



## **C.A.P.E. Estuaries Programme**



### **Situation Assessment Report for the Breede River Estuary**



Linking **People**  
Promoting **Growth**

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**20 May 2008**

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<b>Abbreviations and Acronyms</b>	
CSIR	Council for Scientific and Industrial Research
CWAC	Coordinated Water bird Count
DO	Dissolved Oxygen
DWAF	Department of Water Affairs and Forestry
EstMP	Estuary Management Plan
GIS	Geographical Information System
HDM	Hessequa District Municipality
LBRC	Lower Breede River Conservancy
MCM	Marine and Coastal Management
MPA	Marine Protected Area
pH	Unit measuring acidity (Hydrogen concentration)
RCF	River Conservation Forum
RDM	Resource Directed Measures
REI	Riverine-Estuarine-Inter-phase (Freshwater saltwater inter-phase)
RQO	Resource Quality Objectives
SANParks	South African National Parks
SASS5	South African Scoring System Version 5
SM	Swellendam Municipality
TDS	Total Dissolved Solids



## **1. Introduction:**

Bohlweki Environmental (Pty) Ltd (A SSI Company) was appointed to draft an Estuary Management Plan (EstMP) for the Breede River Estuary.

The contract to draft the EstMP for the Breede River forms part of the C.A.P.E. programme, hosted by the South African National Biodiversity Institute (SANBI) that seeks to conserve and restore the biodiversity of the Cape Floristic Region (CFR) and adjacent marine environment, while delivering significant benefits to the people of the region.

To ensure the protection and sustained utilization of estuary biodiversity in the CFR, a Regional Estuary Management Programme was implemented as part of the overall C.A.P.E. Programme. The C.A.P.E. Estuaries Programme is the first of its kind in South Africa and serves as a test case for the incorporation of strategic decision-making into local estuary management.

This approach is also well aligned with the development of the Integrated Coastal Management Bill, which identifies the development and implementation of estuary management plans (EstMPs) as an integral part of estuary management in South Africa. The Breede River was selected as one of six estuaries, which will be used as case studies aimed at testing the development and implementation of estuary management plans.

According to the Terms of Reference developed by the C.A.P.E. Programme the first objective is to report on a situation assessment, after which the second objectives of drafting an Estuary Management Plan will be dealt with.

The entire Breede River is 322 km long from its source near Ceres to where it enters the Indian Ocean at Witsand/Infanta. The Breede falls within the warm-temperate Agulhas biogeographical region. It drains a large catchment of approximately 12 600 km<sup>2</sup>. The estuarine section covers a total surface area of 455 ha, extending almost 50 km upstream to 10 km past Malgas where tidal influence ceases. There are three large and numerous smaller dams within the catchment that have reduced the original mean annual run-off (MAR) reaching the estuary by 42% to the present-day flow of 1 034 x 10<sup>6</sup> m<sup>3</sup> (Taljaard *et al.* 2001).

The Breede River Estuary is highly responsive to freshwater inflows and high flows of 20-95 m<sup>3</sup>s<sup>-1</sup> are able to completely flush and reset the system during a single tidal cycle (Taljaard *et al.* 2001). The general water quality in the column ranges from well mixed during spring highs to stratified during spring lows and neaps and the river estuarine interface (REI) zone may shift 8-10 km between tides.

## **2. Objective 1: Situation Assessment:**

### **2.1 Review legislation pertaining to the management of environmental threats within estuaries**

This section will frequently refer to the "C.A.P.E. Estuaries Guideline 1: Interpretation of Legislation pertaining to Management of Environmental Threats within Estuaries" by Susan Taljaard of the CSIR, Stellenbosch. This guideline document forms part of the series for C.A.P.E. Generic Estuary Management Plans.

As part of the description of the current situation regarding the management of the Breede Estuary, the different legislation applicable to the Breede Estuary are listed and briefly described below.

A comprehensive list of all the important international obligations and agreements, national policies and legislation, as well as existing operational management strategies and plans relevant to the management of estuaries in South Africa are discussed in Guideline 1.

#### **2.1.1 International Obligations**

Two international conventions worth mentioning are (Taken from Taljaard, 2007):

a) *Convention on Wetlands of International Importance especially as Waterfowl Habitat (1971) (Ramsar Convention)*

The aims of this Convention ([www.ramsar.org/](http://www.ramsar.org/)) are to curb the loss and to promote wise use of all wetlands. This Convention includes estuaries in its definition of wetlands, by defining wetlands as 'areas of marsh, fen, peatland or water whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres' (which includes estuaries). South Africa presently has 17 sites designated as Ramsar sites, with a surface area of 498 721 ha ([www.ramsar.org/profile/profiles\\_southafrica.htm](http://www.ramsar.org/profile/profiles_southafrica.htm)),

including estuaries such as the Orange, Verlorenvlei, Sout (De Hoop Vlei), Heuningnes (De Mond), St Lucia and Kosi Bay. The **Wetland Conservation Bill** that has been proposed will further assist South Africa in meeting the aims of the Convention.

b) *Convention of Migratory Species of Wild Animals (1979) (Bonn Convention)*

The Convention ([www.cms.int/](http://www.cms.int/)) was established in response to the need for nations to co-operate in the conservation of animals that migrate across their borders. These include terrestrial mammals, reptiles, marine species and birds. Special attention is given to endangered species. South Africa is a major partner in this Convention as it is the terminus for many of the migratory species, both the Palearctic (birds) and the Antarctic species (whales and birds). South Africa acceded to the Convention in December 1991.

### **2.1.2 Important National Policies**

All the important National Policies (White Papers) relevant to Estuary Management are listed and briefly described in Guideline 1. The following are worth mentioning because it relates to the local Breede Estuary (Taken from Taljaard, 2007):

- a) White Paper for Sustainable Coastal Development in South Africa (June 2000)
- b) White Paper on a National Water Policy for South Africa (April 1997)
- c) White Paper on Marine Fisheries Policy for South Africa (May 1997)
- d) White Paper on Development and Promotion of Tourism in South Africa (May 1996)
- e) White Paper on the Conservation and Sustainable Use of South Africa's Biological Diversity (August 1998).

### **2.1.3 Applicable National Legislation**

All National Policy (White Papers) are given legal status through National Legislation (Acts). With regard to the management of estuaries, legislation can be subdivided into those related to (Taken from Taljaard, 2007):

- a) Setting of **resource objectives**
- b) Management and control of activities or developments posing a potential threat to estuaries can be categorised as follows:
  - 1. Land use and infrastructure development

2. Water quality and quantity (Water supply/demand and waste)
3. Exploitation of living resources.

**Resource objectives**, mentioned above, refer to strategic objectives relevant to estuarine resources (e.g. on a national or regional/provincial level) down to the resource objectives set for a specific estuary. Resource quality objectives set for a specific estuary, need to be aligned with strategic objectives set for a particular resource type and include both biophysical and socio-economic aspects.

Important legislation relevant to Setting of Resource Objectives in estuaries is listed below. Full details are available in Guideline 1 (Taljaard, 2007).

- The Constitution (Act 108 of 1996)
- National Environmental Management Act (Act 107 of 1998)
- Marine Living Resources Act (Act 18 of 1998) amended 2000
- National Environmental Management: Integrated Coastal Management Bill 2006 A & B
- National Water Act (Act 36 of 1998)
- National Environmental Management: Biodiversity Act (Act 10 of 2004)
- National Environmental Management: Protected Areas Act (Act 57 of 2003)
- World Heritage Convention Act (Act 49 of 1999)
- National Heritage Resources Act (Act 25 of 1999)
- Local Government: Municipal Systems Act (Act 32 of 2000)
- Development Facilitation Act (Act 67 of 1995)
- Local Government Transition Second Amendment Act (Act 97 of 1996).

All relevant legislation is available on [www.capegateway.gov.za](http://www.capegateway.gov.za). A whole collection of relevant government notices and information is also available on this government website

Legislation aimed at the management and control of **activities and developments** posing a potential threat to estuaries can broadly be categorised into those related to (as mentioned above):

1. Land use and infrastructure development
2. Water quality and quantity (Water supply/demand and waste)
3. Exploitation of living resources.

Legislation relating to **Land use and infrastructure development** applicable to the Breede River are listed and described in Guideline 1. Below is a list of the relevant legislation (Taljaard, 2007).

- National Environmental Management Act (Act 107 of 1998)
- Local Government: Municipal Systems Act (Act 32 of 2000)
- Development Facilitation Act (Act 67 of 1995)
- Local Government Transition Second Amendment Act (Act 97 of 1996)
- National Water Act (Act 36 of 1998)
- Water Services Act (No. 108 of 1997)
- National Heritage Resources Act (Act 25 of 1999)
- Conservation of Agricultural Resources Act (No. 43 of 1983)
- Seashore Act (No. 21 of 1935) Amended 1993
- National Environmental Management: Integrated Coastal Management Bill 2006 A & B.

Legislation relevant to **Water Quantity and Quality (Water supply/demand and waste) management** for the Breede River Estuary are the following (Full details in Taljaard, 2007):

- National Environmental Management Act (Act 107 of 1998)
- National Water Act (Act 36 of 1998)
- Marine Living Resources Act (Act 18 of 1998) amended 2000
- Marine Pollution (Control and Civil Liability) Act (No. 6 of 1981)
- Water Services Act (No. 108 of 1997)
- Dumping at Sea Control Act (No.73 of 1980) Amended 1995
- National Environmental Management: Integrated Coastal Management Bill 2006 A & B
- Seashore Act (No. 21 of 1935) Amended 1993
- Draft National Environmental Management: Waste Management Bill (2006).

Relevant legislation to **Exploitation of Living Resources** in the Breede River Estuary is the following (Taken from Taljaard, 2007):

- Marine Living Resources Act (Act 18 of 1998) Amended 2000
- Animal Health Act (Act 7 of 2002).

#### **2.1.4 Important Provincial and Local Legislation**

In South Africa, historically, the powers to control coastal land use and infrastructure development have been delegated to Provincial and Local governments, although National Government was responsible for

developing enabling *national* legislation. With regard to the management and control of Water quantity and quality (water supply/demand and waste) and Exploitation of living resources the responsibility were with the National Government. However, Provincial and Local governments can issue legislation (e.g. Provincial Act, Ordinances or By-law) that will regulate specific activities within there jurisdiction so as to enforce national legislation.

There are mainly two coastal provinces within the Cape Floristic Region (CFR), namely, the Western Cape Province and the Eastern Cape Province.

For the purposes of the Breede River Estuary the focus is on the Western Cape Province. The following are provincial legislation relevant to the Breede River Estuary (Taljaard, 2007):

- Municipal Ordinance (Cape) (No. 20 of 1974)
- Land Use Planning Ordinance, 1985 (Ordinance 15 of 1985, as amended in 2004)
- Western Cape Housing Development Act (No. 6 of 1999)
- Western Cape Planning and Development Act (No. 7 of 1999)
- Cape Nature Conservation Board Act (No. 15 of 1998)
- Cape Nature and Conservation Ordinance (No. 19 of 1974, as amended in 1999).

### **2.1.5 Key Legislation pertaining to Management & Control of Specific Activities and Developments for the Breede River Estuary**

The management and control of activities within estuaries require site-specific resources objectives against which to assess and test for compliance. In the case of the Breede River Estuary the following are considered as the key legislation that currently needs to be taken into account in the setting of resource objectives (Taken from Taljaard, 2007):

<b>Key Legislation</b>
<p><b>Chapter 3, Part 3 of the NWA</b> requires Classification and Resource Quality Objectives to be determined for all water resources, including estuaries. The Water Resource Protection Policy (under this Act) provides detailed guidelines and procedures for the Classification (i.e. predefined health status) and the setting of Resource Quality Objectives for the protection of aquatic ecosystems (including objectives for water quantity, water quality, habitat integrity and biotic integrity).</p> <p><b>Chapter 4 of the MLRA (as amended in 2000)</b> deals with the declaration of Marine Protected Areas and which empowers the Minister (DEAT) to declare an area</p>

to be a Marine Protected Area where various activities are prohibited. These are stipulated in the Declaration of Areas as Marine Protected Areas (No R.1429, 29 December 2000) promulgated under the Act ([www.info.gov.za/documents/regulations/2000.htm](http://www.info.gov.za/documents/regulations/2000.htm)).

**Chapter 3 of the Protected Areas Act** describes the different types of protected areas that can be declared, which may also apply to estuaries.

**Chapter 5 of the Municipal Systems Act** deals with integrated development planning (IDP) that, amongst others, the social and economic objectives for a particular area. The **Municipal Planning and Performance Management Regulations** (Government Notice R.796, 24 August 2001) ([www.info.gov.za/documents/regulations/2001.htm](http://www.info.gov.za/documents/regulations/2001.htm)) promulgated in terms of this Act, describe the content requirements of IDPs. The regulations, for example state that the Spatial Development Framework reflected in the municipality's IDP must 'contain a strategic assessment of the environmental impact of the spatial development framework'.

**Section of Environmental Conservation Act.** Regulations on Sensitive Coastal Areas promulgated under this Act remains in force until replaced with new regulations under NEMA. Currently there are two useful management tools relating to legislation in Sensitive Coastal Areas, namely **Sensitive Coastal Areas Regulations**.

There is also an investigation on the go to see how certain provisions within the National Environmental Management: Integrated Coastal Management Bill 2006 A & B, can be used to properly control fishing of kob in the estuary. According to Steve Lamberth of MCM (pers. com), they are in the process of passing legislation to this effect.

An important issue that needs to be urgently resolved by the management authorities of the Breede River Estuary is the problem relating to the municipal boundary between Swellendam and Hessequa being in the middle of the river. This creates problems during law enforcement. It is recommended that the Municipal Demarcation Board be approached to move the boundary to the high water mark on the eastern bank of the river, so that the entire water area is administered by one local authority.

In terms of controlling the air space over the Breede River Estuary, it is proposed to investigate the possible registration of a "special flight rules area" with the Civil Aviation Authority for the Breede to protect avi-fauna on the estuary. It may also be possible under MPA regulations to limit altitude of over flight by aircraft.

### **2.1.6 Existing Institutional Arrangements at the Breede River Estuary**

The Breede River Estuary is currently managed collaboratively between CapeNature, Swellendam Municipality (SM), Hessequa District Municipality (HDM), Marine and Coastal Management (MCM) and Department of Water Affairs and Forestry (DWAFF).

CapeNature administers the Seashore Act (No. 21 of 1935) Amended 1993, and do regular monitoring on the Breede regarding jetties and slipways, bird counts etc. SM and HDM collectively are involved through the Lower Breede River Conservancy (LBRC). The LBRC has dedicated staff appointed to do law enforcement under the Marine Living Resources Act (Act 18 of 1998) Amended 2000, and bylaws passed by SM.

The CSIR, MCM and DWAFF are also doing regular monitoring on the Breede River. The CSIR is monitoring the salinity gradient in the estuary, MCM monitors the fish populations and species composition and DWAFF measures freshwater flows from the catchment.

The purpose of the proposed Estuary Management Plan (EstMP) is to propose a management structure for the future management of the Breede Estuary.

***Important notice:*** (Regarding the National Environmental Management: Integrated Coastal Management Bill 2006 A & B):

**The “Coastal protection zone” extend inland as a 1km offset from the estuary high water mark.** This should form the basis of the area that should fall under such a management structure.

Further information regarding the “Coastal Protection Zone” can be obtained from:

S.M. Schneier

Principal Environmental Officer

Marine and Coastal Management

Department of Environmental Affairs and Tourism

Tel: 021-4023024

Fax: 021-4023009

Address: Private Bag X2 Roggebaai 8012

It is strongly suggested that inter-institutional agreements be formulated to facilitate the transfer of powers (in terms of the above legislation) to the management authority of the Breede River Estuary. All the executive powers in terms of the regulations that will be developed in terms of the legislation should ultimately be devolved to the Estuary Management Authority managing the "Coastal protection zone".

## **2.2. Goods and services provided by the estuary**

The Breede River Estuary is a very productive estuary, serving as an important nursery area for marine fish species. It is also one of the largest and most important estuaries in SA.

Services provided by the Breede River Estuary include:

- Important habitat for estuarine, marine and freshwater animal and plant species,
- aesthetics of environment (Sense of Place),
- power boating,
- water skiing,
- wakeboarding,
- kite surfing,
- swimming,
- kayaking/canoeing,
- shore based angling,
- fishing from boats,
- bait collection,
- hiking and walking along banks,
- birding,
- other animal (game) spotting,
- water for irrigation (upriver).

Ecological services provided by the estuary include:

- Biodiversity associated with the estuary, rendering free services in terms of water quality and quantity management
- High level of deposited and generated nutrients that result in many animals and plants, thus a very productive area. The river and wetland system also serve as a purification system to absorb various pollutants produced by agriculture and development
- Calm protected environment being a suitable nursery area for many marine fish species
- Both plant and animals adapted to withstand ebb and flow – natural buffer against floods and droughts
- Provision of sand supply for coastal processes

- Host many important inter-tidal processes managing water quantity and quality and harnessing biodiversity for habitat specialists namely:
  - Salt marshes
  - Sand flats
  - Mud Flats
  - Mud banks
  - Riparian vegetation
  - Wading birds
- Important ecological corridor that includes the surrounding terrestrial ribbon along its banks.

Economic services supplied by the estuary include:

- Provides food and materials for subsistence
- Support enterprises like recreation, tourism, natural resources and transport
- Processes waste and provides protection from floods and storms
- Render free services in terms of water quality and quantity management
- Aesthetics serve as draw card for tourism, property market and recreation

### **2.2.1. Threats to goods and services supplied by the Breede Estuary**

During the stakeholder meetings of 11 December 2007 at Witsand and Malgas, and subsequent communications with stakeholders and authorities, the following threats have been identified:

- a) Over utilisation of fish resources with particular reference to Kob
- b) Over utilisation of bait organisms
- c) River bank erosion
- d) Alien infestation of river banks
- e) The management of the structures below the high water mark. Jetties and slipways that are not maintained and authorised
- f) Wake boarding and water skiing activities increase bank erosion
- g) Catchment and wetland degradation resulting from poor land-use management
- h) Flooding more regular and severe due to climate change
- i) Flood damage resulting from altered hydrology due to riparian and catchment degradation
- j) Rising sea levels due to climate change shifting Riverine-Estuarine Interphase (REI) further inland (Need to identify possible replacement sites for migrating reedbeds)

- k) Sedimentation originating from catchment
- l) Reduced freshwater input from catchment and groundwater sources
- m) Forming of sandbanks due to excessive siltation from catchment
- n) Damage to flood plain vegetation and processes (Salt marshes)
- o) Damage to riparian vegetation (reeds)
- p) Destruction of riverine vegetation (Palmiet - *Prionium serratum*)
- q) Too many boats affecting bird breeding and habitat
- r) Airspace infringements by aircraft affecting bird life and sense of place (whale's are also influenced by low flying aircraft)
- s) Presence of alien invader plants in catchment reducing freshwater yield
- t) Management problems in the catchment area e.g. soil erosion, water abstraction, enrichment etc.
- u) Negative impacts on riverbank e.g. erosion due to physical human and boating impact, cutting of indigenous vegetation e.g. reeds
- v) Municipalities not always capacitated to make decisions relating to environmental factors and latest environmental regulations and procedures
- w) Lack of manpower (nature conservators) (together with logistical support) on the river to deal with all legislative matters
- x) Pollution from septic tanks and nutrients from agriculture
- y) Existing good environmental legislation, but lack of enforcement capacity (Environmental Control Officers as well as judiciary)
- z) Unclear demarcation of boundaries, especially sea and estuary
- aa) Increase of boating activity and no determined carrying capacity
- bb) Inter agency co-operation not functioning effectively
- cc) Future residential or holiday developments close to the river.

If the integrity of the Breede River Estuary is to be maintained these threats needs to be addressed urgently and effectively.

The proposed management plan will address the management and mitigation to ensure the continued provision of the above goods and services. A well planned communication campaign will have to be developed to ensure wide spread buy-in by stakeholders.

### **2.3. Issues relating to the exploitation of living resources**

Exploitation of living resources are currently managed through law enforcement and permits issued. The Breede River Estuary is the only large estuary in the Western Cape that is not under statutory

protection that has a dedicated team of law enforcement officers. The Lower Breede River Conservancy (LBRC) fulfills this important function. The LBRC has dedicated staff appointed to do law enforcement under the Marine Living Resources Act (Act 18 of 1998) Amended 2000, and bylaws passed by SM.

Current monitoring of exploitation of living resources includes the following: Fish monitoring, which is based on effort per catch and includes area, species, length, bait, time taken to catch etc. This data is entered into a database compiled and managed by MCM (Pers comm., LBRC). Bait collection (e.g. mud prawn, *Upogebia africana*) is monitored through a permit system. Estuary usage figures include daily tallies of cars and trailers at launching sites. This will also reflect fishing activity in the estuary.

Water quality is regularly monitored by the law enforcement officers and the CSIR. Parameters measured include: Dissolved Oxygen, Total Dissolved Solids (TDS), Salinity, pH, etc. The law enforcement staff also assists MCM during fish netting surveys, monitor water hyacinth, assist CapeNature with CWAC and other bird counts (fish eagle project etc). Ongoing recording of daily observations such as reed cutting, developments, erosion, etc. in daily pocket book, photos, filing in LBRC computer system and reporting to relevant authorities.

Present exploitation of the estuary consists of recreational anglers and bait collectors. One commercial line fisherman uses the river as a launching site to sea. Nine oyster picking concessions were issued for the coastline outside the estuary. No known subsistence fishermen utilize the estuary currently.

Bait collection in the estuary consists of mainly anglers and a few farm workers. There is some illegal netting activity in the river. Illegal Kob exploitation due to variation in sizes allowable in and outside of the estuary is currently creating management and enforcement problems. There may be potential for future controlled subsistence bait collection if this could be properly managed and adequately policed.

It may become necessary to exclude certain areas from utilization in order to maintain undisturbed feeding and breeding areas for certain economically important species such as dusky kob (*Argyrosomus japonicus*). Some inter-tidal marshes may have to be protected against utilization due to their importance to vulnerable bird species. This aspect needs to be addressed in the Management Plan.

### **2.3.1. Monitoring of exploitation.**

Management without adequate data sets is virtually impossible. Managers need sufficient information about the system they have to manage. As a start, a central database should be established with all of the relevant data readily available to all participants in the management system. It may become evident that there are monitoring systems/data sets in place for some of the sections of the Breede River or particular activities within the catchment, but the following items need to be assessed and monitored on a continued basis. Baseline information has to be established for a number of parameters (We will endeavor to list these items during the next phase). It is recommended that rangers be equipped with "tracker" devices to ensure uniform data capture.

There are many other factors that may also impact the integrity of the living resources in the Breede Estuary. These also need to be listed and monitored (See proposed Monitoring Plan under 2.6).

The type and format of the data to be collected needs to be determined through discussion with specialist scientists and local managers.

As part of the EstMP the following will be included in the monitoring plan:

- Microalgae
- Zooplankton
- Macrophytes
- Macrobentos
- Ichthyofauna
- Birds.

### **2.4. Water quantity and quality requirements for the Breede River Estuary**

The Breede River Water Management Agency (WMA) has recently been established, and the WMA will be the responsible for the management of the Breede River catchment. It is therefore important that the management authority of the Breede River Estuary get good representation on the WMA. This will ensure constant and consistent input regarding the requirements of the estuary.

All new water allocations and other licenses in terms of the Water Act should take note of the importance of the Breede River Estuary.

The main water quality problems in the Breede River Estuary are related to agricultural return-flows in the low flow season (pers.comm, Lara van Niekerk). Water quantity came out as the top priority to be properly managed within the bigger catchment.

Sediment loads in the Breede River should be assessed in future to determine and quantify the extent of the problem.

It was noted that the Swellendam municipality is struggling to meet the required effluent standard at their sewage treatment works, and that this may become a water quality issue. It is therefore proposed that DWAF install a water quality monitoring station above the sewage treatment works.

In 2002 a preliminary reserve was determined for the Breede River Estuary. This section is a summary of the report by Taljaard (2002).

For the purposes of the reserve study, the River-Estuary-Interface (REI) zone, i.e. the productive zone at the interface between seawater and freshwater, was defined as the sector of the estuary where salinities were less than 10 ppt. However, in subsequent studies it became apparent that the REI zone may be different for the different biotic components and the definition, therefore, may require further refinement in future.

Criteria that to indicate confidence limits attached to statements throughout the reserve report by Taljaard (2002) were as follows:

LIMIT	DEGREE OF CONFIDENCE
40%	If no data were available for the Breede River Estuary or similar estuaries, i.e. low confidence
60%	If limited data were available for the Breede River estuary or other similar estuaries, i.e. medium confidence
80%	If sufficient data were available for the Breede River Estuary on a particular issue, i.e. high confidence

The preliminary reserve study provides details on the Ecological Reserve, i.e. the water needs of the aquatic ecosystem. Specific needs relating to other water uses, such as the water quality requirements for recreational use (e.g. *Eschericia coli* levels), were not included in the brief and were not included in the study.

During this assessment the Reserve for Water Quantity and Water Quality was set at the head of the Breede River Estuary (about 52 km upstream of the mouth). However, the closest gauging station

(H7H006-A01) and water quality monitoring station (H7H006Q01) is located at Swellendam (about 102 km upstream of the mouth). Major tributaries enter the river downstream of this point, like the (Buffeljags River) and, as a result, input from its catchment also needs to be included (gauging station at Eenzaamheids Buffeljags Dam Station – H7H013-A01).

#### **2.4.1. Geographical Boundaries used during the reserve determination**

For the purposes of the Intermediate Determination of RDM for the Breede River Estuary, the geographical boundaries were defined as follows (Gauss Conform Projection, Clarke 1880 spheroid):

Downstream boundary: The estuary mouth (20° 50' 40" E; 34° 24' 30" S).

Upstream boundary: The head of tidal influence, approximately 52 km from the mouth (20° 30' 40" E; 34° 15' 00" S)

Lateral boundary: The 5 m contour above MSL along the banks (refer to 1:10 000 ortho-photographs).

#### **2.4.2. Recommended Ecological Reserve Category (ERC)**

The ERC of an estuary was determined by its Present Status Category, which was primarily based on the extent to which the present state deviates from a reference condition, as well as the estuary's importance.

The Estuarine Health index score for the Breede River Estuary, based on its Present State, was 78 translating into a Present Status Category of B, The estuarine Importance score came to 86, indicating a 'highly important' estuary.

According to the protocol, the ERC for the Breede River Estuary must be: 'Present Status Category, i.e. B +1', which implies a Category A or, if not possible, best attainable state, with Category B the minimum requirement.

During the specialist workshop, the specialist team concluded 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" (putting it in a Category B) was the large reduction in freshwater input from the river. Therefore, to improve the Breede River Estuary's ERC from a Category B to a Category A, a large amount of water, already

abstracted in the catchment by dams, will have to be re-allocated to the estuary.

Due to the fact that it is highly unlikely that large volumes of water could be re-allocated to the estuary and being within the rules of the protocol (i.e. minimum score to be allocated to a 'highly important' estuary is Category B), the specialist team decided to keep the recommended ERC of the Breede River Estuary as Category B (Confidence = 60%).

### 2.4.3. Reserve for "Water Quantity" for the different ERC targets

The reserve for "Water Quantity" for an *ERC of B* for the Breede River Estuary was estimated at  $954 \times 10^6 \text{ m}^3$  which equates to 53.4% of natural MAR. A summary of the flow distribution (mean monthly flows in  $\text{m}^3/\text{s}$ ) for the water quantity reserve is provided below (confidence = 60%):

MONTH	1%	10%	20%	30%	40%	50%	60%	70%	80%	90%	99%
Oct	123.003	58.931	42.203	27.128	19.824	17.703	14.860	12.231	8.338	5.608	1.952
Nov	115.104	48.469	33.666	18.117	12.362	9.791	7.949	6.321	5.509	4.064	3.277
Dec	38.100	16.345	8.981	6.879	6.283	5.010	4.464	4.100	3.775	3.252	2.496
Jan	86.420	7.510	5.394	4.641	3.861	3.307	2.919	2.568	2.345	1.774	0.817
Feb	54.412	20.207	7.402	3.789	3.305	2.004	1.584	1.120	0.798	0.622	0.363
Mar	29.056	18.113	11.475	7.553	5.930	4.164	2.577	1.974	0.994	0.669	0.322
Apr	156.116	54.623	17.888	12.789	8.702	6.847	4.638	2.265	1.341	0.814	0.165
May	182.647	90.278	43.509	30.722	20.150	12.171	7.745	4.384	2.079	0.227	0.000
Jun	213.267	129.916	68.560	48.999	36.251	23.244	15.811	12.965	9.085	3.938	0.226
Jul	253.084	129.256	86.674	69.586	53.553	43.720	34.699	24.414	16.850	11.823	5.483
Aug	480.461	177.290	101.751	75.337	67.301	48.359	38.477	31.453	27.166	17.289	10.367
Sep	132.406	105.926	64.102	53.221	40.005	31.893	29.146	22.485	20.408	14.379	10.995

Floods: It has been assumed that Reserves set as part of an Intermediate RDM will NOT be used to issue water abstraction licenses that will affect the magnitudes of larger floods (e.g. 1:5 year and above). The Intermediate RDM methodology for estuaries, therefore, does not require extensive evaluation of changes in, for example, the magnitude and occurrence of floods.

Although this study provides a preliminary assessment of potential changes in

floods from one scenario to another, these were based on very limited data sets and are, by no means, sufficient to quantify specific specifications in terms of, for example the magnitude and occurrence of floods. Specific specifications in terms of the occurrence and magnitude of different flood regimes, therefore, can only be provided once more detailed analysis of floods under the Reference Condition, Present State and Future Development Scenario have been conducted.

The reserve for “Water Quantity” for an *ERC of C* for the Breede River Estuary was estimated at 649 x 106 m<sup>3</sup> (36.4% of natural MAR). A summary of the flow distribution (mean monthly flows in m<sup>3</sup>/s) for the water quantity reserve is provided below (confidence = 40%):

MONTH	1%	10%	20%	30%	40%	50%	60%	70%	80%	90%	99%
Oct	107.077	46.512	36.775	19.987	12.632	10.649	8.705	7.346	4.778	3.150	1.684
Nov	102.291	37.660	25.349	13.448	8.687	5.974	4.821	4.276	3.449	2.266	1.941
Dec	32.768	10.935	6.693	5.451	4.683	3.552	3.305	2.888	2.734	2.395	1.635
Jan	58.896	5.091	3.784	3.016	2.443	2.161	1.818	1.536	1.500	1.500	1.500
Feb	46.229	15.996	4.584	2.750	1.750	1.501	1.501	1.501	1.500	1.500	1.438
Mar	27.117	14.405	7.182	5.513	4.524	2.641	2.026	1.501	1.500	1.500	1.225
Apr	139.029	38.437	9.470	7.890	5.025	3.428	1.804	1.501	1.501	1.500	1.488
May	125.996	40.883	20.607	13.303	4.883	2.130	1.500	1.500	1.500	1.500	0.750
Jun	192.149	45.082	24.602	13.745	8.198	6.006	3.479	1.501	1.501	1.500	1.500
Jul	239.611	107.311	66.744	25.980	17.917	13.504	10.009	9.103	6.350	3.305	1.500
Aug	428.612	158.345	78.877	56.925	45.049	30.547	23.536	15.902	12.079	7.372	5.690
Sep	124.754	104.523	63.754	42.412	27.653	21.850	18.252	14.858	12.240	9.590	4.725

Floods: Refer to notes on floods for the Reserve for water quantity for an ERC of B above

The specialist team that did the preliminary reserve for the Breede concluded that a reserve for “Water Quantity” for an *ERC of A* for the Breede River Estuary was not an attainable goal. They further concluded 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” (putting it in a Category B) was the large reduction in river inflow. It would be impossible to improve the Breede River Estuary’s *ERC* from a Category B to a Category A, because a large amount of water, already abstracted in the catchment by dams etc.,

will have to be re-allocated to the estuary. It was assumed unlikely that large volumes of water could be re-allocated to the estuary to be able to elevate the *ERC* to a Category A.

## 2.5. Priority restoration actions

Like any estuary around the country, the Breede River Estuary has been exposed to numerous anthropogenic impacts over the years. These impacts need to be identified and managed to ensure that the ecological and economic integrity of the Breede River Estuary is maintained for future generations.

The main restoration action 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 will be long term, while others may be achievable in the shorter to medium term.

The following are restoration actions that can immediately be started:

- Erosion control measures to be implemented at priority sites
- Prohibit taking out and excessive cutting of reeds
- Urgent identification and implementation of no-take/no-disturbance zones as identified on the GIS map
- Allowing only "Catch and release" of Kob

In the Breede River Estuary the following conservation actions will also start addressing these aspects:

- A buffer area around the estuary to conserve ecological ecotone areas (1 km buffer around perimeter). This is also required in terms of the National Environmental Management: Integrated Coastal Management Bill 2006 A & B
- Prevention of excessive bank erosion
- Protection of sensitive habitat types like: Eel grass - *Zostera* beds, sand and mud banks, and transitional areas between salt and fresh water habitat
- Alien vegetation control and management in riparian zone and buffer area
- Control and management of alien macrophytes (Water Hyacinth - *Eichhornia crassipes*)
- Control and management of jetties and slipways
- Protection of reed beds (*Prionium serratum*, *Phragmites australis*, *Juncus sp.*, *Typha capensis*)
- Determination and enforcement of a setback line for development

- Control and management of boating and other wake producing water activities
- Control of airspace for aircraft to protect birds and other estuarine users. Investigate a possible "special flight rules area" to protect air space infringements affecting avi-fauna on the Breede Estuary
- Protection of fish populations and catch sizes
- Prevention of excessively nutrient rich or polluted water entering system from up river

As a first step the institution of exclusion and no-take areas should be implemented in the areas indicated on the GIS map (included).

### **2.5.1. Rehabilitation/remediation Measures**

After a brief research on the history of the Breede River as well as comments from participants during the first public participation meetings, it is clear that the river has been impacted negatively by erosion in the catchment. Large amounts of silt and sand had been deposited in the river over the last couple of years. It is clear that more information is needed to come to a satisfactory rehabilitation programme regarding this particular aspect.

### **2.5.2. Rehabilitation Needs**

At first glance, the Breede River is still in good health. There is a very active angling community utilizing the fish population of the Lower Breede River, indicating that fish are still utilizing the River for feeding and breeding. Discussions with boat owners and local managers of the Conservancy brought out the fact that there are moving sand banks in the river, making safe navigation difficult. Historically, fairly large sailing boats were able to sail upriver as far as Malgas to pick up loads of wheat. Nowadays it is no longer possible to use the river with large vessels with deeper draft. It is therefore clear that the source of erosion and siltation should be addressed as soon as possible.

### **2.5.3. Preliminary research/monitoring Needs**

The following questions need to be addressed in order to get a clear picture regarding any rehabilitation work on the river:

- How much sand/silt is entering the Breede on an annual basis
- What is the reason for the perceived erosion in the catchment
- What is the quality of the water entering the Breede

- How is ground water being influenced by farming abstraction
- How important is the sub-surface water input for the health of the river
- Can farming activities influence the river negatively, and determine ways of mitigating for the impacts
- What impact does the present sewerage disposal method have on the groundwater and water in the river
- How big is the impact of fishing activities on fish stocks
- What are the impact of boats on the river and river banks
- What impacts do aquatic recreation activities have on the river

Questions that needs to be resolved:

- Is the siltation as widespread and as bad as the first glance indicates
- Where is the source of the sand and silt coming from
- Does the siltation pose a threat to the River health
- Are there endemic organisms present in the river
- Are they negatively affected by the perceived siltation problem
- Will it be feasible to remove the sand from certain areas of the river in order to improve certain conditions (navigation, fish breeding needs etc.)
- If possible, what are the cost implications
- How big is the impact of farming activities on the river health
- Is it only sand, or are there other threats such as herbicides, pesticides and fertilizers
- Is it possible to start an anti erosion drive/programme in the catchment areas
- Will a wetland restoration project have an impact on the amount of sand entering the river river and quantities of water available for post flood runoff
- Will it be feasible to build silt retention systems into the small feeder rivers of the Breede in order to reduce the ingress of sand
- If it is required to remove the sand from portions of the river, can the sand be sold commercially to cover some of the cost of dredging

There are indeed more questions than answers.

#### **2.5.4. Suggested Actions**

It is imperative that known sources of erosion be identified and curtailed. Aerial photography of the catchment area shows a number of potential sources of siltation:

- a) Dirt roads.
- b) Farming activities.
  - 1) Overgrazing.
  - 2) Wheat farming
  - 3) Vineyards/orchards
  - 4) Badly maintained contour systems
  - 5) Hardened surfaces such as holiday developments cause higher runoff.
  - 6) Destruction of wetlands and seeps.

It is quite clear that the known or perceived sources of pollution are diffuse and there is no single identifiable perpetrator. Therefore, it is suggested that a broad based strategy is devised to start addressing the immediate threats. There are several agencies in the area that are directly or indirectly involved with conservation activities in the catchment area of the Breede River:

- a) Organised agriculture.
- b) Department of agriculture.
- c) The Lower Breede River Conservancy (LBRC).
- d) Municipalities.
- e) Cape Nature.
- f) SANParks.
- g) Individual land owners.
- h) C.A.P.E.

The obvious strategy would be to launch a co-operative effort to curtail any further deterioration of this valuable resource. A long history of erosion control in the RSA could serve as a benchmark for best practice on the ground. All of the less successful programmes should be reviewed in order to learn from previous experience.

The immediate solution for some of the issues would be to involve the stewardship programme of Capenature to begin negotiating with potential partners. It is also quite clear that an individual should be tasked with the execution of a well planned strategy. This kind of broad multi-reason problem needs to be addressed with vigor and insight. A clear and unambiguous message must be formulated to address each of the problems.

### **2.5.5. Recommendations**

It is recommended that a comprehensive monitoring/research system be implemented to determine the extent of the perceived erosion problem, and general threats to the estuary as a whole. One action to

achieve this would be to appoint a community liaison officer to start with a programme of advocating land care and wetland restoration projects. This liaison officer should assist the, to be established Estuary Management Forum (EMF), with information collection and sharing. The liaison officer could establish an advisory committee that can assist and advise authorities in decision making. The next step would be to have the data available on a GIS map indicating general problem, and high risk erosion areas.

These unknown aspects will only be properly resolved once data is available to assess these aspects, hence the need for a comprehensive monitoring plan. The following is a first attempt at getting to such a plan.

## **2.5.6. Proposed Monitoring to be instituted**

### **2.5.6.1. Bacteriological contamination of the Estuary**

There are a number of potential threats in the form of sewage disposal systems. The following systems have been noted during discussions with the authorities and stakeholders:

- Bucket system
- Septic tank systems
- Mini plants
- No system.

In view of the wide usage of the river, it is important to determine levels of bacteriological pollution. (It is no longer acceptable to test only for *E. coli*. There are viruses and other pathogens that can have a detrimental effect on human and invertebrate health).

A possible way of getting the monitoring done is to involve professional laboratories as well as some higher education institutions that can do the sampling on contract basis.

Monthly bacteriological sampling will be adequate. Other organisms can be sampled on a 6 monthly basis (summer–winter).

It is possible for non professional people to assist in monitoring of general river health with the Estuary System. The health and integrity of the freshwater sections of the Breede River should be assessed on a seasonal basis using SASS5.

### **2.5.6.2. Sedimentation/Siltation**

It is important to monitor the amount of suspended solids in the river as part of the anti erosion programme. Secchi disk readings should be done on monthly basis as part of the monitoring programme. Suspended solid sampling can be done during low and high flow periods as well as during rain episodes.

Fixed photo points should also be established at critical areas, and or areas known to be problematic. Aerial photography and landsat images can also be utilized.

### **2.5.6.3. Chemical pollution**

Due to the agricultural activities in the river catchment as well as discharge of sewage effluent, it is necessary to determine phosphates, sulphate's, nitrogen's and micro nutrient levels. Where possible within the constraints of the budget, levels of agricultural chemicals in the river need to be determined. (Herbicides, pesticides and hormones used in meat production).

Oxygen levels should be sampled at low flow periods, particularly when high concentrations of nutrients are present. The eventual effective control of enrichment chemicals would be possible when data on the above parameters become available.

### **2.5.6.4. Sampling sites**

Permanent sampling sites should be established where regular samples are taken for all of the above. A set of random sampling sites should also be established in order to pick up possible aberrations to the fixed system.

### **2.5.6.5. DWAF monitoring of effluent standards at WWTW (water quality)**

DWAF runs regular water quality tests on all registered sewage disposal plants. Most of these plants have a permit to discharge effluent to rivers and streams. It is imperative to review all of these water discharge permits of sewage plants discharging into the Breede system. The review should show what quality discharge had up to now been permitted. It is suggested that all permits should be upgraded to allow special standards rather than general standard.

#### **2.5.6.6. Ground water monitoring**

The current increase in groundwater use may have unforeseen effects on wetland and the supply of fresh water to the river. Particularly with the close proximity of the Table Mountain Sandstones to the western side of the estuary, these freshwater discharges to the river may be affected and can have detrimental impact on the water quality of the Breede River.

Both organized agriculture and conservation agencies should keep an eye on groundwater levels by monitoring borehole water levels in the region. Easy and inexpensive ways are available. Access to DWAF water level monitoring systems may be advantageous.

Possible groundwater pollution resulting from licensed and un-licensed waste dump sites in the catchment should be assessed.

#### **2.5.6.7. Carrying Capacity**

A number of activities on and around the river have the capacity of impacting on other users. It is therefore useful to start collecting user information for the management database. Activities such as angling, boating, water skiing, swimming (more) has the potential of growing. A point will be reached where it may become necessary to limit activities, either through quotas or donation and other means.

Carrying capacity determination is a very subjective criterion, relying on experience, personal preference, environmental conditions etc. Accurate information about uses and users in the various activities become a useful tool in such an exercise.

As a start the following areas of exploitation need to be recorded:

- Angling
- Bait collection
- Water skiing
- Kite surfing
- Boating
- Swimming.

#### **2.5.6.8. Siltation and erosion**

Due to the importance of maintaining a healthy flow of fresh water in the river, siltation and erosion need to be controlled and monitored. The most effective way of monitoring this particular aspect is the use

the latest technology in satellite imagery systems, utilizing various color spectrum filters. It is suggested that such a programme be implemented to serve as basis for remedial and preventative action. Erosion hot spots, as well as the development of sand banks in the river can be tracked effectively in this manner. Destruction of wetlands can also be monitored and picked-up.

All collected data should be captured on GIS to enable effective management interventions.

## **2.6. Protected area potential**

Various options exist for a larger protected area along the river banks. According to the National Environmental Management: Integrated Coastal Management Bill 2006 A & B, it is required to have a 1 km offset (coastal protection zone – See GIS map) from the high water mark of an estuary. This should be used as the departure point for determining sensible ecological boundaries (bio-physical) on where this protected area should be located. Land ownership within the 1 km offset zone does not need to be affected. This should be a priority area (core area) for some negotiated form of inclusion in the coastal protection zone or conservancy.

One possible biodiversity corridor runs along the cliff tops to the west of the estuary (See GIS map). The farming community proposed a large conservation area between the river and the De Hoop missile testing range some time ago. This option should be re-visited. Cape Nature officials identified some farming areas for stewardship options. During discussions with officials there was general consensus that the estuary as well as the bay must be part of the greater marine protected area. Ecological corridors, both east-west as well as north-south should be identified and secured. The GIS system in conjunction with aerial photography will assist in determining the final viable corridors. Identified highly sensitivity areas must be demarcated clearly to exclude any utilization. No take zones for bait and Kob should be identified, clearly and indicated with signage. An environmental education/information campaign should be implemented to ensure that knowledge of the positions and reasons for these zones are widely distributed.

As part of the protected area, the air space over head the proposed protected area should also be controlled. This should be managed as a three-dimensional boundary to protect the important avi-fauna associated with the estuary. The close proximity of the De Hoop

missile range is already a special rules area for aviation. This could be changed to include the estuary with special rules regulating aviation activities overhead the estuary. A minimum altitude for aircraft operations should be instituted (1500 ft above msl).

With regards to the pollution problems influencing the estuary and river, it may be possible to create a river conservation system similar to the now defunct Lake Areas Development Act (Act 39 of 1975), in other words, to create a controlled area covering the whole catchment of the Breede River. Within this control area, very specific rules or regulations can be imposed to manage the various actions that have an impact on the estuary and river health (Specific items such as water quality, erosion, agricultural chemicals, sewerage disposal sites, desalination plants etc.).

See attached GIS maps for proposed areas that need to be investigated.

## **2.7. Awareness-raising and public participation/stakeholder involvement**

The first engagement with authorities took place during a meeting held in Swellendam on 27 November 2007, where the process to be followed was communicated to the authorities. At this meeting the consulting team was introduced to the authorities. Authorities were invited to participate in the project and to send in any contributions they felt necessary.

The first stakeholder meetings were held on 11 December 2007. One meeting was held at the Angling club at Witsand at 10h00 in the morning, and as second stakeholder meeting was held at 14h00 at the Malgas Hotel Conference Hall. Both meetings were advertised in the media (Suid Kaap Forum, Breede Brief, Swellendam Gazette), notifications were delivered to each post box in Witsand, five site notices were put up and the Lower Breede Conservancy communicated the meetings to their distribution lists.

Both meetings were well attended. During these meetings the process was discussed, and the core values of the estuary to the community were listed. These values were circulated to the stakeholders to ultimately agree on a draft vision and objectives for the Breede River Estuary Management Plan. A draft vision, mission and objectives were developed and forms part of this document.

In both meetings it was clear that the people are willing to take ownership of the Breede River Estuary, with a strong sense of protection and conservation shared by all. There was strong support for the proposed management plan and many people offered to help and have submitted valuable inputs.

The socio-economic environment will determine the generic awareness programme for the Breede estuary. It is perhaps fortunate that the Breede river catchment is not heavily populated. Role players consist mainly of farmers, worker communities, rural occupation landowners, holiday villages and tourism operators. The estuary has no known informal settlements nearby. There are also no known subsistence fishers operational in the estuary.

Through different proposed communication strategies the local communities will be informed about what estuaries are, the environmental roles they play and the goods and services that they provide.

Proposals will be put forward on how the relevant stakeholders and user groups in estuary can assist in the management and decision-making about the Breede Estuary.

Following the first authorities and stakeholder meetings during December 2007, a list of Estuary Values was circulated to the registered Interested and Affected Parties (I&AP's). After feedback from the stakeholders, and some deliberation by the consulting team a DRAFT vision was developed (See below).

This Situation Assessment Report will also be circulated to all the authorities and stakeholders for input and comments. At the end of February 2008 the second stakeholder meeting will take place where the Situation Assessment Report will be discussed and the Vision and Objectives will be finalized. After this round of stakeholder communication the final report will be submitted to CapeNature Estuaries Programme.

The ultimate Estuary Management Plan will also be made available for input by the stakeholders and authorities.

### **2.7.1. Inputs received to date on the vision and objectives:**

#### Proposed VISION statements.

a) Breede river estuary, a healthy functioning estuary of great beauty and a sense of place supplying an outstanding service to all users, man and beast (**Peet Joubert**).

b) (**Proposal submitted by Jon Keats**) **Our Vision:** The Breede River Estuary is the pristine pride of South African Estuaries. Its bountiful rewards are the fruits of our love and dedication to its wellbeing.

**Mission:** We are the keepers and protectors of our children's rightful inheritance to this beautiful estuary and joyfully accept this privileged responsibility.

**Motto:** Teamwork makes Estuaries Work.

#### ***The Vision could be expanded if necessary to include the CFR 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. We are the keepers and protectors of our children's rightful inheritance to this beautiful estuary and joyfully accept this privileged responsibility.

#### **Core Values:**

- Unique Tidal Estuary
- Unique and Diverse Eco System
- Unique Sense of Place and Beauty
- Unique combination of Flora, Fauna, Avifauna and Aquatic Life
- Mediterranean Climate
- Cultural Heritage and History

#### **Value Opportunities:**

- **Nature**
  - Bird watching
  - Vegetation studies
  - Whale watching
  - Wild animal observation
  - Scenic walks

- **Recreation**
  - Fishing
  - Boating
  - Skiing
  - Windsurfing
  - Diving
  - Cycling
  - Swimming
- **Health and Spiritual Wellbeing**
  - Peace and quiet
  - Relaxation, recuperation and stress relief
  - Spiritual upliftment
  - Physical exercise and fitness
  - Family bonding
- **Tourism, Hospitality, Conferencing**
  - Guest houses and farming community hospitality
  - Guided tours of region
  - Events Management and Conferencing
- **Small Local Business and Job Opportunities**
  - Farm /Cultural/Trading Stalls
  - Bait supply
  - Fish and oyster supply
  - Hire and sale of activity equipment
  - Tour guides
  - Removal of alien plants and re-establishment of indigenous plants
  - Clearing water way and beaches of debris.
  - Estuary nature wardens
  - Construction, Property maintenance, inc. jetties & slipways.
- **Education and Awareness**
  - School tours
  - Underprivileged tours
  - International Delegations
  - Historical museum
- **Scientific Research**
  - Formal research and monitoring of whole estuary environment.

**Strategic Objective:** To restore and sustain the natural resources and biodiversity of our Estuary in coexistence with suitable and responsibly managed social and economic progress.

**Key objectives:** The following key objectives have been identified as the corner stones to the achievement of our strategic objective and ultimate vision.

- Ensure proper management of the estuaries water through input to the CMA
- Ensure protection of aquatic life to optimum sustainable levels in line with improved water resources, whilst also eliminating alien species.
- Eliminating activities that are damaging to the environment already.
- Eradicate all alien plants, within the geographically defined Estuary boundaries and rehabilitate indigenous flora.
- Re-introduce the estuary waters and its defined surrounds, with indigenous Mammals and Birds, catering also for natural migration patterns.
- Clearly define the geographic boundaries of the Breede River Estuary (Land, Sea and Air)
- Establish a competent Estuary Management body (Estuary Management Forum) which has the required authority and resources to undertake and enforce its allocated responsibility and which will be held accountable for its performance.
- Allow social and economic development within the defined Estuary Space, only to the extent that it co-exists in terms of prioritized Estuary Imperatives.
- Develop and implement local bylaws that will enable the Responsible Body to give effect to the BRMP objectives and manage its allocated responsibility. Also make recommendations regarding National Legislation pertaining to Estuary management and protection needs.
- Develop an efficient law enforcing capability to ensure that both proactive and consequent steps are taken in support the Responsible Bodies duties and objectives.
- Develop and implement an ongoing intensive public awareness campaign.
- Establish a voluntary participating forum of public stake holders that are sincerely committed to our Vision and Mission.
- Establish a priority list of problems and an interim process to; identify, monitor, deal with and prevent undesirable and unsuitable developments and activities, whilst the Breede River Management Plan and enabling structures are being put in place.
- Action plans, targets and time frames need to be developed for each of the above Key Objectives. Example: A potential approach to dealing with Interim Priorities is set out below.

### **2.7.2. Interim Priorities according to stakeholders:**

The development and implementation of the Breede River Estuary Management Plan will not happen overnight. In the meantime, undesirable and unsuitable developments and activities will continue and even increase in anticipation of future controls. (The current official structures and enforcement capabilities are severely lacking in ability to deal with both formal applications and illegal developments). The potential degradation that can take place in the interim period may take years to rectify or in many cases may not be reversible at all. It is suggested that an interim process be put in place incorporating the following:

- The formation of a committee which, during the implementation period, will monitor any formal applications or unauthorized activities that occur within the Breeder River Estuary.
- This committee shall meet monthly with relevant authorities and stakeholders to review developments and co- ordinate actions.
- An important function of the committee will be to assess current National, Provincial, and Local legislation, in context of its effectiveness to support the identified objectives of the BRMP. It shall where necessary motivate changes at all levels of legislation, but particularly in respect of Local Bylaws.
- The first actions of this committee should be to compile a detailed list of developments, activities and impacts that need priority attention. Action plans need to be developed and urgently implemented, including appropriate interventions.
- The composition of the committee could be made up of the following parties. Municipal Environmental Managers (Swellendam and Hessequa), Chairman Lower Breede River Conservancy, Town Planners (Swellendam and Hessequa), BRMP consultants P de Villiers and W Roets (or an elected representative)
- Participating Authorities/Parties should include: DEA&P, Cape Nature, DWAF, Department of Agriculture, CSIR, Marine and Coastal Management, Rate Payers Association (Swellendam and Hessequa)

### **2.7.3. Identified Problems from stakeholders.**

This matter was not specifically discussed at the stakeholder's participation meeting. A few problems were however identified during the course of the meeting.

- Radical changes have taken place over the past three decades.--  
- It was recommended that a scientific and carefully thought out questionnaire be developed on the past status of various important aspects of the Estuary and that long time residents of the area be visited with the view to establishing say a 30 year baseline and subsequent changes. A correlation of independent answers, will give a fairly accurate picture. This will enable researchers to identify the rate of change and priority issues for input into the Management Plan.
- The fact that the responsibility for the Breede River Estuary is split between the Swellendam and Hessequa Municipalities is a problem and this needs to be addressed by the consultants.
- The rate of silting up of the Estuary is increasing at a rapid rate.
- The suitability of certain recreational activities and the sustainable capacity of the Estuary to accommodate these needs to be evaluated. Eg number of boats, fishing bag limits, etc. The Lower Breede River Conservancy already plays an important roll in this regard. The current by-laws relating to the control and use of the Breede River need to be expanded.
- There is a serious need to regulate Aircraft activities in the Estuarine airspace. The negative impact of low flying aircraft on sense of place, secretive mammals and especially Avifauna is of great concern. It is important in defining the Estuary Boundaries, that a three dimensional approach is taken, which includes the airspace above the Estuary and of course the green belt corridor, which stretches on both sides of the River Estuary. Restrictions on height as well as landing and take off activities need to be imposed within the defined Estuary space, and setback lines. The current NEMA Listed activities in this regard are not sufficiently protective.
- Alien plants are a problem in certain areas. Land owners can play an important roll in prioritizing the clearing of these on the banks of the estuary and in the Green Belt area.
- Deterioration in water quality, caused by farming activities, damming, release of sewerage into the river, extraction of water from the river etc.
- Other problems – It is suggested that this matter is more fully discussed at the next Stake Holder participation meeting, to ensure that all inputs are received.

## 2.8. GIS map of Breede Estuary

An important part of the situation assessment was the generation of a GIS based map of the estuary, *and to have this user friendly and accessible to managers on the ground.*

The GIS map will be updated with more relevant layers over the next phase of the project. Due to time constraints and contributions from other institutions not arriving in time, the current layers are the only available to date.

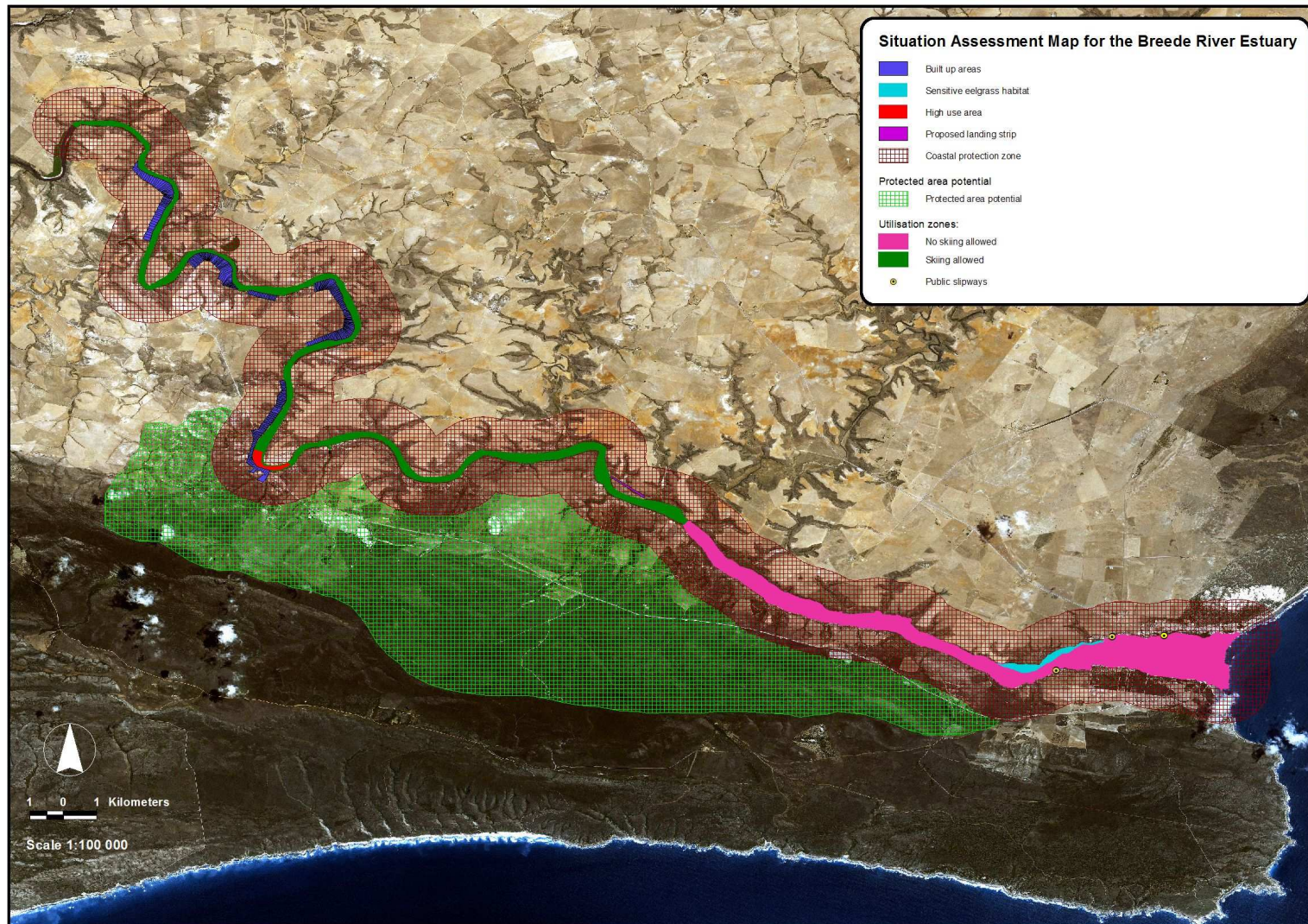
- Important biophysical features (build-up areas, public slipways, Eelgrass habitat and erosion prone areas)
- Proposed protected/conservation area
- Recreational activities and current zonation (e.g. swimming, boating, sailing and esp. kite surfing)
- Vegetation and sensitive habitat map
- Proposed management zones

### 2.8.1. Proposed activities to be restricted within each management zone:

- **No disturbance zone**
  - No anchoring, bottom fishing, beaching or bait collection
- **No go areas (Restricted access)**
  - No fishing, bait collection, beaching or disturbances allowed, even in flood plain areas
- **No take area for kob (0-5 km from mouth)**
  - No catching of Kob allowed in this zone at all
- **REI (Riverine /estuary interface)**
  - Sensitive ecotone area where consensus use will be negotiated

**It is proposed that no development be allowed below 5m contour with immediate effect.** With rising sea levels and increased storm surges these are areas where disturbance should be kept to a minimum.

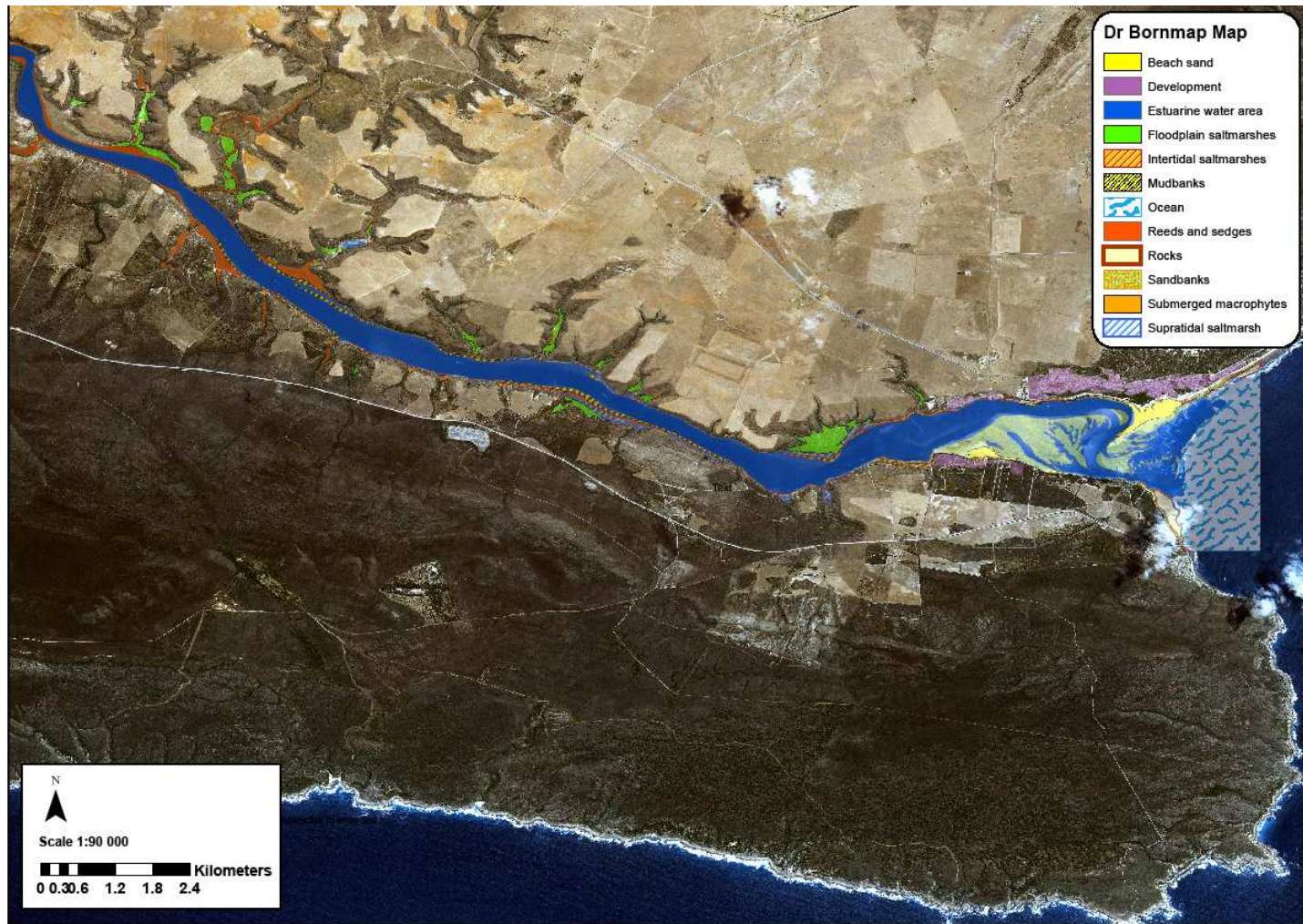
The **proposed altitude restriction for aircraft** should be maintained over the entire 1 km buffer area (Figure 1) "Coastal Protection Zone", and the future protected area associated with the Breede River Estuary.



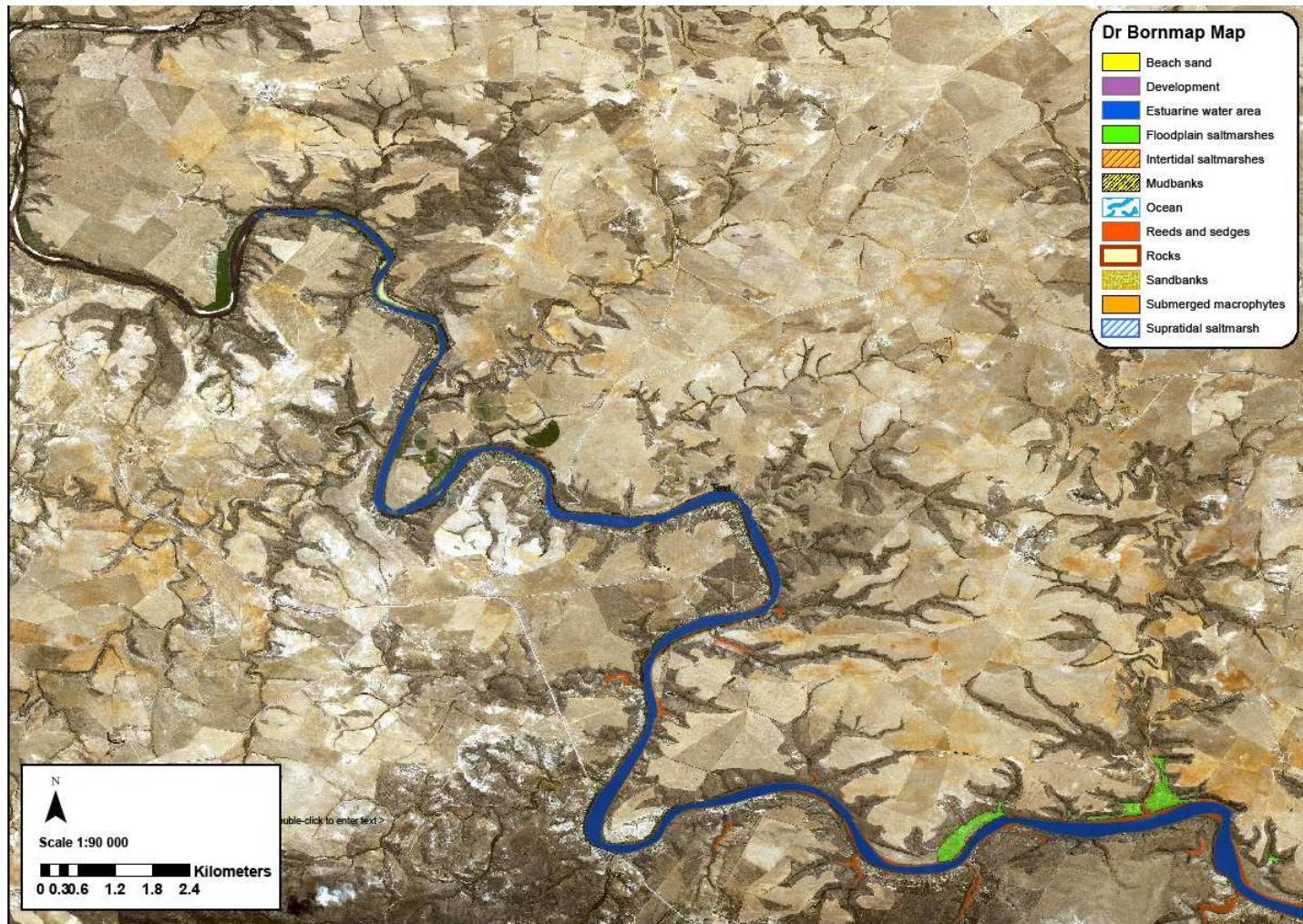
**Figure 1. GIS map showing Situation Assessment layers developed.**



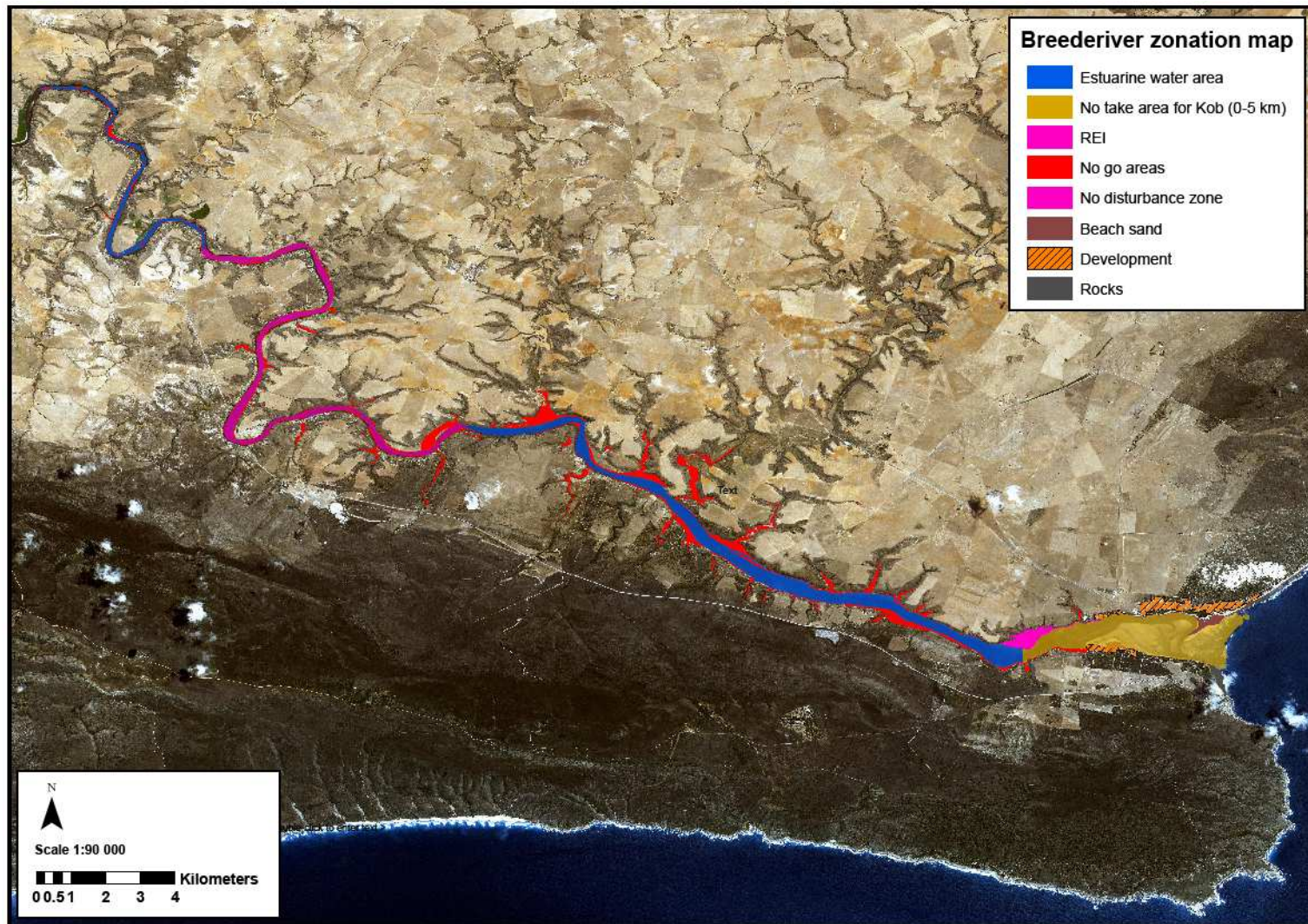
**Figure 2. Map showing vegetation and sensitive habitats**



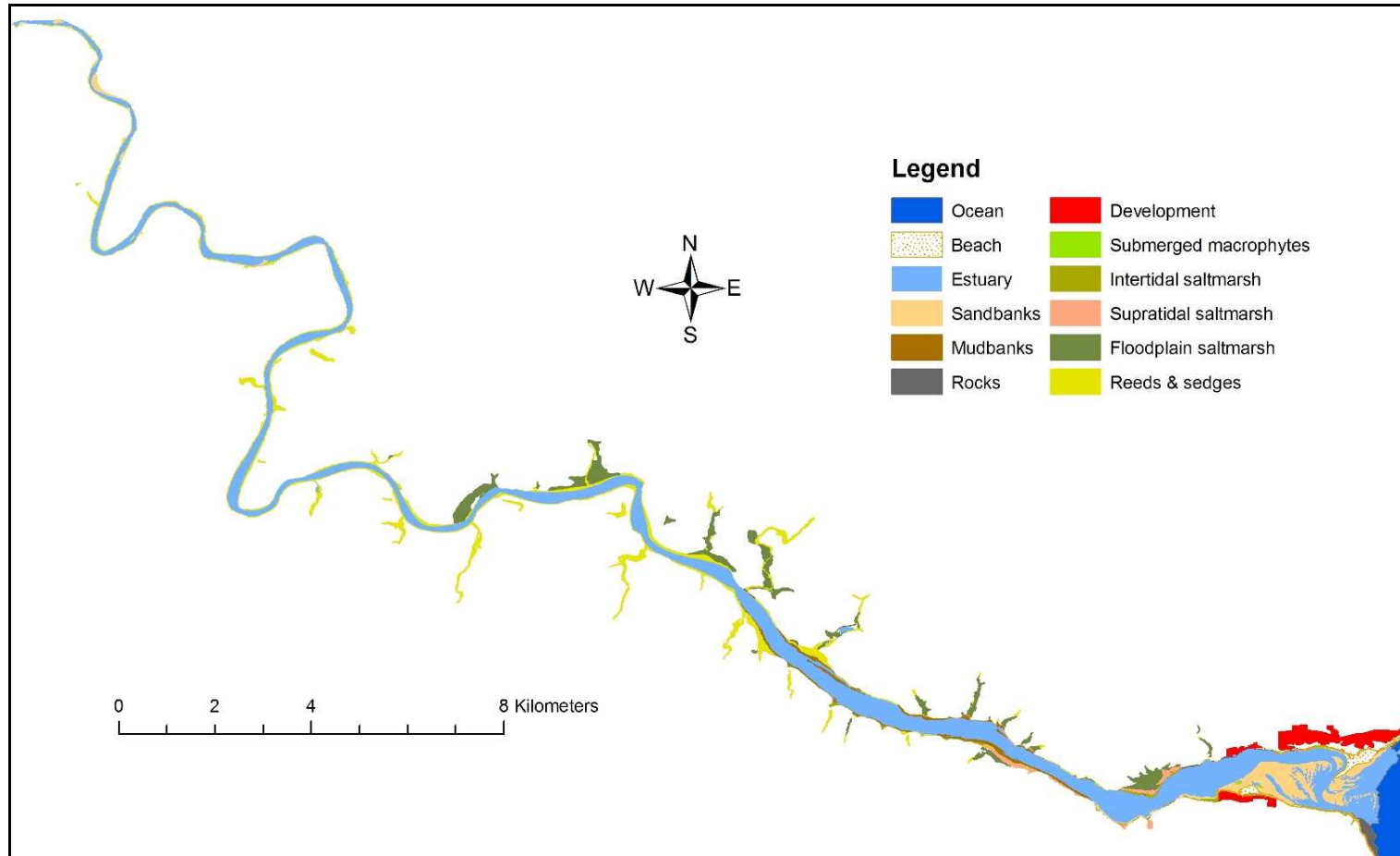
**Figure 3. Map showing vegetation and sensitive areas in lower Estuary**



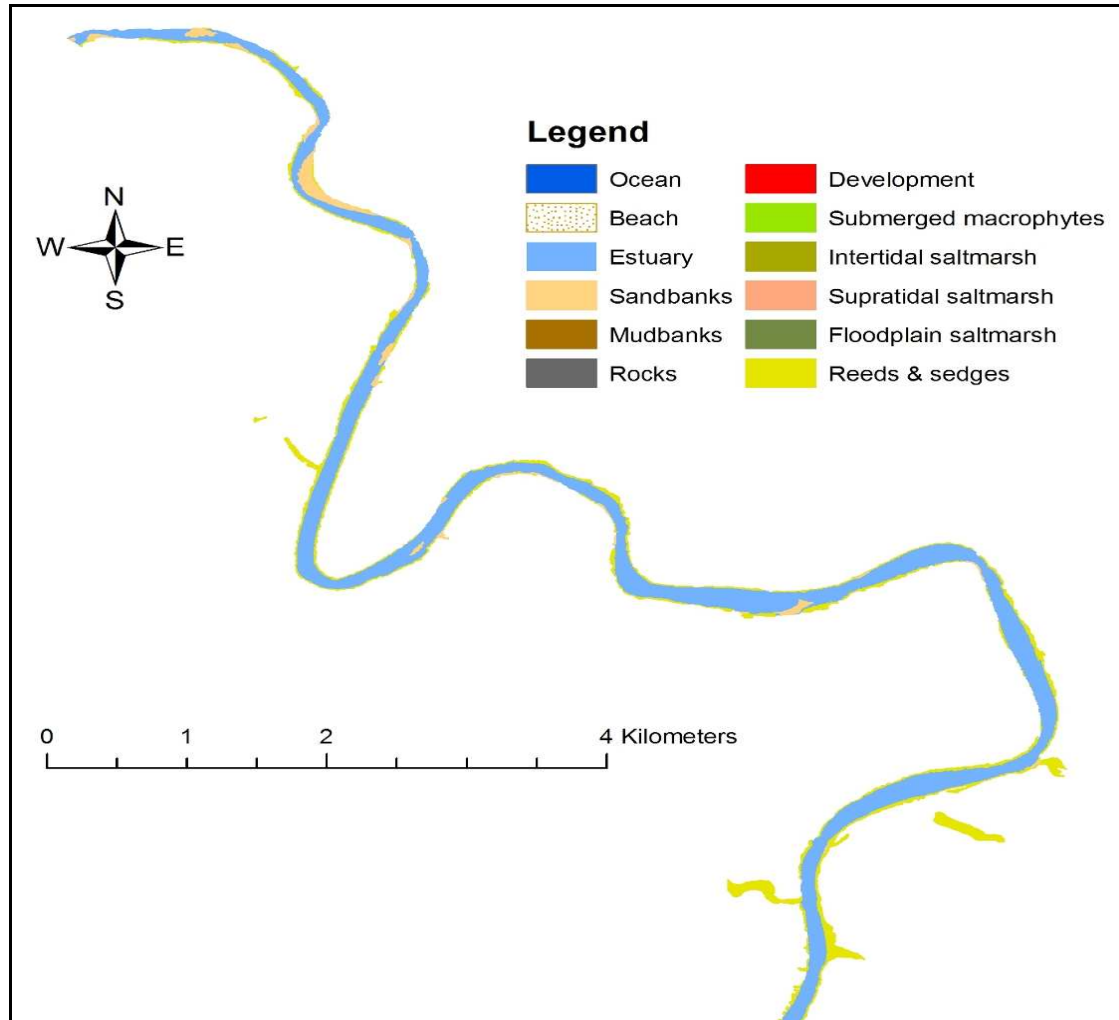
**Figure 4. Map showing vegetation and sensitive areas in upper Estuary**



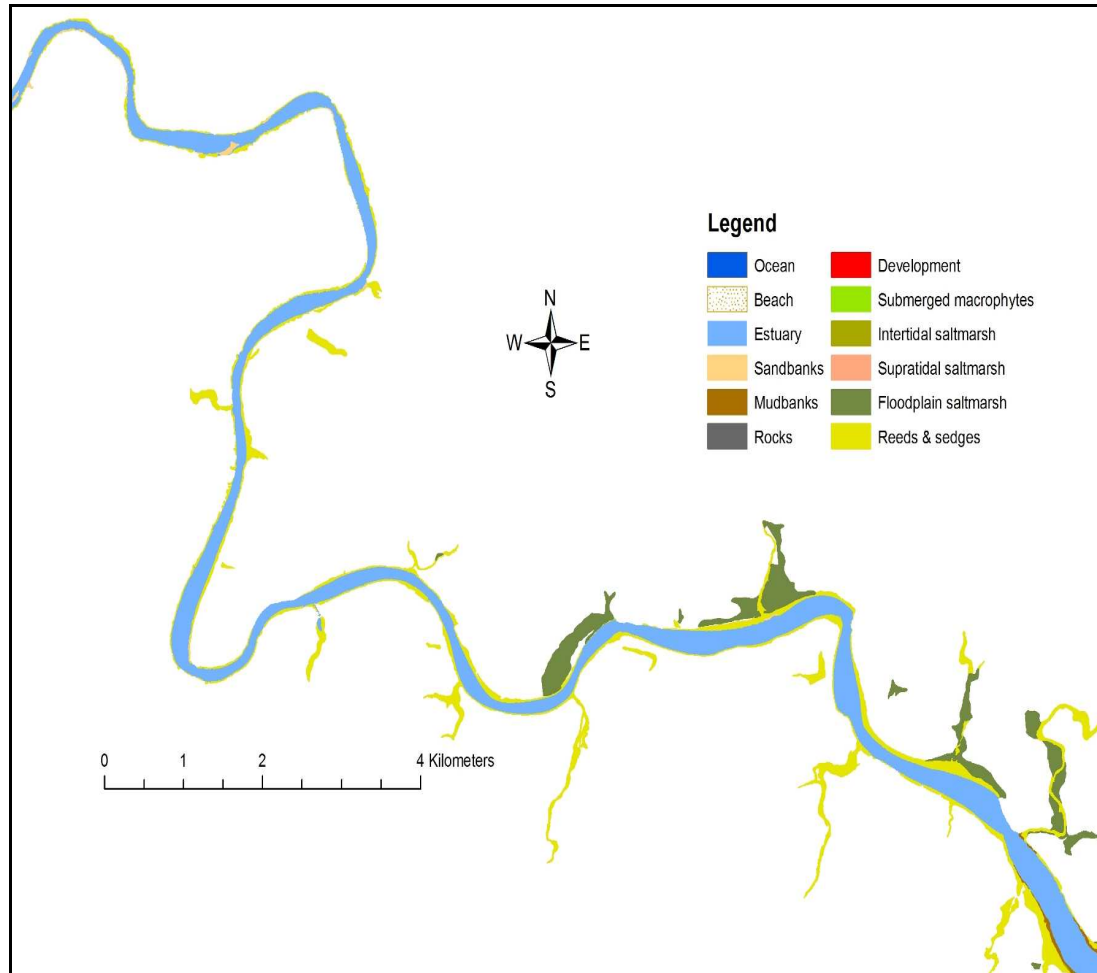
**Figure 5. Map showing proposed management zones**



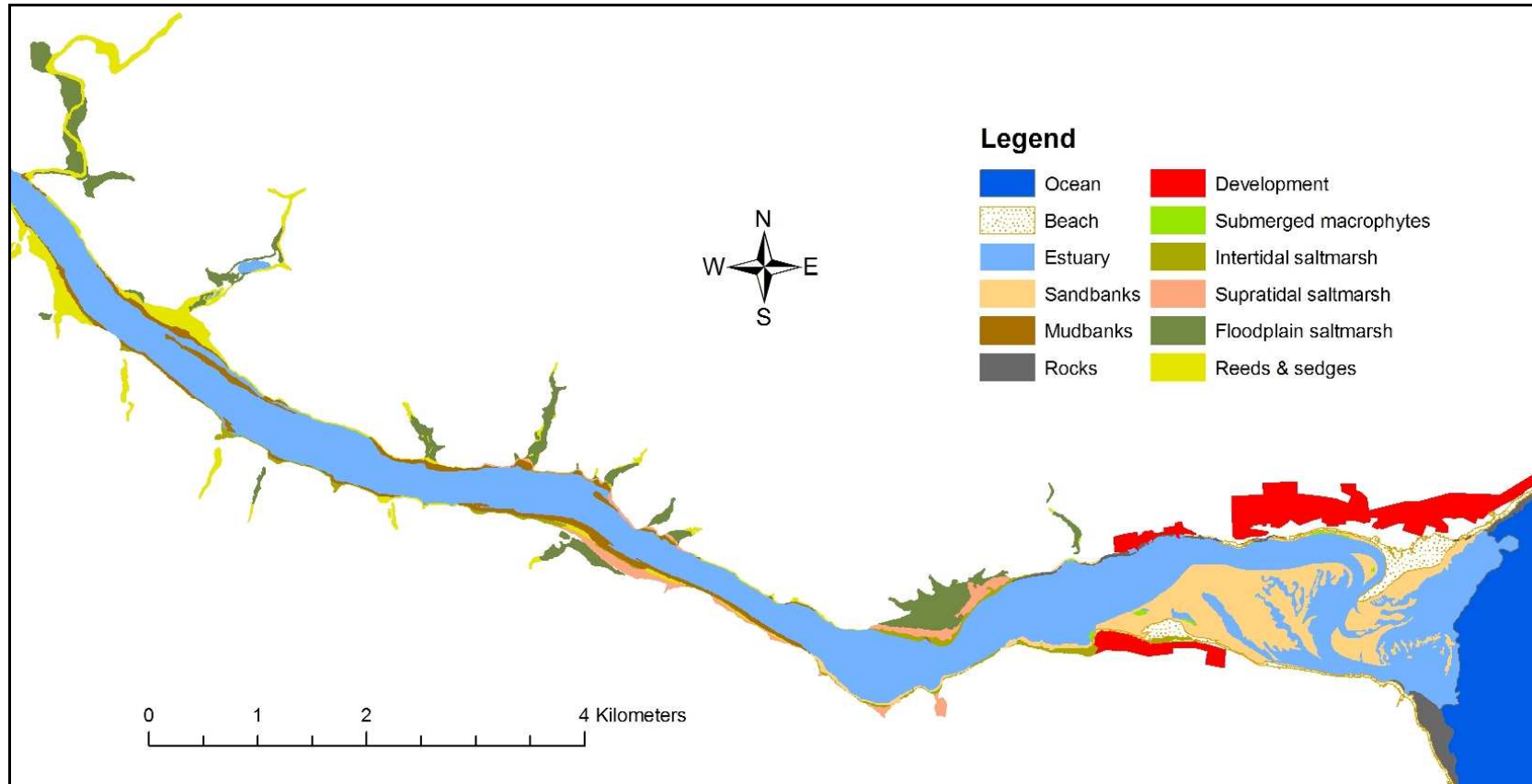
**Figure 6a. Vegetation map**



**Figure 6b. Vegetation map**



**Figure 6c. Vegetation map**



**Figure 6d. Vegetation map**

### 3. References:

**Lamberth S.J. 2007.** Sustainable Fishing in Estuaries. *C.A.P.E. Estuaries Guideline 7, Version1.*

**Taljaard S, Van Niekerk L & Huizinga P.2001.** Breede River Estuary EFR/RDM Study. Specialist report on physical dynamics and water quality. *CSIR report ENV-S-C 2001.*

**Taljaard S. 2002.** Intermediate Determination of Resource Directed Measures for the Breede River Estuary. *CSIR Report ENV-S-C 2002-020/A.*

**Taljaard S. 2007.** Interpretation of Legislation pertaining to Management of Environmental Threats within Estuaries. *C.A.P.E. Estuaries Guideline 1, Version 1.*

**Taljaard S. and Van Niekerk L. 2007.** Promoting appropriate Water Quantity and Quality Management in Estuaries. *C.A.P.E. Estuaries Guideline 5, Version1.*

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**Van Niekerk L and Taljaard S. 2007.** Proposed Generic Framework for Estuarine Management Plan. *C.A.P.E. Generic Estuary Management Plan, Version 1.*

**Wooldridge T. 2007.** Collection of Bait Organisms in Estuaries. *C.A.P.E. Estuaries Guideline 3, Version1.*

## 4. Appendixes:

Teenwoordigheidslys/ Attendance register  
 Publieke Vergadering/ Stakeholder Meeting  
 Breede Estuary Management Plan: 11 December 2007 – at Witsand Angling Club  
 10:00am

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Teenwoordigheidslys/Attendance Register  
 Publieke Vergadering/ Stakeholder Meeting  
 Breede Estuary Management Plan: 11 December 2007- at Malgas

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