Western Cape Government

Department of Environmental Affairs and Development Planning

Draft Revised Breede River Estuarine Management Plan

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DOCUMENT USE

The National Estuarine Management Protocol (NEMP), promulgated in May 2013 and amended in June 2021 under the National Environmental Management: Integrated Coastal Management Act (Act No. 24 of 2008), sets out the minimum requirements for the development of individual estuarine management plans.

This document forms part of the five-year review process and completes the required re-evaluation of the management interventions and inclusion of relevant new information. This EMP must be considered a living document that should be regularly updated and amended as deemed necessary.

The Department of Environmental Affairs and Development Planning's (DEA&DP) Sub-Directorate: Coastal Management, with partners, have implemented a number of activities that were included in the 2018 Breede Estuarine Management Plan (EMP). These are highlighted below:

- Review and finalise roles and responsibilities of Breede River Estuary Advisory Forum (BREAF) in light of the NEMP;
- Institutional arrangements for the BREAF;
- Active collaboration of BREAF with other institutions through shared responsibilities and active representation on Municipal Coastal Committees;
- Active participation and collaboration from relevant government departments and organs of state on BREAF;
- Cost Benefit Analysis (CBA) for the management of Breede estuary;
- BREAF to provide input and comment into the Breede-Gourits Water Classification and Resource Quality Objective project through the DEA&DP and CapeNature;
- Active representation of BGCMA on BREAF;
- Determine the 1:50 and 1:100-year flood lines for the Breede estuary;
- Facilitation of the implementation of Environmental Resources, Protection Plan for the Breede River, Catchment in the Western Cape;
- Identify conservation important areas in line with Protected Area Expansion Strategy (PAES);
- Determine carrying capacities for each water-based activity using the 'Recreational Water Use Manual' (DWA, RW GP2.2) in consultation with relevant organs of state;
- Ensure that the Estuarine Functional Zone (EFZ), Coastal Management Line (CML), risk zones, floodlines and the critical biodiversity areas (identified in the Biodiversity Spatial Plan (BSP) and PAES) (sensitive areas) are included in the Spatial Development Framework and Integrated Development Plans (IDPs) of Municipalities; and
- Terrestrial and aquatic critical biodiversity area map completed for the estuary.

The Breede EMP review process included the below:

Number	Milestones	Timeframe
1.	Internal DEA&DP review and initial engagement with stakeholders.	April 2023
2.	Review of implementation and achievements with regards to the Breede EMP (2018).	July 2023
3.	Integration of outputs from various informants including the Breede EMP Implementation project report (Errol Cerff, 2022), National Biodiversity Assessment (2018) and relevant publications/research relevant to the Breede EMP.	September and October 2023
4.	Focused workshop with stakeholders from the BREAF with the aim to review/revise relevant objectives, actions and integration of Working group outputs.	October 2023
5.	Draft reviewed EMP circulated to BREAF members and stakeholders for comments, edits, suggestions	November 2023
6.	Draft reviewed EMP gazetted for formal public comment for 30 days.	February 2024
7.	Open Day/s to engage local community	19 & 20 December 2023
8.	Approved EMP	March 2024

EXECUTIVE SUMMARY

Introduction

Estuaries are recognised as particularly sensitive and dynamic ecosystems, and therefore require above-average care in the planning and control of activities related to their use and management. For this reason, the National Environmental Management: Integrated Coastal Management Act (No. 24 of 2008), via the prescripts of the National Estuarine Management Protocol (NEMP), require Estuary Management Plans to be prepared for estuaries in order to create efficient and coordinated estuarine management.

The Breede River estuary was one of the first estuaries in the country for which an Estuarine Management Plan was compiled as part of a pilot study under the auspices of the C.A.P.E. Estuaries Management Programme with funding from the World Bank. The process of compiling an Estuarine Management Plan for the Breede River estuary commenced in 2008 when a Situation Assessment Report was commissioned as a platform for the development of the EMP (DFFE, 2015). The Draft Situation Assessment and Estuarine Management Plan were updated in 2011, and again in 2016/17.

This current revision of the Draft Breede River Estuarine Management Plan (EMP) follows on from the previous update/review. The previous review included updating the Situation Assessment and the Management Plan itself, is in response to a review conducted by the National Department of Forestry, Fisheries and Environment: Oceans and Coasts in 2014, to ensure compliance with the minimum requirements for estuary management plans as per the NEMP.

Situation Assessment

The Breede River is 322 km long from its source near Ceres to where it enters the Indian Ocean in Sebastian Bay, draining a catchment of approximately 12 600 km^2. The Breede River estuary comprises approximately the lower 52 km of the river, i.e. from the mouth at Witsand to the extent of the tidal influence 10 km upstream of Malgas and possesses a total surface area of 1367.8 ha. Although the estuary falls within the winter/bimodal rainfall transition zone, most of the catchment falls within the winter rainfall area. Flows are strongly seasonal with peak flows and floods during the winter months, but the estuary nevertheless enters the sea through a permanently open mouth.

The Breede River estuary is located on the border between the Swellendam Local Municipality (LM), the second largest local municipality in the Overberg District Municipality (DM), and Hessequa Local Municipality in the Garden Route District. In terms of population distribution, the numbers within the municipal ward areas around the Breede River estuary are mostly low (< 500 individuals), with isolated areas of larger settlement on the northern bank near Witsand and Port Beaufort at the coast (up to 500 individuals) and on the southern bank in the mid-estuary (up to 1000 individuals). Overall, service provision is of a relatively high standard. Close to 10 % of the households

in the Malgas region are without access to hygienic toilets, while between 12.3 % and 14.3 % of the households in the Swellendam sub-region and Infanta, respectively, do not have access to piped water. Considerably more households are without electricity. The majority of households (76 %) around the estuary obtain an annual income ranging between R 19 601 and R 307 600. Approximately 4 % of the remaining households receive no annual income.

Most of the land abutting the Breede River is privately owned and devoted to agriculture. Approximately 36 % of the Breede catchment within the Swellendam Municipal area is natural vegetation, and 63 % cultivated croplands, urban development, mining and forestry, contribute less than 0.3 % to the catchment area. No comprehensive heritage inventories have yet been compiled for the study area and its direct environs. However, existing built environment surveys of some rural farmsteads exist as well as two known Provincial Heritage Sites (former "National Monuments").

Due to the Breede River estuary's geographic location and size, it possesses a relatively high level of biodiversity within a region of relatively high endemism. The micro-algal community, which comprises of phytoplankton and microphytobenthos, of the estuary is present in a lower biomass than other studied estuaries. This is primarily due to the lower nutrient availability and retention time of the Breede system. A total of 59 species of fish have been recorded in the Breede River estuary with the community dominated by marine estuarine-dependent and estuarine species. Furthermore, 65% of the species recorded by Harrison (2002) were South African endemics with these species accounting for 94 % of the total number of individuals recorded. From the total of 59 species recorded, 23 (30 %) are dependent on estuaries to complete their lifecycle. Consequently, the estuary provides an important nursery and refuge area for the coastal fishes.

The present ecological condition of the Breede River estuary is classified as "good" and is associated with a Present Status Category of "B/C", i.e. largely natural, with some modifications (NBA 2018) and classified as "B" in the Reserve Determination of the Water Resources in the Breede-Gouritz Catchment (DWS, 2022). The Intermediate Determination of the Resource Directed Measures for the Breede River estuary found that the largest factor that contributed to the change in the state of the Breede River estuary from the Reference Condition to its Present State was the large reduction in river inflow. Given that large volumes of water could not be re-allocated to the estuary; estuarine specialists have decided to keep the Recommended Ecological Category of the Breede River estuary as Category B. Other potential threats to the integrity of the Breede River estuary are utilisation of marine living resources (e.g. through recreational fishing and bait collection), recreational activities (e.g. boating, skiing. etc.), water pollution, developments, agricultural activities, and invasive alien plants.

Overall, the Breede River estuary ranks among the top 20 estuaries in the Cape in terms of its subsistence value which was estimated at R120 000 per annum (Turpie & Clark 2007). The Breede River estuary also holds substantial tourism value for the local communities positioned along its banks by means of visitors to the estuary and is estimated to be R 25 million per annum. In addition, the overall property value

contributed by the Breede River estuary is estimated at R 884.1 million, the second most valuable estuary in the Cape, which translates to approximately R 26.7 million per annum in terms of the direct value to the real estate sector of the national economy.

Vision and Objectives

A Vision for the future desired state of the Breede River estuary, and the management objectives designed to attain this Vision, were developed during engagements with the relevant role players and stakeholders from both the government and private sectors. These included:

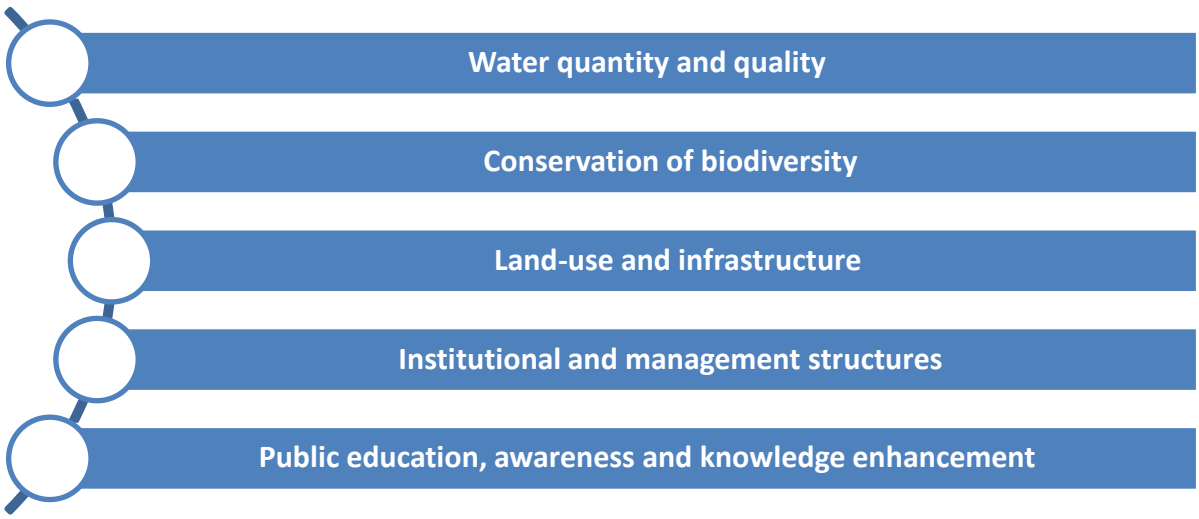
- Various Directorates at the Department of Environmental Affairs and Development Planning (DEA&DP),
- National Department of Forestry, Fisheries and Environment (DFFE): Oceans and Coasts,
- Department of Water and Sanitation (DWS), Breede - Olifants Catchment Management Agency (BOCMA),
- the Department of Agriculture, Forestry and Fisheries (DFFE),
- Garden Route and Overberg district municipalities,
- Swellendam and Hessequa local municipalities,
- CapeNature,
- South African National Parks (SANParks),
- the Lower Breede River Conservancy Trust (LBRCT),
- the Witsand and Malagas Resident Associations,
- Infanta Ratepayers Association,
- Witsand Tourism,
- South African Police Services,
- the National Sea Rescue Institute; and
- the Breede Angling Club.

The Vision for the Breede River estuary was developed and agreed upon at a meeting of relevant stakeholders held at Witsand in 2008:

The Breede River estuary is the pristine pride of South African Estuaries. It is beautiful, rich in plants and animals, attracts visitors, sustains our livelihoods and uplifts our spirits. Its bountiful rewards are the fruits of our love and dedication to its wellbeing now and for future generations.

This Vision essentially captures the need to conserve the **functioning** and **biodiversity** of the Breede River estuary, which ultimately supply the ecosystem goods and services referred to in the Vision.

The corresponding key objectives have been identified as the corner stones to the achievement of the Vision are:



Spatial Zonation

The management objectives have been translated into an estuary zonation plan. The estuary zonation plan (and applicable management objectives) is consequently the blueprint against which all development, and any other activities which impact on the estuary, should be tested for compliance. The 2018 EMP resulted in the development of a proposed zonation map, which divided the Breede River Estuary into distinct use-zones. Extensive stakeholder engagement was initiated through the Breede EMP Implementation project (Errol Cerff, 2022) to engage on an updated zonation plan for the estuary. An updated proposed zonation plan was developed by the BREAF Zonation Working Group.

The current zonation is a further simplification of the zonation proposed in the first draft of the EMP, which was mainly derived from a habitat perspective. Consequently, only three broad zones are identified:

- Conservation/protection zones

Conservation zones aim to give protection to ecologically sensitive habitats found throughout the length of the estuary. Ideally these should be afforded formal protected status, but for the purposes of the current estuary management plan it is envisaged that restriction will be placed on potentially detrimental activities such as, anchoring, beaching of boats, access by boat, grazing and trampling.

- Development buffer zones

Development buffer zones are prescribed by regulatory schemes that define development setbacks (e.g. from watercourses and wetlands, or as coastal management lines in terms of the ICM Act) or forms of 'overlay zonation' that impose development controls via the Land Use Planning Schemes.

- Recreation-based zones.

Various zones specific to different recreational activities are to be defined, based on relevant considerations of environmental and social compatibility, carrying capacities and the potential for conflict between users of the estuary.

Institutional Arrangements

To oversee the overall implementation of the original EMP, in terms of facilitating co-management and efficient governance, a then Estuary Management Forum was established in February 2009. This body, now known as the Breede River Estuary Advisory Forum (BREAF), is representative of local stakeholder sectors and/or persons having appropriate experience, expertise and skills in order to enable the BREAF to carry out its functions. These include national, provincial and local government as well as civil society.

To assist with implementation of aspects of enforcement and compliance management in respect of the municipal bylaws, the Swellendam and Hessequa local municipalities appointed the Lower Breede River Conservation Trust (LBRCT) as their implementing agent (since 1986). The Breede River estuary was therefore managed collaboratively between CapeNature, Swellendam and Hessequa local municipalities, the former Department of Environmental Affairs Tourism: Marine and Coastal Management (MCM) now Department of Forestry, Fisheries and Environment: Oceans and Coasts, and Department of Water and Sanitation (DWS), and the LBRCT. CapeNature does regular monitoring on the Breede regarding jetties and slipways, bird counts etc. Swellendam Local Municipality and Hessequa Local Municipality collectively are involved through the BREAF and LBRCT. The LBRCT has dedicated staff appointed to do law enforcement under the Marine Living Resources Act and by-laws passed by the Local Municipalities.

The National Estuarine Management Protocol identifies the Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) as the Responsible Management Authority responsible for the development of the Breede River EMP as well as being responsible for the co-ordination of its implementation.

Management Priorities

Five project plans have been compiled for the efficient and effective management of the Breede River estuary. Each plan corresponds to a key objective and contains applicable management actions, supporting regulations, level of priority, responsible institution(s), and required resources if such information is available. These are arranged in general order of priority, but nevertheless recognize that the neglect of any leg will compromise overall success:

- Co-management and effective governance;
- Sustaining water quality & quantity;
- Conservation of biodiversity;
- Sustainable development; and
- Public education, awareness and knowledge enhancement.

It should be noted that there is some interconnectedness between the plans and some management actions, as they all ultimately contribute to the conservation of

ecosystem function and patterns of biodiversity, which in turn leads to the conservation of a sustained supply of ecosystem goods and services delivered by the estuary.

Table 1 Summary of the management outputs and performance indicators per management objectives

MANAGEMENT OUTPUTS	PERFORMANCE INDICATOR
1. Institutional and Management Structures	
1.1 Maintain a fully functional estuary advisory forum (the BREAF) that will facilitate co-management and effective governance	Participation of BREAF by relevant national, provincial and municipal representatives; Minutes (highlighting completed actions), reporting, correspondence and information associated with the BREAF meeting; Implementing agent contracted through multi-lateral agreement; Managed conflict with users; Representation on municipal coastal; committees and any other relevant committees; Breede estuary issues raised on agendas; Minutes of meetings
1.2 Unlock the strategic value of the Breede river estuary's ecological infrastructure	Appropriate funding strategy completed; Partnerships and research opportunities investigated.
2. Water Quantity & Quality	
2.1 Ensure that the Reserves for Water Quantity and Water Quality are maintained through on-going interaction between the BREAF and BOCMA	Annual implementation update provided by BOCMA; Recorded attendance at BREAF meetings; Catchment related matters included in agenda of BREAF; Signed membership of BOCMA on BREAF; Minutes of BREAF meetings
2.2 Ensure Disaster Management planning and risk identification	Estuary-specific disaster management; Early warning and reaction protocols developed; Database of disasters and emergency events created and maintained; Flood line incorporated into risk register and spatial tools.
2.3 Reduce bank de-stabilization, erosion, and habitat degradation	Site-specific rehabilitation methods confirmed; Implementation of rehabilitation; Patrols conducted to monitor activities related to erosion control and repair; Comments to be provided for new EIA related authorisation processes

2.4 Minimise water pollution	Pollution sources identified (including solid waste management); Mitigation measures devised; Database of offenders developed; Water quality monitoring programme formalised and maintained; Database & analysis of baseline data and results; Reporting o relevant actions of the Environmental Resources Protection Plan for the Breede River Catchment in the Western Cape
2.5 Control the spread and densification of both aquatic & terrestrial invasive alien plant species	Prioritisation of areas for alien invasive removal; Volume/weight/ha of areas cleared.
3. Conservation of Biodiversity	
3.1 Ensure the conservation of an optimal representation of vital estuarine habitats and associated species	Identify high priority areas for active conservation; Identify conservation measures for each zone; Identify appropriate special conservation measures for individual species where deemed necessary, e.g. Dusky kob lure restrictions & Zambezi shark; Breede Estuary (or parts thereof) formally protected. By-laws enacting conservation zones & associated measures compiled
3.2 Ensure sustainable resource use through effective compliance	Habitat surface area & health maintained; Healthy populations of all species; Low levels of non-compliance; Record (database) of non-compliance
3.3 Regulate recreational use in and around the estuary, including water-based and aviation activities, to reduce habitat degradation, ensure user safety and disturbance to fauna and flora	Compliance management and monitoring system effective, well maintained & ongoing; Number of infringements reduced; Beacons/ aids to navigation erected; Monitoring & compliance enforcement regularly undertaken; By-laws developed & enforced; Database developed to manage & analyse historical data, fee collection, scheduling, no. of participants, boats, zoning; Special flight rules area of500 ft amsl enacted for Breede CPZ;

	All recreational activities included and proposed mitigation measures to be identified.
4. Land-use and Infrastructure	
4.1 Implement an estuary zonation plan that directs infrastructural development and other land use practices (e.g. agriculture) within the various development setback lines/buffer zones	EFZ is demarcated in the SDF. Coastal management line and legal mechanism gazetted in relevant legislation Coastal management lines integrated into IDPs & SDFs Biodiversity mapping updated in EMP as well as IDPs and SDFs. Will be amended when new information becomes available.
4.2 Facilitate equitable access for both pedestrian and vehicular access	Database of jetties and slipways developed & maintained; Infrastructure audit to be undertaken; Breede River Estuary structure policy developed; Report on outcomes of survey patrols or incidents reporting; Efficient management and collection fees for leases agreements; Public access facilitated
4.3 Ensure participation of BREAF in all applications/authorisations that may impact on the estuarine functional zone	All new developments & comments through EIA process; Developments tabled and tracked at BREAF meetings; Data with current information (CML) i.t.o. applications, designs & approvals
4.4. Ensure the incorporation of the estuarine management plan into the Integrated Development Plans and Spatial Development Frameworks	Estuary Zonation Plan & recommendations incorporated in all four relevant IDPs and SDFs;
5. Public Education, awareness and Knowledge Enhancement	
5.1 Promote high levels of public awareness and appreciation of the ecosystem services provided by the Breede River estuary, threats posed to its integrity, and compliance management	Strategically placed signage; Dissemination of information via website, BREAF quarterly newsletter, pamphlets etc., relating to both compliance awareness & environmental education; Number of public events held; Number of participants Annually updated database maintained by BREAF
5.2 Enhance our scientific knowledge, through research and monitoring	Specific bio-indicators identified to monitor the state of the estuary;

	Monitoring database produced & maintained; Monitoring reports; Active research network Research projects and publications; Active research network

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ABBREVIATIONS & ACRONYMS

amsl	Above mean sea level
BOCMA	Breede-Olifants Catchment Management Agency
BREAF	Breede River Estuary Advisory Forum
BRSA	Breede River Stakeholder Association
C.A.P.E.	Cape Action for People and the Environment
CAA	Civil Aviation Act (Act No. 13 of 2009)
CARA	Conservation of Agricultural Resources Act (Act No. 43 of 1983)
CFR	Cape Floristic Region
CMP	Coastal Management Programme
CPZ	Coastal Protection Zone
CSIR	Council for Scientific and Industrial Research
DFFE	National Department of Forestry, Fisheries and Environment
DEA&DP	Western Cape Government's Department of Environmental Affairs & Development Planning
DM	District Municipality
DWS	National Department of Water and Sanitation
EAF	Estuary Advisory Forum
EFZ	Estuarine Functional Zone
EIA	Environmental Impact Assessment
EMP	Estuarine Management Plan(s)
ERC	Ecological Reserve Category
EZP	Estuary Zonation Plan
ha	Hectares
HWM	High-water mark
I&AP	Interested and Affected Party
ICM Act	National Environmental Management: Integrated Coastal Management Act (Act No. 24 of 2008) as amended)
IDP	Integrated Development Plan
IUCN	International Union for Conservation of Nature
LBRCT	Lower Breede River Conservancy Trust
LM	Local Municipality
LUPA	Provincial Western Cape Land Use Planning Act (Act 3 of 2014)
MEC	Member of the Executive Council
MLRA	Marine Living Resources Act (Act No. 18 of 1998) as amended
MSA	Municipal Systems Act (Act No. 32 of 2000)
NEM:BA	National Environmental Management: Biodiversity Act (Act No. 10 of 2004)
NEM:WA	National Environmental Management: Waste Act (Act No. 59 of 2008)
NEMA	National Environmental Management Act (Act No. 107 of 1998)
NWA	National Water Act (Act No. 36 of 1998) as amended
PAES	Protected Area Expansion Strategy
RDM	Resource Directed Measures
REC	Recommended Ecological Category
REI	River-Estuary Interface
RMA	Responsible Management Authority
RQO	Resource Quality Objective
SANParks	South African National Parks
SDF	Spatial Development Framework
SPLUMA	National Spatial Planning and Land Use Management Act (Act 16 of 2013)
the Protocol	National Estuarine Management Protocol (2021)

TPC	Threshold of Potential Concern

SUMMARY OF LEGAL FRAMEWORK

Chapter 4 of the National Environmental Management: Integrated Coastal Management Act (No. 24 of 2008, as amended by Act 36 of 2014) (ICM Act), aims to facilitate the efficient and coordinated management of all estuaries, in accordance with:

a) The Protocol (Section 33) approved by the Ministers responsible for the environment and water affairs; and
b) Estuarine Management Plans (EMPs) for individual estuaries (Section 34).

The Protocol, promulgated in 2013 and updated in 2021, provides a national policy for estuarine management and guides the development of individual EMPs. It must be ensured that the EMPs are aligned with the Protocol and the National Coastal Management Programme (CMP) (DFFE, 2014). The Protocol lays out the following:

a) The strategic vision and objectives for achieving effective integrated management of estuaries in South Africa;
b) The standards for the management of estuaries;
c) The procedures regarding how estuaries must be managed and how the management responsibilities are to be exercised by different organs of state and other parties;
d) The minimum requirements for EMPs;
e) Who must prepare EMPs and the process to be followed in doing so[1]; and
f) The process for reviewing EMPs to ensure that they comply with the requirements of the ICM Act.

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

a) follow a public participation process in accordance with Part 5 of Chapter 6 of the ICM Act;
b) ensure that the EMP and the process by which it is developed are consistent with:
   (i) the Protocol; 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 ICM Act;
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.

One of the pillars of successful integrated coastal (including estuarine) management is the establishment of effective institutional arrangements to underpin both cooperative government and cooperative governance. Cooperative governance is a system that

[1] The National Estuarine Management Protocol identifies the Western Cape Department of Environmental Affairs and Development Planning as the Responsible Management Authority for developing and co-ordinating implementation of the Breede Estuarine Management Plan

allows government and civil society to communicate and contribute to shared responsibility in respect of coastal management objectives and must be well-organized and widely representative of all coastal stakeholders. The ICM Act details the institutional arrangements that will contribute to cooperative coastal management in South Africa. These arrangements are made at national, provincial and municipal government levels, and the embodiment of cooperative coastal governance is vested in what will be known as coastal committees. The ICM Act provides for the permissive, i.e. if so required, establishment of municipal coastal committees, but at a national and provincial level however, the Minister and MECs of coastal provinces are directed to establish national and provincial coastal committees, respectively. Provincial coastal committees must be established within one year of the commencement of the ICM Act.

The National Coastal Committee (the MINTEC Working Group 7) is established by the Minister, and its powers determined by notice in the Government Gazette. It is supported administratively by the National Department of Forestry, Fisheries and Environment. The Premier of each coastal province must identify a lead agency (organ of state) that is responsible for the coordination, monitoring and implementation of the provincial coastal management programme, monitoring the state of the environment in the coastal zone, and identifying relevant trends and priority issues. The lead agency for coastal management is directly responsible to the MEC. Each metropolitan, district or local municipality which has jurisdiction over the coastal zone may establish a municipal coastal committee. The establishment of Municipal Coastal Committees is discretionary.

The lowest tier of institutional arrangements for estuarine management comprises the Responsible Management Authority (RMA) and the Estuary Advisory Forums (EAFs). The role of RMA is for developing and co-ordinating implementation of EMPs.

The purpose of the EAF is to advise the relevant management authority and foster co-operation, participation and co-ordination and maintain transparency and inclusiveness with regards to developing and tracking implementation of the Breede River Estuary Management Plan, guided by the vision and management objectives contained in the plan.

1 INTRODUCTION

The process of compiling an Estuarine Management Plan (EMP) for the Breede River estuary commenced in 2008 when a Situation Assessment Report was commissioned as a platform for the development of the EMP (DFFE, 2015). The Draft Situation Assessment and EMP were updated in 2011 and through the Estuary Management Framework and Implementation Strategy project in 2016, with an approved EMP in place in 2018. In 2022, the DEA&DP also commenced a project that looked at the refinement of the institutional framework and made recommendations for the implementation of parts of the EMP (2018). The project looked at the refinement of the spatial information/maps, other key features in the estuary and extensive stakeholder engagement.

A Vision for the future desired state of the Breede River estuary, and the management objectives designed to attain this Vision, were developed during engagements with the relevant role players and stakeholders from both the government and private sectors.

To oversee the overall implementation of the original EMP, in terms of facilitating co-management and efficient governance, an Estuary Advisory Forum was established in February 2009 and re-established in 2022. This body, now known as the Breede River Estuary Advisory Forum (BREAF), is representative of local stakeholder sectors and/or persons having appropriate experience, expertise and skills in order to enable the BREAF to carry out its functions. These include national, provincial and local government as well as civil society and research institutions.

The National Estuarine Management Protocol (NEMP) identifies the Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) as the Responsible Management Authority (RMA) responsible for the development of the Breede River EMP as well as being responsible for the co-ordination of its implementation.

This EMP is a strategic planning document, and as such does not provide detailed, routine planning for the management of the estuary. This detail should be captured by the RMA or its assigned representative, as well as partners, in its annual budget, Plan of Operations, Integrated Development Plan (IDP), Annual Performance Plan (APP) etc. (as applicable) with the management plan forming the platform for more fine-scale planning. The EMP should also be recognized as a dynamic document, whereby certain components could be revised as important new information becomes available and management priorities change. Adaptive management should be continually pursued through a process of annually reviewing the progress made in achieving the management objectives. Finally, the management plan should be subject to a comprehensive revision on a five-year cycle, as required by the NEMP.

The following table highlights some of the achievements and ongoing achievements over the past five years in the implementation of the BREMP (2018).

- Review and finalise roles and responsibilities of BREAF in light of the NEMP;

- Institutional arrangements for the BREAF;
- Active collaboration of BREAF with other institutions through shared responsibilities and active representation on Municipal Coastal Committees;
- Active participation and collaboration from relevant government departments and organs of state on BREAF Cost Benefit Analysis (CBA) for the management of Breede estuary;
- BREAF to provide input and comment into the Breede-Gourits Water Classification and Resource Quality Objective project through the DEA&DP and CapeNature;
- Cost Benefit Analysis (CBA) for the management of Breede estuary;
- Active representation of BOCMA on BREAF;
- Ensure Disaster Management planning and risk identification;
- Determine the 1:50 and 1:100 year flood lines for the Breede estuary;
- Facilitation of the Implementation of Environmental Resources, Protection Plan for the Breede River, Catchment in the Western Cape;
- Identify conservation important areas in line with Protected Area Expansion Strategy (PAES);
- Determine carrying capacities for each water based activity using the 'Recreational Water Use Manual' (DWA, RW GP2.2) in consultation with relevant organs of state;
- Ensure that the EFZ, CML, risk zones, floodlines and the critical biodiversity areas (identified in the BSP and PAES)(sensitive areas) are included in the Spatial Development Framework and IDPs of Municipalities; and
- Terrestrial and aquatic critical biodiversity area map completed for the estuary.

2 FRAMEWORK FOR DEVELOPMENT OF THE MANAGEMENT PLAN

The Breede River EMP was initially developed using the generic framework for Estuarine Management Plans (Van Niekerk & Taljaard, 2007). The current update is part of the 5-year review. Figure 1 The framework for the development of the estuarine management plans (DFFE, 2015) below is a graphical representation of this framework. Essentially it highlights that successful management of the estuary requires, in the first instance, the setting of a "Vision" of the future desired state of the estuary, followed by the development of overarching objectives, and subsequently management objectives to achieve this state. At the finer scale, an estuary zonation plan and management action plans are then developed as a blueprint for the implementation of the greater objectives, and therefore the EMP as a whole. The implementation of the EMP, should be continually monitored in terms of successes, shortcomings, and the availability of new data (gleaned from both monitoring and research studies), and re-calibrated accordingly. In such a way, management becomes adaptive, and the attainment of the Vision more realistic.

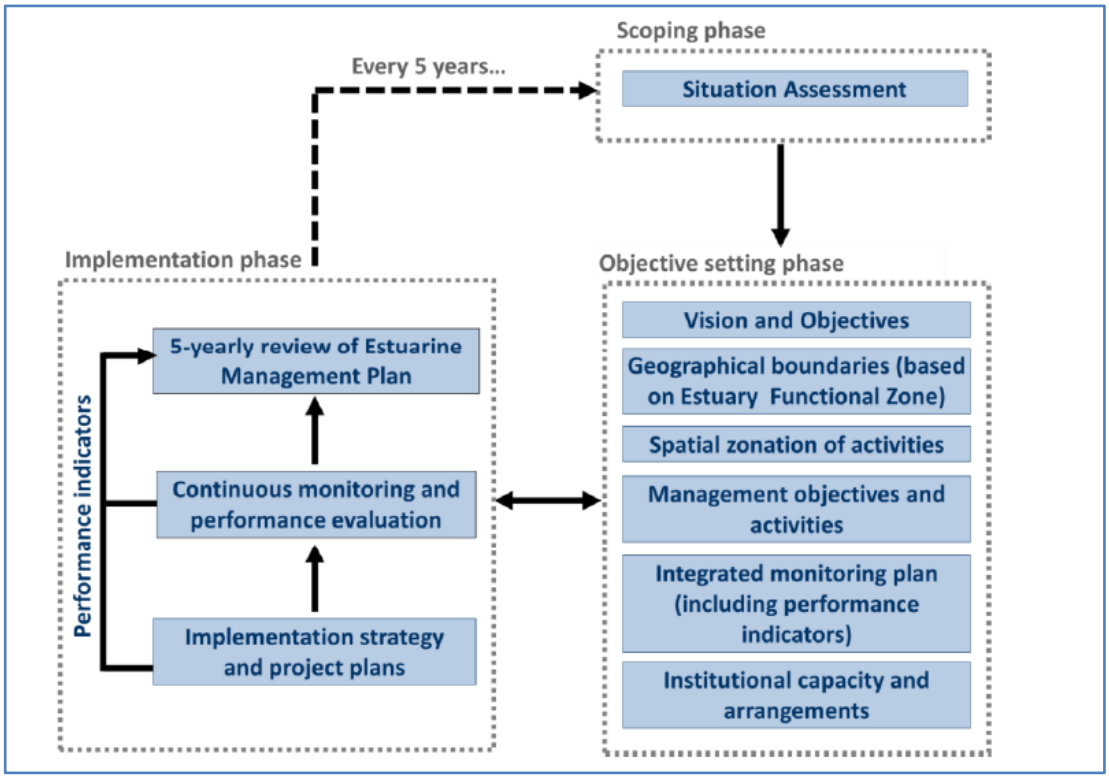


Figure 1 The framework for the development of the estuarine management plans (DFFE, 2015)

3 SUMMARY OF SITUATION ASSESSMENT

3.1 Introduction

The Breede River estuary situated at 34° 24' 26.7634 S and 20° 24'26.762 E was selected, as one of six estuaries in the Western and Eastern Cape, for the development of an estuary management plan, as part of a pilot study under the auspices of the C.A.P.E Estuaries Management Programme with funding from the World Bank. This was in line with Section 34 of the Integrated Coastal Management Act (Act 24 of 2008, as amended), which states that Estuarine Managements Plans (EMPs)must be developed for all estuaries in South Africa. The Breede River EMP underwent its first revision in 2010.

With the promulgation of the National Estuarine Management Protocol, all previously developed plans must be aligned with the minimum requirements prescribed therein and included a five-year review. This review of the Breede River EMP is in response to this directive.

3.2 Catchment Characteristics

The permanently open Breede River estuary is located on the border between the Overberg and Garden Route District municipalities. Most of the Breede River falls entirely within the Swellendam Local Municipality (LM), the second largest local municipality in the Overberg District Municipality (DM) and the remainder of the estuary falls within the Hessequa Local Municipality in the Garden Route District Municipal area.

The Breede River is 322 km long from its source near Ceres to where it enters the Indian Ocean in Sebastian Bay, draining a catchment of approximately 12 600 km^2. Pertaining to its size, the Breede River estuary is approximately 52 km long, i.e. from the mouth at Witsand to the extent of the tidal influence 10 km upstream of Malgas, and possesses a total surface area of 1367.8 ha. Although the estuary falls within the winter/bimodal rainfall transition zone, most of the catchment falls within the winter rainfall area. Flows are strongly seasonal with peak flows and floods during the winter months. The estuary enters the sea through a permanently open mouth located at the southern end of an extensive sand spit and it is considered highly unlikely that the mouth will close under present day conditions. The channel of the estuary is incised in the coastal plain and depths of 3 to 6 m and deeper points are common over the first 28 km.

Three large and numerous smaller dams within the catchment impedes the mean annual runoff (MAR) reaching the estuary to the present day 1 034 x 106 m3, which is approximately 42 % of the MAR under natural conditions. The estuary is highly responsive to freshwater inflows and high flows of 20-95 m^3.s-1 are able to completely flush and reset the system during a tidal cycle. In turn, the estuary ranges from well mixed during spring highs to stratified during spring lows and neaps and the REI zone may shift 8-10 km between tides. In September 2023, the estuary experienced a large flood event and resulted in infrastructure damage.

The Breede River catchment spans three main ecoregions, characterised by different topography, rainfall patterns, vegetation types, and geology. Historically, land use patterns within the Breede River Basin were significantly influenced by the availability of water for irrigation. Historically mixed farming types have been practiced. Overall, 35.6 % of the lower Breede catchment within the Swellendam Municipal area is natural vegetation, 62.6% cultivated croplands, 0.08% urban development, 0.02% mining, 0.18% plantations or afforestation

3.3 Abiotic Characteristics of the Estuary

The Breede River estuary is situated in the warm and cool temperate transition zone, and functions as a predominantly open estuary (Whitfield, 2000, NBA 2018). The estuarine environment covers a surface area of 1367.8 ha, extending almost 50 km upstream to 10 km past Malgas where tidal influence ceases. Harrison et al. (2000) classified the Breede as a large, normally open, barred estuarine system with two major geomorphological features of the mouth being the sand barrier and the flood tidal delta. Five possible abiotic states have been defined for the Breede River estuary. From the comprehensive sediment survey previously undertaken the system was divided into three zones, namely the estuarine sand zone, the estuarine mud zone and the fluvial sand zone.

The state of the physio-chemical environment is temporally variable and is linked to freshwater flows and tidal exchange. The Breede displays five different abiotic states based on these factors, ranging from strongly freshwater-dominated usually in winter (flows > 20 m^3.s-1) to strongly marine-dominated only in summer (<0.5 m^3.s-1); the latter reflecting severe freshwater shortage under extreme drought conditions. Salinity is typically low during winter flows, with marine conditions occurring 3 km upstream during summer. Turbidity of the estuary is generally higher during winter with peak flows with relatively clear conditions prevailing during the summer months, particularly during high tide when saltwater intrusion is at its maximum. The concentration of suspended solids throughout the estuary is typically low (<10 mg/L). The Breede River estuary is well-oxygenated attributed to strong outflow, strong residence times and weak stratification of the water column, which prevents the development of oxygen poor conditions even at depth. Nutrients are also strongly correlated with seasonal flows as run-off from precipitation transporting nutrients from upstream agricultural activities.

Water quality monitoring samples are taken monthly by the Department of Environmental Affairs and Development Planning (DEA&DP), in collaboration with the Lower Breede River Conservancy Trust (LBRCT), at predetermined monitoring points that were chosen to coincide with some of the positions of the Department of Water and Sanitation's (DWS) Resource Quality Services' (RQS) estuarine monitoring programme. DEA&DP monitors ten sites in the estuary and the samples are analysed for the following parameters: pH, Alkalinity, Electrical Conductivity (EC), Turbidity, Nitrogen (Ammonia), Nitrogen (Nitrates and Nitrites) (NOx), Total Nitrogen, Phosphorus (PO4), Total

Phosphorus, Dissolved Organic Carbon (DOC), Total Organic Carbon, Chemical Oxygen Demand (COD), and E.coli.

A snapshot of the water quality over the 2023 monitoring period is included here. With regards to the E. coli levels within the estuary for the 2023 period, it should be noted that no E.coli sampling took place during June and July due to flooding in the estuary. The results demonstrated full compliance, except for isolated spikes during May and February, with the upper limit of the target water quality range for full contact recreational use (>400cfu/100ml) in terms of the South African Water Quality Guidelines (SAWQG) for fresh waters. Results were also well below the threshold (>1000cfu/100ml) for irrigation of pastureland. The average range of E.coli levels in the estuary for the monitoring period is between 10 – 100 cfu/100ml, which is considered to be a low risk in terms of the SAWQG. Spikes in E.coli levels are observed during February and May for sites BR09A, situated downstream of the confluence with the Slang River, and BR10A, located downstream of the Kadies River. These spikes in E.coli can be attributed to manure runoff from cattle and dairy farms situated along the Kadies and Slang Rivers (tributaries to the Breede River) and anthropogenic influences along the Slang River washing down during rainstorm events. Results for May are exceptionally high and may be attributed to a pollution incident or may be contributed to sample contamination. All monitoring sites exceeded the threshold for hypertrophic state, with elevated nitrates-nitrites levels experienced during March, October and November. This can be attributed to nutrients being washed down after the March rains and the September heritage weekend storm. Levels decrease drastically during the summer months of January, February and December. Ortho-phosphate levels for all monitoring sites exceeded the lower limit threshold for a eutrophic state, with most sites showing increased levels phosphates during or after months when heavy rainfall was experienced for the region. During September when the Western Cape experienced intense rainfall which brought flooding in many places and resulted in the estuary being flushed with freshwater, as can be seen by EC values below 2000 mS/m at the mouth from September to November. The EC (salinity) values bare testament to the large volumes of freshwater that was flushed through the system and which resulted in the system remaining freshwater dominated from about May to November. With the intense rainfall events persisting for much of the year, it can be safely assumed that many pollutants were washed down from the upper catchment and tributaries running into the estuary. Although this may be true, E-coli levels within the estuary system were fairly low for most of the 2023 monitoring year, remaining within recreation and irrigation thresholds (SA Water Quality Guidelines). The vast size of the estuary and high microbial predatory rates ensure that E.coli levels remain low. The tidal influence also plays a role in regulating E.coli levels with the continuous flushing of the estuary with saline water from the marine environment. It should also be noted that sampling runs were not coincided with rainfall events and sampling may have missed "first flush" events and together with the dilution factor, could be the reason for the fairly low E-Coli values.

Compared to other estuaries in the Western Cape, the Breede River estuary is one of the estuaries that is not highly polluted, and while there are currently no measured inputs

of toxic substances, pesticides and herbicides associated with agriculture may become problematic in future.

3.4 Biotic Characteristics of the Estuary

Due to the Breede River estuary's geographic location and size, it possesses a relatively high level of biodiversity within a region of relatively high endemism. The micro-algal community is present in a lower biomass than other studied estuaries primarily due to the lower nutrient availability and retention time of the system. Twenty-three dominant macrophytes occur within the estuary with *Zostera capensis* and *Potamogeton pectinatusas* the principle species forming the basis of the macrophyte community. A critical macrophyte community within the estuary is the saltmarsh present at Green Point, which is in a relatively pristine condition and possesses the highest diversity of plant species. The NBA 2018 highlighted the following extent of habitats within the Breede estuary: Intertidal Salt Marsh: 20.5 ha, Supratidal Salt Marsh: 29.55 ha, Submerged Macrophytes: 6.00 ha, Reeds and Sedges: 229.2 ha, with a total area of Total: 1 789.0 ha.

In contrast to the zooplankton and hyperbenthic communities which are considered less important, the macrobenthos communities are distributed based on substrate type. The highest diversity of macrobenthos occurs within the *Zostera* beds and saltmarshes whereas sand flats possess the lowest diversity. These habitats are critical for the maintenance of bait organism populations. A total of 59 species of fish have been recorded in the Breede River estuary with the community dominated by marine estuarine-dependent and estuarine species. The estuary provides an important nursery and refuge area for coastal fishes. The distribution of the fish species for the Breede River estuary is dependent on habitat type and salinity gradients. A total of 48 waterbirds were recorded during summer and winter of 2000, with 1900 and 560 individuals counted during these periods, respectively. Invertebrate feeders (waders) are the most important group, comprising 55 % and 47 % of the bird community in summer and winter, respectively.

Recent data indicates that catch-composition has changed since the earlier estimates especially the relative contributions of spotted grunter and dusky kob. A "switch" has been recorded caused by the collapse of the dusky kob population to critical levels below 1% of pristine values as well as range expansion, stock separation and the establishment of a southern Cape (Breede & adjacent estuaries) breeding population of spotted grunter which is currently above equilibrium level/s. Recent estimates show that catches may exceed 80 tons in some years but are highly variable fluctuating by more than 50%.

3.5 Ecological State and Importance

Considering the size of the Breede River estuary, the diversity of habitats and their respective biota, the system has been classified as a 'Highly Important' estuary and is ranked as the 19th most important estuary within South Africa. Furthermore, the estuary

is also classified as highly important in terms of DFFE Important fish nurseries rating (NBA, 2018). Using several characteristics used to describe the vegetation communities, the Botanical Importance Score for the Breede River estuary was calculated as 350. This is the fifth highest score among all South Africa estuaries and exemplifies the importance of the Breede River estuary in terms supporting estuarine vegetation communities, particularly intertidal saltmarsh. The Breede estuary has been categorised as Vulnerable in terms of the National Biodiversity Assessment 2018 Estuarine Threat Status (NBA 2018). In terms of fish, the system ranks among the top 20 most important estuaries in South Africa in terms of overall conservation importance. In addition, numerous tagged individual fish have been recaptured in adjacent coastal waters indicating the intrinsic connectivity between the Breede and neighbouring estuaries in terms of fish movement along the coastline. Furthermore, the estuary marks the most southerly distribution for *Carcharhinus leuca*, the Zambezi shark. This species is currently listed as Near Threatened by the IUCN Red List and the Breede River estuary is considered critical habitat for this species, and potentially a pupping and nursery ground. Importantly, the Breede River estuary is also utilised by two bird Red Data species, the African Black Oystercatcher and Caspian Tern.

The present ecological condition of the Breede River estuary is classified as "good" and is associated with a Present Ecological State Category of "B/C", i.e. largely natural, with some modifications (NBA 2018). The Intermediate Determination of the Resource Directed Measures for the Breede River estuary found that the largest factor that contributed to the change in the state of the Breede River estuary from the Reference Condition to its Present State was the large reduction in river inflow. Given that large volumes of water could not be re-allocated to the estuary; estuarine specialists have decided to keep the REC of the Breede River estuary as Category B. Other potential threats to the integrity of the Breede River estuary are utilisation of marine living resources (e.g. through recreational fishing and bait collection), recreational activities (e.g. boating, skiing. etc.), water pollution, developments, agricultural activities, and invasive alien plants.

3.6 Ecosystem Goods and Services

The concept of ecosystem goods and services stems from the perception of ecosystems as natural capital, which contributes to economic production.

The main types of ecosystem services that are likely to be produced by the Breede River estuary are provisioning services (food and raw materials); regulating services (Disturbance Regulation, Regulation of Diseases, and Water Quality Amelioration); Supporting services (Refuge Area and export of materials and nutrients); and cultural services (Tangible and Intangible cultural significance).

3.7 Exploitation of Living Resources

Presently angling is the most important attraction of the Breede River estuary with exploitation from recreational anglers and bait collectors. Approximately 40.8 tons of

line fish are caught annually from the Breede River estuary by recreational anglers (40 % of Cape south coast total) (Lamberth et al 2003). Recent estimates show that catches may exceed 80 tons in some years but are highly variable fluctuating by more than 50%. In addition, cast netting and illegal seine and gillnetting occur within the estuary. Numerous fish species are heavily exploited in the Breede River estuary and the current levels of fishing effort remain unsustainable. The stocks of white steenbras and dusky kob are collapsed, leervis are maximally exploited and the status of spotted grunter, is unknown. Although commercial line fishing is not permitted in estuaries, it is said that one commercial line fisherman uses the river as a launching site to sea.

All fishers, commercial, recreational and small-scale (subsistence) have an impact on the resource. It is correct to assume that recreational anglers can deplete fish stocks if they don't comply with regulations. It's equally true that similar can occur if they're compliant but restrictions were not set conservatively enough in the first place. There's no intention to repeal the legislation but rather to extend the night-fishing prohibition to all estuaries countrywide. Stock assessment shows the dusky kob population is critical with breeding fish at <1% of pristine levels. The line fish Management Protocol requires a moratorium on the catching of dusky kob until stock recovery. The night-fishing prohibition is a last-ditch attempt at stock recovery prior to the implementation of a moratorium. The Status Quo therefore remains.

3.8 Primary Impacts and threats

It is evident that the Breede River estuary provides a variety of direct and indirect benefits to both the local and national economies which are dependent on the ecological wellbeing of the Breede River estuary. This is dependent on the water quality and quantity that enters into the system from the catchment. In addition, high levels of boating activity occur in the estuary during the summer season when the system is most active biologically. This negatively impacts on the productivity of estuarine biota, as well as causing bank erosion from the wave activity and beaching of boats, particularly on *Zostera* bed and mud flats. If the integrity of the Breede River estuary is to be maintained these threats needs to be addressed urgently and effectively.

The below issues were raised by stakeholders during the Breede EMP implementation project commissioned by the DEA&DP in 2022 (Errol Cerf, 2022).

- Mud/salt flat erosion;
- Riverine bank erosion;
- Increased intrusion of invasive alien vegetation (AIS) on the banks and in the water courses;
- Possible decline in bait stocks and habitat;
- Possible decline in fish stocks;
- Alleged unlawful erection of jetties and construction of illegal slipways;
- Alleged reckless use of motorboats;
- Lack of management/ enforcement;
- Different levels of enforcement on the two sides of the estuary;

- Conflict between various water users;
- The issue around delineation of the EFZ, especially extension out to sea;
- Balancing the opposing views of scientists, with reference to local knowledge; and
- Public access to Coastal Public Property.

Additional threats identified in the NBA 2018 include:

- Noise pollution (underwater)
- Microplastic pollution

3.9 Socio-Economic Context

In terms of population distribution, the numbers within the municipal ward areas around the Breede River estuary are mostly low (<500 individuals), with isolated areas of larger settlement on the northern bank near Witsand and Port Beaufort at the coast (up to 500 individuals) and on the southern bank in the mid-estuary (up to 1000 individuals). Overall, service provision is of a relatively high standard. Close to 10 % of the households in the Malgas region are without access to hygienic toilets, while between 12.3 % and 14.3 % of the households in the Swellendam sub-region and Infanta, respectively, do not have access to piped water. Considerably more households are without electricity. The majority of households (76 %) around the estuary obtain an annual income ranging between R 19 601 and R 307 600. Approximately 4 % of the remaining households receive no annual income.

The main economic sectors are primary agriculture (and related sectors like transport and storage), and agri-processing of products and other light industrial. Light industry, construction and vibrant financial & business services and retail, and catering and accommodation activities have seen noteworthy economic growth in recent years. Tourism focuses on cultural heritage tourism activities and eco-tourism particularly at resort towns along the coast.

The DEA&DP commissioned a Cost Benefit Analysis project which included the following economic valuation (as at 2017 estimation):

Table 2 Economic valuation of ecosystem services (Futureworks - Cost Benefit Analysis 2017)

Ecosystem services	Information source	Estimated baseline values in 2017 prices
Waste treatment and disease control	Municipal rates	515,654
Recreational angling & bait collection	Turpie & Goss 2014	32,844,388

Water-sport/recreation (excl. angling)	Turpie & Goss 2014	38,099,490
Sense of place	EcoInvest II	5,550,000
Total		77,009,532
Tourism economic multiplier		1.96
Economic impact		**R150,938,683**

3.10 Social Considerations

The direct and indirect benefits derived from estuarine ecosystems services are manifested directly or indirectly in tangible income and employment. Overall, the Breede River estuary ranks among the top 20 estuaries in the Cape in terms of its subsistence value which was estimated at R120 000 per annum Turpie & Clark (2007). The Breede River estuary also holds substantial tourism value for the local communities positioned along its banks by means of visitors to the estuary and is estimated to be R 25 million per annum Turpie & Clark (2007), placing it in the top 10 Cape estuaries. In addition, the overall property value contributed by the Breede River estuary is estimated at R 884.1 million, the second most valuable estuary in the Cape, which translates to approximately R 26.7 million per annum in terms of the direct value to the real estate sector of the national economy.

The Breede EMP (2018) Implementation project developed maps of man-made structures in the Breede River Estuary (see figures 2—8). A distinction was drawn between launch sites (which could be informal and comprising a gap in the reeds or formalised with concrete) and actual structures such as jetties since some properties had only slipways and others had both slipways and jetties. It was important that both man-made structures were mapped since management and impacts of each are slightly different.

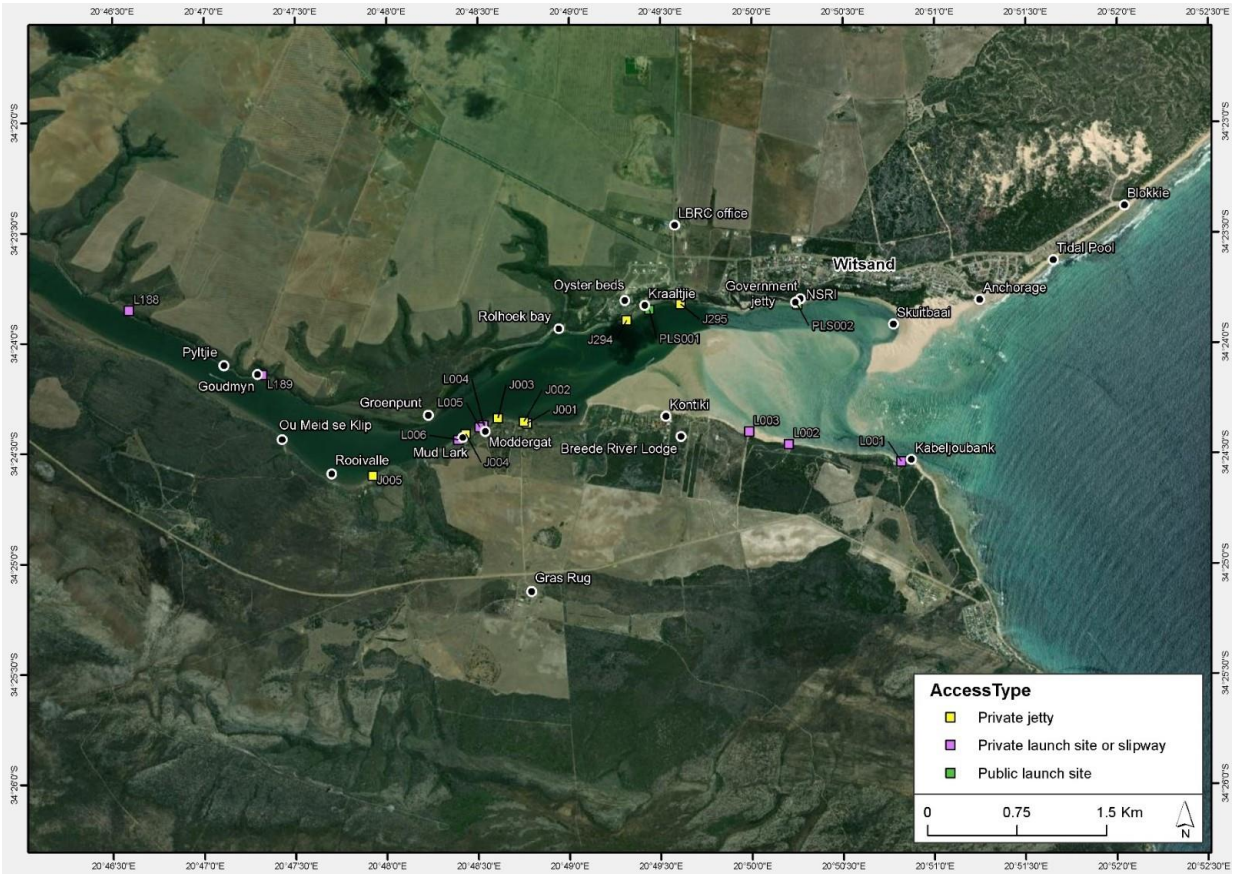


Figure 2 Jetties and launch sites from the Breede River Estuary Mouth to Pyltjie

Figure 3 Jetties and launch sites from Pyltjie to Dammetjies

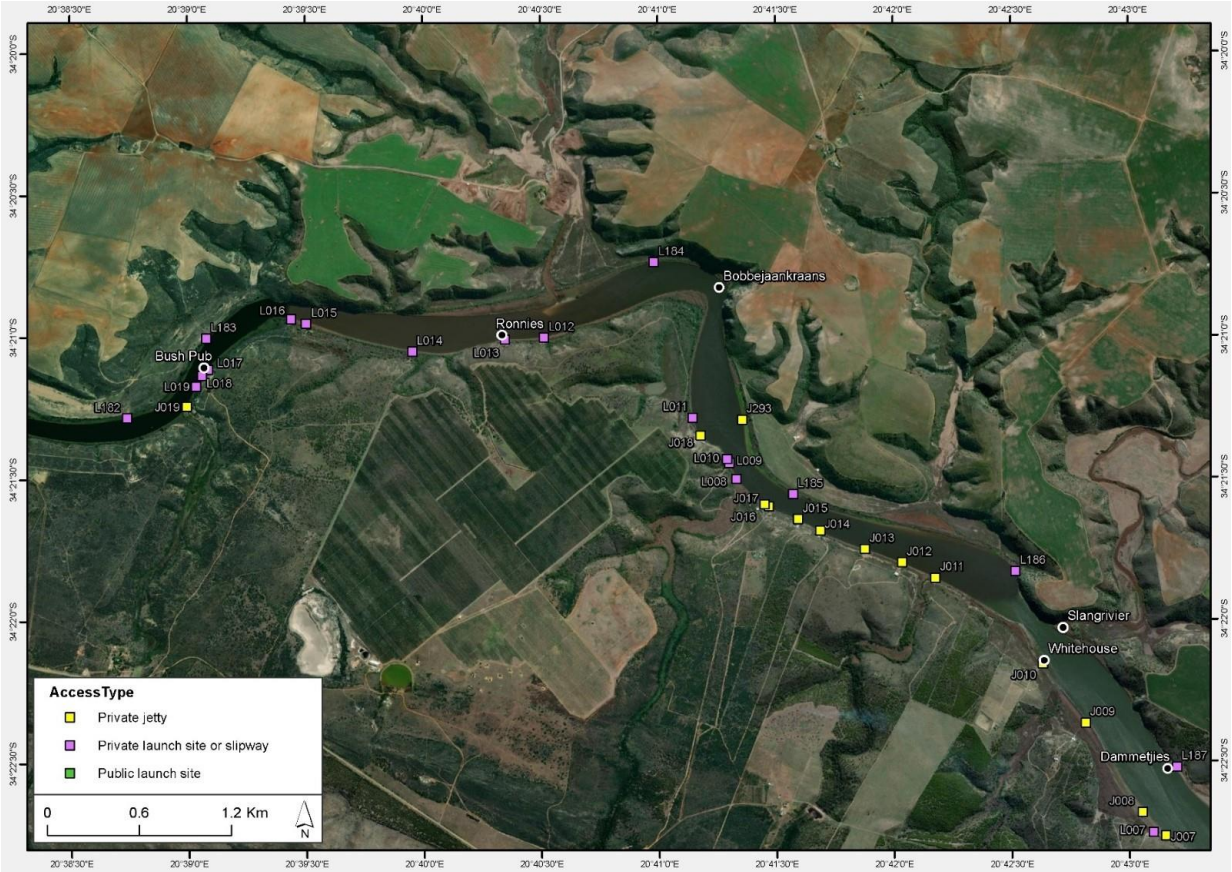


Figure 4 Jetties and launch sites from Dammetjies to the Bush Pub

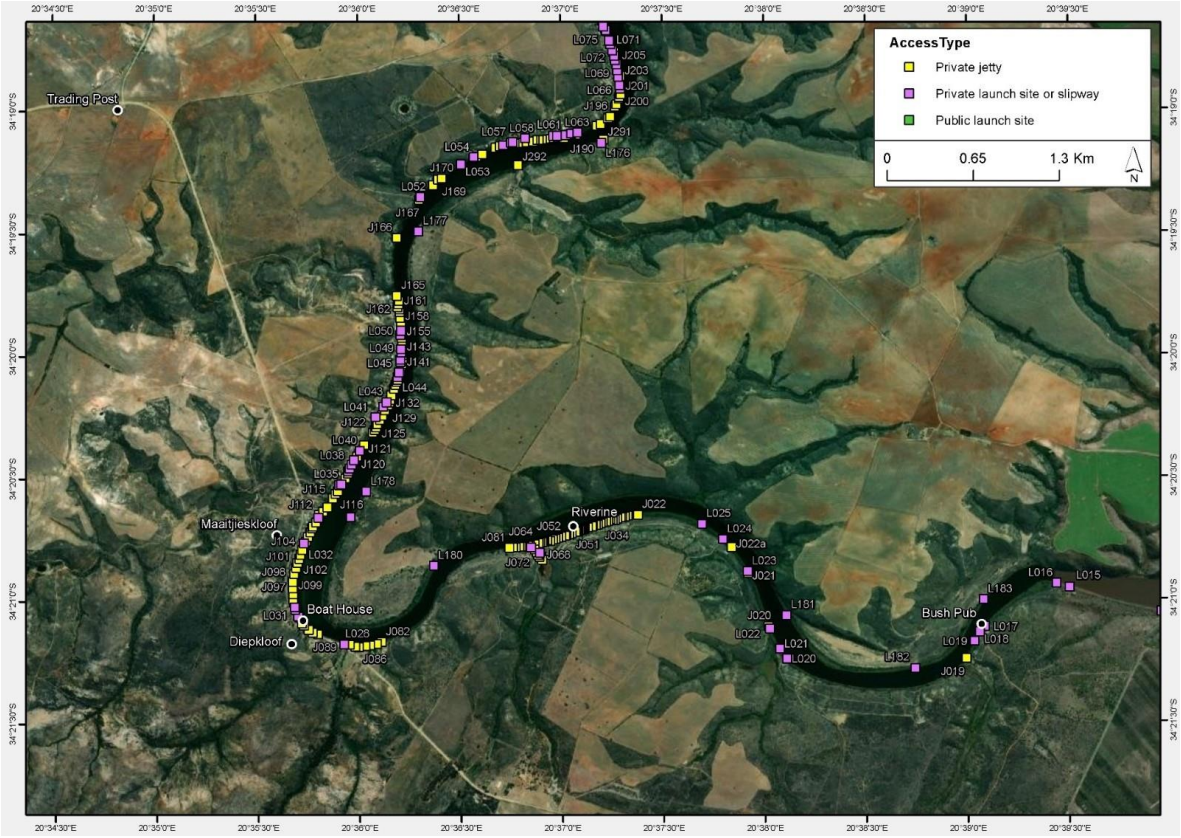


Figure 5 Jetties and launch sites from Bush Pub to Lemoentuin

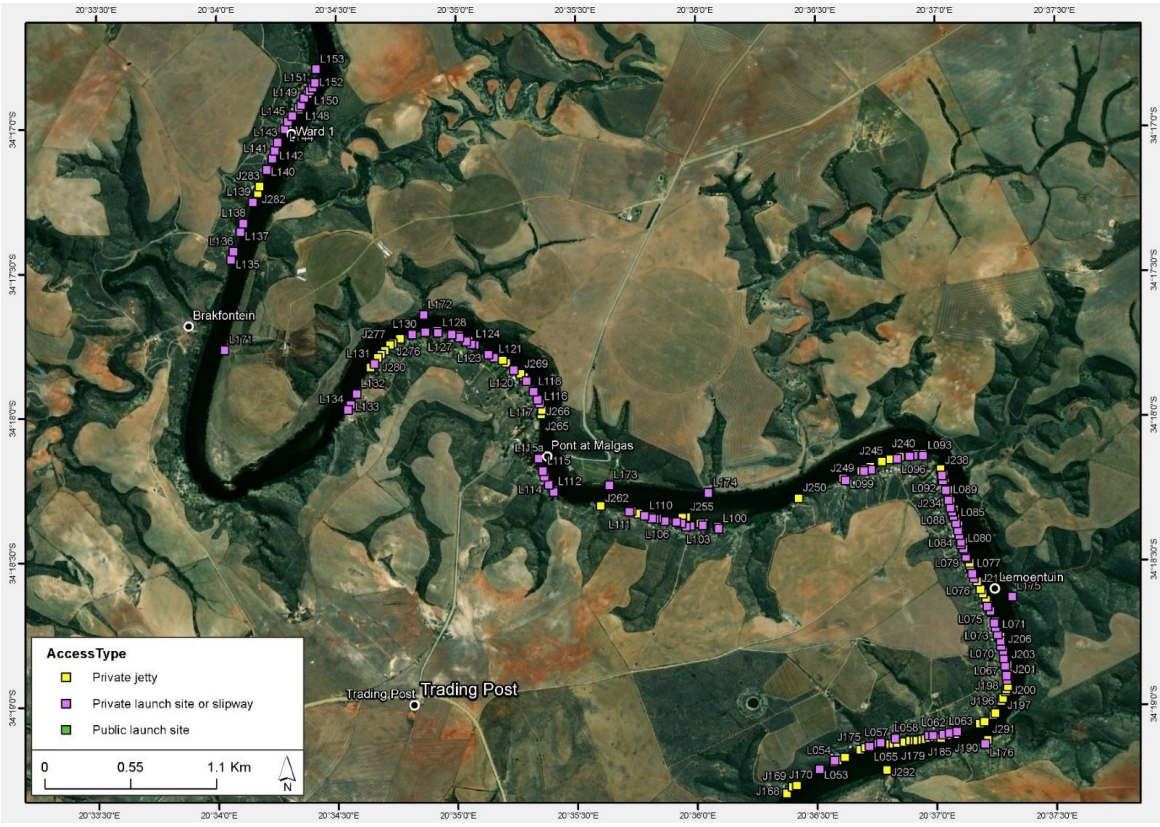


Figure 6 Jetties and launch sites from Lemoentuin to Brakfontein

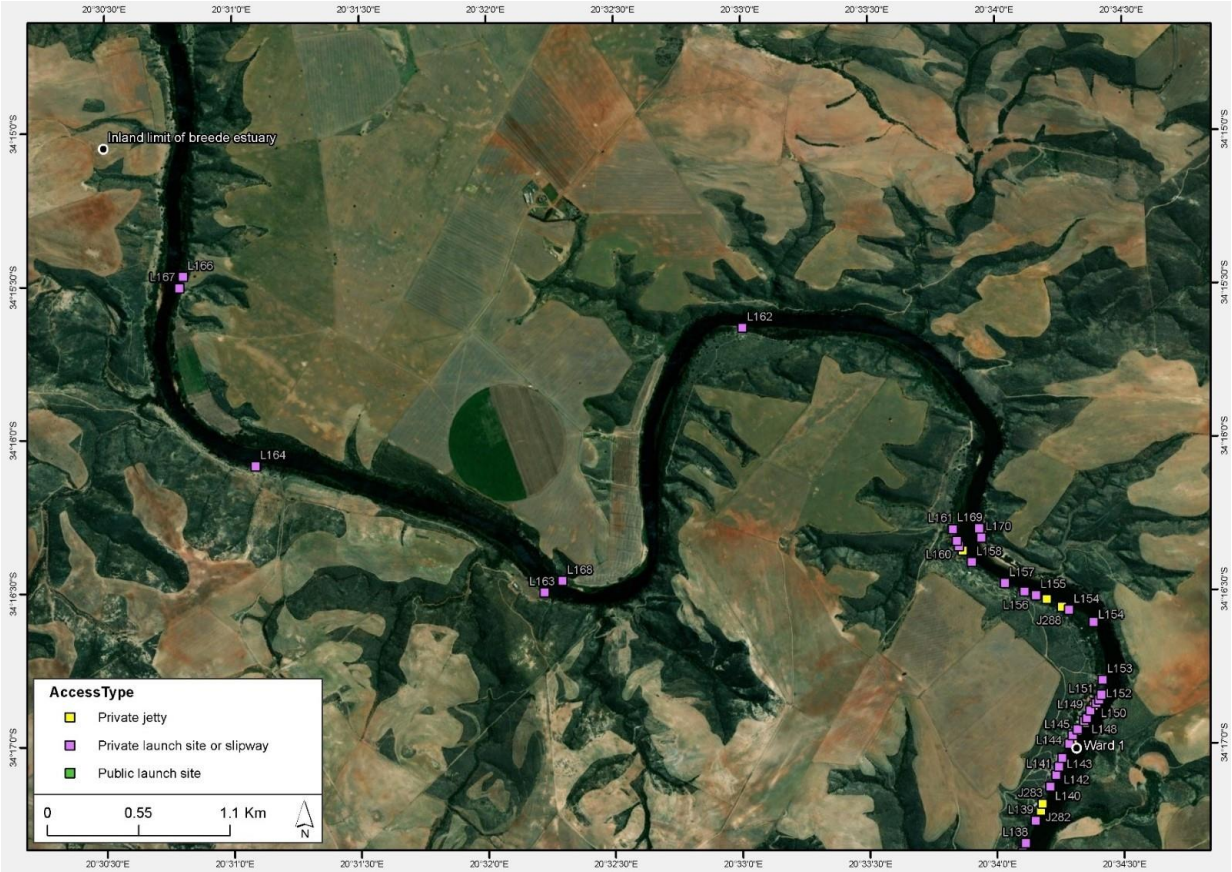


Figure 7 Jetties and launch sites from Brakfontein to Ward 1

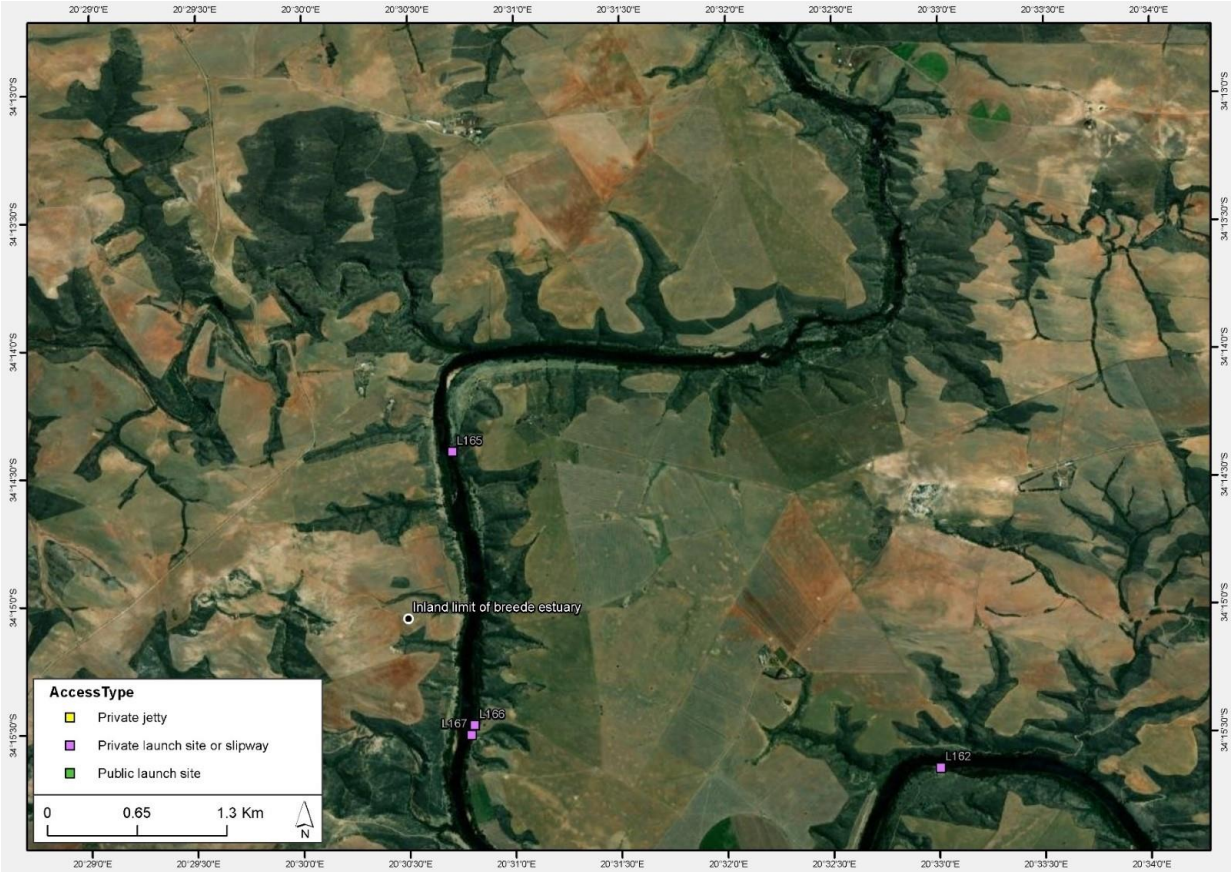


Figure 8 Jetties and launch sites from Ward 1 to the inland limit of the EFZ

A total of 296 private launch sites and 189 jetties were identified, with the bulk of the structures found on the Swellendam bank of the River (Errol Cerff, 2022). The large number of structures has significance in managing the impact of users on the river.

3.11 Legislation, Policy and Management review

A legislative, policy and management review was conducted in the EMP (2018) process and new legislation has been included as part of this review. Existing operational management strategies and plans are relevant to the legislative environment related to the management of estuaries in South Africa. The Provincial Coastal Management Programme (2022-2027) and National Estuarine Management Protocol (2021) provide guidance on the required interventions.

3.12 Existing Institutional Arrangements

The Lower Breede River Conservancy Trust (LBRCT) previously managed aspects of compliance management on the estuary effectively since 1986. They were appointed the role of then- estuarine management authority of the Lower Breede River by the

Swellendam and Hessequa local municipalities (LMs). The Breede River Estuary is currently managed collaboratively between, DEA&DP, CapeNature, Swellendam and Hessequa LMs, DFFE and Department of Water and Sanitation (DWS) and the LBRCT. CapeNature do regular monitoring on the Breede regarding jetties and slipways, bird counts etc. Swellendam LM and Hessequa LM collectively are involved through the LBRCT. CapeNature has secured funding to appoint two local estuary rangers in the Breede Estuary. The CapeNature and LBRCT have dedicated staff appointed to do law enforcement under the Marine Living Resources Act and bylaws passed by Swellendam LM and Hessequa LM.

3.13 Opportunities and Constraints

3.13.1 Protected Area potential

NBA 2018 identifies the Breede estuary as a high priority estuary for formal protection. Western Cape Protected Area Expansion Strategy has included the Breede estuary as a priority site for increasing habitat protection.

3.13.2 Restoration and Rehabilitation

The main restoration actions required for the Breede River estuary is the long-term improvement of estuarine habitats, freshwater requirements, and the creation of a buffer zone around the estuary. It should be recognized that some of the restoration actions would be long term, while others may be achievable in the shorter to medium term.

During the Breede Implementation project, it was highlighted that erosion and accretion naturally occur on a cyclical basis in a tidal estuary and that it is characteristic of a tidal environment. The erosion in parts of the Breede River Estuary is, however, considered by many to be more extensive than can be ascribed to purely natural processes. Two distinct topographical categories were defined as: (1) the salt marsh/ tidal flats near the mouth and (2) the lower salinity riparian mudflats in the vicinity and upstream of Riverine. Possible causes of erosion differ between these two categories and are discussed separately (Errol Cerff, 2022).

During the Breede EMP Implementation project. local knowledge as well as scientific research revealed that the saltmarshes in the mouth of the Breede River Estuary have largely been replaced by sand banks since the 1970s (Errol Cerff, 2022). It was agreed that this was as a result of reduced water flow from the catchment. Thus, the salt marshes in the mouth have been inundated with marine sediment brought in by wave action and the changes in the hydrodynamics have furthermore caused the salt marshes to re-form further upstream. Kupfer *et al*. (2022) and Flemming *et al*. (2021) have described the dynamics of this process is in detail. The most significant salt marsh in the estuary is Groenpunt, approximately 4.5 km from the mouth. (Figure9) (Errol Cerff, 2022).

The Groenpunt salt marsh is under the most pressure from bait users and fishermen because of its size and proximity to access points and recreation nodes (Errol Cerff, 2022).

There are other smaller salt marshes in the system which occur in secluded bays, mostly on the Swellendam bank and at the entrance to tributaries on both banks. Pressures on these salt marshes include bait collection and trampling by fly fishermen (Errol Cerff, 2022).

Riddin and Adams (2020) show evidence that the salt marshes near the mouth are decreasing in size and potentially, productivity. Riddin and Adams (2021) concluded that erosion at Groenpunt can be attributed to increased wind and wave action. The research further confirmed that human activity also plays an important part in the escalation of the erosion (Errol Cerff, 2022).

Trampling and the act of digging up the bait species disrupts the integrity of the salt marsh making it more vulnerable to waves and consequent erosion. Fly fishermen accessing the edge of the salt marshes trample on salt marsh and disrupt the mud structure in the process (Errol Cerf, 2022).

Zostera beds protect the salt marshes from wave action Anchoring/mooring of boats in *Zostera* beds offshore of the salt marshes contributes to the degradation of salt marshes. Boat propellors damage the *Zostera* beds and thus degrade the salt marshes.

Other opinions suggest that the change in salt marsh extent is more likely to be a result of decreased water flow from the catchment.

Dr Stephen Lamberth (pers. comm.) and others suggest that depletion of bait species themselves is possibly not the main source of concern since these species have evolved to recover rapidly from events that deplete their numbers. Of more concern is the destruction of the habitat.

A working group was established by the BREAF to deal with Sensitive habitat protection of various habitats including salt marshes. Additional information from Working Group to be included here.

Figure 9 Location of Groenpunt mudflats

Another area that experiences erosion is along riverbanks. These are found in the low salinity, shallow, sandy or muddy areas normally inundated with the common reed Phragmites. These reeds have extensive, deep root structures which hold the bank and protect it from erosion and the removal of these reeds make the bank vulnerable to erosion. This is evident in the residential areas where the reeds have been removed to improve the resident's view of the river or enable launching of watercraft from private properties. This is most notable at the Riverine development as can be seen on the below image.

Figure 10 Denuded riverine banks.

Activities that generate large waves include wake-boarding and water skiing. These activities are not prohibited from driving close in-shore and generate waves which are claimed, by local residents, to erode the unprotected riverine banks as well as damage jetties and moored boats (Errol Cerff, 2022). Other views suggest that wind and natural wave action may be playing a more significant role. Erosion hotspots were mapped and are available for restoration activities planning (Errol Cerff, 2022).

Two working groups related to these matters were s established by the BREAF. The one deals with Sensitive habitat protection of various habitats including salt marshes and the other deals with Zonation of activities in the estuary.

The Breede Implementation project has confirmed the extent of the erosion of banks as well as extent of salt marsh degradation. A responsive rehabilitation programme is being co-ordinated and informed by the BREAF, and specifically the Working Groups. Current research, local knowledge and the implementation of a pilot project dealing with the rehabilitation of salt marshes within the Berg estuary are critical informants to the development of the rehabilitation programme.

The extent and type of alien invasive species (AIS) was mapped for the terrestrial area as part of the Breede implementation project (Errol Cerff, 2022). The aquatic survey was not concluded due to the flooding at the time of the project. The EFZ showed the greatest infestation of AIS. The nature of the Breede topography complicates control of AIS and consideration should be given to the impact of the removal versus the resultant impact on the ecology and habitat.

The AIS is dominated by *Acacia* species with *A.cylops* being the most prevalent nearer to the coast and further upstream, infested by Black wattle (*A.mearnsii*), *Poplar* (*Populus sp)* and *Eucalyptus*. Residential areas are infested with Manatoka (*Myoporum tenuifolia*), Weeping willow *(Salix babylonica*) and Brazilian peppertree (*Schinus terebinthifolius*). The estates have limited invasion by the *Acacia* species. Previous site inspections showed significant areas of dense Water hyacinth (*Eichhornia crassipes*) and smaller amounts of Parrots feather *(Myriophyllum aquaticum*) within the aquatic environment. Furthermore, it was noted that heavily invaded agricultural areas frequently occurred landward of dense *Phragmites sp* mudflats. Poplar, Pinus and Eucalypts roots tended to secure the bank from erosion- both natural and as a consequence of cattle grazing the banks. The removal of these trees would require careful planning to avoid disturbing the bank structure and causing erosion as a consequence (Errol Cerff, 2022).

3.13.3 Local Economic Development

Value opportunities are identified related to the following categories: Recreational Activities, Spiritual / Cultural, Tourism, Hospitality & Conferencing; and Education and Awareness. In addition, there are additional opportunities for employment through environmental management initiatives for the estuary.

3.14 Climate Change

3.14.1 Climate Change: Drivers, Responses

The research undertaken by CSIR and partners (Van Niekerk et al 2022) highlighted current understanding on climate change impacts on estuaries in South Africa. The following patterns have emerged:

- Changes in the Agulhas current and Cooling along Cape south-west coast & warming in Agulhas current & north of Cape Columbine;
- A 2 °C to 4 °C increase in land temperature in the mid to far futures (Some monthly value >6 °C);
- A shorter and more intense summer rainfall season (become wetter during summer);
- Drier winter rainfall region;
- More intense extreme rainfall events (flooding) & drought;
- Global sea level rise over 10 years with an early projection of 1.0 – 2.0 m;
- In terms of storminess, there will be an increase in air temperatures, increased sea surface temperatures and increased storm surges. A conservative estimate of 6%, the Storminess 10%, increased wind speed of 12%, increased wind stress of 26% and increased wave height of 80%. Mostly winter in winter with a- possible decline summer; and

- Decrease in acidification between 0.1 – 0.3 units (even as much 0.4) and is buffered with natural fluctuations (upwelling) and low pH in rivers and estuaries.

Climate change responses have been highlighted by the recent research (van Niekerk, et. al, 2022) and are as follows:

- Changes in runoff
    - Changes in coastal connectivity (estuary mouth closure)
    - Modifications in salinity intrusion in estuaries & coast (groundwater)
    - Changes in biogeochemical inputs (e.g. nutrients)
    - Changes in sediment processes (estuaries, beaches & fluvial fans)
    - Changes in the contaminant input, behaviour & accumulation
- Sea level rise
    - Changes in salinity penetration in estuaries & coast (groundwater)
    - Changes coastal connectivity (estuary mouth state)
    - Coastal inundation (permanent flooding)
    - Coastal erosion (loss of beaches, coastal properties)
    - Potential loss of 'Blue Carbon' ecosystems (coastal squeeze)
- Increase in frequency and intensity of coastal storms
    - Decrease coastal connectivity (mouth closure)
    - Coastal erosion (loss of beaches, coastal properties)
    - Coastal inundation over wash (event-scale flooding)

The ecological responses to climate change stresses are outlined below:

- Changes in ocean circulation patterns
    - Species distribution
    - Larval and egg survival
- Rising temperatures (land and sea)
    - Changes in species distribution
    - Ecosystem structure (mortality, reproduction, growth, behaviour)
- Ocean Acidification
    - Calcifying organisms may require more energy for producing and maintaining exoskeletons
    - Delayed metamorphosis of planktonic oceanic life history stages

The Breede is located in the Southern Cape region and Van Niekerk et al. (2022) research shows that within the Southern Cape region the following vulnerabilities are rated high and medium:

Table 3 Stressors/Processes/Responses vulnerability rating for the southern Cape region showing only high and medium ratings.

Stressors/Processes/Responses	High Vulnerability Rating.	Medium Vulnerability Rating
Boundary current location and meanders		X
Land temperatures	X	
Sea temperatures		X
Biological Responses: land-sea gradient e.g. change in community composition		X
Biological responses: along-shore gradient e.g. range extensions		X
Biogeochemical regime		X
Sediment deposition/ erosion cycles		X
Sea level rise	X	
Increased salinity penetration		X
Increased tidal flushing/ prism	X	
Changes in the frequency and duration of mouth closure	X	
Biological responses: changes in habitat, (e.g., plants) nursery function and availability	X	
Coastal storms	X	
Increased mouth closure		X
Increased overwash and salinity	X	
Marine sediment ingress/ infilling		X
Biological responses: change in recruitment processes (e.g. fish) linked to mouth state and overwash.	X	

3.14.2 Blue carbon ecosystems

Blue carbon ecosystems store more carbon per unit area than terrestrial forests (Adams, et. al., 2021). Carbon stored in the soils (> 90%) is retained for longer time periods than in terrestrial forests. Carbon is stored in estuarine ecosystem types such as mangroves, salt marshes and seagrasses (Adams, et. al., 2021). At a national scale, Blue carbon ecosystems contribute towards mitigating emissions (Adams, et. Al., 2021). There are many ecosystem services derived from blue carbon ecosystems such as provisioning (food and raw materials), supporting (nursery areas and nutrient cycling and biodiversity), cultural (spiritual value, aesthetic quality and recreation and tourism) and regulating (flood control, erosion control and carbon sequestration) (Raw et al, 2020). Blue carbon ecosystems can protect areas from sea level rise, storm surges and flooding (Raw et al, 2020).

A key component of the EMP is addressing the restoration and maintenance of these blue carbon habitats in the Breede River estuary.

4 VISION & OBJECTIVES

The Vision for an estuary should be inspirational, representing a higher level of strategic intent and aligned with the strategic objectives of the Protocol 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 following Vision for the Breede River estuary was developed and agreed upon at a meeting of relevant stakeholders held at Witsand in 2008.

> ***The Breede River estuary is the pristine pride of South African Estuaries. It is beautiful, rich in plants and animals, attracts visitors, sustains our livelihoods and uplifts our spirits. Its bountiful rewards are the fruits of our love and dedication to its wellbeing now and for future generations***

This Vision essentially captures the need to conserve the **functioning** and **biodiversity** of the Breede River estuary, which ultimately supply the ecosystem goods and services referred to in the Vision. Therefore, this Vision needs to be translated into objectives that address securing the appropriate water reserve (and hence hydrological, biophysical and ecological functions), biodiversity conservation and development needs, as well as the management objectives required in achieving these higher objectives, i.e. co-management, effective governance, and stakeholder support.

The following key objectives have been identified as the corner stones to the achievement of the Vision developed at the stakeholder workshop mentioned above.

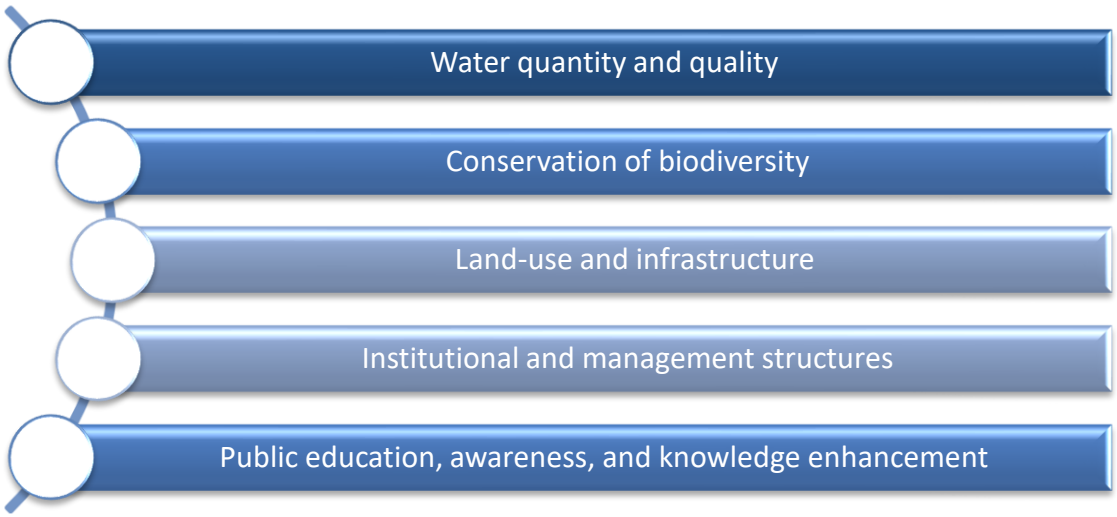


Figure 11 Strategic Objectives for the Breede River Estuarine Management Plan

4.1 Water quantity and quality

The objective in terms of water quantity and quality is to ensure that the Breede River estuary attains its Recommended Ecological Category and Targeted Ecological Category status as a Category "B" estuary, by securing both the Reserve for Water Quantity and the Reserve for Water Quality as defined in the Intermediate Determination of Resource Directed Measures (Taljaard, 2003) and the gazetted Resource Quality Objectives (DWS, 2022). The Resource Quality Objectives have been included in Annexure 3 and will assist with the tracking of the efforts to ensure a healthy estuary.

4.2 Conservation of biodiversity

The biodiversity of the Breede River estuary (e.g. species, populations, communities, habitats, functioning, ecological processes and ecosystem services) should be protected from over-exploitation and other negative impacts, whether they are direct, indirect and/or cumulative.

4.3 Land-use and infrastructure

All developments, including infrastructural and agricultural, which impact or could impact on the Breede River estuary, should be controlled in terms of sustainability, biodiversity conservation and aesthetics.

4.4 Institutional and management structures

Ensure co-operative management of the Breede River estuary in terms of the involvement of the Swellendam and Hessequa local municipalities, Garden Route and

Overberg district municipalities, the BOCMA, DFFE, CapeNature, DWS facilitated by the RMA (DEA&DP), through the effective functioning of the BREAF.

4.5 Public education, awareness and knowledge enhancement

Enhance public awareness of the ecosystem services that the Breede River estuary delivers, the legislation that affords protection of its integrity, and hence the reasons for compliance management.

5 MANAGEMENT OBJECTIVES

The below national priorities outlined in the NBA 2018 inform the management objectives for the Breede River Estuary:

- Reduce pressure on invertebrate and fish living resources.
- Share benefits of estuaries and estuarine protected areas equitably among coastal communities.
- Protect and restore the health of South Africa's estuarine lakes.
- Increase protection levels through the implementation of the National Estuary Biodiversity Plan.
- Respond rapidly to emerging invasive species.
- Ensure that the legal definition of estuaries in South Africa includes the estuarine functional zone.
- Complete ecological water requirements and classification of all estuaries within five years and implement flow requirements within two years of their classification.
- Up-to-date field surveys of the abiotic (topography, bathymetry and sediment structure) and biotic components (plants, inverts fish and bird) of estuaries: National scale field surveys on of South African estuaries were last carried out in the early 1980 and 1990s.
- Strengthen the National Estuary Management Protocol to ensure cooperative governance between the lead authorities that manage estuaries and roll out the development and implementation of Estuary Management Plans in terms of the ICM Act.
- Fund and implement the National Estuary Monitoring Programme initiated by DWS.
- Develop integrated, cross sectorial strategic resource allocation plan for estuaries.

The vision and key objectives should be achieved through the implementation of the strategic management objectives (Figure 12).

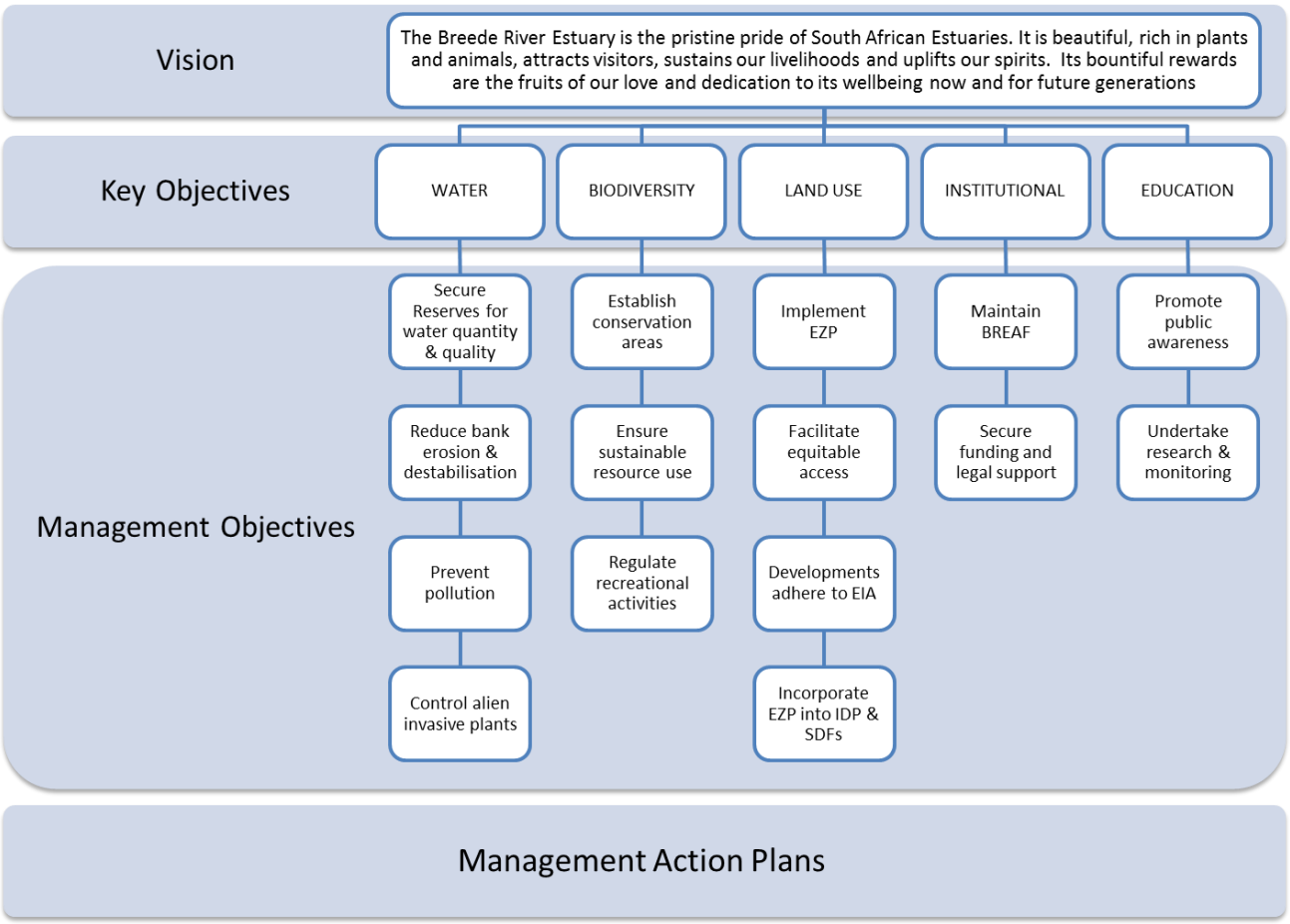


Figure 12 Vision, Key Objectives, Management Objectives, and Action Plans

5.1 Water quantity and quality

- Ensure that the Reserves for Water Quantity and Water Quality, as identified by the Intermediate Determination of the Resource Directed Measures for the Breede River estuary and the gazetted RQOs are maintained, through ongoing interaction between the BREAF and the BOCMA, including active representation of BOCMA on BREAF;
- Identify and address activities that lead to bank de-stabilization, erosion and other activities that reduce water quality, e.g. detrimental agricultural activities such as ploughing and grazing in the riparian zone[1], certain types of water-based recreation, and removal of reed beds2;
- Identify and address activities that lead to water pollution, e.g. siltation, agricultural chemicals, fuel contamination from outboard engines and sewage run-off3; and
- Control the spread and densification of both aquatic and terrestrial invasive alien plant species (water hyacinth) that negatively impact on water quantity and quality and have knock-on effects for aquatic life[2].

[2] Cross links with appropriate land use and infrastructure planning

[3] Cross links with conservation of biodiversity

5.2 Conservation of biodiversity

- Ensure the conservation and rehabilitation of the full suite of existing habitats, especially those that fulfil the role of zones of primary production, fish nurseries, wader feeding grounds (e.g. Zostera beds, salt marshes, etc.), and bank stabilization (e.g. reed beds);
- Ensure sustainable resource use through effective compliance under the Marine Living Resources Act (Act18 of 1998), in terms of fish (including shark and rays) and bait species, e.g. quotas, closed seasons, size limits, collection methods; and
- Regulate recreational use in and around the estuary, including water-based activity (including boating) and aviation activity, through effective compliance management to reduce habitat degradation and disturbance to fauna and flora.
- Alien invasive plant species management and fish species management, specifically the *Tinca tinca* (tench) population and the oyster, *Crassostrea gigas*.

5.3 Land-use and infrastructure

- Implement an estuary zonation plan that directs infrastructural development and other land use practices (e.g. agriculture) within the coastal management lines, flood lines, buffer zones as defined in the relevant environmental legislation, e.g. Integrated Coastal Management Act (Act 24 of 2008, as amended), National Environmental Management Act (Act No. 107 of 1998), National Water Act (Act No. 36 of 1998) and the Conservation of Agricultural Resources Act (Act No. 43 of 1983), in terms of the Coastal Protection Zone, 100 m buffer, 32 m buffer, 100 year flood line, and 5 m contour;
- Facilitate equitable access for both pedestrian and vehicular access. This entails ensuring boat launch sites are licensed and access is not restricted;
- Ensure that all proposed developments within the development buffer zones, adhere to the EIA process in terms of the full suite of relevant environmental legislation;
- Ensure the incorporation of the EMP into the Integrated Development Plans and Spatial Development Frameworks of the Swellendam and Hessequa local municipalities, as well as of those of the Garden Route and Overberg district municipalities; and
- A Breede River Estuary structure policy should be developed which details the permissions required for private jetties and launch sites and their management.

5.4 Institutional and management structures

- Maintain a fully functional estuary advisory forum (the **Breede River Estuary Advisory Forum)** that will facilitate **co-management and effective governance** between Local and National government agencies, DEA&DP as the designated RMA, the two conservation agencies (CapeNature and SANParks), and the full suite of relevant private stakeholders (See Section 8).
- Ensure that **appropriate funding** and **legal support** is secured for the execution of the various management actions and attainment of the objectives set out in this EMP.

5.5 Public education, awareness and knowledge enhancement

- Promote high levels of public awareness (BREAF Quarterly newsletter) and appreciation of the ecosystem services provided by the Breede River estuary, threats posed to its integrity, and compliance management; and

- Enhance our scientific knowledge, through research and monitoring, to:
    - Improve the confidence of the Intermediate Determination of RDM of the Breede River estuary;
    - Estimate more accurate carrying capacity thresholds; and
    - Identify, understand and mitigate indirect and/or cumulative impacts of human activities, both within the estuarine zone, as well as those beyond its boundaries.

6 SPATIAL ZONATION

6.1 Introduction

The zonation of any estuary is necessary to guide sustainable utilization without degradation of the estuarine environment (Clark 1977). Zonation should therefore, essentially demarcate:

a) the geographical boundaries of the estuary (see Figure 13 – 16) (e.g. the Estuarine Functional Zone, 5m amsl contour, river-estuarine interface, coastal protection zone, coastal management line, and floodlines);
b) the conservation of biodiversity[4] through the setting aside of conservation areas/protected zones;
c) appropriate buffers in which land use and development is strictly controlled and monitored; and
d) appropriate recreational activities and carrying capacities thereof.

[4] which is also addressed in terms of compliance under the MLRA

The Breede Implementation project engaged stakeholders extensively and confirmed that there is a need to delineate distinct areas of the Breede River Estuary for management purposes. The following areas were identified based on clearly identifiable land-based features as per SAMSA Aids to Navigation area-based approach and are depicted in Figure 17:

- Area 1 - Upper limits of estuary to Malgas Pont
- Area 2 - Malgas Pont to Lemoentuin
- Area 3 - Lemoentuin to Matjieskloof
- Area 4 - Matjieskloof to Diepkloof
- Area 5 - Diepkloof to Riverine
- Area 6 - Riverine to Whitehouse
- Area 7 - White house to Groenpunt
- Area 8 - Groenpunt to mouth

6.2 Estuarine boundaries

The C.A.P.E Estuaries Programme considered the National Water Act (NWA) definition of an estuary as the most appropriate definition, i.e. "*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*".

For the purposes of determining the Resource Directed Measures (RDM), the then Department of Water Affairs defined the geographical boundaries of an estuary as follows, "*the seaward boundary is the estuary mouth and the upper boundary the full extent of tidal influence or saline intrusion, whichever is the furthest upstream, with the five meter above mean sea level (amsl) contour defined as the lateral boundaries*".

The ICM Act further defines an estuary as "*a body of surface water -*

a) *that is permanently or periodically open to the sea;*
b) *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*
c) *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*".

This 5 m topographic contour encapsulates the Estuarine Functional Zone definition in the NEMA EIA Regulations (GNR 985) 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…*". The National Biodiversity Assessment goes further than this definition of the EFZ and includes the following definition: "*The open water area of an estuary together with the associated floodplain, incorporating estuarine habitat (such as sand and mudflats, salt marshes, rock and plant communities) and key physical and biological processes that are essential for estuarine ecological functioning*".

The Breede River estuary is approximately 52 km long, i.e. from the mouth at Witsand to the extent of the tidal influence about 10 km upstream of Malagas at the mouth of the Napkuys River and is located at 34° 24' 26.7634 S and 20° 24'26.762 E According to Government Notice No. R. 727 dated 16 September 2011 (in terms of the Marine Living Resources Act, Act 18 of 1998), which addresses regulations for fishing in the estuary of the Breede River, the estuary of the Breede River is officially defined as the tidal portion of the Breede River that lies between the longitudes E20°51'342 and E20° 51'.000, as the western and eastern boundaries respectively. More specifically, the boundary lines denoting the Breede River Estuary's extent are as follows:

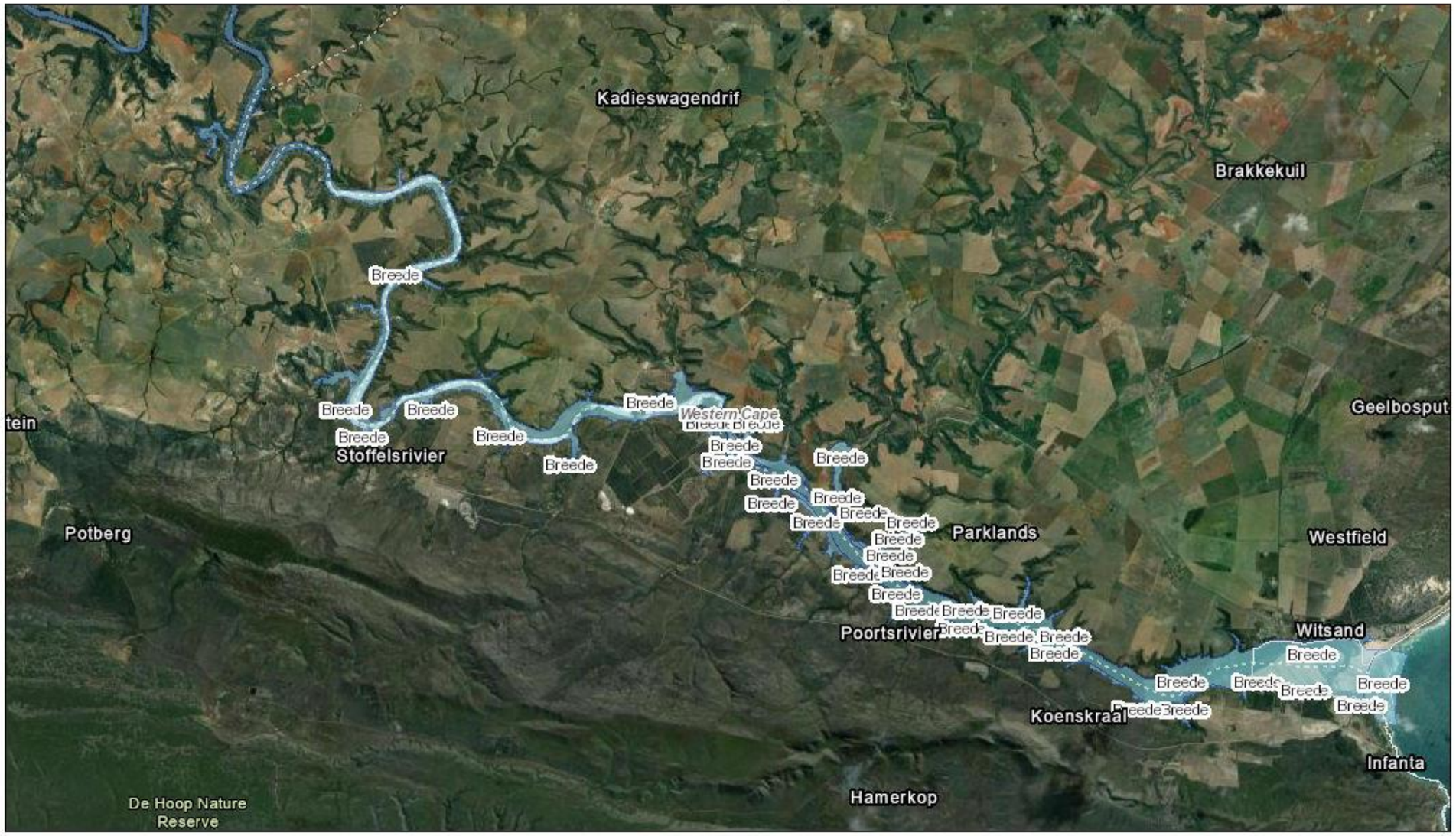
To the west, the official land surveyor's mark as the official extent of the tidal reach placed at position 34°15'0495" latitude and 20°30'4945" longitude. To the east, the eastern boundary line be denoted by the line of latitude east 20°15, whereby the

existing beacon on the buttress of the southern bank is anticipated as being in the correct position. The mouth shall then extend from that point, relevant to its variable extent, to the approximate end of the beach adjacent to the buildings of the beach restaurant and ablution block.

Figure 16 Geographical boundaries of the Breede River estuary – lower estuary

illustrate the boundaries of the Breede River estuary, including the EFZ, geographical regions, biophysical regions, River-Estuarine Interface (REI), floodlines, 5m contour and the Coastal Protection Zone.

Breede Estuary EFZ



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Prince Edward Islands

RSA Mainland

Provinces

Estuaries (NBA 2018)

1:144,448

0 1 2 4 mi

0 1.5 3 6 km

Department of Environmental Affairs: Oceans & Coasts, Esri South Africa, Esri, HERE, Garmin, Foursquare, METI/NASA, USGS, Earthstar Geographics, Dept Environmental Affairs, ESRI, CD:NGI, DWA, SAHRA

DFFE

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Figure 13 Geographical boundaries of the Breede River estuary – Estuarine Functional Zone as per the National Biodiversity Assessment 2018 (DFFE Coastal viewer, 2023)

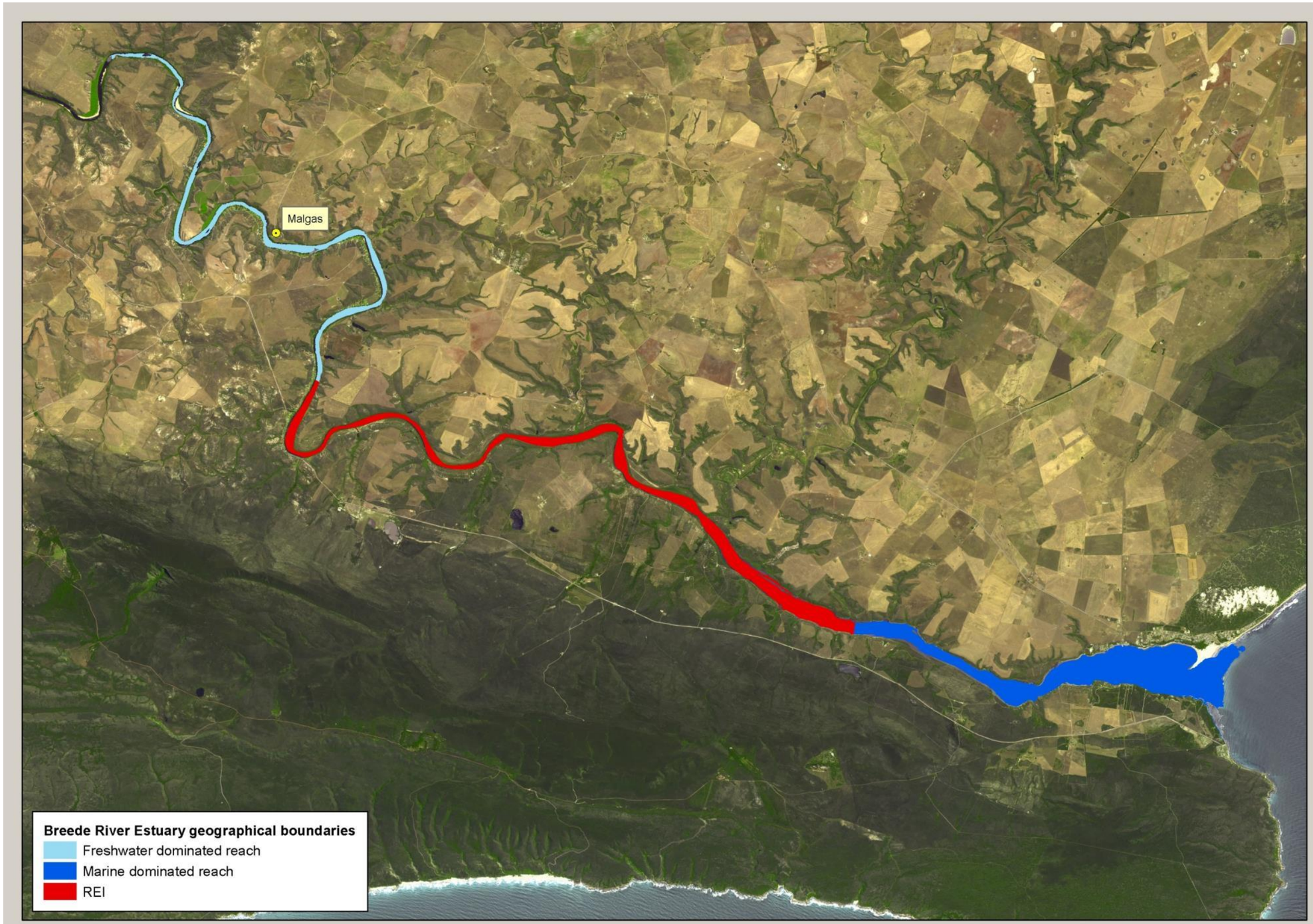

Figure 14 Geographical boundaries of the Breede River estuary, showing different biophysical regions

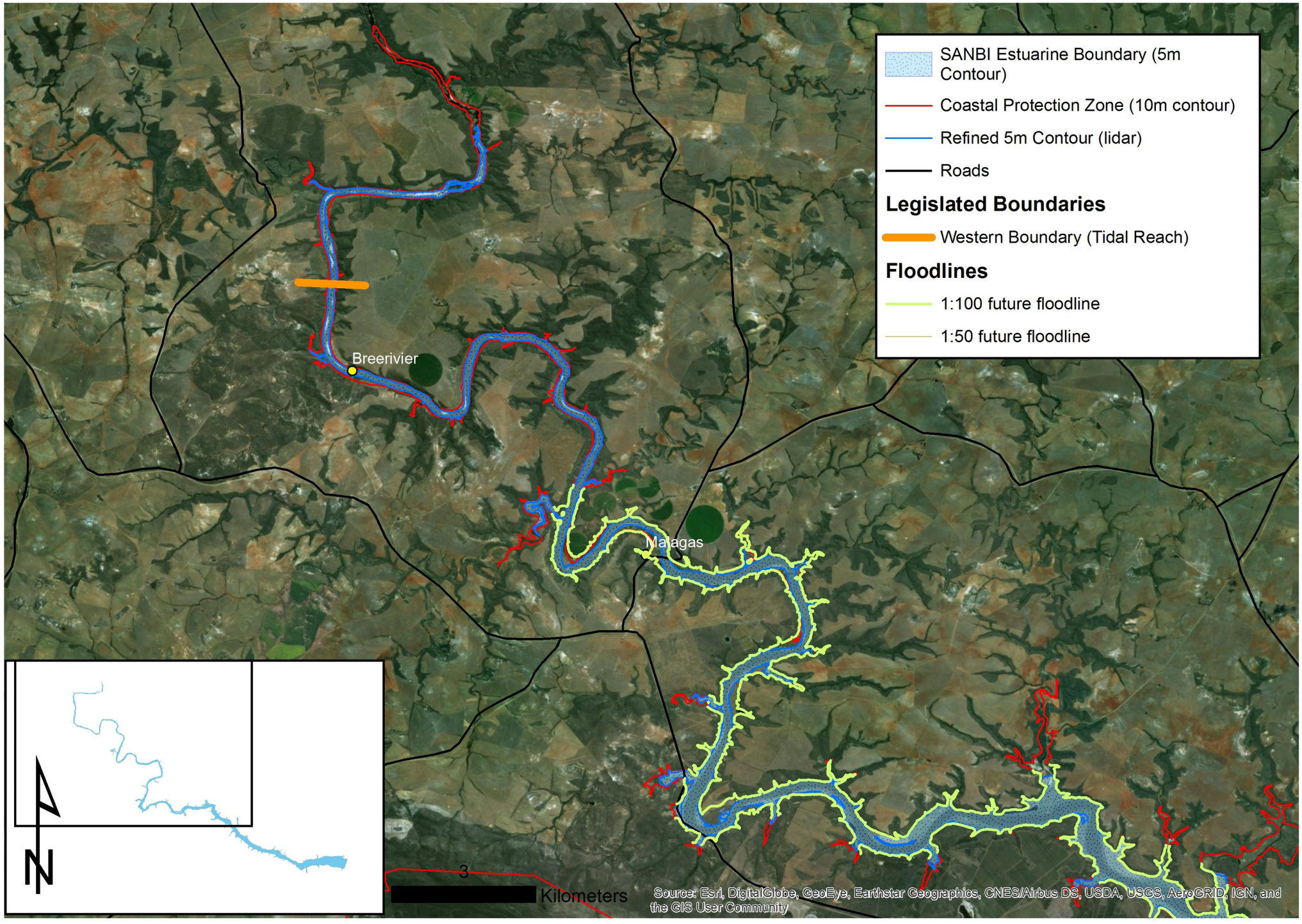

Figure 15 Geographical boundaries of the Breede River estuary – upper estuary

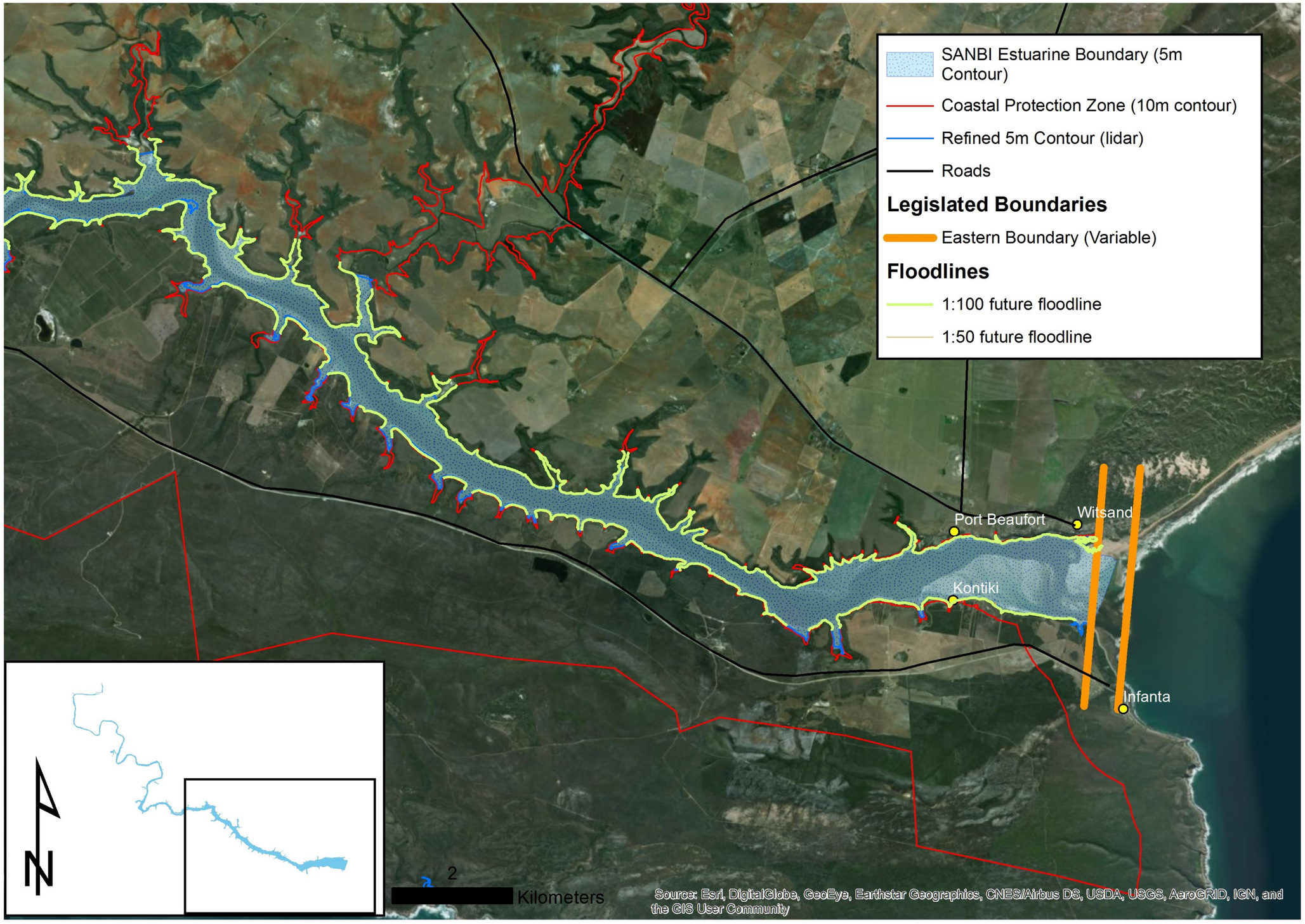

Figure 16 Geographical boundaries of the Breede River estuary – lower estuary

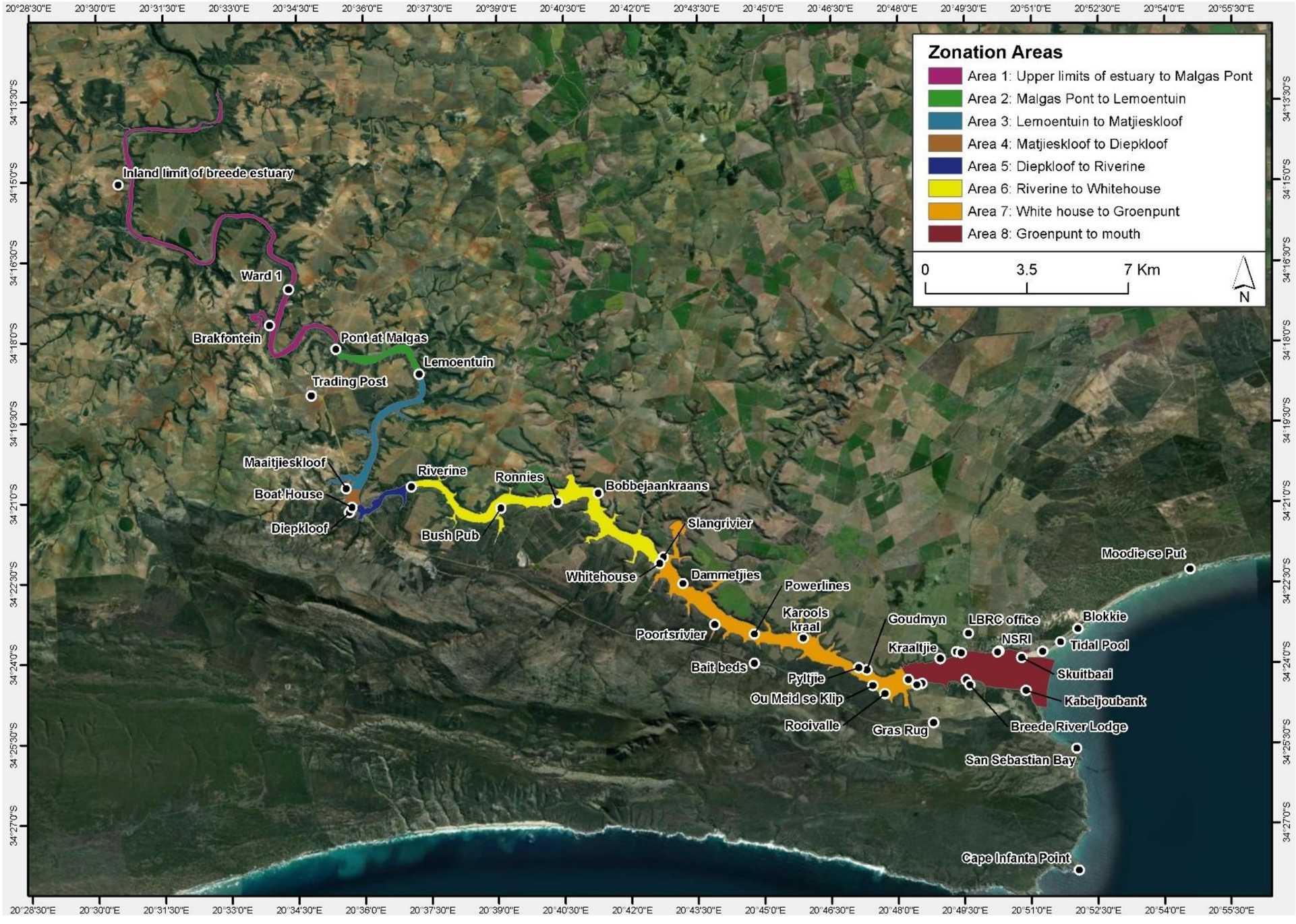

Figure 17 Delineation of Breede River Estuary management areas for future planning (Errol Cerff, 2022)

6.3 Proposed Zonation Plan

The management objectives identified in the previous section have been translated into an estuary zonation plans (EZP) (Figure 20-24). The EZP (and applicable management objectives) is the blueprint against which all development, and any other activities which impact on the estuary, should be tested for compliance.

A habitat sensitivity analysis should be the baseline which guides the differentiation of the various zones, identifying threatened, ecologically important habitats as no-go or minimal disturbance zones; those areas which can support controlled, sustainable exploitation of marine living resources; and those where various forms and levels of appropriate water-based recreation are acceptable.

The habitat map developed by Bornman (cf. SSI, 2008), was used as the baseline for the identification of sensitive estuarine habitats on the Breede River estuary (see

Figure 18 Habitats of the Breede River estuary (lower section)

The zonation proposed in the previous EMP, was mainly derived from a habitat perspective, but was deemed too complex, and therefore, from an implementation and management perspective, impractical to establish, monitor and enforce (see Proceedings of Review Workshop; CSIR, 2009).

Working Groups within the Breede River Estuary Advisory Forum (BREAF) have been established on either a permanent or a temporary basis to deal with issues that require more detailed attention. The Working Groups have specific terms of reference as assigned by the BREAF Chair in collaboration with BREAF members. These Working Groups provide report back to the BREAF on a regular basis as specified in their terms of reference. Working Groups focusses on priority matters derived from the BREMP. The Working Groups actively engages local citizens and bring their local knowledge and experience to address priority issues.

As part of this review, the Zonation Working Group have assisted in drafting a transparent zonation plan that is both functional and rational delineating three broad zone types:

- Conservation/protection zones (Figure 20 & 21);
- Development buffer zones (Figure 22 & 23); and
- Recreation-based zones (Figure 24).

Economies around estuaries change, and as new activities come into existence the zonation should be adjusted to manage and potential conflicts between new and different interests now and in the future. On the spatial level of the zonation plan it is desired to have all interests represented appropriately, identified sensitive areas be protected, and that there is clarity on where certain activities are permitted.

There are different users on the estuary and in the interest of orderly and better management it is important that it is clear to all what can and cannot happen on the

estuary system without compromising the environmental integrity of the system in terms of sustainability and other management issues.

6.3.1 Conservation/protection zones

OPERATIONAL OBJECTIVES:

- Identify priority areas for conservation/protection;
- Estimate Thresholds of Potential Concern in terms of loss of habitat and species population dynamics;
- Identify an appropriate suite of conservation measures for each priority area;
- Maintain high levels of compliance in respect to conservation measures through the full suite of compliance management methods, e.g. awareness, legal support, law enforcement, etc.;
- Rehabilitate disturbed sites;
- Control of invasive alien plants;
- Aircraft altitude restrictions; and
- Prevent encroachments.

The identification of conservation/protected zones should be based on studies such as Carter (1983) and Taljaard (2003) (in conjunction with Bornman's habitat map), wherein the ecological importance of habitats that fulfil the role of zones of primary production, fish nurseries, wader feeding grounds (e.g. Zostera beds, salt marshes, freshwater tributaries mud banks, etc.), and bank stabilization (e.g. Reed beds), are highlighted (Figure 20 and Figure 21).

An inherent problem with defining conservation/protected zones in the Breede River estuary is the spatial configuration of developments (both infrastructural and agricultural) and the levels of water-based recreation that already exist on this estuary. The sensitive habitats that should be afforded some level of conservation management, are also spread along the length of the estuary, often as fragmented units, whilst the main forms of recreation (e.g. boating and fishing) and associated activities (e.g. skiing and bait collection), are also practiced along extensive stretches of the estuary. This is exacerbated by two development nodes being spaced almost at opposite ends of the estuary, i.e. Witsand at the mouth and Malagas near the upper reach of the estuary. This makes it not only difficult from a compliance management perspective, but also in the identification of the priority areas for conservation (as per National and Provincial Protected Area Expansion Strategy).

Furthermore, some of the habitats can be transient, both spatially and temporally, e.g. episodic flooding events influence the spatial dynamics of the habitats in terms of geographical position and size. The challenge will therefore, be with the assistance of estuary experts, to identify the high priority sites and adequate representation thereof. Only then can different levels of management be afforded to these areas in terms of how much disturbance, if any, is permissible. Conservation measures could include regulation of activities such as bait collection, anchoring, beaching of boats, access by boat, grazing and trampling, whilst the more sensitive/irreplaceable areas, that are

indeed locally threatened, could be protected by a total restriction of any direct human activity. Innovative forms of compliance management will be required to afford adequate conservation of representative areas of these habitats. It will be necessary to enact any restrictions with law, to assist in conserving/protecting these zones.

In the initial EMP review workshop (CSIR, 2009), it was noted that the freshwater input sites (tributaries) which provide refuge areas and ecotones in terms of salinity and therefore biodiversity, should be protected in terms of conservation. These sites are considered important fish nursery refuges. Salt marsh areas (supratidal, intertidal and floodplain salt marshes), *Zostera capensis* beds and mudflats have also been identified as ecologically important habitats in the estuary, which are sensitive to disturbance and require conservation (Carter, 1983; Taljaard, 2003). Zostera beds are important as they provide sheltered rich habitats for many estuarine invertebrates and juvenile fish and feeding grounds for invertebrate feeding waders. Zostera beds are disturbed by bait collection, trampling and the beaching of boats. Once the root and rhizome system have been disturbed, the plants may take years to recover. The plants are also sensitive to increases in turbidity as a result of boating activities that stir up bottom sediments and reduce light available for photosynthesis. The *Zostera* beds are reported to have decreased in area (Taljaard, 2003).

Common Reeds (*Phragmites australis*) are a widespread and robust reed. Reaching four metres in height this reed species can tolerate water with a salinity of up 40 PSU (seawater is ±35 PSU) if their roots are in freshwater seepage areas. However, common reeds typically occur in estuaries where the salinity is less than 15 PSU. In the Breede River Estuary these reeds first occur at Powerlines (12km from mouth). Dense stands are found in the upper reaches of the estuary.

There has been a decrease in the total area covered by reeds and sedges in the Breede between 2009 (229.3 ha) and 2020 (132.9ha). The flowering season is between December and June. Within systems, this species is ecologically important in stabilising riverbanks and increasing habitat availability for fish by acting as a nursery area. The reeds and sedges in the Breede are an important source of organic matter and nutrients in the system which is important for higher trophic levels (position of an organism in the food chain) to be supported in this estuary (Riddin and Adams, 2020).

It is recommended that fixed point photography sites are established along the length of the Estuary to assist in quantifying the extent (rate) of erosion taking place. Approximately 50 sites, visited and photographed regularly, could help to identify drivers of erosion at the lower Breede Estuary. Fixed point photography site selection should be guided by existing erosion evidence, both natural and man-made; habitat type, with an emphasis on erosion prone habitats; known erosion drivers, such as wind and vessel wakes; and existing man-made structures. The information collected could assist in guiding infrastructure standards and policymaking in the medium term.

The Breede implementation project commissioned by the DEA&DP in 2020 has highlighted some short term and low coast management interventions that could be

included to protect sensitive habitats. DFFE Fisheries Research (Dr Stephen Lamberth pers. comms), recommended the following process:

1. Designate all salt marsh bait collection areas as "sensitive";
2. Designate a certain percentage of the total and perhaps of the large bait collection areas as "sanctuaries" or "rehabilitation" zones;
3. These must be clearly marked with buoys, or related markers, as no-go zones, and this must be enforced;
4. The existence of these zones must be widely publicised through the BREAF;
5. The rationale and scientific basis for this selection of "sanctuaries" must be developed in collaboration with the local residents- perhaps as a sub-committee of the BREAF;
6. The designation as a "sanctuary" must have a finite duration based on the estimated time the area will take to recover. The time duration of this designation and measures which will indicate recovery must also be developed in collaboration with the local residents;
7. When an area is removed from the "sanctuary" list and reopened, all stakeholders must be notified via the BREAF; and
8. If another area needs to be rehabilitated, the process must be followed again.

The EMP should aim to engage local residents on proposed "sanctuary" zones for fish species as per the above section on bait sanctuaries. These proposals would aim to assist with the recovery of the overfished cob and grunter stocks.

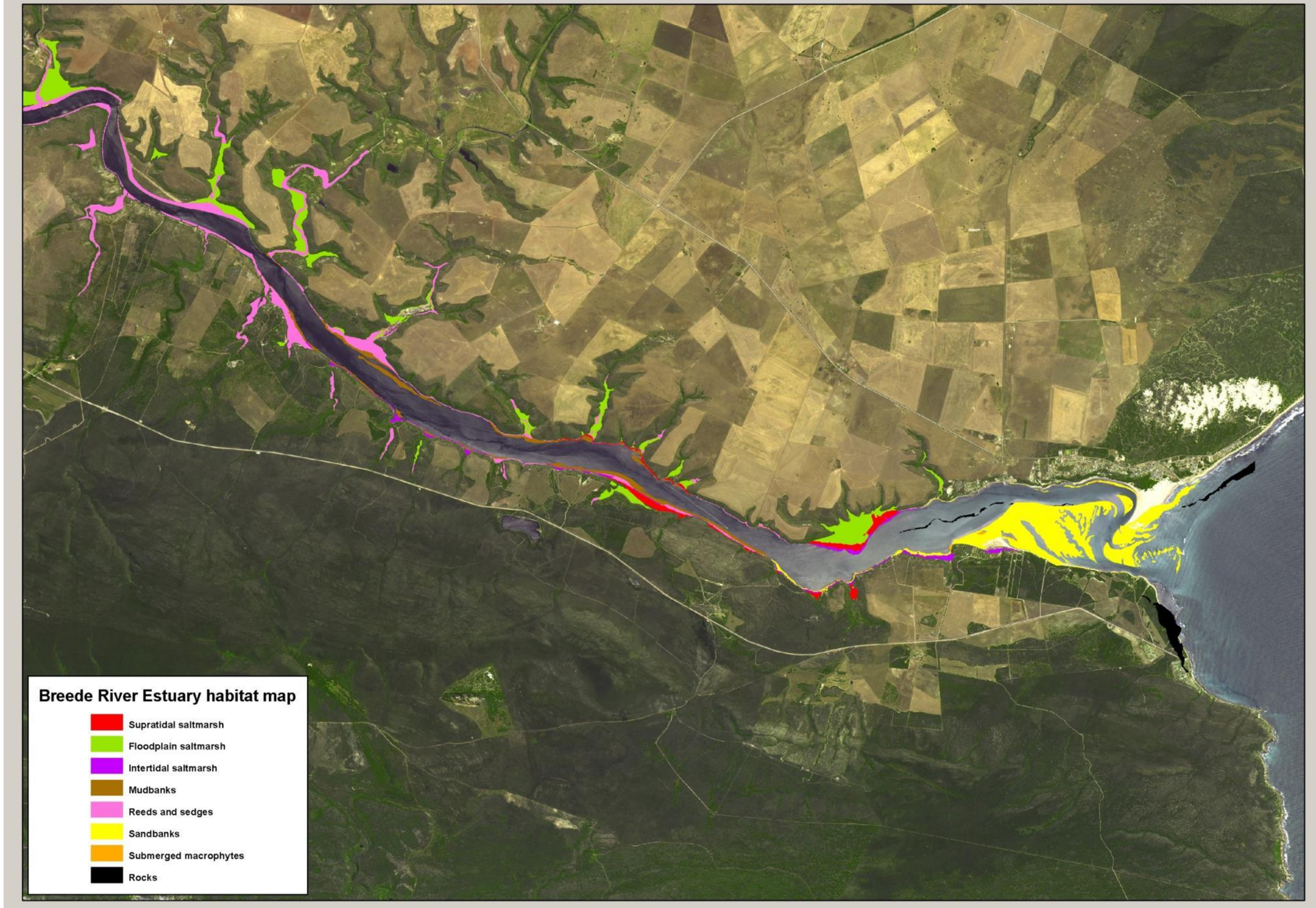

Figure 18 Habitats of the Breede River estuary (lower section)

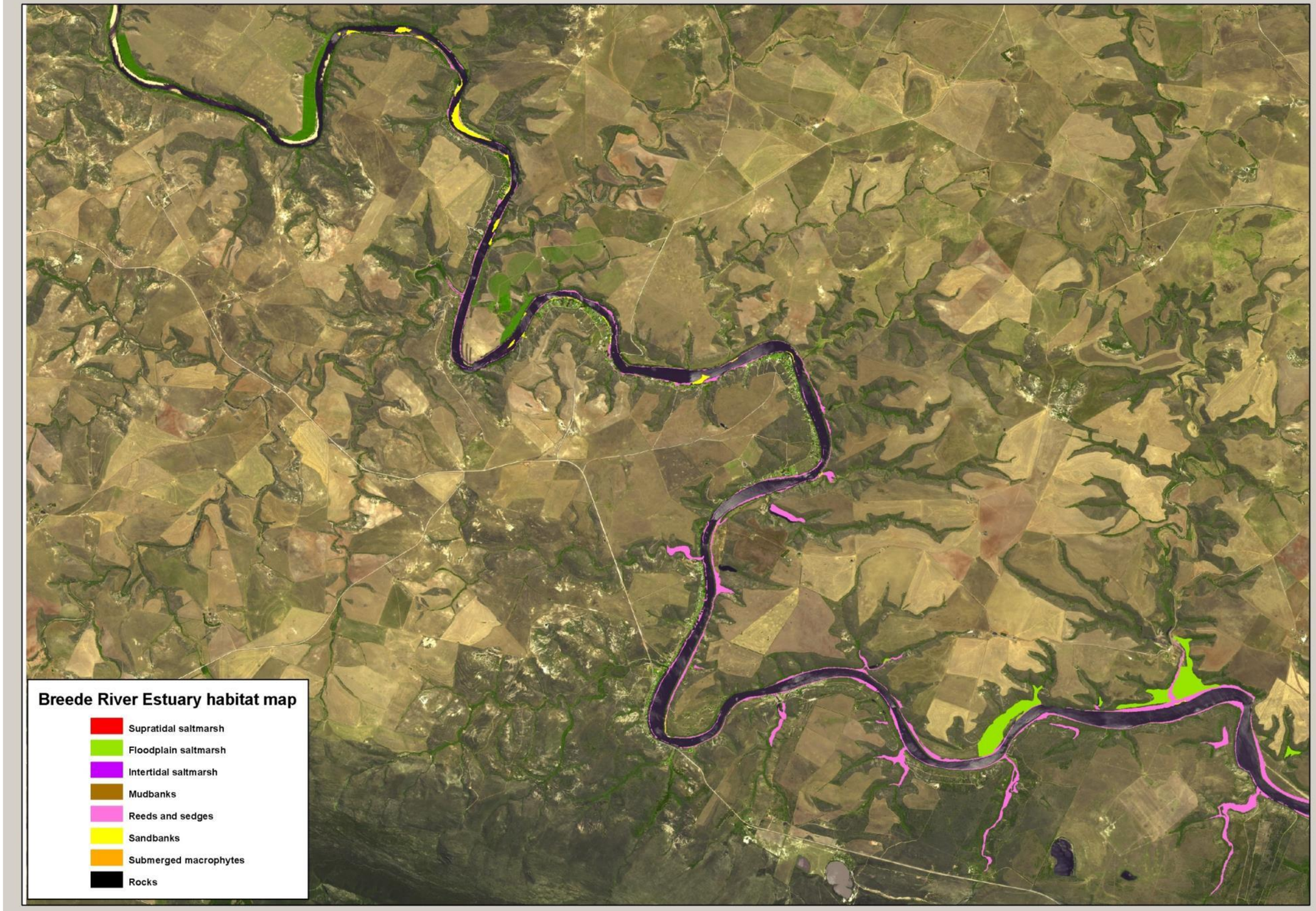

Figure 19 Habitats of the Breede River estuary (upper section)

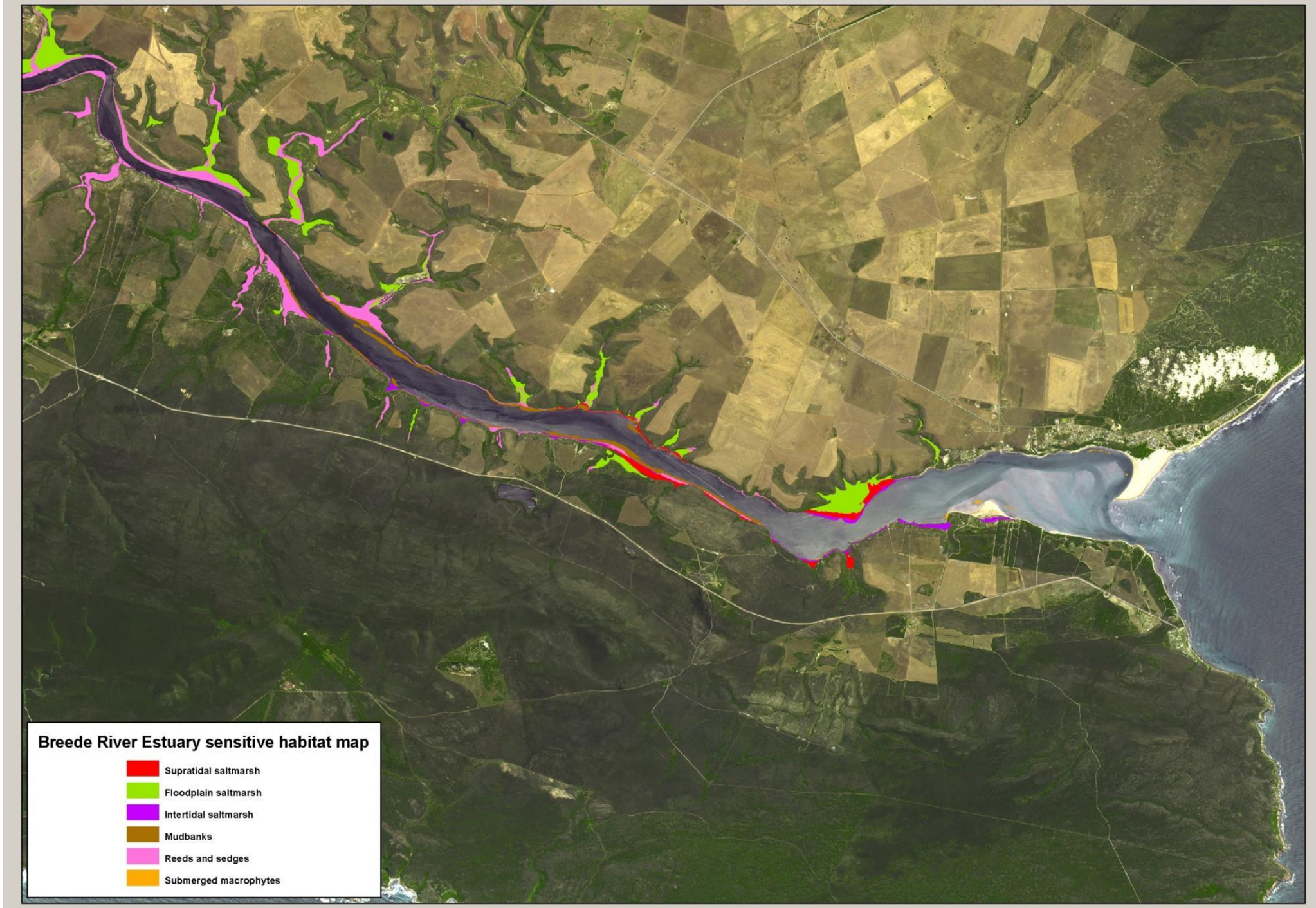

Figure 20 Conservation/protected zones proposed for the Breede River estuary (lower section)

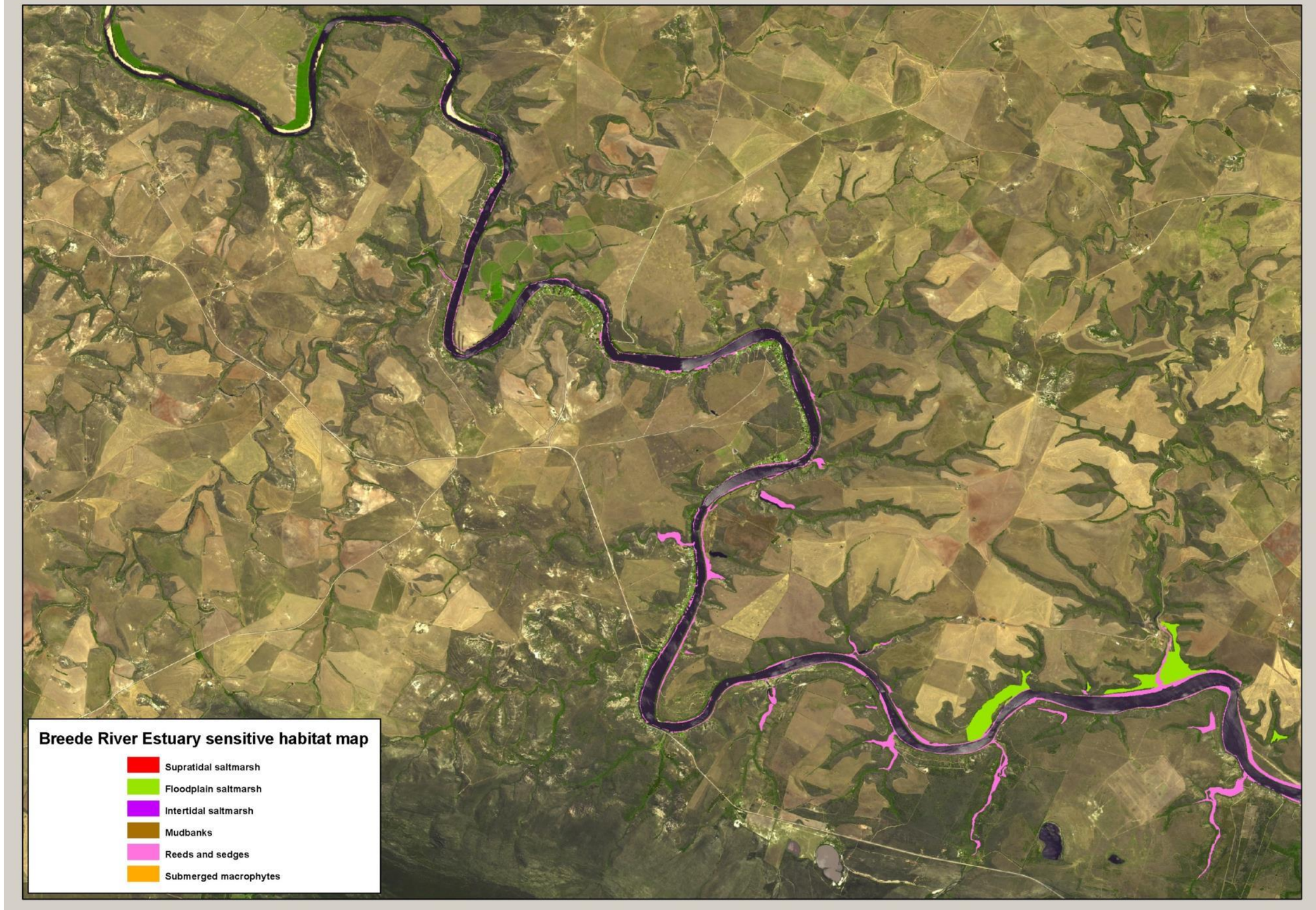

Figure 21 Conservation/protected zones proposed for the Breede River estuary (upper section)

6.3.2 Development buffer zones

OPERATIONAL OBJECTIVES:

- To ensure that all proposed developments within the development buffer zones, adhere to the EIA process in terms of the full suite of relevant environmental legislation, e.g. ICMA, NEMA, NWA, CARA, WMA, NHRA, NPRDA etc.;
- To ensure that the relevant development buffer zones are captured into the municipal IDPs and SDFs;
- To highlight area where applications are relevant to the Breede estuary and that should be tabled at the BREAF meetings;
- To ensure that the BREAF is timeously made aware of all proposed developments and is afforded adequate opportunity to make comment;
- To empower the implementing agent(s) to monitor compliance with Environmental Authorisations; and
- To take into consideration the possible implications of the 5m contour line and the determined flood lines, in terms of existing and proposed developments and activities.

Four development buffer zones are identified in the existing environmental legislation, e.g. the ICM Act (Act No. 24 of 2008, amended 2014), the National Environmental Management Act (Act No. 107 of 1998) (NEMA), etc. (see **Error! Reference source not found.** and **Error! Reference source not found.**).

6.3.2.1 Coastal Overlay Zone and Coastal Protection Zone

Under the ICM Act, the default Coastal Protection Zone (CPZ) is a continuous strip of land extending from the coastal and estuarine high-water mark to at least 1 000 m inland in rural areas, and 100 m in urban areas, covering all areas not already zoned for residential or industrial development. The relevant municipalities are required to incorporate the default CPZ and coastal management lines and proposed coastal overlay zones, once adopted, within their spatial development frameworks and land use management systems in order to manage and regulate the use of land at the coast and ensure an adequate buffer for the estuary.

6.3.2.2 32 m river and wetland buffer

A buffer area of 32 m from the edge/bank of all rivers, water bodies and wetlands/salt marsh is a buffer zone intended to protect the ecological functioning of the riparian system. Any activities within this area are controlled by the EIA regulations of NEMA. This 32 m zone is listed in terms of the new EIA regulations (2014). An environmental authorization is required for activities within this zone. The area is proposed as a development setback line along the estuary in order to facilitate the protection of riverbanks and the sensitive vegetation along these banks. It is also proposed as a rehabilitation priority area where current agricultural/development encroach into this buffer zone. In such areas (e.g. wherever ploughing is occurring within this 32 m buffer) the priority is to discourage such activities and rehabilitate existing disturbed areas.

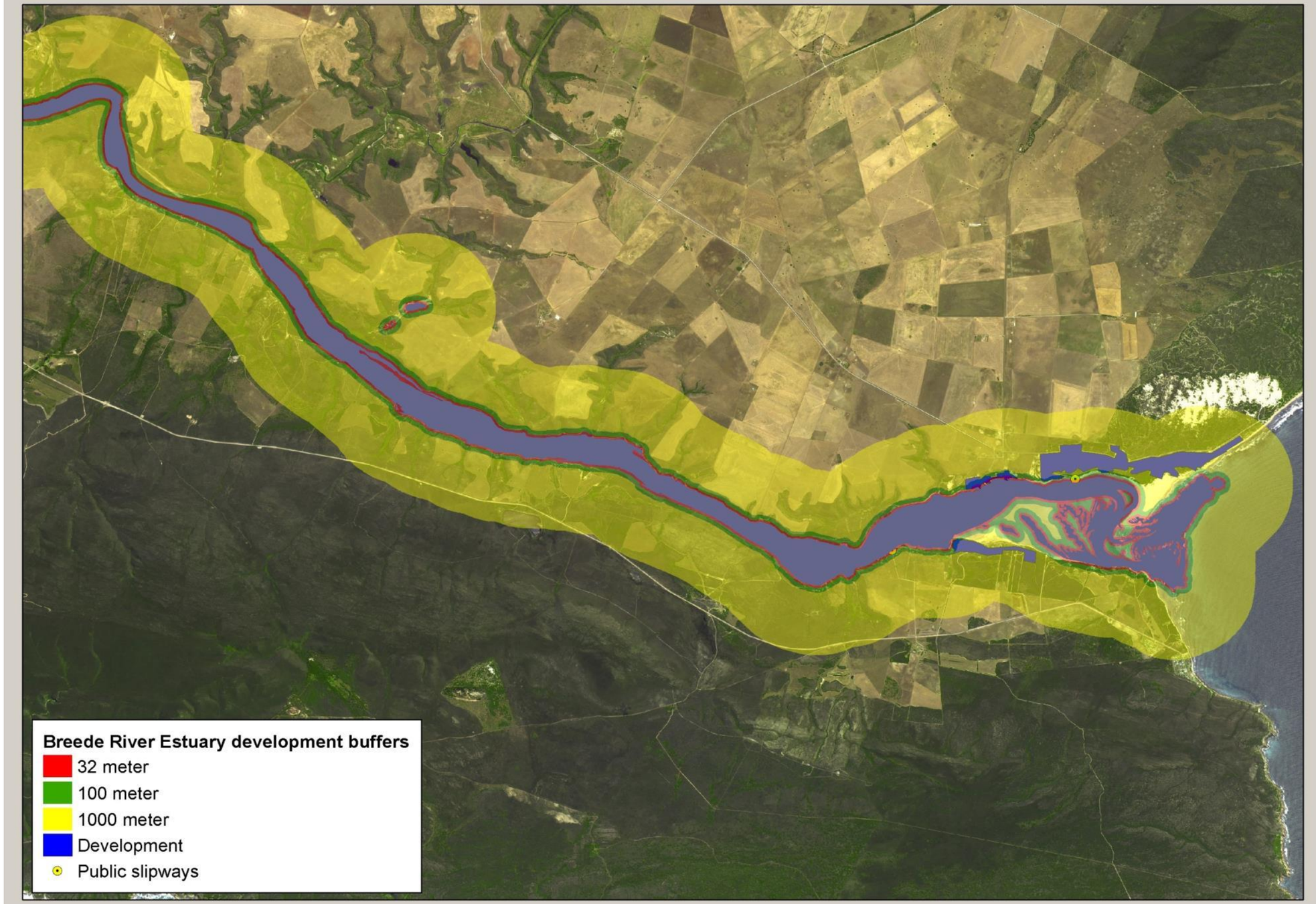

Figure 22 Development buffer zones for the Breede River estuary (lower section)

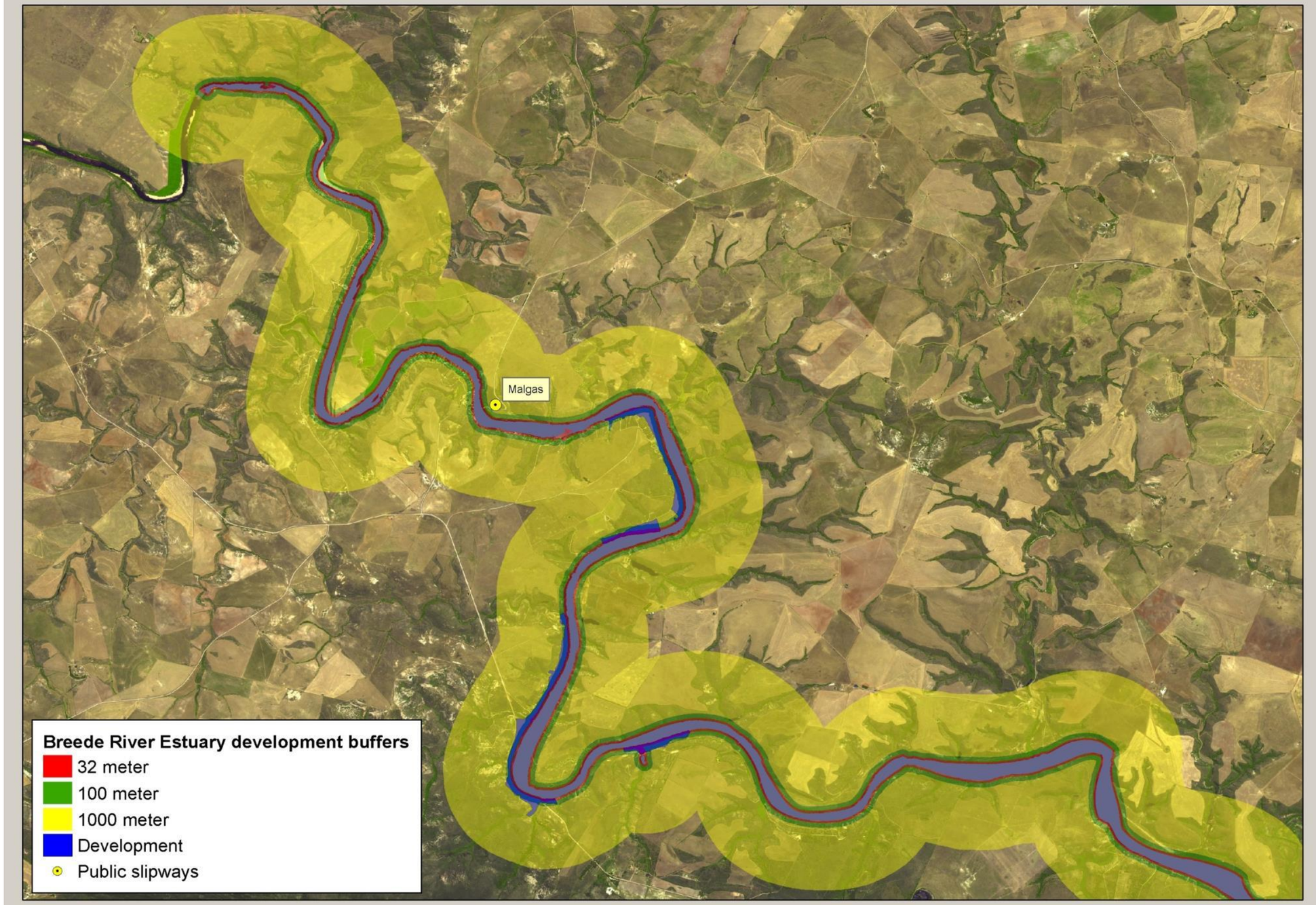

Figure 23 Development buffer zones for the Breede River estuary (upper section)

6.3.3 Recreation-based zones

OPERATIONAL OBJECTIVES:

- To enforce by-laws in terms of the current suite of water-based activities, e.g. skiing and non-skiing zones, speed limits, etc.
- Identify measures to mitigate environmental impacts (see also conservation zones)
- To identify and demarcate zones for other activities such as kite-surfing, windsurfing and catamarans

The main activities on the Breede River estuary are boating, recreational fishing, and skiing. Other uses, predominantly near the mouth, include wind-surfing, kite-surfing, and occasionally sailing.

In the interest of safety, it is recommended that a no-wake zone is established 100 metres on either side of the Malgas Pont / Ferry.

Skiing, wakeboarding, and skurfing (surf-skiing) are perhaps the activities which have the potential to cause the most conflict, and for this reason, a "No-skiing" zone and a "Skiing" zone were enacted in the by-law (Province of the Western Cape: Provincial Gazette No 6697, 12/02/2010) Figure 13), i.e., no skiing below the confluence of the Slangrivier mouth. It is noted that the Hessequa and Swellendam by-laws both prohibit driving a boat in a reckless manner (3. (1)(a)) or without due consideration of other users (3.(1)(f)) or in contravention of any usage zone as determined by the municipality (3.(1)(j)). With reference to the clauses quoted earlier, the municipal approval of the EMP and its associated zonation would mean that the zonation can be regulated using the EMP without additional regulatory mechanisms. The municipalities are also mandated to designate areas of the river for environmental or conservation purposes (3.(7)).

Wake-boarding is an activity that may only take place in the "Skiing" zone. It has potential for environmental impacts, particularly in terms of bank erosion, and hence, may not, according to the existing by-law, take place closer than 30 m to the banks of the estuary. It was proposed that the existing by-law be changed to state that in areas where the river is less than 60 m wide, as well as opposite any development nodes, e.g. Lemoentuin, Malagas, and Riverine, etc. that wake- boarding should also not be permitted.

Kitesurfing, windsurfing, and sailing are also activities that could potentially conflict with recreational fishing and boating. The lower estuary is recognised internationally as a world class kitesurfing site. However, the lower estuary is also at times a high boating

hazard area, and for this reason, it was proposed that a kitesurfing/windsurfing/sailing zone be identified, designated, and enacted in the bylaw, in terms of human safety and user conflict. It is recommended that the western boundary of the kitesurfing and windsurfing zone should be 50 metres from the Government Slipway on the east bank diagonally across to the Aasbank parking area on the west bank. It ought to be mentioned that waterbirds, such as white-fronted plovers, utilise Skuitbaai and the surrounding sand banks as nesting sites. An increase in recreational activity and foot traffic in the mouth area could have negative impacts on local breeding populations. It is therefore recommended that regular monitoring of the sandbanks take place to develop mitigation strategies if negative impacts of recreational activities and foot traffic are observed. It is worth noting that the ideal conditions for kitesurfing are strong winds, which are usually conditions that discourage recreational fishing. The potential for conflict is therefore, most likely less than anticipated.

It is proposed that all water sports performed behind a boat, travelling on the plane, should be allowed west of the Slangrivier confluence, irrespective of boat type and area location. These recreational activities include:

- skiing and slaloming
- tubing
- wakeboarding (behind a boat on a plane)
- knee boarding

It has been identified through extensive stakeholder engagement that large wakes caused by recreational activities performed behind boats that are not on a plane and/or are fitted with wake-generating apparatus such as wedges / ballast tanks / people purposefully adding weight to the stern are responsible for increasing conflict between user groups and damage to jetties, moored boats, and riverbanks.

It is therefore recommended that a designated 'Wake/Off-Plane Sports Test Zone' is established east of the Breede Riverine Estate to the confluence of the Slangrivier. Activities allowed in this zone include:

- skurfing (surf-skiing),
- wakeboarding (behind a wake boat or off the plane),
- hydro foiling,
- as well as any other activity requiring the use of large wakes as referred to above.

Negative impacts created by large wake sports would be mitigated by restricting these activities to the proposed area where there are relatively few moored boats alongside jetties and more reedbeds to buffer the impacts of riverbank erosion. The river is also wider in this area, allowing the wakes to lose energy before reaching the riverbank.

It has been proposed that, given the increasing trend of certain property owners purchasing large boats with the ability to create deeper, more dynamic waves in the wake, these boats be classified as unsuitable for the Breede River Estuary based on the resultant damage to private property and the environment. Furthermore, it must be noted that all wake studies indicate that the Breede River Estuary is too narrow to support wake / off-plane water sports.

The table below summarises the Zonation Working Group's proposed recreation-based zones for towed water sports on the estuary:

Table 4 Recreational Zoning for Towed Water Sports on the Breede River Estuary

PLANING WATER SPORTS ZONE All recreational activities performed behind a boat travelling on a plane, irrespective of boat type and location west of the Slangrivier confluence.	WAKE/OFF-PLANE TEST ZONE A designated zone established east of the Breede Riverine Estate to the confluence of the Slangrivier in which the following wake-generating sports will be permitted.
Skiing	Skurfing (surf-skiing)
Wakeboarding (behind a boat travelling on a plane)	Wakeboarding (behind a wake boat or off the plane)
Tubing	Hydro foiling
Knee boarding	Any other activity requiring the use of large wakes as referred to above

Based on the relevant research and extensive engagements, the following map indicates proposed zonation of recreational activities in the Breede estuary (Figure 24).

Implementation of the recreation-based zones

The final zoning of the estuary must be widely published. It remains the responsibility of the local and provincial authorities to inform members of the public accordingly.

SAMSA approved marker buoys are required to designate the western and eastern boundaries of the 'Wake / Off-plane Sports' zone and the no-wake zone 100 metres of either side of the Malgas Pont.

Boats traversing to the designated 'Wake / Off-plane Sports' zone should do so with consideration to the environment and property owners by having their engines trimmed and travelling on a plane to minimise wakes.

From an enforcement perspective, the Municipal River Management by-law pertaining to safe and lawful recreational use of the Breede River Estuary must be revised to include the proposed geographical restrictions to the aforementioned recreational activities. The revised bylaw must include a fine for when a boater is in contravention of the respective zoning of the Breede River Estuary.

Figure 24 Proposed zonation for the Breede estuary – current EMP

Figure 25 Proposed Kite surfing / Windsurfing zone as per proposed zonation plan (Figure 24)

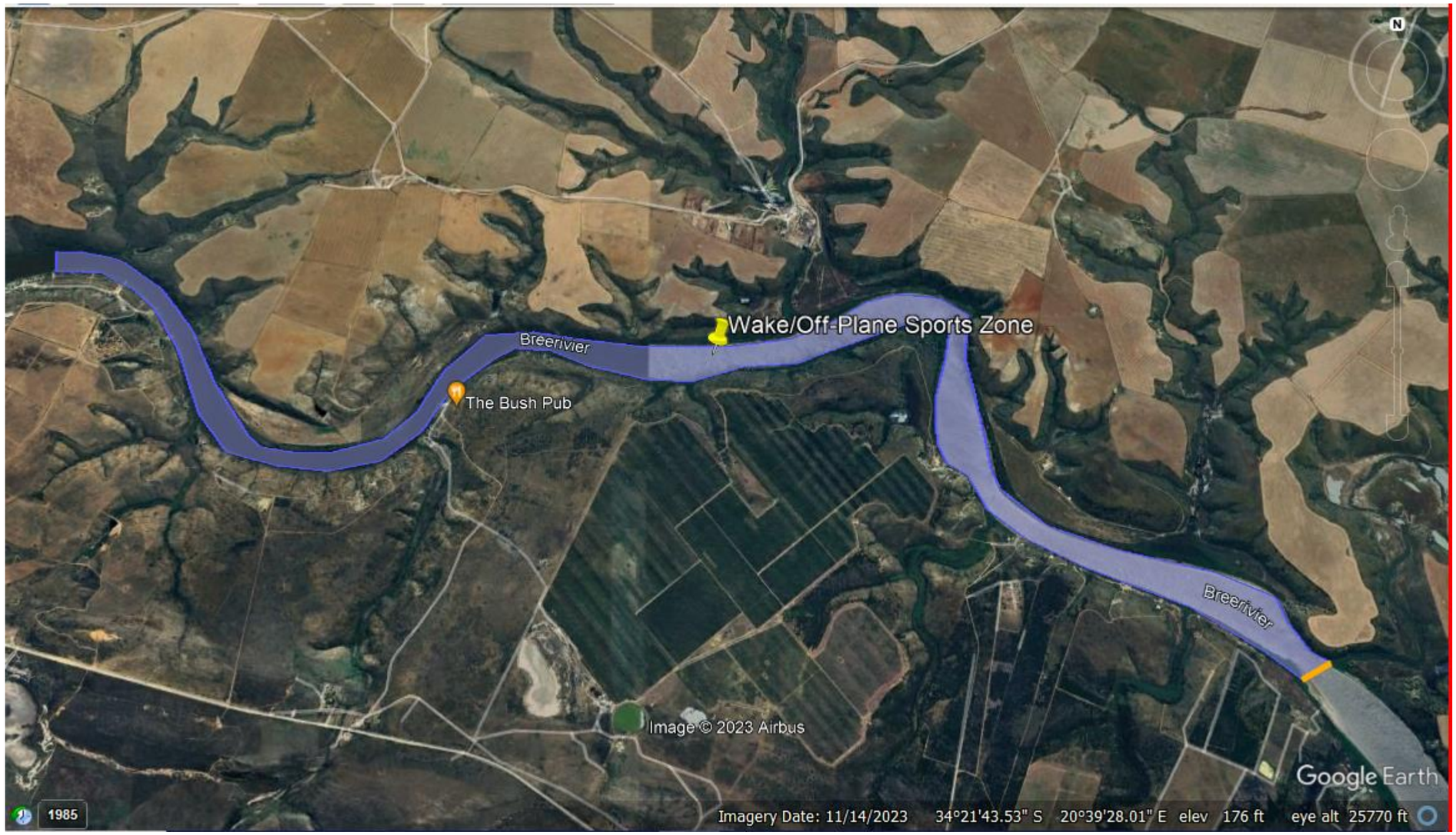

Figure 26 Proposed Wake/Off-plane Sports zone as per proposed zonation plan (Figure 24)

Figure 27 Proposed no wake zone as per proposed zonation plan (Figure 24)

7 RECOMMENDED MANAGEMENT PRIORITIES

The project plans discussed hereunder, give effect to the various management objectives and the EZP by identifying the priority management interventions that are required to ensure their realisation.

Five project plans have been compiled for the efficient and effective management of the Breede River estuary. Each plan corresponds to a key objective and contains applicable management actions, supporting regulations, level of priority, responsible institution(s), and required resources if such information is available. These are arranged in general order of priority, but nevertheless recognize that the neglect of any leg will compromise overall success:

- Co-management and effective governance;
- Sustaining water quality & quantity;
- Conservation of biodiversity;
- Sustainable development; and
- Public education, awareness and knowledge enhancement.

It should be noted that there is some interconnectedness between the plans and some management actions, as they all ultimately contribute to the conservation of ecosystem function and patterns of biodiversity, which in turn leads to the conservation of a sustained supply of ecosystem goods and services delivered by the estuary.

7.1 Institutional and Management Structures

Co-management and effective governance is the keystone for achieving the vision set by the stakeholders for the Breede River estuary, and therefore attainment of the overall strategic objective of conserving its ecological functioning and biodiversity. Without well-structured and efficient institutional and management arrangements, integrated environmental management of the estuary may be no more than a series of uncoordinated reactions to immediate problems. Ensuring co-management and effective governance is therefore probably the most important objective to be achieved. To this end, DEA&DP is in the process of developing the Western Cape Estuarine Management Framework and Implementation Strategy to set criteria for conformance with respect to establishing institutional and management structures for estuarine management within the province.

Regarding the Breede, three main 'institutions' will be in effect regarding the management of activities in and around or relating to the Breede River estuary. These are: the **Responsible Management Authority (DEA&DP)**; the **BREAF**, which is a collection of stakeholders with vested interest in the estuary and the vehicle through which the implementation of the EMP can be monitored; and the **implementing agent on behalf of DEA&DP,** which can be designated by DEA&DP to implement certain priorities on behalf of the Management Authority in respect of the EMP (See Section 8.1 for more detail).

Table 5 Management Actions for Institutional and Management Structures

ACTION	RELEVANT LEGISLATION	PERFORMANCE INDICATOR	WORK PLAN	
			TIMING	RESPONSIBILITY
Management Objective 1: Maintain a fully functional estuary advisory forum (the BREAF) that will facilitate co-management and effective governance*				
Identify and appoint implementing agent	ICMA MSA NEMP IGRFA	Implementing agent contracted through multi-lateral agreement.	2024 and Ongoing	DEA&DP Swellendam and Hessequa Municipalities Organs of State
Mediate conflict between river users in collaboration with the BREAF	ICM Act and Municipal Systems Act	Managed conflict with users.	2024 and Ongoing	All BREAF Members
Active collaboration of BREAF with other institutions through shared responsibilities and active representation on Municipal Coastal Committee(s) and other relevant committees	ICM Act	Representation on municipal coastal committees and any other relevant committees; Breede estuary issues raised on agendas; Minutes of meeting	2024 and ongoing	DEA&DP BREAF DFFE
Active participation and collaboration from relevant government departments and organs of state on BREAF	ICM Act Water Act Municipal Systems Act IDP MLRA CARA NEMA	Participation at BREAF by relevant national, provincial & municipal representatives; Minutes (highlighting completed actions), reporting, correspondence and information associated with the meeting	2024and ongoing-	DEA&DP BREAF DFFE

ACTION	RELEVANT LEGISLATION	PERFORMANCE INDICATOR	WORK PLAN	
			TIMING	RESPONSIBILITY
	Disaster Management Act			
Management Objective 2: Unlock the strategic value of the Breede river estuary's ecological infrastructure				
Identify appropriate funding strategies linked to the action plans, recommended by the CBA, per relevant organ of state	ICM Act	Appropriate Funding Strategy completed.	2024 and ongoing	DEA&DP DFFE BREAF Swellendam and Hessequa Municipalities Overberg and Garden Route district municipalities
Continued Investigation and facilitation of partnerships and research opportunities linked to key priority actions	ICM Act and Municipal Systems Act	Partnerships and research opportunities investigated.	2024 and ongoing	DEA&DP Swellendam and Hessequa Municipalities Overberg and Garden Route District municipalities Implementing agent DFFE: Oceans and Coasts branch; NMU, CERC, LBRCT, SAIAB, Research scientists

* Cross cutting with water quantity & quality in terms of cooperative governance with BOCMA

7.2 Water quantity and quality

Securing an appropriate quantity and quality of freshwater input into the Breede River estuary, is the primary action that must be taken to conserving functioning and biodiversity of this unique system. Other conservation management activities aimed at sustaining the integrity of patterns and processes, is the rehabilitation of degraded areas, (e.g. bank erosion, trampling, etc,) as well as effective control of invasive alien plant species. The latter is cross cutting in terms of preserving biodiversity. An affiliation between BOCMA and BREAF will facilitate securing and maintaining the Reserves for Water Quality and Water Quantity for the Breede River estuary. A representative from BOCMA should be a member of BREAF.

Table 6 Management Actions for water quantity and quality

ACTION	RELEVANT LEGISLATION	PERFORMANCE INDICATOR	WORK PLAN	
			DURATION	RESPONSIBILITY
Management Objective 1: Ensure that the Reserves for Water Quantity and Water Quality are maintained through ongoing interaction between the BREAF and BOCMA				
BREAF to monitor the implementation of the Resource Quality Objectives determined by DWS.	NWA	Annual implementation update provided by BOCMA.	2024 and ongoing	CapeNature BOCMA DEA&DP DWS
Continued representation of BOCMA on BREAF	NEMP	Recorded attendance at BREAF meetings; Catchment related matters included in agenda of BREAF Signed membership of BOCMA on BREAF Minutes of BREAF meetings	2024 and Ongoing	BREAF BOCMA DEA&DP
Management Objective 2: Ensure Disaster Management planning and risk identification				

ACTION	RELEVANT LEGISLATION	PERFORMANCE INDICATOR	WORK PLAN	
			DURATION	RESPONSIBILITY
Develop and implement the Disaster Management Plans for the Breede Estuary, including early warning and reaction protocols in response to for e.g. riverine flooding, sea-level rise, storm events.	Disaster Management Amendment Act (Act No. 16 of 2015) Municipal Disaster Risk Assessment Reports	Estuary-specific disaster management Early warning and reaction protocols developed Database of disasters and emergency events created and maintained Flood line incorporated into risk register and spatial tools	2024 and ongoing	Western Cape: Department of Local Government: Disaster Management Centre (WCDMC) Swellendam and Hessequa Municipalities Garden Route and Overberg District Municipalities
Management Objective 3: Reduce bank de-stabilization, erosion and degradation				
Cost estimates for the rehabilitation of degraded and disturbed areas (e.g. bank erosion, trampling, disturbed riparian vegetation)	ICM Act CARA	Site-specified rehabilitation methods confirmed; Implementation of rehabilitation	2024 and ongoing	Swellendam and Hessequa Municipalities DWS DFFE DEA&DP CapeNature Implementing agent
Monitor activities related to erosion control and repair.	ICM Act NEMA EIA Regulations.	Patrols conducted to monitor activities related to erosion control and repair, Comments to be provided for new EIA related authorisation processes .	2024 and ongoing	DEA&DP Implementing Agent
Management Objective 4: Minimise water pollution				

ACTION	RELEVANT LEGISLATION	PERFORMANCE INDICATOR	WORK PLAN	
			DURATION	RESPONSIBILITY
Identify sources & types of pollution & prioritise mitigation measures	NWA NEM: WA	Pollution sources identified (including solid waste management); Mitigation measures devised; Database of offenders developed	2024 and ongoing	DEA&DP BOCMA DFFE Hessequa Municipality Swellendam Municipality
Formalise water quality monitoring programme within the estuary		Water quality monitoring programme formalised & maintained; Database & analysis of baseline data and results	Ongoing	DWS DEA&DP DFFE BOCMA Garden Route District Municipality Research Institutions.
Facilitation of the Implementation of Environmental Resources Protection Plan for the Breede River Catchment in the Western Cape		Reporting on relevant actions of the Environmental Resources Protection Plan for the Breede River Catchment in the Western Cape	Ongoing	DEA&DP Swellendam and Hessequa Municipalities Overberg and Garden Route District Municipalities DWS BOCMA Implementing Agent CapeNature DoA
Management Objective 5: Control the spread and densification of both aquatic and terrestrial invasive alien plant species				
Eradication of invasive alien plant infestation	CARA NEMA NEM:BA	Prioritisation of areas for alien invasive removal. Volume/ weight/ ha of areas cleared	2024 and ongoing	Landowners EPIP DWS

ACTION	RELEVANT LEGISLATION	PERFORMANCE INDICATOR	WORK PLAN	
			DURATION	RESPONSIBILITY
				Swellendam and Hessequa Municipalities DEA&DP DFFE DoA: LandCare

7.3 Conservation of Biodiversity

Conservation of the functional attributes and biodiversity patterns and processes of the Breede River estuary is obviously crucial to securing the environmental goods and services that the estuary provides. In terms of conserving biodiversity, more specific actions relate to preserving and affording protection to vital estuarine habitats and species, and compliance management, both in terms of sustainable consumptive use (e.g. fishing, bait collecting) as well as non-consumptive use (e.g. minimizing damage caused by boating-related activities in sensitive habitats, building of jetties, altitude restrictions etc.).

Table 7 Management Actions for conservation of biodiversity

ACTION	RELEVANT LEGISLATION	PERFORMANCE INDICATOR	WORK PLAN	
			TIMING	RESPONS-IBILITY
Management Objective 1: Ensure the conservation of an optimal representation of vital estuarine habitats and associated species				
Secure and conserve through a network of conservation areas representative biodiversity in terrestrial, coastal, wetlands, estuarine and the marine environments including ecosystems, habitats, species, genes and ecological infrastructure.	ICM Act Provincial Biodiversity Strategy and Action Plan MLRA	Identify high priority areas for active conservation; Identify conservation measures for each zone; Identify appropriate special conservation measures for individual species where deemed necessary, e.g. Dusky kob lure restrictions & Zambezi shark	2024 and ongoing	DFFE Implementing agent CapeNature
Track implementation of Protected Area Expansion Strategy (PAES)	NEM: PAA Protected Area Expansion Strategies	Breede Estuary (or parts thereof) formally protected.	2026.	DEA&DP CapeNature DFFE

Enact conservation important zones / areas and associated measures (inclusive of sharks and rays fishing control measures)	Municipal By-laws MLRA regulations	By-laws enacting conservation zones & associated measures compiled	2024 and ongoing.	Swellendam and Hessequa Municipalities DFFE CapeNature
Management Objective 2: Ensure sustainable resource use through effective compliance management				
Implement a compliance management system to enforce conservation measures for living and non-living resources (including fish & bait species related quotas, closed seasons, bag limits, collection methods)	CARA NWA ICM Act MLRA Sea Birds & Seals Protection Act Seashore Act NEM:BA MPRDA MSA Municipal By-laws	Habitat surface area & health maintained; Healthy populations of all species; Low levels of non-compliance Record (database) of non-compliance	Ongoing	DFFE CapeNature Implementing agent
Management Objective 3: Regulate recreational use in and around the estuary, including water-based and aviation activities, to reduce habitat degradation, ensure user safety and disturbance to fauna and flora				
Implement a compliance management and monitoring system pertaining to water-based activities, e.g. skiing and non-skiing zones, speed limits, wake-boarding etc.	Municipal By-laws National Vessels Safety Regulations 2007	Compliance management and monitoring system effective, well maintained & ongoing; Number of infringements reduced	Ongoing	Swellendam and Hessequa Municipalities Implementing agent SAMSA
Identify, enact & demarcate zones, and access, for other activities such as kite-surfing, windsurfing and catamarans	Municipal By-laws National Vessels Safety Regulations 2007	Beacons/ aids to navigation erected;	Ongoing	Swellendam and Hessequa Municipalities Municipalities

		Monitoring & compliance enforcement regularly undertaken; By-laws developed & enforced		Implementing agent SAMSA
Regulate water-based competitions by maintaining an application database	Municipal By-laws-	Database developed to manage & analyse historical data, fee collection, scheduling, no. of participants, boats, zoning	Ongoing	Swellendam and Hessequa Municipalities Implementing agent
Negotiate with Civil Aviation Authority to investigate the possibility of a 'special flight rules area' for the air space over the CPZ	CAA Section NEM:PAA	Special flight rules area of500 ft amsl enacted for Breede CPZ	2018	Civil Aviation Authority BREAF Implementing agent
Review the environmental impacts of the existing water-based activities and identify mitigation measures	NEMA	All recreational activities included and proposed mitigation measures to be identified.	Ongoing	DEA&DP Implementing agent BREAF DFFE

7.4 Land-use and infrastructure

The Swellendam and Hessequa municipalities are required, in terms of the ICM Act, to incorporate the proposed coastal management line and updated Coastal Protection Zone within their spatial development frameworks. The BREAF should champion the integrating of the coastal management line and the EMP as a whole into the Integrated Development Plans (IDPs) and Spatial Development Frameworks (SDFs) of the four municipalities. Additional special planning regulations, in terms of style and sustainability, should also be identified and adhered to.

Table 8 Management Actions for sustainable development

ACTION	RELEVANT LEGISLATION	PERFORMANCE INDICATOR	WORK PLAN	
			DURATION	RESPONSIBILITY
Management Objective 1: Implement an estuary zonation plan that directs infrastructural development and other land use practices (e.g. agriculture) within the various floodlines, coastal management lines, buffer zones and overlay zones				
Ensure that the EFZ, CML, risk zones, floodlines and the critical biodiversity areas (identified in the BSP and PAES)(sensitive areas) are included in the Spatial Development Framework and IDPs of Municipalities.	ICM Act NEMA CARA MSA	EFZ is demarcated in the SDF.	ongoing	BREAF CapeNature Implementing agent DEA&DP DFFE
Monitor implementation of coastal management line(s), coastal protection zone & legal mechanism	ICM Act MSA NEMA	Coastal management line and legal mechanism gazetted in relevant legislation Coastal management lines integrated into IDPs & SDFs	ongoing	BREAF DFFE DEA&DP Swellendam and Hessequa Municipalities Implementing agent
Review/amend terrestrial and aquatic critical biodiversity area map when necessary	NWA ICM Act NEMBA	Biodiversity mapping updated in EMP as well as IDPs and SDFs. Will be amended when new information becomes available.	Ongoing	DWS DEA&DP Swellendam and Hessequa Municipalities DFFE Overberg and Garden Route District Municipalities

				Implementing agent
Management Objective 2: Facilitate equitable access for both pedestrian and vehicular access				
Development & maintenance of spatially-explicit database on which existing jetties and public and private launching sites are captured	Seashore Act ICMA	Database of jetties and slipways developed & maintained Infrastructure audit to be undertaken	Ongoing	CapeNature Implementing agent
Breede River Estuary structure policy addressing consistent approach towards private launch sites and jetty applications and management	Seashore Act ICMA	Breede River Estuary structure policy developed	2024/25	CapeNature DEA&DP Implementing agent
Surveys/patrols to monitor for new structures being built without authorisation	Seashore Act ICMA	Report on outcomes of survey patrols or incidents reporting	Ongoing	BREAF CapeNature Implementing agent
Efficient authorisation & licensing system with respect to lease agreements as issued by CapeNature	Seashore Act	Efficient management and collection fees for leases agreements	Ongoing	CapeNature
Respond to complaints about restricted access to coastal public property	ICMA Coastal Access Bylaws	Public access facilitated	Ongoing	DEA&DP Municipalities DFFE
Management Objective 3: Ensure participation of BREAF in all applications/authorisations that may impact on the estuarine functional zone				
Ensure that all new EIA, development, rezoning applications are tabled at the BREAF.	ICM Act NEMA NWA CARA	All new developments & comments through EIA process	Ongoing	Municipalities DEA&DP DWS BOCMA

	NEM:WA EIA Regulations MPRDA	Developments tabled and tracked at BREAF meetings		DMRE DFFE CapeNature Implementing agent BREAF
Develop & maintain database to monitor adherence to building plan system for developments within EFZ	Municipal By-laws	Data with current information (CML) i.t.o. applications, designs & approvals	Ongoing	Swellendam and Hessequa Municipalities Implementing agent
Management Objective 4: Ensure the incorporation of the estuarine management plan into the Integrated Development Plans and Spatial Development Frameworks				
Ensure capturing of zonation & associated recommendations into the SDFs	ICM Act MSA	Estuary Zonation Plan & recommendations incorporated in all four relevant IDPs and SDFs	Ongoing	BREAF Swellendam & Hessequa local municipalities, Garden Route & Overberg district municipalities

7.5 Public education, awareness and knowledge enhancement

Raised public appreciation in terms of the environmental goods and services provided by the estuary, and the compliance management rules and regulations necessary to protect these resources, is crucial. The former implementing agent, the LBRCT developed a website (www.breede-river.org) that provides a valuable platform for the dissemination of all relevant information in terms of conservation on the Breede River estuary, including compliance issues, monitoring and research results, and general values of the estuary. The LBRCT also produced a newsletter than deals with topical issues. Educational and compliance signage has also been provided at strategic points. These existing efforts must be sustained on the long term, through funding secured from the local municipalities.

Table 9 Management Actions for public education, awareness and knowledge enhancement

ACTION	RELEVANT LEGISLATION	PERFORMANCE INDICATOR	WORK PLAN	
			DURATION	RESPONSIBILITY
Management Objective 1: Promote high levels of public awareness and appreciation of the ecosystem services provided by the Breede River estuary, threats posed to its integrity, and compliance management				
Raise and maintain public awareness of the values of the estuary, threats & compliance measures		Strategically placed signage; Dissemination of information via website, BREAF quarterly newsletter, pamphlets etc., relating to both compliance awareness & environmental education	Ongoing	BREAF CapeNature DFFE DEA&DP Implementing agent
Promote public involvement in data collection and estuary monitoring (through Citizen science and Adopt-a-Beach initiatives)		Number of public events held Number of participants Annually updated database maintained by BREAF	Ongoing	BREAF DEA&DP Implementing agent DFFE CapeNature

Management Objective 2: Enhance our scientific knowledge, through research and monitoring				
Implement comprehensive monitoring programme (as per Appendix 1 Resource Monitoring Protocol) through collaboration	ICM Act	Specific bio-indicators identified to monitor the state of the estuary; Monitoring database produced & maintained; Monitoring reports; Active research network	Ongoing	DEA&DP DWS Implementing agent BREAF DFFE CapeNature Research Institutions
Engage Dept of Science and Technology, academic, research institutions and estuarine experts/ specialists to undertake scientific research	MLRA NWA ICM Act NEM:BA	Research projects and publications; Active research network	Ongoing	DEA&DP Implementing agent BREAF DST SAEON DFFE

8 IMPLEMENTATION

8.1 Key role players

It is essential that this EMP is regarded as a strategic plan that can guide the detailing of implementation actions and identification of implementing agents. Therefore, it does not specify the required resources (human and financial) required for proper management of the estuary. However, it does 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 action plans and the implementation thereof. Ways of empowering historically disadvantaged individuals with regards to the local management of the Breede River estuary must be explored and implemented.

Co-management and effective governance have already been identified as the keystone to the efficient and effective management of the Breede River estuary.

8.1.1 Estuary Management Authority

The NEMP identifies the **Western Cape DEA&DP**, or its assigned representative, as the **Responsible Management Authority** responsible for the development of the Breede River EMP as well as being responsible for the co-ordination of its implementation. This implementation function can be effected through a range of different forums and actors.

8.1.2 Implementing Agent (IA)

The DEA&DP as the RMA will need to appoint an IA that will assist the RMA in execution of assigned functions as included in the EMP. In order for the IA to be effective it needs to have the following characteristics:

1. The IA must be technically capable of implementing the functional aspect of the BREMP;

2. The IA must be legally empowered and trained (preferable EMIs) to enforce national provincial and local legislation;

3. The IA must be independent of all political structures;

4. There must be a continual IA enforcement presence on the river;

5. The IA must collate and synthesise all monitoring data and disseminate to organs of state and private stakeholders;

6. The IA must be adequately funded for staff, running budgets and equipment; and,

7. The enforcement agency (which could also be the Implementing agent) must represent the two local and two district municipalities equally.

The LBRCT is responsible for compliance management in terms of recreation- related by-laws of Swellendam and Hessequa municipality and for the implementation of the Marine Living Resources Act on behalf of the DFFE. They also support important functions in conservation management, monitoring development, ecological research and monitoring, water quality monitoring and public awareness.

8.1.3 The Breede River Estuary Advisory Forum

The purpose of the BREAF is to advise the relevant management authority and foster co-operation, participation and co-ordination and maintain transparency and inclusiveness with regards to developing and tracking implementation of the Breede River Estuary Management Plan, guided by the vision and management objectives contained in the plan.

The responsibilities of the BREAF are:

1. To act as a platform where local knowledge, experience and requirements can be solicited, recorded and made available for consideration in the relevant decision-making processes;

2. To act as an effective communication channel between the RMA and relevant stakeholders, including all Government departments, both national, provincial and local, and in particular, to be a channel through which speedy and decisive action can be motivated in the best interests of the management of the estuary;

3. To help ensure that recreational activities, both consumptive and non-consumptive usage, are carried out and permitted within a framework that guarantees sustainability and the least amount of peripheral interference and negative impact on the environmental system.

Forum status is detailed as follows:

1. The EAF for the Breede River estuary shall be called the Breeder River Estuary Advisory Forum (BREAF);

2. The BREAF status shall be that of an advisory body, whose recommendation and resolutions shall be taken into account by the RMA;

3. Any decision(s) or resolutions taken by the BREAF is not binding or mandatory on the RMA or any organ of state or government department to implement; and

4. The BREAF is not a consensus seeking body and its individual members may hold opposing views on related matters and have the right to have those views recorded and communicated via the BREAF lines of reporting.

8.1.4 Working Group

Working groups within the BREAF can be established on either a permanent or a temporary basis to deal with issues that require more focussed attention. The working groups will be provided with specific terms of reference by the BREAF Chair in

collaboration with BREAF members. These sub-committees will report back to the BREAF on a regular basis as specified in their terms of reference. The terms of reference will address the following aspects:

1. Content focus and desired outcomes

2. Membership composition and skills requirement, bearing in mind the stipulation of Section 3.6.1.viii of this institutional Framework – "With the agreement of its members, BREAF shall be entitled to co-opt ad hoc representation of individuals or representatives of bodies who it considers necessary to perform its duties in any matter from time to time"

3. Method of operating, albeit virtual or physical meetings or research based

4. Reporting format and frequency

8.1.5 The successful implementation of the EMP may be seen as also dependent on the contribution of a number of important governmental role players, including:

- **Western Cape Government departments**: Responsible for legislative support, including compliance, funding, research and monitoring;
- **Municipalities, including Hessequa and Swellendam Local Municipalities, and Garden Route and Overberg District Municipalities**: Responsible for legislative support and funding;
- Relevant **National government departments**, especially **Department of Forestry, Fisheries and Environment**, **Department of Water & Sanitation** (via the regional office), Rural Development and Land Reform; and
- Organs of State (SANParks, **CapeNature, BOCMA**).

The **National Department of Forestry, Fisheries and Environment** is responsible for national standardisation of estuarine management and fisheries management, amongst others. Involvement in individual estuaries management, such as the Breede, will occur via the BREAF and existing forums for intergovernmental coordination. These forums will have the management of the Breede River estuary on their agendas from time to time, and include:

- **Western Cape Provincial Coastal Committee**: Responsible for facilitating co-management and effective governance and provincial co-ordination of estuarine management;
- **Overberg District Municipal Coastal Committee**: Responsible for facilitating co-management and effective governance; and
- **Garden Route District Municipal Coastal Committee**: Responsible for facilitating co-management and effective governance.

8.2 Research and monitoring

8.2.1 Resource monitoring

Although a considerable amount of ecologically-based research and monitoring has been undertaken on the Breede River estuary, there are nevertheless gaps in knowledge that should be addressed to contribute to the effective management of this ecosystem. Research and monitoring should focus on abiotic and biotic components, as well as on the impacts of resource utilisation (see Appendix I), to evaluate the health of the estuary, achievement of biodiversity targets and for compliance monitoring purposes. Taljaard (2003) also identified future monitoring requirements to (a) improve the confidence in the data required by the Intermediate determination of the RDM, for the estuary, (b) to meet the requirements of a Comprehensive Determination of RDM, and (c) to validate the predictions made during the allocation of Reserve and Resource Quality Objectives. The collection of data for the projects identified in Appendix I should be aligned with the requirements of the RDM studies.

8.2.2 Review and evaluation

This EMP should be reviewed and updated on a five-yearly from the date it was approved and adopted to ensure that objectives and targets are being achieved. An audit should be undertaken alongside the review and evaluation to determine and grade the success and failures with the implementation of the management plan according to the specified performance indicators (Appendix 2). The audit should ultimately be the responsibility of the RMA or its assigned representative and the BREAF.

The review will involve revisiting the Situation Assessment to determine the progress or changes that have come about as a result of the EMP in terms of the objectives that were originally set as well as any changes in legislation or policies and followed by revisions or refinement of the objectives and where necessary, aspects of the management actions plans or monitoring protocol.

9 CONCLUSION

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.

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APPENDIX 1: RECOMMENDED RESOURCE MONITORING PROTOCOLS

The following table provides a list of recommended abiotic and biotic parameters that should be monitored for the Breede River estuary to assess compliance with the recommended freshwater reserve for the estuary (see Taljaard, 2003). Additional recommendations have been included for monitoring estuarine usage. Fine scale monitoring requirement including Thresholds of potential concern as per the RQOs (2022) have been included in Annexure 3.

COMPONENT	OBJECTIVES	INDICATORS	SPATIAL SCALE	TEMPORAL SCALE	Sampling/analytical techniques	Lead agents
Biota: • Microalgae • Zooplankton • Macrophytes • Macrobentos • Ichthyofauna • Birds • Inter- and sub-tidal vegetation	To assess population trends of the different organism types associated with the Breede River estuary to inform management actions	Population dynamics • Growing • Shrinking • Population structure – age and sex ratios	Designated sites (existing and new ones to be identified)	Quarterly	• Water column chlorophyll • Map using aerial photos • Surveys	DFFE (fish, invertebrates), DWS, CapeNature (birds). Research institutions (CSIR, NMU, SAIAB, UCT, etc.) , Birdlife
Exploitation of living resources • Fish • Bait	To assess extent of living resources exploitation to inform management actions	Relate exploitation of fish and bait to population dynamics • Amount of permits issued • Amount of non-compliance documented	Throughout estuary for fish Throughout for bait (sand- and mud banks)	Quarterly	Permits issued Non-compliance data	DFFE FCOs (compliance monitoring data) – CapeNature, DFFE, LBRCT,
Water quality: • Freshwater reach	To assess water quality in each	Physical and chemical: • Nitrate • Ammonium	Sampling sites in each	Quarterly	Collect water quality samples according to laboratory	DEA&DP, BOCMA, DWS, DFFE

COMPONENT	OBJECTIVES	INDICATORS	SPATIAL SCALE	TEMPORAL SCALE	Sampling/analytical techniques	Lead agents
• Marine reach • REI reach	of the river reaches	• Phosphate • pH • EC/Salinity • Oxygen • Temperature	respective reach		specifications and sending it for analysis pH, EC, salinity, Temp and Oxygen measured *in situ*	
Bacteriological monitoring	To pick up bacteriological pollution as an early warning system of pollution to inform recreational use	Bacteriological concentrations: • Total coliform bacteria • Faecal coliform bacteria • Must be less than 100 per 100ml for full contact recreation	Sampling at problem sites where full-contact recreation is exercised	Quarterly	Collect water quality samples according to laboratory specifications and sending it for analysis	DEA&DP, Garden Route DM, BOCMA
Sedimentation	To assess sedimentation at problem sites and monitor efficiency of management actions	Increasing or stable sedimentation/sandbanks: • Fixed photo points • Landsat imagery • Bathymetry	At pre-selected sites	Quarterly	• Secchi measurements as at water quality sites – filter and weigh • Fixed photo monitoring (annually) • Landsat interpretation • Bathymetric measurements	• DEA&DP, DFFE, DWS/BOCMA, CSIR (NBA)
Groundwater: • quality • water level	To assess groundwater quality and water levels To inform management	Groundwater quality: • EC • pH • Hydro-geochemistry • Aquifer "type" characteristics	Groundwater usage within CPZ and within 10 km thereof	Quarterly	• Collect water quality samples according to laboratory specifications	• DWS

COMPONENT	OBJECTIVES	INDICATORS	SPATIAL SCALE	TEMPORAL SCALE	Sampling/analytical techniques	Lead agents
	interventions and effectiveness	Groundwater level data: • Rising • Declining • Rainfall relation			and sending it for analysis • pH and EC can be measured *in situ*	
Chemical pollution	• To assess level of chemical pollution at problem sites • To intervene with management where appropriate	Chemical compound & concentration: • Concentration • Possible source	At pre-selected sites only (*ad hoc*)	Quarterly	Collect water quality samples according to laboratory specifications and sending it for analysis	DEA&DP, BOCMA, DFFE
Estuarine usage: • Angling • Bait collection • Water skiing • Kite surfing • Boating • Swimming • Public slipways • Jetties	• To assess level of estuarine use by different user groups • To relate estuary use to all of the above • To inform management interventions where appropriate	• Number of boats registered • Numbers of permits issued • Number of non-compliance documented • Number of organized events and participants • Number of reported incidents	Through-out estuary: Access points (public slipways, boat permits etc.)	Quarterly	• Permits issued • Non-compliance data for each respective activity • *Ad hoc* counts	LBRCT, DFFE, Municipalities, CapeNature, SAMSA (boating)

To improve the confidence of the Intermediate determination of RDM of the Breede River estuary, in particular, the following monitoring surveys are recommended (Taljaard, 2003):

Abiotic components:

1. Atypical rain patterns during the study period, prevented specialists from measuring the extreme extent of saline intrusion typically encountered during low flow periods in the Breede River estuary. To improve confidence, particularly for the low flow period, salinity distribution patterns, as well as water quality conditions at such times still need to be monitored.

2. The levels of water quality variables, such as suspended solids and toxic substances (e.g. pesticides and herbicides) in inflowing river water need to be established for the Present State.

3. Reference Conditions for water quality variables need to be established for inflowing river water needs to be established.

Biotic Components:

1. To improve confidence of the predictions that need to be made in RDM determinations requires more data on the relationships between different biotic and abiotic variables. This requires in-depth research – a cross-sectional analysis across different states or systems to determine these relationships. Some of these issues are being addressed in a Water Research Commission Project aimed at improving information requirements and understanding in terms of determination of Resource Directed Measures.

2. The utilisation of microphytobenthos needs to be better established, i.e. "Who eats what" is not well understood.

3. Plant habitat monitoring: Area of intertidal flats should distinguish *Zostera* beds, and area of unvegetated sandflat versus mudflat.

4. The extent to which macrophytes in the Breede River estuary rely on groundwater must be established.

5. Phytomicrobenthos species and biomass assays need to be conducted to determine the extent of species change with seasons.

6. Monitoring the distribution of fringing macrophytes along the banks of the estuary, particularly *Phragmites australis*. If average salinity increases in an upstream direction, dieback of macrophytes may occur as a consequence. Sampling during the wet and dry season.

7. Monitor distribution and abundance (hole counts) of intertidal macrobenthos, particularly large burrowing forms. If average salinity increases in an upstream direction, more suitable conditions provided by higher salinity values may allow colonization of new intertidal banks by some species. At the same time, subsurface sediment samples should be collected at high, mid and low tide levels for particle size analysis.

8. For fish, four sampling exercises at 25 sites from the mouth to 40 km upstream during spring, summer, autumn and winter need to be undertaken. At least one sampling exercise must be done over a complete weather cycle or 7 days to get some idea of the short-term responses of fish to changes in flow.

9. To improve confidence and to evaluate performance in the long term, the following would be required for birds: all water birds need to be counted in the different estuarine section described in this report during late summer (Feb-Mar) (essential), midwinter (Jun-Jul) (important), and spring (Sep) (could be important) at spring low tides. Also, birds in the lower estuary should be counted in one low tide period, upper estuary in one day (the following day at low tide), count on days of low human disturbance.

APPENDIX 2: RECOMMENDED PERFORMANCE MONITORING PLAN

MANAGEMENT OUTPUTS	PERFORMANCE INDICATOR	TIMING	LEGISLATION	RESPONSIBILITY
6. Institutional and Management Structures				
1.1 Maintain a fully functional estuary advisory forum (the BREAF) that will facilitate co-management and effective governance	Constituted BREAF Ongoing record of meetings held	Assess twice a year	ICM Act	BREAF DEA&DP DFFE
1.2 Secure appropriate funding and legal support for implementation of the Breede River EMP	Guaranteed annual allocation of funds Specific by-laws developed	Assess twice a year	ICM Act MSA	DEA&DP Municipalities BREAF Implementing agent
7. Water Quantity & Quality				
2.1 Ensure that the Reserves for Water Quantity and Water Quality are maintained through ongoing interaction between the BREAF and BOCMA	Sustained estuarine health and function Sustained river flow Good water quality	Biannual for BOCMA	NWA: RDM	DWS DEA&DP BOCMA BREAF CSIR
2.2 Reduce bank de-stabilization and erosion, and habitat degradation	Number of degraded areas rehabilitated and secured	Ad hoc visual monitoring during normal daily activities or responsibilities	ICM Act CARA	Implementing agent Local municipalities DWS: WfW
2.3 Minimise water pollution	Number and volume of sources of pollution reduced	Annually for DWS Monthly Implementing agent	NWA NEM:WA	DFFE DWS DEA&DP Implementing agent Local municipalities

2.4 Control the spread and densification of both aquatic & terrestrial invasive alien plant species	Increased number of tons removed/ hectares cleared	Annually for disturbed sites	CARA NWA	Implementing agent DWS: WfW DFFE:WfC Swellendam and Hessequa Municipalities Landowners
8. Conservation of Biodiversity				
3.1 Ensure the conservation of an optimal representations of vital estuarine habitats and associated species	Conservation areas secured through by-laws	Once a year	Municipal By-laws Protected Area Expansion strategies	DFFE DEA&DP BREAF CapeNature Implementing agent Swellendam and Hessequa Municipalities
3.2 Ensure sustainable resource use through effective compliance management under the Marine Living Resources Act	Reduction in infringement incidences	Ongoing for compliance and MLRA appointed personnel; daily patrols and inspections. BREAF & angling club members may assist.	MLRA	DFFE CapeNature Swellendam and Hessequa Municipalities
3.3 Regulate recreational use in and around the estuary, including water-based	Reduction in infringement incidences	Ongoing for compliance monitors and appointed	Municipal By-laws	Local municipalities BREAF

and aviation activities, through effective compliance management		personnel; daily patrols and inspections.		DWS Implementing agent
9. Land-use and Infrastructure				
4.1 Implement an estuary zonation plan that directs infrastructural development and other land use practices (e.g. agriculture) within the various development setback lines/buffer zones	Reduction/cessation of inappropriate development in and around the estuary	Every 5 years	ICM Act MSA	BREAF DEA&DP DFFE Implementing agent
4.2 All jetties and slipways authorised and licensed	Reduction in illegal development and operations of jetties & slipways	Every 6 months	Seashore Act NEMA	Implementing agent CapeNature
4.3 Ensure that all proposed developments within the development buffer zones adhere to the EIA process	Each development lawfully constructed	Depends on number of developments and EA granted	NEMA ICM Act	BREAF DEA&DP DFFE DWS Implementing agent Swellendam and Hessequa Municipalities CapeNature
4.4. Ensure the incorporation of the EMP into the Integrated Development Plans and Spatial Development Frameworks	EMP is adopted into IDPs and SDF	Every IDP/SDF review cycle	MSA ICM Act	Swellendam, Hessequa, Garden Route& Overberg municipalities BREAF
10. Public Education and Awareness and Knowledge Enhancement				

5.1 Promote high levels of public awareness and appreciation of the ecosystem services provided by the Breede River estuary, threats posed to its integrity, and compliance management	Increase in number of newsletters; Sufficient number of public notice boards; Increase in number of conservancy members and voluntary monitors; Increase public participation in coastal/estuary/river clean ups and other initiatives eg. Breede Watch Increase in number of visiting school groups	Once year		BREAF Implementing agent
5.2 Enhance our scientific knowledge, through research and monitoring	Increase in number of research projects and monitoring programmes	Once a year		BREAF DEA&DP DWS DFFE Implementing agent DST

APPENDIX 3: RESOURCE QUALITY OBJECTIVES (DWS, 2022)

Resource Quality Objectives for RIVERS in priority Resource Units in the Integrated Unit of Analysis F11 Lower Breede Renosterveld

IUA	Class	Quaternary Catchment	RU	Resource Name	Biophysical Node Name	TEC	Component	Sub-component	Indicator	RQO Narrative	RQO Numeric												
F11 Lower Breede Renosterveld	III	H70G	F11-R17	Breede River	niii4	C	Quantity	Low flows High flows	Maintenance low flows Maintenance high flows	Flows shall be sufficient to maintain the Breede River in a condition equal to or better than a B/C category.	Months		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
											Maintenance flows (million cubic metres)	High	0	5.055	0	0	0	0	5.055	58.796	11.469	56.997	26.206	0
												Low	42.827	28.026	9.569	7.407	8.604	3.827	10.237	13.818	31.627	44.934	64.391	55.658
							Quality	Nutrients	Phosphate (PO_4-P)	Nutrient levels must be maintained in the river at a mesotrophic or better condition.	≤ 0.075 milligrams/litre (50th percentile)												
									Total inorganic nitrogen (TIN)		≤ 1.75 milligrams/litre (50th percentile)												
								Salts	Electrical conductivity (EC)	Salt concentrations need to be maintained in a Tolerable category for Irrigation water supply.	≤ 270 milliSiemens/metre (95th percentile)												
								System variables	pH range	pH, temperature, and dissolved oxygen are important for the maintenance of ecosystem health.	6.5 ≥ pH ≤ 8.5 (5th and 95th percentiles)												
									Dissolved oxygen		≥ 6 milligrams litre (5th percentile)												
									Water temperature		No more thatn2°C change in natural monthly range (minimum and maximum)												
								Toxins	Ammonia	Toxicity levels must not pose a threat to aquatic ecosystems.	≤ 0.073 milligrams per litre (95th percentile)												
									Atrazine		≤ 0.079 milligrams per litre (95th percentile)												
									Endosulfan		≤ 0.0013 milligrams per litre (95thpercentile)												

IUA	Class	Quaternary Catchment	RU	Resource Name	Biophysical Node Name	TEC	Component	Sub-component	Indicator	RQO Narrative	RQO Numeric
								Pathogens	Escherichia coli	Concentrations of waterborne pathogens should be maintained in an Acceptable category for full contact recreation.	≤ 165 counts/100ml (95th percentile)
							Habitat	Geomorphology	GAI score	GAI score should be within B category (82-87%).	B category (82-87%)
								Riparian vegetation	VEGRAI score	VEGRAI level 3 should be within a C category (62-77%).	C category (62-77%)
									Marginal zone cover abundance		No exotic species, no terrestrial woody species
									Lower zone cover abundance		No exotic species, no terrestrial woody species
									Upper zone cover abundance		Exotic species < 5%, terrestrial woody species > 30%
							Biota	Fish	FRAI score	FRAI should be within a C category (62-77%).	C category (62-77%)
								Invertebrates	MIRAI score	MIRAI score to be within D category (42-57%).	D category (42-57%)
									Invertebrate diversity		SASS score > 40, ASPT score > 4.3
									Number of families		> 15 families at abundances A - C

Resource Quality Objectives for ESTUARIES in priority Resource Units in the Integrated Unit of Analysis F11 Lower Breede Renosterveld

IUA	Class	Quaternary Catchment	RU	Resource Name	Biophysical Node Name	TEC	Component	Sub-component	Indicator	RQO Narrative	RQO Numeric													
F11 Lower Breede	II	H70K	F11-E11	Breede Estuary	nxi2	B	Quantity	Flow	MMR/MAR (% Nat)	Maintain flow regime as per recommended ecological flow	Months	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual
											MMR/MAR (% Nat)	57.6	50.1	34.0	33.0	34.6	41.7	59.7	56.6	61.2	47.6	51.3	27.3	47.2
							Quality	Nutrients	DIN	Inorganic nutrient concentrations not to exceed TPCs for macrophytes and microalgae	Entire estuary and river inflow: DIN <300µg/ℓ													
									DIP		Entire estuary and river inflow: DIP <25 µg/ℓ													

IUA	Class	Quaternary Catchment	RU	Resource Name	Biophysical Node Name	TEC	Component	Sub-component	Indicator	RQO Narrative	RQO Numeric
								Salinity	Salinity	Salinity distribution not to exceed TPCs for fish, invertebrates, macrophytes and microalgae	Zone A (0-15 km upstream of mouth): 40> Salinity >20, Zone B (15-30 km): 30> Salinity >10, Zone C (30-40 km): 20> Salinity >5, Zone D (40-50 km): <10
								System variables	Dissolved oxygen	System variables not to exceed TPCs for biota	Entire estuary and river inflow: DO >5 mg/ℓ
								Pathogens	Enterococci	Concentrations of waterborne pathogens should be maintained in an Acceptable category for full contact recreation	≤185 Enterococci/100 ml) (90th percentile)
									Escherichia coli		≤500 E. coli/100 ml (90th percentile)
							Habitat	Hydrodynamics	Mouth state	Maintain connectivity with marine environment	Estuary mouth permanently open
									Tidal variation		Average tidal amplitude near the mouth during low flows (summer) must not change by >10% from established baseline.
								Sediments	Sediment characteristics, Channel shape/size	Flood regime to maintain natural bathymetry and the sediment characteristics	Channel shape/size, sediment grain size and organic matter must not change by >30% from established baseline
							Biota	Microalgae	Biomass and community composition of phytoplankton and benthic microalgae community	Maintain the composition and richness of phytoplankton and benthic microalgae groups and medium-low biomass	Median phytoplankton chlorophyll *a* (minimum 5 sites) not to exceed 3.5 µg/ℓ; prevent formation of localised phytoplankton blooms; maintain a high median intertidal benthic microalgal biomass; median intertidal benthic chlorophyll a (minimum 5 sites) not to exceed 42 mg/m$^{2;\ site}$ specific chlorophyll a concentration not to exceed 20 µg/ℓ and cell density not to exceed 10 000 cells/ℓ.

IUA	Class	Quaternary Catchment	RU	Resource Name	Biophysical Node Name	TEC	Component	Sub-component	Indicator	RQO Narrative	RQO Numeric
								Macrophytes	Extent, distribution and richness of macrophytes	Maintain extent, distribution and richness of macrophyte groups, limit colonisation/spread of the EFZ by alien species	Maintain the present area (2014) covered by the macrophyte habitats: intertidal salt marsh: 20.5 ha, supratidal salt marsh: 29.55 ha, submerged macrophytes: 6 ha, reeds & sedges: 4.8 ha, sand/mud banks: 136 ha; maintain the integrity of the remaining supratidal salt marsh; maintain the reed and sedge stands in the upper reaches of the estuary; rehabilitate 20% of the floodplain habitat by removing any agricultural berms and invasive plants; maintain the integrity of the riparian zone.; invasive plants (e.g. *Eucalyptus*, prickly pear, *Tamarix*) cover not to exceed 5% of total floodplain area
								Invertebrates	Macrofauna community composition, abundance and richness	Maintain composition, richness and abundance of different groups of benthic macrofauna and zooplankton	Maintain rich populations of the mudprawn *Upogebia africana* on mudbanks in the middle estuary (Zone B); maintain rich invertebrate communities associated with the REI zone in the upper estuary (zooplankton and benthos); mudprawn density should not deviate from average baseline levels by more than 25% in each season; dominant species in the zone (zooplankton and benthos) should not deviate from average baseline levels by more than 40% in each season
								Fish	Fish community composition, abundance and richness	Maintain composition, richness and abundance of different groups of fish, prevent colonisation/increase of alien species	Fish assemblage should comprise the 5 estuarine association categories in similar proportions (diversity and abundance) to that under the reference (see 2015 EWR report); numerically assemblage should comprise: Ia estuarine residents (50-80% of total abundance), Ib marine and estuarine breeders (10-20%), IIa obligate estuarine-dependent (10-20%), IIb estuarine associated species (5-15%), IIc marine opportunists (20-80%), III marine vagrants (not more than 5%), IV indigenous fish (1-5%), V catadromous species (1-5%); Category Ia species should contain viable populations of at least 4 species; Category IIa obligate dependents should be well represented by large exploited species

IUA	Class	Quaternary Catchment	RU	Resource Name	Biophysical Node Name	TEC	Component	Sub-component	Indicator	RQO Narrative	RQO Numeric
								Birds	Avifauna community composition, abundance and richness	Maintain composition, richness and abundance of different avifauna groups	The estuary should contain a diverse avifaunal community that includes representatives of all the original taxonomic groups (see 2015 EWR report).; tern roosts should be seen at the estuary on a regular basis; apart from gulls, terns and regionally increasing species such as Egyptian Goose, the estuary should generally support more than 200 birds; numbers of birds other than gulls, terns and regionally increasing species should not fall below 120 for three consecutive counts; numbers of waterbird species drop should not below 15 for 3 consecutive counts

APPENDIX 4: TERMS OF REFERENCE FOR THE BREEDE RIVER ESTUARY ADVISORY FORUM

1.1. Organisational Structure

The Institutional Framework for EAFs recommends a number of potential structures for the organisational structured of the EAFs. These recommendations are based, for the most part, on the distinguishing features of the institutional landscape of the Estuary in question.

Table Recommended EAF organisational structures (edited for relevance to the BREAF)

Distinguishing feature of the estuary	Recommended EAF structure
Forms part of a protected area or is designated as a future protected area (i.e. identified in the Provincial Protected Area Expansion Plan)	• Protected Area Advisory Committee or similar functions as EAF, with specific working groups/subcommittees to address specific issues • Members contribute to the formulation of the EMP as well as the overall PAMP by providing input and comment as well as consider progress made with actions identified • Protected Area Advisory Committee assists the management authority in monitoring actions, identifying problems and resolving conflicts
Crosses the boundary between two District Municipalities	• EAF constituted and managed by DEA&DP • EAF assists DEA&DP in monitoring actions, identifying problems and resolving conflicts • EAF functions as subcommittee of the Provincial Estuaries Task Team

1.2. Vision

A Vision for the future desired state of the Breede River estuary, and the management objectives designed to attain this Vision were developed and agreed upon at a meeting of relevant stakeholders held at Witsand in 2008. The stakeholders involved in the 2008 consultation included:

• Various Directorates at the Western Cape Government Department of Environmental Affairs and Development Planning (DEA&DP),

- National Department of Fisheries, Forestry and the Environmental Affairs (DFFE): Oceans and Coasts,
- Department of Water and Sanitation (DWS), Breede - Gouritz Catchment Management Agency (BOCMA),
- Department of Agriculture,
- Garden Route and Overberg district municipalities,
- Swellendam and Hessequa local municipalities,
- CapeNature,
- South African National Parks (SANParks),
- Lower Breede River Conservancy Trust (LBRCT),
- Witsand and Malagas Resident Associations,
- Infanta Ratepayers Association,
- Witsand Tourism,
- South African Police Services,
- National Sea Rescue Institute; and
- Breede Angling Club.

The meeting arrived at the following Vision:

The Breede River estuary is the pristine pride of South African Estuaries. It is beautiful, rich in plants and animals, attracts visitors, sustains our livelihoods and uplifts our spirits. Its bountiful rewards are the fruits of our love and dedication to its wellbeing now and for future generations.

This Vision was adopted and incorporated into the 2018 (current) revision of the BREMP.

The corresponding key objectives identified in the BREMP as the corner stones to the achievement of the Vision are:

- Water quantity and quality;

- Conservation and biodiversity;
- Land-use and infrastructure;
- Institutional and management structures; and,
- Education and awareness and knowledge enhancement.

Chapter 4 of the BREMP contains a detailed discussion on how these key objectives can be achieved.

1.3. Purpose and Responsibilities of the BREAF

The purpose of the BREAF is:

to advise the relevant management authority and foster co-operation, participation and co-ordination and maintain transparency and inclusiveness with regards to developing and tracking implementation of the Breede River Estuary Management Plan, guided by the vision and management objectives contained in the plan.

The responsibilities of the BREAF are:

1. To act as a platform where local knowledge, experience and requirements can be solicited, recorded and made available for consideration in the relevant decision-making processes;

2. To act as an effective communication channel between the RMA and relevant stakeholders, including all Government departments, both national, provincial and local, and in particular, to be a channel through which speedy and decisive action can be motivated in the best interests of the management of the estuary;

3. To help ensure that recreational activities, both consumptive and non-consumptive usage, are carried out and permitted within a framework that guarantees sustainability and the least amount of peripheral interference and negative impact on the environmental system.

1.4. Forum status

Forum status is detailed as follows:

5. The EAF for the Breede River estuary shall be called the Breeder River Estuary Advisory Forum (BREAF);

6. The BREAF status shall be that of an advisory body, whose recommendation and resolutions shall be taken into account by the RMA;

7. Any decision(s) or resolutions taken by the BREAF is not binding or mandatory on the RMA or any organ of state or government department to implement.; and

8. The BREAF is not a consensus seeking body and its individual members may hold opposing views on related matters and have the right to have those views recorded and communicated via the BREAF lines of reporting.

1.5. The estuary extent

The estuary extent is formally defined in the BREMP as the estuary functional zone (EFZ) and delineated on the BREMP maps. The EFZ in the BREMP has been updated in light of the revised delineation of the National Biodiversity Assessment of 2018.

There have been calls to extend the definition of the Breede Estuary EFZ to include the inshore area of San Sebastian Bay. However, it is understood that the stakeholders request, rather than suggesting revising or modifying the EFZ, that the scope of interest of the BREAF (in other words items to be placed on the agenda) be wider than, and not necessarily constrained by the geographic limits of the EFZ. In this way, issues relating to land-based and offshore-based activities and concerns can be aired at the BREAF meetings and escalated to the appropriate statutory departments as required. As such it is useful to look at the geographic focus for the BREAF rather as "Zone of Influence" as an interim measure to gauge which potential agenda items are of relevance to the BREAF.

1.6. Membership

i. Membership of the BREAF is detailed as follows

1. Members shall represent stakeholder sectors and/or be such persons having appropriate experience, expertise and skills in order to enable the BREAF to carry out its functions. Individual (private) membership will only be allowed under exceptional circumstances and needs to be clearly motivated for in the Membership Application Form;

2. Consideration will also be given to allowing "visitor" seats in the event of private individuals requesting the opportunity to make representation to the BREAF on a once-off basis where such individuals are not affiliated to any of the constituent organisations:

3. Membership to the BREAF shall not be restricted, but necessarily will be limited to a maximum of two representatives for any specific body.

4. Any member who represents any Government Department, NGO or any organization on the BREAF for the estuary shall provide the BREAF with a letter confirming their appointment by the appropriate organization;

5. Organs of State will only be represented by officials from these entities and not by contracted agents or service providers.

6. The Overberg and Garden Route District Municipalities, as well as the Swellendam and Hessequa Local Municipalities will be standing members of the BREAF. All other current members of the Project Steering Committee for the Breede River Estuary Management Plan Implementation project will also be considered to be de facto member of the BREAF and will continue to receive invitations to the BREAF meetings until otherwise requested by the member in question.

7. With the agreement of its members, BREAF shall be entitled to co-opt ad hoc representation of individuals or representatives of bodies who it considers necessary to perform its duties in any matter from time to time; and,

8. Application for membership can be undertaken by submitting a completed membership application form to the BREAF Secretariat.

ii. Duties and responsibilities of members

It is proposed that people are members of the BREAF in their capacity as a representative of their organisation or stakeholder group. Since they are members in a representative capacity, they are proposed to have the following responsibilities:

1. Attendance of BREAF meeting on a regular basis;

2. In the event that the member being unable to attend the meeting, arrangements should be made for the alternative representative from the organisation to attend;

3. Reporting to the BREAF on the activities of their organisation that impact on the specific estuary or group of estuaries and the implementation of the EMP(s);

4. Reporting back to the members of their organisation regarding issues that arose in the BREAF that are of significance to the organisation; and

5. Abide by the agreed-upon code of conduct.

iii. Lines of reporting to organisations and stakeholders

While the BREAF must maintain open communication channels with all estuary stakeholders, BREAF members are responsible for reporting back to their nominating organisations within a reasonable timeframe. It is however acknowledged that many the organisations that will form part of the BREAF already have rules and protocols for reporting.

iv. Code of conduct

The following general etiquettes must be abided with:

1. All individuals participating in meetings - will be treated with dignity and respect, honouring their uniqueness and value. There will be zero tolerance for abuse, the use of derogatory remarks, personal insults, threats or any form of discrimination or intimidation.

2. Meeting participants are expected to be constructive in their contributions and represent the interests of their respective constituencies / communities rather than themselves as individuals.

3. Participants must deal with each other in an open, honest and respectful manner.

4. Participants will respect the views of others and allow others the opportunity to speak freely without interruption.

5. Participants are expected to conduct business in an inclusive way.

6. Participants are expected to have completed the necessary advance preparation for meetings and be prepared to dedicate sufficient time and energy to the forum's agenda and business.

7. Communication in meetings will be clear, timely, concise, to the topic and avoid indecorous language and/or reference to personalities.

8. Participants will only speak at the invitation/recognition of the Chairman. Individual participants will not seek to dominate proceedings. If the Chairman of a meeting believes that a participant is in breach of the Code of Conduct, he or she will request the individual to withdraw from the meeting and be suspended from further participation.

1.7. Meetings and Procedures

1.7.1 Chair

The RMA will provide both the Chair and Secretarial functions for the BREAF.

1.7.2 Meetings

The BREAF shall agree to the frequency of meetings, which shall be at least twice a year, and the venue of such meetings. The BREAF shall further agree the formalities to be followed at each meeting, including the option to hold meetings via email or other collaborative technology solutions if necessary, and the procedures to be followed.

1.7.3 Procedures

Additional procedures are detailed as follows:

1. Should any member of the BREAF fail to attend two consecutive meetings such member shall be assumed to have resigned, and, in the event that it is a representative of a Governmental Department, the department shall be advised accordingly;

2. Any member who no longer meets the criteria of fulfilling the criteria of being a fit and proper person (someone possessing integrity, objectivity, dignity, capacity for hard work, respect for legal order and a sense of equality or fairness) shall be required to resign and may be replaced;

3. In all instances the BREAF shall endeavour to reach recommendations and resolutions by consensus; and

4. No issue will be put to vote. Should a stalemate occur on a particular position on an issue. The chairman in such cases will request the members through their constituencies to put their concerns and perspective in writing to the appropriate government agencies, or to the RMA. This will ensure that all aspects of the stalemate are documented.

1.7.4 Agenda

The standing Agenda for the BREAF was debated and finalised during the inaugural meeting of the BREAF, held on Tuesday the 1st of February 2022. It was resolved that the agenda should include the following standing items:

1. Welcome and apologies
2. Introductions and presentations by (two) member organisations
3. Approval of previous minutes
4. Amendments to the agenda
5. Actions items from previous meeting
6. Report back on progress with implementation of EMP
7. Report back on the implementation of, and compliance with, legislation, including local bylaws
8. Report back on monitoring
9. Report back from working groups
10. Feedback to and from MCC and PCC by RMA
11. Education and awareness
12. New matters arising
13. Summary of action items.

1.7.5 Submission of Agenda Items

Additional agenda items should be submitted to the secretariat two weeks prior to the next meeting.

1.7.6 Minutes and Administrative Support

The RMA shall provide a secretariat that will be responsible for all administrative actions associated with convening and recording meetings. This includes minuting of all meetings, distribution of minutes and maintaining a database of members and alternate members. Documentation relevant to members and matters under discussion can be distributed by the secretariat. The Chair will provide oversight of work undertaken. The secretariat shall co-ordinate all communication on behalf of the BREAF.

1.7.7 Working Groups

Working groups within the BREAF can be established on either a permanent or a temporary basis to deal with issues that require more focussed attention. The working groups will be provided with specific terms of reference by the BREAF Chair in collaboration with BREAF members. These sub-committees will report back to the BREAF on a regular basis as specified in their terms of reference. The terms of reference will address the following aspects:

1. Content focus and desired outcomes

2. Membership composition and skills requirement, bearing in mind the stipulation of Section 3.6.1.viii of this institutional Framework – "With the agreement of its members, BREAF shall be entitled to co-opt ad hoc representation of individuals or representatives of bodies who it considers necessary to perform its duties in any matter from time to time"

3. Method of operating, albeit virtual or physical meetings or research based

4. Reporting format and frequency

1.7.8 Technical support

Technical support to the BREAF will be provided by the Western Cape Government Estuaries sub-committee of the Western Cape Provincial Coastal Committee. This sub-committee, linked to the PCC, includes scientists from the DFFE, CSIR, Universities as well as government bodies. Technical support refers to any matters that require detailed scientific input, discussion and recommendations.

1.8. Lines of reporting to the MCC

The RMA, in their role as the Chairperson of the BREAF, will report directly to the MCC and PCC, of which they are already a member. The RMA will be responsible for reporting to and

from the PCC and MCC on the BREAF. This will include report back on the proceedings of the MCC and PCC where it relates to the management of the Breede River Estuary.

1.9. Liability

No BREAF member shall be liable to any natural person or juristic person whatsoever for any act of omission by himself /herself, by the BREAF, or by its representatives or agents. Member(s) of the BREAF may not enter, negotiate or conclude any agreement or contract on behalf of the BREAF.

1.10. Finance

The RMA will meet all the costs associated with convening meetings. Individual members will be responsible for the costs associated with their own attendance and participation in the BREAF. The RMA and/or Western Cape Estuaries programme co-ordinator shall have the discretion to motivate to fund the subsistence and travel costs of any non-governmental organisation who needs to attend the meeting and is unable to fund its own attendance.

In certain specific circumstances and in agreement with the RMA the BREAF may provide the RMA with input into the process of drafting submission(s) to donor(s) and foreign funders for financial assistance for specific projects that may contribute to the ecological sustainability of the estuary. Implementing agents of projects initiated with donor funding may be requested to provide report(s) to the BREAF on activities undertaken and to what extent its actions contribute to the implementation of the EMP.

1.11. Amendments to the Terms of Reference

From time-to-time members shall be entitled to amend the terms of reference subject to due notice thereof being given and such amendments being approved at any formal BREAF meeting. Notice to amend the terms of reference with full particulars of the proposed amendment shall be distributed to all member representatives with the notice announcing a special or an BREAF meeting. Any amendment to the terms of reference shall be approved by the RMA.