



**Western Cape  
Government**  
Environmental Affairs and  
Development Planning

# **Klipdrifsfontein Estuary Draft Estuarine Management Plan**

2021

## DOCUMENT DESCRIPTION

**Document title and version:**

Klipdriffontein Estuary Draft Estuarine Management Plan (2021)

**Project Name:**

Western Cape Estuarine Management Framework and Implementation Strategy

**Client:**

Western Cape Government, Department of Environmental Affairs and Development Planning

**Royal HaskoningDHV reference number:**

MD1819

**Authority reference:**

EADP 1/2015

**Developed by:**

Coastwise Consulting & Royal HaskoningDHV

**Acknowledgements:**

Western Cape Government Environmental Affairs & Development Planning

Directorate: Biodiversity and Coastal Management

Sub-Directorate: Coastal Management

Email: [coastal.enquiries@westerncape.gov.za](mailto:coastal.enquiries@westerncape.gov.za)

**Date:**

August 2021

**Photo:**

Ralph Pina

**This document should be referenced as**

Western Cape Government (2021). Klipdriffontein Estuary Draft Estuarine Management Plan (2021). Western Cape Department of Environmental Affairs and Development Planning.

**Disclaimer**

The Estuarine Functional Zone depicted in this estuarine management plan will be subject to change based on new data published from time to time



## EXECUTIVE SUMMARY

The National Environmental Management: Integrated Coastal Management Act (Act 24 of 2008) (ICMA) was developed to facilitate the sustainable use and management of South Africa's coastline and coastal and estuarine resources. The ICMA requires that estuaries within South Africa are managed in a co-ordinated and efficient manner, and in accordance with the 2021 National Estuarine Management Protocol (NEMP), the National Coastal Management Programme (CMP) and Western cape CMP, which lay out specific objectives for management of the South African coastline, including estuaries. This document represents the first-generation Estuarine Management Plan (EMP) for the Klipdrifsfontein estuary developed under the auspices of the Western Cape Estuarine Management Framework and Implementation Strategy (EMFIS), a strategic project emanating from the provincial CMP, specifically priority area 7.

The purpose of this Draft EMP is to provide the Vision of the future desired state of the Klipdrifsfontein estuary and guide the management of human activities in and around the system by setting out strategic objectives, management priorities and detailed management strategies with actions/activities. The co-ordination of the implementation of the EMP vests with the responsible management authority (RMA) as per the NEMP.

### Geographical Boundaries

The Klipdrifsfontein estuary is a small temporarily closed estuarine system, located approximately 35 km from Bredasdorp, on the Cape south coast in the Cape Agulhas Local Municipality, Overberg District. The entire Klipdrifsfontein and estuary is situated within the De Hoop Nature Reserve Complex, which is managed by CapeNature. The size of the estuary, as defined by estuarine functional zone (EFZ), is approximately 2.2 ha, with an open water habitat of approximately 0.4 ha.

### Vision and Objectives

The following Vision for the Klipdrifsfontein estuary was proposed based on the Vision, and purpose for the De Hoop Nature Reserve Complex (DHNRC).

*The Klipdrifsfonteinspruit estuary is a protected, natural and functional system that contributes to the preservation of important coastal habitats and ecosystem services, and is sustainably well managed for the benefit of all*

Strategic objectives, performance indicators and priorities for the Klipdrifsfontein estuary are as follows:

Sector/ Category	Strategic Objectives	Performance Indicator(s)	Priority
<b>1 Estuarine Health and Function</b>	1.1 The Klipdrifsfontein estuarine ecosystem and its processes are conserved and maintained, living	<ul style="list-style-type: none"><li>Maintain an A ecological condition</li><li>Ecological reserves for water quantity and quality are secured</li></ul>	<b>MEDIUM</b>

		resources are sustainably managed and estuary nursery function protected as dictated by a hotter climate future.	<ul style="list-style-type: none"> <li>• Climate change and estuary requirements are integrated into catchment management processes</li> <li>• Invasive alien plant species are eradicated</li> <li>• Water quality programme is in place</li> <li>• Ecological monitoring programmes are in place</li> <li>• Sustainable use of estuarine resources</li> </ul>	
<b>2</b>	<b>Biodiversity Conservation</b>	2.1 The representative biodiversity of the Klipdriffontein estuary within the DHNRC is conserved	<ul style="list-style-type: none"> <li>• EMP is adopted &amp; incorporated into the DHNRC Protected Area Management Plan (PAMP)</li> <li>• Spatial zonation plan is adopted and enforced</li> <li>• All developments environmental legislation and environmental best practice / risk aversion approach</li> <li>• Estuarine habitats are conserved</li> </ul>	<b>HIGH</b>
<b>3</b>	<b>Institutional &amp; Management Structures</b>	3.1 Integrated and cooperative management (including partnerships) is achieved	<ul style="list-style-type: none"> <li>• EMP is incorporated into the DHNRC PAMP and municipal planning</li> <li>• CapeNature is well capacitated with knowledgeable personnel</li> <li>• Overberg Review Committee (ORC) is functioning and effective</li> <li>• Mandated authorities and participating agencies are well capacitated, actions are fulfilled</li> <li>• Effective communication between responsible authorities</li> </ul>	<b>MEDIUM</b>
<b>4</b>	<b>Socio-economic considerations</b>	4.1 Biodiversity access and benefit sharing opportunities are provided to communities.	<ul style="list-style-type: none"> <li>• Increased employment opportunities and employment of local suppliers and programmes</li> <li>• Growing numbers of people directly benefitting from Sustainable Livelihood Programmes</li> </ul>	<b>LOW</b>
		4.2 Appropriate nature-based recreation, tourism and sustainable income generation activities are provided within the framework of the Green Economy.	<ul style="list-style-type: none"> <li>• Income targets are met</li> <li>• Visitors experience positive</li> <li>• Reserve objectives are not Compromised</li> </ul>	<b>LOW</b>

		4.3 The cultural heritage and traditional significance of the Klipdriffontein estuary within the DHNRC are conserved.	<ul style="list-style-type: none"> <li>Heritage assets are mapped, preserved and well managed according to a Cultural Heritage Resource Management Plan</li> </ul>	<b>MEDIUM</b>
<b>5</b>	<b>Education &amp; Awareness</b>	5.1 Quality environmental education, awareness and outreach programmes are provided.	<ul style="list-style-type: none"> <li>Awareness programme developed and successfully implemented on an on-going basis</li> <li>Informative signage erected and information disseminated</li> <li>Potberg Environmental Education Centre well equipped, manned by qualified and passionate staff</li> </ul>	<b>LOW</b>

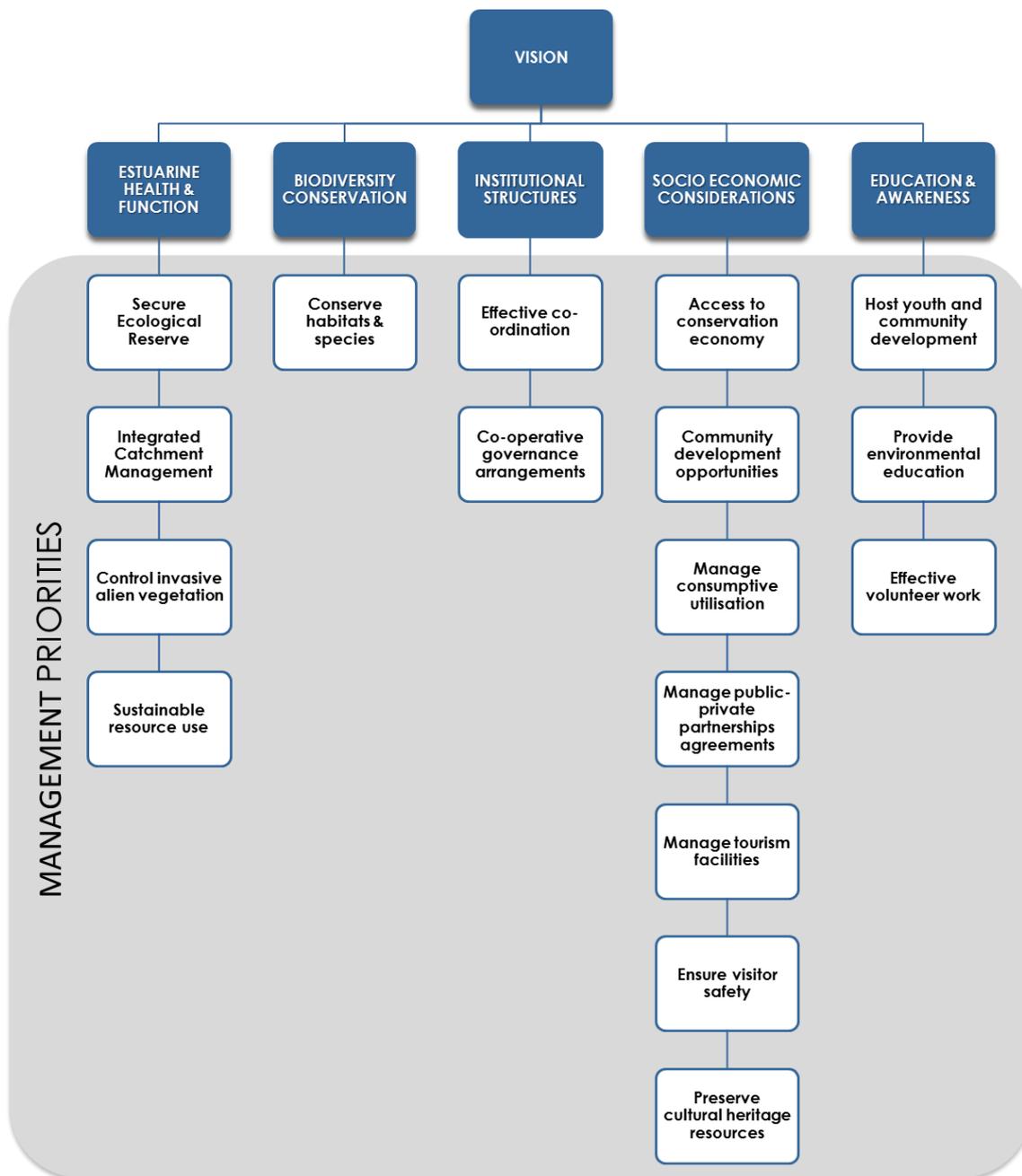
### Priority management objectives and associated activities

An illustrative overview of the priority management objectives is provided below. Detailed action plans were developed for each of these priority areas.

### Proposed spatial zonation

In general, spatial zonation of activities on an estuary are used to prevent user conflict and to guide sustainable utilization of resources without degradation of the estuarine environment. Given the location of the Klipdriffontein estuary within the DHNRC, the proposed zonation of the estuary is dedicated by the zonation scheme used by CapeNature. A single zonation type is proposed, namely 'Primitive Zone', because of the remote location of the estuary, its small size, and the absence of any known use of the system. The objectives of this zone are as follows:

- To provide users with an experience of solitude in natural landscape with little nearby evidence of human presence;
- To limit visitor use, numbers and infrastructure to minimise impact in sensitive environments;
- To reduce need for management of users and visitor impacts; and
- To allow for minimal or more intensive biodiversity management interventions.



### Integrated monitoring plan

Monitoring is a crucial aspect of the adaptive estuarine management planning process as the generated data will be used to inform and update management decisions. Three broad categories of monitoring are incorporated into an integrated monitoring plan, namely resource monitoring, compliance monitoring and performance monitoring.

General baseline information for the Klipdriffontein estuary is lacking. There are no ecological monitoring programmes (e.g. water quality, fish or birds, etc.) in place, apart from visual observations of the system during ad hoc visits by reserve officers. The generic baseline and long-term monitoring programmes to improve the confidence of the preliminary reserve determination are provided. These include details on the ecological component, monitoring action, temporal scale, as well as spatial, scale of monitoring proposed. CapeNature should establish a basic monitoring plan to evaluate the priority components.

---

By and large, compliance monitoring within the DHNRC is the responsibility of CapeNature and is undertaken according to applicable legislation and policies and by means of law enforcement and compliance monitoring protocols internal to CapeNature. Currently, no compliance monitoring is taking place, as there is no need for compliance action due to the remote geographical position of the estuary.

The performance monitoring plan is proposed to be used by CapeNature to assess the effectiveness with which planned management activities contained in the EMP are being performed and ultimately to gauge progress in achieving the vision and objectives. A monitoring plan relative to the proposed management priorities is included. It is also anticipated that CapeNature will employ the Management Effectiveness Tracking Tool – South Africa (METT-SA) to assess the implementation of the EMP and effectiveness of the management of the estuary, in the context of DHNRC management assessment.

### **Institutional Capacity and Arrangements**

This EMP should be regarded as a strategic plan that can guide the detailing of management actions and identification of implementing agents/authorities that are mandated to implement certain actions. While, it does not specify the required resources (human and financial) required for effective management of the estuary, it does provide for their prioritisation. Co-management and effective governance are vital aspects to the efficient and effective estuarine management and key role players in the management of the Klipdriffontein estuary are identified.

The 2013 NEMP identifies CapeNature as the RMA, responsible for the co-ordination of the implementation of the Klipdriffontein EMP because the estuary falls within the DHNRC. **It is noted that in the proposed amendments to the 2013 NEMP, such responsibilities remain allocated to the applicable conservation authority, in this case CapeNature, in respect to estuaries in protected areas or part of a protected area expansion strategy.** Ultimately the role of the RMA must be designated through formal signed agreement. Effective implementation of this EMP requires the augmentation of capacity within CapeNature, with the recommended appointment of a regional estuarine management co-ordinator (EMC) within DEA&DP. This individual will play a pivotal co-ordinating role for all other implementing agencies as well as CapeNature departments (e.g. Scientific Services). Specific implementation actions identified in this EMP remain the responsibility of mandated government agencies.

While the establishment of an estuary advisory forum (EAF) for each estuary is no longer a requirement in the 2013 NEMP, the Western Cape Government still support their establishment and recommend that private entities and non-government organisations continue to play a supporting role in the implementation of this EMP. While an individual EAF is not recommended, it is suggested that the Overberg Review Committee (ORC), responsible for monitoring the sustainable and responsible environmental management of the greater De Hoop Conservation Area and Marine Protected Area (MPA), fulfil the role of an EAF in terms of fostering stakeholder engagement and monitoring implementation of the EMP.

---

Key government departments and organs of state are identified, and a template provided for the conversion of the priority actions into detailed project plans, which must be prepared and adopted into the respective departmental implementation strategies.

The following items/issues are considered critical towards the ultimate achievement of the vision and should be immediately addressed and/or receive greatest effort in respect to human/financial resources:

- A watching brief is kept over the Klipdrifsourcein estuary to ensure its continued ecological health and protection;
- A basic monitoring programme should be established and undertaken by CapeNature; and
- The DEA&DP to consider the appointment of a Regional estuarine management co-ordinator/champion to support CapeNature.

## TABLE OF CONTENTS

<b>1</b>	<b>INTRODUCTION</b>	<b>1</b>
1.1	BACKGROUND	1
1.2	PURPOSE OF THE EMP	2
1.3	MANDATE AND RESPONSIBILITIES OF THE RMA	3
1.4	STRUCTURE OF REPORT	4
<b>2</b>	<b>GEOGRAPHICAL BOUNDARIES</b>	<b>5</b>
<b>3</b>	<b>SYNOPSIS OF THE SITUATION ASSESSMENT</b>	<b>6</b>
<b>4</b>	<b>VISION &amp; OBJECTIVES</b>	<b>10</b>
4.1	VISION	10
4.2	STRATEGIC OBJECTIVES	11
<b>5</b>	<b>PRIORITY MANAGEMENT OBJECTIVES AND ASSOCIATED ACTIVITIES</b>	<b>15</b>
5.1	ESTUARINE HEALTH AND FUNCTION	17
5.2	BIODIVERSITY CONSERVATION	21
5.3	INSTITUTIONAL AND MANAGEMENT STRUCTURES	22
5.4	SOCIO-ECONOMIC CONSIDERATIONS	26
5.5	EDUCATION & AWARENESS	30
<b>6</b>	<b>PROPOSED SPATIAL ZONATION</b>	<b>32</b>
6.1	INTRODUCTION	32
6.2	LEGISLATED COASTAL BOUNDARIES AND BUFFER ZONES	32
6.2.1	De Hoop Nature Reserve Complex	32
6.2.2	Estuarine Functional Zone	33
6.2.3	Coastal Protection Zone and proposed Coastal Management Line	34
6.2.4	Environmental Impact Assessment regulatory line	35
6.3	ESTUARY ZONATION	36
6.3.1	Municipal Zonation	36
6.3.2	Proposed Spatial Zonation / De Hoop Nature Reserve Complex	36
6.3.3	Areas requiring rehabilitation	39
<b>7</b>	<b>INTEGRATED MONITORING PLAN</b>	<b>41</b>
7.1	RESOURCE MONITORING	41
7.1.1	Current Resource Monitoring	41
7.1.2	Recommended Resource Monitoring Programmes	41
7.1.3	Resource Quality Objectives / Ecological Specifications	42
7.2	COMPLIANCE MONITORING	42
7.3	PERFORMANCE MONITORING (REVIEW & EVALUATION)	42
<b>8</b>	<b>INSTITUTIONAL CAPACITY &amp; ARRANGEMENTS</b>	<b>44</b>
8.1	KEY ROLE PLAYERS	44
8.2	RESPONSIBLE MANAGEMENT AUTHORITY	44
8.3	ESTUARY ADVISORY FORUM	45
8.4	GOVERNMENT DEPARTMENTS AND ORGANS OF STATE	46
8.4.1	Project Plans for Implementation	47
<b>9</b>	<b>RECOMMENDATIONS AND CONCLUSION</b>	<b>48</b>

---

<b>10</b>	<b>REFERENCES</b>	<b>49</b>
	<b>APPENDIX 1: RECOMMENDED MONITORING PROGRAMMES</b>	<b>51</b>
	<b>APPENDIX 2: ECOLOGICAL SPECIFICATIONS</b>	<b>56</b>
	<b>APPENDIX 3: PERFORMANCE MONITORING PLAN</b>	<b>58</b>
	<b>APPENDIX 4: PROJECT PLAN TEMPLATE</b>	<b>62</b>

## TABLE OF FIGURES

Figure 1: Location of the Klipdrifsfontein estuary within the Cape Agulhas Local Municipality	1
Figure 2: A framework for integrated estuarine management in South Africa	2
Figure 3: Geographical boundaries of the Klipdrifsfonteinspruit estuary EFZ showing the 5 m topographical contour and 2018 NBA (SANBI 2019) EFZ boundary	5
Figure 4: Sectors or categories of issues relevant to the management of the Klipdrifsfontein estuary	12
Figure 5: Summary of priority management objectives per management sector	16
Figure 6: De Hoop Nature Reserve Complex proclaimed boundaries	33
Figure 7: Coastal boundaries of the Klipdrifsfontein Estuary and risk projections (WCG, 2015)	35
Figure 8: Zonation map of De Hoop Nature Reserve Complex (yellow arrow indicating Klipdrifsfontein estuary) (CapeNature, 2016a)	37
Figure 9: Invasive vegetation map and management compartments of De Hoop Nature Reserve Complex (yellow arrow indicating Klipdrifsfontein estuary) (CapeNature, 2016a)	40
Figure 10: Key role players for the management of the Klipdrifsfontein estuary	44

## LIST OF TABLES

Table 1: Geographical boundaries of the Klipdrifsfontein estuary	5
Table 2: Strategic Objectives for management of the Klipdrifsfontein estuary according to the De Hoop Nature Reserve Complex Protected Area Management Plan, their indicators and level of priority	13
Table 3: SWOT Analysis	15
Table 4: Management Objectives and Actions for Estuarine Health & Function	17
Table 5: Management Objectives and Actions for Conservation (includes utilisation of living resources)	21
Table 6: Management Objectives and Actions for Institutional and Management Structures	22
Table 7: Management Objectives and Actions for Biodiversity Access and Benefit Sharing	26
Table 8: Management Objectives and Actions for Nature-based Recreation, Tourism and Sustainable Income Generation	27
Table 9: Management Objectives and Actions for Cultural Heritage Resources	29
Table 10: Management Objectives and Actions for Education, Awareness and Outreach	30
Table 11: Primitive Zone: Zonation prescriptions for the Klipdrifsfontein estuary (CapeNature, 2016a)	38
Table 12: Primitive Zone Management Guidelines (CapeNature, 2016a)	39
Table 13: Recommended minimum requirements for long-term monitoring (Priority: Red = High; Orange = Medium, Yellow = Low) (DWS, 2017)	51
Table 14: Generic baseline surveys to improve confidence in the preliminary reserve determination of estuaries (Priority components are highlighted) (based on DWS, 2017)	53
Table 15: EcoSpecs for the Klipdrifsfonteinspruit Estuary (Category A) (DWS, 2018)	56
Table 16: Recommended Performance Monitoring Plan for the management of the Klipdrifsfontein estuary	58

## ACRONYMS AND ABBREVIATIONS

ABI	Agulhas Biodiversity Initiative
amsl	Above mean sea level
APO	Annual Plan of Operations
BGCMA	Breede Gouritz Catchment Management Agency
CARA	Conservation of Agricultural Resources Act (Act No. 43 of 1983)
CBA	Critical Biodiversity Area
CFR	Cape Floristic Region
CML	Coastal Management Line
CMP	Coastal Management Programme
CMS	Catchment Management Strategy
CPZ	Coastal Protection Zone
CSIR	Council for Scientific and Industrial Research
CWAC	Coordinated Waterbird Counts
DAFF	Department of Agriculture, Forestry and Fisheries (now DALRRD / DEFF)
DALRRD	Department of Agriculture, Land Reform and Rural Development (formerly DAFF)
DEA	Department of Environmental Affairs (now DEFF)
DEA&DP	Western Cape Government's Department of Environmental Affairs & Development Planning
DEFF	Department of Environment, Forestry and Fisheries (formerly DEA / DAFF)
DEFF: O&C	Department of Environment, Forestry and Fisheries: Oceans & Coasts branch
DEFF: WfC	Department of Environment, Forestry and Fisheries: Working for the Coast
DEFF: WfW	Department of Environment, Forestry and Fisheries: Working for Water
DHNRC	De Hop Nature Reserve Complex
DM	District Municipality
DSL	Development Setback Line
DST	Department of Science and Technology
DWS	Department of Water and Sanitation
EAF	Estuary Advisory Forum
EE	Environmental Education
EFZ	Estuarine Functional Zone
EIA	Environmental Impact Assessment
EMFIS	Western Cape Estuarine Management Framework and Implementation Strategy
EMI(s)	Environmental Management Inspector
EMC	Estuarine Management Co-ordinator
EMP	Estuarine Management Plan(s)
EPIP	Environmental Protection and Infrastructure Programmes
EPWP	Expanded Public Works Programme
GNR	Government Notice Register
HWM	High Water Mark
IAPs	Invasive Alien Plants
ICM	Integrated Coastal Management
ICMA	National Environmental Management: Integrated Coastal Management Act (Act No. 24 of 2008)
IDP	Integrated Development Plan
LM	Local Municipality
LUPA	Western Cape Land Use Planning Act (Act No. 3 of 2014)
MEC	Member of the Executive Council
METT-SA	Management Evaluation Tracking Tool – South Africa
MLRA	Marine Living Resources Act (Act No. 18 of 1998)
MOU	Memorandum of Understanding
MPA	Marine Protected Area
MSA	Municipal Systems Act (Act No. 32 of 2000)
NBA	National Biodiversity Assessment
NEM: BA	National Environmental Management: Biodiversity Act (Act No. 10 of 2004)
NEM: PAA	National Environmental Management: Protected Areas Act (Act No. 57 of 2003)

---

NEMA	National Environmental Management Act (Act No. 107 of 1998)
NEMP	National Estuarine Management Protocol (2013)
NHRA	National Heritage Resources Act (Act No. 25 of 1999)
NWA	National Water Act (Act No. 36 of 1998)
OICG	Overberg Integrated Conservation Group
ORC	Overberg Review Committee
OTR	Denel Overberg Test Range
PAAC	Protected Area Advisory Committee
PAES	Protected Area Expansion Strategy
PAMP	Protected Area Management Plan
PES	Present Ecological State
PPP	Private Public Partnership
RDM	Resource Directed Measures
REC	Recommended Ecological Category
RMA	Responsible Management Authority
RQO(s)	Resource Quality Objectives
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SAR	Situation Assessment Report
SDF	Spatial Development Framework
SMME	Small, Medium and Micro-Enterprise(s)
SWOT	Strengths, Weaknesses, Opportunities and Threats analysis
WCG	Western Cape Government
WQ	Water Quality
WRC	Water Research Commission

# 1 INTRODUCTION

## 1.1 Background

The National Environmental Management: Integrated Coastal Management Act (Act 24 of 2008) (ICMA) was developed to facilitate the sustainable use and management of South Africa's coastline and coastal and estuarine resources. The ICMA requires that estuaries within South Africa be managed in a co-ordinated and efficient manner, and in accordance with the 2013 National Estuarine Management Protocol (hereafter referred to as the NEMP), the National Coastal Management Programme (CMP) and the Western cape CMP, which lay out specific objectives for management of the South African coastline, including estuaries.

In response to the directive issued under the ICMA and the 2013 NEMP, the Western Cape Government, and specifically the Provincial Department of Environmental Affairs and Development Planning (DEA&DP), commissioned the development of the Western Cape Estuarine Management Framework and Implementation Strategy (EMFIS), a strategic project emanating from the provincial CMP, specifically priority area 7, to facilitate the consistent development and implementation of Estuarine Management Plans (EMPs) in the Western Cape Province.

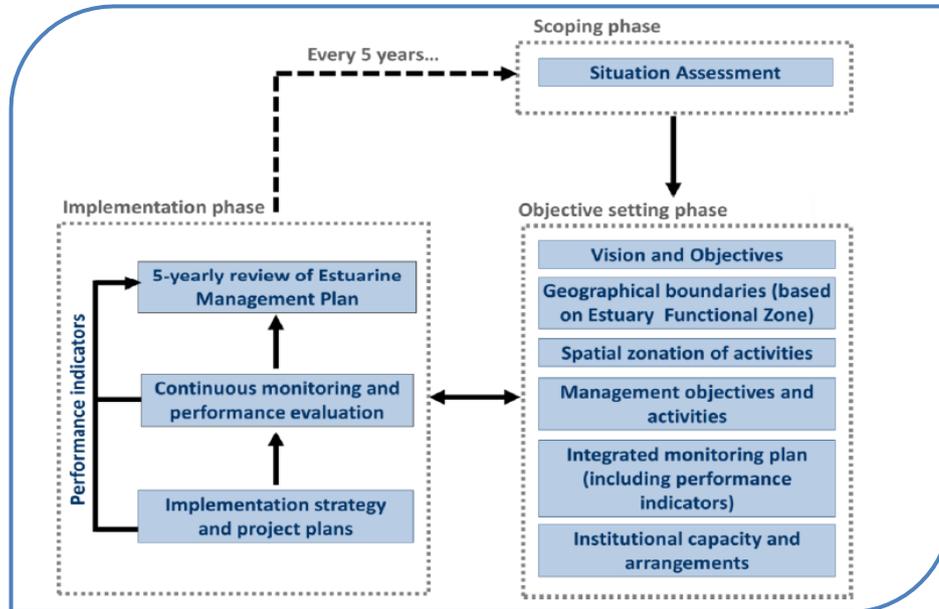
This document represents the first generation EMP for the Klipdriffontein estuary (Figure 1) developed under the auspices of the Western Cape EMFIS and brings the De Hoop Nature Reserve Complex (DHNRC) Protected Area Management Plan (the 'PAMP') (CapeNature, 2016a) in alignment with the 2013 NEMP, in respect to provisions for estuarine management. This EMP is deemed a sector plan of the PAMP.



**Figure 1: Location of the Klipdriffontein estuary within the Cape Agulhas Local Municipality**

## 1.2 Purpose of the EMP

The development of an EMP is a three-phase process, as illustrated in Figure 2, comprising an initial scoping phase, followed by an objective setting phase, and finally an implementation phase. An adaptive management approach should be adopted during the latter phase with detailed reviews being conducted at five-yearly intervals.



**Figure 2: A framework for integrated estuarine management in South Africa**

This report constitutes the second objective and core component of the estuarine management planning process, namely the EMP. The purpose of this component is to provide the Vision of the future desired state of the Klipdriffontein estuary and guide the management of human activities in and around the system by setting out strategic objectives, management priorities and detailed management strategies with actions/activities. These aspects of the EMP are founded on the vision, purpose, values and objectives of the DHNRC (CapeNature, 2016a).

Estuarine management is by definition not only focused on the Estuarine Functional Zone (EFZ) but inclusive of coastal hinterland and marine influences, shoreline status, catchment management, climate change and human development impacts such as tourism, recreation and agriculture, amongst many others. This EMP is the primary document for use by the identified responsible management authority (RMA) to facilitate coordination of the identified management interventions to ultimately ensure the longevity of the estuarine system concerned. This is also the critical reference document for the incorporation of estuarine management into the DHNRC PAMP, as well as the municipal Integrated Development Planning (IDP) and Spatial Development Framework (SDF) processes.

---

### 1.3 Mandate and responsibilities of the RMA

The co-ordination of the implementation of the EMP vests with the RMA (i.e. CapeNature) as per the 2013 NEMP. One of the strategic objectives of this EMP is to promote and facilitate the cooperative governance relationship between the RMA and an existing or a new estuary advisory forum (EAF) or, any other supporting structures or organisations with estuarine-related duties and functions. In the case of the Klipdriffontein estuary within the DHNRC, this may be a new Protected Area Advisory Committee (PAAC) or Liaison Committee, or the existing Overberg Review Committee (ORC), who will assume the role of EAF, as proposed in the NEMP (see below).

The designated RMA is responsible for the development of the EMP<sup>1</sup> and the overall co-ordination of the actions of other implementing agencies, and not necessarily the implementation actions themselves. Section 7.3 of the NEMP indicates that:

*“...management actions...shall be translated into project plans by the responsible government department that is responsible for certain aspects of estuary management (as per legislative mandates...”*

Specifically, the RMA responsibilities are described by the Protocol as:

Section 5: *“...authorities are **responsible for the development of EMPs and coordination of the implementation process...**”*

Section 5(e): *“The identified responsible management authority to develop the EMP needs to **budget accordingly for the development of these plans.**”*

Section 8(1): *“The responsible management authority developing an EMP must **actively engage all the relevant stakeholders** including government departments, non-government organisations and civil society in the development and implementation of the EMP.”*

Section 9.1(1) and 9.2: *“...it **must obtain formal approval** for the EMP...” and “Once approved...the EMP shall be... **Integrated..**” and “**incorporated** into that protected area’s management plan as contemplated in section 39 of NEMPAA.”*

The responsible body contemplated in Section 33(3)(e) of the ICMA who develops an EMP must:

- a) follow a public participation process in accordance with Part 5 of Chapter 6 of the ICMA; and
- b) ensure that the EMP and the process by which it is developed are consistent with:

---

<sup>1</sup> In this instance, the EMP for the Klipdriffonteinspruit estuary was developed under the auspices of the Western Cape EMFIS commissioned by the Western Cape Government.

- 
- i) the 2013 NEMP; and
  - ii) the National CMP and with the applicable provincial CMP and CMP referred to in Parts 1, 2 and 3 of Chapter 6 of the ICMA;
- c) If applicable, ensure that relevant legislation is enacted to implement the EMP; and
- d) Submit an annual report to the Minister on the implementation of the EMP, the legislation and any other matter.

Coordination of the implementation actions by the RMA and its strategic partners can be supported by an EAF (or existing structure) representing all key stakeholder groups on the estuary.

## 1.4 Structure of Report

This report is structured as follows:

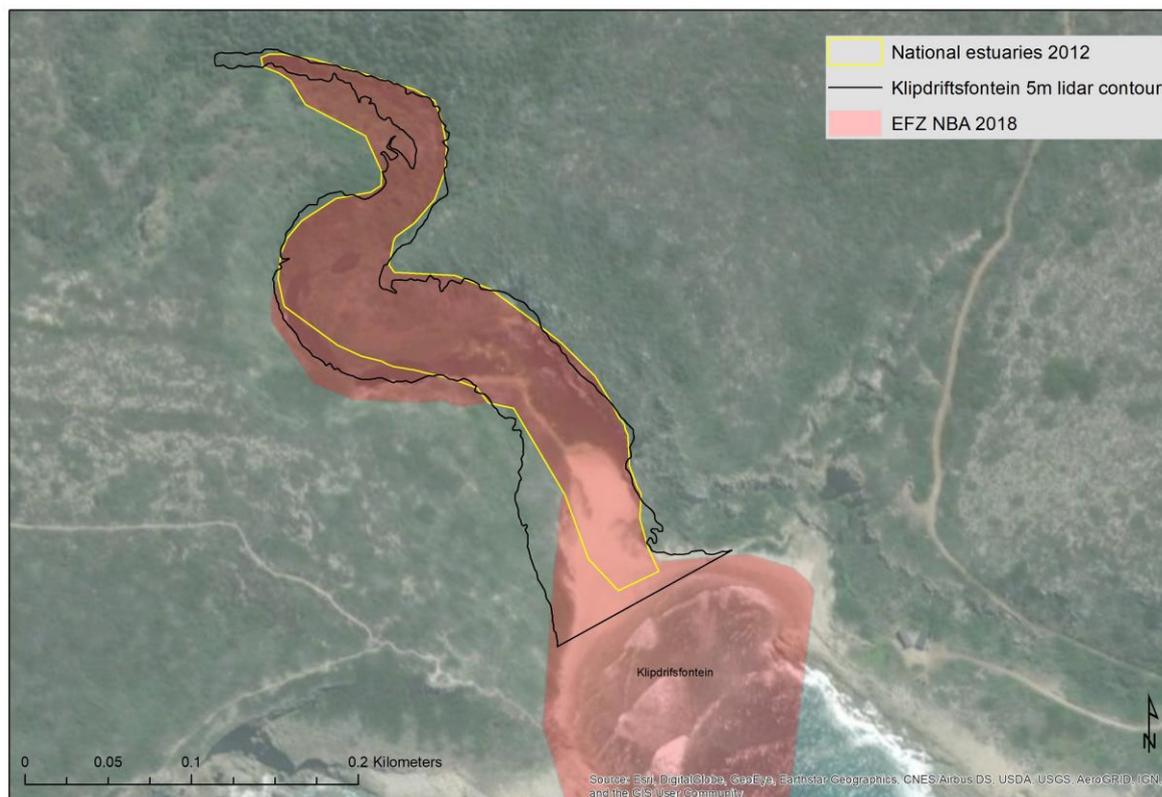
- **Section 2** introduces the estuary and details the **geographical boundaries** of the estuary, i.e. the management area to which this EMP applies;
- **Section 3** provides a synopsis of the **situation assessment**, thereby providing context to the vision, strategic objectives and management objectives and management priorities;
- **Section 4** presents the **local vision and strategic objectives** as informed by the stakeholders, for the management of the Klipdriffontein estuary. They collectively describe the desired future state and provide the overarching logical framework for the action plans;
- **Section 5** prescribes the **management priorities and associated activities**, i.e. the required actions and activities to be undertaken within the next 5 years, captured as individual action plans. This EMP contains refined or detailed management objectives accompanied by action plans to facilitate implementation, and in this manner, serves to mobilise and co-ordinate all relevant government departments, institutions and other role players to undertake specific actions within their mandate or sphere of influence;
- **Section 6** describes the various components and zones included in the proposed **spatial zonation** of the estuary;
- **Section 7** set out the **integrated monitoring plan** encompassing resource monitoring, compliance monitoring, as well as performance monitoring in respect to achieving the objectives of the EMP;
- **Section 8** details the **institutional capacity and proposed arrangements** that are required to implement the actions contained in the plan, including key role players and participating institutions, and the recommended projects provided for in the action plans; and
- **Section 9** details key **recommendations** and **concludes** the plan.

## 2 GEOGRAPHICAL BOUNDARIES

The Klipdrifsfontein estuary is defined in the 2018 National Biodiversity Assessment (NBA) (SANBI, 2019) as a small temporarily closed estuarine system, located approximately 35 km from Bredasdorp, on the Cape south coast in the Cape Agulhas Local Municipality, Overberg District. The entire Klipdrifsfontein and estuary is situated within the DHNRC, which is managed by CapeNature (Figure 1, pg. 1). The geographical boundaries of the Klipdrifsfontein estuary, delineating the EFZ, are provided in Table 1 and illustrated in Figure 3.

**Table 1: Geographical boundaries of the Klipdrifsfontein estuary**

<b>DOWNSTREAM BOUNDARY:</b>	-34.451963° S, 20.731415° E (estuary mouth)
<b>UPSTREAM BOUNDARY:</b>	-34.449028° S, 20.729096° E (head of the estuary)
<b>LATERAL BOUNDARIES:</b>	Approximated by the boundary of estuarine vegetation along each bank, and informed by the 5 m above Mean Sea Level (amsl) contour



**Figure 3: Geographical boundaries of the Klipdrifsfonteinspruit estuary EFZ showing the 5 m topographical contour and 2018 NBA (SANBI 2019) EFZ boundary**

---

## 3 SYNOPSIS OF THE SITUATION ASSESSMENT

The Klipdrifsfontein estuary is defined in the 2018 National Biodiversity Assessment (NBA) (SANBI, 2019) as a small temporarily closed estuarine system situated on the south coast in the Cape Agulhas Local Municipality (LM), approximately 35 km from Bredasdorp. The entire Klipdrifsfontein and estuary is situated within the De Hoop Nature Reserve Complex (DHNRC), which is managed by CapeNature.

In accordance with the 2013 National Estuarine Management Protocol (NEMP), developed in terms of the National Environmental Management: Integrated Coastal Management Act (Act No. 24 of 2008, as amended by Act No. 36 of 2014), an Estuarine Management Plan must be developed for the Klipdrifsfontein estuary which is proposed as a stand-alone supporting document to the De Hoop Nature Reserve Complex Protected Area Management Plan. This document is the Situation Assessment Report which provides detailed background information in preparation for the management planning process.

### **Catchment Characteristics**

The Cape Fold Belt mountains lie to the north of the Cape Agulhas LM, separating the country's arid interior from the flat coastal plains. Two distinct topographical regions are found within the municipality, namely the rolling hills of the Rûens and the large coastal lowland called the Agulhas Plain, within which the Klipdrifsfontein estuary is situated. The area surrounding the Klipdrifsfontein estuary is dominated by the semi-consolidated and unconsolidated sediments of the Tertiary and Recent Bredasdorp Group, with the De Hoopvlei and Wankoe Formations forming the estuary mouth and lower reaches of the river.

The climate of the region is typically Mediterranean, comprising of cold wet winters and hot dry summers. The mean annual rainfall in the DHNRC is 572 mm, although rainfall can vary by 15 – 17% year-on-year. The average summer maximum for the area is 19.7°C, with an average winter minimum of 13.0°C.

The Klipdrifsfontein catchment is situated entirely within DHNRC and is almost entirely naturally vegetated. Overnight accommodation for the Whale Hiking Trail is situated just east of the mouth at Noetsie.

### **Overview of Ecological Function and State of the Estuary**

The Klipdrifsfontein estuary is a small temporarily closed estuarine system situated in the DHNRC. It has a floodplain of approximately 2.2 ha, and an open water habitat of approximately 0.4 ha.

#### ***Abiotic function***

Very little is known about the hydrology of the Klipdrifsfontein estuary. A desktop assessment of the estimates the change in mean annual runoff (MAR) between Reference (0.24 Mm<sup>3</sup>/a) and Present (0.23 Mm<sup>3</sup>/a) (1.8% reduction), which is not unexpected given the lack of any dams or significant use of water in the catchment.

---

Very little information is available on the hydrodynamics. The system enters the sea 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 substrate of this estuary largely consists of marine sand, with rock on the sides and back. There is little information available on the water quality of this small system. However, it can be expected that the key water quality characteristics in terms of salinity, pH, turbidity, dissolved oxygen and inorganic nutrients remain largely similar to the natural state, as most of this system's catchment is located within the DHNRC. Due to the protected status of the surrounding area, the Klipdrifsfontein estuary has not been altered by anthropogenic impacts, and the estuary is considered to be in excellent condition.

### ***Biotic function***

There are no macrophytes recorded for this system. The satellite image of the estuary is of poor quality and steep cliffs along the length of the estuary shadow the estuary itself. It is assumed that there is no salt marsh due to the steepness of the valley.

Very little information is available on this system in respect to fish and 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, which provides some information on the birds within the area. A total of 260 bird species have been recorded on the reserve, 97 of which are waterbirds. The DHNRC Protected Area Management Plan (PAMP) records 277 bird species, 35 species of birds which are listed as threatened nationally and/or internationally.

### ***Ecological Health Status, Importance, and Recommended Future State***

The Klipdrifsfontein Estuarine Health Assessment was conducted as an Ecological Water Requirement study desktop procedure in 2016 using a standardized approach also applied in Ecological Water Requirement studies for the Department of Water and Sanitation (DWS). The health condition (also referred to as the Present Ecological State (PES)) of an estuary is typically defined on the similarity of its current condition to an estimated natural condition. The health condition is described using six Ecological Categories, ranging from natural (A) to critically modified (F). The overall ecological health of the Klipdrifsfontein estuary is in an A Category.

Due to its location in the DHNRC, the Klipdrifsfontein estuary. The estuary was deemed of average to low overall estuarine importance. The Recommended Ecological Category (REC), or desired state, signifies the level of protection assigned to an estuary from a flow perspective. The REC for the Klipdrifsfontein estuary as defined by DWS is an A Category. Key interventions required to maintain; the Recommended Ecological Category of an A include:

- Maintaining the present flow regime;
- No development in the Estuarine Functional Zone (EFZ); and
- Maintaining good water quality conditions in the catchments through land-use management.

---

## Important Ecosystem Goods and Services

The natural environment provides a range of valuable ecosystems services (also termed goods and services) to society, including provisioning services (such as food, water and other resources), regulating services (e.g. climate regulation, as well as air and water purification), cultural services (e.g. aesthetic, spiritual, recreational, educational and cultural benefits), and life-support services (such as nutrient cycling and soil formation). The rating of all these services for the Klipdrifsfontein estuary are low except for the provision of climate regulation, which is rated as medium, and disturbance regulation (e.g. flood control and drought recovery) which is rated as high.

## Impacts or Potential Impacts

There are limited pressures on the Klipdrifsfontein estuary. It is in a relative pristine condition. Potential impacts include:

- Potential unsocial behaviour of Whale Trail visitors;
- CapeNature budgetary and/or capacity constraints; and
- Invasive alien plant infestation.

## Overview of Socio-Economic Context

The population for the Overberg District Municipality (DM) is approximately 286 786 people, the population increased by 11.08 %, with an average growth rate of 2.39 % per annum. The Cape Agulhas LM has the smallest population in the Overberg District with an estimated total population of 36 000 people and an average growth rate 1.95 % per annum. Population density of the Cape Agulhas LM is low with an estimated 9.5 persons/km<sup>2</sup>. Of the population aged 20 years and older, 30 % have completed matric, and 8 % have some form of higher education, while 2% have no form of schooling. There are 11 320 households in the Cape Agulhas LM, of which 86 % have access to piped water within their dwelling. Electricity for lighting is provided to 96.5 % of all households.

In terms of the population within the estuary surrounds, the Klipdrifsfontein estuary and its catchment falls within Ward 4 of the Cape Agulhas LM, of which a large portion consists of the DHNRC. As such, the total population size is small (5 613 people) and the area sparsely populated with 4.3 persons per km<sup>2</sup>. Approximately 30.2 % of the population are poor (earning less than R38 200 per household), with 606 persons not employed (9.2 %).

In 2015, the Cape Agulhas LM contributed 14.9 % (R1.990 billion) to the Overberg DM's Gross Domestic Product (GDP) of R13.33 billion. The GDP growth average over the period 2005 – 2015 was 3.6 % which was lower than the Overberg DMs average of 4.0 %. Based on 2015 values, the Commercial Services sector is the largest and most important economic sector within the Cape Agulhas LM, contributing R1.1 billion (55.6 %) to the Municipality's GDP. The industry also employs 48.9 % of the Municipality's workforce. This was followed by the Government, Community, Social and Personal Services Sector, which contributed R325.3 million (16.3 %) to the Municipality's GDP and employed 21.6 % of the Municipality's workforce. Tourism has been identified as one of the fastest growing economic sectors within the Cape Agulhas LM. Boasting the Southern-most tip of Africa and the meeting place of two oceans, the key characteristics that promote

---

tourism are to its natural resources, conservation areas, coastline and beaches, and historic monuments and places.

### **Legislative Instruments and Related Strategies / Programmes**

The main directive for instituting estuarine management stems from the Integrated Coastal Management Act (ICMA) (No. 24 of 2008) and the associated National Estuarine Management Protocol, which prescribes the national estuarine management objectives, the contents and minimum requirements of estuarine management plans, as well as assigns responsibilities for developing and coordinating implementation of estuarine management plans to various levels of government based on municipal jurisdiction. According to the 2013 NEMP, the overall co-ordination of the implementation of the EMP for the Klipdrifsfontein estuary vests with Cape Nature as the identified Responsible Management Authority (RMA), given the location of the Klipdrifsfontein estuary within the De Hoop Nature Reserve. **It is noted that proposed amendments to the 2013 NEMP allocate such responsibilities to the provincial environmental department unless agreement, or until agreement, is reached with the respective municipality to undertake the coordination of the implementation process.**

Under the legislative review, key legal instruments that are applicable to estuarine management are described, and include national, provincial and local management documents. At the local management level, both the Overberg District Municipality Integrated Development Plan and the Cape Agulhas Local Municipality Integrated Development Plan address the management of estuaries within their jurisdiction areas, e.g. the Overberg District Coastal Management Programme, advocates the preservation of the coastal zone, and all watercourses, wetlands and estuaries are considered vital components of the ecological infrastructure of the region. Of particular relevance to this report and estuarine management plan is the DHNRC PAMP.

### **Opportunities and Constraints for Consideration in Estuarine Management Plan**

A Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis for the management of the Klipdrifsfontein estuary was undertaken. The main strength is that the estuary, and its undeveloped catchment, fall within the DHNRC, i.e. the system is formally conserved with a designated management authority already in place. Consequently, the system maintains excellent ecological health, and little management intervention is required. The main management weaknesses are represented by little to no biophysical baseline information available on the estuary and the lack of monitoring, given the remote location and limited financial and human resources to do so. Other weaknesses and threats include poor vehicular access for management, potential anti-social behaviour of visitors to the Whale Trail, as well as haphazard uncoordinated and potentially increased tourism demand from Noetsie visitors.

### **Recommendations to Address Major Information Gaps**

There is very limited water quality data available for the catchment and there are significant information gaps with regard to baseline information, so it is recommended that a regular monitoring programme as well as a research programme be put in place for the estuary.

---

## 4 VISION & OBJECTIVES

### 4.1 Vision

The Vision for an estuary should be inspirational, representing a higher level of strategic intent and aligned with the strategic objectives of the 2013 NEMP, Western Cape CMP and the greater Cape Floristic Region (CFR). The National Vision and Vision of the Estuaries of the CFR are as follows:

**The estuaries of South Africa are managed in a sustainable way that benefits the current and future generations**

**The estuaries of the CFR will continue to function as viable systems which are beautiful, rich in plants and animals, attract visitors, sustain our livelihoods and uplift our spirits**

The 2016 Western Cape Provincial Coastal Management Programme (PCMP), identifies estuarine management as one of its nine priority areas and sets out the goal for the Western Cape as:

**Co-ordinated and integrated estuarine management which optimises the ecological, social and economic value of these systems on an equitable and sustainable basis**

The Vision for the DHNRC as part of the protected area network in the Overberg area is:

**To conserve a system of sustainable living land- and seascapes that are representative of the region's biodiversity and ecosystem services through integrated management, for the benefit of all**

The purpose is the foundation on which all future actions are based and is in line with the overall management philosophy of the organisation. For the DHNRC, the purpose is defined as follows:

**Conserve and maintain important coastal, wetland and terrestrial habitat for conservation, coastal ecosystem services, archaeological and geological features and provide opportunities and benefits for sustainable nature based tourism and access ecosystem services through integrated management, for the benefit of all**

---

In line with above vision and purpose for the DHNRC, the following vision is proposed for the Klipdrifsfontein estuary:

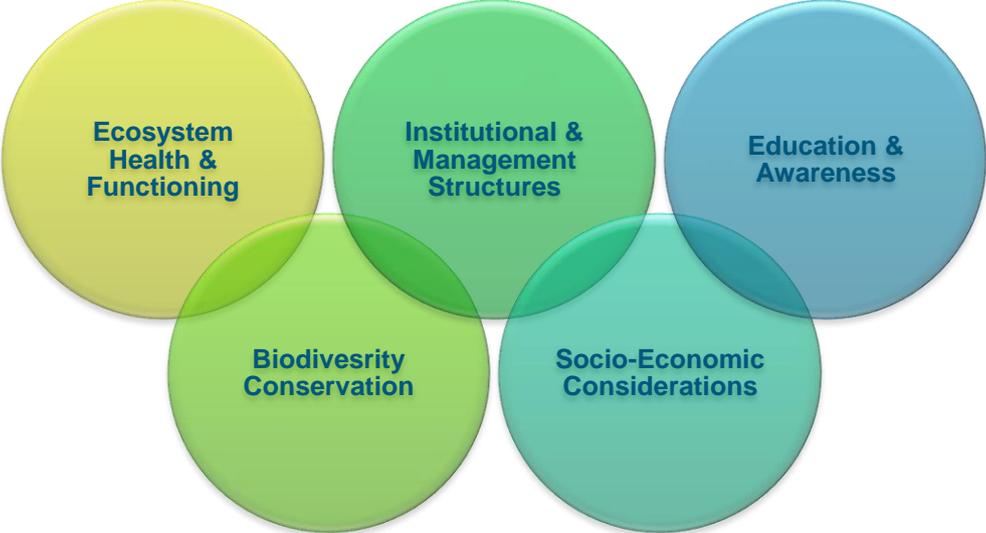
*The Klipdrifsfonteinspruit estuary is a protected, natural and functional system that contributes to the preservation of important coastal habitats and ecosystem services, and is sustainably well managed for the benefit of all*

## 4.2 Strategic Objectives

Objectives are qualitative statements of the values derived from the vision and typically reflect the overarching issues. They should answer the following question, “How will you know when you have achieved the Vision?”. The strategic objectives inform the development of the detailed management strategies that are carried forward as plans of action.

**The strategic objectives for the Klipdrifsfontein estuary are derived from the DHNRC PAMP as well as the SAR, and align with the following identified sectors or categories of issues (Figure 4,**

Table 2):



**Figure 4: Sectors or categories of issues relevant to the management of the Klipdriffontein estuary**

**Table 2: Strategic Objectives for management of the Klipdrifsfontein estuary according to the De Hoop Nature Reserve Complex Protected Area Management Plan, their indicators and level of priority**

Sector/ Category	Strategic Objectives	Performance Indicator(s)	Priority
1 <b>Estuarine Health and Function</b>	1.1 The Klipdrifsfontein estuarine ecosystem and its processes are conserved and maintained, living resources are sustainably managed and estuary nursery function protected as dictated by a hotter climate future.	<ul style="list-style-type: none"> <li>• Maintain an A ecological Condition</li> <li>• Ecological reserves for water quantity and quality are secured</li> <li>• Climate change and estuary requirements are integrated into catchment management processes</li> <li>• Invasive alien plant species are eradicated</li> <li>• Water quality programme is in place</li> <li>• Ecological monitoring programmes are in place</li> <li>• Sustainable use of estuarine resources</li> </ul>	<b>MEDIUM</b>
2 <b>Biodiversity Conservation</b>	2.1 The representative biodiversity of the Klipdrifsfontein estuary within the DHNRC is conserved	<ul style="list-style-type: none"> <li>• EMP is adopted &amp; incorporated into the DHNRC PAMP</li> <li>• Spatial zonation plan is adopted and enforced</li> <li>• All developments environmental legislation and environmental best practice / risk aversion approach</li> <li>• Estuarine habitats are conserved</li> </ul>	<b>HIGH</b>
3 <b>Institutional &amp; Management Structures</b>	3.1 Integrated and cooperative management (including partnerships) is achieved	<ul style="list-style-type: none"> <li>• EMP is incorporated into the DHNRC PAMP and municipal planning</li> <li>• CapeNature is well capacitated with knowledgeable personnel</li> <li>• ORC is functioning and effective</li> <li>• Mandated authorities and participating agencies are well capacitated, actions are fulfilled</li> <li>• Effective communication between responsible authorities</li> </ul>	<b>MEDIUM</b>
4 <b>Socio-Economic Considerations</b>	4.1 Biodiversity access and benefit sharing opportunities are provided to communities.	<ul style="list-style-type: none"> <li>• Increased employment opportunities and employment of local suppliers and programmes</li> <li>• Growing numbers of people directly benefitting</li> </ul>	<b>LOW</b>

		from Sustainable Livelihood Programmes	
	4.2 Appropriate nature-based recreation, tourism and sustainable income generation activities are provided within the framework of the Green Economy.	<ul style="list-style-type: none"> <li>Income targets are met</li> <li>Visitors experience positive</li> <li>Reserve objectives are not Compromised</li> </ul>	<b>LOW</b>
	4.3 The cultural heritage and traditional significance of the Klipdriffontein estuary within the DHNRC are conserved.	<ul style="list-style-type: none"> <li>Heritage assets are mapped, preserved and well managed according to a Cultural Heritage Resource Management Plan</li> </ul>	<b>MEDIUM</b>
<b>5</b>	<b>Education &amp; Awareness</b>	5.1 Quality environmental education, awareness and outreach programmes are provided. <ul style="list-style-type: none"> <li>Awareness programme developed and successfully implemented on an on-going basis</li> <li>Informative signage erected and information disseminated</li> <li>Potberg Environmental Education (EE) Centre well equipped, manned by qualified and passionate staff</li> </ul>	<b>LOW</b>

## 5 PRIORITY MANAGEMENT OBJECTIVES AND ASSOCIATED ACTIVITIES

After the review of the background information, as well as after conducting stakeholder engagement, a Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis of the Klipdriffontein estuary under the current management practices was prepared.

**Table 3: SWOT Analysis**

<b>STRENGTHS</b> <i>(highlights, uniqueness?)</i>	<b>WEAKNESSES</b> <i>(what could be improved?)</i>
<ul style="list-style-type: none"> <li>• Undeveloped catchment area with limited access</li> <li>• System is located within the DHNRC protected area</li> <li>• Excellent PES (Category A)</li> <li>• Minimal management intervention is required to maintain, or improve its condition</li> <li>• Overberg Coastal Management Programme and Cape Agulhas Coastal Management Programmes have been developed to facilitate co-ordinated management</li> <li>• Supported local community and strong existing partnerships and agreements.</li> <li>• Cultural heritage / archaeological site in respect to the Klipdrift shelter</li> </ul>	<ul style="list-style-type: none"> <li>• Little to no biophysical baseline information available</li> <li>• No monitoring undertaken</li> <li>• Limited funding, resources and staff within CapeNature</li> <li>• Very remote and small. There is little societal value to be extracted from it.</li> <li>• Poor external and internal roads limiting both recreational use and hindering effective management (when required)</li> <li>• Potential anti-social behaviour of visitors to the Whale Trail</li> <li>• Limited opportunities to accommodate scientific researchers</li> </ul>
<b>OPPORTUNITIES</b> <i>(opportunities for positive change)</i>	<b>THREATS</b> <i>(what could prevent the EMP from working?)</i>
<ul style="list-style-type: none"> <li>• Job creation opportunities for alien plant clearing for greater DHNRC</li> <li>• Conservation related job opportunities in DHNRC</li> <li>• Contribution to scientific research</li> </ul>	<ul style="list-style-type: none"> <li>• Reactionary (vs proactive) response to management requirements when necessary</li> <li>• Uncoordinated and haphazard management interventions</li> <li>• Climate change and loss of aquatic ecosystem</li> <li>• Increased demand from tourism – increased facility provision at Noetsie</li> </ul>

The priority management objectives detailed in the following section were informed by the SWOT analysis and other critical issues identified as part of the scoping phase and stakeholder engagement. They represent the focus areas for the 5-year cycle of this EMP. An illustrative overview of the priority management objectives is provided in Figure 5 below.

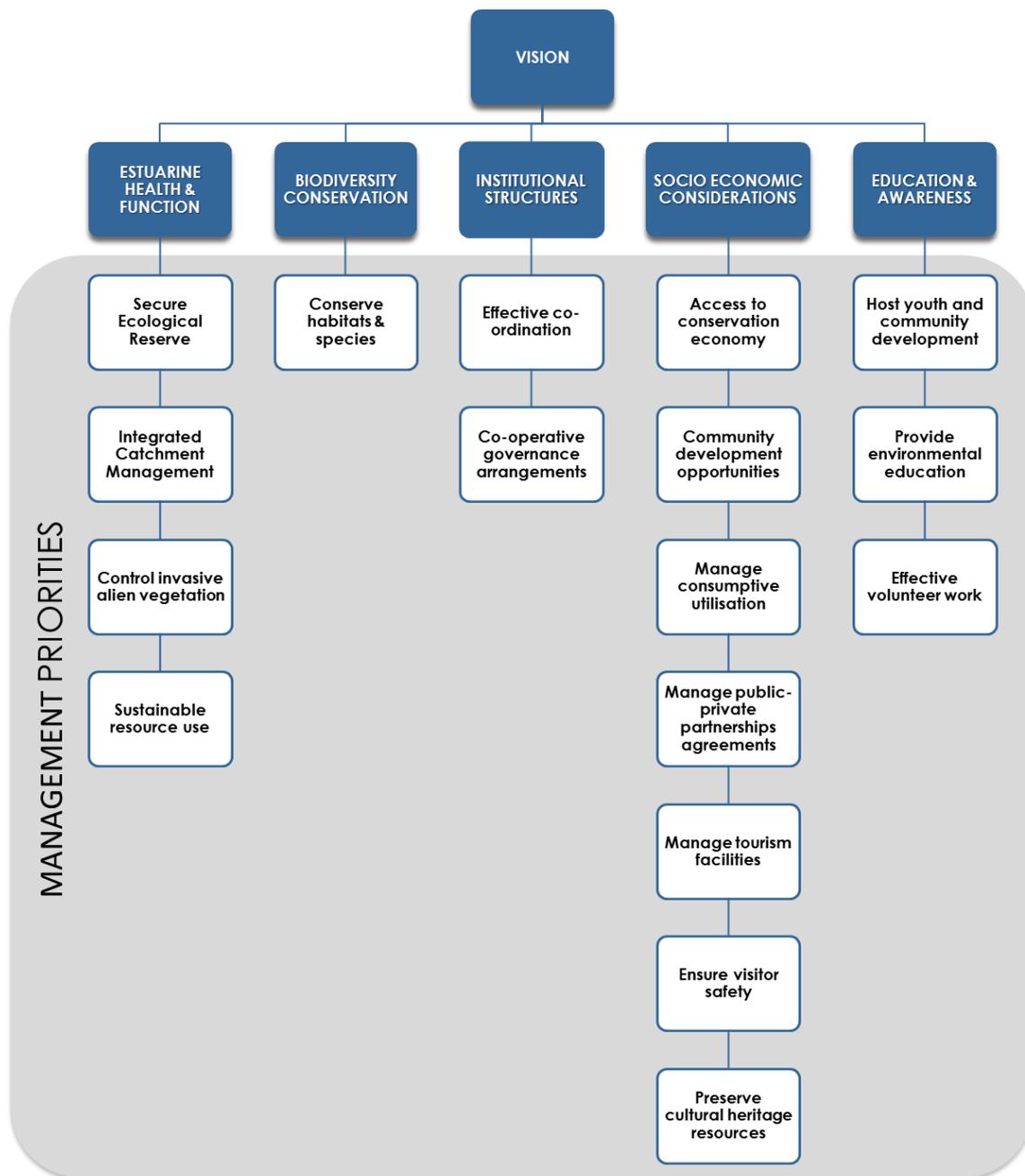


Figure 5: Summary of priority management objectives per management sector

## 5.1 Estuarine Health and Function

**Strategic Objective 1: The Klipdriffontein estuarine ecosystem and its processes are conserved and maintained, living resources are sustainably managed and estuary nursery function protected, under a hotter climate future**

**Table 4: Management Objectives and Actions for Estuarine Health & Function**

Action	Relevant Legislation	Performance Indicator	Priority	Responsibility
<b>Management Objective 1.1: Secure adequate quantity and quality of freshwater input to maintain ecosystem health and functioning</b>				
<b>a.</b> Lobby Department of Water and Sanitation (DWS) Minister to sign off the recommended freshwater reserves	National Water Act (NWA)	<ul style="list-style-type: none"> <li>Category 'A' ecological condition maintained</li> <li>Meetings held and correspondence written</li> <li>Recommended reserve(s) signed off</li> </ul>	LOW	Breede Gouritz Catchment Management Agency (BGCMA), CapeNature
<b>b.</b> Once classification study signed off, follow up on implementation of water resource classification process	NWA	<ul style="list-style-type: none"> <li>Water resource classified</li> <li>Reserves secured</li> </ul>	LOW	BGCMA, CapeNature
<b>c.</b> Monitor natural mouth dynamics	NWA	<ul style="list-style-type: none"> <li>Mouth state documented</li> <li>Photographic database generated</li> </ul>	HIGH	CapeNature
<b>d.</b> Undertake seasonal basic water quality monitoring taking Resource Quality Objectives (RQOs) into account	NWA	<ul style="list-style-type: none"> <li>Estuary Water Quality (WQ) database maintained to facilitate long term database</li> <li>EMP informed by monitoring results going forward</li> </ul>	HIGH	CapeNature, BGCMA
<b>e.</b> Catchment water quality to be summarised and reported on annually	NWA	<ul style="list-style-type: none"> <li>Annual report submitted to CapeNature and ORC</li> </ul>	LOW	DWS, BGCMA

<b>f.</b>	Implement a seasonal monitoring programme of fish and bird populations present in or utilising the estuary, and compile an inventory. RQOs must be taken into account.	NWA (RDM), NEM:BA, Marine Living resources Act (MLRA)	<ul style="list-style-type: none"> <li>Monitoring of fish and birds of estuary included in the DHNRC's ecological matrix</li> <li>Monitoring programme implemented</li> <li>Species inventory and abundance data produced and reported on</li> <li>Database developed</li> <li>Data incorporated into EMP 5-year review</li> </ul>	HIGH	CapeNature, Department of Environment, Forestry and Fisheries (DEFF), South African National Biodiversity Institute (SANBI), (funding from Water Research Commission (WRC), Department of Science and Technology (DST))
<b>g.</b>	Undertake full Resource Directed Measures (RDM) monitoring every 3 years to facilitate adaptive management (physico-chemical attributes, fauna and flora)	ICMA, NWA	<ul style="list-style-type: none"> <li>Required monitoring undertaken</li> <li>Data produced and reported on</li> <li>Data incorporated into EMP 5-year review</li> </ul>	LOW	BGCMA
<b>h.</b>	Implement and document DEFF and DWS policy to not allow effluent discharge to the estuary	NWA	<ul style="list-style-type: none"> <li>Discharge of wastewater prohibited</li> </ul>	LOW	CapeNature, Cape Agulhas Local Municipality (LM)
<b>Management Objective 1.2: Ensure estuary requirements are integrated into catchment processes to ensure healthy water quality</b>					
<b>a.</b>	Catchment land use map developed and updated annually	NWA	<ul style="list-style-type: none"> <li>Updated land use map produced every year</li> </ul>	MEDIUM	Department of Agriculture, Land Reform and Rural Development (DALRRD)
<b>b.</b>	Land use and effluent management included in the Catchment Management Strategy (CMS)	NWA	<ul style="list-style-type: none"> <li>CMS identifies sources of pollution (land use and effluent) to the estuary and provides mitigation strategies</li> </ul>	LOW	BGCMA
<b>c.</b>	Water use plan updated on an annual basis	NWA	<ul style="list-style-type: none"> <li>Updated water use plan produced every year</li> </ul>	LOW	DWS (Resource protection)

<b>d.</b>	Participate in BGCMA activities, and table estuary issues	NWA	<ul style="list-style-type: none"> <li>• Meetings attended</li> <li>• Minutes of meetings</li> </ul>	MEDIUM	CapeNature
<b>Management Objective 1.3: Control the spread and densification of invasive alien plant species</b>					
<b>a.</b>	Identify, map and prioritise infested areas within the estuary and supporting habitats (e.g. wetlands)	Conservation of Agricultural Resources Act (CARA), NWA, ICMA	<ul style="list-style-type: none"> <li>• Invasive species map</li> <li>• Priority areas identified</li> <li>• Appropriate methods of control determined</li> </ul>	HIGH	CapeNature, DEFF: Working for the Coast (DEFF: WftC), DEFF Working for Water (DEFF: WfW)
<b>b.</b>	Include Klipdriffontein estuary in the invasive alien species eradication programme	CARA, NWA, ICMA	<ul style="list-style-type: none"> <li>• Invasive Alien Plants (IAPs) eradication programme implemented</li> <li>• biological control employed where possible</li> <li>• % total area cleared and kept cleared</li> </ul>	HIGH	CapeNature, DEFF: WftC, DEFF: WfW
<b>Management Objective 1.4: Ensure sustainable resource use through an effective level of compliance management</b>					
<b>a.</b>	Assess and quantify extractive resource use activities on the estuary through relevant monitoring activities	MLRA	<ul style="list-style-type: none"> <li>• Monitoring programme developed and implemented</li> <li>• Counts of number of harvesters and users</li> <li>• Ad hoc patrols</li> <li>• Number of permit holders</li> <li>• Report submitted to CapeNature and ORC</li> </ul>	MEDIUM	CapeNature
<b>b.</b>	Deploy human resources for ad hoc compliance and enforcement in respect to the MLRA based on findings	MLRA	<ul style="list-style-type: none"> <li>• Number of Environmental Management Inspector (EMI's) trained and appointed</li> <li>• Number of sea fisheries officers trained and appointed</li> </ul>	LOW	CapeNature
<b>c.</b>	Ensure staff are adequately capitated and equipped to do law enforcement	MLRA		LOW	CapeNature

	effectively (within the CapeNature's mandate)		<ul style="list-style-type: none"> <li>• Ad hoc patrols conducted</li> <li>• Incidents of poaching reduced</li> <li>• Transgressors prosecuted</li> <li>• Report submitted to CapeNature and ORC</li> </ul>		
<b>d.</b>	Appropriate staff have designated as environmental management inspectors/fishery control officers	MLRA		LOW	CapeNature
<b>e.</b>	Initiate and enforce ban on night fishing	MLRA		When adopted	DEFF

## 5.2 Biodiversity Conservation

**Strategic Objective 2:** The representative biodiversity of the Klipdriffontein estuary within the De Hoop Nature Reserve Complex is conserved.

**Table 5: Management Objectives and Actions for Conservation (includes utilisation of living resources)**

Proposed Activity/Action		Relevant Legislation	Performance Indicator	Priority	Responsibility
<b>Management Objective 2.1: Ensure the conservation of estuarine habitats and species</b>					
a.	Adopt, implement and enforce spatial zonation plan	ICMA, NEM: PAA	<ul style="list-style-type: none"> <li>EFZ controls enforced and offenders prosecuted</li> </ul>	HIGH	CapeNature
b.	Ensure that all proposed developments adhere to the full suite of relevant environmental legislation, particularly the coastal management line and associated development controls	ICMA, Land Use Planning Act (LUPA), (National Environmental Management Act (NEMA), NWA, NEM: PAA, National Environmental Management: Biodiversity Act (NEM:BA), etc.	<ul style="list-style-type: none"> <li>Corrective action undertaken</li> <li>No permanent development, infilling or land transformation of EFZ</li> <li>All developments comply with environmental legislation and environmental best practice / risk aversion approach</li> <li>Reduced habitat loss/degradation and disturbance, and inappropriate behaviour</li> </ul>	HIGH	CapeNature, Cape Agulhas LM, DEA&DP

## 5.3 Institutional and Management Structures

**Strategic Objective 3: Integrated and cooperative management (including partnerships) is achieved**

**Table 6: Management Objectives and Actions for Institutional and Management Structures**

Action	Relevant Legislation	Performance Indicator	Priority	Responsibility	
<b>Management Objective 3.1: Ensure effective co-ordination of estuarine management responsibilities</b>					
a.	CapeNature to adopt and facilitate implementation of the EMP by incorporating the EMP and the spatial zonation plan into the DHNRC PAMP	NEM: PAA, ICMA	<ul style="list-style-type: none"> <li>EMP and zonation plan adopted by CapeNature</li> <li>EMP included in all relevant planning documents</li> </ul>	HIGH	CapeNature
b.	Inform and integrate the management objectives for the DHNRC into the SDF's and IDP's of the Overberg District and Cape Agulhas Municipalities.	Municipal Systems Act (MSA), LUPA, ICMA	<ul style="list-style-type: none"> <li>The protected area is integrated into land-use planning outside of the protected area</li> </ul>	MEDIUM	CapeNature
c.	Inform and integrate the estuarine management objectives for the EMP into all relevant government department planning documents and processes	MSA, LUPA, NEMA, ICMA, NWA	<ul style="list-style-type: none"> <li>EMP included in all relevant planning documents</li> </ul>	MEDIUM	CapeNature
d.	Maintain and implement the Memorandum of Understanding (MOU) with Department of Environment, Forestry and Fisheries: Oceans & Coasts (DEFF: O&C) in respect to estuarine management	NEM: PAA, ICMA	<ul style="list-style-type: none"> <li>Signed MOU with DEFF: O&amp;C</li> <li>MOU implemented</li> </ul>	LOW	CapeNature
e.	Undertake needs analysis and identify skills and equipment requirements	ICMA, NEM: PAA	<ul style="list-style-type: none"> <li>Needs and shortages identified</li> <li>Motivation for acquisition drafted and approved</li> </ul>	LOW	CapeNature

			<ul style="list-style-type: none"> <li>• Equipment purchased and maintained</li> </ul>		
<b>f.</b>	Implement skills development and ongoing training in respect to estuarine management to ensure capacity	ICMA, NEM: PAA,	<ul style="list-style-type: none"> <li>• Motivation for training drafted and approved</li> <li>• Staff attend relevant accredited training courses</li> </ul>	LOW	CapeNature
<b>g.</b>	Develop effective communication protocols and processes with implementing agents (CapeNature to develop working relationships with mandated department & agreements need to be developed to address each management action)	ICMA, NEM: PAA	<ul style="list-style-type: none"> <li>• Project champions identified</li> <li>• Networks established, and contacts database compiled</li> <li>• Regular email correspondence</li> </ul>	MEDIUM	CapeNature
<b>h.</b>	Engage the Overberg Review Committee (ORC) for the De Hoop Conservation Area to facilitate co-operative governance	ICMA, NEM: PAA	<ul style="list-style-type: none"> <li>• DHNRC represented on ORC</li> <li>• ORC is functioning and effective</li> <li>• ORC meets on a biannual basis</li> </ul>	HIGH	CapeNature
<b>i.</b>	Develop and apply a Terms of Reference for involvement of stakeholders in advising management according to their expertise/ mandate.	ICMA, NEM: PAA	<ul style="list-style-type: none"> <li>• Estuary issues are tabled</li> <li>• Minutes of meetings</li> </ul>	HIGH	CapeNature
<b>j.</b>	Estuarine Management Co-ordinator (EMC) present on critical forums and committees to ensure that estuarine issues are tabled, e.g. Municipal Coastal Committee, Overberg Integrated Conservation Group (OICG) and Agulhas Biodiversity initiative (ABI) in the Overberg (ABI2) and other relevant District and Local conservation bodies, BGCMA, etc.	ICMA, NEM: PAA	<ul style="list-style-type: none"> <li>• EMC attendance at critical forum and committee meetings</li> <li>• Minutes of meetings</li> </ul>	HIGH	DEA&DP, CapeNature
<b>c.</b>	Monitor and report on the status of the estuary on an annual basis	NWA	<ul style="list-style-type: none"> <li>• Annual report produced by CapeNature/EMC and submitted to ORC</li> </ul>	MEDIUM	CapeNature, DEA&DP

			<ul style="list-style-type: none"> <li>• Data incorporated into EMP 5-year review</li> </ul>		
<b>k.</b>	Ensure that EMP is maintained, reviewed, enforced and budgeted for annually	ICMA, NEM: PAA	<ul style="list-style-type: none"> <li>• Feedback solicited from participating agencies</li> <li>• Biannual and annual reporting progress of EMP actions and achievements to DEFF and ORC</li> <li>• Action plans updated as and when required</li> <li>• An action plan for securing future funding drafted and approved</li> <li>• Funding secured for 5-year cycle</li> </ul>	HIGH	CapeNature, with input from all authorities
<b>l.</b>	Undertake formal 5-year review of the EMP as prescribed by the 2013 NEMP	ICMA	<ul style="list-style-type: none"> <li>• Management Evaluation Tracking Tool – South Africa (METT-SA) assessment undertaken</li> <li>• Motivation for updated drafted and approved</li> <li>• Funding confirmed</li> <li>• Terms of Reference drafted</li> <li>• Consultants appointed</li> <li>• EMP updated</li> </ul>	LOW	CapeNature, with input from all authorities
<b>Management Objective 3.2: Define co-operative governance arrangements</b>					
<b>a.</b>	Implement procedures to ensure cooperative governance between all government departments with a mandate to act	ICMA, Inter-governmental relations Act (Act 13 of 2005)	<ul style="list-style-type: none"> <li>• Roles and responsibilities defined and accepted via MOUs signed between CapeNature and spheres of government and participating agencies</li> <li>• Minutes of meetings</li> <li>• Active collaboration of various implementing agents</li> </ul>	HIGH	All authorities

<b>b.</b>	Overberg Review Committee to monitor performance of CapeNature in respect to implementation of EMP	ICMA	<ul style="list-style-type: none"> <li>• Authorities to provide formal feedback on mandated activities</li> <li>• ORC meets on a biannual basis</li> <li>• Minutes of meetings</li> </ul>	MEDIUM	All authorities, All stake-holders
<b>c.</b>	Individual agencies to identify and address training needs, with possible secondment to address training and capacity shortfalls	ICMA	<ul style="list-style-type: none"> <li>• Motivation for training drafted and approved</li> <li>• Staff attend relevant accredited training courses</li> <li>• MOUs to be developed for secondments</li> </ul>	MEDIUM	All authorities
<b>d.</b>	Individual agencies to allocate resources, create and fill posts (including project champions), and acquire necessary infrastructure, resources and equipment of fulfil their mandates	MSA, NWA, ICMA, NEMA, NEM: PAA	<ul style="list-style-type: none"> <li>• Need and Desirability investigation undertaken</li> <li>• Motivation for acquisition drafted and approved</li> <li>• Equipment purchased and maintained</li> <li>• Project champion(s) for allocated management actions</li> <li>• Staff performance appraisals per Performance Management System in terms of management actions and projects</li> </ul>	MEDIUM	All authorities
<b>e.</b>	Mandated authorities and participating agencies to confirm budget allocations for mandated actions	MSA, NWA, ICMA, NEMA, NEM: PAA	<ul style="list-style-type: none"> <li>• Formal feedback from authorities on mandated activities</li> <li>• Motivation for budget drafted and approved</li> <li>• Funding secured for 5-year cycle</li> </ul>	LOW	All authorities

## 5.4 Socio-Economic Considerations

**Strategic Objective 4.1: Biodiversity access and benefit sharing opportunities are provided to communities.**

**Table 7: Management Objectives and Actions for Biodiversity Access and Benefit Sharing**

Action		Relevant Legislation	Performance Indicator	Priority	Responsibility
<b>Management Objective 4.1.1: Create access to the conservation economy through the implementation and management of appropriate initiatives and projects</b>					
a.	Include estuarine specific actions in Integrated Work plan compiled	ICMA, NEM: PAA,	<ul style="list-style-type: none"> <li>• Number of Extended Public Works Programme (EPWP) / Environmental Protection and infrastructure Programmes (EPIP) job opportunities</li> <li>• Number of EPWP / EPIP full time equivalents</li> <li>• Number of people directly benefitting from Sustainable Livelihood Programmes</li> <li>• Number of person days employment created.</li> </ul>	MEDIUM	CapeNature
b.	Include estuarine specific actions in Annual Plan of Operations (APO) compiled according to the required timeframes	ICMA, NEM: PAA,		MEDIUM	CapeNature
c.	Complete estuarine specific actions reporting on EPWP / EPIP database monthly	ICMA, NEM: PAA,		MEDIUM	CapeNature
<b>Management Objective 4.1.2: The De Hoop Nature Reserve Complex provides community development opportunities through various capacity building interventions, linked to job creation opportunities</b>					
a.	Determine estuarine specific training needs and facilitate the implementation of a training plan	ICMA	<ul style="list-style-type: none"> <li>• Number of EPWP / EPIP job opportunities</li> <li>• Number of EPWP / EPIP full time equivalents</li> </ul>	LOW	CapeNature
b.	Promote the appointment and development of estuarine specific Small,	ICMA		LOW	CapeNature

	Medium and Micro-Enterprise(s) (SMME's) with appropriate training		<ul style="list-style-type: none"> <li>• Number of people directly benefitting from Sustainable Livelihood Programmes</li> <li>• Number of person days employment created.</li> </ul>		
<b>Management Objective 4.1.3: Manage consumptive utilisation of biological resources</b>					
<b>a.</b>	All requests to utilise resources from the DHNRC and the estuary specifically will be dealt with in terms of the CapeNature Policy on consumptive utilisation	NEM: PAA, MLRA	<ul style="list-style-type: none"> <li>• Number of people directly benefitting from Sustainable Livelihood Programmes</li> </ul>	MEDIUM	CapeNature

**Strategic Objective 4.2: Appropriate nature-based recreation, tourism and sustainable income generation activities are provided within the framework of the Green Economy.**

**Table 8: Management Objectives and Actions for Nature-based Recreation, Tourism and Sustainable Income Generation**

Action	Relevant Legislation	Performance Indicator	Priority	Responsibility	
<b>Management Objective 4.2.1: Management of public-private partnerships (PPP) agreements in respect to the Klipdriffontein estuary</b>					
<b>a.</b>	Ensure that the PPP management plans are implemented in respect to the estuary	NEM: PAA	<ul style="list-style-type: none"> <li>• Income targets are met</li> <li>• Visitors experience positive</li> <li>• Reserve objectives are not Compromised</li> </ul>	MEDIUM	CapeNature
<b>b.</b>	Have regular management meetings as per agreement	NEM: PAA		MEDIUM	CapeNature
<b>c.</b>	Ensure that activities are in line with the DHNRC Strategic Management Plan.	NEM: PAA		MEDIUM	CapeNature
<b>d.</b>	Ensure activities are in line with the approved PPP Activities plan	NEM: PAA		MEDIUM	CapeNature

<b>Management Objective 4.2.2: Management of tourism facilities other than those managed by public-private partnerships</b>					
<b>a.</b>	Maintain the Whale Trail huts and all related facilities and equipment.	NEM: PAA	<ul style="list-style-type: none"> <li>• Reserve objectives are not compromised</li> <li>• Whale Trail successfully operated and huts maintained</li> <li>• Positive feedback from hikers using Whale Trail on facilities, services and staff</li> <li>• Curio shop both viable and successful</li> </ul>	HIGH	CapeNature
<b>b.</b>	Maintain communication channels with hikers by providing relevant information verbally and per pamphlets.	NEM: PAA		HIGH	CapeNature
<b>c.</b>	Maintain and operate the curio shop at Potberg for the benefit of hikers and other visitors.	NEM: PAA		HIGH	CapeNature
<b>d.</b>	Maintain the operation of cleaning, portage and shuttle services for the Whale Trail.	NEM: PAA		HIGH	CapeNature
<b>e.</b>	Maintain a visitor information and control service at the De Hoop main gate.	NEM: PAA		HIGH	CapeNature
<b>f.</b>	Train relevant staff in tourism handling and communication.	NEM: PAA		HIGH	CapeNature
<b>Management Objective 4.2.3: Ensure visitor safety</b>					
<b>a.</b>	Compile safety regulations for visitors to DHNR & Marine Protected Area (MPA)	NEM: PAA	<ul style="list-style-type: none"> <li>• Health &amp; Safety audit</li> </ul>	HIGH	CapeNature

**Strategic Objective 4.3:** The cultural heritage and traditional significance of the Klipdriffontein estuary within the De Hoop Nature Reserve Complex is conserved.

**Table 9: Management Objectives and Actions for Cultural Heritage Resources**

Proposed Activity/Action		Relevant Legislation	Performance Indicator	Priority	Responsibility
<b>Management Objective 4.3.1: Preserve and manage cultural heritage resources</b>					
<b>a.</b>	Maintain and build on the heritage/cultural resource (middens, caves) inventory for the DHNRC, flagging areas in and around the Klipdriffontein estuary and adjacent coastline	National Heritage Resources Act (NHRA)	<ul style="list-style-type: none"> <li>Information gathered, and database developed</li> <li>Heritage assets mapped, and values managed consistent with objectives</li> </ul>	LOW	CapeNature South African Heritage Resource's Agency (SAHRA)
<b>b.</b>	Implement the Cultural Heritage Resource Management Plan as it applies to the Klipdriffontein estuary	NHRA	<ul style="list-style-type: none"> <li>Updated and implemented Cultural Heritage Plan</li> </ul>	LOW	CapeNature
<b>c.</b>	Access to the Klipdriffontein estuary within the DHNRC for spiritual, cultural and traditional purposes will be allowed subject to permit conditions and with prior approval	NEM: PAA	<ul style="list-style-type: none"> <li>Number of persons accessing CapeNature protected areas for cultural, traditional, spiritual, youth development and sustainable harvesting activities.</li> </ul>	LOW	CapeNature

## 5.5 Education & Awareness

**Strategic Objective 5: Quality environmental education, awareness and outreach programmes are provided in respect to the Klipdriffontein estuary**

**Table 10: Management Objectives and Actions for Education, Awareness and Outreach**

Action	Relevant Legislation	Performance Indicator	Priority	Responsibility
<b>Management Objective 5.1: Host youth and community development through environmental awareness that assists in developing the knowledge, skills, values and commitment necessary to achieve environmentally sustainable development (specific focus on DHNRC and MPA).</b>				
<b>a.</b> Compile information and resource material (including signage posters, pamphlets and webpage design) on DHNR & MPA, climate change, coastal management and the Klipdriffontein estuary for dissemination and presentation on Environmental Awareness calendar days (e.g. Heritage Day, National Marine Week and Marine Protected Area Awareness).	NEM: PAA	<ul style="list-style-type: none"> <li>• Number of learners provided with environmental education opportunities</li> <li>• Number of awareness events</li> <li>• Number environmental education resources developed for distribution</li> </ul>	MEDIUM	CapeNature
<b>b.</b> Collaborate with partners to arrange Environmental Awareness events and scheduled school activities.	NEM: PAA		MEDIUM	CapeNature
<b>Management Objective 5.2: Environmental education is provided to promote an understanding of biodiversity and the use of the natural environment as a vehicle for learning and personal development</b>				
<b>a.</b> Develop and implement an education and awareness programme linked to the objectives of DHNR & MPA and general conservation & environmental management principles.	NEM: PAA	<ul style="list-style-type: none"> <li>• Education &amp; awareness programme developed and implemented</li> <li>• Number of learners provided with environmental education opportunities</li> </ul>	MEDIUM	CapeNature

<b>b.</b>	Internal staff trained and capacitated to facilitate environmental education.	NEM: PAA	<ul style="list-style-type: none"> <li>• Number of outreach and capacity building programs</li> <li>• Number of schools visiting the education centre</li> <li>• Estuarine management included in programmes conducted and material provided</li> </ul>	MEDIUM	CapeNature
<b>c.</b>	Co-facilitate the capacity building of teachers to provide environmental education to learners.	NEM: PAA		MEDIUM	CapeNature
<b>d.</b>	Management will strive to raise the profile of the DHNRC including the Klipdriffontein estuary through linked awareness and education programmes.	NEM: PAA		MEDIUM	CapeNature
<b>e.</b>	Include estuarine management in awareness and outreach programmes conducted.	NEM: PAA		MEDIUM	CapeNature
<b>f.</b>	Ensure that the content of material provided is accurate and compatible with the learner's curriculum.	NEM: PAA		MEDIUM	CapeNature
<b>g.</b>	Provide training and capacity building opportunities for conservation trainees (interns).	NEM: PAA		<ul style="list-style-type: none"> <li>• Number of staff enrolled in courses</li> <li>• Qualified staff</li> </ul>	MEDIUM
<b>h.</b>	Informative signage, indicating zonation and allowable activities, to be placed at strategic points for all users/visitors	NEM: PAA	<ul style="list-style-type: none"> <li>• Key public spaces / access points identified</li> <li>• Signage created and erected</li> <li>• Posters and pamphlets erected/ disseminated</li> </ul>	MEDIUM	CapeNature
<b>i.</b>	Engage and educate all visitors and estuary users (subsistence & recreational users)	NEM: PAA	<ul style="list-style-type: none"> <li>• Reduction in illegal activities</li> <li>• Reduced habitat loss/degradation and disturbance, and inappropriate behaviour</li> <li>• Informative surveys/talks undertaken</li> </ul>	MEDIUM	CapeNature
<b>Management Objective 5.3: Effective use of volunteers</b>					
<b>a.</b>	Accommodate volunteers depending on the needs of the reserve, experience of the volunteer and in accordance with CapeNature policies and strategies.	NEM: PAA	<ul style="list-style-type: none"> <li>• Number of volunteers accommodated</li> <li>• Activities conducted by volunteers</li> </ul>	LOW	CapeNature

---

## 6 PROPOSED SPATIAL ZONATION

### 6.1 Introduction

Spatial zonation of activities on an estuary is necessary to avoid user conflict and to guide sustainable utilization of resources without degradation of the estuarine environment. The spatial zonation plan provides a means of geographically transposing the aims of the management objectives, where applicable, and is typically informed by the following (DEA, 2015):

- The geographical boundary of the estuary also indicating important habitats (e.g. floodplain, open water, reed beds, sandflats, etc.);
- The surrounding land uses, e.g. protected areas, and existing infrastructure;
- Areas designated for the conservation and protection of biodiversity;
- Appropriate buffers in which land use and development are strictly controlled and monitored; and
- Zones where certain types of activities (recreational, commercial, industrial, harvesting etc.) are permissible and others not permissible.

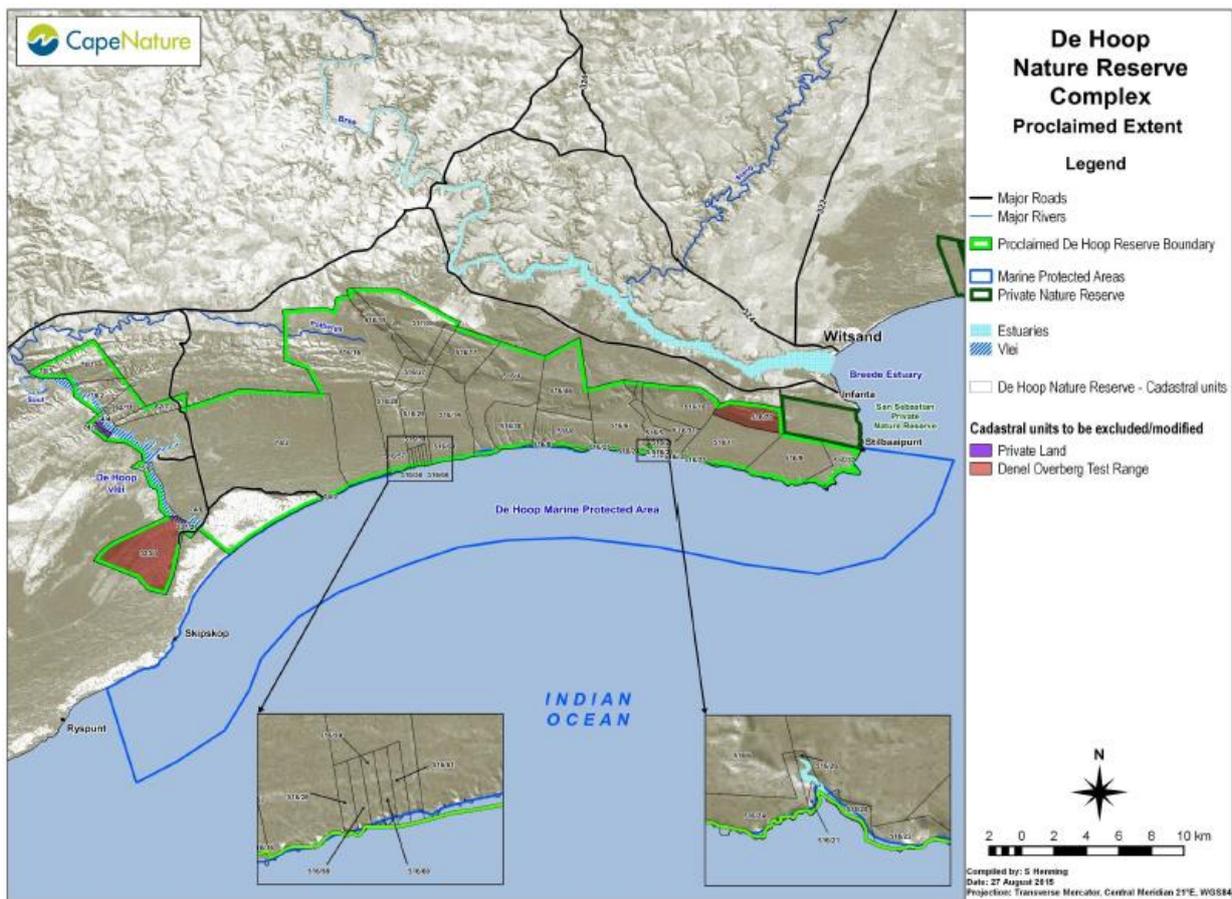
As the Klipdriffontein estuary falls within the DHNRC, the whole estuary, and the surrounding terrestrial landscape are protected. There is no known use of the estuary in respect to extractive resource or recreation. There is also no development within the EFZ. Zonation of the estuary in regard to these use types is therefore not necessary. However, legislated boundaries and buffer zones are still applicable.

### 6.2 Legislated Coastal Boundaries and Buffer Zones

#### 6.2.1 De Hoop Nature Reserve Complex

The DHNRC was proclaimed a Provincial Nature Reserve in 1976 and is situated between Arniston in the west and the Breede River Estuary in the east (CapeNature, 2016a). The nature reserve also has World Heritage Site status (declared in 2009), as a critical biodiversity site within the Cape floral Region Protected Areas World Heritage Site. The De Hoop Vlei is registered as a Ramsar wetland of international importance. The eastern sector of the DHNRC is declared as an ammunition site and is utilised by Denel for missile testing (CapeNature, 2016a). The Complex includes the De Hoop Marine Protected Area (MPA), re-proclaimed in 2000, which abuts the entire length of the nature reserve (Figure 6).

The Klipdriffontein estuary and its catchment are protected within the DHNRC, which is under the administration of CapeNature. The boundaries of the DHNRC are implicated in the designation of CapeNature as the RMA.



**Figure 6: De Hoop Nature Reserve Complex proclaimed boundaries**

### 6.2.2 Estuarine Functional Zone

The ICMA defines an estuary as “a body of surface water -

- that is permanently or periodically open to the sea;
- in which a rise and fall of the water level as a result of the tides is measurable at spring tides when the body of surface water is open to the sea; or
- in respect of which the salinity is higher than fresh water as a result of the influence of the sea, and where there is a salinity gradient between the tidal reach and the mouth of the body of surface water”.

Similarly, the National Water Act (NWA) defines an estuary as “a partially or fully enclosed water body that is open to the sea permanently or periodically, and within which the seawater can be diluted, to an extent that is measurable, with freshwater drained from land”.

However, the 2018 National Biodiversity Assessment provides a more detailed definition of an estuary, that is: “a partially enclosed permanent water body, either continuously or periodically open to the sea on decadal time scales, extending as far as the upper limit of tidal action, salinity penetration or back-flooding under closed mouth conditions. During floods an estuary can become a river mouth with no seawater entering the formerly estuarine area or, when there is little or no fluvial input, an estuary can be isolated from the sea by a sandbar and become fresh or even hypersaline” (SANBI 2019).

The EFZ is defined by the 2014 Environmental Impact Assessment (EIA) Regulations (as amended in 2017) (GN 324) as “the area in and around an estuary which includes the open water area, estuarine habitat (such as sand and mudflats, rock and plant communities) and the surrounding floodplain area, as defined by the 5 m topographical contour (referenced from the indicative mean sea level)”. The 2013 NEMP acknowledges the EFZ as the geographical boundary of estuaries in South Africa. In practice, it is found that the 5 m topographic contour approximates the EFZ for most estuaries in South Africa. It is consequently commonly used to delineate the EFZ in the absence of specific biophysical assessments. Where biophysical information is available, the EFZ can be delineated according to the presence of estuarine vegetation or features such as wetlands that are directly supportive of the estuary. This approach informed the EFZ used in the 2018 NBA (SANBI, 2018) (refer to Figure 3)

### 6.2.3 Coastal Protection Zone and proposed Coastal Management Line

The Integrated Coastal Management (ICM) Act defines a default **Coastal Protection Zone (CPZ)** which, in essence, consists of a continuous strip of land, starting from the high-water mark (HWM) and extending 100 m inland in developed urban areas zoned as residential, commercial, or public open space, or 1 000 m inland in areas that remain undeveloped or that are commonly referred to as rural areas. It also includes certain sensitive or at-risk land such as estuaries, littoral active zones and protected areas.

The Provincial Member of the Executive Council (MEC), in consultation with the Local Municipalities, is required to refine and formally adopt the CPZ. A process is currently underway to formally establish a CPZ for the Western Cape Coastline. In accordance with provisional delineation of the CPZ for estuaries in the Overberg, as per draft delineations recommended in the Coastal Set-back / Management Lines for the Overberg District project (WCG, 2015), the CPZ is informed by a coastal risks zone approximated by the 10 m Above Mean Sea Level (amsl) contour or 1:100 year floodline around an estuary, whichever is wider. **Where protected areas are concerned, the CPZ is extended to include these areas (i.e. within the DHNRC).**

The ICMA also provides for the establishment of a **Coastal Management Line (CML)**, designed to limit development in ecologically sensitive or vulnerable areas, or an area where dynamic natural processes pose a hazard or risk to humans. A CML, as envisaged by the amended ICMA, is informed by the projections of risk (Figure 7) emanating from dynamic coastal processes such as sea level rise or erosion, information on ecological or other sensitivities adjacent to the coast, as well as the location and extent of existing development and existing executable development rights. The CML is a continuous line, seawards of which lies:

- Areas of biophysical or social sensitivities such as sensitive coastal vegetation identified as priority conservation areas and formal protected areas;
- those areas that should be left undeveloped, or only be granted appropriately restricted development rights, due to a high risk from dynamic coastal processes; or
- coastal public property.

In estuaries, the CML is delineated by the 5 m amsl contour or 1:100 year floodline, whichever is wider, to differentiate a zone where formal development should be discouraged. The coastal boundaries for the Klipdrifsfontein estuary are illustrated in Figure 7.



**Figure 7: Coastal boundaries of the Klipdrifsfontein Estuary and risk projections (WCG, 2015)**

#### 6.2.4 Environmental Impact Assessment regulatory line

In respect of the EIA regulatory scheme, an additional line called the Development Set-Back Line (DSL) needs to be differentiated as it relates to the ‘development set-back’ referred to in the EIA regulations<sup>2</sup> rather than the coastal management lines described in the ICM Act. However, as part of the on-going process of defining coastal management lines for the Western Cape, it is currently **proposed that the CML, as defined under ICMA, also be used as the DSL.**

Reference to development set-backs is found in the EIA Listing Notices that list a range of activities that require different levels of environmental impact assessment and the issuing of an environmental authorisation prior to being undertaken.

<sup>2</sup> The Environmental Impact Assessment Regulations, 2014 (as amended in 2017), published under Government Notice No. 326 in Gazette No. 40772 of 4 April 2017, in terms of sections 24(5) and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998)

---

Typically, an activity would be listed in the form of a range of thresholds which, if exceeded, trigger the need for an environmental impact assessment in the form of a Basic Assessment or EIA. In some cases, however, a development set-back line is used as spatial reference to include or exclude activities. The EIA regulations indicate that: *“development setback” means a setback line defined or adopted by the competent authority*. This implies that if such a setback is defined, the setback delineation replaces the default parameters for an activity, as read within the context of that activity. The competent authority in the Western Cape is DEA&DP or the National Department of Environment, Forestry and Fisheries.

The EIA regulations also refer to whether a development is in front or behind the line – for a coastal development set-back this equates to any development seaward of the line being ‘in front of’, whilst landward of the line being ‘behind’.

An important further point to note is that the development set-backs are usually linked to the presence of urban built-up areas. The regulations indicate that *““urban areas” means areas situated within the urban edge (as defined or adopted by the competent authority), or in instances where no urban edge or boundary has been defined or adopted, it refers to areas situated within the edge of built-up areas”*. These exclusion areas create *de facto* islands in the area below the DSL, within which the specifically excluded EIA triggers do not apply.

**The Western Cape Government, as designated competent authority, considers the area below/seaward of existing development as falling outside of the ‘built-up area’.** Therefore, any exclusions based on a listed activity taking place within the built-up area would not apply to this strip of coastal land, and the prescriptions for environmental assessments related to the particular activity will apply. For example, the beach in front of seafront houses is not considered ‘built-up’ and environmental authorisations will be required to execute any listed activities on that beach.

## 6.3 Estuary Zonation

### 6.3.1 Municipal Zonation

The DHNRC is zoned as Nature Conservation area in the Cape Agulhas Municipal Town Planning Scheme. The purpose of the Nature Conservation zone *“is to provide for open spaces that are not actively used for recreational purposes, but form part of the visual amenity of an area and play an ecological or conservation role. Consent for limited tourism related uses may be granted in such zones”* (Cape Agulhas Municipality, 2014). Nature conservation, a single dwelling unit, public open space and private open space are allowable uses with 4x4 trails, place of instruction, tourist facilities, holiday accommodation; rooftop base station and transmission tower being consent uses.

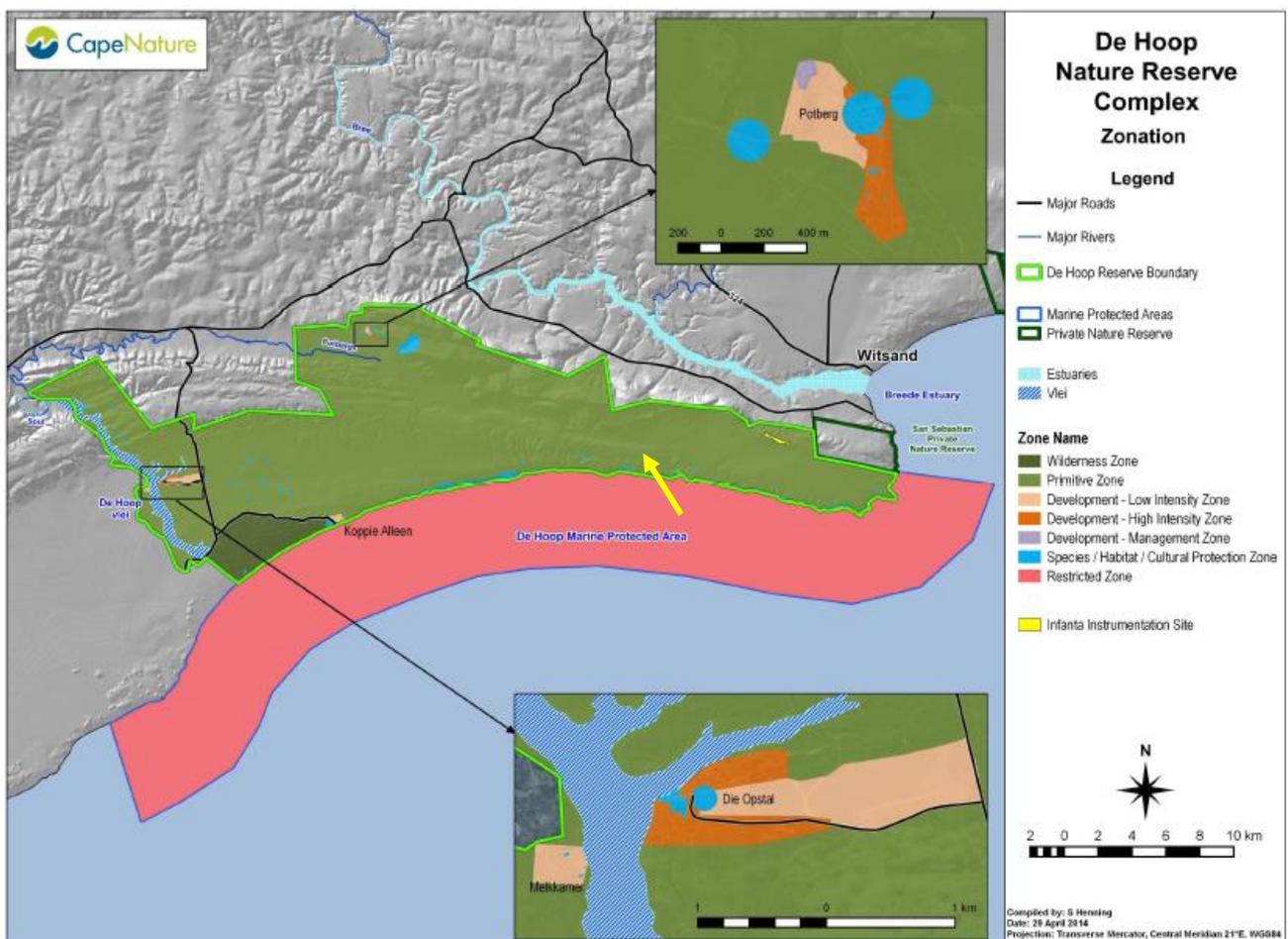
### 6.3.2 Proposed Spatial Zonation / De Hoop Nature Reserve Complex

Zonation of the Klipdriffontein estuary is dictated by the zonation of the DHNRC (CapeNature, 2016a) and therefore CapeNature prescriptions apply.

Apart from isolated development nodes, the entire DHNRC, including the Klipdrifsfontein estuary and the surrounding terrestrial landscape, is zoned as **Primitive Zone** (CapeNature, 2016a) (Figure 8). The objectives of this zone are as follows:

- To provide users with an experience of solitude in natural landscape with little nearby evidence of human presence;
- To limit visitor use, numbers and infrastructure to minimise impact in sensitive environments;
- To reduce need for management of users and visitor impacts; and
- To allow for minimal or more intensive biodiversity management interventions.

Allowable activities in this zone are to be managed as per Table 11 below (CapeNature, 2016a). CapeNature management guidelines in terms of visitors, conservation and consumptive use are provided in Table 12. Formal development or construction activities in this zone are to be regulated according to the EIA Regulations and any future controls emanating from the Provincial determination of coastal management lines.



**Figure 8: Zonation map of De Hoop Nature Reserve Complex (yellow arrow indicating Klipdrifsfontein estuary) (CapeNature, 2016a)**

**Table 11: Primitive Zone: Zonation prescriptions for the Klipdriffontein estuary (CapeNature, 2016a)**

RELEVANT LEGISLATION	RESPONSIBLE AUTHORITY	ENFORCEMENT
<b>NEM: PAA</b>	<b>CAPENATURE</b>	<b>CAPENATURE</b>
<b>VISITOR ACTIVITIES</b>	<ul style="list-style-type: none"> <li>• Guided or unguided nature observation</li> <li>• Primarily intended for hiking or walking access (i.e. no water-based craft, motorised or non-motorised)</li> <li>• Only allows for 4x4 routes or vehicle access if specifically considered and noted.</li> <li>• Only allows for non-hiking accommodation node if specifically considered and noted.</li> <li>• Fishing/ harvesting subject to approval by CapeNature.</li> <li>• No development within the EFZ.</li> </ul>	
<b>VISITOR ACCESS</b>	<ul style="list-style-type: none"> <li>• Visitor access only by permit (i.e. no access without permit)</li> <li>• Control of visitor numbers, frequency and group sizes to meet zone objectives.</li> <li>• Only users of facilities/activities will access to this zone.</li> <li>• Defined or non-defined hiking and day trail routes.</li> <li>• On foot always.</li> <li>• Bicycle, 2x4 or 4x4 vehicle, or horseback on designated routes only.</li> </ul>	
<b>FACILITIES / INFRASTRUCTURE</b>	<ul style="list-style-type: none"> <li>• Deviation from natural state to be minimised.</li> <li>• Infrastructure should not be visible from Wilderness Zones.</li> <li>• May provide isolated, small, unobtrusive accommodation facilities for up to 16 guests on restricted footprints, particularly for overnight hiking trails.</li> <li>• May have defined or beacons hiking routes, management access roads, tracks and firebreaks.</li> <li>• All roads, tracks or trails to be located and constructed to reduce maintenance, visibility and erosion. Where un-surfaced tracks will result in erosion, use concrete strip or interlocking pavers to stabilise. Re-route unstable or erosion-prone road sections if this will lower long-term visual and environmental impact.</li> <li>• New roads for visitor access only justified if also required for management access.</li> <li>• Avoid wide surfaced roads or roads and tracks wider than required for a single vehicle.</li> </ul>	

**Table 12: Primitive Zone Management Guidelines (CapeNature, 2016a)**

CONDITIONS OF USE	
<b>Visitor Management</b>	<ul style="list-style-type: none"> <li>• Manage to conserve natural and cultural resources, ecological processes and wild appearance &amp; character.</li> <li>• Restrict numbers of visitors and allow for noise rest periods if required.</li> <li>• All facilities will be small, very basic, self-catering and distributed to avoid contact between users.</li> <li>• There should be limited if any interaction between groups.</li> <li>• Since visitor use usually cannot be intensively managed, re-route trails away from any areas with sensitive local habitats or plant and animal species.</li> <li>• Trail layout, design and construction must reduce maintenance requirements.</li> <li>• Visible &amp; audible human impacts from adjacent zones should be mitigated.</li> </ul>
<b>Conservation Management</b>	<ul style="list-style-type: none"> <li>• Habitats with lower or higher management requirements. May be natural burning zones.</li> <li>• Usually remote areas so roads and trails should be planned and constructed assuming infrequent maintenance.</li> <li>• Prevent or restore visible trampling or any other visitor impact.</li> <li>• Rehabilitate non-useful roads to natural vegetation.</li> </ul>
<b>Consumptive Use</b>	<ul style="list-style-type: none"> <li>• Sustainable use can be appropriate under controlled circumstances subject to a formal assessment and application in accordance with CapeNature policies.</li> </ul>

### 6.3.3 Areas requiring rehabilitation

As the Klipdriffontein estuary is in a natural and pristine state (WCG, 2018), priorities for rehabilitation pertain only to eradicating invasive alien vegetation in the catchment. In terms of the DHNRC PAMP, eradication of invasive alien vegetation is considered one of the highest management priorities. The areas immediately adjacent to and above the estuary are densely infested (Figure 9) (CapeNature, 2016a), and should be targeted under the nature reserve’s integrated fire and invasive alien management programme.

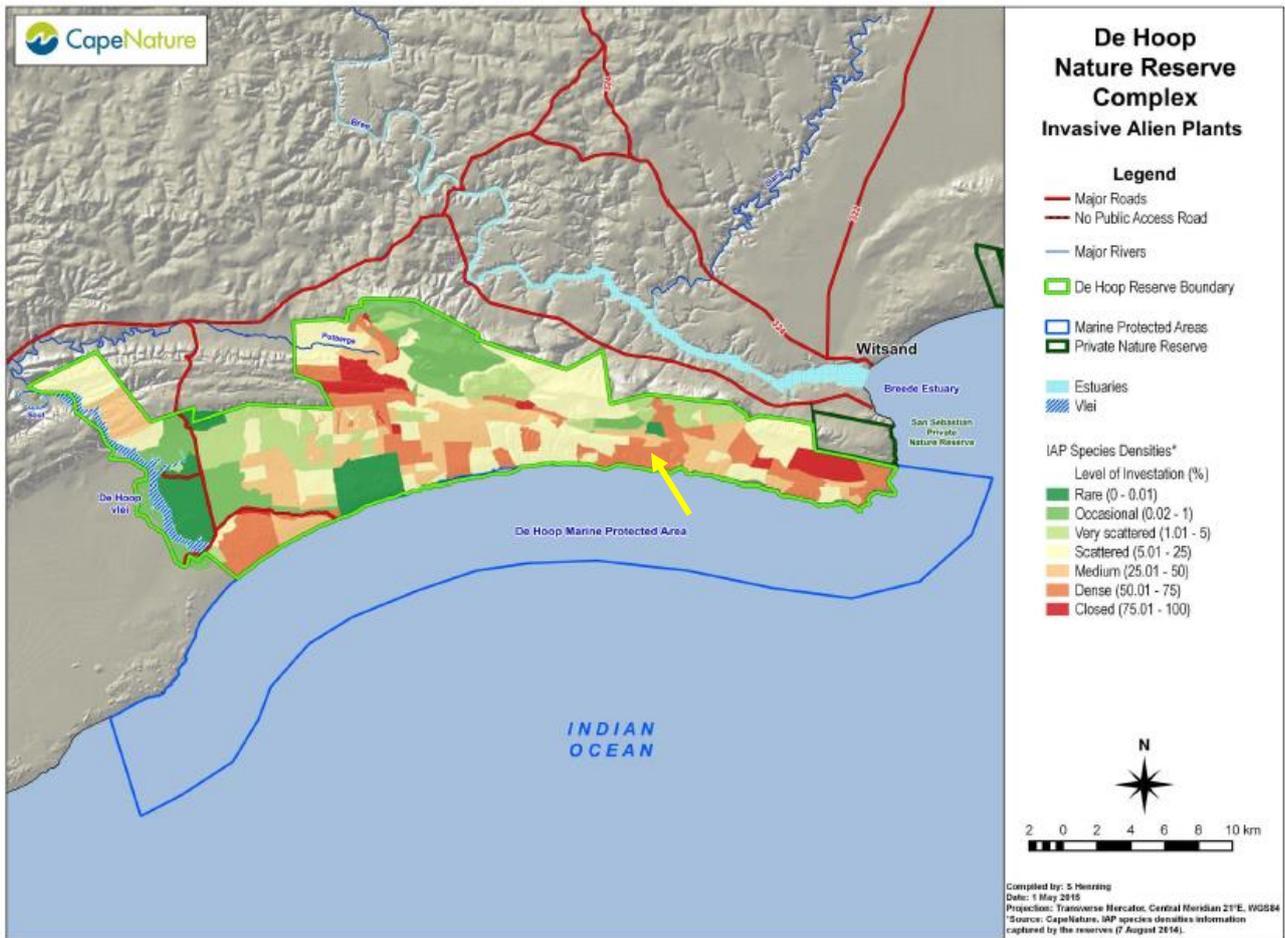


Figure 9: Invasive vegetation map and management compartments of De Hoop Nature Reserve Complex (yellow arrow indicating Klipdriffontein estuary) (CapeNature, 2016a)

---

## 7 INTEGRATED MONITORING PLAN

According to the standards for estuarine management, management actions should be based on sound scientific evidence. Thus, monitoring is a crucial aspect of the adaptive estuarine management planning process as the generated data will be used to inform and update management decisions. However, the collection, processing and interpretation of such data, particularly ecological data, are generally costly and time-consuming and often require considerable scientific expertise.

In the context of estuarine management, there are three broad categories of monitoring which should be incorporated into an integrated monitoring plan, namely resource monitoring, compliance monitoring and performance monitoring (DEA, 2015). These components are discussed in the following sections.

### 7.1 Resource Monitoring

#### 7.1.1 Current Resource Monitoring

There are no ecological monitoring programmes (e.g. water quality, fish or birds, etc.) in place for the Klipdriffontein estuary apart from visual observations during ad hoc visits by reserve officers.

Only Coordinated Waterbird Counts (CWAC) are undertaken at the De Hoop Vlei (S. Tembe, *pers. comm.*<sup>3</sup>), which is a Ramsar wetland of international importance.

#### 7.1.2 Recommended Resource Monitoring Programmes

In the context of the Klipdriffontein estuary, general baseline information is lacking. The recommended minimum monitoring requirements as prescribed by Breede-Gouritz Water Classification Study (DWS, 2017) to ascertain impacts of changes in freshwater flow, and current and future impacts on the estuary and/or any improvement or reductions therein are listed in Table 13(Appendix 1). The purpose of recommended long-term monitoring programme, is also to test for compliance with Ecological Specifications (Ecospecs) and to continuously improve understanding of ecosystem function. Recommended baseline monitoring requirements to improve the confidence of the reserve determination are listed in Table 14 (Appendix 1).

A basic monitoring programme should be established by CapeNature for the Klipdriffontein estuary to address the indicated priority requirements as soon as possible.

---

<sup>3</sup> Mr S. Tembe, CapeNature: De Hoop Reserve Manager, July 2018.

---

### 7.1.3 Resource Quality Objectives / Ecological Specifications

Resource Quality Objectives (RQOs) or Ecological Specifications (EcoSpecs) are clear and measurable specifications of ecological attributes (in the case of estuaries - hydrodynamics, sediment dynamics, water quality and different biotic components) that define a specific ecological category, in the case of the Klipdriffontein estuary, a Category A (DWS, 2018). The EcoSpecs are presented in Table 15 (Appendix 2).

## 7.2 Compliance Monitoring

Compliance monitoring refers to the monitoring of the character and intensity of uses/activities and developments within an estuary or the EFZ. Such monitoring is usually prescribed in relevant legislation, regulations, policies, standards, guidelines and or permits and license agreements (DEA, 2015). The purpose of this form of monitoring is to test whether activities are compliant with the established limits and objectives as well as to detect growing pressures on resources.

By and large, compliance monitoring within the DHNRC is the responsibility of CapeNature and is undertaken according to legislation and policies applicable to provincial protected areas, and by means of law enforcement and compliance monitoring protocols internal to CapeNature.

Currently, no compliance monitoring is taking place, as there no need for compliance action due to the remote geographical position of the estuary (S. Tembe, *pers. comm.*).

## 7.3 Performance Monitoring (Review & Evaluation)

A performance monitoring plan is used by the RMA, and/or identified implementing agents, to assess the effectiveness with which planned management activities contained in the EMP are being performed and ultimately to gauge progress in achieving the vision and objectives. This component utilises the performance indicators included for the various actions, specifically the management priorities, and includes a temporal scale or the frequency of the collection of the performance data and the targets that should be achieved. Table 16 in Appendix 3 provides the performance monitoring plan corresponding to the management priorities proposed in this EMP.

Ultimately, the EMP must be holistically reviewed every 5 years from the date it was adopted, ideally in line with the review cycles of the applicable IDP, SDF and/or CMP. The EMP review is the responsibility of CapeNature. CapeNature applies the Management Effectiveness Tracking Tool – South Africa v.3a (METT-SA) to assess the effectiveness of the management of its protected areas. The METT-SA is intended to report on progress (CapeNature, 2016b). Thus, the score is the baseline against which future assessments are made to see if there has been improvement in management effectiveness. The METT-SA is site-specific and uses a specific set of indicators tailored for the protected area concerned. In addition to the overall score, the ratings of individual indicators can be tracked, and the next steps required to improve management effectiveness for this particular element can

---

thus be determined (CapeNature, 2016b). The assessment process is typically undertaken at the end of the 2-year financial period and culminates in the compilation of a METT-SA Action Plan to address the shortcomings or poor performance. It is envisaged that CapeNature will employ the METT-SA to assess the management effectiveness of the Klipdrifsfontein EMP at the 5-year review period.

According to the 2013 NEMP, this review should include an assessment of:

- The effectiveness of the EMP and success with meeting the objectives (i.e. the performance monitoring plan);
- Environmental changes at a local or a wider scale that could affect the estuarine resources or the implementation of the EMP; and
- Changes (if any) to legislation, land-use planning, goals or policies that may require the EMP to be amended.

This review may involve revisiting the SAR to determine the progress or changes that have come about because of the EMP in terms of the objectives that were originally set. It may also require the EMP to be amended, including a revision of the objectives, amendments to the management actions, and/or monitoring protocols. Ideally, representatives and experts in the major sectors (e.g. water quantity and quality, land-use and infrastructure planning and development), should evaluate the efficiency of the EMP in the context of their mandate or area of expertise. Public participation will be required before the amended EMP can be approved.

## 8 INSTITUTIONAL CAPACITY & ARRANGEMENTS

It is essential that this EMP is regarded as a strategic plan that can guide the detailing of management actions and identification of implementing agents. Therefore, it does not specify the required resources (human and financial) required for effective management of the estuary. It does, however, offer a schedule or phased planning approach that incorporates capacity building and implementation at the local level over a five-year period. It is crucial that champions/project leaders/teams are identified who will be responsible for the formulation of detailed project plans and the implementation thereof.

### 8.1 Key Role Players

Co-management and effective governance have been identified as vital aspects of estuarine management. Figure 10 displays the key role players that may be included the management of the Klipdrifsfontein estuary.

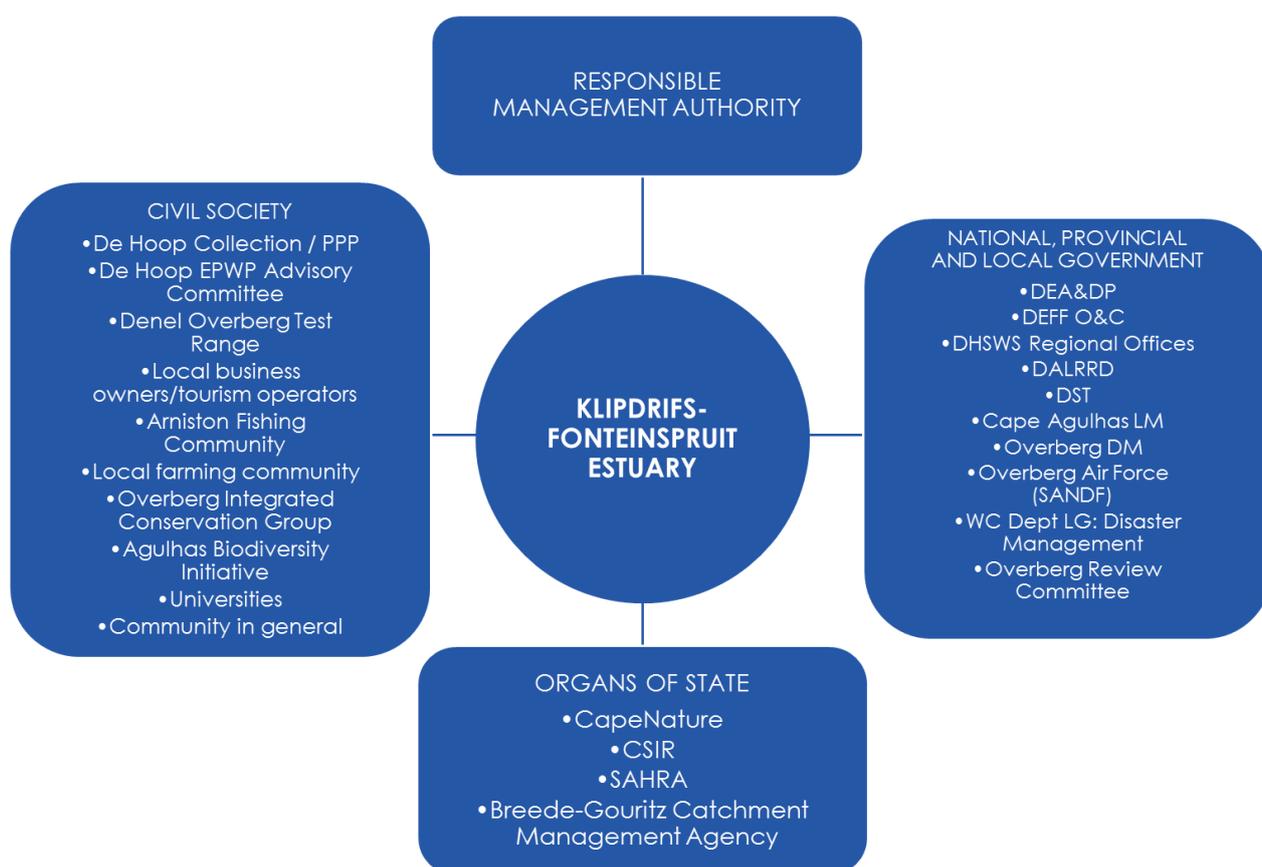


Figure 10: Key role players for the management of the Klipdrifsfontein estuary

### 8.2 Responsible Management Authority

According to the NEMP, the RMA responsible for the co-ordination of the implementation of the Klipdrifsfontein EMP is CapeNature by virtue of the estuary's location within the DHNRC, where CapeNature is legally responsible for the management thereof. **It is noted**

---

**that in the amendments to the 2013 NEMP, such responsibilities remain allocated to the applicable conservation authority, in this case CapeNature, in respect to estuaries in protected areas or part of a protected area expansion strategy.** Ultimately the role of the RMA must be designated through formal signed agreement.

Effective implementation of this EMP requires the augmentation of capacity within CapeNature, with the recommended appointment of a regional estuarine management co-ordinator (EMC) within DEA&DP. This individual will play a pivotal co-ordinating role for all other implementing agencies as well as CapeNature departments (e.g. Scientific Services). Specific implementation actions identified in this EMP remain the responsibility of mandated government agencies as well as respective departments within CapeNature. It is crucial that champions/project leaders/teams are identified by CapeNature, who will be responsible for the formulation of detailed project plans and the implementation thereof. For example, it is strongly recommended that a CapeNature official be appointed (if not done so already) to address all matters relating to the wetlands and water bodies (De Hoopvlei and Klipdriffontein) with the De Hoop NR. This is likely to be the De Hoop NR Conservation Manager<sup>4</sup>.

Progress towards achieving the objectives set out in this EMP should be reviewed on an annual basis by CapeNature and communicated to stakeholders via the Overberg Review Committee as well as to DEA&DP and DEFF via an annual report. This EMP will need to be revisited and updated after five years to reflect goals that have been achieved and to accommodate changing priorities.

### 8.3 Estuary Advisory Forum

While the establishment of an Estuary Advisory Forum (EAF) for each estuary is no longer a requirement in the 2013 NEMP, the Western Cape Government still supports their establishment and recommend that private entities and non-government organisations continue to play a supporting role in the implementation of this EMP.

The DHNRC does not have a permanent dedicated Protected Area Advisory Committee or Liaison Committee, but CapeNature recognizes the importance of stakeholder participation of protected areas to enhance conservation of natural resources. The DHNRC and the MPA partake in different Liaison Committees and forums where management activities, monitoring and research are discussed (*S. Tembe, pers. comm.*).

The Committees include: Local Joint Meetings where safety and security matters are discussed between different Law Enforcement agencies; the Breede River Estuary Advisory Forum; the Municipal Coastal Advisory Committee where focus is placed on coastal management and research with partners, such as WWF and the Department of

---

<sup>4</sup> Minutes of the Second Stakeholder Meeting for the Ratel and Klipdriffonteinspruit estuaries, 11<sup>th</sup> of April 2019, Department of Agriculture Lecture Hall, Bredasdorp.

---

Environment, Forestry and Fisheries (formerly DEA); as well as the De Hoop Expanded Public Works Programme Advisory Committee (S. Tembe, *pers. comm.*).

As the Denel Overberg Test Range (OTR) has certain testing rights on the reserve and the fact that the Overberg Air Force base controls the airspace above the reserve and MPA, the Overberg Review Committee (ORC) has been established to monitor the sustainable and responsible environmental management of the greater De Hoop Conservation Area and MPA. This long-standing committee has independent expert scientists as members, as well as a representative from the adjacent farming community, and also the Arniston Fishing Community. It meets quarterly to review reports submitted by OTR, the Air Force and CapeNature (S. Tembe, *pers. comm.*).

It is strongly recommended that the existing ORC be utilised to fulfil the function of an EAF, where estuarine related matters can be raised in the context of the greater De Hoop Conservation Area.

It is anticipated that relevant government departments would already be represented on this Committee by delegates mandated by the respective department to do so. Additional members may be invited to join the Committee. Each government representative will be tasked to convey recommendations to his/her department and report back to the ORC on behalf of the department. Moreover, representatives from the authority/ies who have executive powers within the specific sector should also be present. This ensures that recommendations are executed, and resources are made available for priority tasks or activities. This also streamlines the flow of information and decreases the turnaround time of required interventions.

## 8.4 Government Departments and Organs of State

The key to successful implementation of this EMP is the commitment and contribution of all spheres of government to the process, including:

- CapeNature as the RMA;
- Cape Agulhas Municipality: Responsible for providing key municipal services, addressing issues relating to tourism, as well as the provision of management, technical and legislative support;
- Overberg District Municipality: Responsible for issues relating to water and sanitation, disaster management as well as the provision of management and technical support;
- Western Cape Government departments: Responsible for legislatively mandated responsibilities as well as support, including compliance, funding, and monitoring (e.g. DEA&DP, Department of Transport and Public Works, etc.);
- Relevant National government departments, especially DEFF: O&C (for the MPA), DWS (via the regional office), DALRRD, and Department of Science and Technology (DST), South African National Defence Force (SANDF)- Overberg Air Force; and
- Organs of State: e.g. Breede-Gouritz Catchment Management Agency (BGCMA), Council for Scientific and Industrial Research (CSIR), and South African Heritage Resources Agency (SAHRA).

---

A crucial element towards achieving the vision and objectives of this plan, now and in future, is to ensure that the responsible authorities and their constituent departments, fulfil their roles and responsibilities as identified within the EMP. In terms of practical implementation of the EMP, each responsible government department is required to produce internal project plans linked the identified management actions, and in line with their legislative mandates. Funding and staff resources will need to be sourced within each respective sector department and/or institute. Alternatively, departments may fund other entities to undertake their necessary functions on their behalf.

The DEFF is generally responsible for national standardisation of estuarine management and approval of provincially-compiled estuarine management plans. Direct involvement in individual estuaries will occur via existing forums for intergovernmental coordination. These forums will have the estuarine management on their agendas, and include:

- The Overberg Municipal Coastal Committee: Responsible for facilitating co-management, effective governance and district level co-ordination of coastal and estuarine management issues;
- The Overberg Review Committee responsible for monitoring the greater De Hoop Conservation Area and MPA;
- The Western Cape Provincial Coastal Committee: Responsible for facilitating co-management and effective governance and provincial co-ordination of coastal and estuarine management; and
- Western Cape Estuaries Task Team: Responsible for facilitating provincial co-ordination of estuarine management.

#### **8.4.1 Project Plans for Implementation**

Effective implementation of this EMP requires the conversion of the priority actions into detailed project plans, which must be prepared and adopted into the respective departmental implementation strategies. A template for such project plans is provided in the EMP Development Guideline (DEA, 2015) and is attached as Appendix 4.

---

## 9 RECOMMENDATIONS AND CONCLUSION

The following items/issues are considered critical towards the ultimate achievement of the vision and should be immediately addressed and/or receive greatest effort in respect to human/financial resources:

- A watching brief is kept over the Klipdriffontein estuary to ensure its continued ecological health and protection;
- A basic monitoring programme should be established and undertaken by CapeNature; and
- The DEA&DP to consider the appointment of a Regional estuarine management co-ordinator/champion, to support CapeNature.

In conclusion, this plan adopts the principle of adaptive management and presents an integrated and holistic approach to addressing not just the impacts but also the social and economic drivers that affect estuarine health. The actions proposed in this EMP reflect an ongoing process of implementation and should accommodate potential amendment due to changing circumstances. They are the first steps of a long-term process designed to secure ongoing and sustainable improvements to the current situation.

---

## 10 REFERENCES

- Cape Agulhas Municipality (2014). Repeal and Replacement of Zoning Scheme Regulations in the Cape Agulhas Municipal Area. Western Cape Provincial Gazette dated 27 June 2014.
- Cape Agulhas Municipality (2017). Cape Agulhas Municipality Integrated Development Plan 2017/18 – 2021/22. Resolution 99/2017.
- CapeNature (2016a). De Hoop Nature Reserve Complex Protected Area Management Plan. CapeNature.
- CapeNature (2016b). Standard Operating Guideline: Applying the METT-SA to assess Protected Area Management Effectiveness (and accompanying Microsoft Excel Spreadsheet). CapeNature Directorate: Conservation Management & Biodiversity Support Services.
- Department of Environmental Affairs (DEA), (2013). National Environmental Management Integrated Coastal Management Act 2008 (Act No. 24 of 2008): National Estuarine Management Protocol (NEMP).
- Department of Environmental Affairs (DEA) (2015). Guidelines for the Development and Implementation of Estuarine Management Plans in terms of the National Estuarine Management Protocol. Department of Environmental Affairs, Cape Town.
- Department of Water and Sanitation (DWS) (2015). Reserve Determination Studies for the Selected Surface Water, Groundwater, Estuaries and Wetlands in the Gouritz Water Management Area: Monitoring Report. Prepared by Koekemoer Aquatic Services and Scherman Colloty & Associates cc.. Report no. RDM/WMA16/00/CON/1213.
- Department of Water and Sanitation (DWS) (2017). Determination of Water Resources Classes and Resource Quality Objectives in the Breede-Gouritz Water Management Area: Quantification of the Ecological Water Requirements and changes in Ecosystem Goods, Services and Attributes. Report No: RDM/WMA8/00/CON/CLA/0117.
- Department of Water and Sanitation (DWS) (2018). Determination of Water Resources Classes and Resource Quality Objectives in the Breede-Gouritz Water Management Area: Outline of Resource Quality Objectives Report. Report No: RDM/WMA8/00/CON/CLA/0717.
- Overberg District Municipality (2016). Overberg District Integrated Development Plan 2016/17. Final Report.
- South African National Biodiversity Institute (SANBI) (2019). National Biodiversity Assessment 2018: The status of South Africa's ecosystems and biodiversity. Synthesis Report. South African National Biodiversity Institute, an entity of the Department of Environment, Forestry and Fisheries, Pretoria. pp. 1–214.

- 
- StatsSA, (2011). Cape Agulhus. Key Statistics from the 2011 National Census. Statistics South Africa. URL: [http://www.statssa.gov.za/?page\\_id=993&id=cape-agulhas-municipality](http://www.statssa.gov.za/?page_id=993&id=cape-agulhas-municipality). Accessed 27 November 2018.
- StatsSA, (2016). Cape Agulhas Community Survey data 2016. URL <https://wazimap.co.za/profiles/municipality-WC033-cape-agulhas/>. Accessed 27 November 2018.
- Western Cape Government (WCG) (2015). *Coastal Management (Set-back) Lines for the Overberg District*, 31 March 2015. Western Cape Department of Environmental Affairs and Development Planning.
- Western Cape Government (WCG) (2018). *Klipdriffontein Estuarine Management Plan: Situation Assessment Report. Draft 1*. Western Cape Department of Environmental Affairs and Development Planning.

## APPENDIX 1: RECOMMENDED MONITORING PROGRAMMES

**Table 13: Recommended minimum requirements for long-term monitoring (Priority: Red = High; Orange = Medium, Yellow = Low) (DWS, 2017)**

COMPONENT	MONITORING ACTION	TEMPORAL SCALE (FREQUENCY AND WHEN)	SPATIAL SCALE (NO. STATIONS)	PRIORITY
Hydro-dynamics	Record estuary water levels.	Continuous	In main water body	Yellow
	Observe mouth status	Daily or weekly	Mouth	Orange
	Measure groundwater level.	Continuous	Near head of estuary	Yellow
	Satellite photographs of estuary (30x 30 m).	Every 3 years	Entire estuary	Red
Sediment dynamics	Bathymetric surveys: Series of cross-section profiles and a longitudinal profile collected at fixed 100-200 m intervals, but in more detail in the mouth. The vertical accuracy should be about 5 cm.	Every 3 years	Entire estuary	Yellow
	Set sediment grab samples (at cross section profiles) for analysis of Particle Size Distribution (PSD) and origin (i.e. using microscopic observations).	Every 3 years (with invert sampling)	Entire estuary	Yellow
Water quality	Water quality (e.g. system variables (e.g. pH, oxygen, turbidity), nutrients and toxic substances) measurements in Groundwater entering the head of the estuary.	Monthly continuous	Close proximity to head of estuary	Yellow
	<i>In situ</i> salinity and temperature observations.	Continuous	In main water body (1 to 3 stations)	Red
	Longitudinal salinity and temperature profiles (in situ) collected over a spring and neap tide during high and low tide at: <ul style="list-style-type: none"> <li>End of low flow season (i.e. period of maximum seawater intrusion).</li> <li>Peak of high flow season (i.e. period of maximum flushing by river water).</li> </ul>	Every year at end of dry season	Entire estuary (3-5 stations)	Yellow
	Water quality measurements (i.e. system variables, and nutrients) taken along the length of the estuary (surface and bottom samples).	Seasonal surveys, every 3 years	Entire estuary (3-5 stations)	Yellow
	Measurements of organic content and toxic substances (e.g. trace metals and hydrocarbons) in sediments along length of the estuary, where considered an issue.	Every 5 years	Focus on sheltered, depositional areas	Yellow
	Water quality (e.g. system variables, nutrients and toxic substances) measurements on near-shore seawater.	Use available literature	Seawater adjacent to estuary mouth at salinity 35	Yellow
Microalgae	Record relative abundance of dominant phytoplankton groups, i.e. flagellates, dinoflagellates, diatoms and blue-green algae.	Summer survey every 3 years	Entire estuary	Yellow
	Chlorophyll-a measurements taken at the surface, 0.5 m and 1 m depths, under typically high and low flow conditions using a recognised technique, e.g. HPLC.	Summer survey every 3 years	Entire estuary	Yellow

COMPONENT	MONITORING ACTION	TEMPORAL SCALE (FREQUENCY AND WHEN)	SPATIAL SCALE (NO. STATIONS)	PRIORITY
	Intertidal and subtidal benthic chlorophyll-a measurements.	Summer survey every 3 years	Entire estuary	High
Macrophytes	Ground-truthed maps to document changes in macrophyte habitats over time. Document area covered by sensitive habitats i.e. submedged macrophytes.	Summer survey every 3 years	Entire estuary	Medium
	Record number of macrophyte habitats, identification and total number of macrophyte species, number of rare or endangered species or those with limited populations documented during a field visit.	Summer survey every 3 years	Entire estuary	Medium
	Note extent of macroalgal blooms, floating aquatic macrophytes and area occupied by invasive vegetation.	Summer survey every 3 years	Entire estuary	Medium
	Take measurements of depth to water table	Summer survey every 3 years	Upper reaches	High
Invertebrates	Record species and abundance of zooplankton, based on samples collected across the estuary.	Summer survey every 3 years	Entire estuary (3-5 stations)	High
	Record benthic invertebrate species and abundance, based on subtidal and intertidal grab samples at a series of stations up the estuary, and counts of hole densities.	Summer survey every 3 years	Entire estuary (3-5 stations)	High
	Measures of sediment characteristics at each station.	Summer survey every 3 years	Entire estuary (3-5 stations)	High
Fish	Record species and abundance of fish, based on seine net sampling.	Summer survey every 3 years	Entire estuary (3-5 stations)	Medium
Birds	Undertake counts of all water associated birds, identified to species level.	Annual winter (Jul/Aug) and summer (Jan/Feb) surveys	Entire estuary	Medium

**Table 14: Generic baseline surveys to improve confidence in the preliminary reserve determination of estuaries (Priority components are highlighted) (based on DWS, 2017)**

<b>Monitoring action</b>	<b>Temporal Scale (frequency and timing)</b>	<b>Spatial Scale (Number of stations)</b>
<b>Hydrology</b>		
For larger systems record river inflow at head of estuary (smaller systems hydrology to be simulated every 10 years).	Continuous.	Install recorder near head of estuaries.
<b>Hydrodynamics</b>		
Record water levels Large system (permanent recorder DWS levelled to mean sea level). Smaller systems (small in situ probe).	Continuous.	Near mouth.
Aerial photography (or using high resolution satellite imagery i.e. 5x5 m pixel size, e.g. Google Pro or BirdEye).	Once-off.	Entire estuary.
<b>Sediment dynamics</b>		
Monitoring berm height using appropriate technologies.	Quarterly.	Mouth.
Bathymetric surveys: Series of cross section profiles and a longitudinal profile collected at fixed 500 m intervals, but in more detail in the mouth including the berm (every 100 m). Vertical accuracy at least 5 cm.	Once-off.	Entire estuary.
Collect sediment grab samples (at cross section profiles) for analysis of particle size distribution and organic content (and ideally origin, i.e. microscopic observations).	Once-off.	Entire estuary.
<b>Water quality</b>		
Electrical conductivity, pH, inorganic nutrients and organic content (e.g. Total P and Kjeldahl N) in river inflow (preferably also suspended solids and temperature).	Monthly (as in DWS monitoring programme).	Include monitoring station near head of estuary.
Salinity and temperature profiles (and any other in situ measurements possible e.g. pH, DO, and turbidity).	Quarterly, preferably for two years.	Along entire length of estuary (at least three stations covering all zones).
Inorganic nutrient concentrations (together with above).	Quarterly, preferably for two years.	Along entire length of estuary (at least three stations covering all zones).
Measure pesticides/herbicides and metal accumulation in sediments (for metals investigate establishment of distribution models – refer to Newman and Watling, 2007)	Once-off.	Entire estuary, including depositional areas (i.e. muddy areas).

Monitoring action	Temporal Scale (frequency and timing)	Spatial Scale (Number of stations)
<b>Microalgae</b>		
<p>Record relative abundance of dominant phytoplankton groups, i.e. flagellates, dinoflagellates, diatoms, chlorophytes and blue-green algae.</p> <p>Chlorophyll-a measurements taken at the surface, 0.5 m and 1 m depths, under typically high and low flow conditions using a recognised technique, e.g. spectrophotometer, HPLC or fluoroprobe.</p> <p>Intertidal and subtidal benthic chlorophyll-a measurements (four replicates each) using a recognised technique, e.g. sediment corer or fluoroprobe.</p>	<p>Quarterly preferably for two years.</p>	<p>Along length of estuary minimum five stations.</p>
<b>Macrophytes</b>		
<p>Map area covered by different macrophyte habitats using recent imagery. Conduct field survey to record total number of macrophytes habitats, identification and total number of macrophytes species, number of rare or endangered species, or those with limited populations. Assess extent of invasive species in EFZ.</p> <p>Where there are salt marsh areas greater than 1 ha measure % plant cover along elevation gradient. Sediment samples collected along the transect and analysed in the laboratory for sediment moisture, organic content, EC, pH and redox potential. In the field measure depth to water table and ground water salinity</p>	<p>Once-off, in summer.</p>	<p>Entire estuary (mapping). Where there is salt marsh (minimum three transect sites).</p>
<b>Invertebrates</b>		
<p>Collect duplicate zooplankton samples at night from mid-water levels using WP2 nets (190 µm mesh) along estuary</p> <p>Collect sled samples (day) at same zooplankton sites for hyper benthos (190 µm)</p> <p>Collect grab samples (five replicates) (day) from the bottom substrate in mid-channel areas at same sites as zooplankton (each sample to be sieved through 500 µm).</p> <p>Intertidal invertebrate hole counts using 0.25 m<sup>2</sup> grid (five replicates per site).</p> <p>Establish the species concerned (<i>C. kraussi</i> or <i>U. africana</i>) using a prawn pump.</p> <p>Collect sediment samples using the grab for</p>	<p>Quarterly, preferably for two years.</p>	<p>Minimum of three sites along length of entire estuary.</p> <p>For hole counts –three sites in each of muddy or sandy areas.</p>

Monitoring action	Temporal Scale (frequency and timing)	Spatial Scale (Number of stations)
particle size analysis and organic content (at same sites as zooplankton) (preferably link with sediment dynamics).		
<b>Fish</b>		
<p>Record species and abundance of fish, based on seine net and gill net sampling. Sampling with a small beam trawl for channel fish should also be considered.</p> <p>Seine net specifications: 30 m x 2m, 15 mm bar mesh seine with a 5 mm bar mesh with a 5 mm bar mesh 5 m either side and including the cod-end.</p> <p>Gill nets specifications: Set of gill nets each panel 30 m long by 2 m deep with mesh sizes of 44 mm, 48 mm, 51 mm, 54 mm, 75 mm, 100 mm and 145 mm.</p> <p>Gill net sampling can be replaced by a large mesh seine (44 mm stretch mesh, 100 m x 2 m).</p> <p>Trawl specification: 2 m wide by 3 m long, 10 mm bar nylon mesh in the main net body and a 5 mm bar in the cod-end.</p>	Once-off, in spring/summer and autumn/winter.	Larger system (> 5 km): 10 - 15 stations along length of estuary (~ length/10). Small systems (< 5 km): 3 - 5 stations (mouth, mid, top).
<b>Birds</b>		
Undertake count of all water birds.	Once-off.	Entire estuary.

## APPENDIX 2: ECOLOGICAL SPECIFICATIONS

**Table 15: EcoSpecs for the Klipdriftfonteinspruit Estuary (Category A) (DWS, 2018)**

ECOLOGICAL COMPONENT		ECOSPECS							MEASURES				
Hydrology		Maintain at least present-day base flows							Varies more than 10% of MAR.				
Month	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual
MMR/MAR (%Nat)	62.5	68.0	63.3	58.4	58.3	65.7	68.6	64.4	60.2	61.2	66.8	64.3	<b>64.8</b>
Hydrodynamics		Maintain connectivity with marine environment at a level that ensures water quality and habitat remains suitable for biota typically found in the estuary							Closed mouth state should not increase by >10% from established baseline				
Water quality		Salinity distribution not to cause exceedance of TPCs for fish, invertebrates, macrophytes and microalgae System variables (temperature, pH, turbidity, dissolved oxygen, suspended solids and turbidity) not to cause exceedance of TPCs for biota Dissolved inorganic Nitrogen (DIN)/dissolved inorganic phosphate (DIP) concentrations not to cause exceedance of TPCs for macrophytes and microalgae Concentrations of waterborne pathogens should be maintained in an Acceptable category for full contact recreation							10 < Salinity < 40 Entire estuary and river inflow: DO > 6 mg/l Turbidity < 5 NTU Entire estuary and river inflow: DIN < 300 µg/l Entire estuary and river inflow: DIP < 25 µg/l ≤ 185 Enterococci/100 ml (90th percentile) ≤ 500 E. coli/100 ml (90th percentile)				
Sediment dynamics		Flood regime is sufficient to maintain natural bathymetry and sediment characteristics							Channel shape/size, sediment grain size and organic matter must not change by >30% from established baseline				
Microalgae		Maintain the composition and richness of phytoplankton and benthic microalgae groups and medium-low biomass							Maintain the distribution of different phytoplankton groups and low biomass (< 20 µg.l <sup>-1</sup> )				
Macrophytes		Maintain the distribution of current macrophyte habitats Maintain extent, distribution and richness of macrophyte groups, Limit colonisation/spread of the EFZ by alien species							<20 % change in the area covered by different macrophyte habitats (accounts for natural changes due to the dynamic nature of estuaries); Submerged macrophytes such as pondweed ( <i>Potamogeton pectinatus</i> ) should be present during low flow conditions				
Invertebrates		Maintain composition, richness and abundance of different groups of benthic macrofauna and zooplankton							The estuary should have viable populations of <i>Callinassa kraussi</i> in sandy zones and <i>Upogebia africana</i> in muddy zones				

ECOLOGICAL COMPONENT	ECOSPECS	MEASURES
Fish	Maintain composition, richness and abundance of different groups of fish, prevent colonisation/increase of alien species	<p>Maintain fish assemblage that includes:</p> <ul style="list-style-type: none"> <li>at least 2 estuarine breeding species (Category I),</li> <li>3 estuary dependent marine species (Category IIa &amp; IIb);</li> <li>1 indigenous catadromous species (Category V);</li> </ul> <p>Estuarine residents should dominate numerically, but the proportion of estuary dependent marine species (based on abundance) should not fall below 2%.</p>

## APPENDIX 3: PERFORMANCE MONITORING PLAN

**Table 16: Recommended Performance Monitoring Plan for the management of the Klipdriffontein estuary**

MANAGEMENT OUTPUT	PERFORMANCE INDICATOR	TEMPORAL SCALE (frequency)	RELEVANT LEGISLATION	RESPONSIBLE AUTHORITY
<b>1. ESTUARINE HEALTH AND FUNCTION</b>				
<b>1.1. The Klipdriffontein estuarine ecosystem and its processes are conserved and maintained, living resources are sustainably managed and estuary nursery function protected, under a hotter climate future</b>				
<b>1.1.1. Secure adequate quantity and quality of freshwater input to maintain ecosystem health and functioning</b>	<ul style="list-style-type: none"> <li>• Category A ecological condition maintained</li> <li>• Recommended reserve(s) signed off and implemented</li> <li>• Sustained river flow &amp; natural mouth dynamics</li> <li>• Good water quality</li> <li>• Water quality and ecological monitoring programmes established, and data generated</li> <li>• Good annual report card</li> <li>• Monitoring of fish and birds of the estuary included in the DHNRC's ecological matrix</li> <li>• Faunal inventory (species list) compiled, and data generated</li> </ul>	<ul style="list-style-type: none"> <li>• Biannually for DWS</li> </ul>	NWA	DWS , BGCMA, CapeNature
<b>1.1.2. Ensure estuary requirements are integrated into catchment processes to ensure healthy water quality</b>	<ul style="list-style-type: none"> <li>• Updated catchment maps provided</li> <li>• Good catchment water quality</li> <li>• Participation in in BGCMA activities</li> </ul>	<ul style="list-style-type: none"> <li>• Twice a year</li> </ul>	NWA, NEM:PAA	CapeNature, BGCMA, DWS
<b>1.1.3. Control the spread and densification of invasive alien plant species</b>	<ul style="list-style-type: none"> <li>• IAPs eradication programme implemented</li> <li>• Increased area of IAPs cleared and kept clear</li> </ul>	<ul style="list-style-type: none"> <li>• Biannually</li> </ul>	CARA, NWA, NEM:PAA	CapeNature BGCMA, DWS
<b>1.1.4. Ensure sustainable resource use through an effective level of compliance management</b>	<ul style="list-style-type: none"> <li>• Monitoring programme implemented to determine estuarine use</li> <li>• Ad hoc patrols undertaken, and findings reported on</li> <li>• Reduced habitat degradation and inappropriate behaviour/activities</li> </ul>	<ul style="list-style-type: none"> <li>• Biannually</li> </ul>	NEM: PAA, ICMA, MLRA, NEM:BA	CapeNature, DEFF

<b>2. BIODIVERSITY CONSERVATION</b>				
<b>2.1. The representative biodiversity of the Klipdriffontein estuary within the De Hoop Nature Reserve Complex is conserved</b>				
<b>2.1.1. Ensure the conservation of estuarine habitats and species</b>	<ul style="list-style-type: none"> <li>Spatial zonation plan adopted and enforced</li> <li>All developments comply with environmental legislation and environmental best practice / risk aversion approach</li> <li>Reduced habitat loss/degradation and disturbance, and inappropriate behaviour</li> </ul>	<ul style="list-style-type: none"> <li>Annually</li> </ul>	NEM:PAA, ICMA, NEM:BA	CapeNature
<b>3. INSTITUTIONAL AND MANAGEMENT STRUCTURES</b>				
<b>3.1. Integrated and cooperative management (including partnerships) is achieved</b>				
<b>3.1.1. Ensure effective co-ordination of estuarine management responsibilities</b>	<ul style="list-style-type: none"> <li>EMP adopted and incorporated into DHNRC PAMP, and all relevant government planning documents</li> <li>CapeNature well-capacitated with personnel who are trained and knowledgeable</li> <li>Funding secured for 5-year cycle</li> <li>Regional estuarine management function established and EMC appointed</li> <li>Overberg Review Committee (ORC) serves as 'EAF' to facilitate stakeholder engagement</li> <li>Good communication and working relationship established/maintained with implementing agencies</li> <li>Annual reporting undertaken by CapeNature on state of the estuary and progress of EMP achievements</li> <li>Formal review of EMP every 5 years with input from ORC</li> </ul>	<ul style="list-style-type: none"> <li>Biannually</li> </ul>	ICMA, NEM: PAA	CapeNature, supported by DEA&DP
<b>3.1.2. Define co-operative governance arrangements</b>	<ul style="list-style-type: none"> <li>MOUs signed between CapeNature and spheres of government and participating agencies</li> <li>ORC is functional and effective</li> <li>Active collaboration of various institutions, private and civil stakeholders</li> <li>Individual agencies knowledgeable and with capacity and resources to carry out mandated actions</li> </ul>	<ul style="list-style-type: none"> <li>Quarterly</li> </ul>	ICMA, NEM:PAA	CapeNature supported by all authorities
<b>4. SOCIO-ECONOMIC CONSIDERATIONS</b>				
<b>4.1. Biodiversity access and benefit sharing opportunities are provided to communities</b>				
<b>4.1.1. Create access to the conservation economy through the implementation and management of appropriate initiatives and projects.</b>	<ul style="list-style-type: none"> <li>Number of EPWP job opportunities</li> <li>Number of EPWP full time equivalents</li> <li>Number of people directly benefitting from Sustainable Livelihood Programmes</li> <li>Number of person days employment created.</li> </ul>	<ul style="list-style-type: none"> <li>Annually</li> </ul>	MLRA, NEM:PAA, MLRA	CapeNature

4.1.2. The De Hoop Nature Reserve Complex provides community development opportunities through various capacity building interventions, linked to job creation opportunities				
4.1.3. Manage consumptive utilisation of biological resources				
<b>4.2. Appropriate nature-based recreation, tourism and sustainable income generation activities are provided within the framework of the Green Economy</b>				
4.2.1. Management of public-private partnerships (PPP) agreements in respect to the Klipdriffontein estuary	<ul style="list-style-type: none"> <li>• EPWP programmes adopted and implemented</li> <li>• Increased employment opportunities</li> <li>• Increased employment of local suppliers/stakeholders</li> </ul>	• Annually	ICMA, NEM:PAA	CapeNature
4.2.2. Management of tourism facilities other than those managed by public-private partnerships	<ul style="list-style-type: none"> <li>• Income targets are met</li> <li>• Positive visitor experiences</li> </ul>	• Monthly	ICMA, NEM:PAA	CapeNature
4.2.3. Ensure visitor safety	<ul style="list-style-type: none"> <li>• Health &amp; Safety regulation and audit</li> </ul>	• Biannually	NEM:PAA	CapeNature
<b>4.3. The cultural heritage and traditional significance of the Klipdriffontein estuary within the De Hoop Nature Reserve Complex is conserved</b>				
4.3.1. Preserve and manage cultural heritage resources	<ul style="list-style-type: none"> <li>• Cultural Heritage Plan in place</li> <li>• Number of persons accessing CapeNature protected areas for cultural, traditional, spiritual, youth development and sustainable harvesting activities.</li> </ul>	• Annually	ICMA, NEM:PAA	CapeNature
<b>5. EDUCATION &amp; AWARENESS</b>				
<b>5.1. Quality environmental education, awareness and outreach programmes are provided in respect to the Klipdriffontein estuary</b>				
5.1.1. Host youth and community development through environmental awareness that assists in developing the knowledge, skills, values and commitment necessary to achieve environmentally sustainable development (specific focus on DHNR and MPA).	<ul style="list-style-type: none"> <li>• Education &amp; awareness programme developed and implemented</li> <li>• Environmental awareness events hosted, with numerous schools attending the Potberg EE centre</li> <li>• Educational signage erected, educational resources and interpretive materials developed for distribution and teaching</li> <li>• Numbers of volunteers and activities conducted</li> </ul>	• Biannually	ICMA, NEM:PAA	CapeNature

<p><b>5.1.2. Environmental education is provided to promote an understanding of biodiversity and the use of the natural environment as a vehicle for learning and personal development</b></p>				
<p><b>5.1.3. Effective use of volunteers</b></p>				

## APPENDIX 4: PROJECT PLAN TEMPLATE

<b>ACTION</b>	Describe the action to be undertaken																																																											
<b>COMPLETION DATE</b>	Provide date of expected completion																																																											
<b>PERFORMANCE INDICATOR</b>																																																												
Requirements stipulated in policy and legislation																																																												
Available methods, protocols and best practice-guides																																																												
Spatial zonation consideration (e.g. limits/targets)																																																												
Detailed work plan	Task 1: Task 2: Task 3: Task 4:																																																											
Scheduling	<table border="1"> <thead> <tr> <th rowspan="2">TASK</th> <th colspan="9">TIME (months)</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> <th>9</th> </tr> </thead> <tbody> <tr> <td>1</td> <td style="background-color: #4F81BD;"></td> <td style="background-color: #4F81BD;"></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td style="background-color: #4F81BD;"></td> <td style="background-color: #4F81BD;"></td> <td style="background-color: #4F81BD;"></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="background-color: #4F81BD;"></td> <td style="background-color: #4F81BD;"></td> <td style="background-color: #4F81BD;"></td> <td></td> </tr> <tr> <td>4</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="background-color: #4F81BD;"></td> <td style="background-color: #4F81BD;"></td> </tr> </tbody> </table>	TASK	TIME (months)									1	2	3	4	5	6	7	8	9	1										2										3										4									
TASK	TIME (months)																																																											
	1	2	3	4	5	6	7	8	9																																																			
1																																																												
2																																																												
3																																																												
4																																																												
Milestone/interim performance indicator	<table border="1"> <thead> <tr> <th>MILESTONE</th> <th>INTERIM PERFORMANCE INDICATOR</th> <th>DUE DATE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> </tr> <tr> <td>3</td> <td></td> <td></td> </tr> </tbody> </table>	MILESTONE	INTERIM PERFORMANCE INDICATOR	DUE DATE	1			2			3																																																	
MILESTONE	INTERIM PERFORMANCE INDICATOR	DUE DATE																																																										
1																																																												
2																																																												
3																																																												
Responsibilities for different tasks	E.g. Identify specific departments, personnel and/or service providers responsible for execution of this action																																																											
Monitoring and reporting plan	E.g. <ul style="list-style-type: none"> <li>Define data and information to measure in order to monitor performance indicator/s</li> <li>Specify frequency at which data/information should be collected/monitored</li> <li>Where and when to report on progress</li> </ul>																																																											
Human resource plan	<table border="1"> <thead> <tr> <th rowspan="2">HUMAN RESOURCE</th> <th colspan="4">WEEKS PER TASK</th> </tr> <tr> <th>1</th> <th>2</th> <th>4</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>Staff member 1</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Staff Member 2</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Service provider</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	HUMAN RESOURCE	WEEKS PER TASK				1	2	4	4	Staff member 1					Staff Member 2					Service provider																																							
HUMAN RESOURCE	WEEKS PER TASK																																																											
	1	2	4	4																																																								
Staff member 1																																																												
Staff Member 2																																																												
Service provider																																																												
Financial resource plan	<table border="1"> <thead> <tr> <th>TASK</th> <th>COST (ZAR)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> </tr> <tr> <td>2</td> <td></td> </tr> <tr> <td>3</td> <td></td> </tr> <tr> <td>4</td> <td></td> </tr> <tr> <td>TOTAL</td> <td></td> </tr> </tbody> </table>	TASK	COST (ZAR)	1		2		3		4		TOTAL																																																
TASK	COST (ZAR)																																																											
1																																																												
2																																																												
3																																																												
4																																																												
TOTAL																																																												

Source: DEA (2015)