Province of the
EASTERN CAPE
ECONOMIC DEVELOPMENT,
ENVIRONMENTAL AFFAIRS & TOURISM

EASTERN CAPE COASTAL MANAGEMENT PROGRAMME

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Table 1: List of abbreviations and acronyms

ABBREVIATION	IN FULL
ADZ	Aquaculture Development Zone
CMLs	Coastal Management Lines
CMP	Coastal Management Programme
COGTA	Cooperative Governance and Traditional Affairs
CPP	Coastal Public Property
CPZ	Coastal Protection Zone
CSIR	Council for Scientific and Industrial Research
DEA	Department of Environmental Affairs*
DEAT	Department of Environmental Affairs and Tourism*
DEDEAT	Department of Economic Development, Environmental Affairs & Tourism
DFFE	Department of Forestry, Fisheries and the Environment
DM	District Municipality
DRDAR	Department of Rural Development and Agrarian Reform
EEZ	Exclusive Economic Zone
EFZ	Estuarine Functional Zone
EMP	Estuarine Management Plan
GBF	Kunming-Montreal Global Biodiversity Framework
GDP	Gross Domestic Product
ha	Hectares
HWM	High-water mark
ICM	Integrated Coastal Management
ICMA	Integrated Coastal Management Act (24 of 2008 and Amendment Act 36 of 2014)
ICM Act / ICMA	National Environmental Management: Integrated Coastal Management (Act No. 24 of 2008).
IUCN	International Union for the Conservation of Nature
KZN	KwaZulu-Natal
LM	Local Municipality
MCC	Municipal Coastal Committee
MEC	Member of the Executive Council
MINTEC	Ministerial Technical Committee for the Environment
MLRA	Marine Living Resources Act (18 of 1998 and Amendment Act 5 of 2014)
MPAs	Marine Protected Areas
NCC	National Coastal Committee
NCMP	National Coastal Management Programme
NEMA	National Environmental Management Act (107 of 1998)
NEMP	National Estuarine Management Protocol
NGO	Non-Governmental Organisation
NMBM	Nelson Mandela Bay Metropolitan Municipality
NRF	National Research Foundation
OECMs	Other Effective Conservation Measures
PCC	Provincial Coastal Committee
PCMP	Provincial Coastal Management Programme
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SANCOR	South African Network for Coastal and Oceanic Research
SDF	Spatial Development Framework
SDG	Sustainable Development Goals
SEA	Strategic Environmental Assessment
SAEON	South African Environmental Observation Network
SPLUMA	Spatial Planning and Land Use Management Act (6 of 2013)

UNEP	United Nations Environment Programme
WG 7	Working Group 7

Executive Summary

Province of the EASTERN CAPE
ECONOMIC DEVELOPMENT, ENVIRONMENTAL AFFAIRS & TOURISM

Introduction

Coastal environments are a rich and diverse asset, providing valuable economic, social and ecological services and development opportunities. As such, they need to be carefully managed to ensure long-term sustainability. South Africa, following global trends, developed and enacted the Integrated Coastal Management Act (24 of 2008) and its subsequent Amendment Act (36 of 2014), hereafter referred to as the ICM Act.

The ICM Act contains a variety of tools to ensure that the coastal zone will be managed co-operatively, of which the development of Coastal Management Programmes (CMPs) is a key instrument. A CMP is a policy directive for the management of the coast and includes strategies and plans for the effective implementation of the ICM Act. The Eastern Cape provincial CMP (EC CMP) sets out goals and objectives for the achievement of Integrated Coastal Management in the province. This EC CMP has been developed in the context of existing policy documents for the Eastern Cape province and South Africa.

The aim and purpose of this Coastal Management Programme

The primary goal of a provincial Coastal Management Programme (CMP) is to implement integrated coastal management (ICM) within the coastal zone under provincial jurisdiction, while aligning with national coastal management objectives. This updated CMP builds on the foundation laid by the inaugural plan, with a specific focus on the unique and diverse characteristics of the Eastern Cape coastline.

Recognising the region's ecological, social, and economic significance, the plan identifies key areas of concern that require targeted attention. Using this information, the CMP outlines a strategic framework to guide both public and private sector actions, with the aim of improving the well-being and livelihoods of coastal communities. In addition, this CMP seeks to support effective decision-making, strengthen coastal governance, and promote greater awareness of the coastal zone's value to both people and the environment.

Vision and Priorities

The vision for the EC coast was developed during the EC CMP (2024-25) process and is informed by the National CMP, and the expertise of the EC Provincial Coastal Committee (PCC) and stakeholders. The vision and mission are underpinned by a set of core principles which follow international best practice.

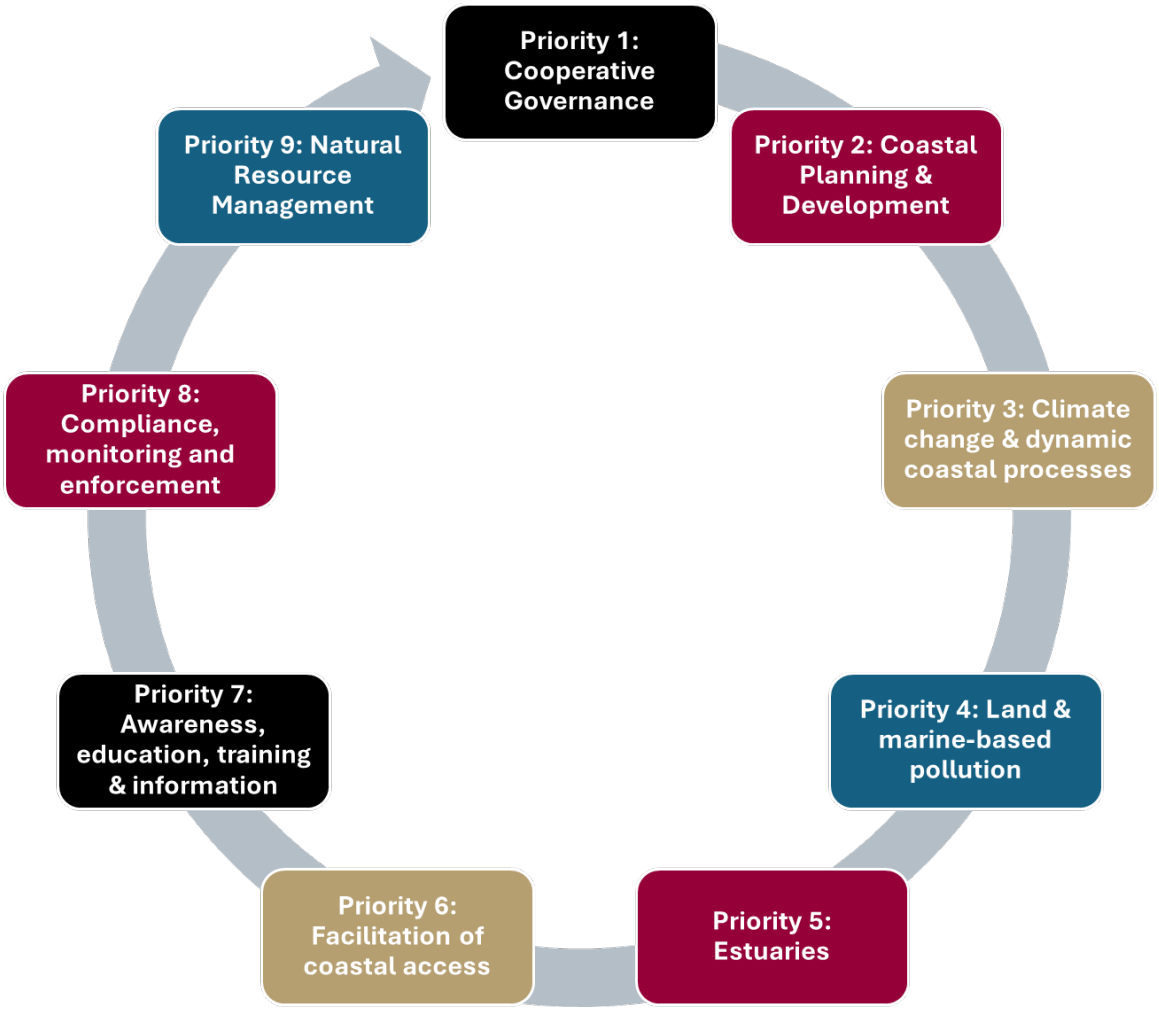
The Vision for the Eastern Cape coast:

> *A coast with unique scenic beauty, ecological diversity, and cultural significance that benefits both present and future generations without compromising its ecological and cultural values.*

The Vision is to be supported by the Mission Statement for the Eastern Cape Coast:

> *To utilize our coastal resources wisely and equitably, balancing economic prosperity with environmental protection, and empowering communities to benefit from our shared coastal asset.*

The ecological, economic, social and cultural values of the coast is protected, restored and enhanced, while ensuring climate change resilience and promoting equitable access and sustainable use of coastal resources for all stakeholders and user groups.



Priority Areas that provide direction for achieving the coastal management vision for the Eastern Cape coast

Nine priority areas remain the focus of the EC CMP. The identified priorities provide direction for achieving the coastal management vision for the Eastern Cape. The aim of these priority areas and associated implementation strategies is to address and build upon key issues of concern outlined during the CMP review process and public consultation processes.

Implementation

Implementation of the EC CMP is guided by the Eastern Cape DEDEAT. This includes commitment to the priorities, objectives and actions outlined, as well as various relevant international and national drivers such as the National Development Plan and the National CMP. Where required, the Department commits to promoting and supporting the development of inter-governmental processes, structures and mechanisms to enable integrated coastal management.

The Eastern Cape coastal environment is unique and complex to manage. The EC CMP is therefore intended as an integrative planning and policy instrument, guiding the management of a diverse array of activities within the EC coastal zone, without compromising environmental integrity or economic development.

In this context, however, the EC CMP acknowledges the important role that Municipal CMP's, Integrated Development Plans (IDPs) and Spatial Development Frameworks (SDFs) must play in managing the coastal zone at the local level. The EC CMP further recognises the respective mandates and functions of the Department of Forestry, Fisheries and the Environment (DFFE), Department of Water and Sanitation (DWS), Department of Mineral and Petroleum Resources (DMPR), Department of Public Works and Infrastructure (DPWI), Eastern Cape Cooperative Governance and Traditional Affairs (EC COGTA), EC Parks and Tourism Agency, and the Provincial Coastal Committee in contributing to the overall management of the EC coastal zone.

1 Introduction

1.1 The value of the coast

Globally, coasts face significant challenges relating to environmental sustainability, economic growth, poverty, inequality and unemployment. The Eastern Cape coast is a valued environment within which ecological diversity, human activity and socioeconomic influences are interdependent and interact (Goble et al. 2014). It is a focal area for development, livelihoods and leisure. These results are increased pressure for the provision of food, human settlement, businesses, industry, tourism and ports.

Direct value is generated by the main sectors operating on the coast, namely tourism, fishing, agriculture, ports, mining, coastal development, government services and manufacturing. While the direct economic value of the ocean and coast is a significant opportunity to unlock, from a sustainability perspective, the indirect value of the ocean and coast from an ecosystem-services perspective cannot be underestimated or undervalued. Indirect benefits of coastal ecosystem-services include erosion control; waste treatment; soil formation; water regulation and supply; nutrient cycling; biological control; habitats; pollination; climate regulation; genetic resources; gas regulation and existence value.

Estuaries are a significant coastal asset as nursery grounds for many species of birds, fish, and other animals, as well as the water filtration and the socio-economic benefits that they provide. These unique characteristics make estuaries among the most valuable types of ecosystems on earth (Raw et al., 2021).

The economic value of the South African coast as a resource is considered in the Operation Phakisa: Ocean Economy Lab, which has indicated a potential value of R177 bn in GDP could theoretically be unlocked through the various workstreams by the year 2033 (IGD, 2018). Operation Phakisa identified the important role players within the various sectors of South Africa's oceans and coast economy and has established a number of workstreams and delivery units that all work towards achieving the goals as set out during the Operation Phakisa process that began in 2014. The Eastern Cape Government actively engages in the various Operation Phakisa workstreams.

1.2 The aim and purpose of this Coastal Management Programme

The primary goal of a provincial Coastal Management Programme (CMP) is to implement integrated coastal management (ICM) within the coastal zone under provincial jurisdiction, while aligning with national coastal management objectives. This updated CMP builds on the foundation laid by the inaugural plan, with a specific focus on the unique and diverse characteristics of the Eastern Cape coastline.

Recognising the region's ecological, social, and economic significance, the plan identifies key areas of concern that require targeted attention. Using this information, the CMP outlines a strategic approach to guide both public and private sector actions, intending to improve the well-being and livelihoods of coastal communities.

In addition, this CMP seeks to support effective decision-making, strengthen coastal governance, and promote greater awareness of the coastal zone's value to both people and the environment.

1.3 Coastal management cycle

Following the publication and adoption of the inaugural Coastal Management Programme (CMP) for the Eastern Cape in 2004 and its second iteration in 2013, the Eastern Cape Department of Economic Development, Environmental Affairs and Tourism (DEDEAT) is entering its third iterative coastal management cycle.

The CMP review process is in line with the requirements of the National Environmental Management: Integrated Coastal Management Act (Act No. 24 of 2008, hereafter the ICM Act). The proposed 2025 EC CMP builds on, and updates, existing provincial coastal policies and provides a coherent, integrated and co-coordinated framework and directive for coastal management and decision-making. It builds upon the existing strengths and successes of operational management tools and interventions outlined in the earlier CMPs and is thus structured within this context, the outcomes of a public consultation process, as well as the principles of integrated coastal management.

1.4 Integrated Coastal Management Mandate

Integrated Coastal Management (ICM) is a globally recognised approach used to improve the sustainable management of coastal areas and their resources (Goble et al. 2014). In alignment with international best practices, South Africa acknowledged the need for dedicated coastal legislation (FAO 2007), which led to the development of the Integrated Coastal Management Act (No. 24 of 2008) and its Amendment Act (No. 36 of 2014).

This legislation provides a comprehensive framework to ensure the cooperative and sustainable management of the coastal zone. Its goal is to balance economic development and human use of coastal areas with the protection, preservation, and restoration of coastal ecosystems. The Act also seeks to minimise risks to human life and property, while enhancing public access and enjoyment of coastal environments—within the limits of ecological carrying capacity and natural dynamics (DEA 2014).

One of the key tools introduced by the ICM Act is the **Coastal Management Programme (CMP)**. CMPs serve as policy directives that outline strategies and implementation plans for managing the coast effectively. They play a critical role in coordinating the efforts of all spheres of government, the private sector, and local communities to ensure that coastal development and resource use are both socially and economically justifiable and ecologically sustainable.

ICM emphasises building institutional adaptive capacity as a cornerstone for achieving resilient and sustainable coastal development. It promotes integration across sectors, linking government and communities, science and management, and public and private interests. This integrated approach enables actions that combine development investment with the conservation of coastal environments.

In South Africa, ICM is underpinned by strong governance structures across national, provincial, and local levels. These include the establishment of coastal committees, which facilitate cross-sectoral collaboration and public participation in achieving shared coastal management objectives.

1.5 Strategic Alignment

Implementation of the EC CMP is guided by the Eastern Cape DEDEAT. This includes commitment to the priorities, objectives and actions outlined, as well as various relevant international and national drivers such as the National Development Plan and the National CMP. Where required, the Department commits to promoting and supporting the development of inter-governmental processes, structures and mechanisms to enable integrated coastal management.

The Eastern Cape coastal environment is unique and complex to manage. The EC CMP is therefore intended as an integrative planning and policy instrument, guiding the management of a diverse array of activities within the EC coastal zone, without compromising environmental integrity or economic development.

EC CMP strives to establish mechanisms for the comprehensive participation of representatives from all sectors of coastal communities, as well as providing management tools to empower decision-makers to manage and utilise the coast. In this context, the EC CMP acknowledges the important role that Municipal CMP's and Integrated Development Plans (IDPs) and Spatial Development Frameworks (SDFs) must play in managing the coastal zone at the local level. The EC CMP further recognises the respective mandates and functions of the

Department of Forestry, Fisheries and the Environment (DFFE), Department of Water and Sanitation (DWS), Department of Mineral and Petroleum Resources (DMPR), Department of Public Works and Infrastructure (DPWI), Eastern Cape Cooperative Governance and Traditional Affairs (EC COGTA) and the Provincial Coastal Committee in contributing to the overall management of the EC coastal zone.

2 The Eastern Cape Coastal Zone

The EC coast is shaped by a unique assemblage of physical features comprising climatic, geological, and oceanographic characteristics. Collectively, they create a distinctive coastal environment rich in social, economic and ecological resources. The coastline of the Eastern Cape Province is approximately 875 km long, almost a quarter of South Africa's total shoreline, and nearly one third of the province's total jurisdictional boundary.

In terms of the ICM Act, the coastal zone, the primary area requiring dedicated ICM management, is defined as:

> *"the area comprising coastal public property (CPP), the coastal protection zone (CPZ), coastal access land, coastal protected areas, the seashore and coastal waters, and includes any aspect of the environment on, in, under and above such area".*

2.1 Socio-economic context

In the Eastern Cape, approximately 2.33 million people reside within a 20 km distance to the Eastern Cape's coast, accounting for about 35% of the province's total population (CSIR, 2025, unpublished). Of these people, about 147 900 lived in coastal zones between the highwater mark and the 20 m elevation contour, constituting about 2.4% of the province's total population.

Population projections indicate that the currently existing settlements and metros on the coast and nearby traditional settlements will see high to extreme population growth until 2025 (Figure 1). The highest growth is expected for coastal settlements in the Kouga local municipality, Nelson Mandela Bay Metropolitan, and in Great Kei Local Municipality in the coastal towns of Arena, Chintsa East, Kei Mouth and Komga. Other small towns (< 2 000 inhabitants) that are projected to experience a high population increase are Port St Johns (OR Tambo DM) and Mzamba A (Winnie Madikizela-Mandela Local Municipality).

Figure 1: Hotspots of expected population growth on South Africa's east coast, 2050 relative to 2011

2.1.1 Coastal population and communities

The Eastern Cape province comprises four coastal district municipalities, which include twelve coastal local municipalities and two coastal metropolitan municipalities. The four district municipalities are O.R. Tambo, Amathole, Sarah Baartman, and Alfred Nzo, while the two metropolitan municipalities are Nelson Mandela Bay and Buffalo City. As of 2022, the Eastern Cape province had a total population of approximately 7.2 million people, reflecting a 10% increase from 2011, with all coastal district municipalities experiencing population growth between 2011 and 2022.

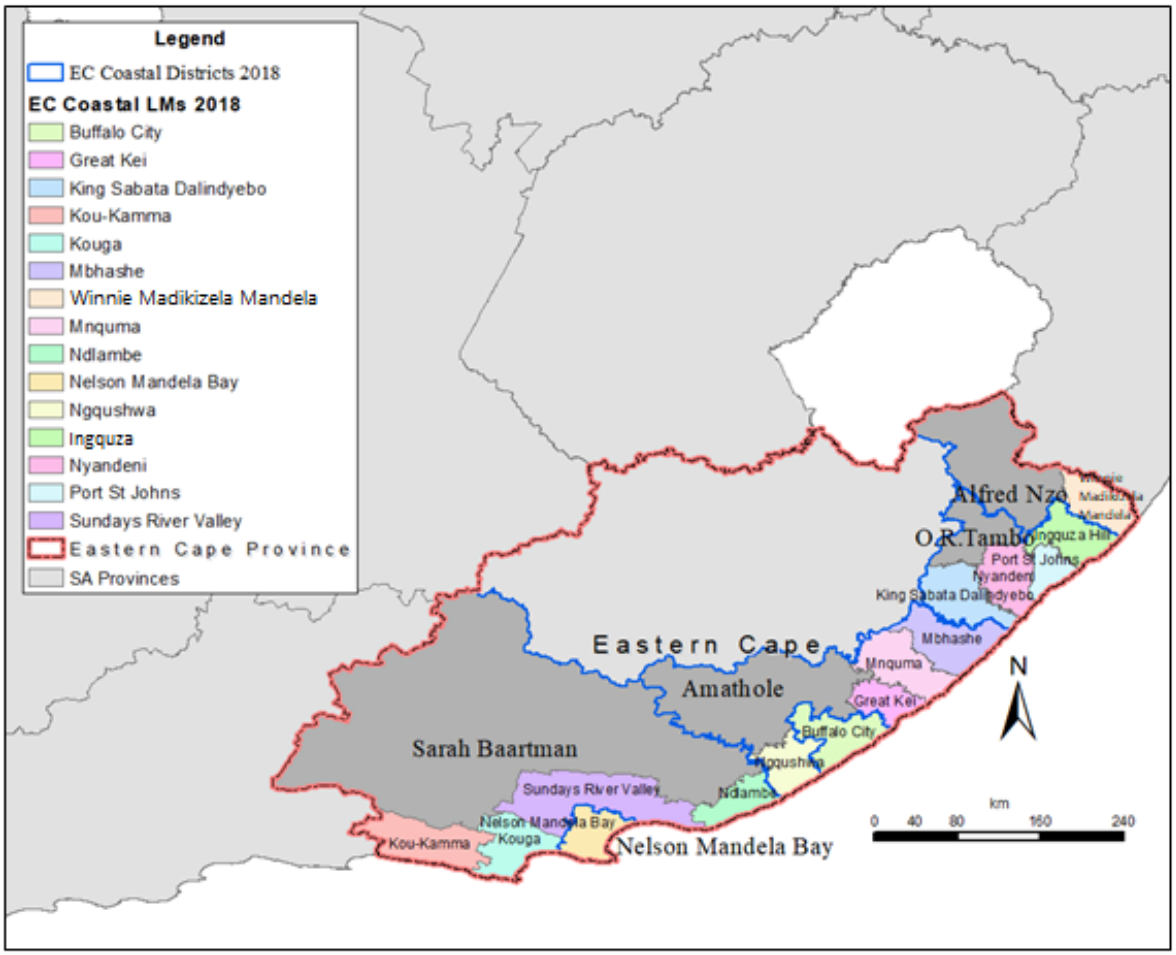


Figure 2: The Eastern Cape's coastal Metropolitan, District and Local municipalities

There is a stark contrast between the southwestern and north-eastern parts of the province's coast in terms of development and settlement types. The southwestern portion, including the metropolitan cities Gqeberha (formerly Port Elizabeth) and eMonti (formerly East London), is more developed, serving as key urban and economic hubs for the province. In contrast, the north-eastern portion—formerly known as the Transkei during apartheid, a rural homeland for Xhosa-speaking people—is characterised by a dense network of traditional settlements (Figure 3).

This imbalance also reflects in social and economic differences and challenges between the coastal district municipalities.

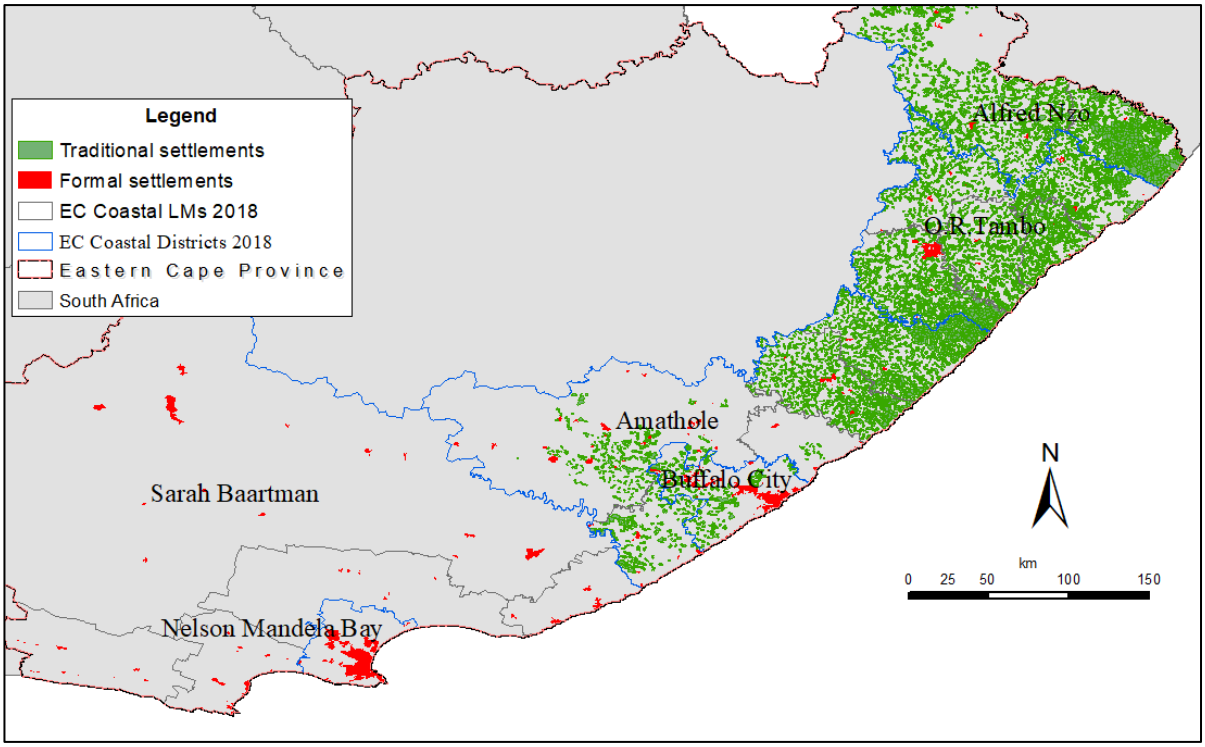


Figure 3: The Eastern Cape's coastal District and Local municipalities

2.1.1.1 OR Tambo District

The O.R. Tambo district which includes four coastal local municipalities, King Sabata Dalindyebo, Nyandeni, Port St. Johns and Ingquza Hill, has a total population of 1 501 700, making it the most populous district in the province. It is followed by Nelson Mandela Bay, which has a population of 1 190 500. The Sarah Baartman district is the least populated district in the Eastern Cape, with a total population of 533 250 (Statistics South Africa, 2022). The district occupies 9.5% of the provincial land and has 313 500 households, making it the most densely populated area. In 2022, the population was comprised of 53% female and 47% male, a disparity attributed to high male migration to urban areas in search of employment opportunities (CoGTA, 2020; Statistic South Africa, 2022). The largest proportion of the population falls within the working-age group (15–64 years), while the elderly population (65 years and older) represents the smallest share.

O.R. Tambo is classified as a C2 municipality, indicating a predominantly rural character with a low urbanisation rate. Within the settlements, 77% of households consist of formal dwellings, marking a significant increase from 43% in 2011. Additionally, 0.9% are classified as informal dwellings, while 21.5% consist of traditional dwellings. The provision of municipal services, including weekly refuse disposal, electricity, access to piped water and flushing toilets connected to sewerage, has improved within the district. Furthermore, the district supports a diverse range of economic activities, including forestry, agriculture and tourism (CoGTA, 2020).

O.R. Tambo District is ranked as the fourth poorest district in South Africa. Notably, three of the ten poorest local municipalities in the country are located within this district, namely Port St. Johns (73.5%), Nyandeni (72.5%) and Ingquza Hill (72%). Elevating the importance of access to coastal resources and livelihoods is essential.

2.1.1.2 Sarah Baartman District

The Saran Baartman district is the least populated coastal municipality in the Eastern Cape. The district covers approximately a third of the provincial land and comprises 7% of its population (Department of National Treasury, 2021). The population is comprised of 52% females and 48% males. This district has an average annual growth rate of 1.6% (CoGTA 2020). Similarly, the largest proportion of the population falls within working age,

accounting for 67% of the population (Statistics South Africa, 2022), while the elderly accounts for 10%. Approximately 90% of these households are formal dwellings. The Department of Human Settlements reported 34 informal settlements within the district in 2020/21. Furthermore, 6% of these households were headed by children, while 58% were headed by women. The provision of municipal services, including weekly refuse disposal, electricity, access to piped water and flushing toilets connected to sewerage, has improved significantly within the district since 2011.

2.1.1.3 Amathole District

The Amathole district contains four coastal local municipalities, with a population of 871 600 (Statistic South Africa, 2022). The population accounts for 12% of the Eastern Cape's population, and it is comprised of more females than males. Similarly, 60% of the district's population is of working age.

Great Kei takes about a 42 km share of the coastline of the Eastern Cape. And encompasses four coastal towns and the Glens, with a rich heritage to leverage on both for tourism and other opportunities. A total of 241 600 households reside in the district, of which 4 000 were headed by children and 39% headed by women. Over 80% of households are formal dwellings, with only 35% of all households have access to piped water. Furthermore, only 40% have access to flushing toilets connected to a sewer system, while the majority of the population use pit latrine toilets. This raises concerns regarding human well-being and the pollution risk to the coastal environment. The provision of weekly refuse disposal has improved, however, more than 50% of the population still relies on their own refuse dump, thus raising the potential for solid waste pollution.

The percentage of people living in poverty in the district has shown a declining trend in the last decade. Among the local coastal municipalities, the highest proportion of individuals living in poverty was recorded in Mbhashe.

2.1.1.4 Alfred Nzo District

This district includes one coastal local municipality, namely Winnie Madikizela-Mandela. The local municipality has a population of 350 000, accounting for 35% of the total district population, making it the most populous municipality in the district. Similarly, the population is also female-dominated, with a large proportion within working-age group. The unemployment rate in 2011 was 44% (StatsSA; no more recent data available). Nearly 70% of households consist of formal dwellings, yet only 16% have direct access to piped water. More than 50% of households lack access to piped water, while the remaining portion obtains it from community stands or inside yards. Although the provision of piped water has increased since 2011, the majority of the population still lacks adequate access to this service. Furthermore, the availability of weekly refuse disposal has improved, rising from 2% in 2011 to 16% in 2022. However, 72% of households continue to rely on self-managed refuse disposal, with associated solid waste (e.g. plastics) pollution risks.

2.1.1.5 Metropolitan Municipalities

Nelson Mandela Bay municipality (NMBM) has a population of over 1 million people, making it the most populous Metro in the Eastern Cape, followed by Buffalo City Metropolitan municipality is ranked third most populated area with a population of over 900 000 people (Statistic South Africa, 2022 & NMBM, 2024). Both populations are comprised of 53% females and 47% males. Between 2014 and 2019, the Nelson Mandela Bay population growth rate showed a declining trend, which is contrary to the Buffalo City population growth rate, which remained stable. The population growth rates in both municipalities are higher than that of the Eastern Cape. The population structures of both Buffalo City and Nelson Mandela Bay Metropolitan Municipality (NMBM) are characterised by a majority working-age population (over 60%) and a relatively small elderly population (less than 10%). However, in Nelson Mandela Bay, the working-age population increased from 60.2% in 2019 to 62.5% in 2022, leading to a 6% decline in the dependency ratio. This suggests improved economic potential, as a larger share of the population is of working age, reducing the burden on dependents.

Conversely, Buffalo City's working-age population remained constant between 2011 and 2019, with no significant changes in the dependency ratio. This stability may indicate limited demographic shifts within the municipality over this period. According to CoGTA (2020) and ECSECC (2017), these trends highlight Nelson Mandela Bay's evolving demographic structure, potentially reflecting migration patterns, economic opportunities, or differences in birth and mortality rates compared to Buffalo City.

Nearly 92% of households in the Nelson Mandela Bay Municipality (NMBM) were formal dwellings, compared to 85.6% of households in Buffalo City. Service provision in both municipalities has improved, with over 90% of the population now having access to electricity. However, the provision of piped water to households is slightly lower in Buffalo City than in NMBM, as is the case with refuse disposal and sanitation services.

2.2 Land use change

Since 2014, the land cover and land use in the EC's coastal zone have undergone major changes. A comparison of the National Land Cover maps from 2014 and 2022 for a 20 km wide strip inland from the coast shows that since 2014, of the 8 435 km^2 coastal area, approximately 1 165 km^2 (~14%) were subjected to change (Figure 4). The urban areas increased by 2.9 km^2, while some significant changes between urban types also took place[1], e.g. industrial and commercial areas increased by about 15 km^2. Of major concern is the loss of more than 280 km^2 of natural woodlands and 74 km^2 of shrublands which have been converted into almost 200 km^2 of croplands, an additional 10 km^2 of planted forest, and about 38 km^2 of grasslands. Figure 4 illustrates the observed land cover changes for the wider Nelson Mandela Bay area. The loss of Forested land and the expansion of agricultural land and grasslands is clearly visible.

2.3 Coastal economies and livelihoods

The EC's coastline is rich in natural resources and scenic assets that underpin diverse economic opportunities. Along the Wild Coast, its natural beauty supports a vibrant eco-tourism sector, while in the Algoa Bay area, recreational activities such as diving, whale and shark watching, and beach-based tourism are key attractions.

The ports in Algoa Bay provide opportunities relating to trade and manufacturing, as well as boat building and maintenance. Universities in the region - Nelson Mandela University, Rhodes, Walter Sisulu University, Fort Hare - present an academic platform which can support any coastal and ocean activity.

Agriculture and conversion of forests into grassland for livestock grazing) has also become increasingly prominent in the coastal region in the last decades. Apart from these large industries, the coastal zone also provides the basis for community and individual livelihoods, especially in regions where other economic opportunities are missing. These include small-scale fishing and collecting of fish, crustaceans and other invertebrates, sand mining, seaweed farming, medicinal plant harvesting, as well as potentially the use of trees for timber and fuel wood.

However, these livelihoods face challenges such as poverty, seasonal employment, and increasing pressure from development and limited infrastructure, with a particular vulnerability in former homeland areas of the province, where the lack of economic opportunities leads to large parts of the workforce migrating into other parts of the country.

[1] *Some of the changes in urban classes might be due to different class definitions in both maps though.*

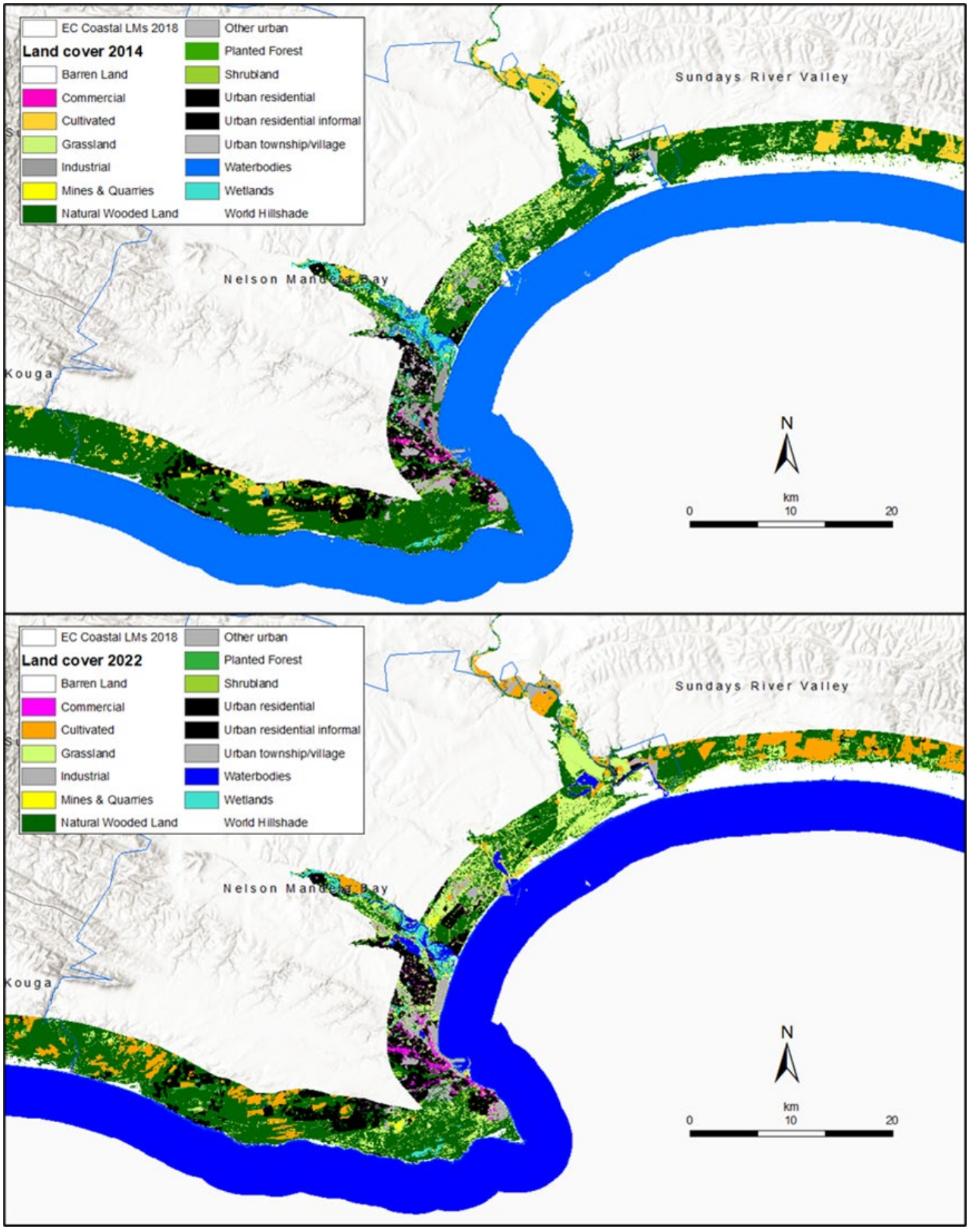


Figure 4: Land Cover in the Nelson Mandela Bay metro in 2014 (top) and 2022 (bottom).

These include subsistence fishing and collecting of fish, crustaceans and other invertebrates, sand mining, seaweed farming, medicinal plant harvesting, as well as potentially the use of trees for timber and fuel wood.

However, these livelihoods face challenges such as poverty, seasonal employment, and increasing pressure from development and limited infrastructure, with a particular vulnerability in former homeland areas of the province where the lack of economic opportunities leads to large parts of the workforce migrating into other parts of the country.

2.4 Cultural and heritage aspects

Within 20 km of the Eastern Cape coast, 74 SAHRA-registered Heritage sites are located (**Error! Reference source not found.**), providing tourism opportunities to the region. Of these, 71 are historical buildings, mainly located in the urban areas of Gqeberha and East London (Figure 5).

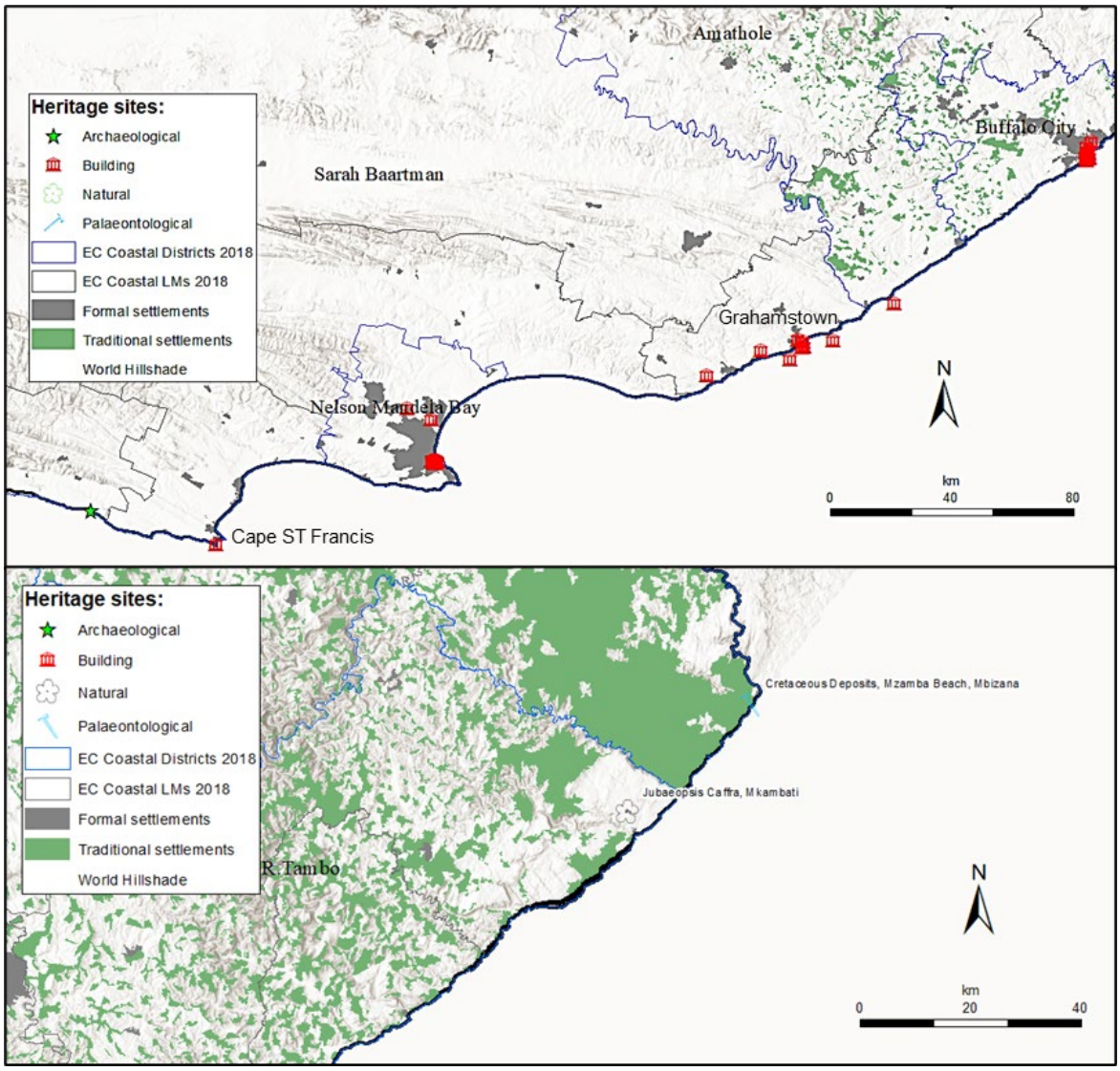


Figure 5: Heritage sites on EC's coast (Source: SAHRA).

The Klasies River Caves, located near Humansdorp in the Kou-Gamma District, has yielded some of the earliest and most extensive evidence for anatomically modern humans in southern Africa and some of the oldest behavioural evidence for a coastal economy through the extensive use of marine resources in Africa. The sites also preserve the most extensive record on stone artefact technology, food gathering and settlement organisation in the Middle Stone Age in sub-Saharan Africa. The site has become an iconic locality for the study of modern human origins, expressed through the ongoing research publications, both locally and abroad, originating from the site and providing information about environmental changes and human adaptations over the past 120 000 years (https://www.sahra.org.za/).

Along the eastern coast of the Eastern Cape, the palaeontological site of Cretaceous Deposits are located on Mzamba Beach in Winnie Madikizela Mandela Local Municipality. The deposits consist of greyish-brown sandstone and limestone that is extremely rich in fossil material dating back 80-million years. The deposits include masses of marine shells which include beautiful examples of tightly coiled ammonites, echinoids (sea urchins) and bivalve shells.

A natural heritage site is also located in Mkambati, where Jubaeopsis caffra (Pondo coconut, Dwarf Pondoland palm, Mkambati palm) occurs, which is the only species in its genus and is endemic to Pondoland in the Eastern Cape, South Africa, where it is found along the Mtentu and Msikaba rivers.

While not the direct focus of ICM, there is a responsibility to support the preservation of sites of cultural significance.

2.4.1 Operation Phakisa

Operation Phakisa aims to unlock the economic potential of South Africa's oceans. The oceans have the potential to contribute up to R 177 billion to the gross domestic product (GDP) and create just over one million jobs by 2033. One goal of the presidential initiative is to boost South Africa's Oceans Economy, specifically focusing on the following areas (https://www.operationphakisa.gov.za/):

- Small Harbour and Coastal State Land development;
- Aquaculture;
- Offshore Oil and Gas;
- Marine Protection and Governance;
- Marine Transport and Manufacturing; and
- Coastal and Marine Tourism.

In the Eastern Cape, the proclaimed harbours of Port St. Johns, Mzamba and Hamburg harbour have been prioritised by the government in the near future (10 yr+) for upgrades and renovations.

As for Aquaculture development, marine Aquaculture Development Zones (ADZs) have been designated for western Algoa Bay (Nelson Mandela Bay Metro's coast) and the coasts of Buffalo City, Great Kei and Mnquma local municipalities. A freshwater ADZ also covers Buffalo City's, Great Kei's and parts of Mnquma's inland area (Figure 6). In addition, several marine aquaculture projects are thus in different phases of implementation, inside and outside the designated ADZs. All aquaculture developments are screened through EIA processes and national scientific working groups to ensure that their risk to coastal ecology is managed.

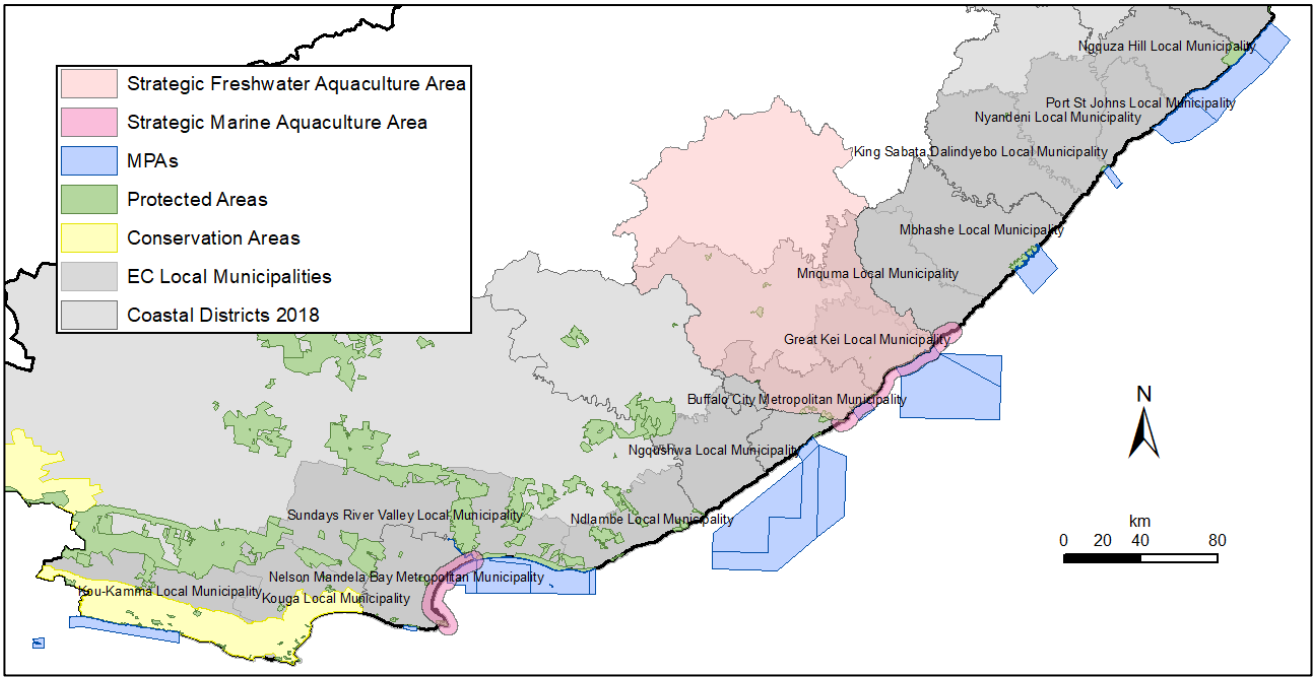


Figure 6: Strategic Aquaculture Development Zones, MPAs, and Protected and Conservation Areas.

2.4.2 Eastern Seaboard Development (ESD)

The Eastern Seaboard was declared as a region in terms of Section 18 (3) of the Spatial Planning and Land Use Management Act No. 16 of 2013 (SPLUMA). The declaration seeks to address the legacy of apartheid spatial planning and to provide increased sustainable service delivery that will improve the quality of life of current and future residents across the region (https://www.cogta.gov.za/index.php/eastern-seaboard-development/). The Eastern Seaboard is located along the 250 km coastal stretch between Coffee Bay in the King Sabata Dalindyebo Local Municipality in the south and Scottburgh in uMdoni Local Municipality in the north. The ESD will have significant coastal management implications as it foresees the development of a continuous "Higher Order Settlement" between Port Edward and Pennington in KZN's Ugu district, together with the development of a new coast-near N2 route. Further, the town of Port St Johns is planned to be developed, together with Operation Phakisa's small harbour development plans.

3 Natural Coast

3.1 Biophysical context

The Eastern Cape coastline extends for approximately 875 km along the east coast of South Africa, representing roughly a quarter of South Africa's total shoreline. The coast comprises nearly one third of the province's total jurisdictional boundary, connecting the Western Cape Province to the south and KwaZulu-Natal Province to the north. The coastline of the former Transkei, to the north, is typically undulatory and rugged, resulting in one of the most unspoilt and scenic stretches of the South African coastline due to limited accessibility. Further south, the coastal topography becomes more regular with an extensive coastal plain (e.g. Nelson Mandela Bay Metropolitan and Kouga Municipalities), while the coastline in the far south becomes once again more undulatory with steep-sided cliffs falling away to the sea (Arcus Gibb Engineering and Science, 2010).

Shaped by dynamic interactions between physical features and natural processes, the Eastern Cape coastline encompasses a diverse range of habitats, including sandy beaches, rocky headlands, wave-cut platforms, bays, and steep cliffs (Lubke & de Moor, 1998), which provide a wide variety of habitats for coastal marine organisms (DEAT, 1998; Coastal and Environmental Services, 2004).

The Agulhas Current, a major oceanic system along this coastline, transports warm tropical waters southwest along South Africa's southern shores (Imbole-Nkwinkwa et al., 2021). Coastal water temperatures average 25°C in summer and 22°C in winter. Inshore, a counter-current known as the north-eastward littoral drift redistributes sand, causing localised erosion in some areas and depositional areas in others. As the Agulhas Current flows southward, it moves farther offshore west of Cape Padrone due to the broadening continental shelf. This offshore shift reduces the current's direct influence on the coastline compared to areas northeast of Cape Padrone, where the continental shelf is narrower (Lubke & de Moor, 1998). The coastline is also exposed to strong southern swells, with frequent wave heights exceeding five meters, which increase the risk of coastal erosion and storm damage.

Given its limited accessibility and minimal urbanisation, the Wild Coast, stretching from the Great Kei River to the uMtamvuna River, has retained much of its ecological integrity, unspoiled, picturesque landscapes and extraordinary ecological value (Breetzke et al., 2013). The region is home to a significant diversity of indigenous flora and fauna, with the Pondoland Coast recognised globally as a centre of endemism.

Key environmental pressures and risks affecting the Eastern Cape Province's coastline include climate change, unsustainable resource use, agriculture, overgrazing, human development, and invasive alien plant species (Berliner & Desmet, 2007; Harris et al., 2019).

3.2 Biomes and Ecosystems

Eastern Cape spans a wide climate gradient, with a temperate perennial rainfall climate west of East London and a subtropical summer rainfall climate to the east of East London. Six out of the nine South African biomes can be found in the 20 km wide coastal zone (Figure 7).

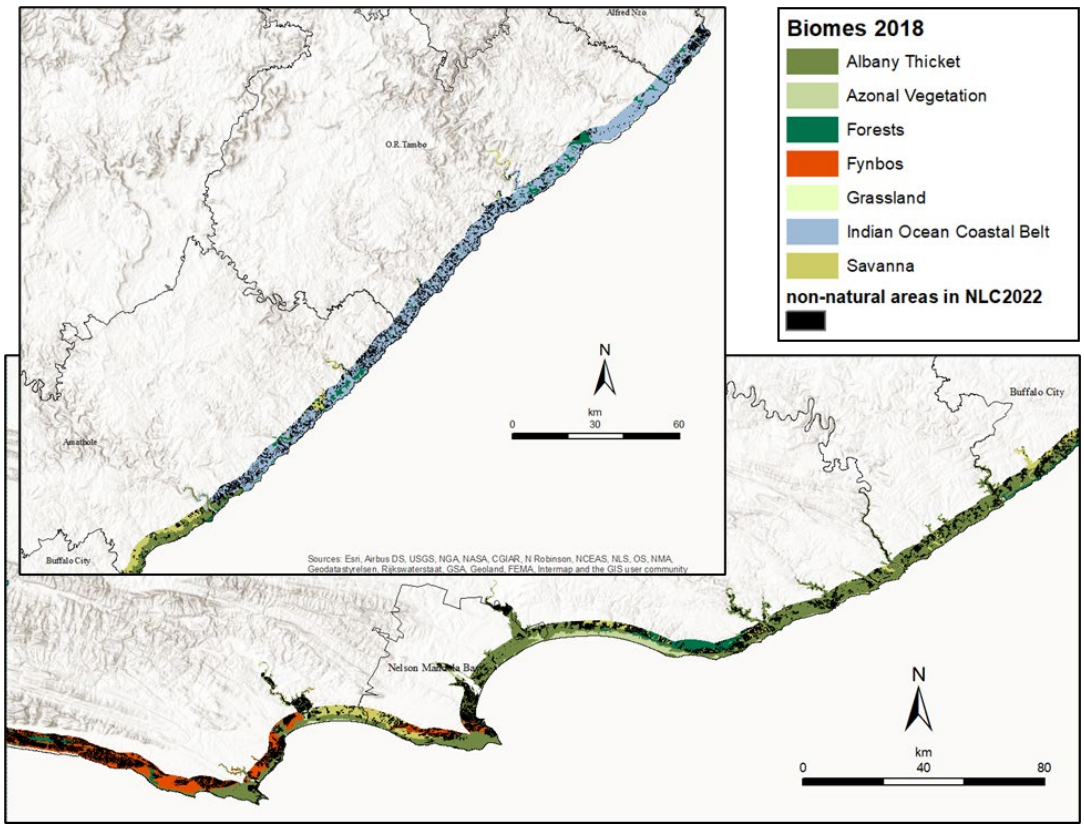


Figure 7: Biomes in the EC coastal zone and non-natural areas in 2022

West of Gqeberha, Fynbos and Savanna dominate inland, while Albany thicket dominates the coast to East London. Natural pockets of Forest also occur throughout the coast. Natural grassland makes up about 3 km^2 of

the coastal belt (National Biodiversity Assessment NBA 2018, Harris et al. 2019), while Azonal Vegetation is mainly classified as shoreline vegetation. Non-natural areas (agriculture, forest, urban and commercial and industrial areas) make up about only 16 % of the total coastal area (Figure 7).

3.3 Biodiversity hotspots

EC's coast is also home to **two globally recognised biodiversity hotspots**: the **Cape Floristic Kingdom**, and the **Maputaland-Pondoland-Albany region** (Berliner and Desmet, 2007). Additionally, it houses **two important Centres of Plant Endemism: the Albany Centre, and the Pondoland Centre** (Figure 8).

The Maputaland-Pondoland-Albany biodiversity hotspot spans a substantial portion of the Eastern Cape, including much of its coastline, and accounts for more than half of the province (Berliner and Desmet, 2007). Extending along the east coast of southern Africa below the Great Escarpment, this region serves as a vital centre for plant endemism. Its intricate interplay of geology, climate, and vegetation supports remarkable biodiversity, with three distinct areas of exceptional species richness and endemism. Among these, the Pondoland and Albany regions are primarily located within the Eastern Cape Province, highlighting the province's ecological significance.

The Albany Centre spans approximately nine million hectares and is characterised by subtropical thicket vegetation, which includes thorny, succulent-rich plants. This region serves as a convergence point for six of the seven biomes found in the Eastern Cape Province, fostering exceptional biodiversity. Of the 4,000 species found here, approximately 15% are endemic. However, the Albany Centre faces significant threats, including agricultural activities, overgrazing, the spread of invasive alien plants, and urban development (Berliner and Desmet, 2007).

The Pondoland Centre, represented by the Pondoland - Ugu Sandstone Coastal Sourveld (see Figure 9 above), is closely associated with nutrient-poor sandstone bedrock and supports a diverse array of vegetation linked to grassland, forest, and savanna biomes. This area is home to numerous endemic species, with over 8 % of its 1,500 recorded species classified as endemic. Poor land-use practices pose a serious threat to this region's biodiversity, as will the Eastern Seaboard Development, should it come into fruition.

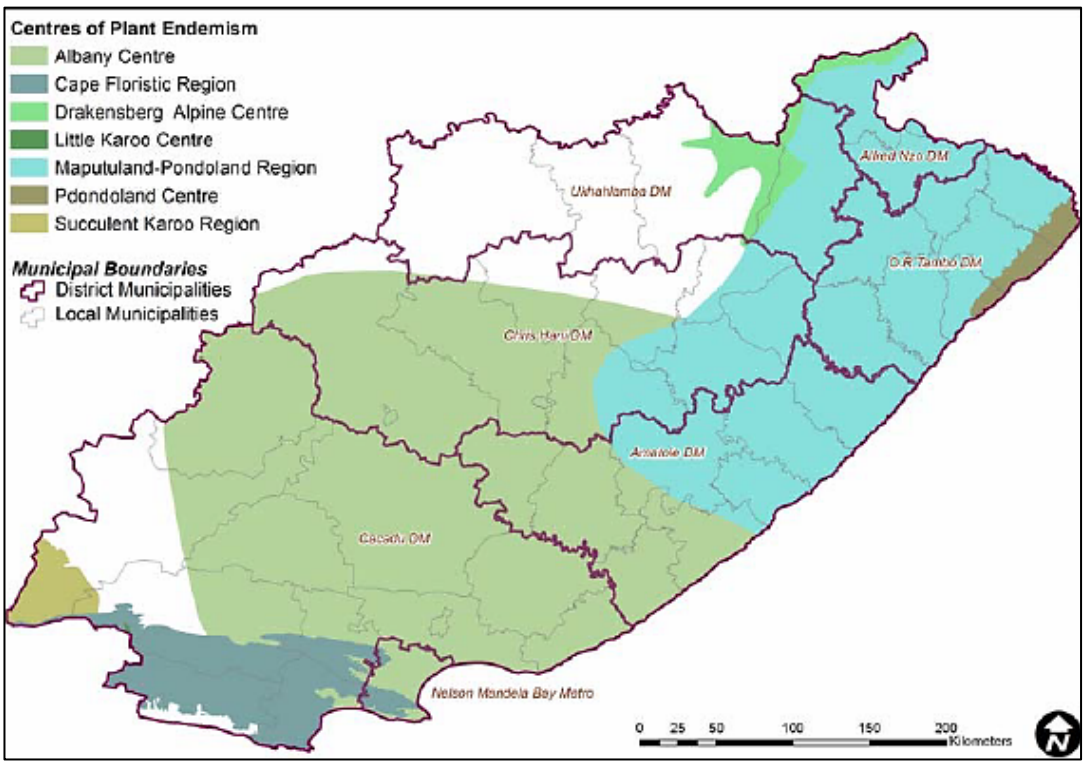


Figure 8: Centres and Regions of Plant Endemism within the Eastern Cape (From Berliner and Desmet, 2007).

In addition to the land biomes, the Eastern Cape coastline spans four distinct marine bioregions: the Agulhas Bioregion, Natal Bioregion, Indo-Pacific Bioregion, and South-West Indian Ocean Offshore Bioregion (Sink et al., 2012). Coastal ecosystems are categorised into terrestrial, estuarine and marine ecosystem types, with the diversity of coastal ecosystems on the EC coast is very high - 15 terrestrial and nearshore ecosystems and 11 estuary ecosystem types (Harris et al. 2019; Figure 9). In the NBA 2018, the EC's terrestrial coastal ecosystems were predominantly classified as least concern due to low pressure levels, while marine coastal ecosystems were primarily assessed as being Vulnerable.

3.4 Estuaries

The Eastern Cape has the most estuaries of all the provinces, with 156 systems stretching from the Bloukrans Estuary in the west to the Umtentwana Estuary in the east (Van Niekerk et al 2019). Together, they represent more than 50% of South Africa's estuaries. The major systems include the Great Fish, Sundays, Nahoon, Great Kei, Mtata and uMzimvubu estuaries (DEAT, 1998). Five estuary functional types occur in the Eastern Cape, with 29 Predominantly Open estuaries (e.g. Swartkops, Great Fish, Sundays, Bushmans) representing nearly two-thirds of the estuarine estate in the province, followed by 47 Large Temporarily Closed (e.g. Mngazi) and 72 Small Temporarily Closed estuaries (e.g. Rufane). Less prolific, but no less important, are 3 Large Fluvially Dominated systems (Mbashe, Great Kei and Umvumvubu) and 5 Small Fluvially Dominated (Lottering, Elandsbos, Storms, Elands, Groot (Oos)). These types represent a diversity of estuarine habitats and processes.

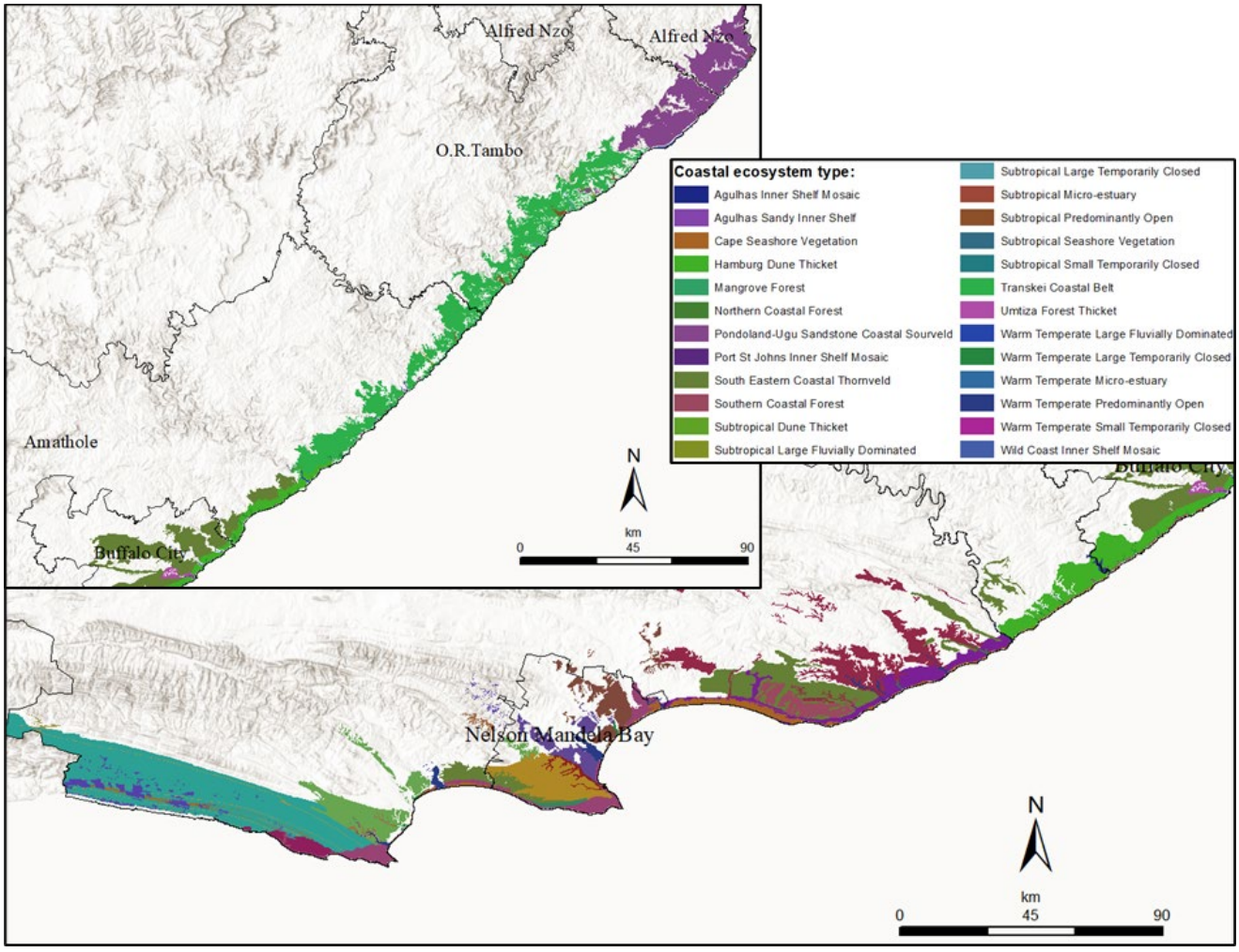


Figure 9: Coastal Ecosystem Types (From Harris et al. 2019)

3.4.1 Estuarine Biodiversity and Conservation Importance

The National Estuaries Biodiversity rating found 13 estuaries are of 'Very high' biodiversity importance in the region, 30 estuaries as 'Important', and the remaining 113 estuaries were rated as of 'Low to Average' importance (DWS 2024). In terms of National Estuarine Biodiversity Plan conservation targets, 58 of the 120 core estuaries required to meet the national biodiversity targets are in the Eastern Cape, 30 of which require full conservation protection and 28 require partial protection (e.g. some restriction on use) (Turpie et al. 2012). Thus far, various forms of environmental management programmes (e.g. mangroves, natural resources) and/or active forums exist for five estuarine systems.

In addition, South Africa, as a party to the Convention on Biological Diversity (CBD), supports Target 3 of the 2030 Kunming-Montreal Global Biodiversity Framework (GBF 30X30 target) and is committed to expanding and enhancing its conservation areas to the maximum possible within its national capabilities and circumstances. As part of this process, several estuaries in the region were identified as 30x30 priorities to meet the expanded 30% protected areas target, with a focus on estuaries that provide essential ecosystem services such as carbon sequestration (e.g. now include all mangrove estuaries >5 ha) and important nursery function (DWS 2024).

A spatial analysis (2018) showed that at present, 97 estuaries in the region are partially or fully situated in protected areas such as National Parks, Marine Protected Areas, nature reserves and/or under formal stewardship/contracted reserves, albeit small fractions of the estuarine area in some cases, e.g. only the mouth and/or beach area. Indicating that biodiversity targets can be achieved with relatively little further commitment.

3.4.2 Estuary Ecosystem Services

Blue Carbon: refers to carbon that is stored in mangroves, salt marsh and seagrasses (DWS 2024). Several of the estuaries in the Eastern Cape support the endangered seagrass *Zostera capensis*, the largest stands being in the Swartkops (59.8 ha). The top three estuaries with the largest salt marsh are the Swartkops (543.5 ha), Keiskamma (395.6 ha) and Great Fish (198 ha), while the largest mangrove stands occur in the Mngazana (147 ha), Mtata (50.9 ha) and Xora (22.5 ha).

Estuary Nursery function: The diverse habitats (such as seagrass, mangroves, salt marsh, sand and mud), shelter and abundance of food in estuaries make estuaries ideal nursery areas for fishes, with South Africa's estuaries dominated by juvenile marine fish (DWS 2024). Seagrass is a particularly important nursery habitat for many fishery species as it provides complex structure for shelter and food. In predominantly open South African estuaries with extensive seagrass beds, juvenile sparids or seabreams, which are omnivorous or herbivorous, particularly Cape stumpnose *Rhabdosargus holubi,* blacktail *Diplodus capensis* and strepie *Sarpa* salpa, are abundant and dominate this habitat. While the preferred nursery habitat for juvenile dusky kob *Argyrosomus* japonicus is deeper waters in very turbid estuaries with high freshwater input (James et al. 2022). Particularly important dusky kob nursery estuaries include the Mbashe, Great Kei and Mtata. Juvenile spotted grunter *Pomadasys commersonnnii* also prefer turbid systems, such as the Mzimvubu, Sundays, Great Fish, Great Kei and Gamtoos (Figure 10).

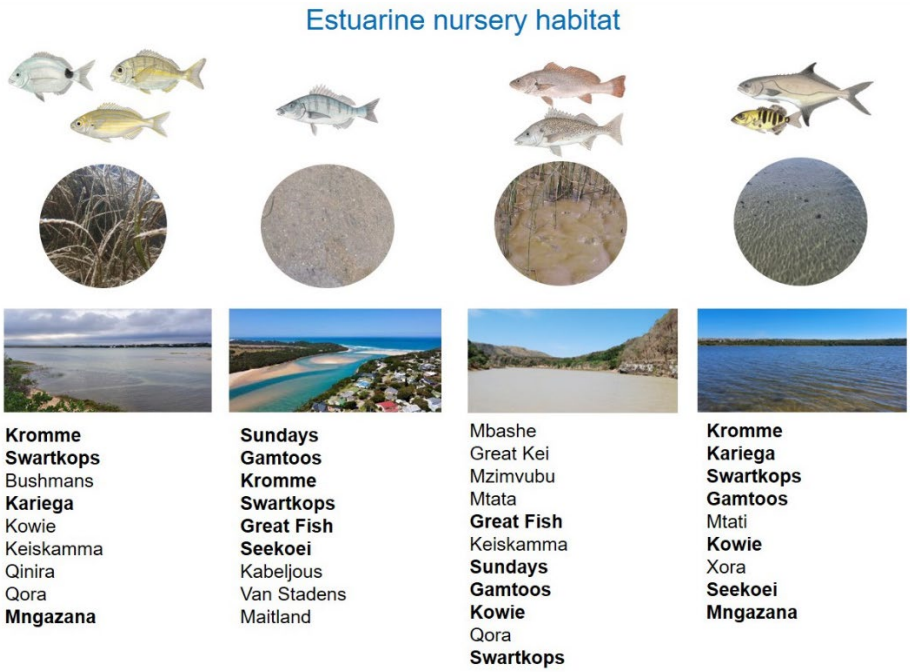


Figure 10: Important nursery estuaries within the Eastern Cape for fishery species, based on area of available habitat, abundance of juveniles and expert opinion. Estuaries which are important nurseries to several species are in bold (DWS 2024).

Piscivorous leervis *Lichia amia*, which rely on visual feeding, are attracted to clear water systems such as the Kromme, Swartkops and Bushmans. Shallow intertidal and littoral areas in the sandy areas of estuaries are critical nursery habitats for the white Steenbras, Lithognathus lithognathus, with this largely driven by the availability of prey such as sand prawns Callianassa krausii. Important white steenbras estuaries include the Sundays, Gamtoos, Kromme, Swartkops, Great Fish and Seekoei. Estuaries which are important nurseries for several fishery species with different nursery habitat requirements, are the Kromme, Gamtoos, Seekoei, Swartkops, Sundays, Kariega, Kowie, Great Fish and Mngazana.

3.4.3 Key pressures on EC estuaries that need to be managed

An assessment of the pressures on the Eastern Cape estuaries clearly shows that most systems in the extensive rural parts of the study area have limited pressures on them (Van Niekerk et al. 2019; DWS 2024). A few systems reflected the impact of urbanisation around the metros and larger towns. Key pressures that require management on estuaries include (See Appendix B for more detail on estuary pressures):

- Freshwater flow modification;
- Pollution (agricultural return flow, stormwater and sewage);
- Over-exploitation of living marine resources (especially illegal gillnetting);
- Land-use change and development;
- Grazing and cattle browsing;
- Biological invasions;
- Sand and mineral mining; and
- Artificial breaching at a limited number of systems.

3.4.4 Estuary Condition

The Eastern Cape hosts some of South Africa's most important and pristine estuaries. An evaluation of the estuary condition indicates that a large number of the estuaries in the study area are still in a natural to near-natural state. A third of the systems (52 estuaries) are in a Present Ecological State (PES) of a natural state (A to A/B Category), while 42% (66 estuaries) are in near natural state (B Category) (DWS 2024). An additional 25 estuaries are moderately modified - 10 estuaries are in a B/C Category and 15 systems are in the C Category. Four systems are largely modified to a C/D and D Category each (DWS 2024). Only 5 systems are critically modified below a D Category (D/E=2, E/F=2, F=1), with all of these clustered around urban centres (DWS 2024). Three systems, namely the Baakens, Papenkuils, and Coega (Ngcura) estuaries, have been irreversibly modified and are consequently significantly degraded without any likelihood of natural estuarine function being restored.

3.5 Coastal and Marine Conservation

The region is home to 12 of South Africa's 42 Marine Protected Areas (MPAs), which play a critical role in safeguarding key coastal and marine species and ecosystems. MPAs contribute to sustainable fisheries by providing essential breeding and nursery grounds for fish populations, promoting carbon storage, and mitigating the impacts of climate change (Figure 11). Notable MPAs along the Eastern Cape Province's coastline include:

- Tsitsikamma MPA,
- Addo Elephant National Park MPA,
- Sardinia Bay MPA,
- Bird Island MPA,
- Amathole MPA,
- Dwesa-Cwebe MPA,
- Hluleka MPA, and
- Pondoland MPA.

At present, South Africa is revisiting its protected areas network in light of the increase in the global target to 30% representation of all ecosystem types. This ongoing process may require future expansions of the network.

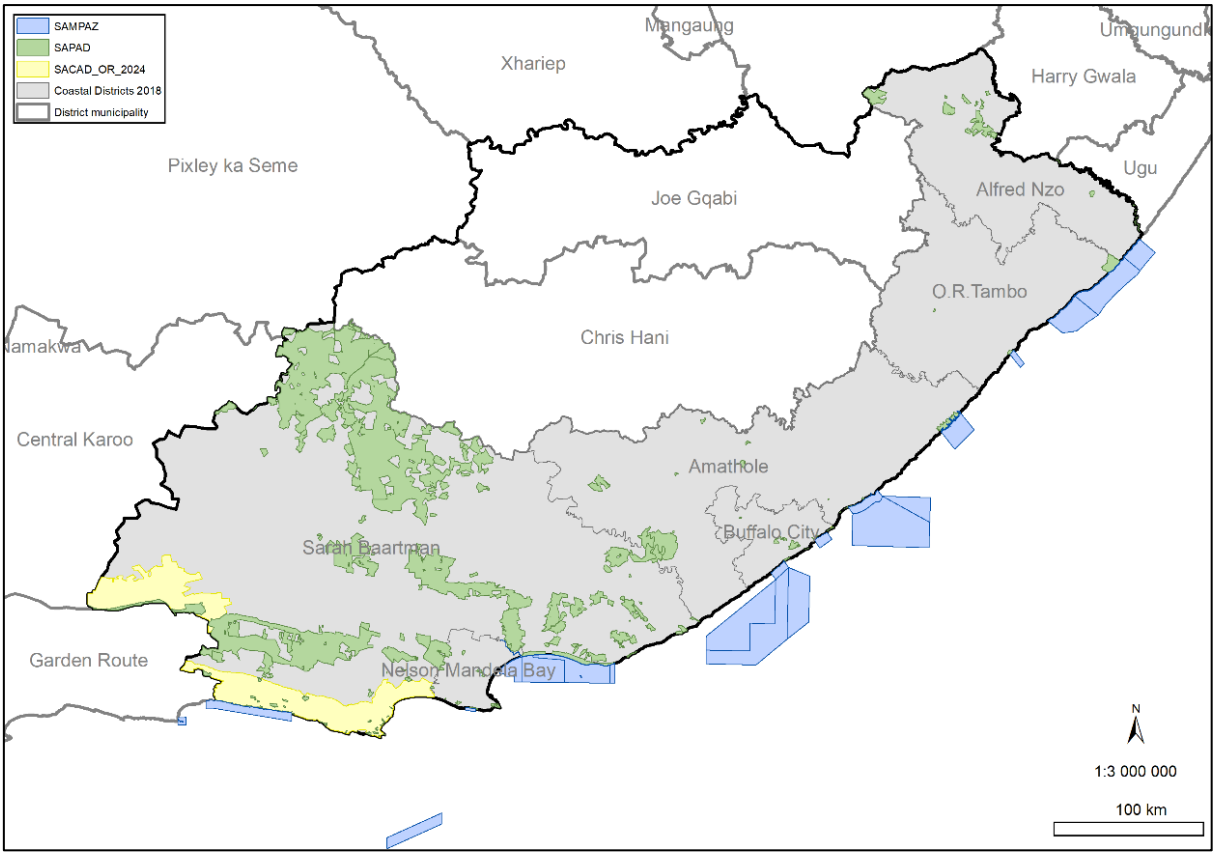


Figure 11: Marine Protected Areas (MPA), Protected Areas (PA) and Conservation Areas (CA) in the Eastern Cape.

4 Climate Risks

4.1 Current Climate Risks

South Africa's coastal climate, spanning a wide range of climate zones, is influenced by tropical, subtropical and mid-latitude systems (Bopape et al. 2024). Subtropical high-pressure systems transport moisture, and ex-tropical cyclones can make landfall along the east coast. Antarctic cut-off low pressure systems can hit especially southern and southwestern coast in winter, and all these systems can result in severe weather events which already impact lives, property and the economy of the country.

Consequently, extreme rainfall events have a high occurrence in the eastern inland areas of South Africa, but also throughout the coastal zone of the Western Cape, Eastern Cape and KwaZulu-Natal (Figure 12c and d). The eastern part of the Eastern Cape also sees a high occurrence of >50 mm daily rainfall events (Figure 12c).

Interestingly, while the Eastern Cape coast is receiving about the same amount of rainfall as the KwaZulu-Natal coastal region, flood disasters have been reported here less frequently, attributed to the lower development density and the tendency for settlements to be located in high-lying areas (compare Figure 13 and Figure 12). This might change, though, as coastal development accelerated (e.g. Eastern Seaboard Development) and is subject to an increase in extreme rainfall events that can result in flash floods in the river basins and estuaries as well.

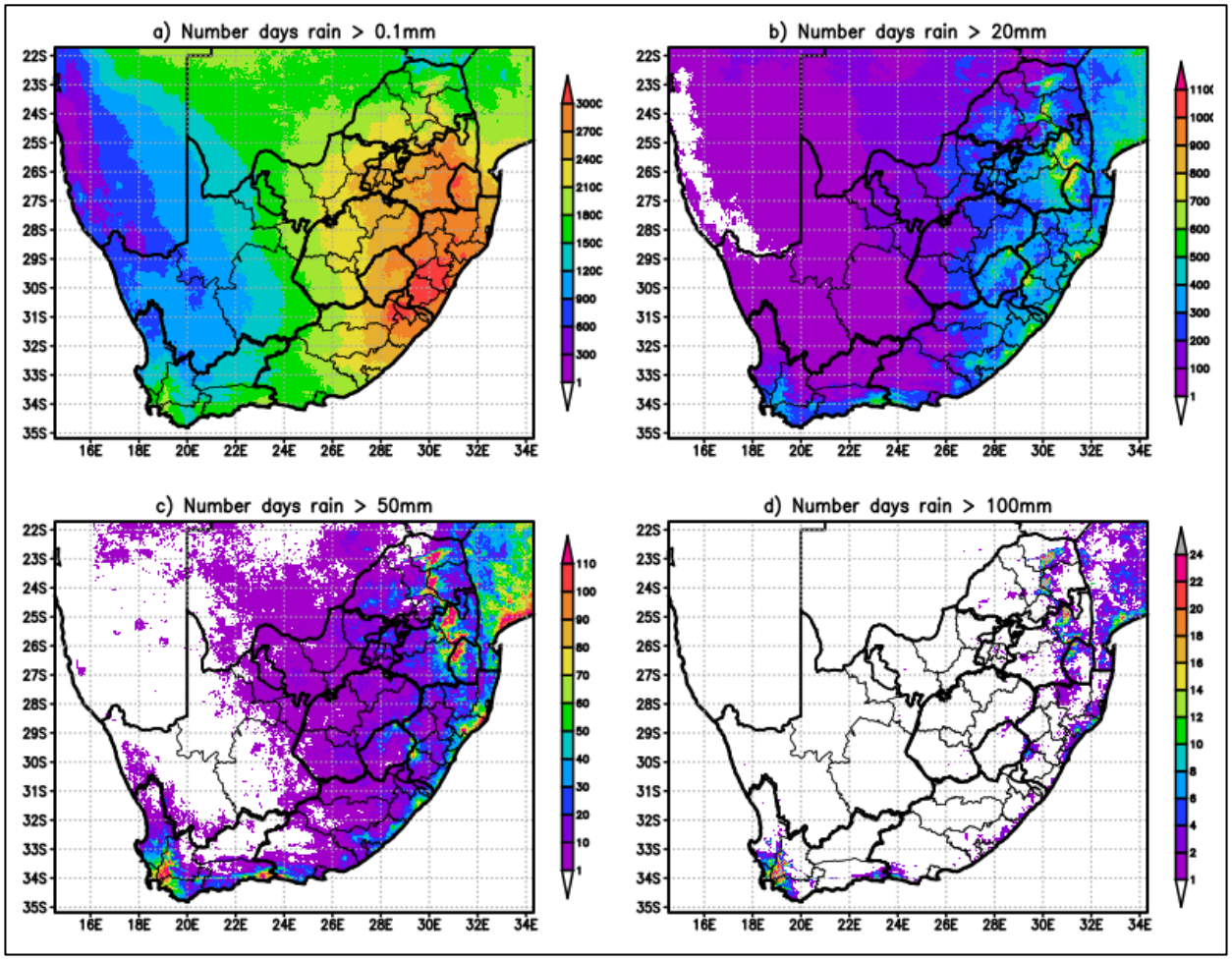


Figure 12: Number of days with respective total rainfall amounts between 1980-2022. Source: Bopape et al. 2024.

Floods and storms are by far the most frequently occurring disasters as far as the coast is concerned, and where they largely originate from extreme rainfall events Figure 13. The Eastern Cape districts, and the coastal districts

in particular, have registered the second highest number of weather-related disasters between 1980 – 2022. Again high highlighting the need for proactive planning.

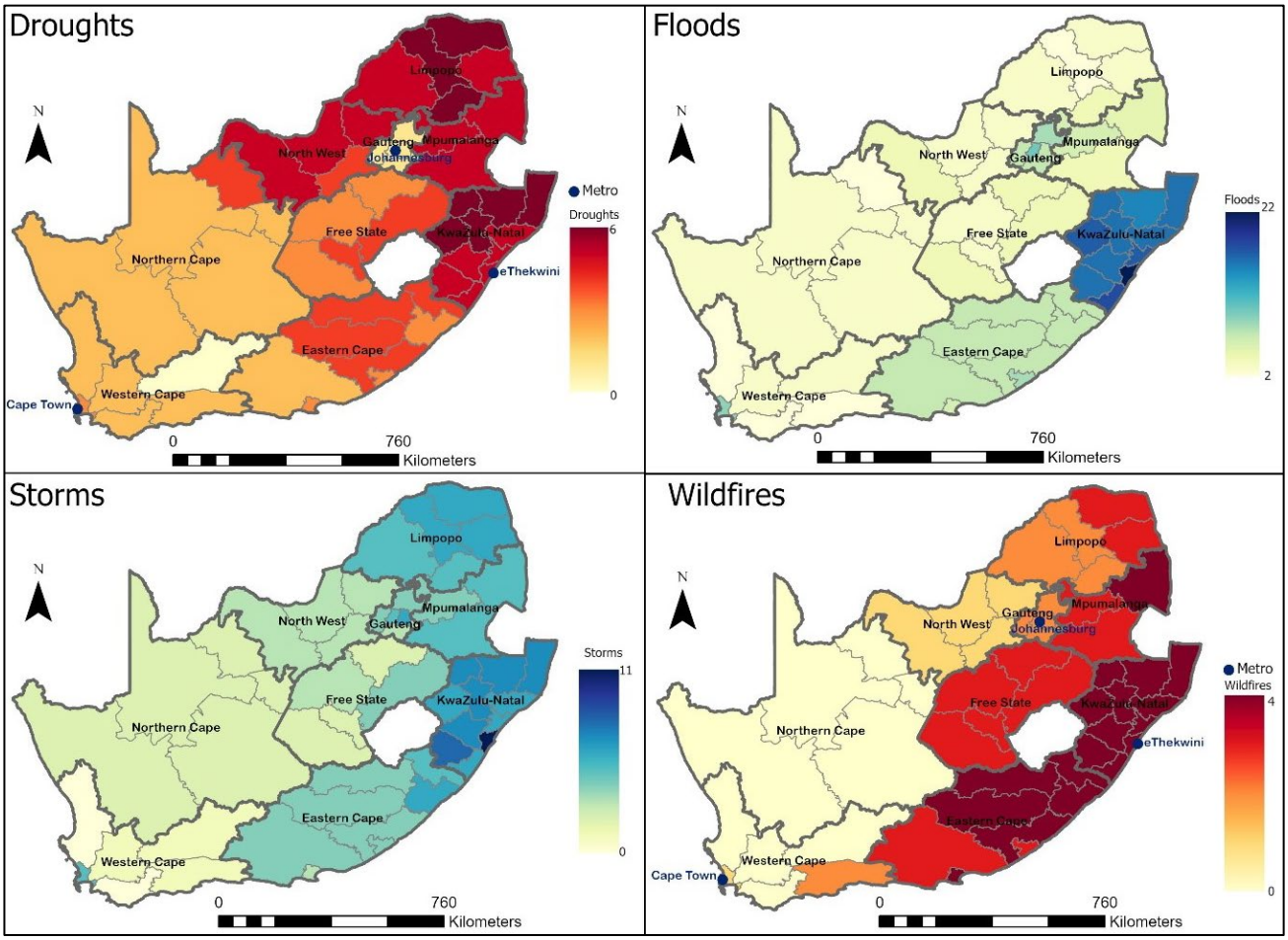


Figure 13: Weather-related disasters (drought, flood, storm and wildfire) in South Africa between 1980-2022. Source: Bopape et al. 2024

4.2 Future climate threats

Downscaled Global climate models (8 km resolution) predict under the RCP 8.5 worst-case scenario (Figure 14) that by 2050 the already concerning prevalence of storms and floods in the eastern parts of the province is likely to be further exacerbated (Engelbrecht 2019, www.greenbook.co.za). While the southwestern parts are expected to get hotter and drier, therefore increasing the risk of droughts, extreme temperatures and potential water shortages. Future urban development in the region (e.g. Eastern Seaboard Development) needs to consider climate-safety in planning to prevent the potential for future climate-related disasters.

One of the greatest climate threats is the high water supply vulnerability. Figure 16 shows that the expected relative change in water supply vulnerability does not follow the regional climate patterns, as here, apart from rainfall amount also changes in water demand by a growing population are being considered, as well as the general condition of current water infrastructure.

These predictions show the high variability of regional climate predictions and settlement vulnerability. This will require the tailoring of very context-specific climate response activities and would render a one-fits-all adaptation recommendation throughout the province's coastal zone unsuitable.

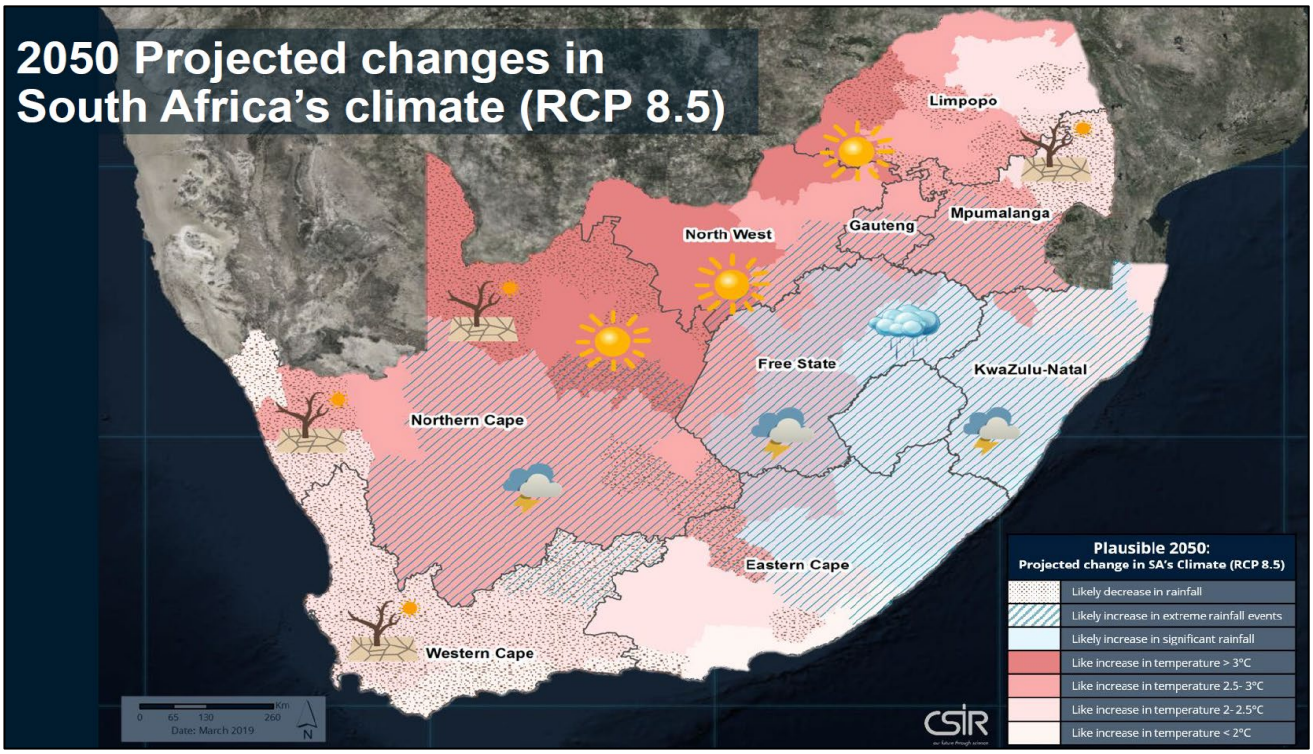


Figure 14: Projected climate changes for South Africa until 2050 under a worst-case RCP 8.5 scenario. Source: CSIR, 2019b.

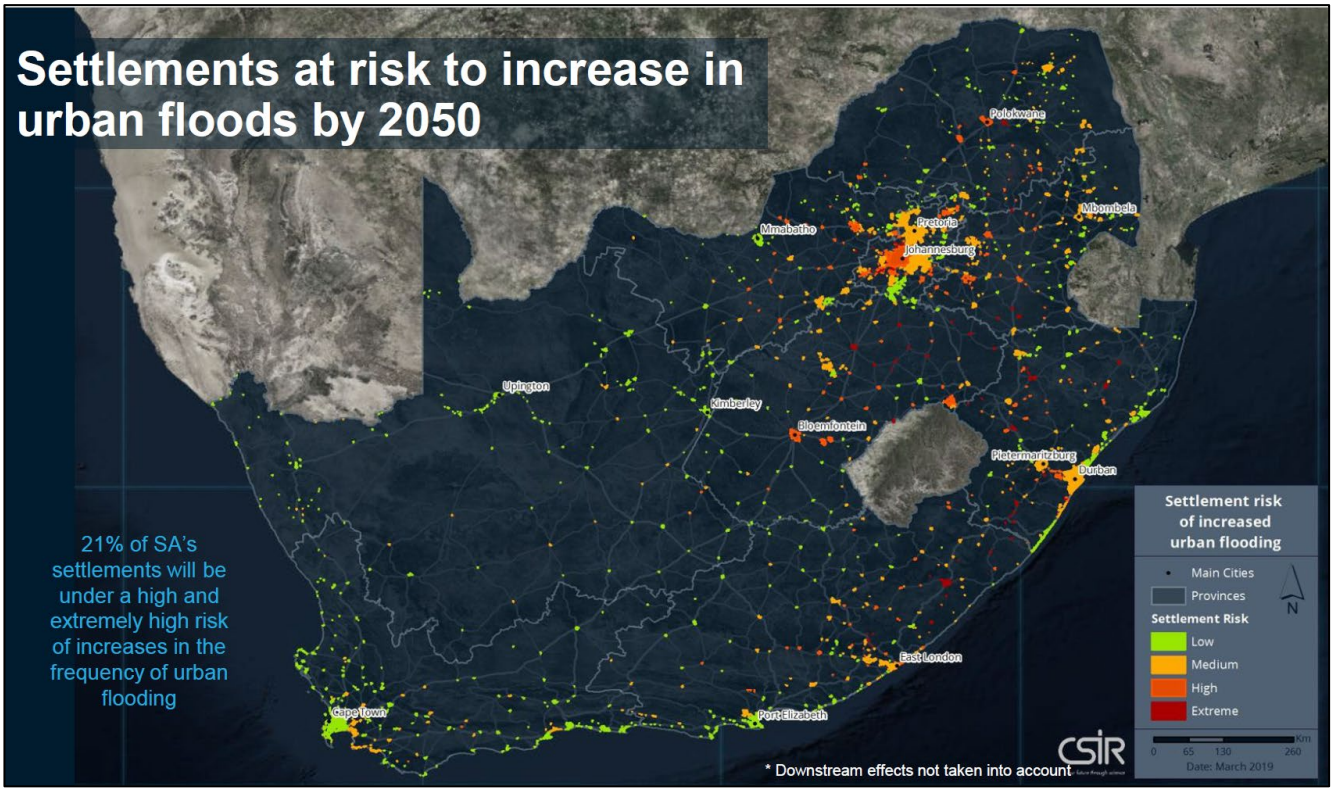


Figure 15: Projected increase of urban floods until 2050 under a worst-case RCP 8.5 scenario. Source: CSIR, 2019b.

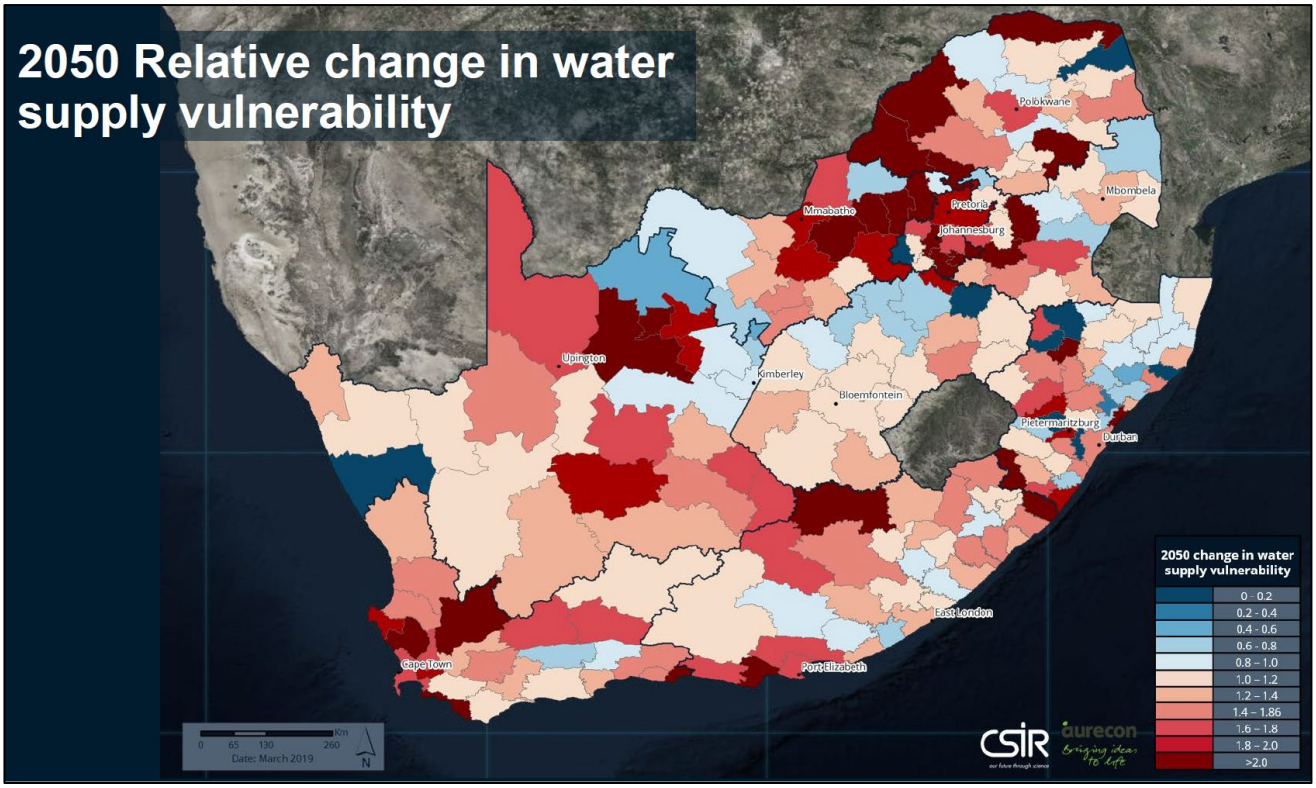


Figure 16: Relative change in water supply vulnerability until 2050 on municipality level. Source: CSIR, 2019b

4.3 Climate impacts on the oceans

4.3.1 Ocean warming, acidification and oxygen loss

Carbon emissions from human activities are causing ocean warming, acidification and oxygen loss, which are likely to provoke changes in nutrient cycling and primary production. According to the IPCC Special Report on the Ocean and Cryosphere in a Changing Climate (Bindoff et al. 2019), the ocean continues to warm, particularly in the upper ocean layers, leading to increased stratification and decreased mixing of the water column, continuing the clear multi-decadal ocean warming trends documented in the IPCC Special Report on the Ocean and Cryosphere (Bindoff et al. 2019). By the end of the century, the annual mean stratification of the top 200 m (averaged between 60ºS–60ºN relative to the 1986–2005 period) is projected to increase in the very likely range of 1–9% for RCP2.6 and 12–30% for RCP8.5, respectively (IPCC SROCC: Bindoff et al. 2019).

Apart from increasing mean temperatures, the ocean is also affected by marine heatwaves, which can, similarly to atmospheric heatwaves, cause severe impacts to the marine environment. Figure 17 highlights the occurrence of marine heatwaves and other ocean climate extremes between 1982 and 2011.

Rising atmospheric carbon dioxide concentrations are partially absorbed by the oceans. However, the continued carbon uptake is leading to the acidification of the oceans. The open ocean surface water pH has been declining by 0.017−0.027 pH units per decade since the late 1980s. The intensity of acidification is expected to increase during the next decades (Bindoff et al. 2019). Seagrass beds hold the potential to act as pH events.

Three out of the four major Eastern Boundary Upwelling Systems (EBUS, such as the Benguela on South Africa's west coast) have shown large-scale wind intensification in the past 60 years. However, the interaction of coastal warming and local winds may have affected upwelling strength, with the direction of changes varying between and within EBUS (Bindoff et al. 2019).

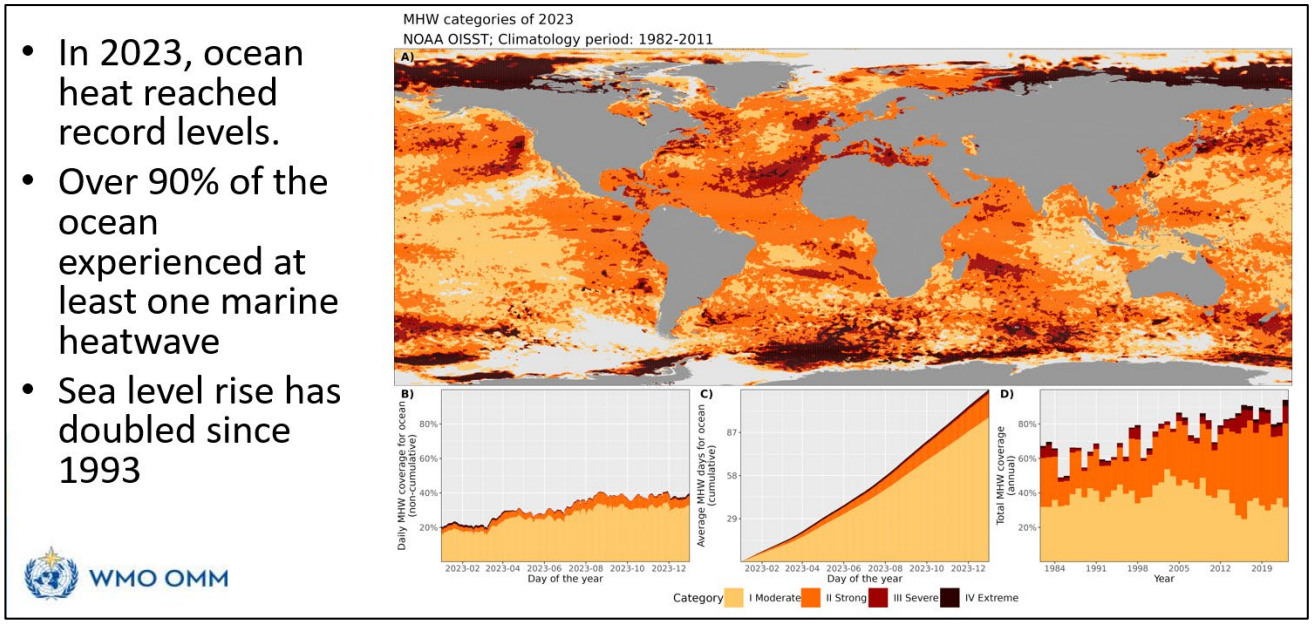


Figure 17: Occurrence of Marine Heatwaves (MHW) and other climate extremes. Source: WMO, Johan Stander, ACCESS conference STB May 2024.

4.3.2 Sea level rise

Global sea levels (GMSLs) have been oscillating throughout Earth's history (Fagan 2014). Lower sea levels occurred during glacial periods, while rising sea levels occurred during warm periods. For example, Last Interglacial period the global mean surface temperature was 0.5°C–1.0°C warmer, leading to sea levels being 6–9 m higher than today, and the mid-Pliocene Warm Period been 2°C–4°C warmer with sea levels about 25 m higher than today (IPCC SROCC: Oppenheimer et al. 2019).

Since the 1970s, the sea level is rising at an accelerated rates under anthropogenic forcing (Figure 18). Tide gauges and altimetry observations increased from 1.4 mm/yr over the period 1901–1990 to 3.6 mm/yr over the period 2006–2015. Models predict that the sea level will rise between 0.43 and 0.84 m by 2100 relative to 1986–2005 (Oppenheimer et al. 2019).

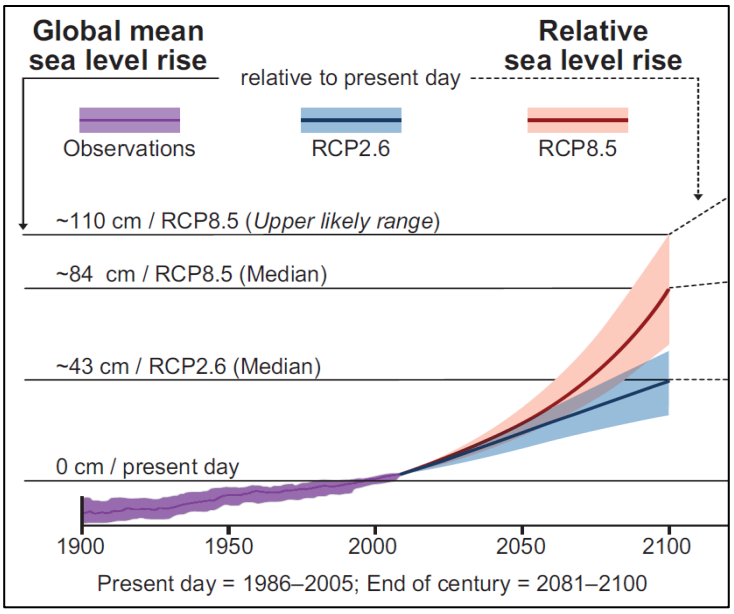


Figure 18: Global Mean Sea Level Rise relative to present day. Source: Oppenheimer et al. (2019, p. 328)

Sea level rise is not globally uniform and varies regionally. Differences from the global mean can be greater than ±30% in areas of rapid vertical land movements, including those caused by local anthropogenic factors such as groundwater extraction. These findings on anthropogenic subsidence imply that a consideration of local processes is critical for projections of sea level impacts at local scales.

As for future sea levels on South Africa's coasts, Mather et al. (2009) observed that sea level rise rates along the southern African coastline vary. Over the last decades the west coast saw a rise of +1.87 mm/yr, the south

coast of +1.47 mm/yr, and east coast of +2.74 mm/yr, which – assuming a constant SLR rate – would lead to a total SLR of 7.48 cm, 10.96 cm and 5.88 cm between 2010 and 2050 and 16.83 cm, 24.66 cm and 13.23 cm between 2010 and 2100 on the west, south and east coast respectively.

Due to projected Sea Level Rise, extreme sea levels that are historically rare (for example, today's hundred-year event) will become common by 2100 under all RCPs. Many low-lying cities and small islands at most latitudes will experience such events annually by 2050 (Oppenheimer et al. 2019). Risk related to Sea Level Rise (including erosion, flooding and salinisation) is expected to significantly increase by the end of this century along all low-lying coasts in the absence of major additional adaptation efforts (Oppenheimer et al. 2019). Overall, in the absence of adaptation interventions, more intense and frequent extreme sea level events, together with trends in coastal development, will increase expected annual flood damages by 2–3 orders of magnitude by 2100 (Oppenheimer et al. 2019).

The implementation of stringent Coastal Management Lines (CMLs) as required by the ICM Act, is urgently required for the EC, as they aim to regulate development in coastal zones at risk of flooding and erosion (among other management goals) and contribute to risk and disaster reduction, for current and future development. In short, CML's is one of the most effective adaptation tools for ensuring coastal climate change resilience. This is especially the case for a coast that is largely still undeveloped, and which can thus benefit significantly from such proactive measures.

4.4 The need for Coastal Adaptation

Climate change stressors - sea-level rise, increased wave heights, increased frequency and magnitude of storm events, increased temperatures, shifts in rainfall – combined with poor land use decisions, contribute to habitat degradation and declining ecosystem productivity. Furthermore, extractive uses such as mining also put significant pressure on the coastal resilience and ecological functioning of sensitive ecosystems. Thus, requiring careful management to protect their value and sustain the direct and indirect ecosystem services they produce.

The coastal zone is a dynamic interface between land and ocean, with powerful natural forces at play. Extreme coastal processes such as tidal extremes, wave and wind erosion, coastal storm surges, wave overtopping and flooding inherently put people, property and economic activities at risk. The situation is, however, compounded by the multi-dimensional nature of human-induced climate change that will affect local extreme weather conditions and long-term climatic patterns. Even more disconcerting is the expectation of crossing of planetary thresholds, triggering extreme climatic change responses, and accelerated sea level rise that would result from the destabilisation and melting of ice sheets in Antarctica and Greenland (Voosen, 2021).

The Eastern Cape's coastal ecosystems, including estuaries, will be affected by the predicted changes in key climatic parameters such as rainfall and temperature, affect ecosystem functioning, as well as social and economic prosperity. It is important to recognise that these changes may compound risk and are not 'future' problems - the changes are already being experienced in observed global warming in increasing average temperatures and in extreme weather events, with concomitant effects on ecosystems. The impacts resonate throughout our social and economic systems, affecting our infrastructure, our livelihoods, the quality of estuarine environments and the attractiveness of our coastal recreational assets.

Adaptation of social and economic activities in response to the threats posed is therefore unavoidable. However, while the government cannot control global warming, it does have the option to choose how to respond to manage local impacts and protect the public good and provide clear guidance to the private sector regarding the adopted measures to ensure a climate-resilient and future-proof local economy.

It is essential for the Eastern Cape to adopt proactive coastal adaptation strategies as opposed to a reactive 'sit back and wait' response. The latter will involve significant costs of responding to disasters rather than a disaster risk reduction approach. The impacts of the increased frequency and magnitude of storm surges have already resulted in reactive measures in some areas. This is evidenced by the requirements to replace damaged infrastructure or restore degraded ecosystems where such are failing to keep up with the changes taking place, both in terms of the scale of change and the cost of responses required (DEA&DP, 2018). Adapting to the

changing environment does not need to come at a cost. Appropriately planned and managed, adaptation responses can bring about co-benefits such as restored catchments for water security and restored dune systems for lower cost coastal defences. Looking after natural resources, offering climate change protection, also improves the attractiveness of the coast as a tourist destination and increases coastal property values.

Proactive adaptation to the impacts of climate change can optimise opportunities for social upliftment, economic growth and protection of infrastructure to the extent that any costs are more than offset by the potential savings. This applies even to capital-intensive built infrastructure investments that aim to address a particular risk or threat; these investments could be costly, however, if well-directed and implemented appropriately, this approach could assist in protecting vulnerable households. Other potential investments that can bear fruit in respect of reducing the risks can take the form of institutional programmes, or the use of nature-based solutions that invest in natural capital. It is, however, clear that the co-benefits of Nature-based responses make it possible to deliver a high magnitude of benefits to a large proportion of the population, but for a relatively low cost.

Coastal management consequently forms a key part of disaster management strategies. The Disaster Management Act (Act 57 of 2002) includes the requirement for climate change adaptation to be part of all Disaster Management Plans at all levels of government, and this includes Ecosystem-based Adaptation (EbA) responses. As a key focus, the PCMP contributes to the overall objective of increasing the social and economic resilience of communities (DEA & SANBI, 2016).

4.5 Mainstreaming Climate Change into ICM

Mainstreaming climate change into ICM and developing Climate Change Adaptation Response Plans involves integrating climate resilience into coastal planning, policies, and practices at all levels of government and community. This is achieved through targeted training, providing data and tools, securing financial support, aligning policies with national strategies, fostering collaboration, and establishing monitoring systems to ensure that coastal management effectively addresses the impacts of climate change.

The coastal sector has a range of adaptation actions at its disposal to enhance resilience and mitigate risks posed by rising sea levels, extreme weather events, and changing climatic patterns. Some of the categories of actions include:

- **Early warning systems and emergency preparedness plans** are critical tools to ensure swift responses to extreme weather events, minimising the impact on vulnerable communities.
- **Infrastructure development**, encompassing the construction of seawalls, levees, and barriers to protect against rising sea levels and extreme weather events. These engineered solutions provide immediate protection and enable longer-term adaptation efforts, but are very expensive to construct and require maintenance.
- **Environmental protection,** such as restoring coastal ecosystems like mangroves, dunes, and wetlands, not only provides natural buffers but also supports biodiversity and Blue Carbon-based climate mitigation options.
- **Integrated urban planning** is essential to create climate-resilient cities and settlements. Land-use regulations should be adapted to consider climate risks, prioritising construction practices that enhance resilience. Elevating structures above projected sea levels and using climate-resilient materials in building design can minimise impacts.
- **Green infrastructure** initiatives offer sustainable and ecosystem-based solutions (EbAs). Cities and settlements can implement urban green spaces, green roofs, and permeable pavements to absorb excess water, reduce flooding, and mitigate the urban heat island effect. Such approaches not only enhance climate resilience but also contribute to improved air quality and overall urban liveability.
- **Innovative water management strategies** are essential for coastal settlements and economies facing changing precipitation patterns, increasing water scarcity, and decreasing water quality. Diversifying

water sources, implementing water efficiency measures, and investing in advanced stormwater management systems contribute to water security (in terms of quantity and quality) and sustainable resource use.

- **Community engagement and education** are pivotal components of successful adaptation strategies. Empowering residents to understand and respond to climate risks through awareness campaigns, education programmes, and participatory planning initiatives can enhance local adaptive capacity (CSIR 2019a).
- **Retreat.** In the coastal zone, rising sea levels and increasing threats to infrastructure and livelihoods might render all the above actions unfeasible in the long term. In such cases, giving up areas at risk and moving infrastructure and settlements to higher, safer grounds can be considered.

Many of the above actions are cross-sectoral and embedded in the EC CMP; however, to ensure effective climate-proofing outcomes often requires reviewing, refining and/or prioritising existing actions to ensure a more beneficial outcome.

5 Vision, Mission and Guiding Principles

5.1 Vision and Mission

The Vision for the Eastern Cape coast is as follows:

A coast with unique scenic beauty, ecological diversity, and cultural significance that benefits both present and future generations without compromising its ecological and cultural values.

The Vision is to be supported by the Mission Statement for the Eastern Cape Coast:

To utilize our coastal resources wisely and equitably, balancing economic prosperity with environmental protection, and empowering communities to benefit from our shared coastal asset.

The vision and mission reflect a recognition of the unique, integral values of the coast and place a focus on the need for collaboration in coastal management activities. The health, productivity and diversity of natural systems and the unique sense of place and diverse cultural heritage of the coast are to be protected and promoted in a spirit of stewardship, caring and shared responsibility.

The Eastern Cape coast is diverse, rich, unique and resilient and is respected and celebrated. The inherent value of the coast is to be equitably shared and sustainably grown by optimising access, livelihoods and economic and social benefits. The coast and its diverse cultural heritage are recognised as valuable assets and to be nurtured through integrated, cooperative and adaptive management interventions and the promotion of compliance.

5.2 Guiding principles

The overarching 10 guiding principles for the Eastern Cape coast, as first articulated in 2004, are detailed in Figure 19.

National Asset	• The coast must be retained as a national asset for the benefit and enjoyment of all people of the province.
Economic Development	• Coastal economic development opportunities must be optimised to meet society's needs and to promote the well being of coastal communities through sustainable activities that do not compromise the long term opportunities for people living in the coastal zone.
Social Equity	• Coastal management efforts must ensure that all people, including future generations, enjoy the rights of human dignity, equality and freedom. Access to resources and benefits from the many opportunities provided by coastal resources must be made available to the public in an equitable manner.
Ecological Integrity	• The diversity, health and productivity of coastal ecosystems must be maintained and, where appropriate, rehabilitated.
Holism	• The coast must be treated as a distinctive and indivisible system, recognising the interrelationships between coastal users and ecosystems and between the land, sea and air.
Risk Aversion & Precaution	• Coastal management efforts must adopt a risk-averse and precautionary approach under conditions of uncertainty.
Accountability & Responsibility	• Coastal management is a shared responsibility. All people must be held responsible for the consequence of their actions or lack of actions, including financial responsibility for negative impacts.
Duty of Care	• All people and organisations must act with due care to avoid negative impacts on the coastal environment and coastal resources.
Integration & Participation	• A dedicated, co-ordinated and integrated coastal management approach must be developed and conducted in a participatory, inclusive and transparent manner.
Co-operative Governance	• Partnerships between government, the private sector and civil society must be built in order to ensure co-responsibility for coastal management and to empower stakeholders to participate effectively.

Figure 19: Guiding principles for the Eastern Cape Coast

6 Context and Purpose of the Eastern Cape Provincial Coastal Management Programme

6.1 Coastal legislation landscape

In South Africa, the National Environmental Management: Integrated Coastal Act (No 24 of 2008) (ICM Act) is the primary piece of legislation aimed at establishing a system of integrated coastal and estuarine management to promote the conservation and sustainable development of South Africa's coastal zone, including coastal waters. However, the broad range of issues covered by the ICM Act necessitates links to other legislation. Focusing on the coastal environment, Taljaard et al. (2019) provided a detailed overview of relevant international obligations, as well as key national legislation and policies applying to sound coastal management spanning numerous sectors overlapping in the coastal space (Figure 20) (see Appendix C for norms and standards).

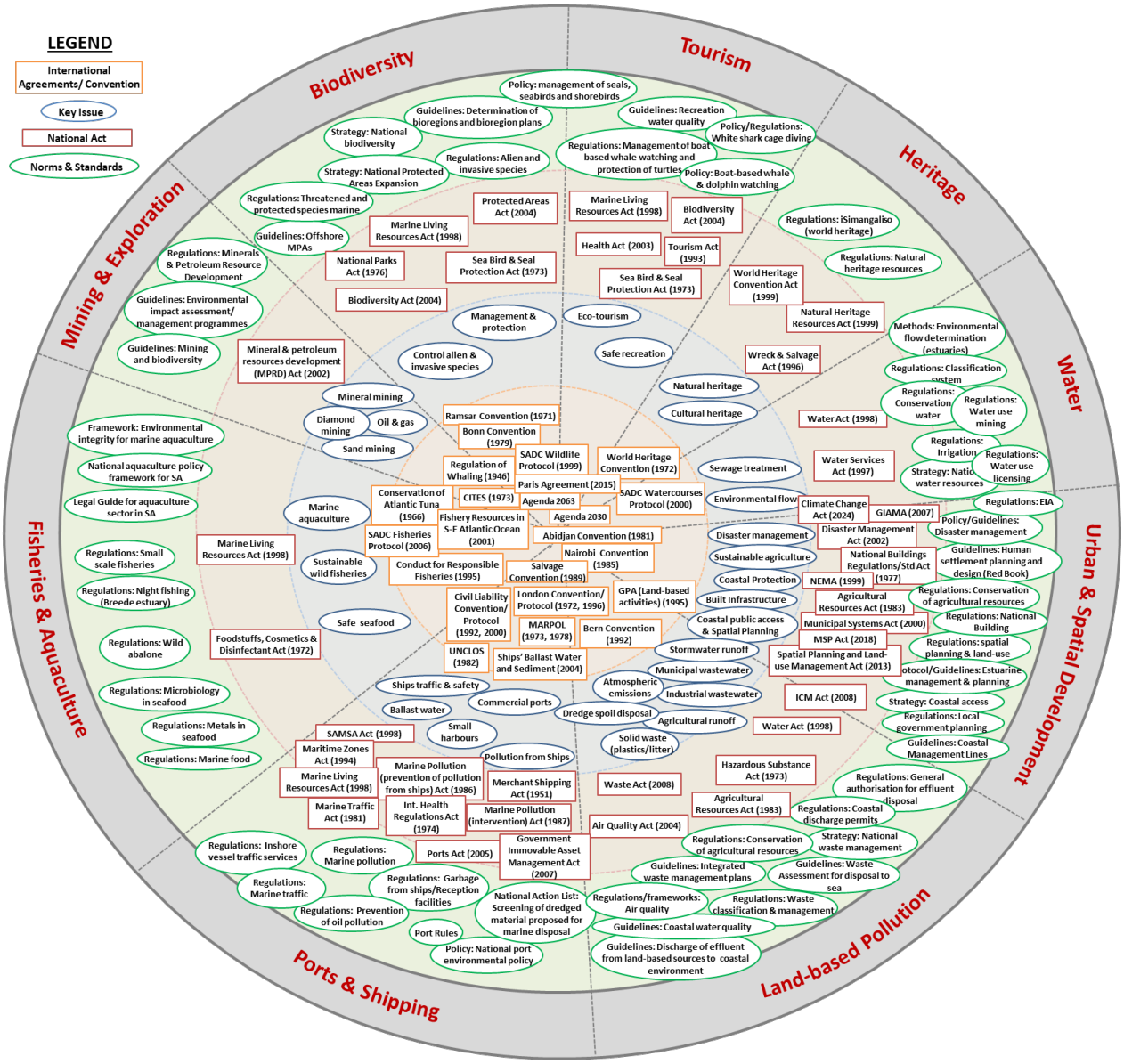


Figure 20: Overview of legal landscape governing various aspects related to integrated coastal management in South Afrifa (adapted from Taljaard et al. 2019)

As shown in Figure 1, policy and legislation pertaining to integrated coastal management in South Africa can be wide-ranging. It is therefore useful to identify the key legislation most relevant to oversight at the provincial level, for example, those pertaining to *urban & spatial planning, tourism, conservation (biodiversity protection), land-based pollution* and *heritage* as listed in Table 2.

Table 2: Key legislation supporting coastal management in South Africa relevant to implementation and oversight at provincial level (adapted from Taljaard et al. 2019)

SECTOR	ACT	LEAD AGENT	SHORT DESCRIPTION
Urban & spatial development	National Environmental Management: Integrated Coastal Management Act (No. 24 of 2008)	Environment	Provides for (amongst other matters) development and use of coastal resources that is socially and economically justifiable and ecologically sustainable.
	Local Government: Municipal Systems Act (No. 32 of 2000)	Provincial and Local Government	Provides for integrated development planning intended to encompass and harmonise planning over a range of sectors such as water, transport, land use and environmental management.
	Climate Change Act (No. 22 of 2024)	Environment	Enables development of an effective climate change response and a long-term, just transition to a low-carbon and climate-resilient economy and society for South Africa in context of sustainable development
	National Environmental Management Act (No. 107 of 1998)	Environment	Provides that sensitive, vulnerable, highly dynamic or stressed ecosystems require specific attention in management and planning procedures, especially where subjected to significant human resource usage and development, through mandating EIAs for specific listed activities.
	Marine Spatial Planning Act (No. 16 of 2018)	Environment	Provides national framework for marine spatial planning and for development of marine spatial plans and for institutional arrangements required for governance and implementation.
	Spatial Planning and Land Use Management Act (No. 16 of 2013)	Rural Development and Land Reform	Provides for a framework to govern planning permissions and approvals, sets parameters for new developments and provides for different lawful land uses.
	Disaster Management Act (No. 57 of 2002)	Cabinet	Provides for integrated and co-ordinated disaster management policy that focusses on preventing or reducing the risk of disasters, mitigating the severity of disasters, emergency preparedness, rapid and effective response to disasters and post-disaster recovery.
Tourism	Marine Living Resources Act (Act 18 of 1998, as amended in 2000)	Fisheries (delegated to Environment)	Provides for control of tourism activities related to marine living resource (e.g. sharks, whales and dolphins). This includes the control of fishing activities and appointment of harbour masters in the small fishing harbours.
	Sea Bird and Seal Protection Act (No. 46 of 1973)	Environment	Provides for protection and control of the capture, killing and products produced from seabirds and seals. Parts of this act has now been repealed under Marine Living Resources Act (1998)
	National Health Act (No. 61 of 2003)	Health &t Municipalities	Delegates responsibility for environmental health to metropolitan and district municipalities, where these organs of state must ensure that appropriate municipal health services are effectively and equitably provided in their respective areas. These include (insofar as it influences human health, except in ports) water quality monitoring, waste management and environmental pollution control.
Conservation (Biodiversity)	Environmental Management:	Environment	Establishes a system of integrated coastal and estuarine management in South Africa to promote the conservation of the

SECTOR	ACT	LEAD AGENT	SHORT DESCRIPTION
	Integrated Coastal Management Act (No. 24 of 2008)		coastal environment and maintain the natural attributes of coastal landscapes and seascapes, and to ensure that development and the use of natural resources within the coastal zone is socially and economically justifiable and ecologically sustainable.
	National Water Act (No. 36 of 1998)	Water	Provides for protection of aquatic ecosystems of water resources, including estuaries.
	National Environmental Management: Biodiversity Act (Act 10 of 2004)	Environment	Provides for conservation of biological diversity and regulates the sustainable use of biological resources and to ensure a fair and equitable sharing of the benefits arising from the use of genetic resources.
	National Environmental Management: Protected Areas Act (No. 57 of 2003)	Environment	Provides for protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes.
Land-based pollution	Environmental Management: Integrated Coastal Management Act (No. 24 of 2008)	Environment	It stablishes a system of integrated coastal and estuarine management in South Africa. Specifically, it controls dumping at sea (including dredge disposal), land-based pollution, inappropriate development and other adverse effects on coastal environment.
	National Environmental Management: Waste Act (No. 59 of 2008)	Environment	Regulates (solid) waste management to protect health and environment by providing reasonable measures for prevention of pollution and ecological degradation and for securing ecologically sustainable development.
	National Environmental Management: Air Quality Act (No. 39 of 2004)	Environment	Regulates air quality to protect environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development.
	National Water Act (No. 36 of 1998)	Water	Identifies certain land uses (e.g. activities resulting in stream-flow reduction such as afforestation and cultivation of crops), infrastructural developments (e.g. altering the bed, banks, course or characteristics of a watercourse), water supply/demand and waste disposal to estuaries (from land-based activities) as 'water uses' that require authorisation (licensing)
	Hazardous Substances Act (No. 15 of 1973)	Health	Provides for control of substances which may cause injury or ill health to, or death, of human beings by reason of their toxic, corrosive, irritant, strongly sensitising or flammable nature.
Heritage	National Heritage Resources Act (No. 25 of 1999)	Environment (through South African Heritage Resources Agency)	Provides for an integrated and interactive system for management of national heritage resources (which include landscapes and natural features of cultural significance), providing opportunity for communities to participate in identification, conservation and management of cultural resources.

While provincial authorities may not be directly responsible for the implementation of much of this legislation, it is important, in their oversight role, to ensure that these are effectively implemented in their province. **Therefore, as strategic documents, provincial coastal management programmes must be aligned with existing legislation and guidelines to ensure effective governance of integrated coastal management within a province**. This also requires knowledge of the roles and responsibilities of various role players for effective implementation of the programme.

Within the various relevant legislation (Table 2) an array of strategies, regulations and guidelines provide specific guidance for effective implementation, as summarised in Table 3.

Table 3: Important strategies, regulations and guidelines supporting coastal management in South Africa relevant to implementation and oversight at the provincial level (adapted from Taljaard et al. 2019)

SECTOR	ACT	IMPORTANT POLICIES, REGULATIONS AND GUIDELINES
Urban & spatial development	National Environmental Management: Integrated Coastal Management Act (No. 24 of 2008)	National Estuarine Management Protocol (Government Gazette, 10 May 2013)
		Guidelines for Development and Implementation of Estuarine Management Plans in terms of National Estuarine Management Protocol (March 2015)
		National Strategy for the facilitation of coastal access (March 2014)
		National guideline towards the establishment of coastal management lines (August 2017)
	Local Government: Municipal Systems Act (No. 32 of 2000)	Local government: Municipal planning and performance management Regulations (Government Gazette, 24 August 2001)
	Climate Change Act (No. 22 of 2024)	National Climate Change Adaptation Strategy (November 2019)
	National Environmental Management Act (No. 107 of 1998)	Environmental Impact Assessment Regulations (Government Gazette, 4 December 2014)
	Marine Spatial Planning Act (No. 16 of 2018)	National Framework for Marine Spatial Planning (2021)
	Spatial Planning and Land Use Management Act (No. 16 of 2013)	Regulations in terms of the Spatial Planning and Land Use Management Act (Government Gazette, 23 March 2015)
	Disaster Management Act (No. 57 of 2002)	Disaster management policy framework (Government Gazette, 29 April 2005)
		Guidelines on the development and structure of a disaster management plan (Government Gazette, 26 May 2017)
Tourism	Marine Living Resources Act (Act 18 of 1998, as amended in 2000)	Regulations for the management of boat-based whale watching and protection of turtles (Government Gazette, 4 July 2008)
		Regulations for the management of white shark cage diving (Government Gazette, 4 July 2008)
		Policy on white shark cage diving (Government Gazette, 31 May 2017)
	Sea Bird and Seal Protection Act (No. 46 of 1973)	Policy on the management of seals, seabirds and shorebirds (Government Gazette, 7 December 2007)
	Environmental Management: Integrated Coastal Management Act (No. 24 of 2008)	Management of public launch sites in the coastal zone regulations requires formal permission, management by an appointed body, and adherence to operational / management plans. Launching motorised craft outside of these permitted sites is illegal (27 June 2014).
	National Health Act (No. 61 of 2003)	South African water quality guidelines for coastal marine waters. Volume 2: Recreational use (March 2012)
Conservation (Biodiversity)	Environmental Management: Integrated Coastal Management Act (No. 24 of 2008)	South African water quality guidelines for coastal marine waters: Natural Environment & Mariculture (1995, under revision)
		Regulations for control of use of vehicles in the coastal area by generally prohibiting it unless permitted through an authorisation, permit, or exemption. Driving is generally limited to wet sand between the high and low tide marks when allowed (27 June 2014)
	National Water Act (No. 36 of 1998)	Water Resource Protection and Assessment Policy Implementation Process. Resource Directed Measures for protection of water resources: Methodology for the Determination of the Ecological Water Requirements for Estuaries. Version 2 (2008)

SECTOR	ACT	IMPORTANT POLICIES, REGULATIONS AND GUIDELINES
	National Environmental Management: Biodiversity Act (Act 10 of 2004)	Guidelines regarding the determination of bioregions and the preparation of and publication of bioregional plans (Government Gazette, 16 March 2009)
		South Africa's National Biodiversity Strategy and Action Plan (2015 – 2025) (July 2015)
		Alien and invasive species Regulations (Government Gazette, 1 August 2014)
		Threatened and protected species marine Regulations (Government Gazette, 30 May 2017)
	National Environmental Management: Protected Areas Act (No. 57 of 2003)	National Protected Areas Expansion Strategy (NPAES), currently in the process of being revised with a revised strategy in commenting phase (2008)
Land-based pollution	Environmental Management: Integrated Coastal Management Act (No. 24 of 2008)	Guidelines for the assessment of wastes or other material that may be considered for dumping at sea (Schedule I of ICM Act)
		National Guideline for the Discharge of Effluent from Land-based Sources into the Coastal Environment (2014)
		National Action List: Screening of dredged material proposed for marine disposal (2012)
		Coastal Waters Discharge Permit Regulations (Government Gazette, 15 March 2019)
		General authorisation in terms of Section 69(2) of ICM Act (coastal discharges)
	National Environmental Management: Waste Act (No. 59 of 2008)	Guideline for the development of Integrated Waste Management Plans (IWMP)
		National Waste Management Strategy (November 2011)
		Waste classification and management Regulations (Government Gazette, 23 August 2013)
	National Environmental Management: Air Quality Act (No. 39 of 2004)	List of activities which result in atmospheric emissions which have or may have a significant detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage (Government Gazette, 31 March 2010)
		National Dust Control Regulations (Government Gazette, 1 November 2013)
		National pollution prevention plans Regulations (Government Gazette, 21 July 2017)
		National framework for air quality assessment in the Republic of South Africa (Government Gazette, 26 October 2018)
	National Water Act (No. 36 of 1998)	Revision of general authorisation in terms of section 39 of the National Water Act (Government Gazette, 6 September 2013) (estuaries)
	Hazardous Substances Act (No. 15 of 1973)	Hazardous substances Regulations (Government Gazette, 25 March 1977)
Heritage	National Heritage Resources Act (No. 25 of 1999)	National Heritage Resources Act Regulations (Government Gazette, 2 June 2000)

6.2 The Coastal Protection Zone

The concept of a **Coastal Protection Zone (CPZ)** is based on the idea that the coast is vulnerable to a range of hazards and impacts, and that it is important to take proactive steps to protect it. Coastal protection zones are often established in response to specific threats or vulnerabilities, such as the risk of erosion, flooding, or other types of coastal damage.

The need for coastal protection has been recognised for as long as humans have lived near the coast. Throughout history, people have taken various measures to protect their communities and resources from the

forces of the sea, including building physical structures such as seawalls or building communities farther inland. With the growth of coastal populations and the increasing value of coastal resources, the concept of coastal protection has become more formalised and systematic, with governments and other organisations establishing policies and programs to protect the coast.

The components of the coastal protection zone can vary depending on the specific needs and conditions of the area, but some common elements may include:

COMPONENTS	COASTAL PROTECTION ZONE MAY INCLUDE:
All land falling within an area declared as sensitive coastal area in terms of the Environment Conservation Act, 1989 (Act 73 of 1989) (ECA).	land regarded as sensitive coastal area and within which activities identified in terms of section 21 (1) of ECA may not be undertaken without an authorisation.
Any part of the littoral active zone that is not coastal public property	This includes sensitive coastal features such as coastal dunes, salt marshes etc.
Coastal protected area, or part thereof, that is not coastal public property;	Protected areas declared in terms of Chapter 3 of the National Environmental Management: Protected Areas Act (Act No. 57 of 2022), (NEMPAA).
Land unit and / or part of a river that is situated within one kilometre of the highwater mark that is zoned for agricultural, undetermined use or which is not zoned and was not part of a lawfully established township, urban area or other human settlement.	Any rural land unit that is situated within one kilometre (1000 metres) of the high water mark which is zoned as agricultural or undetermined.
Land unit and / or part of a river that is situated within 100 metres of the highwater mark in urban areas.	Land on the landward side of the coastal public property in urban areas
Any coastal wetland, lake, lagoon or dam which is situated wholly or partially within the CPZ in rural or urban areas	All wetlands, lakes, lagoons or dams within 1 kilometre inland of the high-water mark in rural areas or within 100 meters in land of the high-water mark in urban areas.
Any part of the seashore which is not coastal public property, including privately owned land below the highwater mark	This includes land that has been lawfully alienated from the coastal public property.
Any admiralty reserve which is not coastal public property;	Land defined as Admiralty Reserve in terms of the ICM Act.
Any land adjacent to an area referred to in	Any land situated within the areas listed above and which land would be inundated by 1:100 year flood or storm.

paragraphs *(a)* to *(h)* that would be inundated by a 1:100 year flood or storm even	

Overall, the components of the coastal protection zone are designed to work together to protect the coast and the communities and resources that depend on it.

6.3 Coastal Public Property

Coastal Public Property (CPP) refers to land and water that are the property of the public, held in trust by the state, and are open to the public for use and enjoyment. CCP belongs to the people of South Africa, and all citizens have a right of reasonable access to it. To ensure this, no fee may be charged for access CPP without ministerial-level approval. CPP include a variety of different types of areas, such as beaches, walkways, marinas, and protected areas. Some common components of coastal public property may include:

COMPONENTS	EXAMPLE
Coastal waters	This includes internal waters, territorial waters, exclusive economic zone and continental shelf of the Republic as described in the Maritime Zones Act (Act 15 No. of 1994), including estuarine waters.
Land submerged by coastal waters,	This includes land and material underneath that land that is covered by coastal waters, or land flooded by coastal waters e.g. when a harbour or a canal system is excavated.
Natural island within coastal waters	This is any natural island, with no exception and does not include artificially made island
Seashore	This includes the area between the low water mark and high-water mark including the seashore of a natural or reclaimed island and the sea shore of a reclaimed land.
Admiralty reserves	Strips of state owned land adjoining the high-water mark that were historically set aside for public use.
Land owned or controlled by the State declared coastal public property in terms of Section 8 of the Act	The Minister may declare (and withdraw any such declaration) any state-owned land as coastal public property in order to achieve the objectives of having the coastal public property as outlined in the Act.
Land reclaimed in terms of section 7C of the Act	Reclamation of land for purposes other than the development of state infrastructure will only be considered in exceptional circumstances which are not in conflict with the purpose of the coastal public property.
Natural resources	Any natural resources on or in the CPP, including the exclusive economic zone.

In terms of the ICM Act, **CPP** entail the following components:

The high-water mark (HWM) is the line on the shore that is reached by the highest tide of the year. The high-water mark is an important reference point in environmental management because it represents the boundary between the land and the water, and it is used to determine the extent of the jurisdiction of various regulatory agencies.

Since the HWM is determined by natural processes, it is considered to be a dynamic boundary that can change over time depending on coastal erosion/accretion and seasonal changes in wave patterns. Despite this dynamic

nature, it remains a necessary boundary line for coastal management because it allows for the responsible and sustainable use of coastal resources by **clearly defining the limits of public and private ownership.**

In the South African context, the HWM is used to delineate the legal boundary between the CPP and the CPZ and can be used to identify areas of the coast that are subject to certain regulations or protection measures. For example, certain activities or developments may be restricted in areas below the high-water mark to protect the coast from environmental damage. The high-water mark is also used to define the boundary between the CPP and the CPZ, and it can be used to determine the ownership and management of coastal resources, making it an important tool for managing and protecting the coast, used by several countries to ensure the sustainable use and conservation of the coastal environment.

6.4 Roles and responsibilities

The ICM Act clearly assigns roles and responsibilities to all three spheres of government, with mandatory functions assigned to national, provincial, and local governments that are specifically defined within the Act.

6.4.1 National government roles and responsibilities

The national government has a range of roles and responsibilities as indicated below:

ASPECT	RESPONSIBILITIES
The management of coastal public property	Ensuring the state provides for the protection, management and enhancement of coastal public property as an inalienable area within the coastal zone that belongs to the citizens of South Africa. Achieved by developing regulations to control the use of coastal public property, determine and adjust the boundaries of coastal public property as deemed appropriate, as well as designate and inclusion of certain portions of state-owned land as coastal public property, to achieve the objectives of the ICM Act.
National Estuarine Management Protocol	Ensure that the National Estuarine Management Protocol (No. 533 of June 2021 as amended) is implemented and that all estuaries along the coast has Estuarine Management Plans. Plans must meet the minimum requirements as prescribed by the Protocol in collaboration with responsible authorities.
National Coastal Committee	Establish and coordinate the National Coastal Committee (NCC) and appoint representatives for the Committee.
Monitor the appointment of provincial lead agencies	Ensure that provincial lead agencies for ICM are established and functioning on a continual basis.
Development and Implementation of the National Coastal Management Programme (NCMP)	Develop a National CMP aligned with the contents of the ICM Act.
Consistency and alignment between the NCMP and other statutory plans	Ensure that any plan, policy or programme adopted by an organ of state that may affect coastal management is consistent and aligned with the NCMP.
Consultation and public participation	Ensure meaningful consultation with government and other coastal stakeholders.
Environmental authorisations for coastal activities	Where an environmental authorisation is required for listed activities within the coastal zone, the competent authority must take into account all relevant factors listed in Section 63(1) of the ICM Act. Ensure that where an environmental

	authorisation is not required for coastal activities, the Minister considers listing activities that may require a permit or license in terms of Section 63(6).
Discharge of effluent into coastal waters	Ensure that point source discharges of polluted effluent are effectively assessed, controlled and monitored.
Dumping of waste into coastal waters	Prohibit incineration at sea and ensure that the overall intent of Section 70 and 71 of the ICM Act is understood by stakeholders.
Emergency dumping at sea	Ensure that consideration is given to emergency situations relating to the dumping of waste at sea.
National Action List	The selection of and prioritisation of certain substances that will allow for the effective screening of waste proposed for marine disposal according to its potential effect on human health and the marine environment.
Determination of national appeals powers	Establish powers of Ministers and MECs, with appeals procedures as determined by NEMA Appeals Regulations.
Prescribing regulations and fees	Develop regulations for the management of activities within coastal public property and consult the Minister of Finance before making any regulations that will entail expenditure of funds in future years, application fees, or regulations imposing fees, costs, or any other charges.
General provisions applicable to regulations	Specify general procedures relating to regulations, including penalties for contraventions.
Marine protected areas	The MLRA and the MLRA Regulations set out rules, prohibitions and limitations for MPAs (still active under the transitional provisions in terms of the National Environmental Management: Protected Areas Amendment Act (Act No. 21 of 2014)

6.4.2 Provincial government roles and responsibilities

The Eastern Cape provincial government's roles and responsibilities with regard to coastal management encompass the following:

ASPECT	RESPONSIBILITIES
Management of the coastal protection zone	Ensuring the protection, management and enhancement of the coastal protection zone. Achieved by developing regulations to control the use, determine and adjust the boundaries of the coastal protection zone as deemed appropriate, as well as the designation and inclusion of certain portions of provincially controlled state-owned land as coastal public property to achieve the objectives of the ICM Act. This may also include the appointment of voluntary coastal officers.
Establishment of coastal management lines	Establish coastal management lines by notice in the Gazette to restrict or prohibit certain activities that may have an adverse effect on the coastal zone.
Adjusting coastal boundaries	The MEC may determine or adjust any coastal boundary related to CPZ. Any boundaries determined or adjusted in terms of Section 26 of the ICM Act by the MEC must be communicated to affected municipalities so that they must include these in zoning maps and / or land use schemes.
Designation of provincial lead agencies	In collaboration with the Premier, ensure that provincial lead agencies for coastal management are designated and function effectively to promote and coordinate coastal management within a coastal province.
Establishment and functioning of Provincial Coastal Committees (PCCM)	Establishment of the Provincial Coastal Committee (PCC), determination of its powers and appointment of representatives for the Committee.
Development and Implementation of PCMPs	Develop PCMPs aligned with the contents of the ICM Act and NCMP.

ASPECT	RESPONSIBILITIES
Consistency and alignment between PCMPs and other statutory plans	Ensure that any plan, policy or programme adopted by an organ of state that may affect coastal management is consistent and aligned with PCMPs, which in turn is aligned with the NCMP.
Consultation and public participation	Adequate consultation and public participation precede the exercise of a power by the MEC, which the ICM Act requires to be exercised in accordance with this section.
Environmental authorisations for coastal activities	Coastal management issues considered in terms of Section 63 of the ICM Act and requirements of this section complied with before an environmental authorisation is issued in terms of Chapter 5 of the NEMA.
Implementation of national Regulations	Implement national Regulations, for example, list public boat launch sites that may be used by the public to access the coastal zone.
Regulations by MECs	Develop regulations for the management of activities within the coastal protection zone and specify general procedures relating to regulations, including penalties for contraventions.
Information and Reporting on Coastal Matters	Prepare a report on the state of the coastal environment in the province which must contain any information prescribed by the Minister.
Co-ordination of actions between provinces and municipalities	Liaise with coastal municipalities in the province to co-ordinate actions taken in terms of this Act by provincial organs of state in the province with actions taken by municipalities.

6.4.3 Local government / municipal roles and responsibilities

District and local municipalities key roles and responsibilities as indicated below:

ASPECT	RESPONSIBILITIES
Access to coastal public property	Ensuring that the public has equitable access to coastal public property by designating coastal access land, designate in by-laws of coastal access land to promote access to CPP along the coast, withdraw inappropriate coastal access land and follow an environmentally sensitive and socially responsible process in designating coastal access land.
Coastal management line demarcation on zoning maps	Delineate coastal management lines in Spatial Development Frameworks and municipal zoning / land use scheme maps (should participate in any provincial coastal management line determinations, but this is discretionary; work with relevant provincial department to determine municipal coastal management lines which the province must Gazette). Contribute to the implementation of legal framework associated with coastal management lines.
Determining and adjusting coastal boundaries of coastal access land	Ensure specified considerations are taken into account when determining or adjusting a coastal boundary of coastal access land.
Marking coastal boundaries on zoning maps	Delineate coastal boundaries determined or adjusted in terms of Section 26 of the ICM Act on zoning scheme maps and in Spatial Development Frameworks, where applicable and appropriate.
Municipal CMPs	Prepare and adopt a municipal CMP for managing the coastal zone or specific parts of the coastal zone in the municipality.
Consistency and alignment between Municipal CMPs and other statutory plans	Ensure that any plan, policy or programme adopted by an organ of state that may affect coastal management is consistent and aligned with municipal coastal management programmes, which in turn is aligned with provincial coastal management programmes and the national coastal management

ASPECT	RESPONSIBILITIES
	programme and ensure that IDPs (including its spatial development framework) is consistent with other statutory plans (See Section 52 (1)(a-f) of the ICM Act) adopted by either a national or a provincial organ of state.
Consultation and public participation	Adequate consultation and public participation precede the exercising of a power by a municipality, which this Act requires to be exercised in accordance with Section 53 of the ICM Act.
Implementation of land use legislation in coastal protection zone	Section 62 of the ICM Act obliges any organ of state that is implementing any legislation that regulates the planning or development of land, in a manner that conforms to the principles of cooperative governance contained in Chapter 3 of the Constitution, apply that legislation in relation to land in the coastal protection zone in a way that gives effect to the purposes for which the protection zone is established as set out in Section 17 of the ICM Act. Furthermore, SPLUMA requires that a land use scheme must comply with environmental legislation.

6.5 Institutional structures

ICM Act (2008) specifies the institutional structures for overseeing integrated coastal management in South Africa, comprising a national coastal management committee, provincial coastal management committees and municipal coastal committees.

Historically, the role of the **National Coastal Committee** (NCC) was fulfilled by Mintech's Working Group 7, a technical forum that supports coastal legislation, government bodies, and coastal committees. However, in August 2024 the DFFE established a dedicated institutional structure as the NCC. In accordance with the ICM Act, the NCC must promote integrated coastal management in South Africa, coordinate the effective implementation of the act and the implementation of the national coastal management programme.

In addition, **Provincial Coastal Committees** (PCCs) have been established in the four coastal provinces, with the following functions:

- Promoting integrated coastal management in the province and the coordinated and effective implementation of this Act and the provincial coastal management programme
- Advising the MEC, the provincial lead agency and the NCC on matters concerning coastal management in the province
- Advising the MEC on developing, finalising, reviewing and amending the provincial coastal management programme
- Promoting a coordinated, inclusive and integrated approach to coastal management within the province by providing a forum for, and promoting, dialogue, co-operation and co-ordination between the key organs of state and other persons involved in coastal management in the province
- Promoting the integration of coastal management concerns and objectives into the plans, programmes and policies of other organs of state whose activities may have caused or may cause adverse effects on the coastal environment
- Performing any coastal governance function delegated to it.

The PCCs play a key role in coordinating various sectors of government, civil society and communities aimed at synchronising environmental, economic, social and political factors that influence sustainable use and development of their coastal environments and resources. According to the ICM Act, the PCCs must appoint persons who by virtue of the office that they hold, or their expertise, are able to assist the PCC in fulfilling its functions, specifically, it needs to include one or more members:

- With expertise in fields relevant to coastal management
- Representing municipalities in the coastal zone
- Representing community-based and non-government organisations

- Representing scientific or coastal research institutes.

The Eastern Cape established its Provincial Coastal Committee in 2013 and has maintained a functional PCC since then.

Municipal Coastal Committees (MCCs) may be established by municipalities at District and Metropolitan levels, as may Local Municipalities with jurisdiction in coastal areas. Where these have been established, their function including:

- Promoting integrated coastal management in the municipality and the coordinated and effective implementation of this Act and the municipal coastal management programme
- Advising the municipal manager, the municipal council and the provincial coastal committee on matters concerning coastal management within the area of jurisdiction of the municipal coastal committee
- Advising the municipality on developing, finalising, reviewing and amending 15 the municipal coastal management programme
- Promoting a coordinated, inclusive and integrated approach lo coastal management within the municipality by providing a forum for, and promoting, dialogue, co-operation and co-ordination between the key organs of state and other persons involved in coastal management within its area of jurisdiction
- Promoting the integration of coastal management concerns and objectives into the municipality's integrated development plan and spatial development framework and into other municipal plans, programmes and policies that affect the coastal environment
- Performing any coastal governance function delegated to it.

As per the ICM Act the composition of MCC must appoint persons with expertise in fields relevant to coastal management, including representatives of the management authorities of coastal protected areas or special management areas within the municipality. Representatives of communities or organisations with a particular interest in contributing to effective coastal management, such as port authorities, organs of state, persons whose livelihoods or businesses rely on the use of coastal resources, environmental interest groups and research organisations.

7 Priority Management Areas and Goals

The EC CMP provides detailed direction for achieving the coastal management vision for the Eastern Cape coast (Section **Error! Reference source not found.**). The aim of these priority areas and implementation strategies is to address the key issues of concern and build upon directives outlined during previous cycles of the plan and public stakeholder engagement.

Prioritisation was classified as follows:

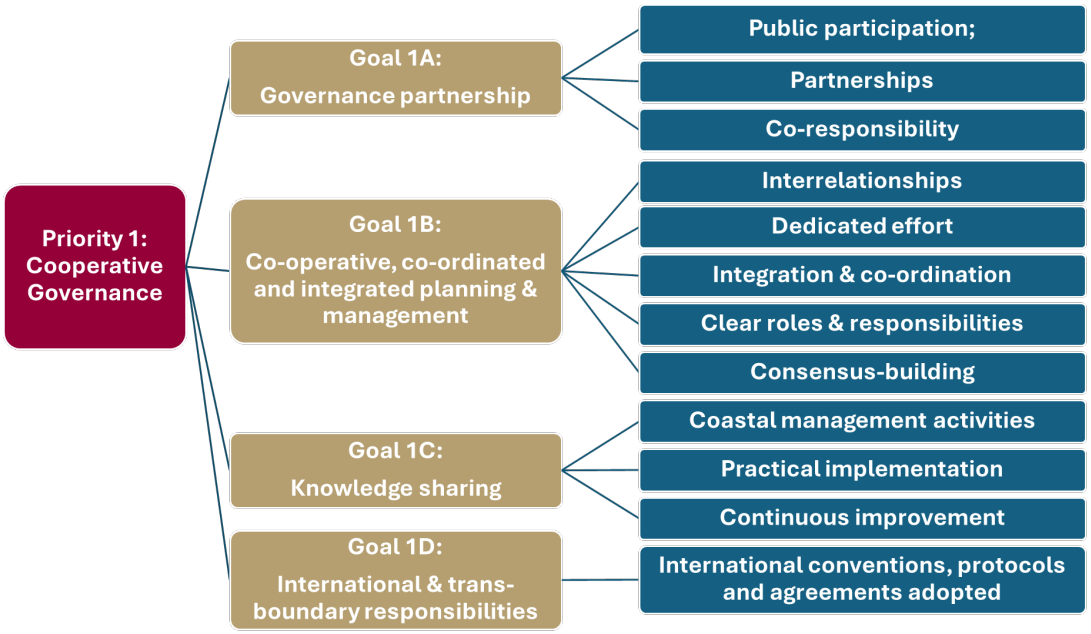
H	Implementation actions requiring immediate attention and to be completed within 3 years
M	Less critical implementation actions to be completed within 3 – 6 years
L	Least critical implementation actions to be completed within 6 – 10 years

If used correctly, performance indicators serve both as a corrective function during the coastal management cycle - enabling timely adjustments - and/or as a guide to structuring future projects more effectively (DEA, 2012). With this in mind, the priority areas for implementation and the five-year plan of action include output indicators for monitoring progress of the EC CMP implementation.

7.1 Priority area 1: Cooperative Governance

7.1.1 Key concepts of the priority area

- Participation of all stakeholders, coastal governance & co-responsibility;
- Integrated, co-ordinated decision making, planning and management;
- Ongoing, continued learning and practical implementation of programmes and processes; and
- Compliance with International conventions, protocols and agreements.



7.1.2 Key issues / Goals in Priority Area 1

Goal 1A	**To ensure meaningful public participation, and to promote partnerships between all spheres of government, the private sector and civil society (NGOs, private sector & traditional leadership) in order to foster co-responsibility in coastal management.**
	Objectives • Public participation; • Partnerships • Co-responsibility
	Overview • There shall be meaningful public participation in all coastal planning and management efforts. • All spheres of government shall proactively seek to develop partnerships with the private sector, civil society and the research community in coastal planning and management. • A caring and responsible attitude towards the coast shall be encouraged amongst all coastal-resource users to foster co-responsibility for its management.

Goal 1B	**To promote a dedicated, co-operative, co-ordinated and integrated coastal planning and management approach**
	Objectives • Interrelationships • Dedicated effort • Integration and co-ordination • Roles and responsibilities • Consensus-building
	Overview • All planning and management efforts shall demonstrate that the inter-relationships between coastal ecosystems and human users have been taken into account. • Provision shall be made to ensure that there is adequate financial support (dedicated resource allocation for coastal plans and management), suitably trained and experienced personnel, appropriate technical equipment and capacity for coastal planning and management is sufficient for organs of state, including municipalities, to carry out their mandate effectively. • Institutional arrangements shall promote dialogue, co-operation, co-ordination and integration within and between government departments, the private sector and civil society. • The roles and responsibilities of government departments must be clarified and clearly understood at all levels of government (national, provincial and local). • Conflict shall be resolved wherever possible in a collaborative problem-solving, consensus-building manner.
Goal 1C	**To conduct coastal planning and management activities in a manner that promotes learning through continuous research, monitoring, review and adaptation**
	Objectives • Coastal management activities • Practical implementation • Continuous improvement/Learning by doing
	Overview • The dedicated coastal management initiative developed must continue to be implemented and adapted through a process of continuous research, monitoring, review and adaptation. • Coastal planning and management activities shall be strategic, focused, practical and operational as well as SMART[2]
Goal 1D	**To fulfil international and trans-boundary responsibilities, whilst retaining South Africa's sovereignty**
	Objectives • International conventions, protocols and agreements adopted and domesticated

[2] *Specific, measurable, attainable, realistic and time bound*

	Overview • Relevant international conventions, protocols and agreements shall be adopted and domesticated as they relate to the Eastern Cape Province.

PRIORITY AREA 1: COOPERATIVE GOVERNANCE

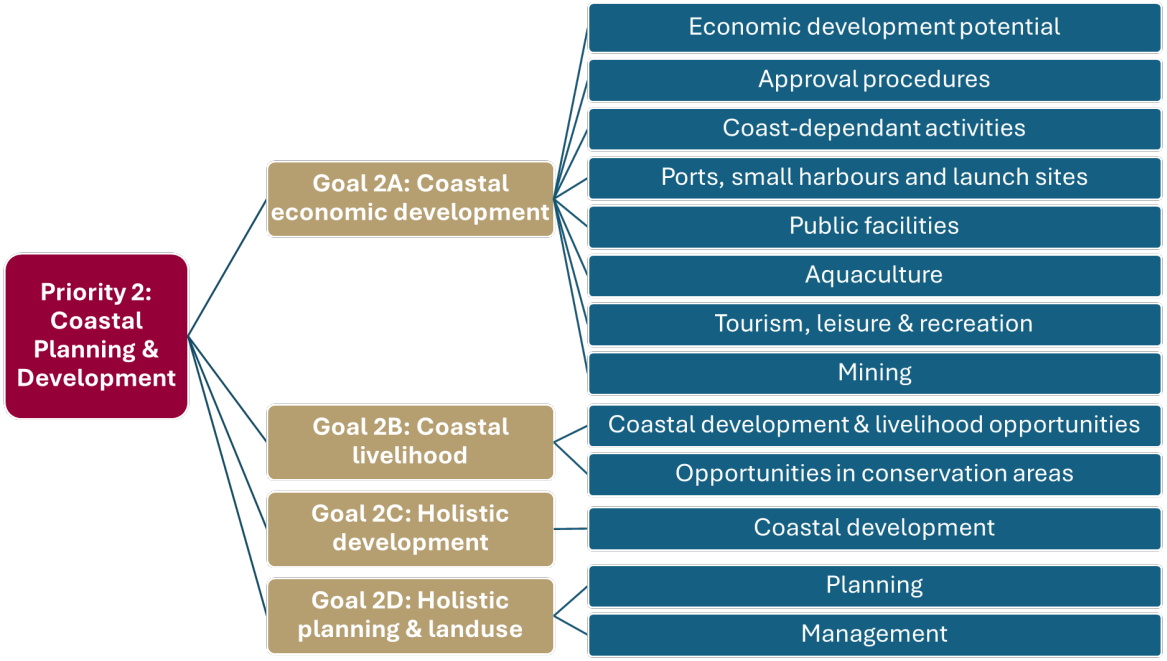
	Implementation strategies	Indicators	Priority	Lead agency	Time frame	Estimated Cost
1	Maintain a database of coastal stakeholders, including all spheres of government, NGOs, Traditional leaders, researchers, managers and key contacts/ stakeholders	• Maintain up to date coastal stakeholders database	H	DEDEAT	Ongoing	Operational costs
2	Facilitate Provincial Coastal Committee	• Regularly revised agreed Terms of reference • Minutes of regular meetings	H	DEDEAT	Ongoing	Operational costs
3	Develop mechanisms for co-operative governance between organs of state and ensure co-ordination	• A record of diverse attendance at PCC, National Coastal Committee, Working Group 7, Estuarine and MPA Task Team meetings • Attendance of Municipal Coastal Committee meetings (4 coastal districts and NMBM) • Revive Intergovernmental Relation Forum (mayors in each local municipality) • Memorandum of Agreements	H	DEDEAT	Ongoing	Operational costs
4	Increase ICM capacity to support municipalities	• Participation in capacity-building programmes • Increased capacity to deal with ICM issues at the municipal level	H	DEDEAT	Ongoing	R2 000 000.00 – R2 500 000.00 / annum (staff increase 2 – 3 people)

	Implementation strategies	Indicators	Priority	Lead agency	Time frame	Estimated Cost
5	Alignment between EC CMP with IDPs, SDFs and other spatial planning tools	• Provincial coordination to facilitate alignment between spatial planning tools (regular dialogue during drafting processes, attendance of IDP forums) • Assessment coastal IDPs, SDFs for alignment • Coastal aspects (including Climate Change Adaptation responses) incorporated into IDPs	H	DEDEAT	Ongoing	Operational costs
6	Facilitate Municipal Coastal Committees	• Terms of reference • Minutes of meetings	H	District & Metros	Ongoing	Operational costs
7	Incorporate international obligations and best practices and incorporate into relevant frameworks	• Assessment of relevant aspects of international obligations and incorporation of relevant aspects into future CMP updates	L	DFFE DEDEAT	Ongoing	Operational costs

7.2 Priority area 2: Coastal Planning and Development

7.2.1 Features of this priority area:

- Emphasis on local economic development opportunities and approval procedures;
- Identification and exploitation of sustainable livelihood opportunities; and
- Holistic planning and development processes with emphasis on sustainable and equitable spatial development trends in the coastal zone.



7.2.2 Key issues / Goals in Priority Area 2

Goal 2A	To promote the diversity, vitality and long-term viability of coastal economies and activities, giving preference to those that are distinctly coastal or dependent on a coastal location taking the upliftment of coastal communities into account
	Objectives • Economic development potential • Streamline approval procedures • Coast-dependant activities • Ports, small harbours and launch sites • Public facilities • Aquaculture • Tourism, leisure and recreation • Mining
	Overview • The long term economic development potential of coastal localities and regions shall be promoted.

	• Coastal planning, administrative and management decision-making approval procedures shall be clarified and streamlined and duplication avoided. • Preference shall be given to distinctly coastal economic development opportunities and to activities that are dependent on a coastal location, rather than to those activities that could be located inland. • Cognisance needs to be taken of Ports, small-craft harbours and related facilities and ski-boat launch sites should be effectively managed. • Adequate and accessible public facilities shall be provided at appropriate coastal locations by both conservation authorities and coastal municipalities. • Mariculture and aquaculture opportunities and initiatives shall be supported where such activities would have beneficial impacts for local communities. • Coastal tourism, leisure and recreational development opportunities/initiatives shall be identified and promoted at appropriate coastal locations. • All activities relating to coastal prospecting and mining rights shall be conducted in an environmentally responsible manner.
Goal 2B	**To alleviate coastal poverty through proactive coastal development initiatives that generate sustainable livelihood options**
	Objectives • Coastal development and sustainable livelihood opportunities • Opportunities in conservation areas
	Overview • Development opportunities that seek to eliminate coastal poverty shall be proactively identified through local economic development initiatives and should promote sustainable livelihood options. • Manage conservation areas in a manner that increases the value of the coastal zone.
Goal 2C	**To maintain an appropriate balance between built, rural and wilderness coastal areas**
	Objective • Coastal development
	Overview • Coastal planning efforts shall proactively identify and promote new, sustainable, distinctively coastal development opportunities that retain the scenic beauty of coastal areas, while promoting the densification of existing coastal corridors and nodes, and limiting ribbon development.
Goal 2D	**To design and manage coastal settlements to be in harmony with local and regional aesthetic, amenity, biophysical and cultural opportunities and constraints**
	Objectives • Planning • Management
	Overview • Manage the design and built form of coastal settlements in harmony with the aesthetic, amenity, biophysical, economic, social and cultural opportunities and constraints of the coastal zone.

	• Coastal settlements and associated activities shall be managed to promote and enhance the socio-economic benefits, diversity, health and productivity of coastal ecosystems.

PRIORITY AREA 2: COASTAL PLANNING AND DEVELOPMENT

	Implementation strategies	Indicators	Priority	Lead agency	Time frame	Estimated Cost
1	Coordinate compilation of an inventory and of coastal resources that can be utilised as drivers of Local Economic growth. Development. Conduct a feasibility assessment, including setting limits to coastal utilisation	• Inaugural coastal resources inventory • Incorporation of inventory into decision-making frameworks	H	DEDEAT	2029	R 1000 000.00
2	Develop Eastern Cape Coastal & Marine Tourism Strategy	• Approved Eastern Cape Coastal & Marine Tourism Strategy	H	DEDEAT	2029	R 1000 000.00
3	Develop/revise key draft by-laws, to assist with the implementation of the requirements of the ICM Act	• Needs identification completed • Develop by-laws template to streamline process across province • Draft by-laws developed • By-laws adopted	H	Municipalities	2029	Operational cost
4	Establish buffer zones around conservation areas, with different levels of sustainable natural resource use	• Buffer zone needs analysis undertaken • Coastal-specific buffer zones established • Incorporation into bioregional planning	M	Eastern Cape Parks and Tourism Agency DEDEAT, SANParks	2032	R 1000 000.00

	Implementation strategies	Indicators	Priority	Lead agency	Time frame	Estimated Cost
5	Streamline administrative procedures and databases for authorising coastal activities	• Establishment of combined planning databases (GIS) and protocols for the Province	M	DEDEAT	Ongoing	Operational cost
6	Provide or improve public facilities at key nodes to meet recreational, health and safety needs	• Key nodes/needs assessment for the province • Implementation of findings	M	Municipalities	Ongoing	Initial assessment R1 000 000.00, implementation as per detailed project budgets
7	Identify coastal lands that have inappropriate zoning or rights and identify mechanisms to address these problem areas	• Town planning investigation completed • Action taken	M	Municipalities	Ongoing	R 1000 000.00
8	Support implementation of provincial coastal livelihoods strategy	• Support DFFE in the development of coastal livelihoods strategy	M	DFFE: Fisheries DEDEAT	2032	Operational cost
9	Provide the required infrastructure to support coastal economic initiatives	• Enhanced coastal economic activities	L	Municipalities and relevant state departments	Ongoing	As per detailed project budgets
		•				

7.3 Priority area 3: Climate change and dynamic coastal processes

7.3.1 Features of this priority area:

- Responding to dynamic coastal processes through increased resilience of natural and social systems; and
- Phased retreat of infrastructure in high risk areas.

7.3.2 Key issue / Goals in Priority Area 3

Goal 3A	**To plan and manage coastal development to avoid increasing the incidence and severity of natural hazards and to avoid exposure of people, property and economic activities to significant risk from dynamic coastal processes**
	Objectives • Identify Coastal hazards • Determine Climate Change Vulnerability • Enable coastal retreat
	Overview • Coastal development shall be planned in a manner that minimises disruption of dynamic coastal processes and avoids exposure to significant risk from natural hazards such as coastal storms. • The potential consequences of medium- and long-term climate change and associated sea-level rise shall be taken into account in all coastal planning and management. • Phased coastal retreat will be prioritised as a principle which informs existing and future coastal development.

PRIORITY AREA 3: CLIMATE CHANGE AND DYNAMIC COASTAL PROCESSES

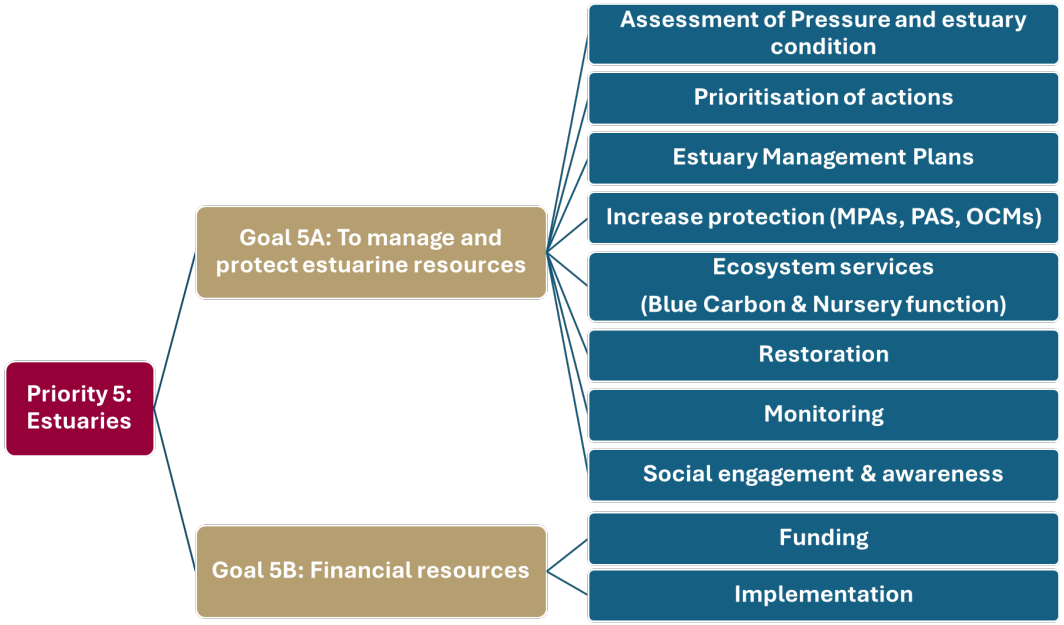
	Implementation strategies	Indicators	Priority	Lead agency	Time frame	Estimated Cost
1	Determine and designate Coastal Management Lines for the Eastern Cape coast	• Gazetted Coastal Management Lines supported by a comprehensive public participation process	H	DEDEAT	2029	R5 000 000.00
2	Determine vulnerable areas and development guidelines in response to dynamic coastal processes and Climate Change	• Identify vulnerable areas subjected to dynamic coastal processes and Vulnerable to Climate Change (e.g. Sea Level Rise, flooding and increased storminess) • Model and monitor extent of the climate change induced impacts on the coastal zone • Update the EC Climate Change Adaptation Response Strategy. • Revised guidelines for coastal protection and a strategy for coastal retreat (if required).	H	DEDEAT	2029	R5000 000.00
3	Protect and maintain dynamic coastal features that act as a buffer against natural coastal processes and hazards	• Identify and demarcate critical coastal infrastructure (e.g. foredunes) • Develop measures to protect critical natural coastal infrastructure, e.g. set Coastal Management Lines	H	DEDEAT, Eastern Cape Parks and Tourism Agency, Municipalities	Ongoing	Operational costs
4	Development and Implementation of Disaster Management Plans and Strategies	• Mapped disaster-prone zones/sites • Disaster management Plans developed, including risk reduction strategies (e.g. maintenance of stormwater infrastructure, investment in Sustainable Urban Drainage Systems (SUDS)) • Early warning system in place	H	Municipalities and industry	Ongoing	Operational costs

5	Facilitate proactive development and approval of Coastal Maintenance Management Plans (under EIA regulations) for coastal infrastructure that is at risk from coastal storms and/or flooding.	• Approved coastal Maintenance Management Plan (under EIA regulations) for key infrastructure at regular risk of natural disaster (not pollution events, which should be fixed as the source)	H	DEDEAT, Municipalities	Ongoing	Operational costs

7.4 Priority area 4: Land and marine-based sources of pollution

7.4.1 Key concepts of this priority area:

- Reducing and responding to land and marine-based sources of pollution in the coastal zone; and
- Adherence to the waste management hierarchy of reduce, reuse, recycle.



7.4.2 Key issue / Goals in Priority Area 4

Goal 4A	**To implement pollution control and waste management measures to prevent, minimise and strictly control harmful discharges into estuarine and coastal ecosystems**
	Objectives • Pollution prevention and waste minimisation • Implement national guidelines • Prevent pollution disasters • Update plans and programmes
	Overview • The future discharge of all land-based point and diffuse sources of pollution that are likely to end up in coastal ecosystems shall be prevented, or minimised and strictly controlled as per the ICM Act requirements, the EC Waste Management Plan and Waste Management Guidelines. • The national guidelines with respect to land-based sources of pollution in the marine environment must be integrated into sector plans, including Estuary Management Plan, and be implemented. • Adequate and effective anticipatory and reactive measures shall be reviewed and supported to reduce the adverse consequences of human-induced coastal pollution disasters and hazards. Disaster management plans must be reviewed annually and updated, if required. • Current planning and programmes must be re-prioritised in line with the EC Waste Management Plan requirements and additional budget allocated for both implementation and monitoring. Implementation should be coordinated by the EC PCC.
Goal 4B	**To manage polluting activities to ensure that they have minimal adverse impact on the health of coastal communities, and on estuarine and coastal ecosystems and their ability to support beneficial human uses**
	Objectives • Ecosystem health • Human health • Pollution monitoring
	Overview • Pollution-control and waste-management measures, as detailed in the Eastern Cape Waste Management Plan, shall be implemented to ensure that discharges of organic and bio-degradable substances are minimal, and that the assimilative capacity of coastal ecosystems is not exceeded. • The discharge of pollutants and waste into coastal ecosystems shall not be allowed to reach levels that adversely affect human health, use and enjoyment of coast and should take cognisance of any coastal management objectives set. • Pollution monitoring must be improved in all sectors of the coastal zone.

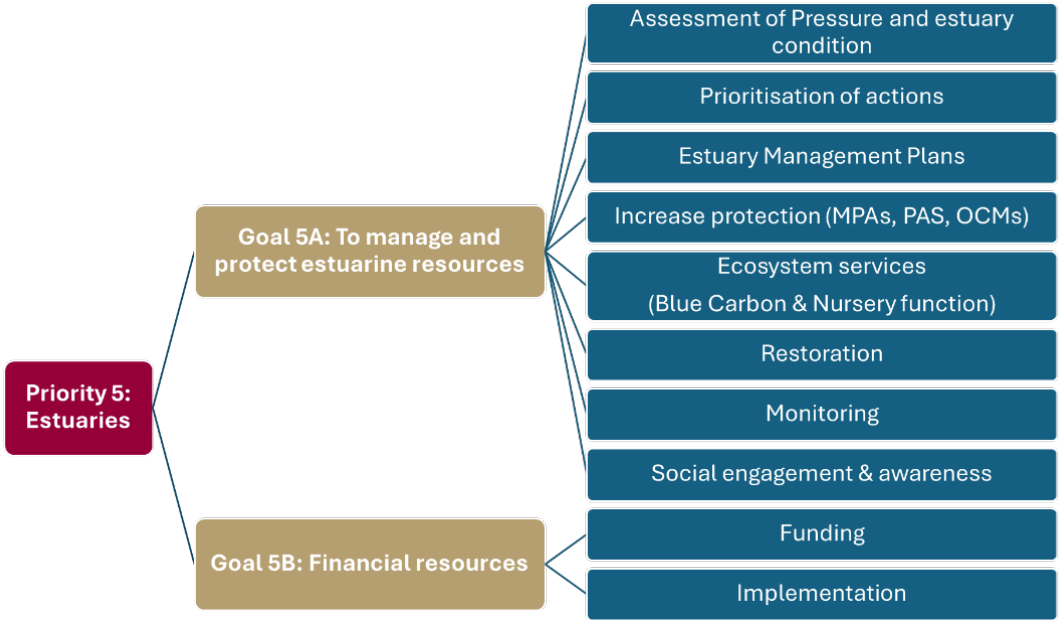
PRIORITY AREA 4: LAND AND MARINE BASED SOURCES OF POLLUTION

	Implementation strategies	Indicators	Priority	Lead agency	Time frame	Estimated Cost
1	Invest and conduct regular maintenance of Wastewater Treatment Works (WWTW) and associated infrastructure to prevent and minimise pollution risk	• Municipal budgets prioritise WWTW maintenance and upgrade costs • Reduction in incidence of WWTW and/or pump station failures and spills • Improvement in coastal waters water quality • Adherence to recreational standards	H	Municipalities	Ongoing	R5 000 000.00 – R10 000 000.00 / annum
2	Re-establish Working for the Coast	• Funding and execution of WftC initiatives	H	DFFE Civil society & private sector	Ongoing	R5 000 000.00
3	Design an integrated pollution monitoring system for the coast, based on existing monitoring structures and taking into account the integrated estuarine monitoring programme	• Development of a standardised pollution monitoring system (including information dissemination platform/ dashboard) • Implement the Adopt a Beach programme • Integration & coordination of monitoring activities	H	DEDEAT Municipalities	Ongoing	R1 000 000.00
4	Establish coastal water quality objectives	• Development of coastal water quality objectives (including setting minimum standards)	H	DWS	2029	R1 000 000.00
5	Ensure that new coastal developments carry out necessary preventative measures to minimise the chances and effects of pollution events	• Pollution-specific conditions incorporated into coastal development approvals	H	DEDEAT Municipalities	Ongoing	Operational cost

7.5 Priority area 5: Estuaries

7.5.1 Key aspects of this priority area:

- Establishing and implementing a strategy to improve the management and protection of estuarine resources; and
- Securing sufficient financial resources to fund and implement identified actions, research projects, initiatives, and advisory forums.



7.5.2 Key issue / Goals in Priority Area 5

Goal 5A	To manage and protect estuarine resources
	Objectives • Assessment of Pressure and Estuary Condition • Prioritisation of actions • Estuary Management Plans • Increase protection (PAs, MPAs or Stewardship/OECMs) • Ecosystem services (Blue Carbon & Estuary fish nursery function) • Restoration

	• Monitoring • Social engagement and awareness
	Overview • Estuaries shall be assessed and prioritised for development of estuary management plans, urgent conservation, restoration and other management interventions. • An estuary management plan shall be developed and implemented for priority estuary according to the National Estuarine Management Protocol, beginning with priority estuarine systems, and all estuary management plans shall be incorporated into coastal development planning (EMF, SEA, IDP, SDF etc) to prevent degradation of ecosystem health and functionality, loss of biodiversity and provision of ecosystem goods and services. • A network of estuarine protected areas shall be established, comprising unique and healthy estuaries, to conserve different estuary types, habitats, species, populations and landscape processes as per the requirements of the National Estuary Biodiversity Plan, and Global Biodiversity Framework Target 3 (30% representation of ecosystem types/ habitats) • Encourage estuarine research that supports ICM and EMP development • Estuary monitoring shall be improved to track the estuary health status, pollution levels, resource utilisation, and coastal development, as well as outcomes of management actions and should form part of estuary management plans. • Community engagement, public participation and awareness programmes shall be promoted to foster appreciation and understanding of the benefits of estuary management.
Goal 5B	**To develop a sustainable estuarine research and development programme responding to estuary management needs**
	Objectives • Funding • Implementation
	Overview • Funding shall be sourced to support estuarine research and monitoring on systems where information is lacking, to support restoration efforts, to facilitate the establishment of regional estuary committees and estuary advisory forums and to undertake necessary management actions. • Operationalise, implement, capacitate and sustain efforts to plan, manage, monitor and report on progress in respect to estuary management goals and objectives.

PRIORITY AREA 5: ESTUARIES

	Implementation strategies	Indicators	Priority	Lead agency	Time frame	Estimated Cost
1	Compile a detailed inventory of all EC estuaries, including: current and future pressure, estuary condition, important ecosystem services and information gaps	• Details on current and future pressures (flow modification, pollution, land use change, biological invasions, artificial breaching); • Summary of Estuary condition; • Blue Carbon (mangroves, saltmash and seagrass) • Important fish nurseries • Key restoration interventions are required • Spatial data on estuarine habitats	H	DEDEAT	Ongoing	See Appendix B for details on pressures, conditions and restoration interventions. R1 000 000.00
2	Develop and implement a Provincial Estuarine Management Strategy to develop EMPs for all estuaries (at a range of detail levels)	• Undertake stakeholder strategy session to assess and prioritise estuaries for: detail EMPs, restoration interventions, compliance interventions, monitoring. • Provincial Estuary Management Strategy that prioritise estuaries and provide high level guidance key issues and interventions across systems. • Identify and address research gaps.	H	DEDEAT Municipalities	2027	Operational cost
3	Estuarine Management Plan development and implementation	• Gazetted and implementation of EMPs at priority sites (10) • Establishment of estuary advisory forums / committees at high use estuaries	H	DEDEAT Municipalities	2027 - 2036	R1 000 000.00 / annum
4	Facilitate proactive development and approval of coastal Maintenance Management Plans (under EIA regulations) for estuaries where artificial breaching is	• Review if artificial breaching of estuary mouths in the province is requirement (e.g. structures are legal, natural levels are to high, road access is compromised)	H	DEDEAT, Municipalities	2027	R2 000 000.00

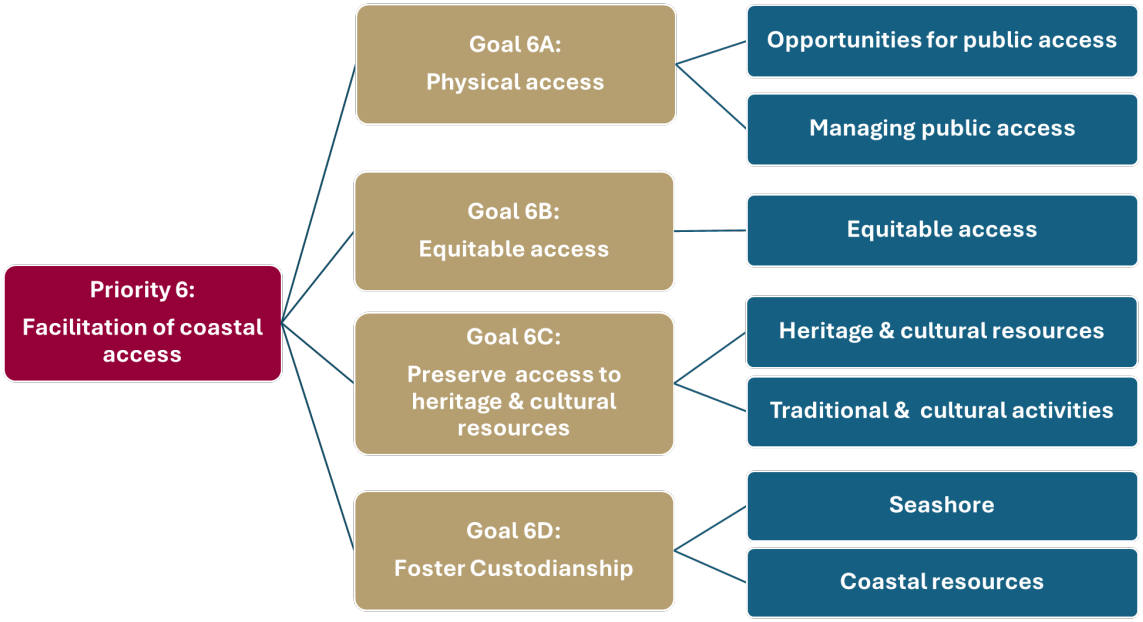
	Implementation strategies	Indicators	Priority	Lead agency	Time frame	Estimated Cost
	practised to protect legal coastal infrastructure from coastal storms and/or flooding.	• Pre-approval coastal Maintenance Management Plan (under EIA regulations) in place to facilitate artificial breaching of an estuary mouth for protection infrastructure at regular risk of natural disaster (not pollution events, which should be fixed as the source)				
5	Review existing estuarine protected area network to determine estuarine ecosystem type and habitat representation and revise accordingly to meet GBF Target 3 (30 x 30)	• Effective protection of estuaries encompassing 30% of all estuarine types and habitats, and preferably linked to terrestrial and/or marine protected areas • Stewardship programme/s and/or OECMs established to promote the protection of Blue Carbon and the estuarine nursery function	M	DEDEAT EC Parks and Tourism Agency SANBI DFFE	2032	R2 000 000.00
6	Establishment of an estuarine monitoring programme	• Estuarine database containing regularly updates of data: remote sensing, water quality data, mouth state data, catchment/ hydrological data, alien invasive plant coverage, harmful algal blooms data, fish and bird surveys. • Annual reporting (preferably automated)	M	DEDEAT, SAEON (WQ) CMR – NMU (Microalgae) NMU National Botanical Database regularly update spatial data on habitats DFFE: Fisheries (Fish & Inverts) SAIAB (Fish)	2032	R500 000.00 / annum

	Implementation strategies	Indicators	Priority	Lead agency	Time frame	Estimated Cost
				DFFE OCIMS (WQ Remote sensing) Municipalities (LiDAR & WQ) DWS (WQ) CWAC (birds) DFFE OCIMS is updating the remote sensing monitoring of Harmful algae bloom (HABs) in estuaries		
7	Develop a strategy for increasing social engagement and environmental awareness among stakeholders and key user groups	• Environmental education programmes in schools and universities • Institutional awareness programmes • Outreach programmes to rural communities and user groups • Informative brochures and signage at key communal areas (resorts, libraries, information centres)	M	DEDEAT, municipalities	Ongoing	R1 000 000.00
8	Identify potential sources of funding and access funding to develop and implement Eastern Cape EMPs.	• Funding secured • EMPs completed and implemented • Restoration project completed and ecosystem restored • Education programmes implemented • Research projects identified and initiated • Capacitated estuary advisory forums	H	DEDEAT DFFE, DWS NGOs	Ongoing	Operational cost

7.6 Priority area 6: The facilitation of coastal access

7.6.1 Key concepts of this priority area:

- Promoting and managing access to coastal public property;
- Promoting and facilitating equitable access to coastal resources and coastal public property;
- Recognising the importance of access preservation; and
- Promoting custodianship and stewardship of the coastal zone.



7.6.2 Key issue / Goals in Priority Area 6

Goal 6A	To ensure that the public has the right of physical access to the coast and along the sea shore on a managed basis
	Objectives • Opportunities for public access • Managing public access

	Overview • Opportunities for public access are provided at appropriate coastal locations, and improved where necessary. • Where appropriate, public access shall be managed (planned, mapped, controlled or consolidated) to minimise adverse impacts and to resolve incompatible uses.
Goal 6B	**To ensure that the public has the right of equitable access to the opportunities and benefits of the coast on a managed basis**
	Objectives • Equitable access • Managing public access
	Overview • Access to coastal resources shall be facilitated, allocated and used in a manner that is fair and just, with particular attention given to the needs and economic upliftment of disadvantaged communities.
Goal 6C	**To support the preservation, protection or promotion of heritage and cultural resources and activities of the coast**
	Objectives • Heritage and cultural resources • Traditional and cultural activities
	Overview • Support the identification, regulation, preservation, or promotion and access (where appropriate) to coastal resources of historical, archaeological, cultural and scientific value. • Given special consideration to traditional and cultural activities in coastal planning and management, and incorporated into environmental management procedures where possible.
Goal 6D	**To ensure that the State fulfils its duties as the legal custodian of all coastal State assets on behalf of the people of South Africa**
	Objectives • Seashore • Coastal resources
	Overview • The State shall retain ownership and ensure effective management of the seashore and per ICM Act assignments. • Coastal resources under the control of parastatal organisations or communities, e.g. former Transkei, shall be managed in the public interest, and coastal land shall not be alienated for private purposes.

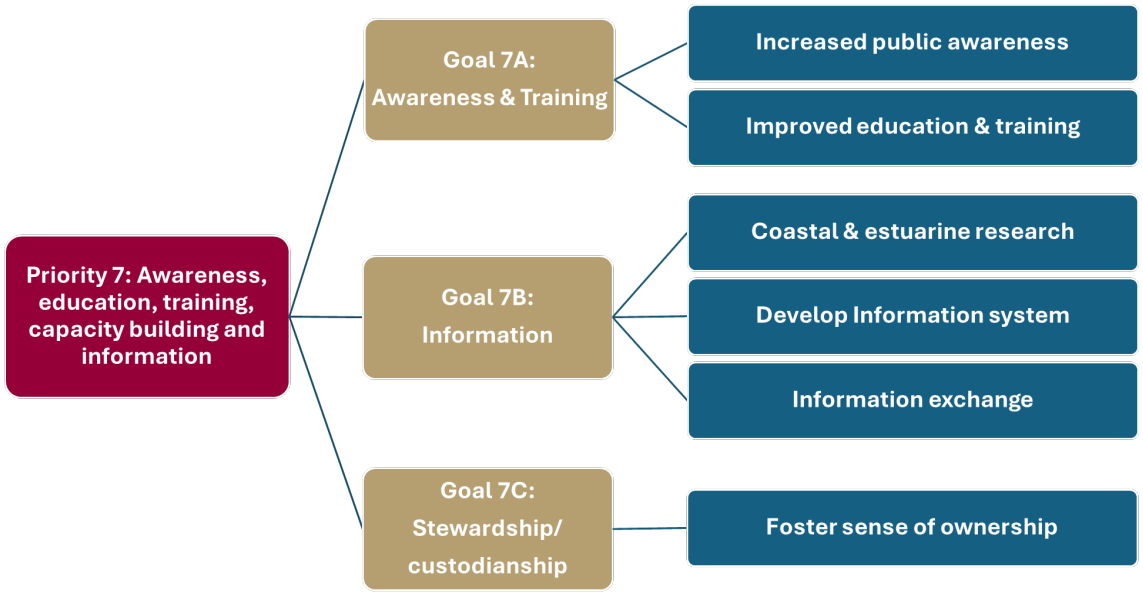
PRIORITY AREA 6: FACILITATION OF COASTAL ACCESS

	Implementation strategies	Indicators	Priority	Lead agency	Time frame	Estimated Cost
1	Undertake a review of access to the Eastern Cape coast	• Review of coastal access provision • Review of restrictions on access to the coastline and removal/modification of restrictions where necessary	H	DFFE, DEDEAT, Municipalities	Ongoing	R2 000 000.00
2	Report on the State of Coastal Access	• Annual reports to DFFE • Designated coastal access land	M	DEDEAT, Municipalities	Ongoing	Operational cost
3	Facilitate the identification and protection of traditional resource users and cultural activities	• Provincial Strategic Impact Assessment undertaken • Incorporate strategies for the protection of traditional resource users into coastal policies • Prevention of inappropriate uses of heritage places, control of illegal • activities	M	Eastern Cape Provincial Heritage Resource Agency; Municipalities	Ongoing	R2 000 000.00
4	Provide public facilities and infrastructure to meet recreational needs and facilitate resource access by all users	• Amenity needs assessment of key coastal nodes • Provision of coastal amenity	L	Municipalities DFFE	Ongoing	Operational budget & project-specific budgets
5	Conduct awareness sessions for coastal access by communities	• Regional awareness sessions on the importance of coastal access	M	Municipality DEDEAT	2032	R500 000.00

7.7 Priority area 7: Awareness, education, training, capacity building and information

7.7.1 Concepts of this priority area:

- Facilitation of knowledge production and exchange;
- Promotion of knowledge sharing of coastal ecosystems and issues; and
- Instilling a sense of ownership and shared custodianship of the coastal zone and its benefits amongst all stakeholders.



7.7.2 Key issue / Goals in Priority Area 7

Goal 7A	**To promote public awareness about the coast and educate and train coastal managers and other stakeholders to ensure more effective coastal planning and management**
	Objectives • Increased public awareness • Improved education and training
	Overview

	• The EC coastal-awareness and education programme must complement the National programme, be sensitive to regional and local needs and report via the Eastern Cape Environmental Empowerment Services. As well as include a proactive outreach and communication plan. • Education and training programmes for all relevant officials, stakeholders and communities shall be developed and implemented and reported on.
Goal 7B	**To promote effective, accessible and co-ordinated research, spatial planning as well as access to information**
	Objectives • Promote coastal and estuarine research that focuses on ICM issues • Information system • Information exchange
	Overview • The integrity of species, habitats and the productivity of coastal ecosystems, the response to pressures, the impacts of future development and population growth, as well as climate change must be researched. • An effective, accessible and co-ordinated integrated spatial planning system must be designed and maintained to support coastal and marine spatial planning and management efforts in the Eastern Cape. • Adequate information exchange and dissemination must be ensured between scientists, coastal managers and all relevant stakeholders.
Goal 7C	**To instil a sense of ownership of the coast in communities and a recognition of its intrinsic value to the Eastern Cape**
	Objectives • Sense of ownership • Stewardship programmes • Annual events
	Overview • Public awareness programmes, education and equitable access to resources should lead to the appreciation of a sense of ownership of the coast and recognition of its intrinsic value to the Eastern Cape. • Stewardship programmes should be encouraged and regulated to ensure a sense of ownership and shared responsibility of the coastal zone • Opportunities created by annual events, such as the annual sardine run, must be capitalised upon to improve ICM awareness.

PRIORITY AREA 7: AWARENESS, EDUCATION, TRAINING, CAPACITY BUILDING AND INFORMATION

	Implementation strategies	Indicators	Priority	Lead agency	Time Frame	Estimated Cost
1	Develop and implement a training and capacity building programme for coastal managers/ officials, councillors and traditional leaders	• Number of Workshops attended • Feedback from implementation efforts	H	DFFE DEDEAT	Ongoing	DFFE budget
2	Develop coastal and marine spatial planning capabilities and collect supporting coastal spatial data on a regular basis	• Effective support developed for Coastal and Marine Spatial Planning • Develop databases and archives to host spatial data. • Remote sensing undertaken (every 5 years) • Aerial surveys are undertaken (every 5 years) • Lidar surveys undertaken (every 5 years)	M	DFFE, Surveyor General COGTA	Ongoing	The Operational cost *OCIMS platform can assist with the serving of land use change and remote sensing data. If standardised outputs are developed*
3	Identify and facilitate an effective network of environmental learning/education centres	• An active operational network of environmental learning centres that support ICM learning • Effective sharing of information • Co-ordinated research initiatives • Research Institution representation on PCC	M	SANCOR, CMR NMU Rhodes Fort Hare CSIR	Ongoing	Operational cost
4	Improve ecosystem protection and benefits through education and public awareness programmes (including stewardship programme)	• Education and public awareness-raising programme developed and implemented • Support provided by provincial or national departments for the coastal educational programme	L	DEDEAT, EC Department of Education	Ongoing	R500 000.00 / annum

7.8 Priority area 8: Compliance, monitoring and enforcement

7.8.1 Aspects of this priority area:

- Facilitation of compliance with coastal legislation; and
- Promotion of the environmental management inspectorate (EMI) and facilitation of training and designation of environmental management inspectors.

7.8.2 Key issue / Goals in Priority area 8

Goal 8A	To promote compliance with coastal and other relevant regulations
	Objectives • Increased compliance • EMI's • Active support for priority actions
	Overview • Compliance with coastal and other applicable regulations must be encouraged and improved. • Designation and specialised training of EMIs within provincial and local government must be supported, and adequate human and capital resources ensured. • EC priority projects should be supported, and Enforcement Task Teams established to ensure their implementation.

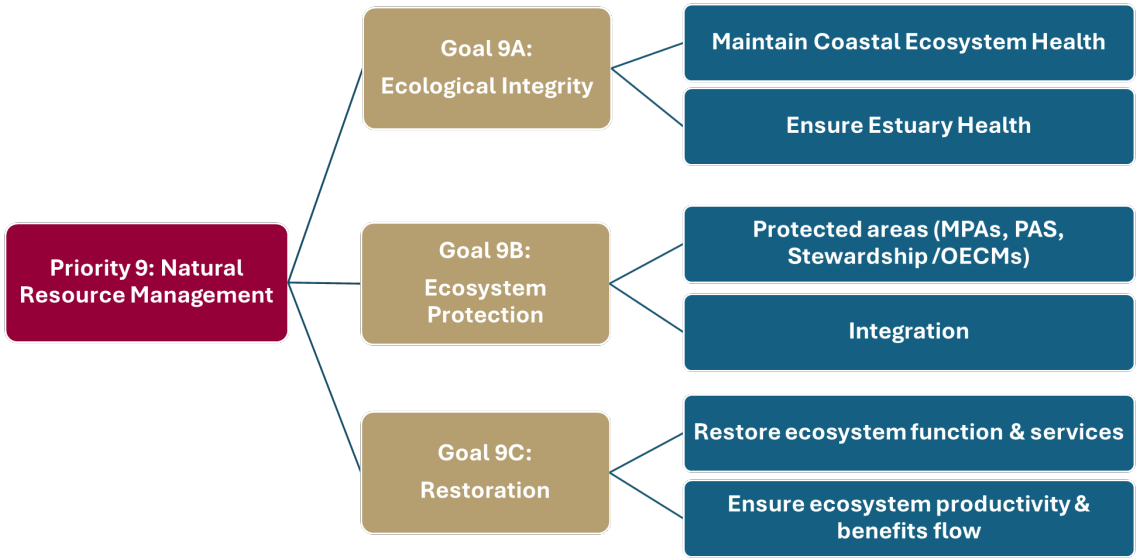
PRIORITY AREA 8: COMPLIANCE, MONITORING AND ENFORCEMENT

	Implementation strategies	Indicators	Priority	Lead agency	Time frame	Estimated Cost
1	The province must ensure the implementation of protocols/ Standard Operating Procedures (SOPs) to streamline bureaucracy.	• Increased convictions • Increased compliance	H	DEDEAT	Ongoing	As per the national programme
2	Registration and training of provincial and municipal EMIs with respect to coastal-specific legislation, including bylaws	• Increased number of EMI's • Built capacity to enhance enforcement effort (each municipality >1 EMI trained) • Increased convictions • Increased compliance • Strengthened law enforcement efforts	H	DFFE, SAPS	Ongoing	Operational cost
3	Coordinated policing and development of mechanisms to encourage compliance	• Awareness-raising programmes • Established and integrated the system between local EMIs and National EMIs • Increased compliance	H	DFFE DEDEAT SAPS DMPR	Ongoing	Operational cost
4	Gap analysis of the impact and effectiveness of EMI's (at all levels).	• Established reporting mechanism • Annual report/performance review • Number of convictions	M	DFFE, DEDEAT	Ongoing	Operational cost

7.9 Priority area 9: Natural Resource Management

7.9.1 Aspects of this priority area:

- The protection and maintenance of coastal ecosystem condition and important ecosystem services (e.g. food security);
- To support and enable the effective management of coastal protected areas (reserves, marine protected areas, stewardship/OECMs); and
- To identify and restore degraded coastal ecosystems and habitats.



7.9.2 Key issue / Goals in Priority area 9

Goal 9A	**To maintain the diversity, health, and productivity of coastal processes and ecosystems**
	Objectives • Maintain coastal and ecosystem health.
	Overview • The biological diversity, natural functioning and ecological integrity, health and productivity of coastal ecosystems are maintained as per the requirements of the Eastern Cape Biodiversity Conservation Plan and other plans (NBSAP, SDFs, EMFs and other coastal plans)
	To establish and effectively manage a system of coastal protected areas

Goal 9B	Objectives • Coastal protected areas • Integration
	Overview • A comprehensive network of protected areas (MPAs, PAs or OECMs) and special (management) areas is established and effectively managed, representative of all coastal ecosystems, critical habitats and species (as per the requirements of the EC Protected Area Expansion Strategy). • Maintain the diversity, health and productivity of coastal ecosystems within protected areas and ensure that local communities share in the benefits • Support and enable (where within mandate) effective protection of endangered coastal species (e.g, African penguin), including identification and engagement with relevant sectors on key threats outside of protected areas (e.g. fuel bunkering) • Coastal protected areas shall be integrated across both the land and sea to optimise protection benefits, where practical
Goal 9C	**To restore damaged or degraded coastal ecosystems and habitats**
	Objectives • Restoration of ecosystem function and services • Maintenance of ecosystem productivity and flow of benefits.
	Overview • Coastal ecosystems and supporting habitats that have been substantially degraded or damaged as a result of past human activities shall be restored. • Ensure that restoration of ecosystems and habitats is maintained through proper planning and environmental capacity building.

PRIORITY AREA 9: NATURAL RESOURCE MANAGEMENT

	Implementation strategies	Indicators	Priority	Lead agency	Time Frame	Estimated Cost
1	Review existing coastal protected areas and Marine Protected Areas to determine representation and revise (if required to meet expanded Global	• Completed review to determine representation, including the potential contribution OECMs/Stewardship can make to the target. • Assessment of % of coastal area needing protection	**H**	EC Parks and Tourism Agency DFFE	2029	R2 000 000.00 (integrate coast, estuaries, marine and terrestrial targets)

	Implementation strategies	Indicators	Priority	Lead agency	Time Frame	Estimated Cost
	Biodiversity Framework Target 3 of 30 x 30)	• Revisit protected area expansion strategy (if 30 x 30 require adjustment) • Donor funding secured to assist with the expansion and management of MPAs and PAs. *Progress have been achieved Operation Phakisa and the protected area expansion strategy. Developed to meet 20% Target. This may require some revision to meet the expanded 30% target.*				
2	Establish baselines of utilisation for high-priority resources, monitor and review the resource status.-	• Priority resources identified and ranked (importance, dependency, threat status) • Baselines established • Resource status reviewed for each high-priority resource (e.g. Least concern, critically endangered) • Resource-specific management plans formulated • Incorporate into provincial research plan *Marine Resource exploitation levels (DFFE Status of South African Marine Fisheries Resources report) and Species Threat Status (NMA 2018/2025) have been updated, but need to be contextualised for EC.*	M	EC Parks and Tourism Agency; DFFE: Fisheries SANBI	2032	R1 000 000.00
3	Identify degraded coastal areas and develop and implement a restoration programme (rehabilitation management plans) (GBF Target 2)	• Priority map/inventory of degraded coastal areas • Long-term (5-10 year) Coastal Restoration Programme developed. • Government resources and/or external funds secured for priority restoration projects identified in the Restoration Programme • Restoration Programme completed	M	EC Parks and Tourism Agency DEDEAT	2032	R1 000 000.00

	Implementation strategies	Indicators	Priority	Lead agency	Time Frame	Estimated Cost
		• Specific Restoration plans were prepared and implemented				
4	Develop guidelines to ensure protection and wise use of blue carbon habitats (mangroves, saltmash and seagrass)	• Guidelines developed to manage overgrazing, cattle browsing of mangroves and the impact of boating. Some agricultural guidelines exits but not tailored to rural areas under traditional leadership.	M	Department of Rural Development and Agrarian Reform	2032	R500 000.00
5	Support the development guidelines to ensure judicious and responsible use of non-renewable resources coastal resources	• Guidelines developed (Some initial discussion launched under DFFE WG 7 ambit, but no progress to date. Sand mining is a growing concern.)	M	DMPR DFFE DEDEAT	2032	R500 000.00

8 Conclusion and Way Forward

Managing highly dynamic, complex and sensitive environments such as the coast is a challenging task. It requires the setting of strategic objectives, planning and implementing goals, and ongoing monitoring of indicators to ensure effectiveness and improve efficiency. The Eastern Cape coastal zone is diverse, not only in terms of its natural attributes and social environments, but also in terms of the challenges that it faces, such as climate change.

The plan of action, as described in this document, becomes essential when striving towards the sustainability of coastal development and growth. This updated CMP, in conjunction with the earlier versions, is intended to function as an integrative planning and policy instrument and a means to manage the diverse array of activities that occur in the coastal zone without compromising ecosystem benefits or economic development. Effective implementation of the priority strategies contained in this coastal management programme should make a significant contribution towards the achievement of integrated coastal management in the Eastern Cape coastline.

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10 Glossary of Terms

Word	Explanation
Benthic	Associated with the seafloor, either sessile (attached) organisms or moving close to the bottom.
Blue Economy (Ocean Economy)	The sustainable use of ocean resources for economic expansion while maintaining the health of marine and coastal ecosystems
Climate Change	Includes both the global warming caused by humans, and its impacts on Earth's weather patterns.
Coastal Management Line	A line determined by the MEC in accordance with the ICMA, to demarcate an area within which development may be prohibited or controlled, to achieve coastal management objectives.
Coastal Management Programme	This is a policy directive for the management of the coast and includes strategies and plans for the effective implementation of the ICMA.
Coastal Squeeze	The loss of natural habitats or deterioration of their quality arising from anthropogenic structures or actions, preventing the landward transgression of those habitats that would otherwise naturally occur in response to sea-level rise in conjunction with other coastal processes.
Estuarine Functional Zone (EFZ)	An area in and around an estuary which includes the open water area, estuarine habitat and the surrounding floodplain area. It is a spatial delineation and sensitive area requiring environmental authorisation for developments.
Exclusive Economic Zone (EEZ)	An area of the ocean extending up to 200 nautical miles (370 km) immediately offshore from a country's coastline in which that country retains exclusive rights to the exploration and exploitation of natural resources.
High-Water Mark (HWM)	The highest line reached by coastal waters, but excluding any line reached as a result of exceptional or abnormal weather or sea conditions, or an estuary being closed to the sea.
ICMA	The Integrated Coastal Management Act outlines the roles and functions of all spheres of government in managing the sustainable use of the coastal environment
IUCN Red Data List of Threatened Species:	This is a critical indicator of the health of the world's biodiversity, providing information on the extinction risk status of animal, fungus and plant species.
Macrophytes	Aquatic plants large enough to be seen by the naked eye.
One Plan (District Development Model)	A long-term plan of action for each identified district and metro, which sets out the service delivery challenges and opportunities for growth and development.
Operation Phakisa	A South African government initiative designed to fast-track the implementation of solutions on critical development issues, including the implementation of the Ocean Economy.
Pelagic	Living or occurring in the open sea.
Sea-Level Rise (SLR)	An increase in the level of the world's oceans
Submerged Macrophytes	Aquatic plants growing below the water surface.
Sustainable Development	An organising principle for meeting present human development goals without compromising the present and future integrity and ability of natural systems to provide the natural resources and ecosystem services on which the economy and society depend.
Sustainable Development Goals (SDGs) (Agenda 2030)	A set of interconnected global goals set up by the UN General Assembly in 2015, intended to serve as a blueprint for achieving a sustainable future for all.

11 APPENDIX A: CMP Progress

11.1 PRIORITY AREA 1: COOPERATIVE GOVERNANCE

	Implementation strategies	2014 Priority	Lead agency	Status/target as of 2014	Progress
1	Develop a database of coastal stakeholders including researchers, managers and key contacts/ stakeholders	H	DEDEAT	ongoing	Achieved: There are currently a databases of relevant stakeholders for coastal management at various spheres of government. This is in the form of Provincial and Municipal Coastal Committees. These databases get updated regularly as and when new stakeholders are identified. In addition, DFFE has a stakeholder list that also covers researchers through the WG7 and NCC
2	Establishment of the provincial coastal committee	H	DEDEAT	asap	Achieved: The PCC for the Eastern Cape has been established and is functioning
3	Develop mechanisms for co-operative governance between organs of state and ensure co-ordination	H	DEDEAT	ongoing	Achieved: A number of cooperative governance and coordination platforms have been established at both the Provincial and District levels, e.g. the Municipal Intergovernmental Relations Forums, Provincial Coastal Committees, Municipal Coastal Committees, Municipal Environmental Management Forums, Compliance & Enforcement Forums etc, where different organs of the state work together towards the achievement objectives.
4	Assessment of spatial distribution of ICM personnel and increase their capacity	H	DEDEAT	Within 6 months then ongoing	Achieved: No formal assessment has been done, but there is data on the number of coastal personnel available in various spheres of government. In service, training has been done for Provincial and Municipal personnel on various ICM topics e.g. CoVu, ICMA implementation, Estuary Management.
5	Alignment of EC CMP with existing and future IDPs, SDFs and other spatial planning tools	H	DEDEAT	Assessment by end 2013	Achieved: This alignment is assessed during the annual Provincial IDP Review process but it is not fully implemented by some municipalities.
				Inclusion by next IDP review	Partially achieved: There is a need to have a question that specifically addresses coastal management and planning provisions.
6	Establishment of municipal coastal committees	M	District & Metros	Within 1 year	Achieved
7	Establishment of co-management system	M	DEDEAT / COGTA	ongoing	Not Achieved
8	Incorporation of coastal management strategies into other forums	M	DEDEAT	ongoing	Partially achieved. Coastal issues are deliberated in forums e.g. Provincial EQM Forum and Technical Committee, Municipal Climate Change Forums, Municipal EMFs etc.
9	Identification of international obligations and best practice	L	DFFE	End 2015	Achieved: Mandates are clear through the legal framework. Currently engaging in Global Biodiversity Framework Targets.

	and incorporation into relevant frameworks				

11.2 PRIORITY AREA 2: COASTAL PLANNING AND DEVELOPMENT

No.	Implementation strategies	Indicators	2014 Priority	Lead agency	Status/target as of 2014	Progress
1	Compile an inventory and feasibility assessment of coastal resources that can be utilised as drivers of Local Economic Development, and provide limits to the level of utilisation of these resources	· Inaugural coastal resources inventory · Incorporation of inventory into decision-making frameworks	H	DEDEAT	End 2013	Not achieved
2	Implement provincial coastal livelihoods strategy	· Approved coastal livelihoods strategy · Coastal livelihoods assessments	H	DEDEAT	End 2013	Partial achieved: DFFE: Fisheries tasked with developing a strategy at the national level. Not a core ICM function
3	Compile up to date maps of the high water mark as per national standards, delineate coastal set-back lines and the coastal zone as per the ICM Act	· Delineated and adopted coastal zone	H	DEDEAT	End 2013	Not achieved
4	Develop Eastern Cape Coastal & Marine Tourism Strategy	· Approved Eastern Cape Coastal & Marine Tourism Strategy	H	DEDEAT	End of 2015	Achieved: The Eastern Cape Development Corporation had developed the strategy.
5	Establish buffer zones around conservation areas, with different levels of sustainable natural resource use	· Buffer zone needs analysis undertaken · Coastal-specific buffer zones established · Incorporation into bioregional planning	M	Eastern Cape Parks and Tourism Agency	End 2014	Not achieved: Bioregional plan needs to be updated (2015)
6	Streamline administrative procedures and databases for authorising coastal activities	· Establishment of combined planning databases (GIS) and protocols for all departments	M	DEDEAT	End 2014	Not achieved
7	Provide or improve public facilities at key nodes in order to meet recreational, health and safety needs	· Key nodes/needs assessment for the province · Implementation of findings	M	DEDEAT, municipalities	Initially end 2014 and then ongoing	Partially Achieved: there has been a roll out of infrastructure projects linked to coastal access across various municipalities, some of these funded by DFFE.
8	Identify and develop key draft by-laws, to assist with the implementation of the requirements of the ICM Act	· Needs identification completed · Draft by-laws developed · By-laws adopted	M	DEDEAT, municipalities	Initially end 2014 and then ongoing	Partially achieved: NMBM, King Sabata Dalindyebo and Kouga Local Municipalities have developed their by-laws.

No.	Implementation strategies	Indicators	2014 Priority	Lead agency	Status/target as of 2014	Progress
						Port St. Johns Local Municipality is currently in the process of developing their by-laws.
9	Identify coastal lands which have inappropriate zonings or rights and identify mechanisms to address these problem areas	· Town planning investigation completed · Action taken	L	DEDEAT	End 2015	Not achieved
10	Provide the required infrastructure to support coastal economic initiatives	· Enhanced coastal economic activities	L	Municipalities and relevant state departments	After 2015	Partial achieved: Majority of public parks and beaches in urban areas have public amenities, public launch sites Blue Flag beaches. However, WWTW a concern but not a core ICM function.

11.3 PRIORITY AREA 3: CLIMATE CHANGE AND DYNAMIC COASTAL PROCESSES

No.	Implementation strategies	Indicators	2014 Priority	Lead agency	Status/target as of 2014	Progress
1	Determine and designate coastal set-back lines for the Eastern Cape coast	· Gazetted coastal set-back lines	H	DEDEAT	End 2013	Not achieved
2	Protect and maintain dynamic coastal features that act as a buffer against natural coastal processes and hazards	· Intact natural systems	H	DEDEAT, Eastern Cape Parks and Tourism Agency, municipalities	Ongoing	Achieved: Currently, Environmental Authorisation is issued with coastal management sub-program inputs. The Department has also implemented a Wild Coast Coastal Management Plan whose purpose was to ensure the sustainable development of the wild coast and protecting the sensitive ecological features in this area.
3	Determine vulnerable areas and development guidelines in response to dynamic coastal processes	· Coastal vulnerability index · Documented extent of the climate change induced impacts on the coastal zone ·Developmental guidelines	M	DEDEAT	End 2014	Partially achieved: Some progress, DFFE has developed CoVu assessment for the SA coast.
4	Disaster management plans	· Plans developed	M	Municipalities and industry	End of 2015	Partially achieved: NMBM and Kouga.

11.4 PRIORITY AREA 4: LAND AND MARINE-BASED SOURCES OF POLLUTION

No	Implementation strategies	Indicators	2014 Priority	Lead agency	Status/target as of 2014	Progress
1	Ensure that new developments carry out necessary preventative measures to minimise the chances and effects of pollution events	· Pollution specific conditions incorporated into coastal development approvals	M	DEDEAT	Ongoing	Achieved: Provisions are embedded in the environmental authorizations and permits issued by the Department.
2	Working for the Coast waste clean-up programmes should be sustained	· Ongoing WftC initiatives	M	DFFE	Ongoing	Partially achieved: Funding dependent
3	Design an integrated pollution monitoring system for the coast, based on existing monitoring structures and taking into account the integrated estuarine monitoring programme	· Development of pollution monitoring system · Implement Adopt a Beach programme · Integration & coordination of monitoring activities	M	DEDEAT	Ongoing	Partially achieved: There is monitoring undertaken at various areas by various Departments, Research institutions and Institutions of Higher Learning.
4	Establish coastal water quality objectives	· Development of coastal water quality objectives	M	DFFE and Municipalities	End of 2014	Partially achieved: The Coastal Water Discharge Permit Regulations were developed & promulgated in 2019, that entails some objectives i.t.o. of setting up standards for discharges to the coastal waters. Subsequently, the Water Quality Guidelines were developed, which sets up some objectives and standards for coastal water quality. Some monitoring by municipalities

11.5 PRIORITY AREA 5: ESTUARIES: PROTECTION, MANAGEMENT AND FINANCIAL RESOURCES

No.	Implementation strategies	Indicators	2014 Priority	Lead agency	Status/target as of 2014	Progress
1	Compile detailed inventory of all estuaries, including an assessment of current and future threats, and information gaps	· High quality GIS database, including maps and aerial photography · Threat and gap assessment	H	DEDEAT	End of 2013	Achieved: NBA provisions are utilized for decision making.
2	Undertake strategy session to assess and prioritise estuaries	· Minutes of strategy session · List of priority estuaries and associated management needs	H	DEDEAT	3 months	Partially achieved: No specific strategy session, but decisions are made as per priorities identified in the NBA and management pressures identified by user groups.

No.	Implementation strategies	Indicators	2014 Priority	Lead agency	Status/target as of 2014	Progress
3	Identify potential sources of funding and access funding to undertake Eastern Cape EMPs, identified actions, research projects, initiatives, and provide support to advisory forums	· Funding secured · EMPs completed and implemented · Education programmes implemented · Research projects identified and initiated · Capacitated estuary advisory forums	H	DEDEAT	Ongoing	Partially Achieved.
4	Develop and undertake a strategy to undertake EMPs for all estuaries	· Specific ToRs developed for prioritized estuaries · Completion and implementation of EMPs · Establishment of estuary advisory forums / committees	H	DEDEAT	End of 2013	Partially Achieved: There are more than 150 estuaries in the province. The Department has development EMP for those priority estuaries with significant modifications.
5	Review existing protected area system to determine estuarine representation and revise accordingly	· Protected areas encompassing targeted estuaries/habitats, and preferably linked to terrestrial and/or marine protected areas · Stewardship programme/s	M	DEDEAT	End of 2014	Not achieved
6	Establishment of an estuarine monitoring programme	· Estuarine database containing regularly updated aerial photography, water quality data, mouth state data, catchment/ hydrological data, biological data, alien invasive plant coverage · Annual reporting	L	DEDEAT, DWA, Municipalities	End of 2015	Partially achieved: There is monitoring undertaken at various estuaries by various departments, research institutions and Institutions of Higher Learning.
7	Develop strategy for increasing social engagement and environmental awareness among stakeholders and key user groups	· Environment education programmes in schools and universities · Institutional awareness programmes · Outreach programmes to rural communities and user groups · Informative brochures and signage at key communal areas (resorts, libraries, information centres)	L	DEDEAT, Municipalities	End of 2014	Partially achieved: Environmental Empowerment Services (EES) awareness done on coastal issues.

11.6 PRIORITY AREA 6: FACILITATION OF COASTAL ACCESS

No.	Implementation strategies	Indicators	2014 Priority	Lead agency	Status/target as of 2014	Progress
1	Undertake a review of access to the Eastern Cape coast	· Review of coastal access provision · Review of restrictions on access to the coastline and modification of these restrictions where necessary	H	DFFE	End of 2013	Achieve: Currently undertaking Coastal Access Audits
2	Report on state of coastal access	· Annual reports to DEA · Designated coastal access land	M	Municipalities	Ongoing	Achieve: Currently, DEDEAT Environmental Research Services (ERS) is in the process of developing State of the Coast Report
3	Identification and protection of traditional resource users and cultural activities	· Provincial SIA undertaken · Incorporate strategies into coastal policies · Prevention of inappropriate uses of heritage places, control of illegal activities	M	Eastern Cape Provincial Heritage Resource Agency	End of 2014	Not achieved: Not core ICM function.
4	Provide public facilities and infrastructure to meet recreational needs and facilitate resource access by all users	· Amenity needs assessment of key coastal nodes · Provision of coastal amenity	L	Municipalities	End of 2015	Partially achieved: Majority of public parks and beaches in urban areas have public amenities, public launch sites Blue Flag beaches. However, failing coastal WWTW infrastructure is prevalent but not a core ICM function.

11.7 PRIORITY AREA 7: AWARENESS, EDUCATION, TRAINING & CAPACITY

No.	Implementation strategies	Indicators	2014 Priority	Lead agency	Status/target as of 2014	Progress
1	Develop and implement a training and capacity building programme for coastal managers/ officials and councillors	· Workshops attended · Feedback from implementation efforts	H	DFFE	End of 2013	Achieved: The Department has rolled out the ICM Act Training for municipalities in the year 2024. There are still a few outstanding municipalities that need to be trained and that will take place in the first quarter of the 24/25 financial year. Buffalo Municipality, Nelson Mandela, Sahar Baartman and OR Tambo. The outstanding Municipalities are Alfred Nzo and Amathole Districts

No.	Implementation strategies	Indicators	2014 Priority	Lead agency	Status/target as of 2014	Progress
2	Coastal spatial data to be collected on a regular basis	· Aerial surveys undertaken · Remote sensing undertaken · Lidar surveys undertaken	M	DFFE, Surveyor General	Ongoing	Achieved: The National Geomatics Management Services branch of the Department of Land Reform and Rural Development has completed a pilot project on the implementation of the Advisory Note to DFFE on the movement of the high-water mark. They have developed the coast-to-coast approximation of the position to the high-water mark. Datasets to be requested from DFFE (njukuda@dffe.gov.za).
3	Identify and facilitate an effective network of environmental learning centres	· Operational network · Effective sharing of information · Co-ordinated research initiatives	M	SANCOR, CSIR	End of 2014	Achieved Partially . There are existing collaborations with institutions such as Nelson Mandela university and South African Environmental Observation Network (SAEON). Notwithstanding, these are to be formally identified and coordinated to directly address the indicators for this strategy.
4	Improve ecosystem functioning through education and public awareness programmes	· Education and public awareness raising programme developed and implemented	L	DEDEAT, EC Dept. of Education	End of 2015	Achieved: The Provincial Environmental Empowerment Service of the Department performs this function. Coastal topics form part of their annual plans DFFE conduct the Introduction to Estuarine Management Course when there is funding available

11.8 PRIORITY AREA 8: COMPLIANCE, MONITORING & ENFORCEMENT

No.	Implementation strategies	Indicators	2014 Priority	Lead agency	Status/target as of 2014	Progress
1	Registration and training of provincial and municipal EMIs in respect to coastal specific legislation including bylaws	· Increased number of EMI's · Built capacity to enhance enforcement effort · Increased convictions · Increased compliance · Strengthened law enforcement efforts	H	DFFE, SAPS	Before end of 2013	Partially achieved: The number of DEDEAT EMI's has increased and also some Municipal officials have been trained. Still under resourced.

No.	Implementation strategies	Indicators	2014 Priority	Lead agency	Status/target as of 2014	Progress
2	Coordinated policing and development of mechanisms to encourage compliance	· Awareness raising programmes · Increased compliance	H	SAPS	Ongoing	Achieved: Improved compliance coordination around the coast. There has also been an improved coordination of the law enforcement agencies under the banner of Operation Phakisa: Initiative 5, where on a regular basis, there are coordinated compliance and enforcement operations focusing on illegal activities.
3	Impact and effectiveness of EMI's need to be monitored and reported on.	· Established reporting mechanism · Annual report / performance review · Number of convictions	M	DFFE, DEDEAT	Before end of 2013	Achieved: DFFE compliance and enforcement has database which has fine issues etc. All institutions within designated EMIs are required to submit to the Department, a report on the activities they have performed in terms of their designation.

11.9 PRIORITY AREA 9: NATURAL RESOURCE MANAGEMENT

No.	Implementation strategies	Indicators	2014 Priority	Lead agency	Status/target as of 2014	Progress
1	Review existing coastal protected areas and Marine Protected Areas to determine representation and revise accordingly	· Completed review to determine representation · Assessment of % of coastal area needing protection · Action plan developed	H	EC Parks and Tourism Agency	Initial prior 2013	Achieved: On-going refinement as the global target moved to 30% of ecosystems.
2	Establish baselines of utilisation for high priority resources and monitor and review the resource status of such high priority resources	· Priority resources identified · Baselines established · Resource status reviewed for each high priority resource · Resource-specific management plans formulated · Incorporate in provincial research plan	M	EC Parks and Tourism Agency	Initial prior 2014	Partially achieved: DFFE Fisheries function.
3	Assess degraded coastal areas and develop and implement a rehabilitation programme (rehabilitation management plans)	· Assessment completed · Rehabilitation Programme completed · Specific rehabilitation plans prepared and implemented	M	EC Parks and Tourism Agency	Initial prior 2014	Partially achieved: Rehabilitation has been taking on a need's basis and in most cases, the municipalities have undertaken the rehabilitation initiatives. In this regard, the Kouga Local Municipality has been issued

						with an environmental authorization for the maintenance and replenishment of the St. Francis Bay Beach as well as the Cape St. Francis Beach. Ndlambe Local Municipality has developed dune maintenance management plans for their infrastructure located along the coast. The Buffalo City Metro is engaged in the process of developing a dune maintenance management plan for its coastline. There is a need for rehabilitation plans and / maintenance management plans for other municipalities along the coast.
4	Develop guidelines to ensure judicious and responsible use of non-renewable coastal resources	· Guidelines developed	L	DMPR	End of 2015	Noted achieved: No evidence of developed guidelines regarding the sustainable use of non-renewable resources.

12 APPENDIX B: Key Pressures and Mitigation Measures Required for Restoration of Estuaries

Key pressures on Eastern Cape Estuaries

An assessment of the pressures on the Eastern Cape estuaries clearly shows that most systems in the extensive rural parts of the study area (Table A.1), have limited pressures on them (Van Niekerk et al. 2019; DWS 2024). A few systems reflected the impact of urbanisation around the metros and larger towns. In most cases, inflowing-hydrology was still in relatively good condition. Exceptions include many of the urbanised systems where abstraction and dam development decrease base flows significantly. Excessive wastewater discharges have also increased baseflows in some systems, e.g. Swartkops. The hydrodynamics (mouth state) and salinity distributions therefore, show a similar pattern.

The water quality in a large number of estuaries in the Eastern Cape has been modified to some degree (DWS 2024). This is largely attributed to diffuse agricultural runoff in rural areas (e.g. fertilizers, herbicides and pesticides) and contaminated stormwater runoff from urban development (e.g. nutrients and toxic substances). In some estuaries, water quality has been compromised by point source WWTW effluent being discharged into estuaries or into rivers near the head of estuaries, e.g. Swartkops. Except for the larger fast-flowing estuaries (e.g. Great Kei, Mbhashe, Great Fish) a large number of systems along this stretch of coast are relatively small with a very high vulnerability to increased nutrient loading. Agriculture along the banks of a large number of systems has led to the loss of marginal vegetation and natural estuarine buffers (DWS 2024). Catchments of many of the estuaries in tribal areas are subjected to subsistence agricultural practice and overstocking, increasing sediment loads that contribute to sedimentation in estuaries. Urbanisation has led to significant habitat modification in some systems in densely populated areas. Road infrastructure has also impacted several systems, with bridge foundations, abutments and road berms causing infilling of systems and consequential habitat destruction, or development across floodplain and channel stabilisation, impacting natural flow patterns resulting in localised scour and deposition. Coega and Buffalo estuaries, comprising operational ports, also stand out as highly transformed estuaries.

Macrophytes reflected the impacts of agriculture and urbanisation, with a significant number of systems showing signs of significant degradation of floodplain vegetation. Grazing and browsing have also severely impacted saltmarsh and mangroves in key systems. In many estuaries, there was also a significant loss of habitat due to the presence of bridge abutments and berms. In several systems, e.g. Swartkops and Sundays estuaries, agricultural return flow, stormwater and/or nutrient input from wastewater treatment have caused eutrophication. Emergent species thrive under these conditions and invasive aquatic macrophytes such as water hyacinth (*Eicchornia crassipes*) and water cabbage (*Pistia stratiotes*) outcompete indigenous plants. Invasive terrestrial species are a further concern with seeds either introduced via floods or through habitat transformation on the floodplains. The category 1b invader *Tamarix ramossisima* occurs at the mouth of the Mbhashe Estuary in what was salt marsh and mangrove mix. Deposition of sand at the mouth from sea storms have altered local topography and the establishment of this salt tolerant invader is taking place. Reduction in freshwater inflow to estuaries and an increase in the frequency and duration of closed mouth conditions are also a threat.

Microalgae have responded positively to increased nutrient loading compounded by increased retention due to reduced flows, but these effects were somewhat buffered by the fact that many of the systems are naturally turbid and/or fast-flowing for most of the year (DWS 2024). Harmful algal blooms have been deterred in several important systems, with cascading effects on estuary food webs.

Changes in hydrology have also impacted invertebrate communities, especially marine invertebrates, both through reduced connectivity (increased closure) and therefore reduced opportunity to recruit into estuaries, and through changes to the salinity regimes in some systems. Declining water quality has also played a role in declining assemblages in several systems in the Eastern Cape and certainly in estuaries in densely populated urban areas. Small estuaries that are predominantly closed are especially prone to water quality impacts. Alteration and destruction of habitat have also contributed to impacts on estuarine invertebrate communities in some systems in the study areas. The invertebrates are primarily impacted by abiotic bottom-up pressures,

hence many of the above impacts cascade in terms of invertebrate compositional changes and overall abundance fluctuations. These have arisen mostly due to the anthropogenic development of estuarine systems and the impact of bait collection. Finally, fishing pressure also impacted invertebrate megafauna populations such as mud crabs and prawns.

Estuarine fish communities in the Eastern Cape overwhelmingly responded to very high fishing pressure, with illegal gillnets being the main pressure in several important nursery systems (DWS 2024). In many estuaries, this was compounded by a reduction in flow, which impacted marine connectivity (mouth state) and salinity regimes. Several estuaries in the study area have also experienced loss of estuarine habitat and loss of natural buffers on their perimeters and inflowing rivers. Critical habitat has been lost in some cases, which has resulted in marked reductions in fish diversity and nursery function. In this regard, the loss of submerged aquatic vegetation, especially the seagrass *Zostera capensis* played a significant role. In systems within the two metropolitan areas, subjected to inflow from WWTWs, stormwater runoff and agriculture (e.g. Sundays), water quality is increasingly becoming an issue. Fish kills have occurred in recent years in a small number of estuaries in the region (e.g. Swartkops). These kills have been related to eutrophication and/or low oxygen events, triggered by wastewater flows (due to infrastructure failure and/or overloading). Eutrophication and/or low oxygen events also lead to a reduced abundance and diversity of fish and habitat squeeze/loss in the productive middle and upper reaches of affected systems (e.g. Sundays and Swartkops).

Birds are impacted by human disturbance, with most systems in urban areas or those subjected to high recreational use showing suppressed numbers. This is further exacerbated in some systems by a reduction in food availability and suitable habitat.

Table A1: Key pressures on the Eastern Cape Estuaries (Extracted from DWS 2024).

No.	ESTUARY NAME	Reference MAR (m3x106)	Present MAR (m3x106)	% Similarity MAR	Pressure: Flow modification	Pressure: Pollution	Pressure: Habitat loss	Pressure: Fishing Effort 2024 (DEFF)	Pressure: Invasive alien plants	Pressure: Alien Fish	Artificial Breaching
1	Lottering	18.50	16.82	91	L	L	L	L		N	
2	Elandsbos	27.16	24.67	91	L	L	L	L		N	
3	Storms	54.07	47.85	89	L	L	L	L		N	
4	Elands	52.20	46.90	90	L	L	L	L		N	
5	Groot (Oos)	46.99	44.12	94	L	L	L	L		N	
6	Tsitsikamma	19.90	13.31	67	M	M	L	H		N	
7	Klipdrif (Oos)	32.93	18.58	56	L	VH4	M	L		N	
8	Slang	5.07	4.58	90	L	VH	H	L		N	
9	Kromme	72.18	36.78	51	VH	L	H	VH		H	
10	Seekoei	20.27	11.36	56	H	H	VH	L	M	L	M
11	Kabeljous	5.27	4.7	89	L	L	L	VH	H	H	L (Past)
12	Gamtoos	404.23	194.82	48	VH	H	H	VH	M	VH	
13	Van Stadens	17.19	15.63	91	M	M	L	L	H	N	
14	Maitland	12.86	11.69	91	M	M	L	L	H	N	
15	Baakens	4.11	3.60	88	H	VH	VH	L		N	
16	Papkuils	2.92	2.89	99	H	VH	VH	L		N	
17	Swartkops	56.9	80.3	71	H	VH	VH	VH	H	H	
18	Coega (Ngqurha)	10.13	8.62	85	H	M	VH	L		H	
19	Sundays	263.1	240.73	91	L	VH	H	VH	H	H	
20	Boknes	14.44	14.38	100	VH	H	L	L		L	
21	Bushmans	43.08	32.66	76	VH	H	M	H		H	
22	Kariega	21.89	13.08	60	VH	L	M	VH		N	

No.	ESTUARY NAME	Reference MAR (m3x106)	Present MAR (m3x106)	% Similarity MAR	Pressure: Flow modification	Pressure: Pollution	Pressure: Habitat loss	Pressure: Fishing Effort 2024 (DEFF)	Pressure: Invasive alien plants	Pressure: Alien Fish	Artificial Breaching
23	Grant's	2.42	2.25	93	H	M	M	L		N	
24	Kasouga	4.30	4.26	99	L	M	L	M		N	
25	Kowie	31.37	27.95	89	L	L	H	VH	M	H	
26	Rufane	1.20	1.12	94	H	M	M	L		N	
27	Riet	2.4	2.3	96	L	L	L	L		N	
28	West Kleinemonde	6.00	5.45	91	L	M	L	L		N	
29	East Kleinemonde	2.86	2.75	96	L	M	L	L		N	
30	Great Fish	496.341	450.9999	91	L	H	L	VH	M	VH	
31	Old Woman's	1.11	0.94	85	M	L	M	L		N	
32	Mpekweni	2.44	2.07	85	M	L	L	M		N	
33	Mtati (Mthathi)	6.03	5.09	84	M	L	L	L		N	
34	Mgwalana	9.71	8.20	84	M	L	L	L		N	
35	Bira (Bhirha)	12.01	9.97	83	M	L	L	L		N	
36	Gqutywa	3.52	2.96	84	L	L	L	L		N	
37	Ngculura (Ngculurha)	0.65	0.56	86	M	L	L	L		N	
38	Mtana	1.06	0.90	84	L	L	L	L		N	
39	Keiskamma	128.68	86.43	67	H	M	M	VH		H	
40	Nqinisa	1.18	1.17	99	L	L	L	L		N	
41	Kiwane (Khiwane)	5.32	5.29	100	L	L	L	L		N	
42	Tyolomnqa	35.56	34.54	97	L	L	L	VH		N	
43	Shelbertsstroom	0.63	0.62	99	L	M	L	L	M	N	
44	Lilyvale	1.11	1.00	91	L	M	L	L		N	
45	Ross' Creek	0.55	0.54	99	L	M	L	L		N	
46	Ncera (Ncerha)	10.99	10.24	93	L	L	L	L		N	
47	Mlele	2.00	1.86	93	L	M	L	L		N	
48	Mcantsi	2.84	2.65	93	L	VH	L	L		N	
49	Gxulu	15.56	14.50	93	L	M	M	L		N	
50	Goda	6.19	5.76	93	L	M	L	L		N	
51	Hlozi	1.75	1.63	93	L	M	L	L		N	
52	Hickman's	1.42	1.33	93	M	VH	M	L		N	
53	Buffalo	96.03	18.70	19	VH	VH	M	VH		VH	
54	Blind	0.65	1.12	58	H	VH	M	L		N	
55	Hlaze (iHlanze)	0.32	0.80	39	VH	VH	M	L		N	
56	Nahoon	32.481	20.41	63	H	H	M	VH	H	H	
57	Qinira (Quinirha)	8.44	8.30	98	L	L	L	H		N	L
58	Gqunube	34.07	32.05	94	L	M	L	H		H	
59	Kwelera (Kwelerha)	34.83	32.80	94	L	L	L	H		L	
60	Bulura (Bulurha)	3.73	3.52	94	L	L	L	H		N	
61	Cunge	0.32	0.31	97	L	L	L	L	M	N	
62	Cintsa	3.99	3.76	94	L	L	M	M		N	
63	Cefane	3.95	3.20	81	L	L	L	M		N	
64	Kwenxura (Kwenxurha)	16.89	16.57	98	L	L	L	M		N	
65	Nyara (Nyarha)	4.34	4.26	98	L	L	L	L		N	
66	Imtwendwe (Mtwendwe)	1.07	1.05	98	L	L	L	L		N	
67	Haga-haga	2.15	2.10	98	L	L	L	L		N	
68	Mtendwe	1.41	1.39	98	L	L	L	L		N	
69	Quko	17.18	16.86	98	L	L	L	L		N	
70	Morgan	2.74	2.69	98	L	L	L	H		H	
71	Cwili	1.18	1.16	98	L	L	L	L		H	
72	Great Kei	1040.7	742.0	71	H	L	L	VH		VH	

No.	ESTUARY NAME	Reference MAR (m3x106)	Present MAR (m3x106)	% Similarity MAR	Pressure: Flow modification	Pressure: Pollution	Pressure: Habitat loss	Pressure: Fishing Effort 2024 (DEFF)	Pressure: Invasive alien plants	Pressure: Alien Fish	Artificial Breaching
73	Gxara (Gxarha)	3.44	3.38	98	L	L	L	L		N	
74	Ngogwane	0.79	0.77	98	L	L	L	L		N	
75	Qolora (Qolorha)	8.90	8.73	98	L	L	L	L		N	
76	Ncizele	1.00	0.98	98	L	L	L	L		N	
77	Timba	0.35	0.35	98	L	L	L	L		N	
78	Kobonqaba (Khobonqaba)	36.22	35.53	98	L	L	M	L		N	
79	Nxaxo/Ngqusi	23.27	22.80	98	L	L	M	H	M	N	
80	Cebe	5.69	5.57	98	L	L	L	L		N	
81	Gqunqe	6.96	6.82	98	L	L	L	L		N	
82	Zalu	1.69	1.66	98	L	L	L	L		N	
83	Ngqwara (Ngqwarha)	5.24	5.14	98	L	L	L	L		N	
84	Sihlontlweni	2.21	2.17	98	L	L	L	L		N	
85	Nebelele	1.05	1.03	98	L	L	L	L		N	
86	Qora (Qhorha)	78.52	72.00	92	L	L	L	VH		N	
87	Jujura (Jujurha)	11.27	10.28	91	L	L	L	L		N	
88	Ngadla	1.56	1.51	97	L	L	L	L		N	
89	Shixini	42.28	41.00	97	L	L	L	M		N	
90	Beechamwood	0.54	0.53	97	L	L	L	L		N	
91	Kwazlelitsha (Kwazwedala)	0.59	0.57	97	L	L	L	L		N	
92	Kwa-Goqo	0.99	0.95	97	L	L	L	L		N	
93	Ku-Nocekedwa	1.08	1.05	97	L	L	L	L		N	
94	Nqabara/Nqabarana	76.44	75.90	99	L	L	L	M	M	N	
95	Ngomane (East)	1.11	1.09	98	L	L	M	L		N	
96	Ngoma/Kobule	6.30	6.17	98	L	L	L	L		N	
97	Mendu	5.19	5.08	98	L	L	L	M		N	
98	Mendwana	1.35	1.33	98	L	L	L	M		N	
99	Mbhashe	786.88	861.16	91	M	M	L	VH		H	
100	Ku-Mpenzu	0.76	0.73	97	L	L	L	L		N	
101	Ku-Bhula (Mbhanyana)	8.92	8.62	97	L	L	L	H		N	
102	Kwa-Suku	0.70	0.67	97	L	L	L	M		N	
103	Ntlonyane	13.63	13.17	97	L	L	L	M		N	
104	Nkanya	2.53	2.44	97	L	L	L	L		N	
105	Sundwana	0.81	0.78	97	L	L	L	L		N	
106	Xora	52.41	40.52	77	H	L	L	VH	M	N	
107	Bulungula	7.61	7.49	98	L	L	L	L	M	N	
108	Ku-Amanzimuzama	1.60	1.57	98	L	L	L	L		N	
109	Nqakanqa	0.84	0.82	98	L	L	L	L		N	
110	Mdikana	0.24	0.24	100	L	L	L	L		N	
111	Mncwasa	26.95	26.49	98	L	L	L	L		N	
112	Mpako	21.68	21.55	99	L	L	L	M		N	
113	Nenga	9.15	9.02	99	L	L	H	M		N	
114	Mapuzi	5.55	5.47	99	L	L	L	L		N	
115	Mtata	392.20	319.02	81	M	H	M	VH	M	VH	
116	Thsani	0.53	0.52	97	L	L	L	L		N	
117	Mdumbi	36.63	35.48	97	L	L	L	H	M	N	
118	Lwandilana	1.43	1.40	98	L	L	L	L		N	
119	Lwandile	3.40	3.30	97	L	L	L	L		N	
120	Mtakatye	63.36	61.70	97	L	L	L	H	M	N	
121	Hluleka	4.27	4.16	98	L	L	L	L		N	
122	Mnenu	19.69	19.21	98	L	L	L	M		N	

No.	ESTUARY NAME	Reference MAR (m3x106)	Present MAR (m3x106)	% Similarity MAR	Pressure: Flow modification	Pressure: Pollution	Pressure: Habitat loss	Pressure: Fishing Effort 2024 (DEFF)	Pressure: Invasive alien plants	Pressure: Alien Fish	Artificial Breaching
123	Mtonga	3.97	3.88	98	L	M	L	L		N	
124	Mpande	4.48	4.38	98	L	L	L	L		N	
125	Sinangwana	11.48	11.20	98	L	L	L	L		N	
126	Mngazana	49.34	47.79	97	L	L	M	VH		N	
127	Mngazi	87.31	83.52	96	L	M	L	H		N	?
128	Gxwaleni	1.64	1.60	97	L	L	L	L		N	
129	Bululo	1.63	1.59	97	L	L	M	M		N	
130	Mtumbane	1.01	0.99	98	L	L	M	L		N	
131	Mzimvubu	2665.58	2552.00	96	L	M	L	H	M	VH	
132	Ntlupeni	3.82	3.76	98	L	L	L	L		N	
133	Nkodusweni	8.21	8.07	98	L	L	L	L		N	
134	Mntafufu	44.53	43.77	98	L	L	L	H	H	N	
135	Ingo	4.57	4.40	96	L	L	L	L		N	
136	Mzintlava	69.78	67.03	96	L	L	L	H		N	
137	Mzimpunzi	9.16	8.48	93	L	L	L	L		N	
138	Kwanyambalala	4.19	3.88	93	L	L	L	H		N	
139	Mbotyi	11.10	10.27	93	L	L	L	H		N	
140	Mkozi	15.74	14.57	93	L	L	L	L		N	
141	Sikatsha	1.85	1.71	93	L	L	L	L		N	
142	Lupatana	6.97	6.45	93	L	L	L	L		N	
143	Mkweni	18.36	17.01	93	L	L	L	L		N	
144	Msikaba	212.39	199.31	94	L	L	L	H	M	N	
145	Mgwegwe	1.22	1.19	98	L	L	L	L		N	
146	Mgwetyana	1.82	1.79	98	L	L	L	L		N	
147	Mtentu	157.03	145.36	93	L	L	L	H	M	H	
148	Sikombe	6.79	6.79	100	L	L	L	L		N	
149	Kwanyana	3.99	3.90	98	L	L	L	L		N	
150	Mtolane	1.78	1.78	100	L	L	L	L		N	
151	Mnyameni	45.87	44.84	98	L	L	L	M		N	
152	Mpahlanyana	1.11	1.04	94	L	L	L	M		N	
153	Mpahlane	2.73	2.54	93	L	L	L	M		N	
154	Mzamba	67.43	62.77	93	L	L	L	H	M	N	
155	Mtentwana	1.26	1.18	94	L	M	M	L		N	
156	uMthavuna	275.19	239.49	87	L	L	L	H	M	L	

Thirty-one percent (48 estuaries) of the 156 estuaries in the region had flow-related pressures on them, while 26% (41 estuaries) were under significant water quality pressure (**Table A.2**). More than 21% (33 estuaries) had undergone significant habitat destruction. A third of the estuaries (49 estuaries) could benefit from some remedial actions and more proactive management of the main vectors of change.

In some of the estuaries, additional water resource development would be possible, as long as the baseflow (low flow regime) is maintained, e.g. the inflowing river can be targeted for off-channel development or runoff river abstraction. However, the majority of the catchments in the region are small and linked to temporarily open/closed estuaries that require a high percentage of the natural runoff to maintain marine connectivity and their required condition. Any increase or decrease in runoff to this type of system rapidly leads to changes in mouth state and related ecological degradation.

It should also be noted that the majority of these estuary mouths close from time to time and are therefore very sensitive to nutrient loading from the catchment or direct surrounding environment. Especially the smaller estuaries of the Eastern Cape region, during closure periods, will retain and accumulate nutrients with consequent impacts on water quality and the microalgae and macrophytes, with cascading ripple effects on all other trophic levels.

A third of estuaries (49 estuaries) had very high levels of fishing effort in the form of illegal gillnets, which compromise nursery function and the ability of fish stock to recover in the region. This will require ongoing efforts to improve compliance, with a focus on the eradication of illegal gill nets. In several systems, bait collection is done with spades (e.g. Swartkops Estuary), which is a highly destructive practice that damages seagrass beds (impacts nursery function and carbon sequestration) and also requires additional compliance efforts and ongoing community education.

The assessment of nutrient discharges from WWTWs into an estuary should consider the impact of this on the receiving environment, in this case, an estuary, rather than relying on adherence to permitted discharge levels. In the case of estuaries, it appears that either general or special standards are applied to the wastewater streams, and the impact of the associated nutrients and any organic material on the estuary appears not to be considered. Therefore, neither general nor special standards are sufficient to prevent a deterioration in overall estuarine health, and the application of a receiving water quality evaluation is advocated when assessing the impacts of discharges on these systems. It is recommended that consideration be given to the advisability of using intermittently open estuaries as conduits for wastewater.

Priority should be given to the removal of alien terrestrial vegetation. Species like *Tamarix ramosissima* stabilise sediment and with their rapid growth can potentially alter local topography and therefore hydrology to the detriment of intertidal habitat like salt marsh and mangroves. The rapid growth of aliens and high reproductive output outcompete indigenous vegetation resulting in loss of biodiversity.

Table below lists key flow and non-flow interventions required to achieve/maintain the recommended ecological condition.

Table A.2: Estuary restoration and compliance measures required to recommended ecological condition.

##	Estuary	PES	REC	Reference MAR (m^3x10^6)	Present MAR (m^3x10^6)	Restore/protect base flows	Restore floods	Improve urban runoff (stormwater)	Manage agricultural runoff (e.g. fertilizing, buffer zones)	Improve WWTW infrastructure/operations	Average WWTW volume (m^3/day)	Major Plastic Pollution	Restore connectivity/ hydrodynamic functioning	Improve mouth management	Rehabilitate riparian areas/ wetlands	Remove alien vegetation	Reduce grazing plan (sheep, cattle, goats)	Implement cattle exclusion zone (Browsing of mangroves)	Control mangrove harvesting	Control recreational activities impacting on birds	Remove/reduce fishing pressure/ bait collection	Investigate eradication of alien fish	Restore/protect against impact from mining
1	Lottering	A/B	A - A/B	18.5	16.8																		
2	Elandsbos	A/B	A - A/B	27.2	24.7																		
3	Storms	A/B	A - A/B	54.1	47.9																		
4	Elands	A/B	A - A/B	52.2	46.9																		
5	Groot (Oos)	A/B	A - A/B	47.0	44.1																		
6	Tsitsikamma	B/C	B	19.9	13.3	●			Catch.												●		
7	Klipdrif (Oos)	C	C	32.9	18.6																		
8	Slang	C/D	C/D	5.1	4.6				Catch.														
9	Kromme	C/D	C	72.2	36.8	●	●	EFZ	Catch.						●					●	●	●	
10	Seekoei	D/E	C	20.3	11.4	●	□		Catch.				●	●	●	●	□						
11	Kabeljous	B	B	5.3	4.7	●							●			●				●	●	●	
12	Gamtoos	D	C	404.2	194.8	●	●		EFZ/Catch						●	●	●			●	●*	●	
13	Van Stadens	B	A/B	17.2	15.6	●			Catch.							●	□						
14	Maitland	B/C	B	12.9	11.7	●			Catch.							●	□						
15	Baakens	E/F	E	4.1	3.6	●		EFZ/Catch		●	Pump stn	●											
16	Papkuils	F	E/F	2.9	2.9	●		EFZ/Catch		●	54 000	●											
17	Swartkops	D	C	56.9	80.3	●		EFZ/Catch	Catch.	●	24 808	●			●	●	□			●	●*	●	
18	Coega (Ngqurha)	E/F	D	10.1	8.6	●		Saltworks				●			●							●	
19	Sundays	C/D	B	263.1	240.7	●			Catch.			●			●	●	□			●	●	●	
20	Boknes	C	C	14.4	14.4	●																	
21	Bushmans	C	B	43.1	32.7	●				●	1 205						●			●	●*	●	
22	Kariega	C	C	21.9	13.1	●				●			●			●	●			●	●		
23	Grant's	C	C	2.4	2.2	●	□		Catch.												□		

##	Estuary	PES	REC	Reference MAR (m^3x10^6)	Present MAR (m^3x10^6)	Restore/protect base flows	Restore floods	Improve urban runoff (stormwater)	Manage agricultural runoff (e.g. fertilizing, buffer zones)	Improve WWTW infrastructure/operations	Average WWTW volume (m^3/day)	Major Plastic Pollution	Restore connectivity/ hydrodynamic functioning	Improve mouth management	Rehabilitate riparian areas/ wetlands	Remove alien vegetation	Reduce grazing plan (sheep, cattle, goats)	Implement cattle exclusion zone (Browsing of mangroves)	Control mangrove harvesting	Control recreational activities impacting on birds	Remove/reduce fishing pressure/ bait collection	Investigate eradication of alien fish	Restore/protect against impact from mining
24	Kasouga	B	B	4.3	4.3				Catch.												●		
25	Kowie	C	B/C	31.4	28.0	●	□		Catch.	●	1 200	□			●	●	□			●	●	●	
26	Rufane	C	C	1.2	1.1	●			Catch.			□											
27	Riet	B	B	2.4	2.3																		
28	West Kleinemonde	B	B	6.0	5.5				Catch.														
29	East Kleinemonde	B	B	2.9	2.7							□											
30	Great Fish	C	B/C	496.3	451.0	●	□		Catch							●	□			●	●	●	
31	Old Woman's	B/C	B/C	1.1	0.9	●																	
32	Mpekweni	B	B	2.4	2.1	●														●	●		
33	Mtati (Mthathi)	B	B	6.0	5.1	●	□																
34	Mgwalana	B	A/B	9.7	8.2	●	□																
35	Bira (Bhirha)	B	A/B	12.0	10.0	●	□																
36	Gqutywa	B	B	3.5	3.0	●	□																
37	Ngculura (Ngculurha)	B	A/B	0.6	0.6	●																	
38	Mtana	B	B	1.1	0.9	●																	
39	Keiskamma	C	B	128.8	86.4	●									●	●	●			●	●	●	
40	Nqinisa	A/B	A - A/B	1.2	1.2																		
41	Kiwane (Khiwane)	A/B	A - A/B	5.3	5.3																		
42	Tyolomnqa	B	A/B	35.6	34.5															●	●		
43	Shelberts-stroom	B/C	B/C	0.6	0.6				Catch.							●	□						
44	Lilyvale	B	B	1.1	1.0				Catch.														
45	Ross' Creek	B	B	0.6	0.5																		
46	Ncera (Ncerha)	B	B	11.0	10.2	●																	

##	Estuary	PES	REC	Reference MAR (m^3x10^6)	Present MAR (m^3x10^6)	Restore/protect base flows	Restore floods	Improve urban runoff (stormwater)	Manage agricultural runoff (e.g. fertilizing, buffer zones)	Improve WWTW infrastructure/operations	Average WWTW volume (m^3/day)	Major Plastic Pollution	Restore connectivity/ hydrodynamic functioning	Improve mouth management	Rehabilitate riparian areas/ wetlands	Remove alien vegetation	Reduce grazing plan (sheep, cattle, goats)	Implement cattle exclusion zone (Browsing of mangroves)	Control mangrove harvesting	Control recreational activities impacting on birds	Remove/reduce fishing pressure/ bait collection	Investigate eradication of alien fish	Restore/protect against impact from mining
47	Mlele	B/C	B/C	2.0	1.9				Catch.														
48	Mcantsi	C	B	2.8	2.6				Catch.	●	600												
49	Gxulu	B/C	B/C	15.6	14.5				Catch.														
50	Goda	B	A/B	6.2	5.8	●	□		Catch.	□													
51	Hlozi	B	B	1.7	1.6				Catch.														
52	Hickman's	C	C	1.4	1.3			Catch.															
53	Buffalo	D/E	D	96.0	18.7	●	□	EFZ/Catc		●	6 000	●									●	●	
54	Blind	D	D	0.7	1.1	●		Catch.															
55	Hlaze (iHlanze)	D	D	0.3	0.8	●		Catch.					●										
56	Nahoon	C/D	C	32.5	20.4	●	●	EFZ/Catc		●	680	●				●	□			●	●	●	
57	Qinira (Quinirha)	B	B	8.4	8.3			Catch.	Catch.					●							●		
58	Gqunube	B/C	B	34.1	32.1			Catch.	Catch.	●	Pump stn				●					●	●	●	
59	Kwelera (Kwelerha)	B	A/B	34.8	32.8																●		
60	Bulura (Bulurha)	B	B	3.7	3.5																●		●
61	Cunge	A/B	A/B	0.3	0.3											●	□						
62	Cintsa	B	B	4.0	3.8																●		
63	Cefane	B	B	4.0	3.2																●		
64	Kwenxura (Kwenxurha)	A/B	A - A/B	16.9	16.6										●	●	□				●		
65	Nyara (Nyarha)	A/B	A - A/B	4.3	4.3																		
66	Imtwendwe (Mtwendwe)	A/B	A - A/B	1.1	1.0																		
67	Haga-haga	B	B	2.1	2.1																		

##	Estuary	PES	REC	Reference MAR (m^3x10^6)	Present MAR (m^3x10^6)	Restore/protect base flows	Restore floods	Improve urban runoff (stormwater)	Manage agricultural runoff (e.g. fertilizing, buffer zones)	Improve WWTW infrastructure/operations	Average WWTW volume (m^3/day)	Major Plastic Pollution	Restore connectivity/ hydrodynamic functioning	Improve mouth management	Rehabilitate riparian areas/ wetlands	Remove alien vegetation	Reduce grazing plan (sheep, cattle, goats)	Implement cattle exclusion zone (Browsing of mangroves)	Control mangrove harvesting	Control recreational activities impacting on birds	Remove/reduce fishing pressure/ bait collection	Investigate eradication of alien fish	Restore/protect against impact from mining
68	Mtendwe	A/B	A - A/B	1.4	1.4																		
69	Quko	A/B	A - A/B	17.2	16.9																		
70	Morgan	B	B	2.7	2.7								●								●	●	
71	Cwili	B	B	1.2	1.2																	●	
72	Great Kei	C	B/C	1041	742	●	●			●					●	●	●	●	●	●	●	●	
73	Gxara (Gxarha)	A/B	A - A/B	3.4	3.4	□									●						□		□
74	Ngogwane	B	B	0.8	0.8	●														□		□	
75	Qolora (Qolorha)	B	B	8.9	8.7	□	□													□		□	
76	Ncizele	A/B	A - A/B	1.0	1.0	□	□																
77	Timba	B	B	0.4	0.3	●	□													□		□	
78	Kobonqaba (Khobonqaba)	B	A/B	36.2	35.5	●	□					□			●			●	●				□
79	Nxaxo/Ngqusi	B	A/B	23.3	22.8								□		●	●	□	●	●	□	●		
80	Cebe	A/B	A - A/B	5.7	5.6								□									□	
81	Gqunqe	A/B	A - A/B	7.0	6.8															□			
82	Zalu	B	B	1.7	1.7								□							□			
83	Ngqwara (Ngqwarha)	A/B	A - A/B	5.2	5.1	●	□								●								
84	Sihlontlweni	A/B	A - A/B	2.2	2.2															□			
85	Nebelele	A/B	B	1.1	1.0								□										
86	Qora (Qhorha)	B	A/B	78.5	72.0										●			●			●		●
87	Jujura (Jujurha)	B	B	11.3	10.3	●	□																
88	Ngadla	A/B	A - A/B	1.6	1.5																		
89	Shixini	A/B	A - A/B	42.3	41.0																●		
90	Beechamwood	B	B	0.5	0.5								□							□			●
91	Kwazlelitsha (Kwazwedala)	A/B	A - A/B	0.6	0.6								□							□			□

##	Estuary	PES	REC	Reference MAR (m^3x10^6)	Present MAR (m^3x10^6)	Restore/protect base flows	Restore floods	Improve urban runoff (stormwater)	Manage agricultural runoff (e.g. fertilizing, buffer zones)	Improve WWTW infrastructure/operations	Average WWTW volume (m^3/day)	Major Plastic Pollution	Restore connectivity/ hydrodynamic functioning	Improve mouth management	Rehabilitate riparian areas/ wetlands	Remove alien vegetation	Reduce grazing plan (sheep, cattle, goats)	Implement cattle exclusion zone (Browsing of mangroves)	Control mangrove harvesting	Control recreational activities impacting on birds	Remove/reduce fishing pressure/ bait collection	Investigate eradication of alien fish	Restore/protect against impact from mining
92	Kwa-Goqo	A/B	A - A/B	1.0	1.0								□							□			□
93	Ku-Nocekedwa	A/B	A - A/B	1.1	1.1								□							□			□
94	Nqabara/Nqabarana	B	A/B	76.4	75.9								□		●	●	□	●		●	●		□
95	Ngomane (East)	B	B	1.1	1.1								□		□			□			□		□
96	Ngoma/Kobule	A/B	A - A/B	6.3	6.2																		
97	Mendu	A/B	A - A/B	5.2	5.1																●		
98	Mendwana	A/B	A - A/B	1.4	1.3																●		
99	Mbashe	B/C	B	786.9	861.2	●	●									●	●	●	●	●	●	●	
100	Ku-Mpenzu	A/B	A - A/B	0.8	0.7															●	●		
101	Ku-Bhula (Mbhanyana)	A/B	A - A/B	8.9	8.6	●	□								●	●	□	●			●		
102	Kwa-Suku	A/B	A - A/B	0.7	0.7	□	□													□	●		□
103	Ntlonyane	B	A/B	13.6	13.2								●		●			●			●		●
104	Nkanya	B	A/B	2.5	2.4															□	□		□
105	Sundwana	A/B	A - A/B	0.8	0.8								□								□		□
106	Xora	B/C	B	52.4	40.5		●									●	□	●	●		●*		
107	Bulungula	B	A/B	7.6	7.5	□	□						□			●	□				□		□
108	Ku-Amanzimuzama	A/B	A - A/B	1.6	1.6																		
109	Nqakanqa	B	B	0.8	0.8	□	□								□				●	□	□	□	
110	Mdikana	B	B	0.2	0.2	□	□														□		
111	Mncwasa	B	B	26.9	26.5	□	□								□					□	□	□	
112	Mpako	B	B	21.7	21.6	□	□								□					□	●		●
113	Nenga	C	C	9.1	9.0								●		●				●		●		□
114	Mapuzi	B	B	5.5	5.5																		
115	Mtata	C	B/C	392.2	319.0	●	●		Catch.						●	●	□	●	●		●	●	●

##	Estuary	PES	REC	Reference MAR (m^3x10^6)	Present MAR (m^3x10^6)	Restore/protect base flows	Restore floods	Improve urban runoff (stormwater)	Manage agricultural runoff (e.g. fertilizing, buffer zones)	Improve WWTW infrastructure/operations	Average WWTW volume (m^3/day)	Major Plastic Pollution	Restore connectivity/ hydrodynamic functioning	Improve mouth management	Rehabilitate riparian areas/ wetlands	Remove alien vegetation	Reduce grazing plan (sheep, cattle, goats)	Implement cattle exclusion zone (Browsing of mangroves)	Control mangrove harvesting	Control recreational activities impacting on birds	Remove/reduce fishing pressure/ bait collection	Investigate eradication of alien fish	Restore/protect against impact from mining
116	Thsani	B	B	0.5	0.5	□	□								□								●
117	Mdumbi	B	A/B	36.6	35.5	□	□						□		●	●	□	●	●		●		●
118	Lwandilana	B	B	1.4	1.4											□	□		□	□	□		□
119	Lwandile	A/B	A - A/B	3.4	3.3																		
120	Mtakatye	B	A/B	63.4	61.7							●			●	●	□	●	●		●		
121	Hluleka	B	A/B	4.3	4.2	□	□								●	●	□				●		
122	Mnenu	A/B	A/B	19.7	19.2								□								●	□	□
123	Mtonga	C	A/B	4.0	3.9				Catch.				●										□
124	Mpande	A/B	A - A/B	4.5	4.4															□	□		
125	Sinangwana	B	B	11.5	11.2															□	□		
126	Mngazana	B	A/B	49.3	47.8	●	□								●			●	●		●*		
127	Mngazi	B	B	87.31	83.52										●	●				●	●		
128	Gxwaleni	A/B	A - A/B	1.6	1.6																		
129	Bululo	B	B	1.6	1.6																		
130	Mtumbane	B	B	1.0	1.0	●									●						●		
131	Mzimvubu	B	B	2665.6	2552.0	●			Catch.							●	□				●	●	
132	Ntlupeni	A/B	A - A/B	3.8	3.8																		
133	Nkodusweni	B	A/B	8.2	8.1										●								
134	Mntafufu	B	A/B	44.5	43.8										●	●	□		●	●	●		
135	Ingo	A/B	A - A/B	4.6	4.4										□				□	□	□		
136	Mzintlava	A/B	A - A/B	69.8	67.0										●				●		●		
137	Mzimpunzi	B	A/B	9.2	8.5										●								
138	Kwanyambalala	B	B	4.2	3.9										●						●		
139	Mbotyi	B	B	11.1	10.3										●						●		
140	Mkozi	A/B	A - A/B	15.7	14.6														●				
141	Sikatsha	A/B	A - A/B	1.9	1.7	□	□													□	□		
142	Lupatana	A/B	A - A/B	7.0	6.5	□	□						□										□

##	Estuary	PES	REC	Reference MAR (m^3x10^6)	Present MAR (m^3x10^6)	Restore/protect base flows	Restore floods	Improve urban runoff (stormwater)	Manage agricultural runoff (e.g. fertilizing, buffer zones)	Improve WWTW infrastructure/operations	Average WWTW volume (m^3/day)	Major Plastic Pollution	Restore connectivity/ hydrodynamic functioning	Improve mouth management	Rehabilitate riparian areas/ wetlands	Remove alien vegetation	Reduce grazing plan (sheep, cattle, goats)	Implement cattle exclusion zone (Browsing of mangroves)	Control mangrove harvesting	Control recreational activities impacting on birds	Remove/reduce fishing pressure/ bait collection	Investigate eradication of alien fish	Restore/protect against impact from mining
143	**Mkweni**	A/B	**A - A/B**	**18.4**	**17.0**	□	□																
144	**Msikaba**	A/B	**A - A/B**	**212.4**	**199.3**											●	□				●		
145	**Mgwegwe**	A	**A**	**1.2**	**1.2**																		
146	**Mgwetyana**	A	**A**	**1.8**	**1.8**																		
147	**Mtentu**	B	**A/B**	**157.0**	**145.4**	●									●	●	□		●		●	●	
148	**Sikombe**	A/B	**A - A/B**	**6.8**	**6.8**	□	□								●					□	□		
149	**Kwanyana**	A/B	**A - A/B**	**4.0**	**3.9**					□													
150	**Mtolane**	A/B	**A - A/B**	**1.8**	**1.8**					□										□	□		
151	**Mnyameni**	A/B	**A - A/B**	**45.9**	**44.8**					□					●						●		
152	**Mpahlanyana**	B	**A/B**	**1.1**	**1.0**	□	□													□	●		
153	**Mpahlane**	B	**A/B**	**2.7**	**2.5**	□	□														●		
154	**Mzamba**	B	**A/B**	**67.4**	**62.8**	□										●	□				●		
155	**Mtentwana**	B/C	**B**	**1.3**	**1.2**	●		EFZ	Catch.				●		●				●	□			
156	**uMthavuna**	B	**A/B**	**275.2**	**239.5**											●					●		

13 APPENDIX C: Norms and Standards for the Eastern Cape Coastal Zone

Norms are management practices that are regarded as typical or best practice. Standards are management rules and guiding principles to achieve certain objectives or outcomes, or to ensure legal compliance. For the purposes of the Eastern Cape CMP, norms take the form of environmental management guidelines, both with reference to specific areas, and guidelines that are more generic. These guidelines have been derived from the gap analysis report as well as from the 2004 CMP and include both existing and proposed guidelines. Standards for the Eastern Cape CMP are proposed for coastal set-back line demarcation and establishment.

1.1 General Environmental Management Guidelines for the Eastern Cape Coast

The following guidelines have been extracted from existing documentation identified in the Gap Analysis report component of this project.

Table 4: General Environmental Management Guidelines for the Eastern Cape Coast

Category	Guideline	Rationale
Consolidation and expansion of protected areas	• Land use planning must be aligned with national policy so that national conservation targets for different natural asset types are adhered to, namely a target of 30% of estuaries conserved. • All natural forests should have a high degree of protection, but will be more difficult to attain, since so many of the existing forests are in a poor state. • If a municipality is endowed with conservation assets of high value, then land uses that support and add value to the assets rather than detract from them, should be promoted. • Formal conservation areas should be consolidated and new developments should be concentrated where there is already development. • Conservation of biodiversity assets are identified in this strategy as of critical importance if sustainability is to become a defining feature of coastal management in the Eastern Cape, but true sustainability means making allowances for communities to benefit from conservation initiatives.	• Opportunities exist to secure South Africa's marine and coastal habitats. • South Africa is poised to expand its Marine Protected Area network. • MPAs are valuable national assets that deliver ecosystem services and socio-economic benefit. • Overexploited fish stocks can recover and provide long-term food and job security.
Implementation of special management areas	• Catchment management should be considered as a critical input into and incorporated into any estuary management planning processes. • A River Corridor, a zone 30m wide on each riverbank, is proposed along all rivers. • No removal of riparian vegetation, and especially no ploughing, should be allowed within 30 m of riverbanks. • No sand mining should be allowed within estuaries. • Larger catchments, such as the Mzimvubu and Mtata rivers, have a greater capacity to absorb the impacts of large-scale land uses, such as irrigated agriculture and forestry. • Everything that is woodland, including bushveld or forest, needs to have some form of informal protection and proper management, as they provide a suite of products and services to the subsistence economy.	• Consideration of the catchment area in relation to the estuary is a key concept. There are many small catchments in the Transkei/Wild Coast region. An estuary of high conservation importance linked to a small catchment will constrain development options in that catchment. • Estuaries are important assets, both for their productive services (mangroves in places, fish and shellfish, sense of place, recreational activities) and biodiversity. • Riparian ecosystems are a critical resource in river channel protection. • The Transkei Coastal Belt, comprising a mosaic of grassland and woodland, occupies the areas immediately inland of the coast, therefore, as part of what gives the landscape its character, this belt also needs to be managed and protected.

Category	Guideline	Rationale
		• Fresh water flowing into the sea is not wasted and is critical for ecosystem functioning.
Expand alien invasive species eradication programmes	• Successful alien eradication programmes for alien invasive trees (e.g. rooikrans) must continue. • The eradication of the European shore crab (*Carcinus maenas*) must be attempted.	• Early detection, risk assessment and quick management action can prevent future invasions by alien species.
Reduce pressures on the natural resource base	• Access points to the coast must be limited, and possibly reduced (sea access from e.g. boat launch sites, slipways and storm water pipes, and shore access from e.g. parking areas and paths). These are also areas where alien species are likely to become established. • Fishing pressures must be reduced, for example, by reducing commercial and/or recreational fishing quotas and promoting compliance with and enforcement of the Marine Living Resources Act. • Abalone poaching must be stopped. Specific abalone reserves are needed, with strict control. • Coastal developments and their associated impacts must be strictly controlled. When considering land use change alternatives, decision-makers must consider how the change in land use will affect the supply of ecosystem services, and who will bear the cost of any change in service supply. • Existing settlements/nodes must be properly managed and maintained to prevent deterioration of the natural environment. Current bad practices must be reversed and degraded areas rehabilitated. • Service infrastructure provided in nodal areas, and proposed to be provided, must be maintained.	• Extractive use of coastal resources remains the single greatest pressure on the coastal zone. • Coastal developments pose a major threat to many components of the coastal and marine environment, owing to their cumulative effects, which are often not taken into account by impact assessments. These effects include organic pollution of run-off and sewage, transformation of the supratidal environment, alteration of dune movement, increased access to the coast and sea, and the negative impacts on estuaries.

1.2 Wild Coast Management Guidelines

The following guidelines have been extracted from existing documentation identified in the Gap Analysis report component of this project and relate specifically to the spatial area of the Wild Coast.

Table 5: Environmental Management Guidelines for the Wild Coast

Guideline	Description
Promote local economic development	• Development on the Wild Coast and in Wild Coast communities must take place and at an accelerated rate. If endemic poverty persists, efforts to protect the environment will in the long term, not succeed; • In order to facilitate essential development, more development nodes must be created and the size of some nodes increased; • Development should be nodal in nature, meaning that there should also be areas that remain undeveloped. Development nodes should cater for a range of types and scale of development;

Guideline	Description
	• Infrastructure provision must be focussed on development nodes; and • Developments and economic activities that do not specifically need to be in a coastal location should be located outside the Coastal Corridor, in this case more than 1 kilometre from the coast.
Prioritise estuary management	• Estuaries that are still pristine and undeveloped should be retained in that state and all development should have a suitable buffer with estuaries, at least 100 metres in most cases. Developments and economic activities that are potentially polluting should not be located near rivers and estuaries;
Promote holistic spatial planning and equitable access	• The immediate coastal zone is a resource common to all and should not be exclusively occupied by large developments that prevent public use of the coastal area; • The rights of communities that have historically occupied and used the coastal corridor must be acknowledged. Such communities should however not expand within the coastal corridor; • Spatial planning must attempt to redress imbalances of the past, and must promote equity; • Spatial planning for the Wild Coast should as far as possible be aligned with existing plans and policies, including The Eastern Cape Provincial Spatial Development Plan and the Spatial Development Frameworks of coastal Municipalities.

Expand protected areas	• Where possible, the following areas should be incorporated into core protected areas:
	  ○ All demarcated forests;
	  ○ The remnant examples of swamp forest;
	  ○ All estuaries and mangrove communities;
	  ○ All remnant dune forest;
	  ○ The scenic wonders of the coastline such as between Drews camp and Luphatana as well as the contiguous grasslands; and
	  ○ The forested river gorges of Msikaba, Mtentu, Sikombe, Nyameni, Mzamba and Umtamvuna.
	• Existing formal Protected Areas must be expanded and new formal Protected Areas established. In this regard the targets set in the Presidential Program of Action, and specifically Outcome 10, should be pursued;
	• Remaining Indigenous Forest on the Wild Coast must be protected and forest clearing of any kind should only be permitted under exceptional circumstances. Indigenous Forest rehabilitation projects should be strongly encouraged

14 APPENDIX D: Inherent Vulnerability of Coastal Local Municipalities

The ability of DMs to conduct effective coastal management and to fulfil other government roles depends on their economic situation and the socio-economic vulnerability of the population. These vulnerabilities, together with the condition of built and service infrastructure, also determine how vulnerable a local municipality will be to external shocks, such as climate-related disasters. Further, a population's dependence on natural resources also makes it vulnerable to external shocks to the natural resources.

The GreenBook (www.greenbook.co.za) developed a framework which sets out indicators that can be used to profile the multi-dimensional and context-specific inherent vulnerability of settlements and municipalities in South Africa. Information and data were derived using GIS analysis and modelling techniques using secondary data and is not based on local surveys. The framework describes and quantifies, where possible, the inherent vulnerability of people, infrastructure, services, economic activities, and natural resources by setting out context and location-specific indicators that were specifically designed to support vulnerability risk assessments of South African municipalities. Population changes drive vulnerability into the future, and therefore population growth and decline of settlements across the district are projected to 2050. Spatial population projections are integral in determining future Integrated Development Goals as well as the potential exposure and vulnerability of a population to hazards, especially in the coastal context.

- Socio-Economic Vulnerability Index shows the vulnerability of households living in the municipality with regard to household composition, income composition, education, mobility, health, access to basic services, access to social government services, political instability, and safety and security of households. A high vulnerability score indicates municipalities that house a high number of vulnerable households with regard to their ability to withstand adverse shocks from the external environment.

- Economic Vulnerability Index speaks toward the economic resilience of the municipality, and considers economic sector diversification, the size of the economy, labour force, the GDP growth/decline pressure experienced in the municipality, as well as the inequality present in the municipality. The higher the economic vulnerability the more susceptible these municipalities are to being adversely affected by external shocks.

- Physical Vulnerability Index relates to the built environment and the connectedness of the settlements in the local municipality. It is a composite indicator that considers road infrastructure, housing types, the maintenance of the infrastructure, densities, and general accessibility. A high physical vulnerability score highlights areas of remoteness and or areas with structural vulnerabilities.

- Environmental Vulnerability Index highlights municipalities where there is a high conflict between preserving the natural environment and accommodating the growth pressures associated with population growth, urbanisation, and economic development. The index considers the human influence on the environment, the amount of ecological infrastructure present that needs protection, the presence of critical water resources, environmental health, and environmental governance. A high vulnerability score highlights municipalities that experience increasing pressure relating to protecting the environment and allowing land use change due to growth pressures.

Table below provides an overview of the vulnerability ratings for the coastal municipalities in the EC. An additional column gives a summary of the projected growth pressure on coastal settlements in each municipality. In the Local Municipalities of Sundays River Valley, Mnquma, Mbhashe, Nyandeni and Ingquza Hill, no settlements were found to be present in the immediate coastal zone. Coastal population and coastal livelihoods might therefore not be a priority in a CMP for these Local Municipalities.

In contrast, Local Municipalities with Socio-economic vulnerabilities and coastal towns present, might experience highly vulnerable communities with high dependence on coastal resources for their livelihoods.

These local municipalities include Great Kei, King Sabata Dalindyebo, and specifically Port St Johns (although a town of about 4000 people) and Winnie Madikizela Mandela (Mbizana).

Table C.1 Inherent socio-economic, economic, physical and environmental vulnerability of EC's coastal LMs and coastal settlement growth pressure (10: highest vulnerability; 1: lowest vulnerability

No	Sphere	Municipality Name	Vulnerability of LMs in EC			
			Socio-economic	Economic	Physical	Environ-mental
	District	Sarah Baartman				
1	Local	Kouga	3.2	3.9	6	3.6
2	Local	Kou-Kamma	3.6	1.3	6.5	5.7
3	Local	Ndlambe	5.2	7.6	7.5	1.7
4	Local	Sundays River Valley	5.1	1.6	6.3	2.8
5	Metro	Nelson Mandela Bay	3.3	6.7	3.9	4.7
	District	Amathole				
6	Local	Ngqushwa	6.7	5.9	5.2	2.2
7	Local	Great Kei	7.6	4.5	5.3	2.8
8	Local	Mnquma	8	4.1	6.6	2.9
9	Local	Mbhashe	9.6	3.4	8	3.1
10	Metro	Buffalo City	4.5	7.5	6.6	3.3
	District	O.R.Tambo				
11	Local	King Sabata Dalindyebo	6.9	6.3	7.2	4.3
12	Local	Port St Johns	9.2	5.5	6.1	4.1
13	Local	Nyandeni	8.6	4	6.5	2.8
14	Local	Ngquza Hill	8.8	4.9	7.6	2.9
	District	Alfred Nzo				
15	Local	Mbizana (Winnie Madikizela-Mandela)	8.8	3.4	8.7	4.5

Those municipalities with high economic vulnerability might struggle economically at a municipal level. This will impact their ability to implement and execute coastal management issues at the local level. High physical vulnerability in terms of the condition of infrastructure might limit coastal management in terms of different management priorities and funding to implement coastal management at the local level. The identification of vulnerabilities at the local level could influence the implementation of priorities in the provincial CMP.