventions.	Heritage Management Guidelines; Eco-matrix; Integrated Work Plan.
	In partnership investigate and, through signed agreements where applicable, provide sustainable tourism access opportunities to suitable heritage, cultural and archaeological sites.	**Lead:** Conservation Manager On-Reserve. **Enablers:** Tourism Development Manager; Infrastructure/Tourism Development Specialist; Tourism Officer, Tourism Liaison Officer, Stakeholder Engagement Officer, Conservation Officer On Reserve, Landscape Unit Manager; Landscape Conservation Intelligence Manager.	Year 1-10	Approved GDHC Heritage Management Plan; Number of annual visitors. Number of supporting infrastructure facilities constructed and maintained.	Heritage Management Guidelines, Eco-matrix, Infrastructure register.
<u>Objective 1.2:</u> By 2036, relevant partners and	Investigate and conduct heritage, cultural and	**Lead:** Conservation Manager On-Reserve.	Year 1-10	Signage register.	Corporate Identity Manual; Communications Policy.

STRATEGY 1	**Promote interest and investment with appropriate partners to inspire connection and develop a plan which will guide the responsible usage, access and maintenance of cultural and archaeological sites in the GDHC**				
LINKED GOALS:	1, 2				
THREATS:	Disturbance and destruction from human activities, illegal activities & access, reducing human management				
TARGET / VALUE:	Archaeological & cultural heritage features, cave ecosystem, marine ecosystem, coastal ecosystem; nature-based tourism activities and access; sense of place and quality of life; learning opportunities through environmental awareness and research				
Objectives	**Actions**	**Responsibility**	**Time-frame**	**Measurable Indicators / Outputs**	**References / Existing Procedures**
stakeholders are actively engaged and fully aware of the significance of the heritage, cultural, and archaeological resources within the GDHC, as well as the importance of their protection.	archaeological awareness through the development of various interpretive signage at Whale Trail huts, on multiple trails, at selected De Hoop cultural sites	**Enablers:** Stakeholder Engagement Officer, Conservation Officer On Reserve, Tourism Liaison Officer, Advocacy General Manager Eco Tourism and Access, Landscape Unit Manager, Tourism Officer.			
	Promote the "Origins of Early Southern Sapiens Behaviour" exhibition housed at De Hoop Collection.	**Lead:** Conservation Manager On-Reserve. **Enablers:** Stakeholder Engagement Officer, Advocacy General Manager Eco Tourism and Access	Year 1-10	Exhibition referenced on CapeNature website, number of awareness events to the exhibition.	CapeNature website, awareness event close-out reports.

STRATEGY 2	**Reduce invasive alien plants by developing a fire regime management strategy utilising prescribed burns, effective use of biocontrol agents and optimising wildfire opportunities**				
LINKED GOALS:	4, 11				
THREATS:	Invasive alien plants, inappropriate fire regime, reducing human management				
TARGET / VALUE:	Terrestrial vegetation, coastal ecosystems, freshwater ecosystems, nature-based tourism activities and access; sense of place and quality of life; learning opportunities through environmental awareness and research; nature-based livelihoods				
Objectives	**Actions**	**Responsibility**	**Time-frame**	**Measurable Indicators / Outputs**	**References / Existing Procedures**
<u>Objective 2.1:</u> By 2036, and beyond the GDHC will have more than 30% natural vegetation cover and wetlands are maintained in a good state.	Implement biological control in identified areas (Limestone Fynbos < 10-year-old veld) on target invasive alien plant species with support from relevant partners.	**Lead:** Conservation Manager On-Reserve **Enablers:** Conservation Officer On-Reserve, Field Ranger, Quality Controller, Landscape Conservation Intelligence Manager, Ecological Coordinator	Year 1-10	30% of De Hoop alien plant infestation indicates the presence of biological control agents, IAPO implementation, IAP Wall2Wall density verification	Invasive Alien Species Monitoring, Control and Eradication Plan for De Hoop, Alien plant density verification, Annual IWP/IAPO, CapeNature Ecological Monitoring Protocol: Mapping and Monitoring of Biological Control.
	Implement mechanical control as a method of invasive alien plant management through mechanisms that could include wood cutters models, alien biomass projects, SMME alien clearing contractors and externally funded invasive alien plant clearing projects.	**Lead:** Conservation Manager On-Reserve **Enablers:** Conservation Officer On-Reserve, Quality Controller, Project Manager, Small, medium and macro enterprises (SMME) Development Specialist, Stakeholder Engagement Officer	Year 1-10	IAPO implementation, Number of Service Level Agreements towards alien plant clearing concluded, number of woodcutter MOUs in place, annual alien plant density verification	Invasive Alien Species Monitoring, Control and Eradication Plan for De Hoop, Alien plant density verification, Annual IWP/IAPO, IAP priority list, annual alien plant density verification
	Determine the resource yield for alien vegetation harvesting within De Hoop for a potential alien biomass project.	**Lead:** Conservation Manager On-Reserve **Enablers:** Conservation Officer On-Reserve; Landscape Unit Manager, Landscape Conservation Intelligence	Year 1-10	IAP density verification	Invasive Alien Species plan

STRATEGY 2	**Reduce invasive alien plants by developing a fire regime management strategy utilising prescribed burns, effective use of biocontrol agents and optimising wildfire opportunities**				
LINKED GOALS:	4, 11				
THREATS:	Invasive alien plants, inappropriate fire regime, reducing human management				
TARGET / VALUE:	Terrestrial vegetation, coastal ecosystems, freshwater ecosystems, nature-based tourism activities and access; sense of place and quality of life; learning opportunities through environmental awareness and research; nature-based livelihoods				
Objectives	**Actions**	**Responsibility**	**Time-frame**	**Measurable Indicators / Outputs**	**References / Existing Procedures**
		Manager, Ecological Coordinator, Stakeholder Engagement Officer, Quality Controller, Project Manager.			
	Implement follow-up operations on the Potberg Mountain to reach maintenance phase and maintain the maintenance phase on 100% of De Mond.	**Lead:** Conservation Manager On-Reserve **Enablers:** Conservation Officer On-Reserve, Quality Controller, Project Manager.	Year 1-10	IAPO implementation, Annual alien plant density verification done, Number of SLAs towards alien plant clearing concluded	Invasive Alien Species Monitoring, Control and Eradication Plan for De Mond and De Hoop, Alien plant density verification, Annual IWP/IAPO, IAP priority list
	Monitor ecological restoration of wetland areas, where applicable, for recovery of ecological functioning.	**Lead:** Conservation Manager On-Reserve **Enablers:** Conservation Officer On-Reserve, Freshwater Ecologist, Ecological Coordinator, Field Rangers	Year 1-10	Wetland delineation	Invasive Alien Species Monitoring, Control and Eradication Plan for De Mond and De Hoop, Wetland inventory for GDHC, wetlands spatial layer
<u>Objective 2.2:</u> By 2036 and beyond, approximately 30% of IAP invested areas have reduced fuel loads through integrated fire management and IAP clearing follow-up operations.	Develop a Fire Management Plan for the GDHC that will be revised when needed following larger veld fire events greater than 1000 ha.	**Lead:** Conservation Manager On-Reserve **Enablers:** Landscape Conservation Intelligence Manager, Conservation Officer On-Reserve, Integrated Catchment Specialist, Ecological Coordinator.	Year 1-10	Fire Management Plan	Landscape Fire Response Plan, Firebreak register, Fire Management Policy. AVM priority list

STRATEGY 2	**Reduce invasive alien plants by developing a fire regime management strategy utilising prescribed burns, effective use of biocontrol agents and optimising wildfire opportunities**				
LINKED GOALS:	4, 11				
THREATS:	Invasive alien plants, inappropriate fire regime, reducing human management				
TARGET / VALUE:	Terrestrial vegetation, coastal ecosystems, freshwater ecosystems, nature-based tourism activities and access; sense of place and quality of life; learning opportunities through environmental awareness and research; nature-based livelihoods				
Objectives	**Actions**	**Responsibility**	**Time-frame**	**Measurable Indicators / Outputs**	**References / Existing Procedures**
	Scheduled block and stack burns are performed as per the Fire Management Plan in previously cleared areas or old veld to reduce fuel loads and for ecological reasons. Planned burns will be informed by veld age and vegetation type.	**Lead:** Conservation Manager On-Reserve **Enablers:** Landscape Unit Manager, Conservation Officer On-Reserve, Ecological Coordinator, Field Rangers, Integrated Catchment Specialist, Landscape Conservation Intelligence Manager.	Year 2-10	Veld age map, Block burn plans approved, IAPO implementation	Fire management plan, Fire Management Policy, Block burn planning approval procedure
	Suppress wildfires threatening identified hotspots, eco-sensitive areas and infrastructure.	**Lead:** Conservation Manager On-Reserve **Enablers:** Landscape Unit Manager, Conservation Officer On-Reserve, Field Rangers.	Year 1-10	Fire report (FireWeb)	Landscape Fire Response Plan Firebreak register, Fire Management Policy

STRATEGY 3	**Contribute to bontebok and Cape mountain zebra metapopulation management by maintaining the desired population ranges on De Hoop through appropriate management actions, including translocations aimed at genetic bolstering**				
LINKED GOALS:	9, 10				
THREATS:	Reducing human management				
TARGET / VALUE:	Priority game species, terrestrial vegetation, nature-based tourism activities and access, sense of place and quality of life, learning opportunities through environmental awareness and research				
Objectives	**Actions**	**Responsibility**	**Time-frame**	**Measurable Indicators / Outputs**	**References / Existing Procedures**
<u>Objective 3.1:</u> By 2026 and beyond, at-risk dispersing Cape mountain zebra have contributed to genetic bolstering of other subpopulations, or the establishment of new populations.	Through regular monitoring, maintain a centralized and standardized database and associated photo-identikit of all Cape mountain zebra on and around De Hoop, for identification of animals, to inform possible translocations.	**Lead:** Conservation Manager On-Reserve **Enablers:** Conservation Officer On-Reserve, Ecological Coordinator, Field Rangers, Faunal Ecologist, Conservation Manager Off-Reserve	Years 1-10	Cape mountain zebra database and identikit updated quarterly. CapeNature CMZ reporting to measure success	Standardized Cape mountain zebra database and identikit. Site-specific Cape mountain zebra monitoring protocol: De Hoop. Ecological matrix.
	Prioritize dispersers for translocation based on age, sex, herd composition and risk (e.g. hybridisation risk, risk of vehicle collisions and landowner attitude).	**Lead:** Faunal Ecologist **Enablers:** Conservation Manager On-Reserve, Conservation Officer On-Reserve, Ecological Coordinator, Field Rangers, Conservation Manager Off-Reserve, Landscape Conservation Intelligence Manager	Years 1-5	Prioritized list of dispersers for translocation created and updated quarterly, Ecological matrix	Standardized Cape mountain zebra database and identikit. Site-specific Cape mountain zebra monitoring protocol: De Hoop. Zebra hybridization pamphlet.
	Translocate dispersing Cape mountain zebra to priority sites under custodianship agreements with relevant suitable landowners.	**Lead:** Landscape Unit Manager **Enablers:** Conservation Manager On-Reserve, Conservation Officer On-Reserve, Field Rangers, Conservation Manager Off-Reserve, Faunal Ecologist,	Years 1-10	Number of custodianship agreements in place. Number of priority dispersers translocated.	Custodianship agreement template. Game Translocation and Utilization Policy. Standard Operating Protocol for Collection of

STRATEGY 3	**Contribute to bontebok and Cape mountain zebra metapopulation management by maintaining the desired population ranges on De Hoop through appropriate management actions, including translocations aimed at genetic bolstering**				
LINKED GOALS:	9, 10				
THREATS:	Reducing human management				
TARGET / VALUE:	Priority game species, terrestrial vegetation, nature-based tourism activities and access, sense of place and quality of life, learning opportunities through environmental awareness and research				
Objectives	**Actions**	**Responsibility**	**Time-frame**	**Measurable Indicators / Outputs**	**References / Existing Procedures**
		Landscape Conservation Intelligence Manager		Number of existing subpopulations which are genetically bolstered. Number of new subpopulations established.	Biological Samples of Cape Mountain Zebra. SANBI Genetics Services Unit Sample submission form.
<u>Objective 3.2:</u> By 2036 and beyond, a core, healthy Cape mountain zebra population of two breeding herds and one bachelor herd is present on De Hoop.	Monitor body condition, herd composition and herd dynamics to inform future translocation decision making.	**Lead:** Conservation Manager On-Reserve. **Enablers:** Field Rangers, Conservation Officer On-Reserve, Ecological Coordinator	Years 1-10.	Zebra body condition scores. Number of Cape mountain zebra surveys, including off-reserve animals, and up-to-date database. Annual De Hoop Cape mountain zebra monitoring report.	Cape mountain zebra monitoring protocol: De Hoop. Annual reserve Cape mountain zebra monitoring report template. De Hoop Cape mountain zebra database and identikit. Ecological matrix.
	Conduct game counts as per protocol on De Hoop and where possible, align with counts on OTR.	**Lead:** Conservation Manager On-Reserve **Enablers:** Conservation Officer On-Reserve, Field Rangers, Ecological Coordinator, Faunal Ecologist	Years 1-10	Bi-annual vehicle-based game surveys carried out twice a year. Aerial game surveys carried out every 5 years.	Coordinated Game Population and Distribution Assessments on Nature Reserves Protocol.

STRATEGY 3	**Contribute to bontebok and Cape mountain zebra metapopulation management by maintaining the desired population ranges on De Hoop through appropriate management actions, including translocations aimed at genetic bolstering**				
LINKED GOALS:	9, 10				
THREATS:	Reducing human management				
TARGET / VALUE:	Priority game species, terrestrial vegetation, nature-based tourism activities and access, sense of place and quality of life, learning opportunities through environmental awareness and research				
Objectives	**Actions**	**Responsibility**	**Time-frame**	**Measurable Indicators / Outputs**	**References / Existing Procedures**
				Monitoring data stored appropriately and analysed	Ecological monitoring protocol: Aerial surveys of large and herd-forming game. State of Biodiversity Population Database. Ecological matrix.
<u>Objective 3.3:</u> By 2036, excess bontebok have contributed to genetic bolstering of other subpopulations, or the establishment of new populations through a viable population of bontebok present on De Hoop	Monitor the bontebok population through game counts on De Hoop and include Denel OTR when possible.	**Lead:** Conservation Manager On-Reserve **Enablers:** Conservation Officer On-Reserve, Field Rangers, Ecological Coordinator, Faunal Ecologist	Years 1-10	Bi-annual vehicle-based game surveys carried out twice a year. Includes data on bontebok numbers, sex- and age-classes and body condition Aerial game surveys carried out every 5 years Monitoring data stored appropriately and analysed	Coordinated Game Population and Distribution Assessments on Nature Reserves Protocol. Ecological monitoring protocol: Aerial surveys of large and herd-forming game. State of Biodiversity Population Database. Ecological matrix.

STRATEGY 3	**Contribute to bontebok and Cape mountain zebra metapopulation management by maintaining the desired population ranges on De Hoop through appropriate management actions, including translocations aimed at genetic bolstering**				
LINKED GOALS:	9, 10				
THREATS:	Reducing human management				
TARGET / VALUE:	Priority game species, terrestrial vegetation, nature-based tourism activities and access, sense of place and quality of life, learning opportunities through environmental awareness and research				
Objectives	**Actions**	**Responsibility**	**Time-frame**	**Measurable Indicators / Outputs**	**References / Existing Procedures**
	Recommend bontebok offtake if needed based on an analysis of population trends and risk factors (e.g. veld condition, body condition).	**Lead**: Faunal Ecologist **Enablers**: Landscape Conservation Intelligence Manager, Conservation Manager On-Reserve, Ecological Coordinator	Years 1-10	Annual report with recommendation for bontebok offtake.	Annual bontebok monitoring reports.
	Translocate possible excess or at-risk bontebok to priority sites under custodianship agreements with relevant suitable landowners.	**Lead:** Landscape Unit Manager **Enablers:** Conservation Manager On-Reserve, Conservation Officer On-Reserve, Field Rangers, Conservation Manager Off-Reserve, Faunal Ecologist, Landscape Conservation Intelligence Manager	Years 1-10	Number of custodianship agreements. Number of bontebok translocated. Number of existing subpopulations which are genetically bolstered. Number of new subpopulations established.	Custodianship agreement template. Bontebok Conservation Translocation and Utilisation Policy. Bontebok DNA Collection Protocol. SANBI Genetics Services Unit Sample submission form.
<u>Objective 3.4:</u> By 2036, targeted research is being conducted to inform strategic adaptive management of Cape mountain zebra and	Encourage and collaborate with research institutions to conduct studies for improved management of Cape mountain zebra and bontebok on De Hoop.	**Lead**: Landscape Conservation Intelligence Manager **Enablers**: Conservation Manager On-Reserve, Conservation Officer On-	Years 1-10	Research question spreadsheet includes suggested projects on Cape mountain zebra and bontebok.	MOUs with partners

STRATEGY 3	**Contribute to bontebok and Cape mountain zebra metapopulation management by maintaining the desired population ranges on De Hoop through appropriate management actions, including translocations aimed at genetic bolstering**				
LINKED GOALS:	9, 10				
THREATS:	Reducing human management				
TARGET / VALUE:	Priority game species, terrestrial vegetation, nature-based tourism activities and access, sense of place and quality of life, learning opportunities through environmental awareness and research				
Objectives	**Actions**	**Responsibility**	**Time-frame**	**Measurable Indicators / Outputs**	**References / Existing Procedures**
bontebok populations within De Hoop.		Reserve, Ecological Coordinator, Faunal Ecologist		Research project proposals and reports.	

STRATEGY 4	**Maximise the contribution of the Potberg Cape vulture population to the metapopulation by working with partners to improve awareness and reduce threats on De Hoop and in the zone of influence**				
LINKED GOALS:	8				
THREATS:	Disturbance and destruction (human activities), reducing human management				
TARGET / VALUE:	Cape vulture, nature-based tourism activities and access, sense of place and quality of life, learning opportunities through environmental awareness and research				
Objectives	**Actions**	**Responsibility**	**Time-frame**	**Measurable Indicators / Outputs**	**References / Existing Procedures**
<u>Objective 4.1:</u> By 2036 and beyond, data on the Potberg Cape vulture colony contributes to provincial, national and international vulture databases	Continue with the annual monitoring programme (three counts per year) at the Potberg vulture colony	**Lead:** Conservation Manager On-Reserve **Enablers:** Conservation Officer On-Reserve, Faunal Ecologist, Field Rangers, Ecological Coordinator	Years 1-10	Centralized and standardized CapeNature vulture population database, updated annually. Centralized and standardized CapeNature vulture incident database, updated annually. Centralized national database, updated as requested. Contributions to Cape vulture red list revisions, as requested.	Cape Vulture Ecological Monitoring Protocol. National Vulture Multi-Species Biodiversity Management Plan. Southern African Red Data Book of Birds. IUCN Red List.
	Maintain a visitor register at the Potberg gate, indicating visitors to the Potberg vulture colony viewing deck	**Lead:** Conservation Manager On-Reserve **Enablers:** Tourism Liaison Officer	Years 1-10	Potberg visitor register	Entry permits
<u>Objective 4.2:</u> By 2036, there is an improved understanding of factors	Analyse all Potberg vulture monitoring data in conjunction	**Lead:** Faunal Ecologist **Enablers:** Landscape Conservation Intelligence	Year 1-10	2036 report of Potberg Cape vulture population trends.	2025 annual Cape vulture monitoring report.

STRATEGY 4	**Maximise the contribution of the Potberg Cape vulture population to the metapopulation by working with partners to improve awareness and reduce threats on De Hoop and in the zone of influence**				
LINKED GOALS:	8				
THREATS:	Disturbance and destruction (human activities), reducing human management				
TARGET / VALUE:	Cape vulture, nature-based tourism activities and access, sense of place and quality of life, learning opportunities through environmental awareness and research				
Objectives	**Actions**	**Responsibility**	**Time-frame**	**Measurable Indicators / Outputs**	**References / Existing Procedures**
influencing population trends of the Potberg colony.	with other available datasets (e.g. weather, visitor register)	Manager, Ecological Coordinator			
	Identify and engage with research collaborators, to facilitate Cape vulture research, particularly research relevant to food availability for the expanding colony and achieving the objectives of the multi-species vulture BMP	**Lead:** Faunal Ecologist **Enablers:** Landscape Conservation Intelligence Manager	Year 1-10	Number of MOUs signed with research collaborators.	National Vulture Multi-Species Biodiversity Management Plan. CapeNature MOU template.
<u>Objective 4.3:</u> By 2036 and beyond, anthropogenic impacts on vultures in the zone of influence will be effectively mitigated through partnerships.	Report powerline incidents involving Cape vultures and follow up to ensure that problem lines are made vulture friendly	**Lead:** Conservation Manager On-Reserve **Enablers:** Conservation Manager Off-reserve, Faunal Ecologist, Conservation Officer On-Reserve, Field Rangers	Years 1-10	Number of powerline incidents per year. Number of incidents reported to Endangered Wildlife Trust. Number of mitigations achieved.	Cape vulture incident database. Eskom-Endangered Wildlife Trust field report form: Electrocution and Collision.
	Comment on development applications in the vicinity of De Hoop, particularly Wind Energy Facilities within a 50-km radius of Potberg and provide input into related	**Lead:** Land Use Advice Scientist Landscape. **Enablers:** Faunal Ecologist, Conservation Intelligence Manager.	Years 1-10	Proportion of relevant development applications commented on. Number of relevant Environmental Management	Land Use Advice procedure

STRATEGY 4	**Maximise the contribution of the Potberg Cape vulture population to the metapopulation by working with partners to improve awareness and reduce threats on De Hoop and in the zone of influence**				
LINKED GOALS:	8				
THREATS:	Disturbance and destruction (human activities), reducing human management				
TARGET / VALUE:	Cape vulture, nature-based tourism activities and access, sense of place and quality of life, learning opportunities through environmental awareness and research				
Objectives	**Actions**	**Responsibility**	**Time-frame**	**Measurable Indicators / Outputs**	**References / Existing Procedures**
	Environmental Management Plans and monitoring reports.			Plans and avifaunal monitoring reports commented on.	
	Establish and maintain partnerships with reputable veterinary and rehabilitation facilities with vulture and wildlife expertise.	**Lead:** Conservation Manager On-Reserve **Enablers:** Landscape Conservation Intelligence Manager, Faunal Ecologist, Conservation Manager Off-Reserve	Years 1-10	Number of birds rehabilitated that received treatment.	Registered rehabilitation and veterinary centres
	Assist with the rescue of compromised/ anthropogenically injured birds.	**Lead:** Conservation Manager Off-Reserve **Enablers:** Conservation Manager On-reserve, Conservation Officer On-Reserve, Field Rangers	Years 1-10	Number of birds rescued unharmed or captured, receiving veterinary care and/or sent to rehabilitation centres.	Cape vulture incident database.
<u>Objective 4.4:</u> By 2036 and beyond, CapeNature actively engages with the relevant stakeholders to raise awareness regarding the importance and vulnerability of the Potberg Cape vultures	Hold or contribute to vulture awareness interventions when needed for communities in the Overberg.	**Lead:** Stakeholder Engagement Officer **Enablers**: Conservation Manager On-Reserve, Conservation Manager Off-Reserve, Faunal Ecologist, Field Rangers	Years 1-10	Number of awareness-raising events held/ contributed to.	Awareness close-off report template.
	Disseminate best-practice guidelines for vulture-friendly farming awareness material.				

STRATEGY 4	**Maximise the contribution of the Potberg Cape vulture population to the metapopulation by working with partners to improve awareness and reduce threats on De Hoop and in the zone of influence**				
LINKED GOALS:	8				
THREATS:	Disturbance and destruction (human activities), reducing human management				
TARGET / VALUE:	Cape vulture, nature-based tourism activities and access, sense of place and quality of life, learning opportunities through environmental awareness and research				
Objectives	**Actions**	**Responsibility**	**Time-frame**	**Measurable Indicators / Outputs**	**References / Existing Procedures**
	Produce and distribute media articles, awareness materials and signage for visitors to the vulture deck and communities in the Overberg.	**Lead**: Faunal Ecologist **Enablers:** Advocacy General Manager, Stakeholder Engagement Officer, Field Rangers, Off-Reserve Conservation Manager	Years 1-10	Number of media articles published. Signage register updated. Number of awareness materials distributed.	CapeNature media reports summary, Signage register, Corporate Identity Manual; Communications Policy.

STRATEGY 5	**Protect the cave ecosystems on De Hoop by reducing anthropogenic disturbance through increased awareness, improved access management, and a better understanding of the current status of De Hoop's bat populations through collaboration with partners**				
LINKED GOALS:	1, 2				
THREATS:	Disturbance and destruction (human activities), illegal activities & access, reducing human management				
TARGET / VALUE:	Cave ecosystem, archaeological and cultural heritage features, sense of place and quality of life, learning opportunities through environmental awareness and research				
Objectives	**Actions**	**Responsibility**	**Time-frame**	**Measurable Indicators / Outputs**	**References / Existing Procedures**
<u>Objective 5.1:</u> By 2036 and beyond, anthropogenic disturbance of cave ecosystems is limited through controlled access	Develop a cave management plan for De Hoop.	**Lead**: Faunal Ecologist **Enablers:** Conservation Manager On-Reserve, Landscape Conservation Intelligence Manager	Year 1-2	De Hoop cave management plan	Recommendations for a Management Policy for caves on De Hoop (Penny 2011)
	Manage guided access to caves according to the cave zoning system of Penny (2011)	**Lead:** Conservation Manager On-Reserve **Enablers:** Landscape Conservation Intelligence Manager, Capability Manager Biodiversity Capabilities, Tourism Development Manager, Tourism Officer	Years 2-10	Cave visitor register, guided access only	Recommendations for a Management Policy for caves on De Hoop (Penny 2011)
<u>Objective 5.2:</u> By 2036 and beyond, CapeNature actively engages with the relevant stakeholders to raise awareness regarding the importance and vulnerability of the De Hoop caves	Investigate, produce and install appropriate interpretive signage at caves that are open to guided access.	**Lead:** Conservation Manager On-Reserve **Enablers:** Landscape Conservation Intelligence Manager, Advocacy General Manager, Tourism Officer	Year 5	Signage register.	Signage register, Corporate Identity Manual; Communications Policy.
<u>Objective 5.3:</u> By 2036 and beyond, anthropogenic	Comment on development applications in the vicinity of	**Lead:** Land Use Scientist	Years 1-10	Comments submitted on development applications,	National Environmental Management Act:

STRATEGY 5	**Protect the cave ecosystems on De Hoop by reducing anthropogenic disturbance through increased awareness, improved access management, and a better understanding of the current status of De Hoop's bat populations through collaboration with partners**				
LINKED GOALS:	1, 2				
THREATS:	Disturbance and destruction (human activities), illegal activities & access, reducing human management				
TARGET / VALUE:	Cave ecosystem, archaeological and cultural heritage features, sense of place and quality of life, learning opportunities through environmental awareness and research				
Objectives	**Actions**	**Responsibility**	**Time-frame**	**Measurable Indicators / Outputs**	**References / Existing Procedures**
impacts on bats in the zone of influence will be effectively mitigated	De Hoop, particularly Wind Energy Facilities within a 50-km radius and provide input into related Environmental Management Plans and monitoring reports.	**Enablers:** Faunal Ecologist, Conservation Manager On-Reserve, Conservation Manager Off-Reserve		environmental management plans and monitoring reports	Environmental Impact Assessment procedure.
<u>Objective 5.4</u>: By 2036 and beyond, the bat populations on De Hoop have been assessed and their status quantified through partnerships with relevant stakeholders	Investigate the feasibility of baseline monitoring of bats on De Hoop with partners.	**Lead**: Faunal Ecologist **Enablers:** Ecological Coordinator, Conservation Manager On-Reserve, Conservation Officer On-Reserve, Field Rangers	Year 1-5	Monitoring report, Eco matrix	South African Good Practice Guidelines for Operational Monitoring for Bats at Wind Energy Facilities.
	Identify and facilitate research on the De Hoop bat population, particularly towards determining population composition, size and trends of bats at the Bat Cave maternity roost.	**Lead:** Faunal Ecologist **Enablers:** Landscape Conservation Intelligence Manager, Ecological Coordinator, Conservation Manager On-Reserve, Conservation Officer On-Reserve, Field Rangers	Year 6-10	Number of research permits, Number of research reports on bats Databases.	Research Permit application.

STRATEGY 6	**Through partnership with relevant stakeholders, address water law compliance, in-stream modification, and best practice for the freshwater ecosystems including De Hoop Vlei in the GDHC and its zone of influence**				
LINKED GOALS:	3, 4, 5, 6				
THREATS:	Illegal activities & access, inappropriate developments and infrastructure, over abstraction of ground- and surface water, reducing human management, pollution				
TARGET / VALUE:	Freshwater ecosystems, nature-based tourism activities and access, sense of place and quality of life, learning opportunities through environmental awareness and research				
Objectives	**Actions**	**Responsibility**	**Time-frame**	**Measurable Indicators / Outputs**	**References / Existing Procedures**
<u>Objective 6.1:</u> By 2036 and beyond, CapeNature in collaboration with partners, advocates and implements water use best practices and compliance within the GDHC and its zone of influence, and the relevant registration and/or licenses are in place	Monitor water abstraction quantity and borehole groundwater level and ensure legal compliance in the GDHC according to the CapeNature and site-specific monitoring protocols	**Lead:** Conservation Managers On-Reserve **Enablers:** Freshwater Ecologist, Field Rangers; Conservation Officer On-Reserve, Ecological Coordinator	Year 1-10	Monitoring report: groundwater monitoring and abstraction/water use reports; water use licenses or general authorisations	CapeNature Groundwater monitoring protocol.
	Initiate a desktop assessment of wetlands that could be impacted by groundwater abstraction	**Lead:** Freshwater Ecologist **Enablers:** Conservation Manager On-Reserve, Restoration Ecologist; Conservation Planner; Capability Manager Biodiversity Intelligence; Field Rangers, Conservation Officer On-Reserve; Ecological Coordinator		Maps, baseline and monitoring reports, IAPO (IAS management plan).	State of Biodiversity database; Ecological Monitoring Protocols; Wetland ground-truthing datasheet.
	Update wetland inventory for GDHC wetland spatial layers and the National Wetlands Map updates and identify priority wetlands for possible rehabilitation (e.g. alien invasive plant removal)				
<u>Objective 6.2:</u> By 2036 and beyond, partnerships with relevant monitoring and regulations agencies (e.g. Breede-Olifants Catchment Management	Review historical water quality data for De Hoop Vlei	**Lead:** Freshwater Ecologist **Enablers:** Landscape Conservation Intelligence Manager, Conservation Manager On-Reserve; Conservation Officer	Year 1-10	Minutes of meetings attended; monitoring reports and data.	Ecological Monitoring protocol (water quality).
	Identify relevant partners/research institutions/monitoring agencies				

STRATEGY 6	**Through partnership with relevant stakeholders, address water law compliance, in-stream modification, and best practice for the freshwater ecosystems including De Hoop Vlei in the GDHC and its zone of influence**				
LINKED GOALS:	3, 4, 5, 6				
THREATS:	Illegal activities & access, inappropriate developments and infrastructure, over abstraction of ground- and surface water, reducing human management, pollution				
TARGET / VALUE:	Freshwater ecosystems, nature-based tourism activities and access, sense of place and quality of life, learning opportunities through environmental awareness and research				
Objectives	**Actions**	**Responsibility**	**Time-frame**	**Measurable Indicators / Outputs**	**References / Existing Procedures**
Agency; South African Environmental Observation Network - SAEON) are established and maintained to obtain relevant data on the water quality fluctuations of the De Hoop Vlei	Initiate engagement sessions to establish a support network Implement water quality monitoring with partners at De Hoop Vlei	On-Reserve; Ecological Coordinator			

STRATEGY 7	**Facilitate and responsibly implement sustainable and clearly defined development, access, and activities within the GHDC through innovative collaboration with partners**				
LINKED GOALS:	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13				
THREATS:	Illegal activities & access, developments/ inappropriate infrastructure, disturbance and destruction (human activities), pollution, over abstraction of water (ground & surface)				
TARGET / VALUE:	Coastal ecosystem, marine ecosystem, estuary ecosystem, freshwater ecosystem, cave ecosystem, terrestrial vegetation, archaeological & cultural heritage features, Cape vulture, priority game species, nature-based tourism activities and access, sense of place and quality of life, learning opportunities through environmental awareness and research				
Objectives	**Actions**	**Responsibility**	**Time-frame**	**Measurable Indicators / Outputs**	**References / Existing Procedures**
<u>Objective 7.1:</u> By 2036 and beyond, sustainable future development (commercial and non-commercial) within the GDHC is undertaken in accordance with the Concept Development Framework, is compatible with the zonation, and is legislatively compliant.	Implement and monitor future developments within the GDHC, both for commercial and non-commercial purposes, in accordance with the Concept Development Framework as identified in section 9.3.	**Lead:** Conservation Manager On-Reserve. **Enablers:** Tourism Development Manager; Infrastructure Specialist; Land Use Scientist	Year 1-10	Compliant developments, environmental authorisation	Zonation; Concept Development Framework, National Environmental Management Act, No. 107 of 1998
	Provide oversight towards implementation of PPP developments as stated in the main PPP agreement between CapeNature and De Hoop Opstal (PTY) LTD.	**Lead:** Conservation Manager On-Reserve. **Enablers:** Tourism Development Manager; Infrastructure Specialist; Land Use Scientist	Year 1-5	Environmental authorisations, Main PPP agreement	Zonation; Concept Development Framework; National Environmental Management Act, No. 107 of 1998 Main PPP Agreement dated 2 Dec 2009.
	Ensure that all development within the GDHC is legislatively compliant.	**Lead:** Conservation Manager On-Reserve. **Enablers:** Tourism Development Manager; Infrastructure Specialist; Land Use Scientist	Year 1-10	Environmental authorisations	Zonation; Concept Development Framework; National Environmental Management Act, No. 107 of 1998

STRATEGY 7	**Facilitate and responsibly implement sustainable and clearly defined development, access, and activities within the GHDC through innovative collaboration with partners**				
LINKED GOALS:	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13				
THREATS:	Illegal activities & access, developments/ inappropriate infrastructure, disturbance and destruction (human activities), pollution, over abstraction of water (ground & surface)				
TARGET / VALUE:	Coastal ecosystem, marine ecosystem, estuary ecosystem, freshwater ecosystem, cave ecosystem, terrestrial vegetation, archaeological & cultural heritage features, Cape vulture, priority game species, nature-based tourism activities and access, sense of place and quality of life, learning opportunities through environmental awareness and research				
Objectives	**Actions**	**Responsibility**	**Time-frame**	**Measurable Indicators / Outputs**	**References / Existing Procedures**
	Maintain and service tourism and operational infrastructure through registers and schedules in accordance with budget availability for trails, roads, buildings, signage and refuse management.	**Lead:** Conservation Manager On-Reserve. **Enablers:** Tourism Development Manager; Infrastructure Specialist, Tourism Officer, Tourism Liaison Officer, Conservation Assistants.	Year 1-10	Infrastructure register, Service registers	U-AMP, Infrastructure register
<u>Objective 7.2:</u> By 2036 and beyond, sustainable natural resource use, and commercial activities within the GDHC are compliant and documented in an Activity Plan.	Annually review and update the PPP activity plan and its associated terms of use, authorizations and zonation compatibility for new activities proposed with the partners.	**Lead:** Landscape Manager **Enablers:** Conservation Manager On-Reserve, Tourism Development Manager; Landscape Unit Manager, Landscape Conservation Intelligence Manager, Land Use Scientist, Ecological Coordinator	Year 1-10	PPP Activity plan	Zonation, PPP Activity plan
	Compile and implement activity plans for De Hoop and De Mond, detailing current and proposed activities, terms of use, carrying capacity, associated authorizations needed and zonation compatibility.			De Hoop Activity Plan, De Mond Activity Plan	Zonation, Activity plan template to be confirmed, De Hoop MPA management plan 2006.

STRATEGY 7	**Facilitate and responsibly implement sustainable and clearly defined development, access, and activities within the GHDC through innovative collaboration with partners**
LINKED GOALS:	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13
THREATS:	Illegal activities & access, developments/ inappropriate infrastructure, disturbance and destruction (human activities), pollution, over abstraction of water (ground & surface)
TARGET / VALUE:	Coastal ecosystem, marine ecosystem, estuary ecosystem, freshwater ecosystem, cave ecosystem, terrestrial vegetation, archaeological & cultural heritage features, Cape vulture, priority game species, nature-based tourism activities and access, sense of place and quality of life, learning opportunities through environmental awareness and research

Objectives	Actions	Responsibility	Time-frame	Measurable Indicators / Outputs	References / Existing Procedures
<u>Objective 7.3:</u> By 2036 and beyond, sustainable visitor access to the GDHC is implemented, actively managed, and continuously monitored	Calculate an estimated user carrying capacity for each nature-based tourism activity and monitor activities for environmental degradation within the GDHC	**Lead:** Conservation Manager On-Reserve **Enablers:** Landscape Unit Manager, Conservation Officer On-Reserve, Landscape Conservation Intelligence Manager, Ecological Coordinator, Tourism Officer, Field Rangers	Year 1-10	Eco-matrix detailed the ecological monitoring activities for De Hoop and De Mond, tourism visitor statistics	Eco-matrix Monitoring manual
	Monitor visitor numbers and user activities through access control at entrance gates			Tourism visitor statistics	Monthly tourism visitor numbers released by CapeNature's Eco-Tourism and Access
	Monitor all visitor freshwater use at various facilities through flow meters			Boreholes and flow meters monitoring data	Main PPP Agreement dated 2 Dec 2009, Borehole monitoring protocol.
	Draft and implement a waste management plan for the collection, storage and off-site removal of all refuge, coastal flotsam and rubbish.	**Lead:** Conservation Manager On-Reserve **Enablers:** Conservation Officer On-Reserve, Tourism Officer		Waste management plan in place	To be determined.
	Evaluate visitor access and possible disturbance to sensitive bird areas, including De Hoop	**Lead:** Conservation Manager On-Reserve		Tourism permit statistics on numbers and activities, gate entrance registers for visitor	De Block report, De Hoop Vlei boat use

STRATEGY 7	**Facilitate and responsibly implement sustainable and clearly defined development, access, and activities within the GHDC through innovative collaboration with partners**				
LINKED GOALS:	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13				
THREATS:	Illegal activities & access, developments/ inappropriate infrastructure, disturbance and destruction (human activities), pollution, over abstraction of water (ground & surface)				
TARGET / VALUE:	Coastal ecosystem, marine ecosystem, estuary ecosystem, freshwater ecosystem, cave ecosystem, terrestrial vegetation, archaeological & cultural heritage features, Cape vulture, priority game species, nature-based tourism activities and access, sense of place and quality of life, learning opportunities through environmental awareness and research				
Objectives	**Actions**	**Responsibility**	**Time-frame**	**Measurable Indicators / Outputs**	**References / Existing Procedures**
	Vlei and the Potberg vulture colony, and implement additional monitoring if needed.	**Enablers:** Conservation Officer On-Reserve, Landscape Conservation Intelligence Manager, Ecological Coordinator, Tourism Officer, Field Rangers		statistics, De Hoop Vlei data monitoring sheet on boat use	data monitoring sheet, Activity plan

STRATEGY 8	**Conduct monitoring and data analysis of selected species according to sound scientific protocols in collaboration with entities with complementary knowledge mandates**
LINKED GOALS:	1, 7, 8, 9, 10, 11, 12, 13
THREATS:	Disturbance and destruction (human activities), illegal activities & access, poaching, natural disease, reducing human management
TARGET / VALUE:	Marine ecosystem, coastal ecosystem, estuary ecosystem, priority game species, Cape vulture, freshwater ecosystems, terrestrial vegetation, cave ecosystem, nature-based tourism activities and access, sense of place and quality of life, learning opportunities through environmental awareness and research, nature-based livelihoods

Objectives	Actions	Responsibility	Time-frame	Measurable Indicators / Outputs	References / Existing Procedures
<u>Objective 8.1</u>: By 2036 and beyond, the Klipdrifsfontein and Heuningnes estuaries will be maintained through sound management	Lead the implementation of the Heuningnes and Klipdrifsfontein Estuary management plans	**Lead:** Conservation Manager On-Reserve **Enablers**: Marine and Coasts Specialist, Landscape Unit Manager, Field Rangers, Ecological Coordinator	Year 1-10	Estuary Governance Tool	Heuningnes and Klipdrifsfontein Estuary management plans. Heuningnes mouth management plan
<u>Objective 8.2:</u> By 2036 and beyond, the GDHC's waterbird data will contribute to national and international databases	Conduct biannual CWAC counts on De Hoop Vlei and Heuningnes Estuary	**Lead:** Conservation Manager On-Reserve **Enablers:** Conservation Officer On-Reserve, Field Rangers, Ecological Coordinator, Faunal Ecologist	Years 1-10	Number of CWAC cards submitted annually	De Hoop Vlei CWAC protocol. Eco-matrixes BirdLife MOU
	Maintain and where necessary formalize partnerships for monitoring assistance with waterbird counts and analysis			Number of waterbird counts with partner assistance	
<u>Objective 8.3:</u> By 2036 and beyond, key species populations, distribution and disturbance events within the De Hoop Marine Protected Area are being accurately monitored to	In partnership with Birdlife, implement the De Hoop African penguin colony project	**Lead:** Conservation Manager On-Reserve **Enablers**: Landscape Conservation Intelligence Manager, Conservation Officer On-Reserve, Ecological Coordinator, Fauna Ecologist	Year 1-10	Annual Birdlife SA De Hoop colony report	African penguin BMP
	Facilitate, promote and support research on key species in the MPA with partner entities and research institutions			Number of research permits issued, research register completed	CapeNature permit system, CapeNature Monitoring and Research Strategy

STRATEGY 8	**Conduct monitoring and data analysis of selected species according to sound scientific protocols in collaboration with entities with complementary knowledge mandates**				
LINKED GOALS:	1, 7, 8, 9, 10, 11, 12, 13				
THREATS:	Disturbance and destruction (human activities), illegal activities & access, poaching, natural disease, reducing human management				
TARGET / VALUE:	Marine ecosystem, coastal ecosystem, estuary ecosystem, priority game species, Cape vulture, freshwater ecosystems, terrestrial vegetation, cave ecosystem, nature-based tourism activities and access, sense of place and quality of life, learning opportunities through environmental awareness and research, nature-based livelihoods				
Objectives	**Actions**	**Responsibility**	**Time-frame**	**Measurable Indicators / Outputs**	**References / Existing Procedures**
measure change in the population dynamics	Continue with long-term persistence and population monitoring of shorebirds, intertidal invertebrates and fish diversity	Field Rangers, Marine and Coast Specialist		Eco matrix, State of Biodiversity databases, CWAC data, BRUV data	Rocky Shore monitoring protocol BRUV monitoring protocol, Coastal CWAC protocol

STRATEGY 9	**Promote co-operative governance and legislative compliance by implementing the De Hoop and De Mond Integrated Compliance Plans and enabling inter-governmental and relevant Non-Governmental Organisation relationships that mitigate negative impacts on biodiversity associated with non-compliance with legislation**				
LINKED GOALS:	1, 2, 3, 4, 5, 7, 8, 11, 12				
THREATS:	Disturbance and destruction (human activities), poaching, illegal activities & access, pollution, developments/ inappropriate infrastructure, over abstraction of water (ground & surface)				
TARGET / VALUE:	Marine ecosystem, coastal ecosystem, priority game species, freshwater ecosystem, cave ecosystem, Cape vulture, terrestrial vegetation, estuary ecosystem, archaeological & cultural heritage features, nature-based tourism activities and access, sense of place and quality of life, learning opportunities through environmental awareness and research, nature-based livelihoods				
Objectives	**Actions**	**Responsibility**	**Time-frame**	**Measurable Indicators / Outputs**	**References / Existing Procedures**
<u>Objective 9.1:</u> By 2036 and beyond, the Integrated Compliance Plan for the GDHC is updated biennially and implemented	Complete biennial update of the Integrated Compliance Plans for De Hoop and De Mond and implement accordingly	**Lead:** Conservation Manager On-Reserve **Enablers:** Conservation Officer On-Reserve, Field Rangers	Year 1-10	Approved ICP's for De Hoop and De Mond	Integrated Compliance Plan (ICP)
	Conduct ongoing law enforcement activities as per annual workplans stemming from partner operations (Phakisa, Provincial Blitz's, Environmental Management Investigation responses) for the GDHC	**Lead:** Conservation Manager On-Reserve **Enablers:** Conservation Officer On-Reserve, Field and Marine Rangers	Year 1-10	The number of planned workplan law enforcement activities implemented	Integrated Compliance Plan Annual IWP/IAPO MPA workplan Estuary workplan
<u>Objective 9.2:</u> By 2036 and beyond, co-operative governance, legislative regulation and compliance is administered and adhered to ensuring ongoing environmental protection	Convene and/or participate in existing local inter-governmental & municipal forums and advisory committees, through the PAAC, Marine Coastal Committee, Cape Agulhas Safety Forum, Phakisa, SAPS JOC, Heuningnes Estuary Forum, Greater Overberg Fire	**Lead:** Conservation Manager On-Reserve **Enablers:** Conservation Manager Off-Reserve, Conservation Officer On-Reserve, Field and Marine Rangers, Landscape Unit Manager, Marine and Coast Specialist	Year 1-10	Number of planned forums and advisory committee platforms where De Mond and De Hoop GDHC is represented Number of joint compliance and law enforcement operations with relevant	Cape Agulhas Safety Plan, Phakisa Grid Planning, GOFPA membership

STRATEGY 9	**Promote co-operative governance and legislative compliance by implementing the De Hoop and De Mond Integrated Compliance Plans and enabling inter-governmental and relevant Non-Governmental Organisation relationships that mitigate negative impacts on biodiversity associated with non-compliance with legislation**
LINKED GOALS:	1, 2, 3, 4, 5, 7, 8, 11, 12
THREATS:	Disturbance and destruction (human activities), poaching, illegal activities & access, pollution, developments/ inappropriate infrastructure, over abstraction of water (ground & surface)
TARGET / VALUE:	Marine ecosystem, coastal ecosystem, priority game species, freshwater ecosystem, cave ecosystem, Cape vulture, terrestrial vegetation, estuary ecosystem, archaeological & cultural heritage features, nature-based tourism activities and access, sense of place and quality of life, learning opportunities through environmental awareness and research, nature-based livelihoods

Objectives	Actions	Responsibility	Time-frame	Measurable Indicators / Outputs	References / Existing Procedures
	Protection Association meetings			partner advisory committee meetings attended	
<u>Objective 9.3:</u> By 2036 and beyond, the De Hoop Provincial Nature Reserve boundary is correctly proclaimed and secure.	Reproclaim the boundaries of De Hoop to include the CapeNature managed land parcels, exclude private land, areas managed by private and state entities and reflect the correct Western boundary between Dene;/OTR and De Hoop Correct and publish the MPA proclamation to reflect the true coordinate of the MPA boundary	**Lead:** Conservation Manager On-Reserve **Enablers:** Landscape Unit Manager, Marine and Coast Specialist, Law Administration	Year 2	Proclamation notice covering all De Hoop land parcels and correct MPA coordinates	Proclamation notice, CapeNature declaration process National Norms and Standards for Management of Protected Areas METT-SA Copies of title deeds, diagrams, noting sheets and proclamations CapeNature GIS database
<u>Objective 9.4:</u> By 2036 and beyond, unlawful development, land clearing, and any other relevant unauthorised activities within the GDHC zone of	Report unauthorised development, land clearing and other relevant unlawful activities within the zone of influence in the approved format	**Lead:** Conservation Manager Off-Reserve **Enablers:** Landuse Scientist; Landscape Unit Manager; Conservation Manager On-	Year 1- 10	Record of reporting on correct forms to the competent authority. Pre-Notices Enforcement Notices	Relevant and various legislation under the National Environmental Management Act, No. 107 of 1998; Conservation of

STRATEGY 9	**Promote co-operative governance and legislative compliance by implementing the De Hoop and De Mond Integrated Compliance Plans and enabling inter-governmental and relevant Non-Governmental Organisation relationships that mitigate negative impacts on biodiversity associated with non-compliance with legislation**				
LINKED GOALS:	1, 2, 3, 4, 5, 7, 8, 11, 12				
THREATS:	Disturbance and destruction (human activities), poaching, illegal activities & access, pollution, developments/ inappropriate infrastructure, over abstraction of water (ground & surface)				
TARGET / VALUE:	Marine ecosystem, coastal ecosystem, priority game species, freshwater ecosystem, cave ecosystem, Cape vulture, terrestrial vegetation, estuary ecosystem, archaeological & cultural heritage features, nature-based tourism activities and access, sense of place and quality of life, learning opportunities through environmental awareness and research, nature-based livelihoods				
Objectives	**Actions**	**Responsibility**	**Time-frame**	**Measurable Indicators / Outputs**	**References / Existing Procedures**
influence are reported and support is given to associated organisations		Reserve; Marine and Coast Specialist			Agricultural Resources Act, 1983.

STRATEGY 10	**Implement an integrated environmental awareness programme aimed at neighbours, natural resource users, learner groups, and visitors in collaboration with partners, to nurture respect and care for the natural, cultural, and historical values of the GHDC**				
LINKED GOALS:	1, 2, 3, 7, 8, 9, 10, 11, 12, 13				
THREATS:	Invasive alien plants, inappropriate fire regime, disturbance and destruction (human activities), poaching, illegal activities & access pollution, developments/ inappropriate infrastructure, over abstraction of water (ground & surface), natural disease				
TARGET / VALUE:	Marine ecosystem, coastal ecosystem, priority game species, freshwater ecosystem, cave ecosystem, Cape vulture, terrestrial vegetation, estuary ecosystem, archaeological & cultural heritage, nature-based tourism activities and access, sense of place and quality of life, learning opportunities through environmental awareness and research, nature-based livelihoods				
Objectives	**Actions**	**Responsibility**	**Time-frame**	**Measurable Indicators / Outputs**	**References / Existing Procedures**
<u>Objective 10.1</u>: By 2036 and beyond, the GDHC has developed and implemented an Environmental Awareness plan	Develop five-year GDHC Environmental Awareness and Capacity Building Plan, inclusive of target audiences, topics requiring environmental awareness intervention, and partner inputs	**Lead:** Stakeholder Engagement Officer **Enablers:** Team Leader Learning and Awareness; Conservation Manager On-Reserve; Conservation Officer On-Reserve; Field Rangers; Tourism Officer, Tourism Liaison Officer	Year 1	Approved GDHC Environmental Awareness and Capacity Building Plan for 5 years	Environmental Awareness Programme Template and annual work plans; Integrated Work Plan; CapeNature Communications Policy; CapeNature Learning & Awareness Annual Plan; CapeNature Advocacy Strategy
	Develop reserve-specific environmental awareness raising resources such as presentations and interpretive signage on identified topics relevant to the conservation targets of the GHDC e.g. wildfires, estuaries, MPA, damage causing animals and game species		Year 1-2	Awareness raising resources (leaflets, pamphlets/booklets, signage, etc.) available and in use	
	Implement the Environmental Awareness and Capacity Building Plan through structured workplan activities		Year 1-5	Number of activity reports, number of target audience reached, shared resources.	

STRATEGY 10	**Implement an integrated environmental awareness programme aimed at neighbours, natural resource users, learner groups, and visitors in collaboration with partners, to nurture respect and care for the natural, cultural, and historical values of the GHDC**				
LINKED GOALS:	1, 2, 3, 7, 8, 9, 10, 11, 12, 13				
THREATS:	Invasive alien plants, inappropriate fire regime, disturbance and destruction (human activities), poaching, illegal activities & access pollution, developments/ inappropriate infrastructure, over abstraction of water (ground & surface), natural disease				
TARGET / VALUE:	Marine ecosystem, coastal ecosystem, priority game species, freshwater ecosystem, cave ecosystem, Cape vulture, terrestrial vegetation, estuary ecosystem, archaeological & cultural heritage, nature-based tourism activities and access, sense of place and quality of life, learning opportunities through environmental awareness and research, nature-based livelihoods				
Objectives	**Actions**	**Responsibility**	**Time-frame**	**Measurable Indicators / Outputs**	**References / Existing Procedures**
	Review and revise the approved GDHC Environmental Awareness and Capacity Building Plan after five years		Year 5	Approved 5-year GDHC Environmental Awareness and Capacity Building Plan	
<u>Objective 10.2:</u> By 2036 and beyond, CapeNature has developed and implemented a GDHC informational signage plan to raise awareness of all conservation targets	Develop and implement a Signage Plan for the GDHC which includes a needs assessment, design process, installation schedule and maintenance program (include interpretive signage)	**Lead:** Conservation Manager On-Reserve. **Enablers:** Tourism Officer, Stakeholder Engagement Officer, General Manager Advocacy	Year 1-10	Signage register, IAPO	Corporate Identity Manual; Communications Policy

STRATEGY 11	**Contribute to economic and social development by providing job and training opportunities, where relevant, to Expanded Public Works Programme (EPWP), contract, and small, medium, and micro-sized enterprise (SMME) staff within the GDHC**
LINKED GOALS:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
THREATS:	Invasive alien plants, inappropriate fire regime, disturbance and destruction (human activities), poaching, illegal activities & access, pollution, developments/ inappropriate infrastructure, over abstraction of water (ground & surface), reducing human management
TARGET / VALUE:	Marine ecosystem, coastal ecosystem, priority game species, freshwater ecosystem, cave ecosystem, Cape vulture, terrestrial vegetation, estuary ecosystem, archaeological & cultural heritage features, nature-based tourism activities and access, learning opportunities through environmental awareness and research, nature-based livelihoods

Objectives	Actions	Responsibility	Time-frame	Measurable Indicators / Outputs	References / Existing Procedures
<u>Objective 11.1:</u> By 2036 and beyond, CapeNature has engaged with partners to identify and promote job and training opportunities within the GDHC	Facilitate meetings with relevant partners and role players to identify and promote job and training opportunities for the GDHC (examples include guiding, alien clearing, veld restoration, infrastructure maintenance)	**Lead:** Stakeholder Engagement Officer **Enablers**: Team Leader EPWP: Compliance & Reporting; Conservation Manager On-Reserve; Conservation Officer On Reserve; Talent Optimisation; Specialist: SMME Development; People and Parks Officer; EPWP projects officer	Year 1-10	Management Information System report, Service Level Agreements implemented, IAPO, workplans, Activity plan, Infrastructure register	Municipal Integrated Development Plans and Strategic Development Frameworks. Ministerial Determination: 4 Expanded Public Works Programmes
	Create employment opportunities linked to alien vegetation clearing through mechanisms such as wood cutter models, alien biomass projects, SMME alien clearing contractors and externally funded alien clearing projects				
	Determine the resource yield for potential future Sour Fig harvesting within the Waenhuiskrans section of De Mond and implement if determined as a viable project.	**Lead:** Conservation Officer On-Reserve **Enablers:** Conservation Manager On Reserve; Landscape Conservation Intelligence Manager, Ecological Coordinator, Stakeholder Engagement Officer.	Year 1-10	Resource Yield Assessment Document	Consumptive Use of Wild Flora from CapeNature-managed Protected Areas Policy (2019), CapeNature Position Statement on the Consumptive Use of Wild Flora.

STRATEGY 11	**Contribute to economic and social development by providing job and training opportunities, where relevant, to Expanded Public Works Programme (EPWP), contract, and small, medium, and micro-sized enterprise (SMME) staff within the GDHC**				
LINKED GOALS:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13				
THREATS:	Invasive alien plants, inappropriate fire regime, disturbance and destruction (human activities), poaching, illegal activities & access, pollution, developments/ inappropriate infrastructure, over abstraction of water (ground & surface), reducing human management				
TARGET / VALUE:	Marine ecosystem, coastal ecosystem, priority game species, freshwater ecosystem, cave ecosystem, Cape vulture, terrestrial vegetation, estuary ecosystem, archaeological & cultural heritage features, nature-based tourism activities and access, learning opportunities through environmental awareness and research, nature-based livelihoods				
Objectives	**Actions**	**Responsibility**	**Time-frame**	**Measurable Indicators / Outputs**	**References / Existing Procedures**
<u>Objective 11.2:</u> By 2036 and beyond, the GDHC has developed a training and skills development plan	Implement the annual corporate training and skill development plan for EPWP staff and identify additional training needs where applicable	**Lead:** Conservation Manager On-Reserve **Enablers:** Stakeholder Engagement Officer, Specialist SMME Development; Talent Optimisation, People and Parks Officer; EPWP Projects Officer; Team Leader EPWP: Compliance & Reporting	Year 1-10	Management Information System report; training register; Personal Development Plans for EPWP staff	Personal Development Plans; EPWP Recruitment and Selection Guidelines 2024.

11 COSTING

This section provides an overview of costing and fund allocation for conservation strategies identified for the GHDC. It outlines existing financial resources (current budget), funding shortfalls, sources of alternate funding and future financial projections.

11.1 Finance and Asset Management

In line with the legal requirement, the strategies identified for implementation within the GDHC, to achieve the desired state, have been costed below.

The GDHC will adhere to the following guiding principles:

- Responsibly manage the allocation of budget, revenue raising activities and expenditure.
- Ensure solid financial management supporting the achievement of the objectives of this plan.
- Compliance with the Public Finance Management Act, 1999 (Act No. 1 of 1999) as well as CapeNature's financial policies and procedures.

A budget for the GDHC was derived based upon the activities in this management plan. When estimating the costs, the following items were considered:

- Those costs and associated resources which could be allocated to specific activities, and which were both of a recurring and once-off nature.
- Unallocated fixed costs (*e.g.,* water, electricity, phones, bank fees).
- Costs associated with maintenance of infrastructure.
- Provision for replacement of minor and major assets, (*e.g.,* furniture, electronic equipment, vehicles, fences).

Items above a specified financial value of (R2 000) are recorded in the fixed asset register. All assets are associated with staff appointed within the GDHC and should any such staff move position, new custodians are appointed. All assets are verified on a regular basis for audit purposes. Minor assets below the specified value are recorded on minor asset register. Broken or obsolete assets are disposed of as per CapeNature's asset disposal protocol.

11.1.1 Income

CapeNature's budget is funded by the Medium-Term Expenditure Framework allocation, other government grants and from own revenue generating commercial activities. Any surplus revenue generated is used to fund shortfalls in management costs across the organisation.

CapeNature has overhead costs relating to support services such as human resources, communication, marketing and learning, finance, biodiversity capabilities, conservation operations, eco-tourism and access, legal services, *etc.* which is not allocated to landscape or individual protected area budgets but covered at a corporate level. Some protected area's cover operational expenses through grant funding such as the Expanded Public Works Programme.

This management plan is a 10-year plan and thus straddles multiple Medium-Term Expenditure Framework periods that impact on actual budget allocation and projection. Due to the ongoing challenging fiscal position South Africa faces, the organisation is under continued financial strain, impacting on the implementation of this management plan.

The total zero-based budget needs projected for 2025/26 is R12 657 883. This excludes Board staff TCOE's. The summary as allocated for 2025/26 is presented in Table 11.1, excluding staff TCOE's.

An annual summary is presented in Table 11.1.

Table 11.1: An annual summary of the total projected income for the GHDC as part of the Overberg Landscape Unit

Income Allocation Source (2025-2026)	Amount (R)
Total Income	R 12 657 883
MTEF Allocation Operational	R 4 499 144
MTEF Allocation Tourism	R 5 160 887
Own Funding	R 786 126
External Funding	R 2 211 726

11.1.2 Expenditure

11.1.2.1 Recurring costs

Annual direct costs may include staff, transport and travel, stores and equipment, and other fixed costs. This expenditure is split according to strategies as illustrated in Figure 11.1

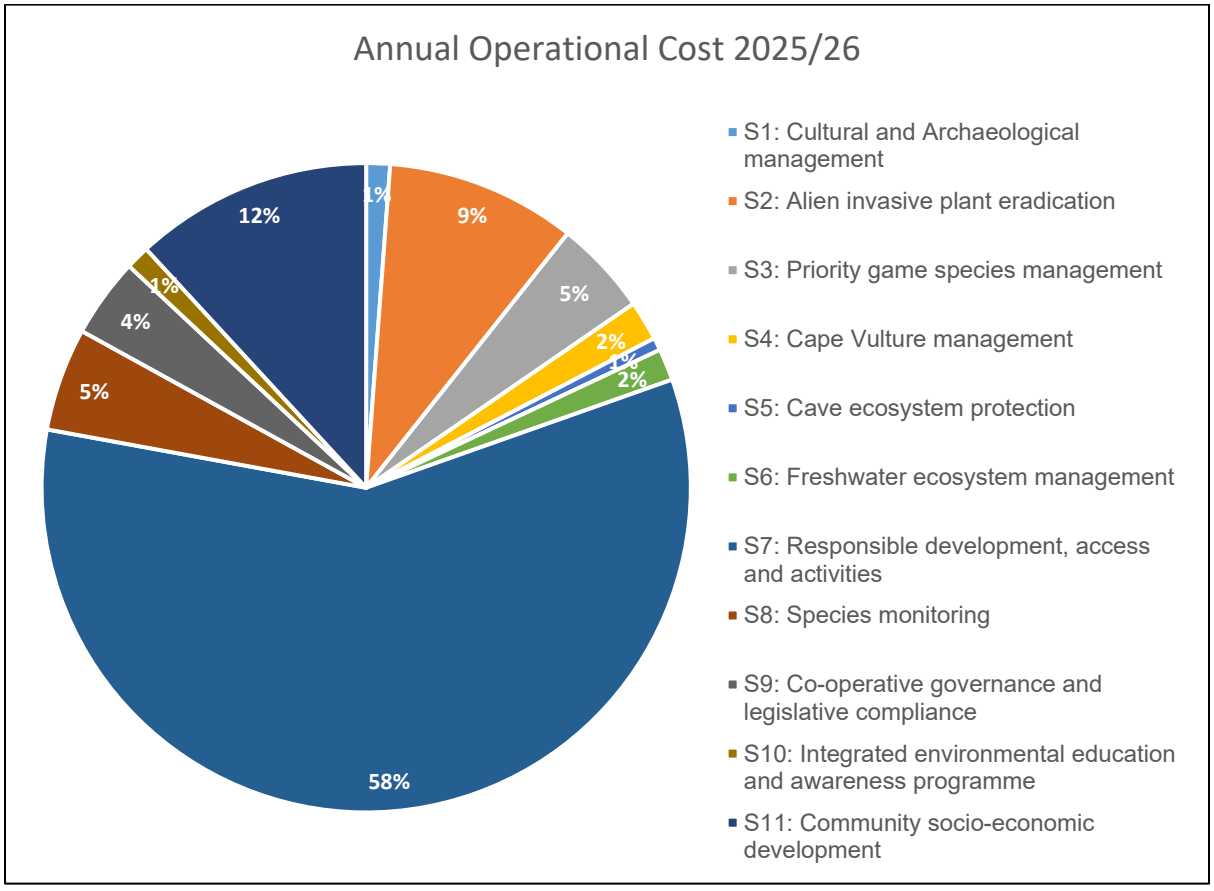


Figure 11.1: The estimated proportion of annual operational costs for the GHDC for year 2025/26 aligned with the identified strategies

11.1.2.2 Once off costs

In addition to recurring costs there might be once-off replacement costs for assets such as tractors, firefighting equipment, field equipment and fencing; that are aligned with the life span of the relevant assets being replaced.

11.1.2.3 Maintenance

An annual earmarked allocation is provided for the development of new tourism and operational infrastructure as well as the upgrade and maintenance for such. Tourism projects are prioritised across all CapeNature facilities and maintenance is scheduled accordingly.

11.1.2.4 Implications

The unsuccessful securing of external funding, replacement and maintenance of critical capital equipment, assets, and infrastructure and further reductions in organisational budget allocation could lead to potential financial shortfalls and will have a negative impact on strategic implementation throughout the GDHC. The implications of this are that the strategic plan may not be fully achieved. Available funding will have to be prioritised accordingly. A zero-based budget assessment is needed to determine the true financial needs of the GDHC.

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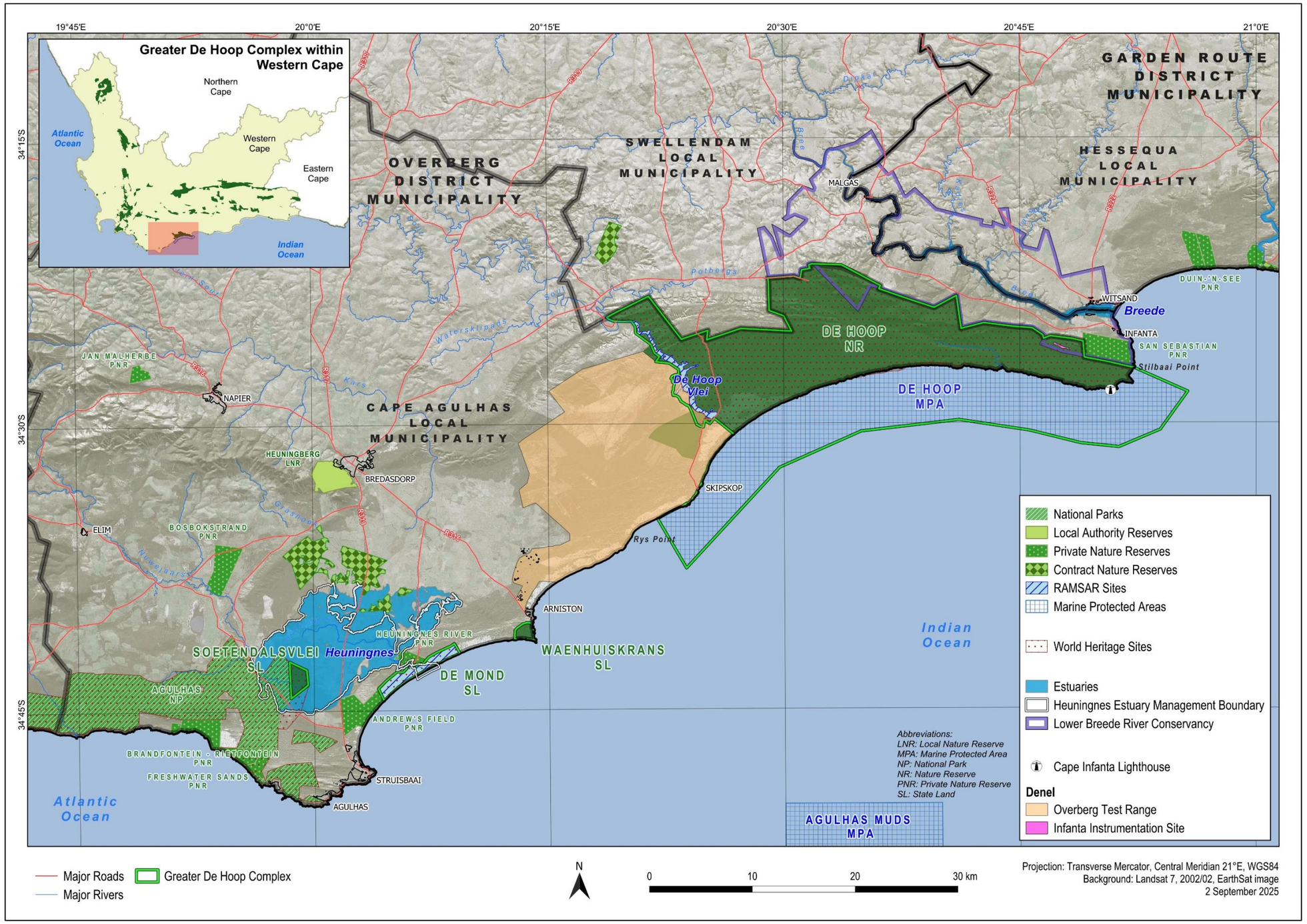
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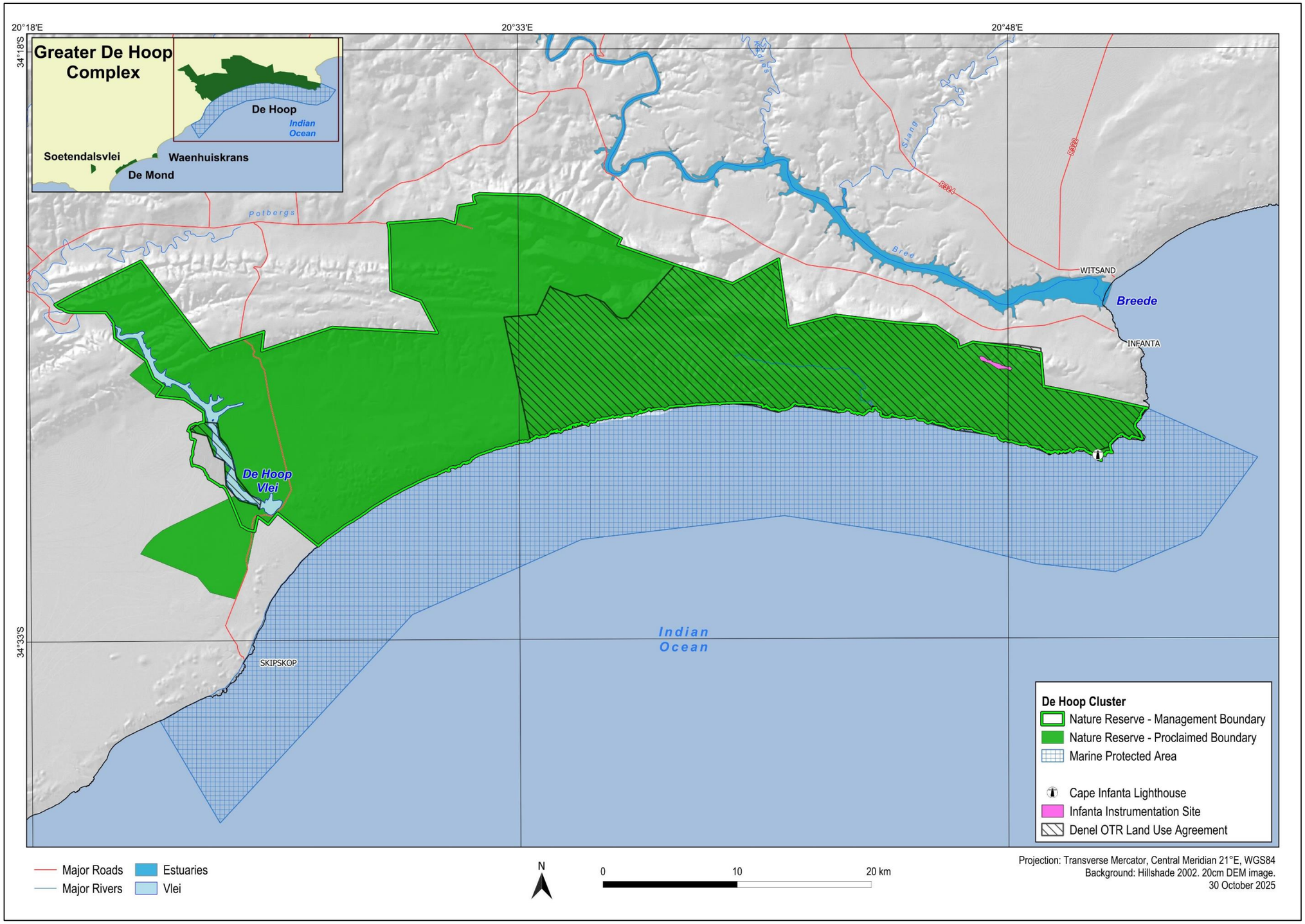
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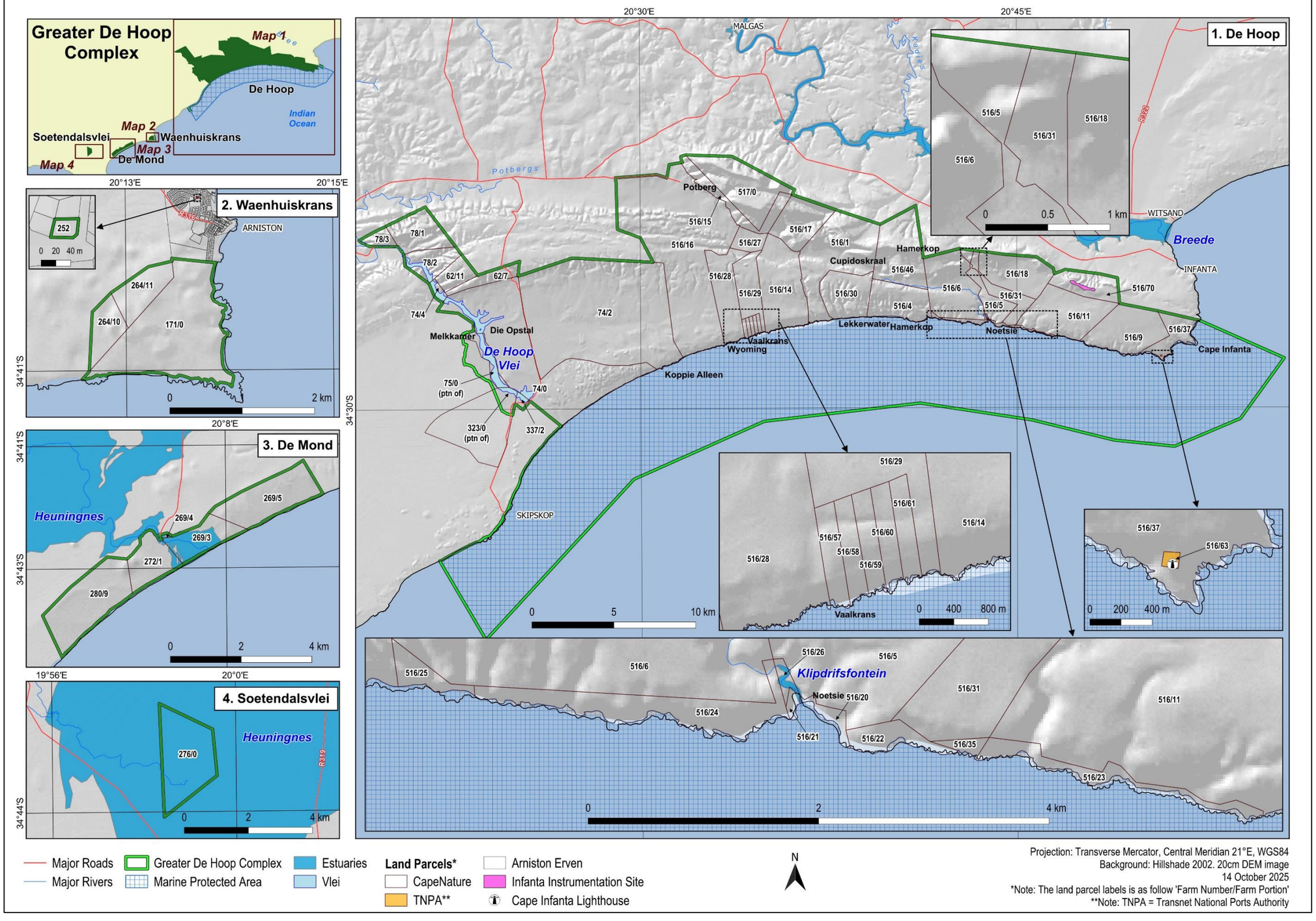
APPENDIX 1 Maps of the GHDC



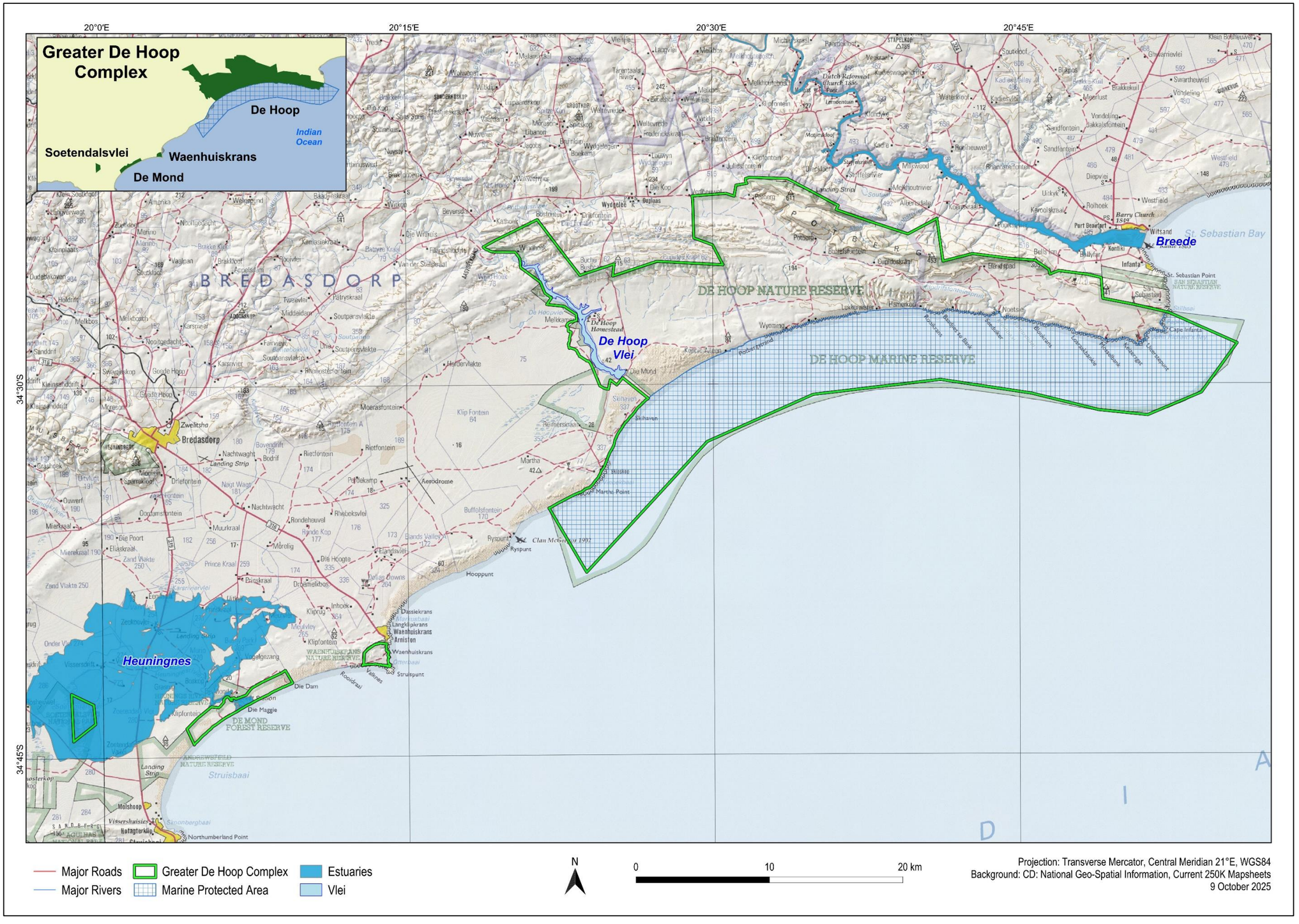
Map 1. Location and extent of the GDHC



Map 2 De Hoop proclaimed and management boundaries



Map 3 Land parcels of the GDHC



Map 4 Topography of the GDHC

Geology - De Hoop*
(1: 50 000): Dominant Lithology (-ies)

QUATERNARY PERIOD

- Alluvium
- Qg Light-grey to pale-red sandy soil
- Qc Calcrete
- Qf Ferricrete
- T-Qt Talus grading into gritty sand

CENOZOIC, BREDASDORP GROUP

- Qsr Strandveld Formation (Dune and beach sand with shell material)
- Qw Waenhuiskrans Formation (Partly calcified dune sand with calcrete lenses)
- Qk Klein Brak Formation (Partly calcified shelly sandstone with pebbles)
- Tw Wankoe Formation (Calcareous sandstone with calcrete lenses)
- Td De Hoopvlei Formation (Calcareous shelly sandstone with conglomerate lenses)

MESOZOIC, KAROO, UITENHAGE GROUP

- Je Enon Formation (Reddish conglomerate, sandstone, mudstone)

PALAEOZOIC, CAPE, BOKKEVELD GROUP

Bidouw Subgroup

- Dk Klipbokkop Formation (Shales and siltstones with subordinate fine-grained sandstone)
- Dw Waboomberg Formation (Mudstone and siltstone interbedded with fine-grained sandstone)

Ceres Subgroup

- Dt Tra Tra Formation (Mudstone and siltstone-rich)

PALAEOZOIC, CAPE, TABLE MOUNTAIN GROUP

Nardouw Subgroup

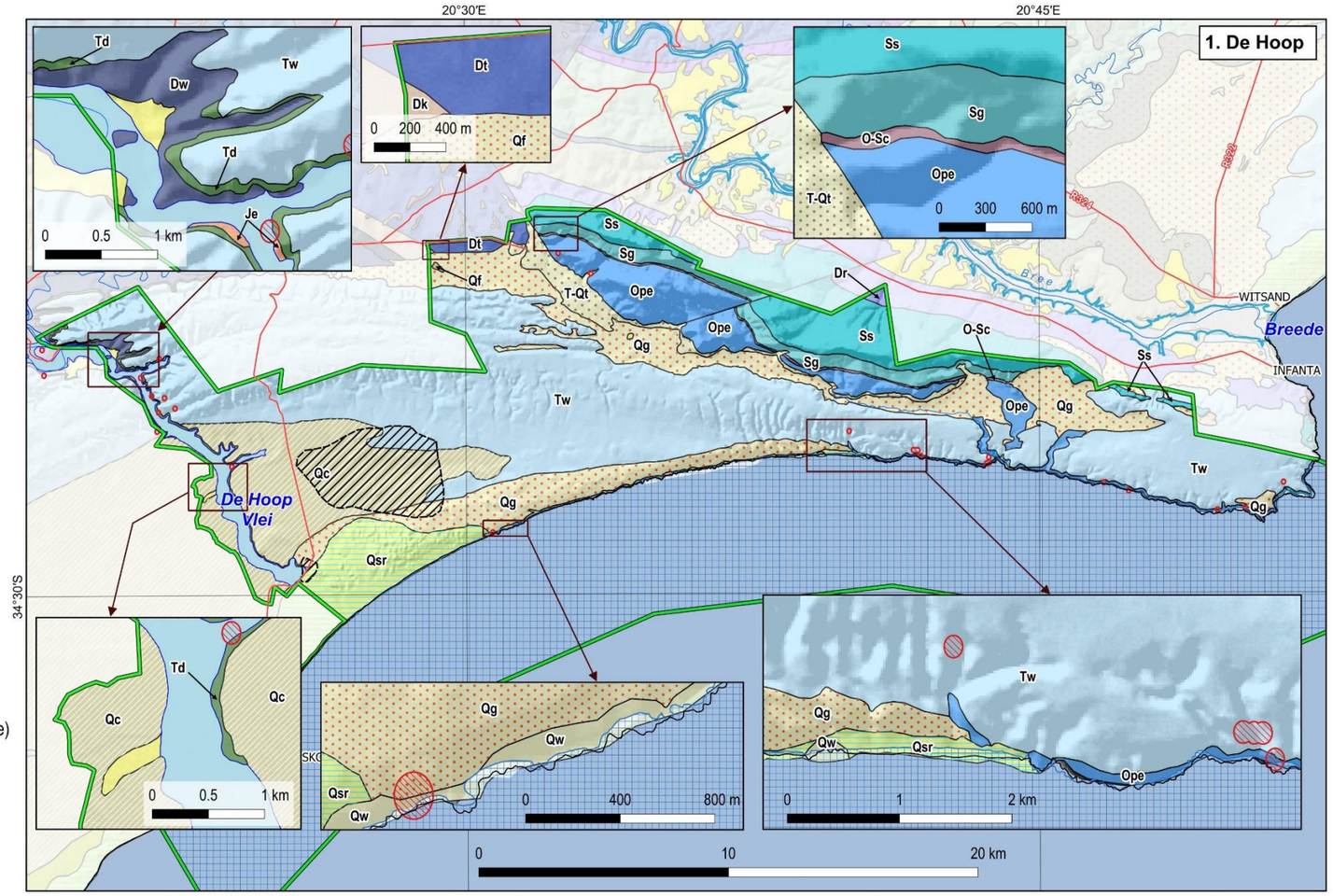
- Dr Rietvlei Formation (Veldspatic sandstone)
- Ss Skurweberg Formation (Quartzitic sandstone)
- Sg Goudini Formation (Reddish quartzitic sandstone)
- O-Sc Cedarberg Formation (Dark-grey shale and siltstone with thin sandstone lenses)

PALAEOZOIC, CAPE, TABLE MOUNTAIN GROUP

- Ope Peninsula Formation (Light-grey quartzitic sandstone)

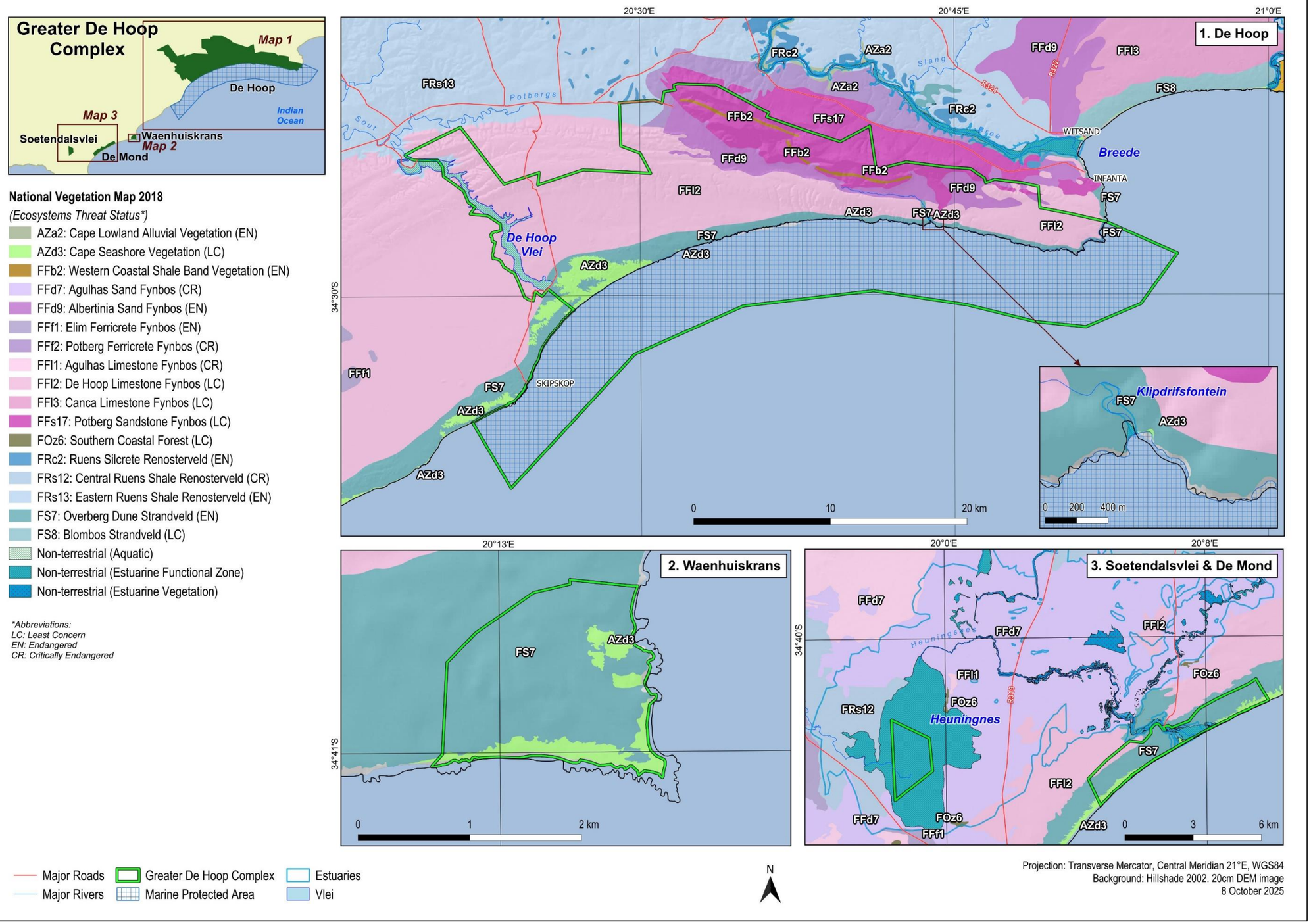
*Source: Council of Geoscience (1999). The Geology for De Hoop was mapped in field in 1984 and transfered onto a 1: 50,000 Topography Maps on which the different geology features were marked.

Major Roads · Major Rivers · Greater De Hoop Complex · Marine Protected Area · Estuaries · Vlei

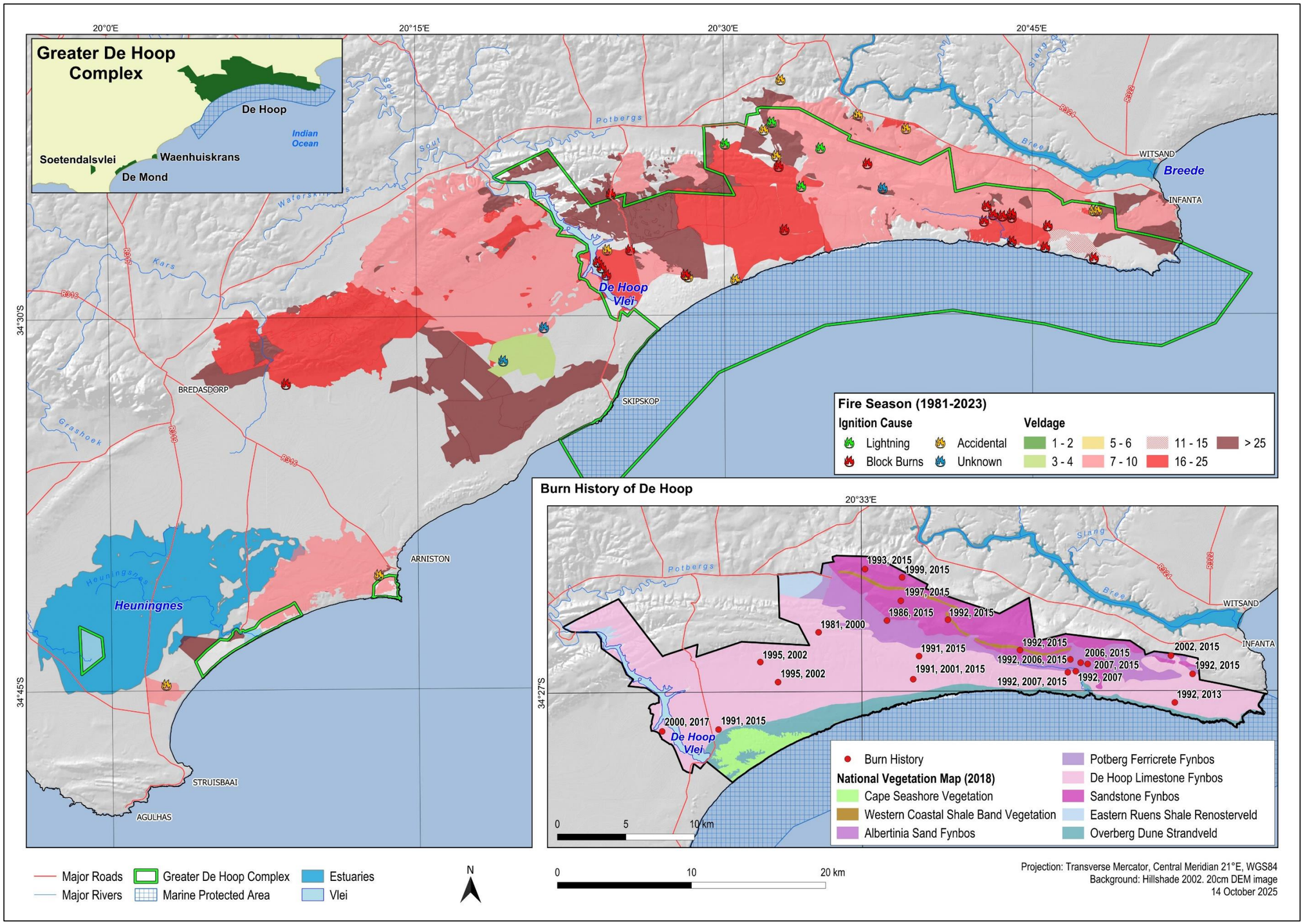


Projection: Transverse Mercator, Central Meridian 21°E, WGS84
Background: Map 1) Hillshade 2002. 20cm DEM image.
Map 2: 1: 250 000 Geology maps of 3420 Riversdale (1993) & 3319 Worcester (1997), courtesy of Council of Geoscience.
8 October 2025

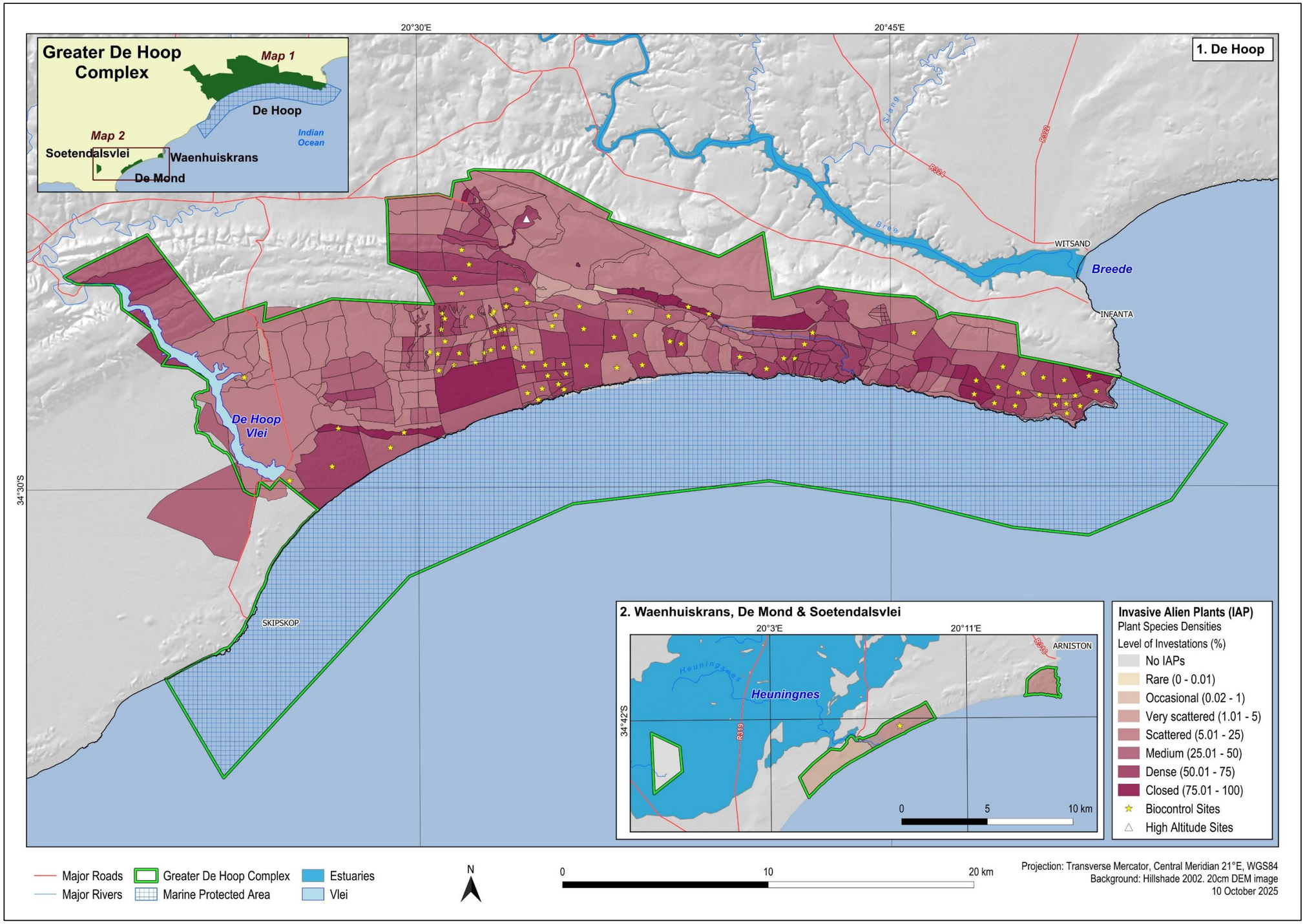
Map 5 Geology of the GDHC



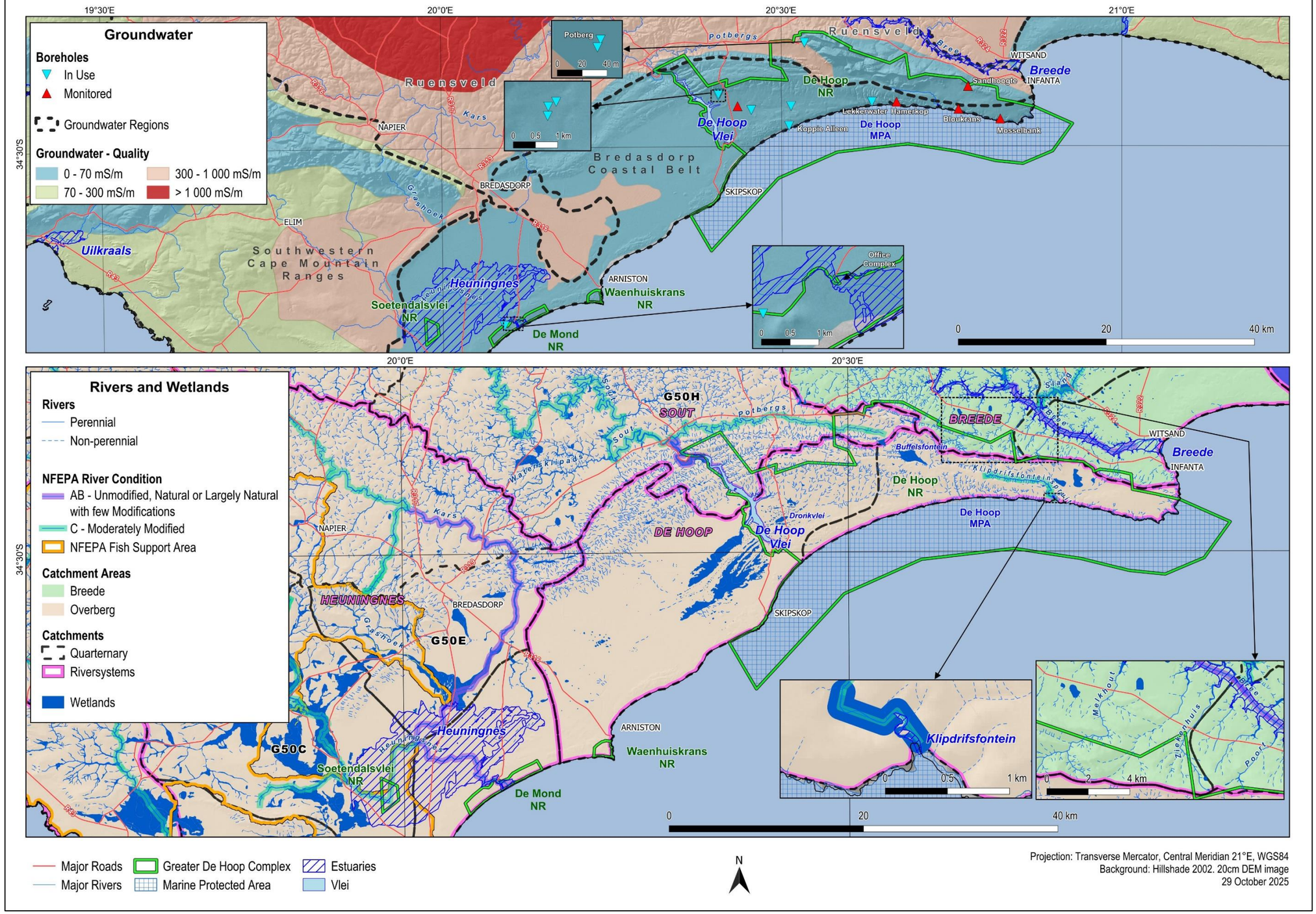
Map 6 Vegetation of the GDHC



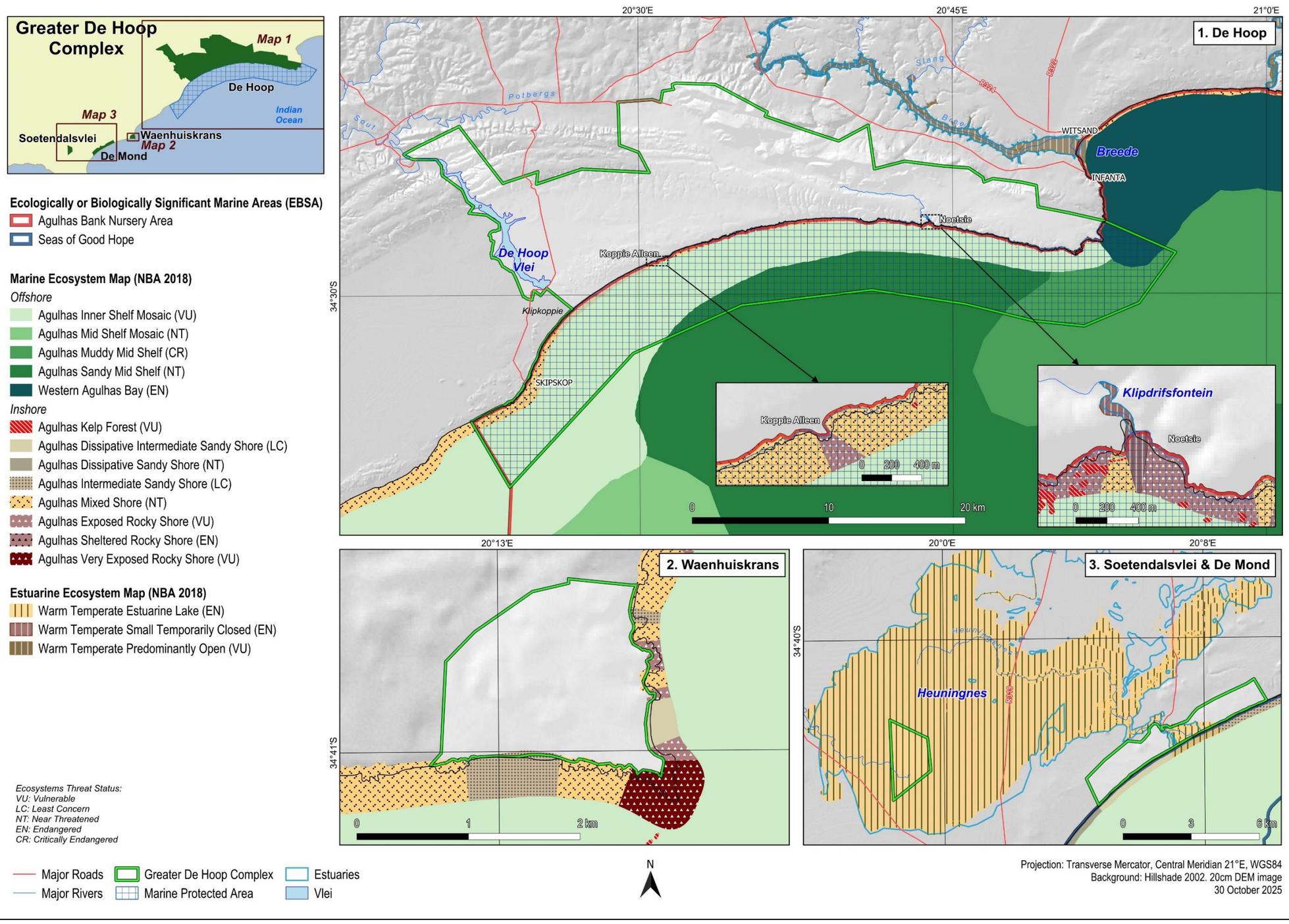
Map 7 Veld age and fire history of the GDHC



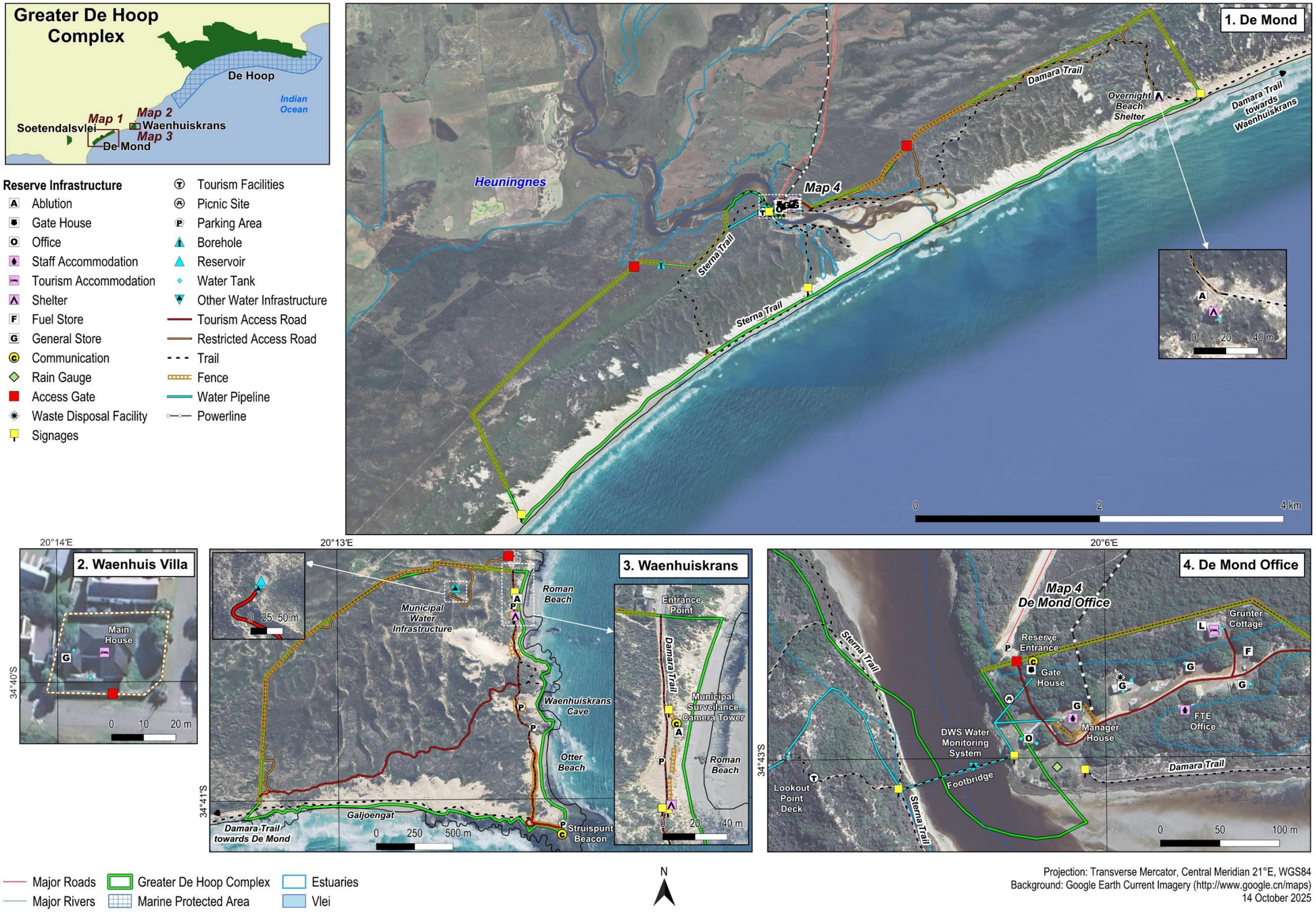
Map 8 Invasive alien plant densities in the GDHC



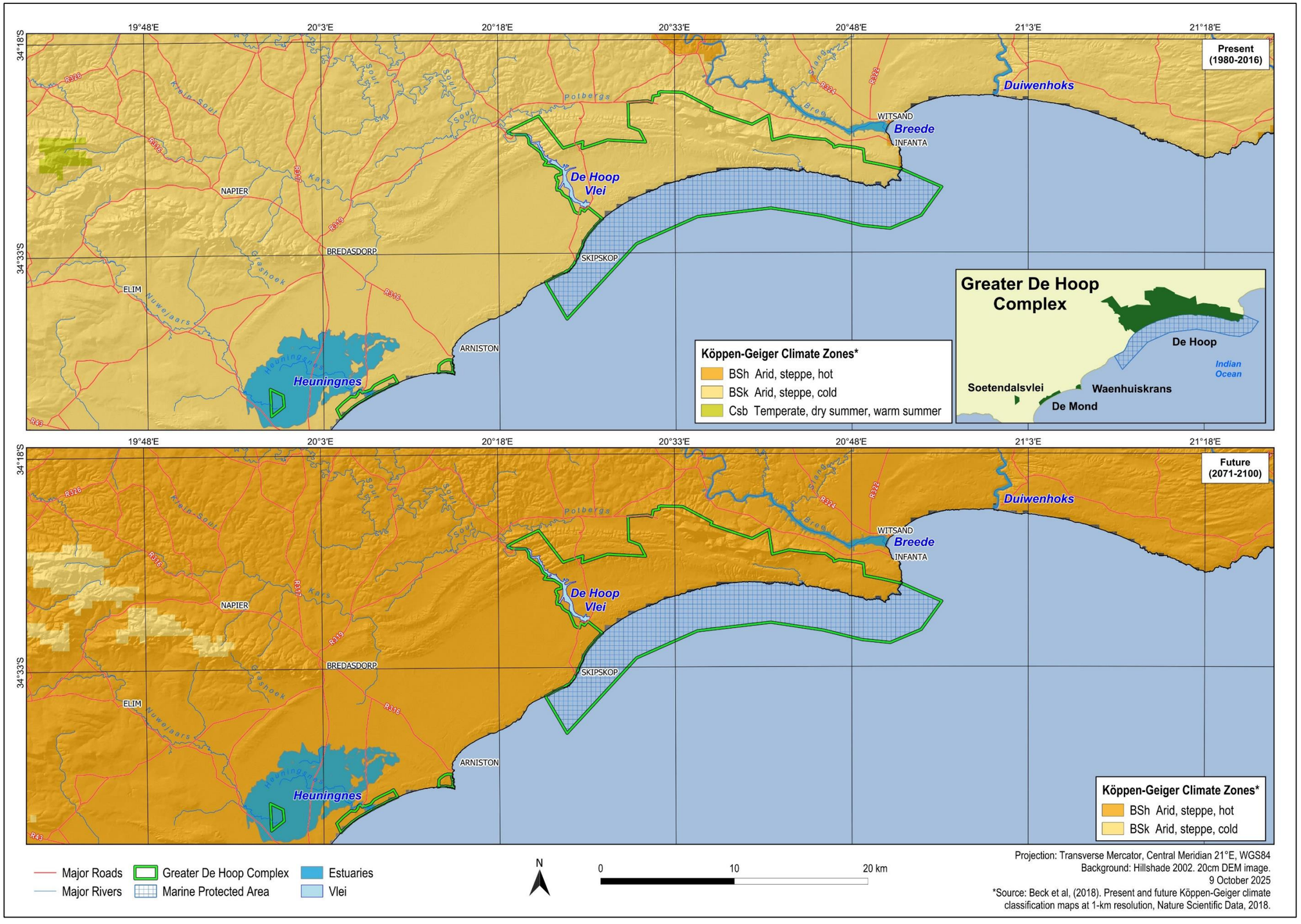
Map 9 Aquatic systems of the GDHC



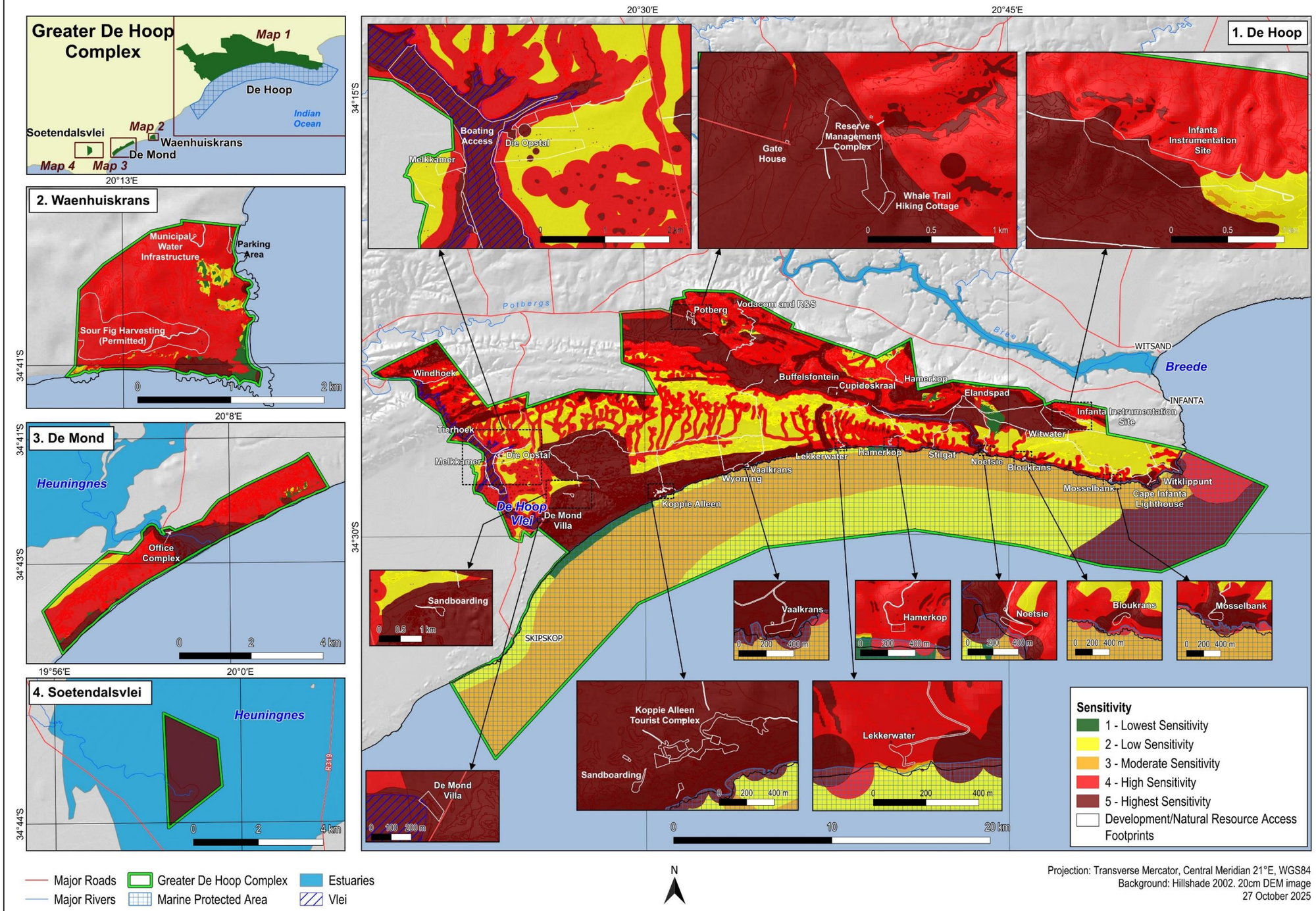
Map 10 Marine and estuarine systems of GDHC



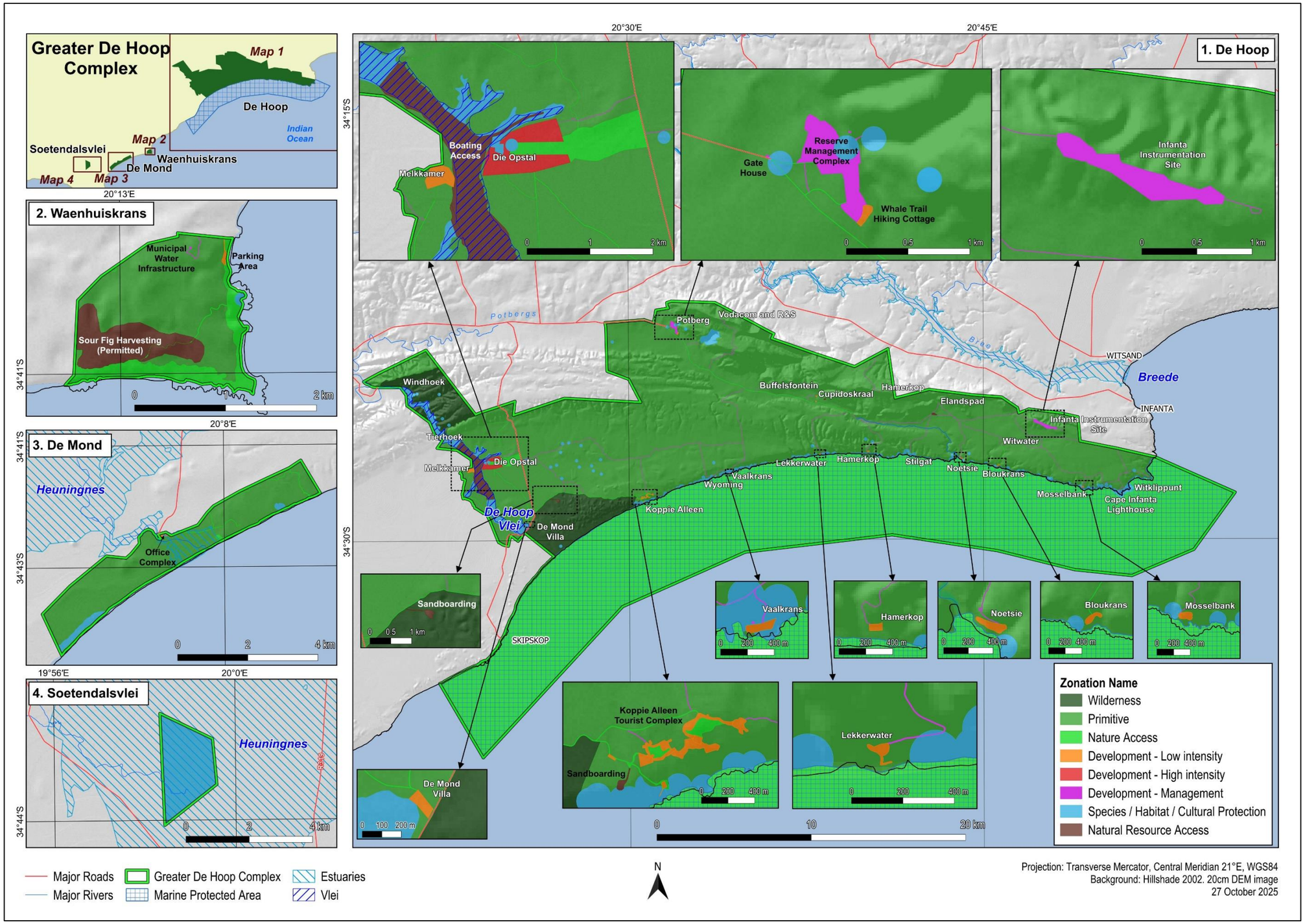
Map 11 Archaeological and cultural heritage of the GDHC



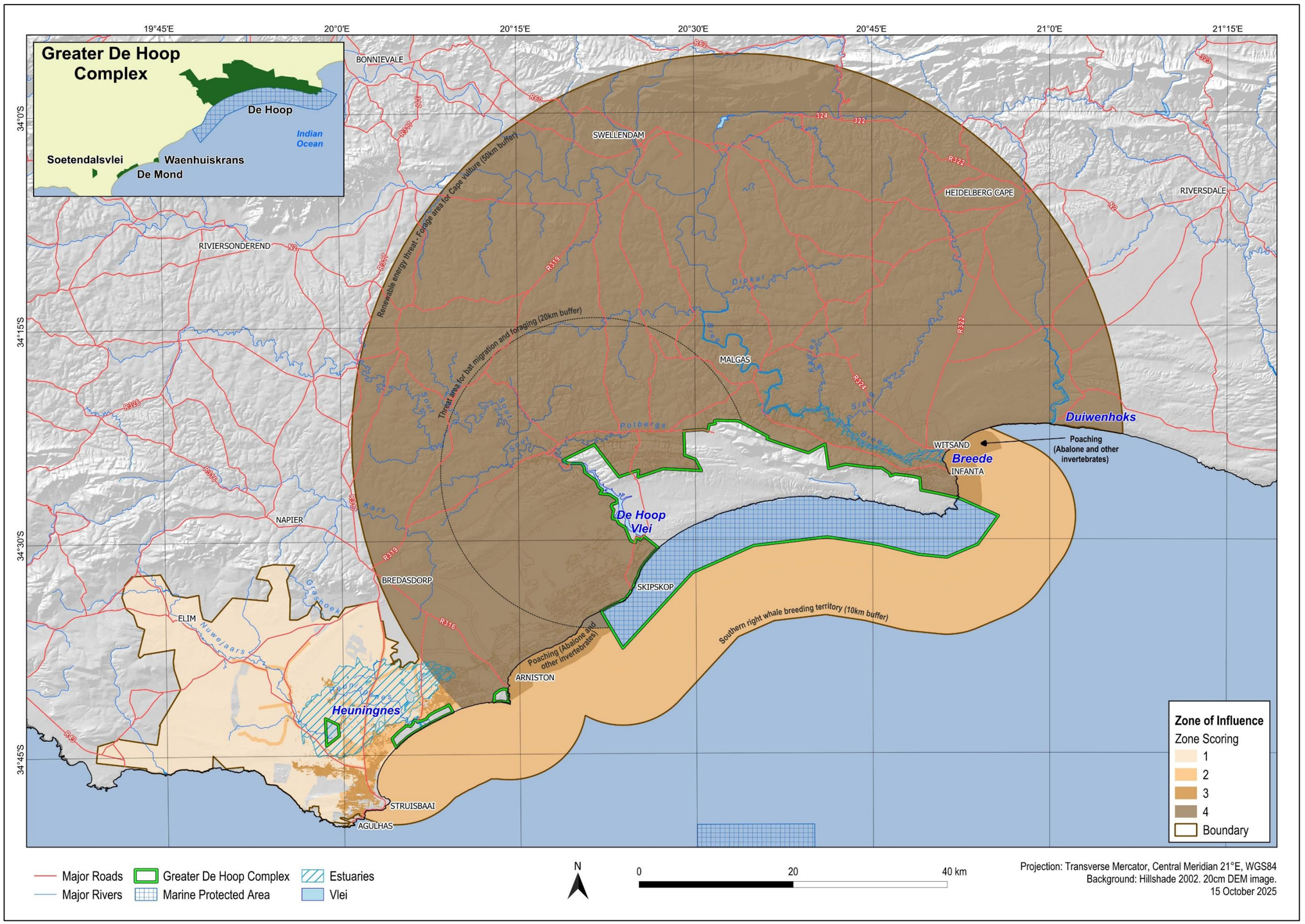
Map 12 Climate change predictions for the GDHC



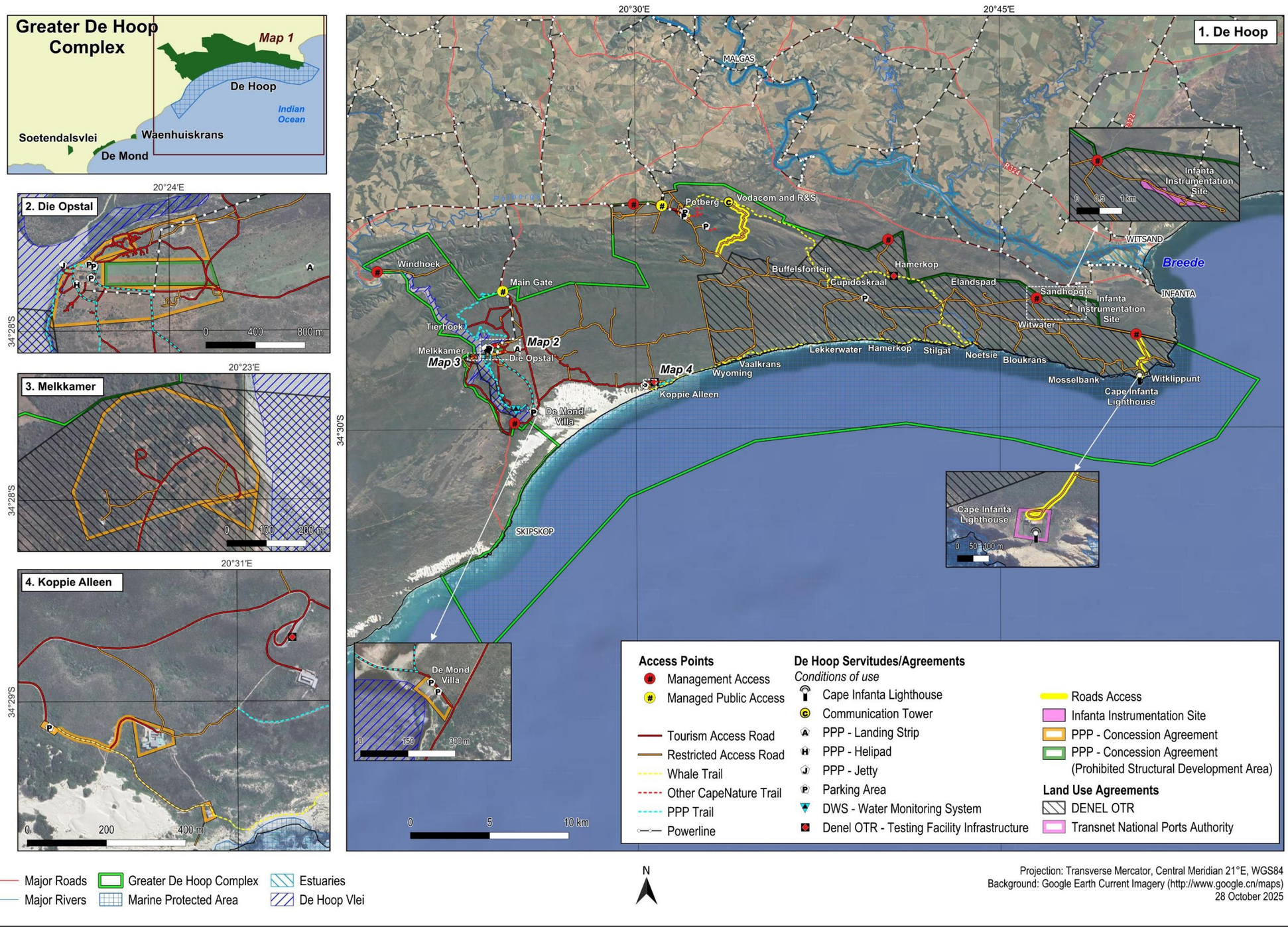
Map 13 Sensitivity of the GDHC



Map 14 Zonation of the GDHC



Map 15 Zone of influence around the GDHC



Map 16 Access and servitudes on De Hoop



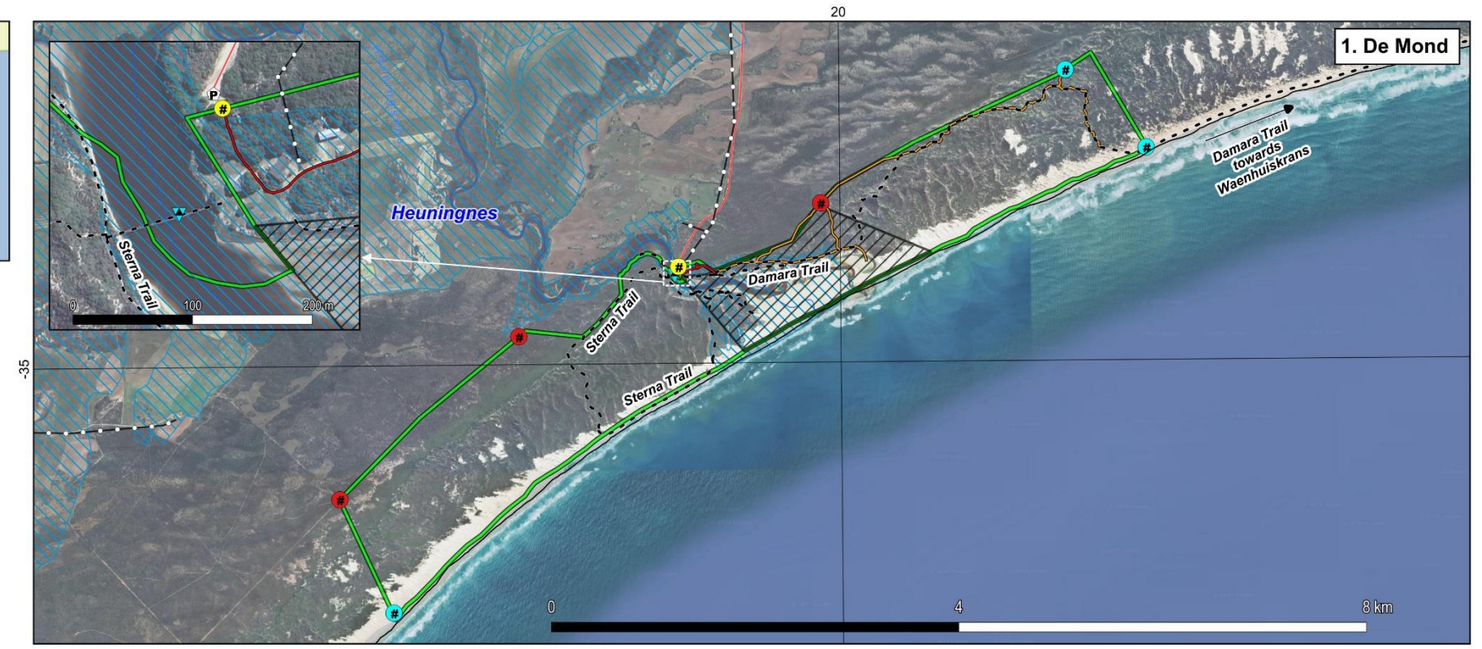
Access Points
- Management Access
- Managed Public Access
- Unmanned Public Access

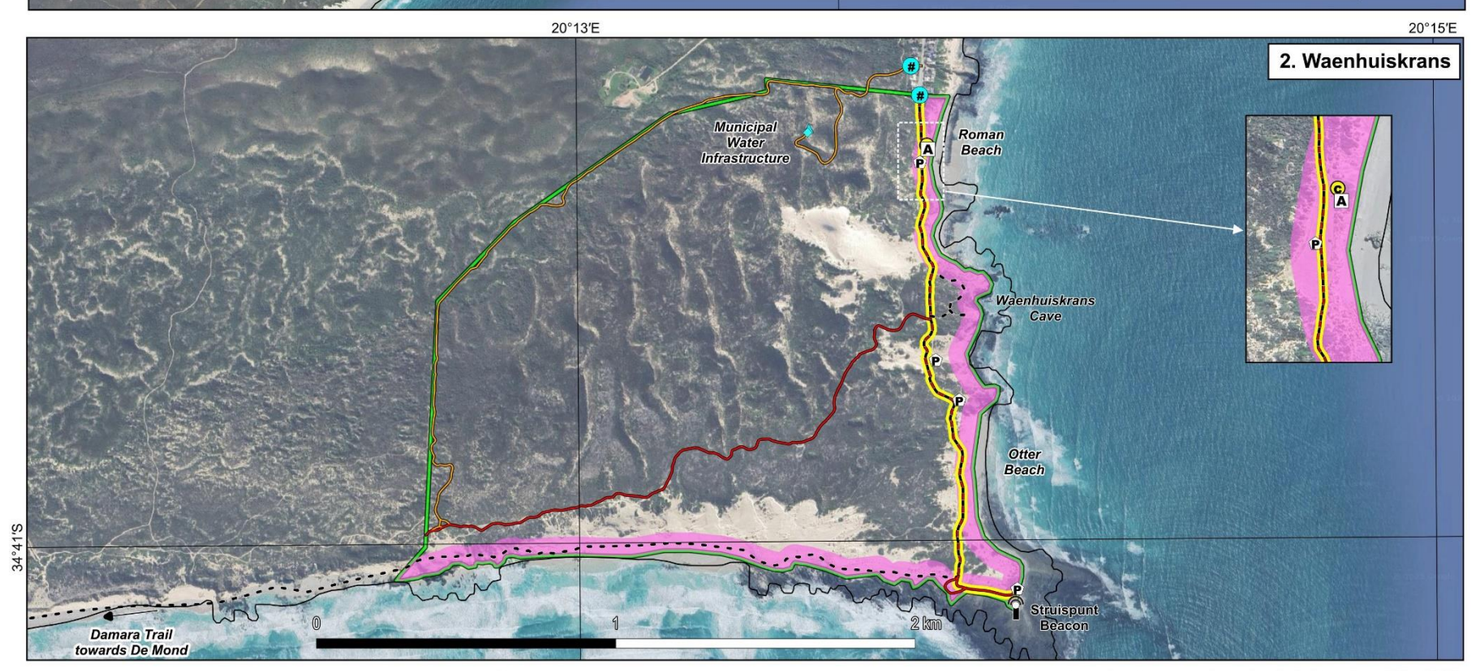
- Navigational Beacon
- Parking Area
- Ablution
- Shelter
- Reservoir
- Water Pump
- DWS Water Monitoring System
- Surveilance Camera

- Tourism Access Road
- Restricted Access Road
- CapeNature Trail
- Powerline

Servitude
Conditions of use
- Public Road
- Public Access to Coast

Formal Agreement
Conditions of use
- Future Development Consent



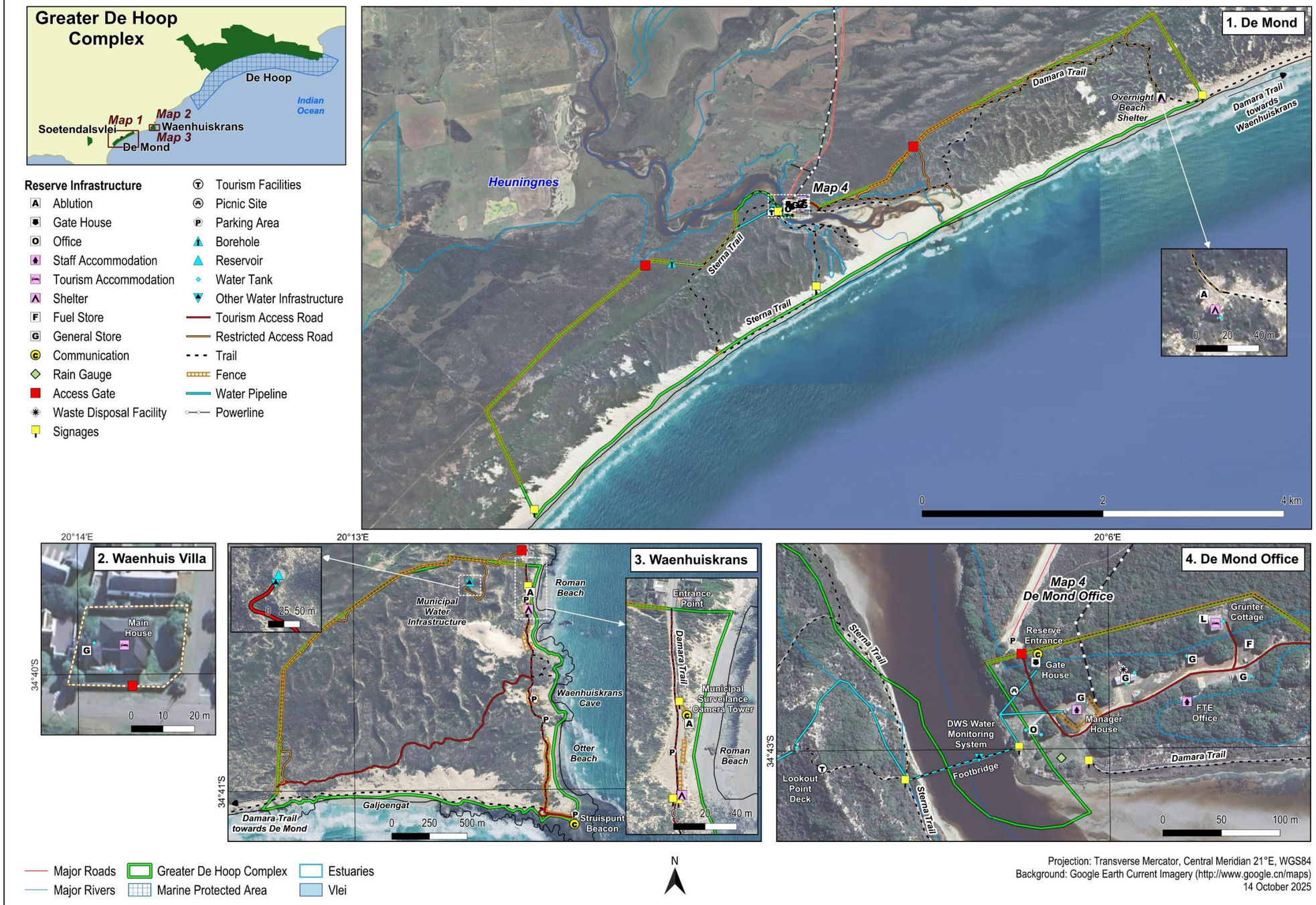


- Major Roads
- Major Rivers
- Greater De Hoop Complex
- Marine Protected Area
- Estuaries
- Vlei

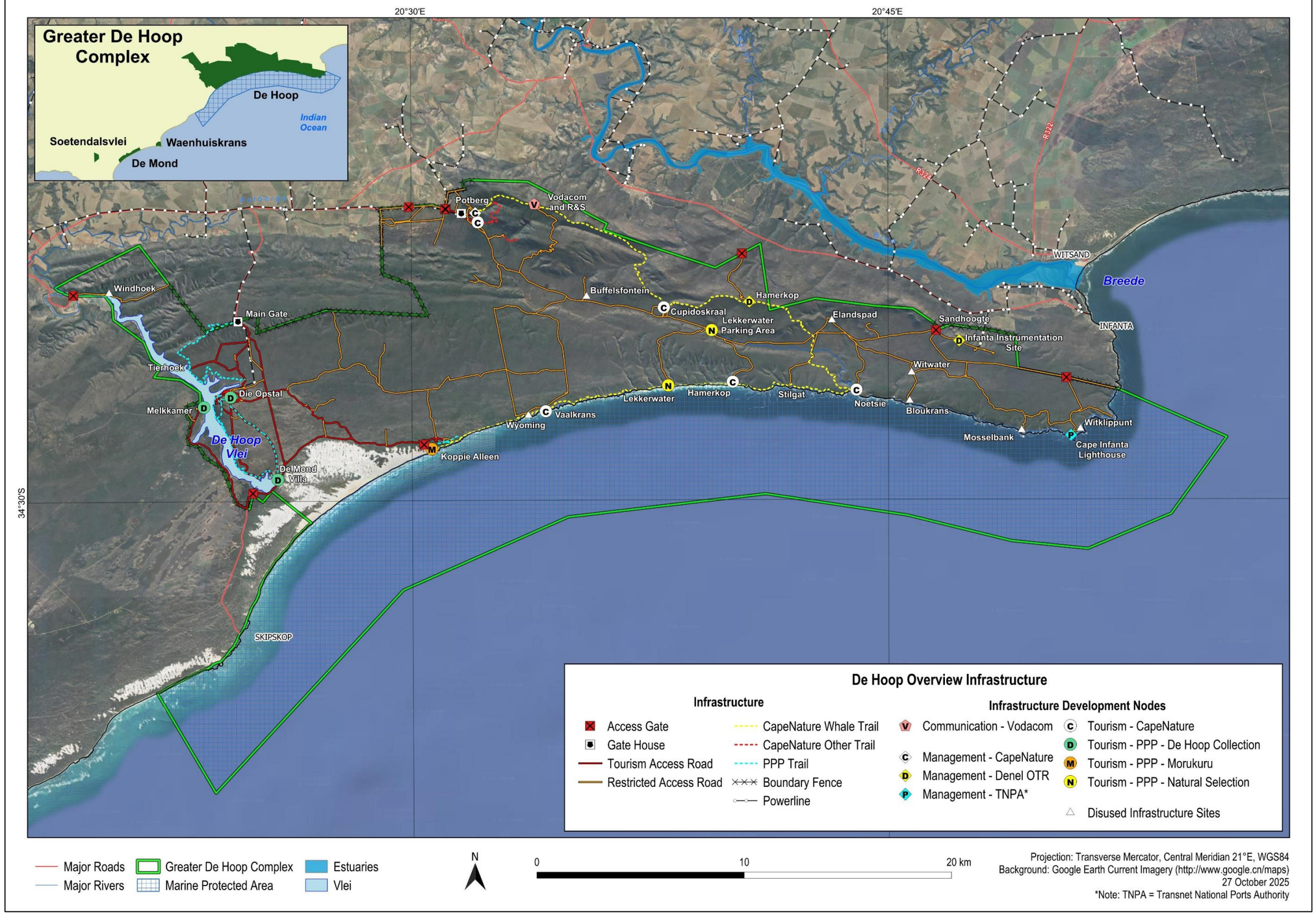
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Projection: Transverse Mercator, Central Meridian 21°E, WGS84
Background: Google Earth Current Imagery (http://www.google.cn/maps)
27 October 2025

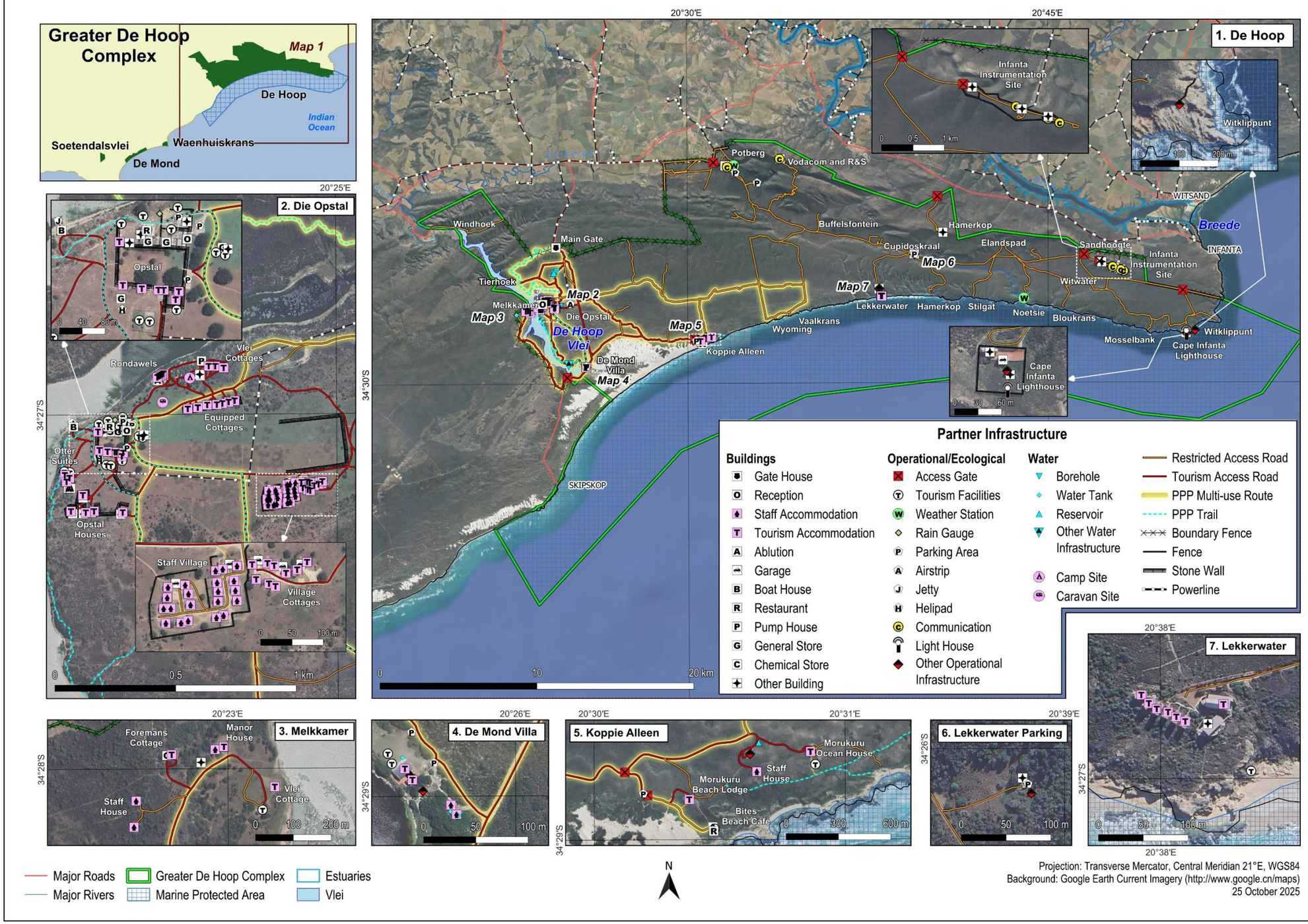
Map 17 Access and servitudes on De Mond and Waenhuiskrans



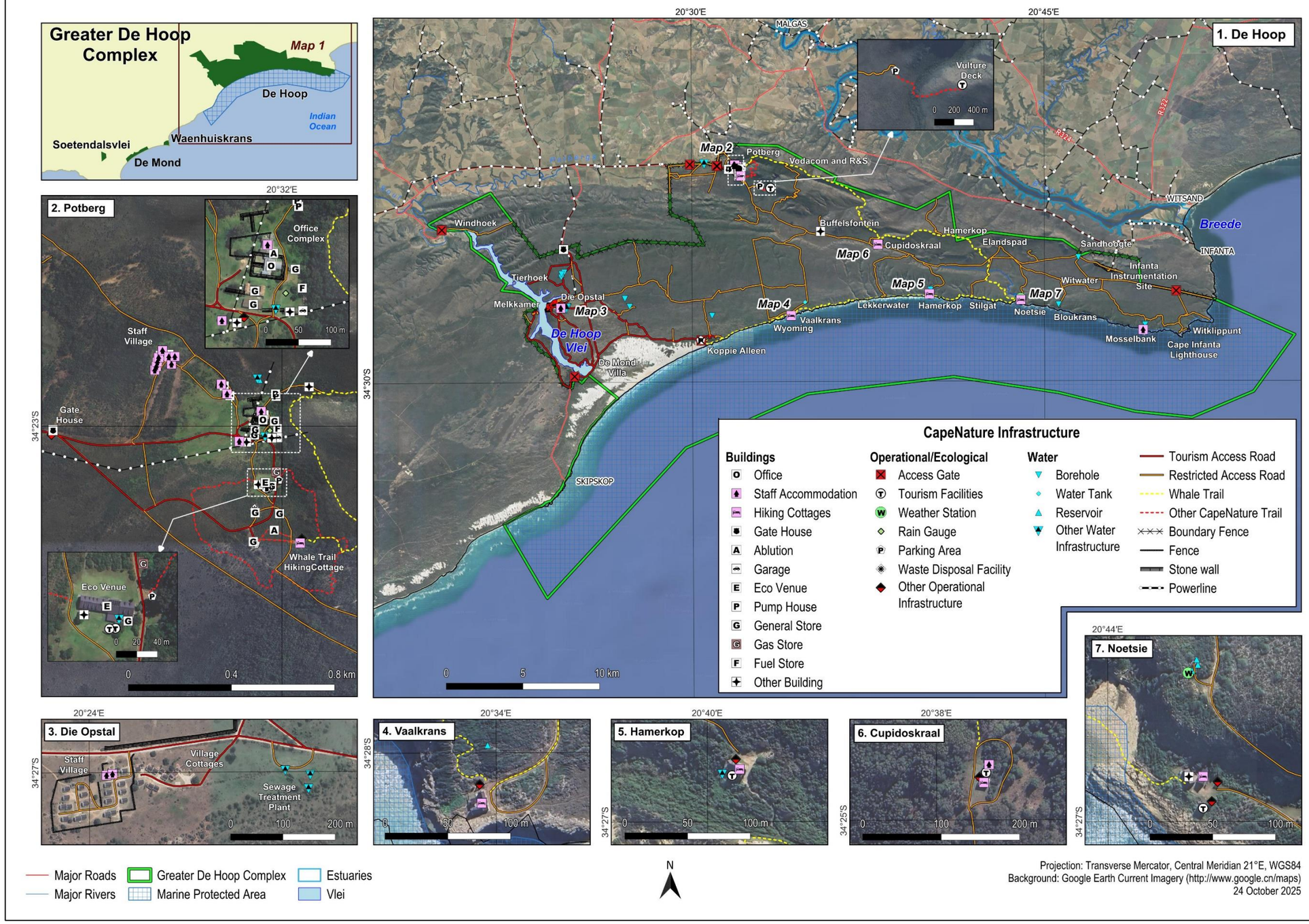
Map 18 Infrastructure on De Mond and Waenhuiskrans



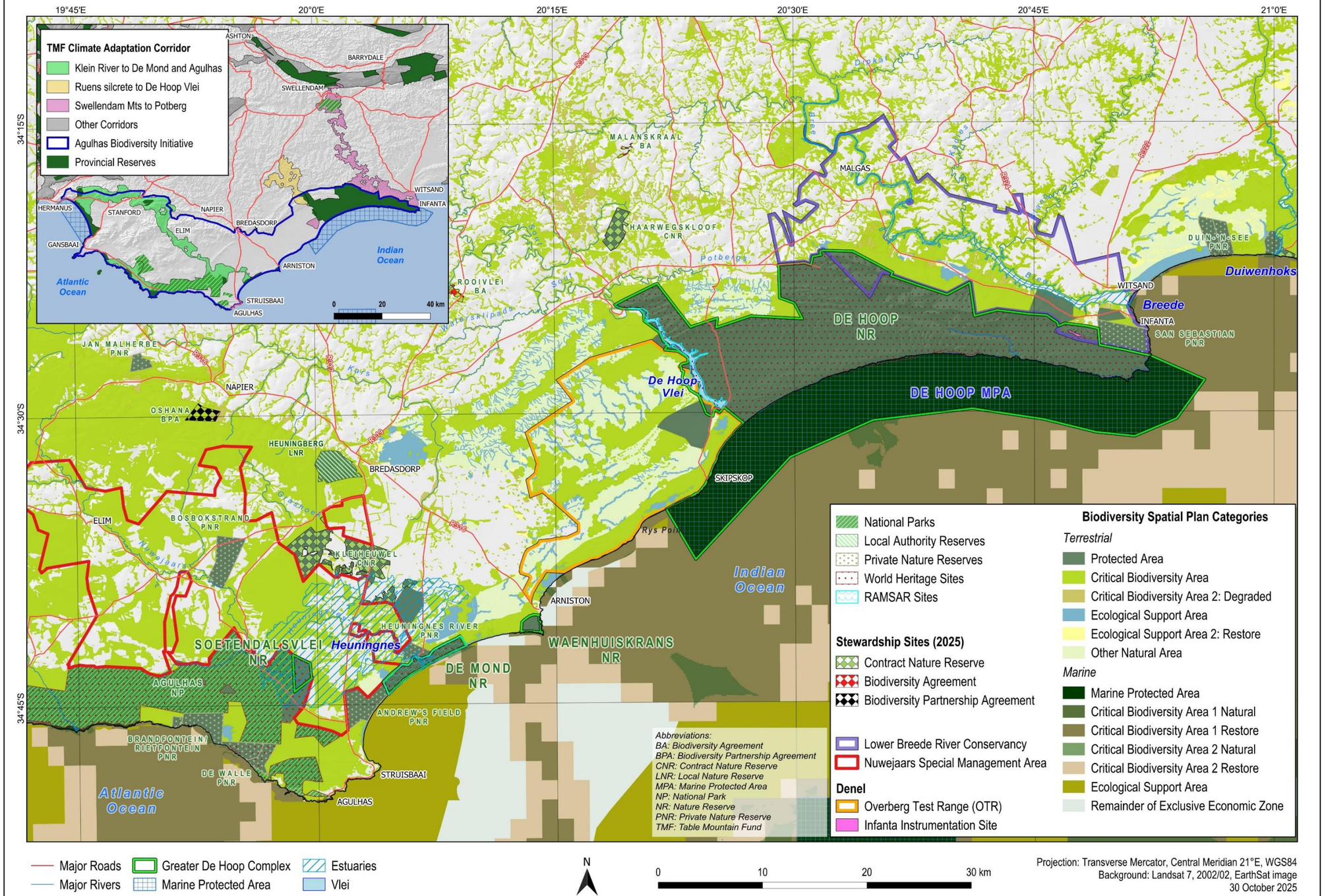
Map 19 Overview of the development nodes on De Hoop



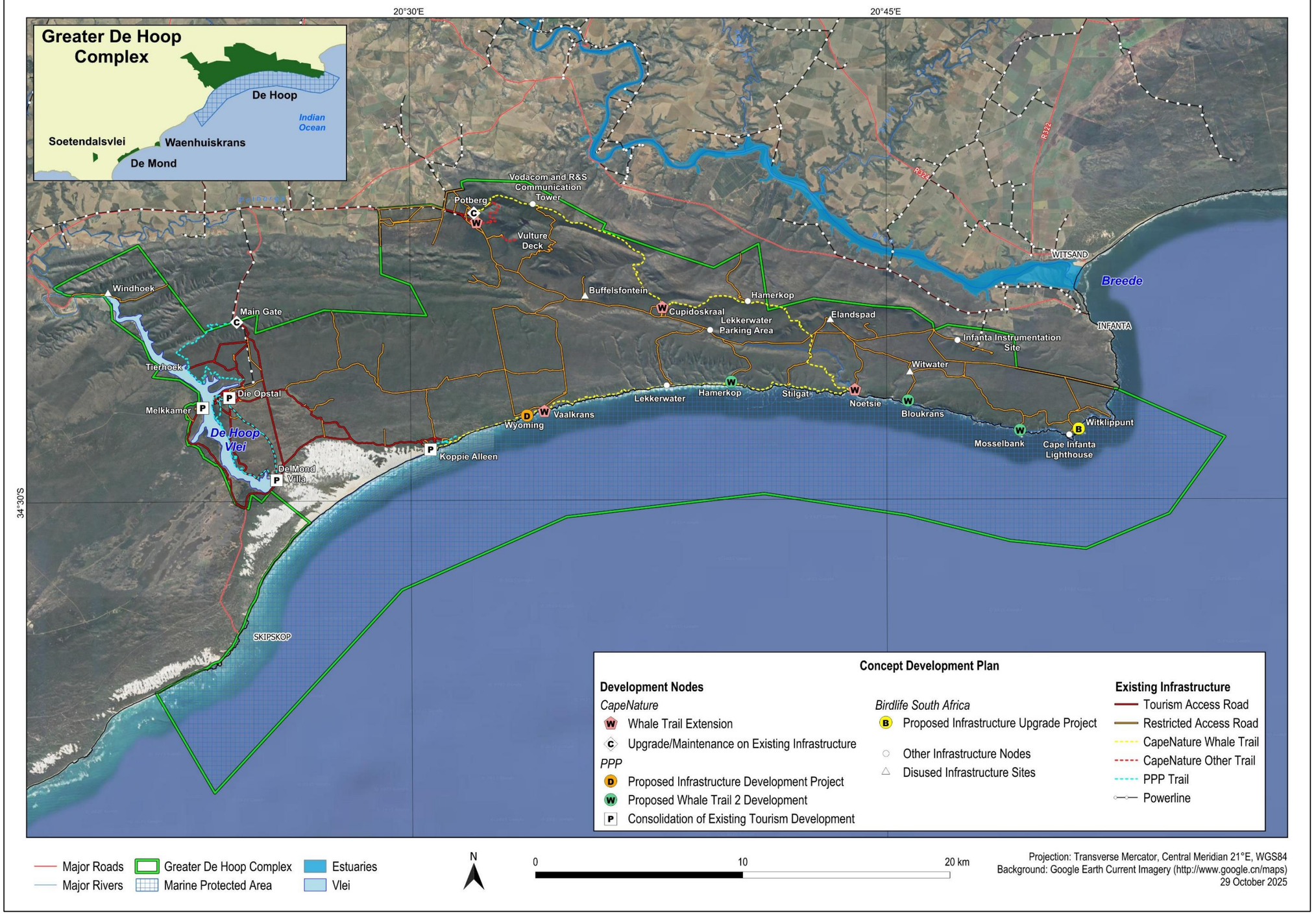
Map 20 Infrastructure of Public Private Partnership and Denel within De Hoop



Map 21 CapeNature managed infrastructure on De Hoop including the Whale Trail



Map 22 Priority conservation habitat surrounding the GHDC



Map 23 Concept Development Plan for De Hoop



Concept Development Plan

Development Nodes

CapeNature

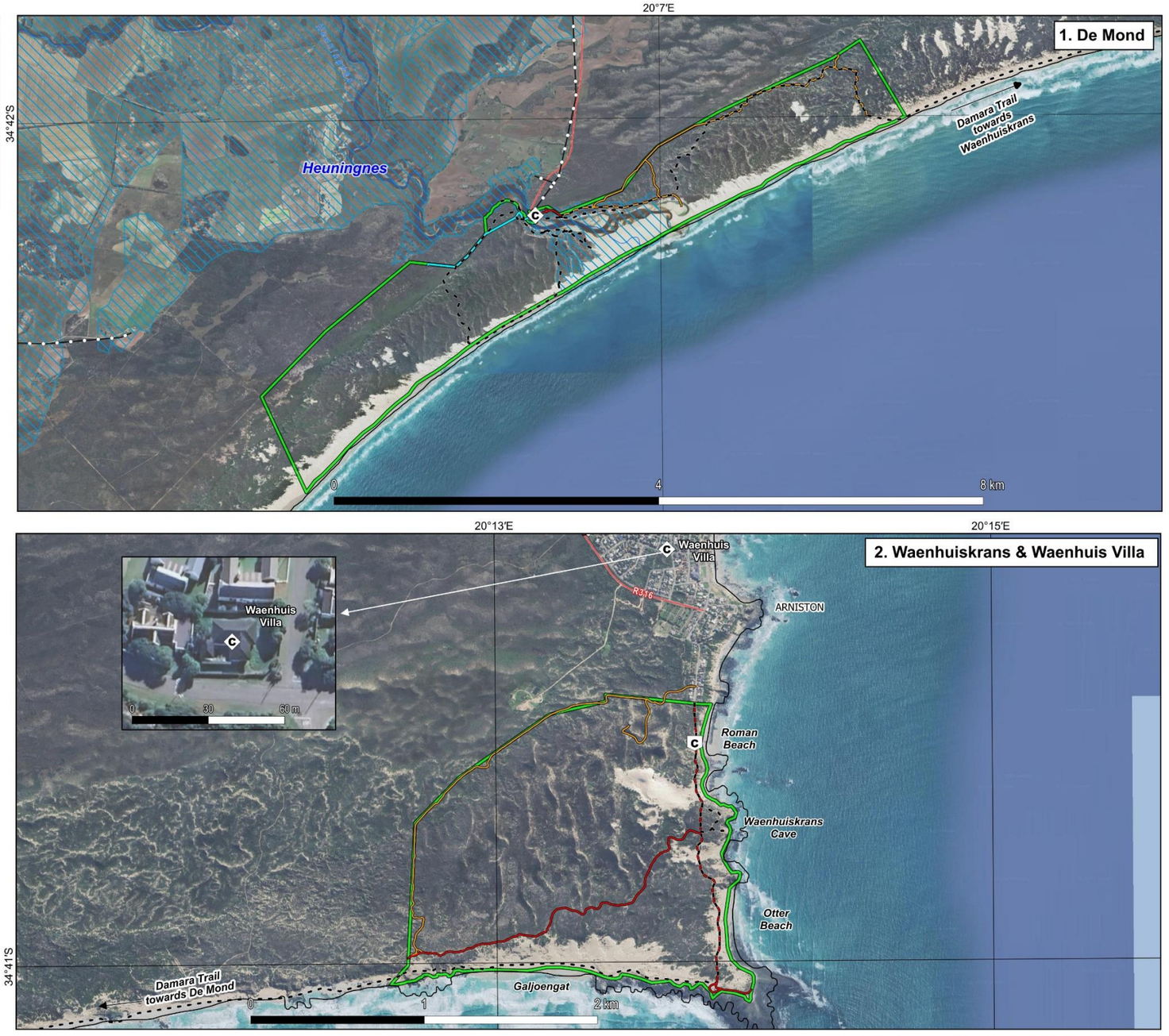
C Upgrade/Maintenance on Existing Infrastructure

CapeNature/Cape Agulhas Municipality

C Upgrade/Maintenance on Existing Infrastructure

Existing Infrastructure

- Tourism Access Road
- Restricted Access Road
- Trail
- Water Pipeline
- Powerline



Major Roads
Major Rivers
Greater De Hoop Complex
Marine Protected Area
Estuaries
Vlei

N

Projection: Transverse Mercator, Central Meridian 21°E, WGS84
Background: Google Earth Current Imagery (http://www.google.cn/maps)
29 October 2025

Map 24 Concept Development Plan for De Mond

APPENDIX 2 Stakeholder Engagement Report for GDHC

Include a picture of the front page of the final stakeholder engagement report.