KOUGA
local municipality
Good Governance through Service Excellence

ORDINARY COUNCIL MEETING

SUPPLEMENTARY AGENDA

Date : 29 May 2020

Time : 10:00

Venue : Virtual Meeting

KOUGA MUNICIPALITY (EC108)	UMASIPALA I-KOUGA (EC108)	MUNISIPALITEIT KOUGA (OK108)
NOTICE CONVENING A MEETING	**ISAZISO NGENTLANGANISO**	**KENNISGEWING VAN VERGADERING**
NOTICE IS HEREBY GIVEN in terms of the amended Directions on Municipal Operations and Governance, in terms of Section 27(2) of the Disaster Management Act, 2002, that a virtual Ordinary Council Meeting will be held on	**OKU KUKWAZISA** malunga neZikhokelo eziLungisiweyo ekuSebenzeni koMasipala kunye noLawulo ngokweMigaqo yeCandelo lama 27(2) loMthetho woLawulo lweNtlekele ka 2002, ukuba kubanjwe intlanganiso ebonakalayo yesigqeba Ye khansile	**KENNIS GESKIED HIERMEE** ingevolge die gewysigde Aanwysings Vir Munisipale Bedrywighede En Bestuur, Ingevolge Artikel 27 (2) van die Wet op Rampbestuur, 2002, dat 'n virtuele raadsvergadering gehou sal word op
DATE: 29 May 2020	**UMHLA: 29 UCanzibe 2020**	**DATUM: 29 Mei 2020**
TIME: 10:00	**IXESHA: 10:00**	**TYD: 10:00**
H. BORNMAN **SPEAKER**	**H. BORNMAN** **USOMLOMO**	**H. BORNMAN** **SPEAKER**

Councillors are required to comply with the Standing Rules and Orders of Council and all its Committees By-law as promulgated in the Provincial Gazette on 22 October 2018 No.4134 and applicable to this meeting of Council. Any person who willfully contravenes any provision of these rules shall be guilty of an offence and which contravention shall be dealt with in accordance with the disciplinary procedures for Councillors.

AGENDA

1. **MATTERS DEALT WITH IN TERMS OF DELEGATED AUTHORITY BY THE EXECUTIVE MAYOR**

   (The reports by the Executive Mayor, in terms of the provisions of Section 63 of the Local Government Municipal Systems Act, 32 of 2000, on matters dealt with by the Executive Mayor in terms of delegated authority as detailed in the Minutes to be noted).

2. **REPORTS BY THE PORTFOLIO CHAIRPERSONS**

2.1 **REPORT BY THE PORTFOLIO CHAIRPERSON: FINANCE**

20/05/F19 Financial Relief For COVID 19

Pages 5-8

2.2 **REPORT BY THE PORTFOLIO CHAIRPERSON: COMMUNITY SERVICES**

20/05/CS8 Adoption Of Coastal Management Program

(Kouga Coastal Management Program not available at the time of distribution of the Council agenda)

Pages 10-157

3. **CLOSURE**

Distribution list:

Executive Mayor
Speaker
Mayoral Committee Councillors
Municipal Manager
All Directors & Relevant Managers
Legal Services
Media Liaison Officer
Committee Services

REPORTS BY THE PORTFOLIO CHAIRPERSON: FINANCE

KOUGA MUNICIPALITY (EC108)

ORDINARY COUNCIL MEETING

FINANCE

DATE: 29 MAY 2020 **ITEM NO: 20/05/F19**

FINANCIAL RELIEF FOR COVID 19

1. Introduction

The purpose of the item is to report to Council on the proposed relief measures due to the declaration of the President of South Africa of a state of disaster.

2. Background

On 23 March 2020 President Cyril Ramaphosa announced a lockdown for the country from 26 March 2020 for 21 days and then further extended the lockdown with the introduction of Levels 5 - 1.

The implications of the national lockdown are that the entire economy comes to an initial halt, except for essential services as gazetted. The economy will then be revived in accordance with the easing of restrictions as the Lockdown Levels reduce in the country, province or district.

The result of this is that businesses and the employed community will suffer severe loss of income due to the lockdown which has a direct impact on their ability to pay for their municipal accounts. The municipality therefore needs to consider relief measures to assist the businesses and community with the Kouga area during this COVID-19 pandemic.

In considering any relief measures to be offered to businesses and the community, the financial sustainability of the Municipality must be considered as well as the effects of a reduction in the collection rate and all expenditure that will need to be incurred during the COVID-19 pandemic to assist the community. The municipality's survival is dependent on revenue collection. When the budget is drafted, it's based on revenue collection projections which in turn determine the expenses that will be funded.

The April 2020 collection rate was 77% which is 19% lower than the collection rate of 96% approved in the 2019/20 Budget. The collection rates for the outer months is unknown but is expected to decline due to the loss of jobs, no work no pay and the decline in the economy. Using the April collection rate as a basis and a decline in the outer months, the expected collection rate is estimated to be 91% which will result in a reduction of R 35 million in revenue in the current financial year.

The impact in the 2020/21 Medium-term Revenue and Expenditure Framework cannot be accurately projected at this point in time. The collection rate for both April and May 2020 will enable the Budget and Treasury Office to perform a more realistic estimate of the impact for the outer years. It is thus important to ensure that the Credit Control Policy of the Municipality is implemented to ensure that the Municipality remains financially sustainable.

Based on the current financial situation, the following interventions are proposed to provide relieve businesses and ratepayers:

General relief measures

1. All blocked meters will be unblocked from 26 March 2020 (as per Gazette);
2. No credit control will be implemented from the commencement of Lockdown up to 30 June 2020 (as per Gazette);
3. No Prepaid recoveries will be implemented up to 30 June 2020 (as per Gazette);
4. Prepaid recoveries will be implemented at a reduced rate of 25% from 1 July 2020 to 31 December 2020;
5. No interest will be charged on all accounts from the commencement of Lockdown up to 30 June 2020.

Relief measures subject to an application process –

1. A 3 month payment holiday will be granted i.e. April, May and June;

2. No interest will be charged on outstanding accounts for account holders up to 31 December 2020;

3. Payment arrangements between 3 to 6 months will be effective;

4. A rates rebate of an additional R85 000 on the value of the property for Pensioners will be effective from 1 July 2020 based on the Tariff Listing;

5. Any household where the breadwinner has lost his or her income over the last few weeks and where the household income has dropped to below the maximum income allowed for the Indigent Subsidy for free basket of services, can apply for the Indigent Subsidy for free basket of service and will immediately be put on a COVID-19 Indigent Register. All accountholders qualifying for the Indigent Subsidy during the COVID-19 will lapse on 31 December 2020 and will need to re-apply.

Businesses and ratepayers will be granted a period of 30 days to apply for the relief measures offered by the Municipality, subject to the following:

- Completing a Relief Application form
- Signing an agreement to pay the debt within 3 to 6 months
- Submitting all supporting documentation to support the application

3. Financial implications

2019 /20 financial year

- Debt recovery from prepaid collection is on average R500 000 per month, this will equate to approximately R1 500 000 for the period up to 30 June 2020;
- Handover recoveries amounts to, on average R180 000 per month, this amounts to approximately R540 000 for the period up to 30 June 2020.
- Interest on outstanding debtors amounts to R813 000 per month, with an effect of about R2,439 million for the period up to 30 June 2020.

2020/21 financial year

- Debt recovery from prepaid collection at the reduced percentage of 25% is on average R250 000 per month, this will equate to approximately R1 500 000 for the period up to 31 December 2020;
- Interest on outstanding debtors amounts to R813 000 per month – the number of applicants is unknown at this point and an accurate estimate of the financial effect cannot be provided. A provision of 40% can however be used as an indicative amount which will approximately be R1.95 million for the period up to 31 December 2020;
- The rates rebate for the Pensioners - the number of applicants is unknown at this point, an accurate estimate of the financial effect cannot be provided. A provision of 40% can however be used as an indicative amount which will approximately be R2 million annually.

4. Recommendation

4.1 That Council approves the Covid-19 Relief measures as follows:

General relief measures

1. All blocked meters will be unblocked from 26 March 2020 (as per Gazette);
2. No credit control will be implemented from the commencement of Lockdown up to 30 June 2020 (as per Gazette);
3. No Prepaid recoveries will be implemented up to 30 June 2020 (as per Gazette);
4. Prepaid recoveries will be implemented at a reduced rate of 25% from 1 July 2020 to 31 December 2020;
5. No interest will be charged on all accounts from the commencement of Lockdown up to 30 June 2020.

Relief measures subject to an application process –

1. A 3 month payment holiday will be granted i.e. April, May and June;

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3. Payment arrangements between 3 to 6 months will be effective;

4. A rates rebate of an additional R85 000 on the value of the property for Pensioners will be effective from 1 July 2020 based on the Tariff Listing;

5. Any household where the breadwinner has lost his or her income over the last few weeks and where the household income has dropped to below the maximum income allowed for the Indigent Subsidy for free basket of services, can apply for the Indigent Subsidy for free basket of service and will immediately be put on a COVID-19 Indigent Register. All accountholders qualifying for the Indigent Subsidy during the COVID-19 will lapse on 31 December 2020 and will need to re-apply.

Drafted by the Manager Revenue R Van Heerden :

Approved by the CFO R Lorgat :

Endorsed by the Municipal Manager C du Plessis :

Item noted by Portfolio Councillor Brenton Williams :

REPORTS BY THE PORTFOLIO CHAIRPERSON: COMMUNITY SERVICES

KOUGA MUNICIPALITY (EC 108)

ORDINARY COUNCIL MEETING

COMMUNITY SERVICES

DATE: 29 MAY 2020 **ITEM NO: 20/05/CS8**

ADOPTION OF COASTAL MANAGEMENT PROGRAM

1. Purpose

The purpose of this report is to submit the Coastal Management Program for recommendation to Council.

2. Introduction

Department of Environmental Affairs (DEA) and Sarah Baartman District Municipality through the EPIP: Working for the Coast program funded the development of an Integrated Coastal Management Programs/Plan for each municipality in the Sarah Baartman District.

CEN the appointed Environmental Assessment Practitioner (EAP) was mandated to develop the District plan in a manner that local authorities could adopt the relevant areas of the plan and implement the plan as their own.

In September 2019 the plan was submitted to the Portfolio Committee to support the plan for public participation and for Kouga Municipality to adopt the plan once the MEC approves the program.

3. Comments

The Coastal Management Program was published by the MEC for public comments from 12 November 2019 until 13 December 2019. Only two comments were received from the Kouga Municipality Area (Paradise Beach & St Francis Bay). All comments were addressed by the Environmental Practitioner and the comments were taken into consideration in the final program.

The MEC has approved and given the go-ahead for municipalities to adopt the Coastal Management Program. The Sarah Baartman District Municipality Council adopted the plan on 29 January 2020. (Annexure 1)

Kouga Municipality has arranged for the Environmental Practitioner of CEN to provide a workshop during April 2020 with relevant stakeholders before the program goes to Council. (Detail to be communicated at a later date).

The workshop will cover:

- Background to what the Program is and why municipalities have to develop and implement
- Demonstrate importance and relevance of coastal management issues
- What is the municipality/Council's responsibility?
- Highlight values/positive aspects of Kouga Municipality Coastal Zone
- Key Risks & Treats that needs to be managed
- Key Recommendation/implementation Strategies
- Where can budget be sourced
- What support is available for municipalities

4. Recommendation

4.1 That the workshop be supported, and all Councillors be available to attend (date to be finalised).

4.2 That the Coastal Management Program be submitted to Council for adoption.

Item prepared by : Director Community Services

Item noted by : Portfolio Head

Annexure 1: Council Resolution Sarah Baartman DM

FILING

COUNCIL – 29 JANUARY 2020

14.1.2.3 **Final Coastal Management Programme for the Sarah Baartman District Municipality**

Cr Sodladla proposed for the adoption of the recommendations.

Cr Seyisi seconded the proposal.

It was thereafter

RESOLVED

that the final SBDM Coastal Management Programme be adopted.

CERTIFIED A TRUE COPY OF THE EXTRACT FROM THE MINUTES OF THE COUNCIL MEETING HELD ON 29 JANUARY 2020.

11/02/2020 .....

DATE

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MUNICIPAL MANAGER

Chapter 5: Kouga Local Municipality

5.1 Overview of the coastal zone

The Kouga Local Municipality (LM) coastal zone extends from east of the Tsitsikamma River mouth to the western side of the Van Stadens River mouth. For the purposes of this CMPr, the coastal zone has been divided into 8 management segments (2A to 2H) (see Figure 3). The 'catchment area' of the segments is also shown in the image, as activities within the catchment have bearing on what happens at the coast (for e.g. poor waste management in the catchment may impact on the coastal zone). A broad description of the key features of the Kouga LM coastal zone is given below, for each of the 3 coastal management themes.

5.1.1 Natural, archaeological and cultural diversity and resource management

Seven warm temperate estuaries occur in the Kouga LM (Klipdrif, Slang, Kromme, Seekoei, and 'unknown' estuary to the east of the Seekoei, Kabeljous, and Gamtoos). An additional two estuaries are shared with the Koukamma and Nelson Mandela Bay Municipal areas (i.e. Tsitsikamma and Van Stadens estuaries respectively).

The area between Tsitsikamma and Cape St Francis and a section between the Gamtoos and Van Stadens River areas is part of the Tsitsikamma strategic surface water area. The coastal zone is classified as a 'major aquifer' – these areas are high-yielding system of good water quality (DWS, 2012). The Tsitsikamma, Klipdrift, Kromme, Seekoei, Swart that drains into the Seekoei, Kabeljous and Gamtoos Rivers are identified as National Freshwater Ecosystem Priority Areas (NFEPAs). Numerous wetlands occur in the coastal zone and catchment as reflected in the most recent National Biodiversity Assessment (2018) aquatic areas layer. The Papiesfontein wetlands between the Kabeljous and Gamtoos Rivers, the wetland system connected to the Seekoei Estuary, and the interdune wetlands in the Oyster Bay/Sand River Dunefield are highlighted as wetland systems with high biodiversity importance.

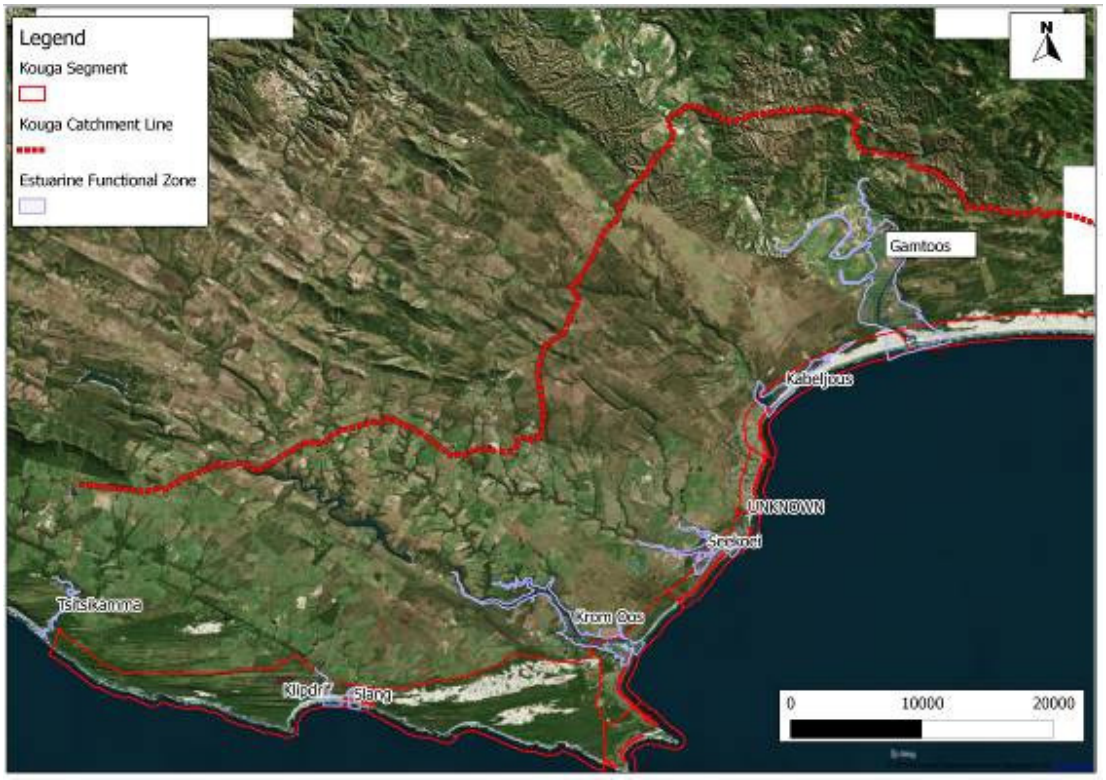


Figure 29: Estuaries in the Kouga LM coastal zone.

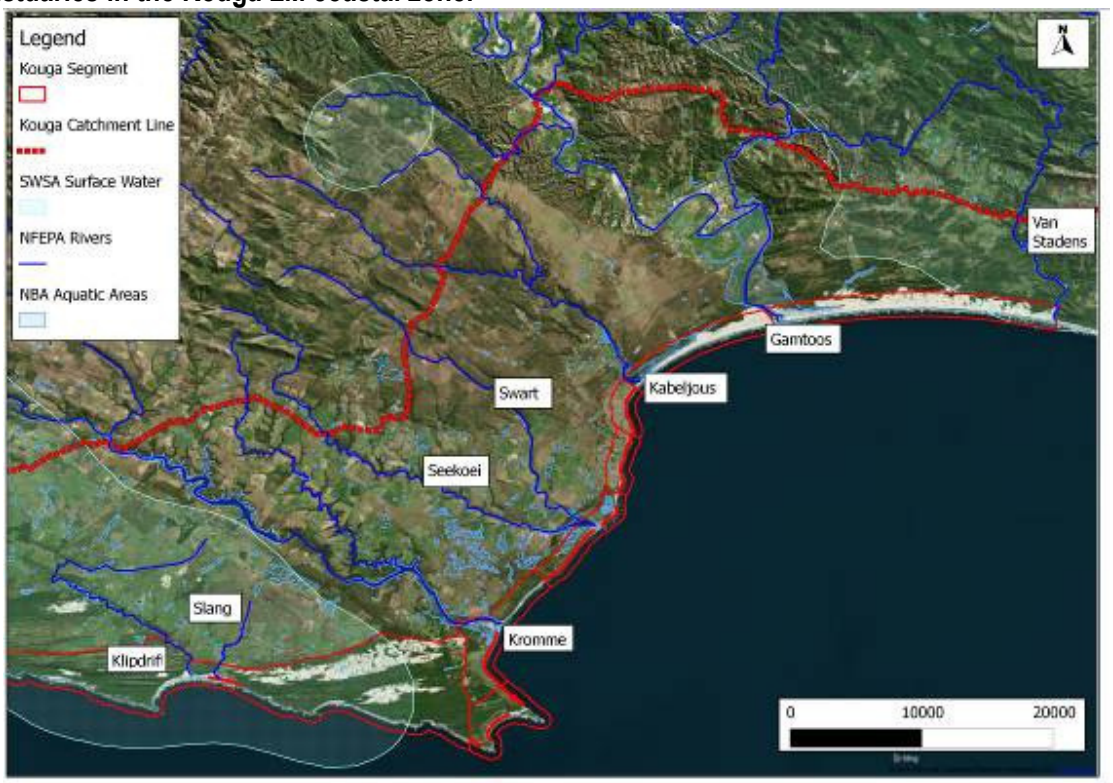


Figure 30: Aquatic features in the Kouga LM coastal zone.

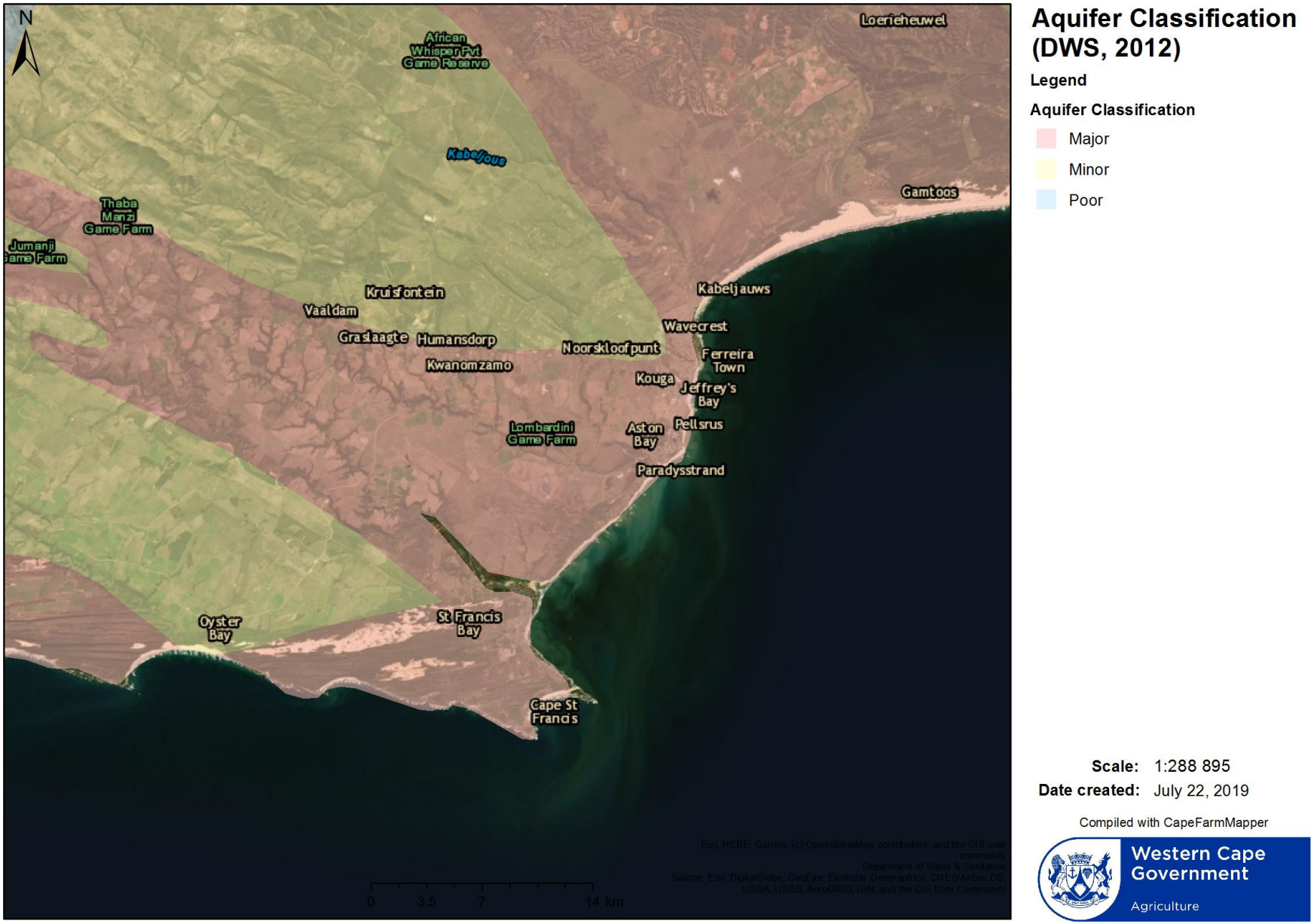


Figure 31: The Kouga LM coastal zone is part of a 'major aquifer' (DWS Aquifer Classification, 2012).

Notable dune systems occur in the St Francis area and between the Gamtoos and Maitlands Rivers. Three headland bypass dunefields in the Cape St Francis area (i.e. Oyster Bay, Thysbaai and Santareme dunefields) supply sand from west to east. Sand blown off upwind beaches (i.e. Slangbaai and Thysbaai areas) is transported across the headlands towards the downwind bays (i.e. St Francis Bay), bypassing the littoral route around the headlands. The presence of functional sandy beaches upwind of headlands that lie crossways to the prevailing wind direction (west) is key to the development of headland bypass dunefields. The local longshore drift system plays a critical role in replenishing beach sand deflated by the wind. These dunefields have been active since at least the Mid to Late Pleistocene. The transverse dunes are separated by well-defined interdune areas, in which water collects to form 'lakes' after rainfall. Artificial stabilization of the dunefields with the development of Oyster Bay and St Francis Bay blocked dune movement and sand supply to St Francis Bay. Sandy supply from downwind beaches to the dunefields has also been blocked (Burkinshaw, 1998; Illenberger, 2010). McConnachie (2013) showed that the drivers of sediment flux in the Oyster Bay dunefield system are different in the western and eastern regions of the dunefield. Wind is the major driver of change up to and across the crest of the dunefield. In the eastern region water (ground water, surface water and the Sand River System) is the primary agent of sediment flux through processes of aggregation and slumping as well as episodic events including debris flows (McConnachie, 2013). The headland-bypass dunefields at Cape St Francis are the only remaining large active dunefields of this type, and should be protected. The dunefields are unique on a local, regional and global scale (Illenberger, 2009).

The coastal zone between Klasies River in the west and Krom River in the east has been highlighted as one of the richest and most significant archaeological cultural landscapes in South Africa. The headland bypass dunefields between Oyster Bay and the Kromme River mouth are underlain by ferricretes, calcretes and fossilized dune sands which are situated on top of Table Mountain Sandstones. Due to the continuous movement of the dunes, many archaeological and paleontological sites are exposed while simultaneously others are covered (Binneman and Reichert, 2017).

Relatively large piles of marine shells (referred to as 'strandloper middens') dating back 600 years are found in the Kouga LM coastal zone, mostly within 300 m of the high water mark of the sea but can occur up to 5 km inland. Middens are found mainly opposite rocky coasts, but also occur along sandy beaches if there was a large enough source of white mussel. Archaeological research shows that places like the Kabeljous Estuary were popular areas for hunter-gatherer and pastoralists to live because of a diversity of food resources in close proximity. Studies done in the area between New Papiesfontein farm and the Kabeljous River revealed 37 archaeological sites, including two KhoiSan skeletons.

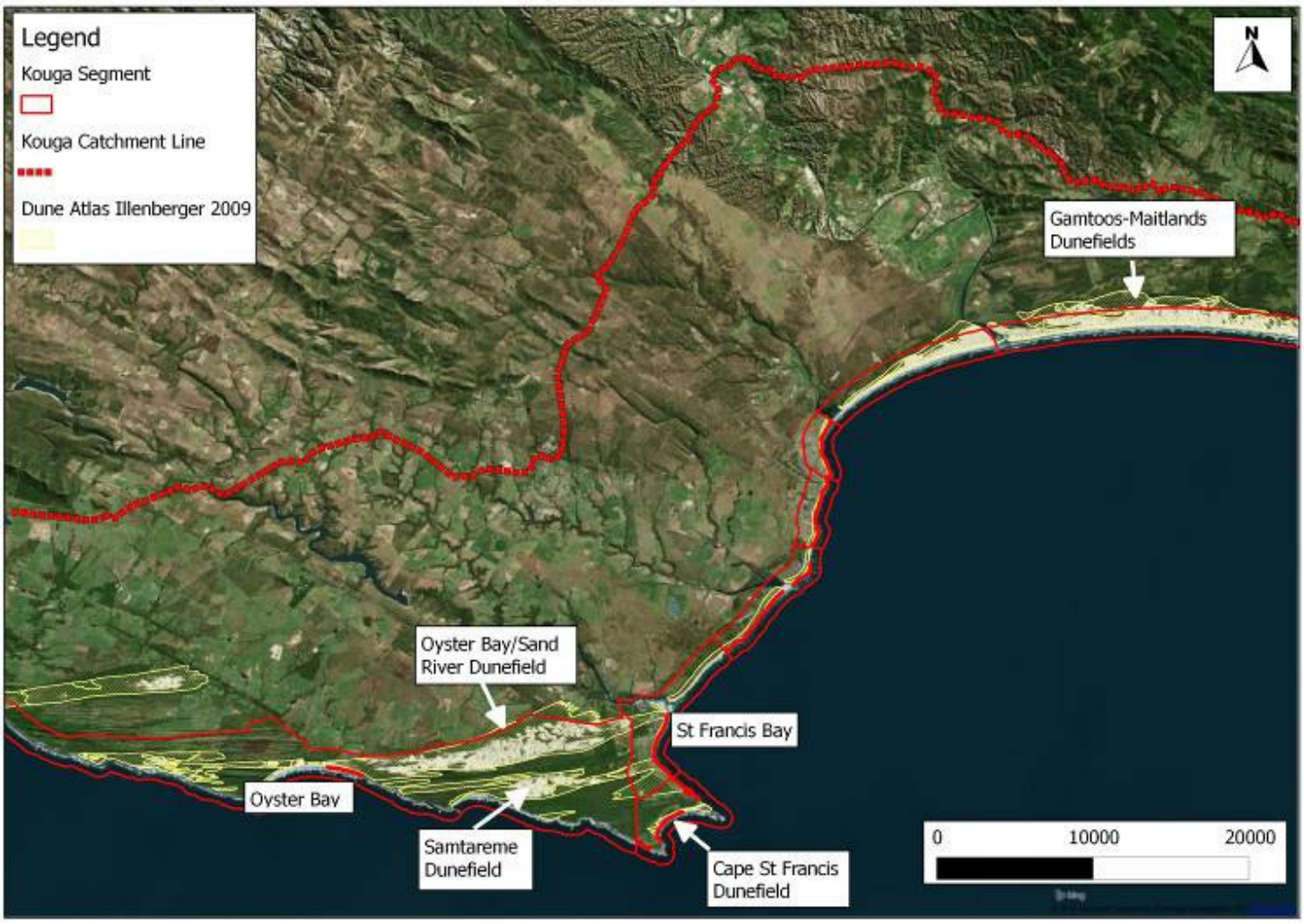


Figure 32: Notable coastal dunefields in the Kouga LM (Illenberger, 2009).

No threatened ecosystems (as identified in the National List of Threatened Ecosystems (2011) published under the Biodiversity Act)) occur within the coastal zone Segments, however a relatively large section of the catchment area between the Kromme and Gamtoos estuaries includes an Endangered ecosystem (that corresponds with the Humansdorp Shale Renosterveld vegetation type). Note that the ecosystem threat status of national vegetation types is under revision with the NBA updates, and the National List of Threatened Ecosystems will need to be amended.

Fourteen vegetation types occur in the coastal zone and catchment area, with Cape Seashore Vegetation, Southern Cape Dune Fynbos, St Francis Dune Thicket, and Sundays Mesic Thicket dominant in the coastal segments (VEGMAP, 2018).

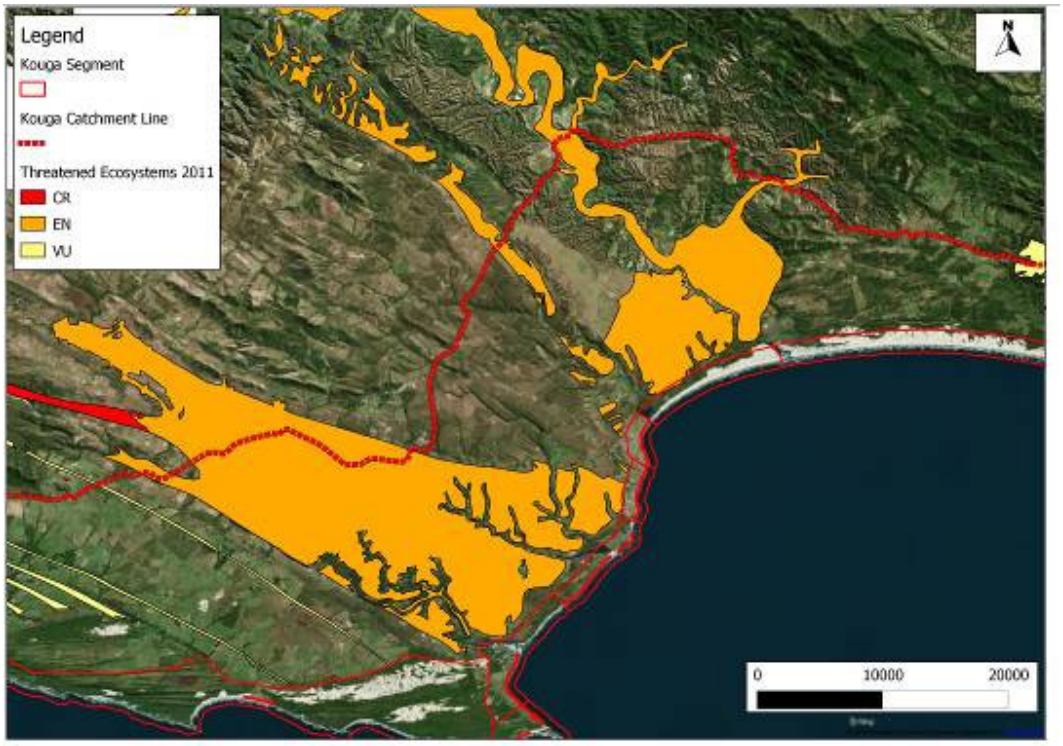


Figure 33: Threatened ecosystems in the catchment of the Kouga LM coastal zone (National List of Threatened Ecosystems, 2011).

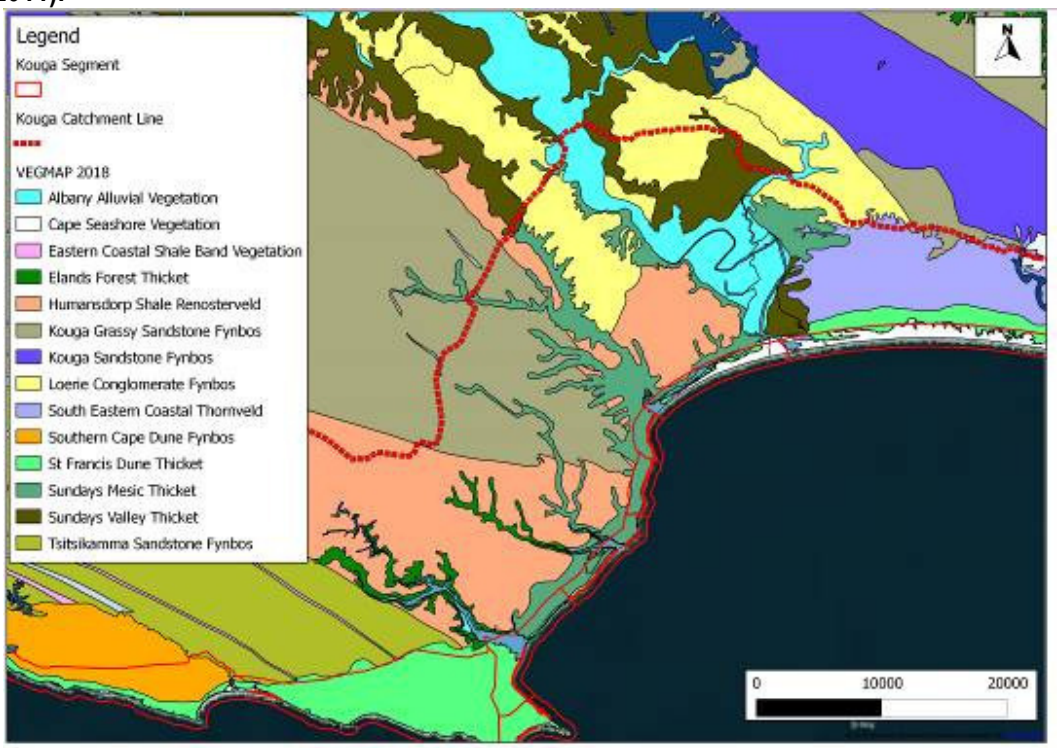


Figure 34: Vegetation types in the Kouga LM coastal zone (VEGMAP, 2018).

The area between Cape St Francis and Oyster Bay is rich is stromatolites. These typically occur at the interface between freshwater seepage points and the marine penetration and date back in the fossil record at least 2.7-3.5 billion years. All

active deposits are supratidal to upper intertidal in position and receive regular inflow of seawater, either as wave overtopping at high spring tide or wave splash during storm surges (Perissinotto *et. al.*, 2014).

Areas classified as forest in DAFF's Forest Inventory occur between Tsitsikamma and Cape St Francis on the western side of the Kouga LM, and near the Van Stadens Estuary on the eastern side.

Threatened and protected plant species recorded on the Custodians of Rare and Endangered Wildflowers (CREW) database occur scattered across the coastal zone, with relatively high concentrations between the Kabeljous and Gamtoos Estuaries, and in the area between Oyster Bay and Cape St Francis.

The Maitland-Gamtoos Important Bird Area occurs just west of the Gamtoos Estuary, extending to the Maitlands Estuary mouth in the east, in the NMBM.

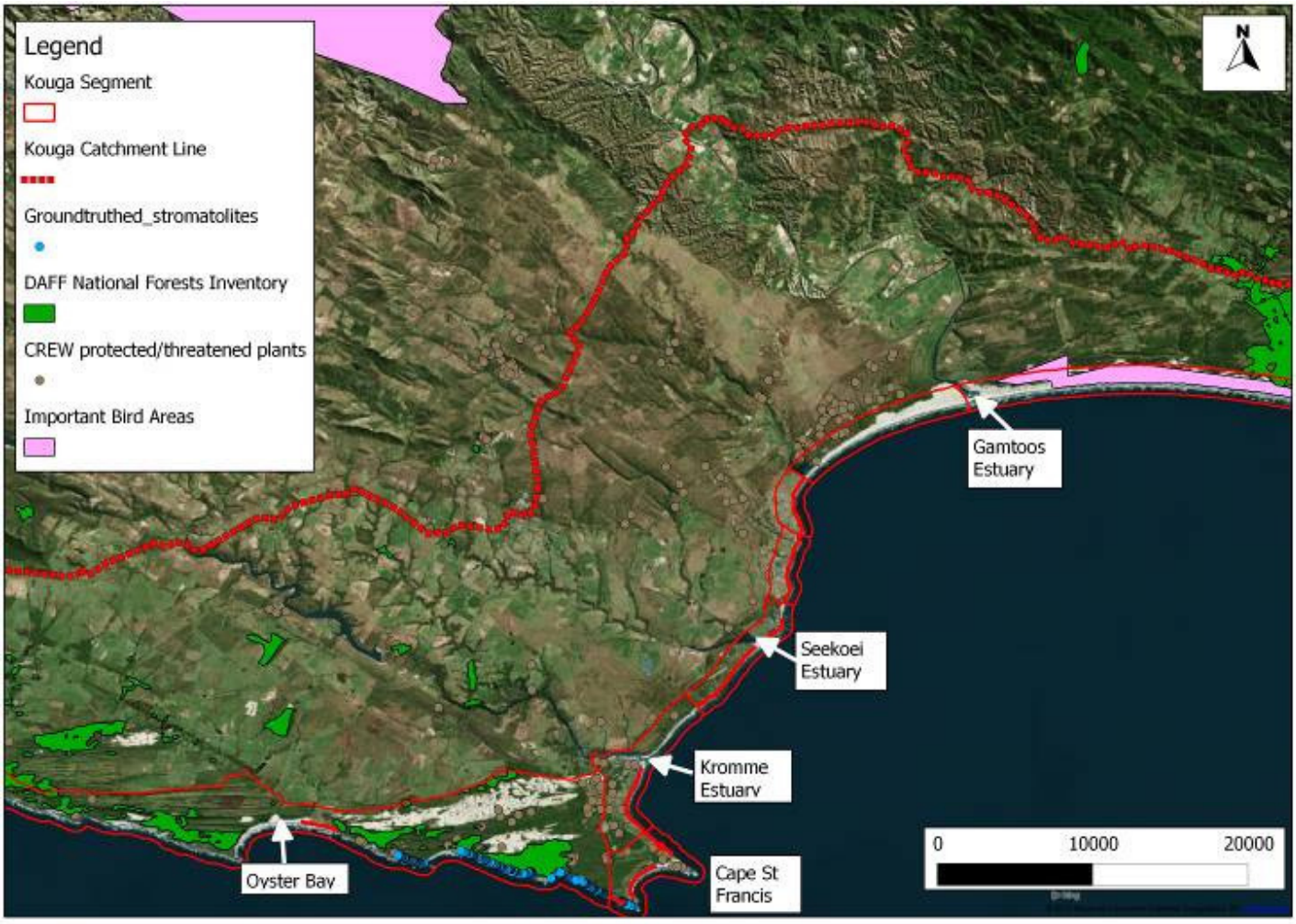


Figure 35: DAFF Forest areas, CREW threatened/protected plants, stromatolites and Important Bird Areas in the Kouga LM coastal zone.

The Garden Route Biodiversity Sector Plan is the finest scale biodiversity plan available for the Kouga LM coastal zone. It covers the area between Tsitsikamma and Aston Bay, stopping just north of Marina Martinique. The East Cape Biodiversity Conservation Plan (2007) would apply to the entire area, but this is currently under revision and the final plan is imminent.

Most of the undeveloped areas in the coastal zone of the Kouga LM are classified as Critical Biodiversity Areas (CBAs) in the Garden Route Biodiversity Sector Plan.

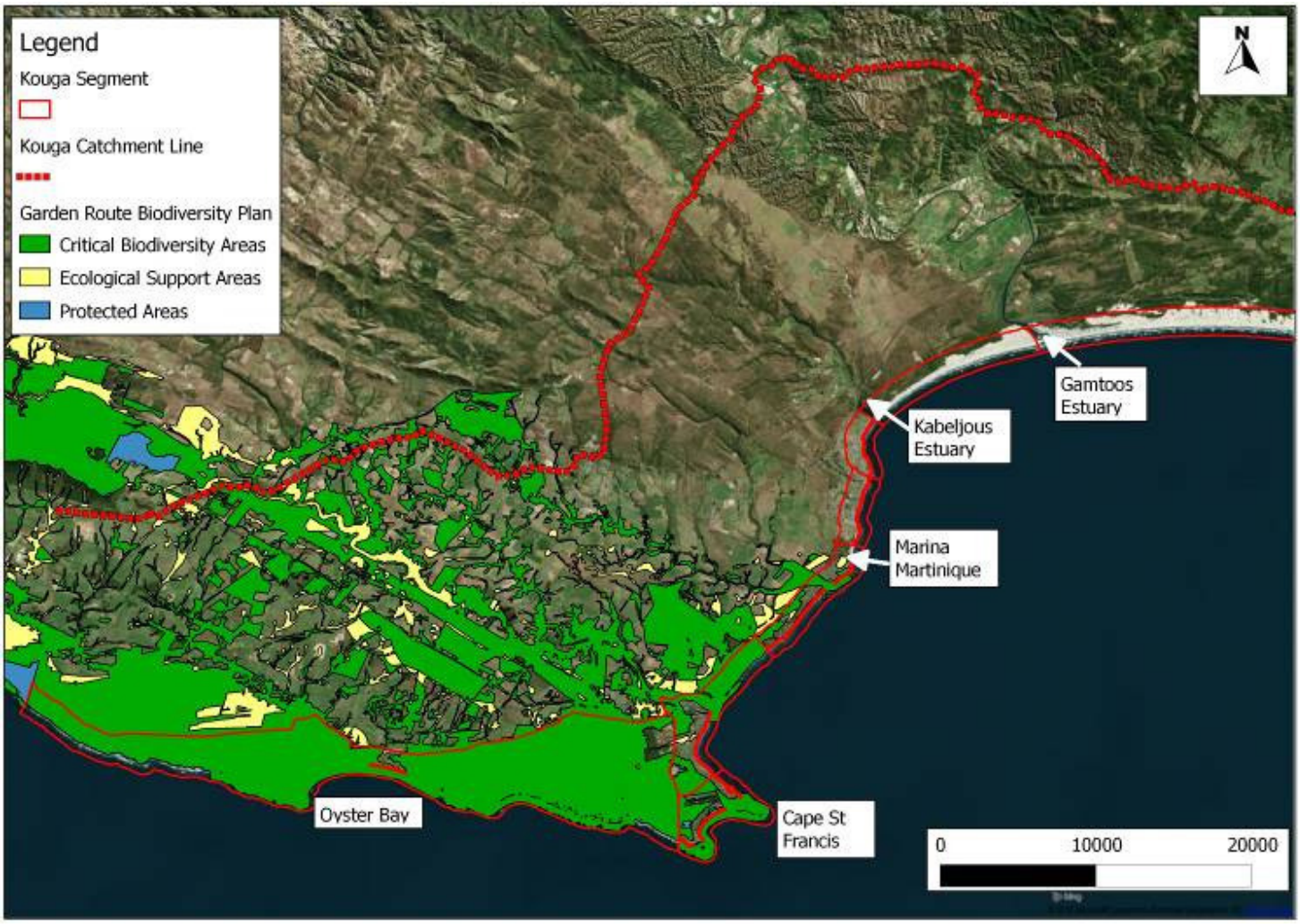


Figure 36: Critical Biodiversity Areas and Ecological Support Areas in the Kouga LM coastal zone (Garden Route Biodiversity Sector Plan).

Protected Areas: there are 12 terrestrial protected areas in the coastal zone, and 1 awaiting proclamation (Rocky Coast Nature Reserve).

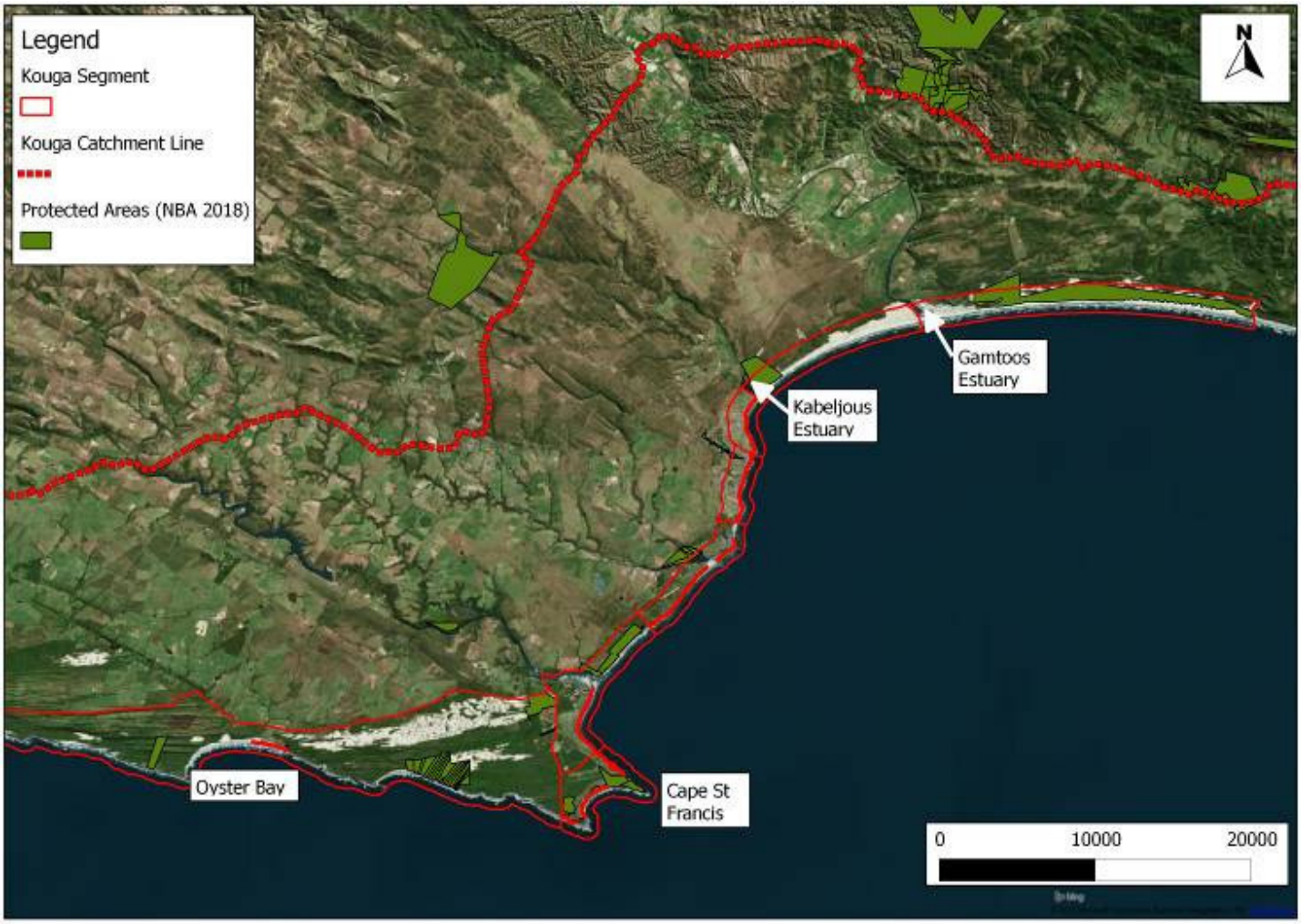


Figure 37: Protected Areas in the Kouga LM coastal zone (NBA, 2018).

Marine Environment:

The benthic and coastal habitat types occurring in the coastal zone, inshore zone and offshore zone; and the respective threat status assigned to the various habitat types are show in Figure 38 to Figure 40.

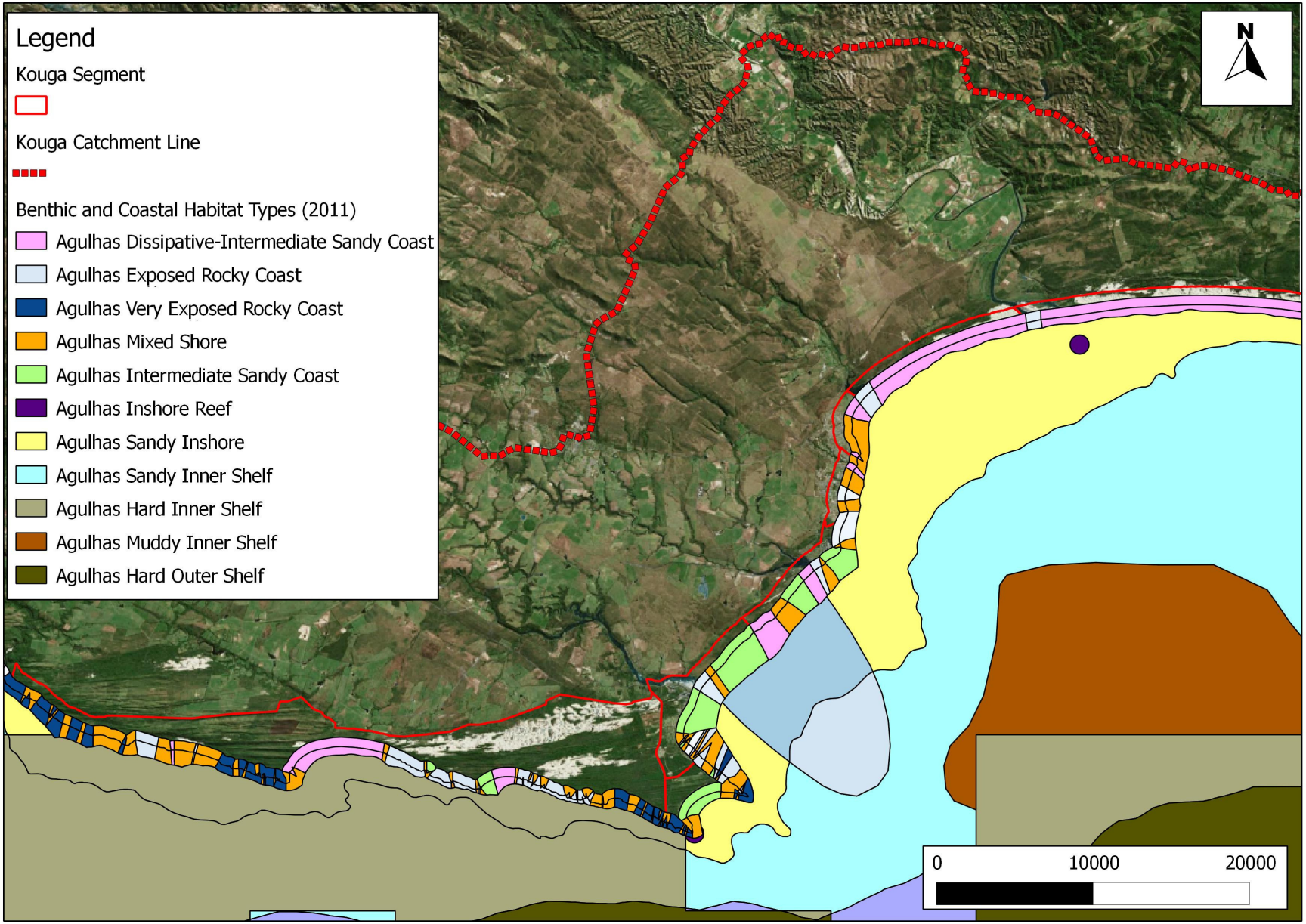


Figure 38: Benthic and coastal habitat types along the Kouga LM coastal zone (coastal and inshore zones).

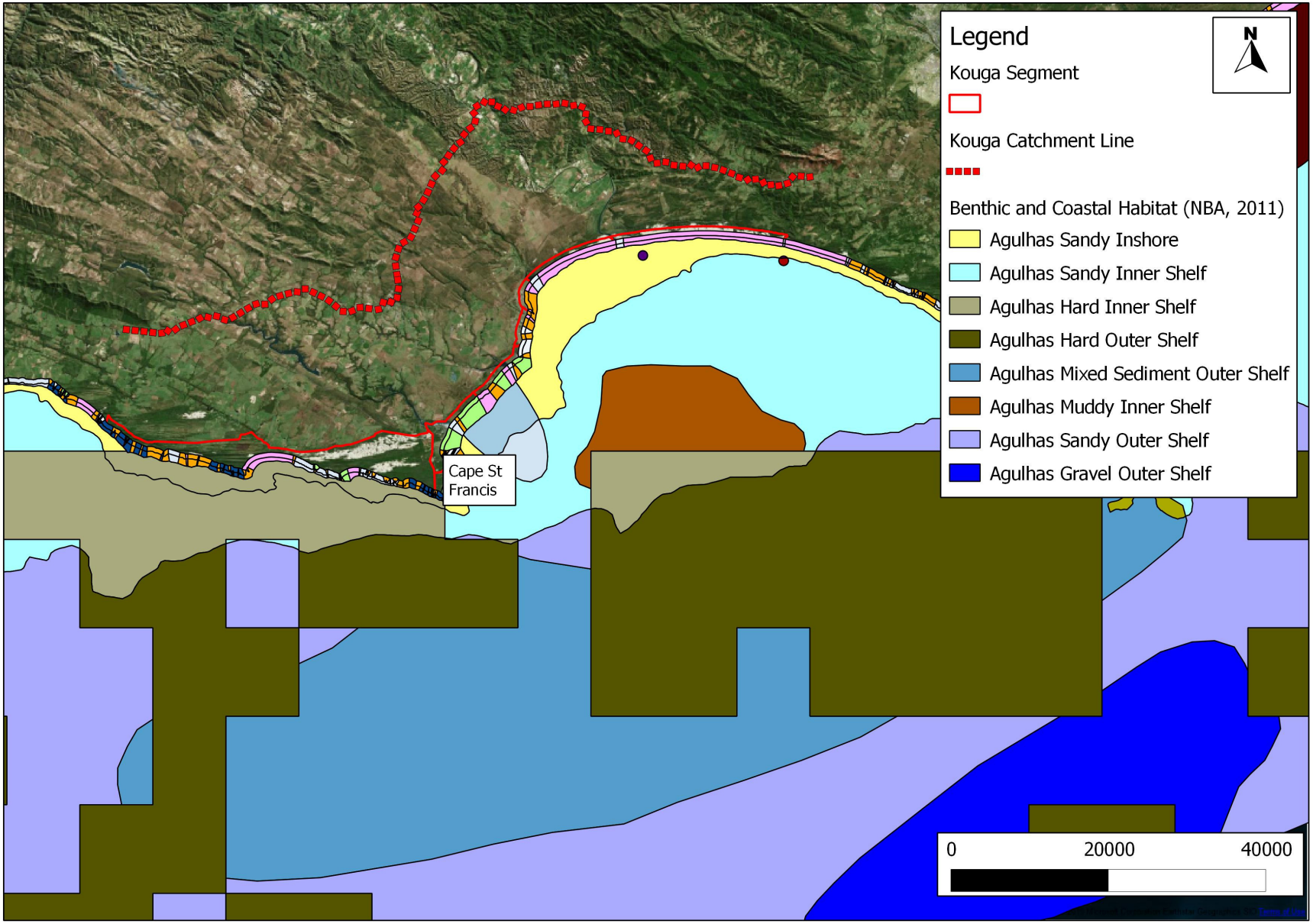


Figure 39: Benthic and coastal habitat types along the Kouga LM coastal zone (inshore and offshore zones).

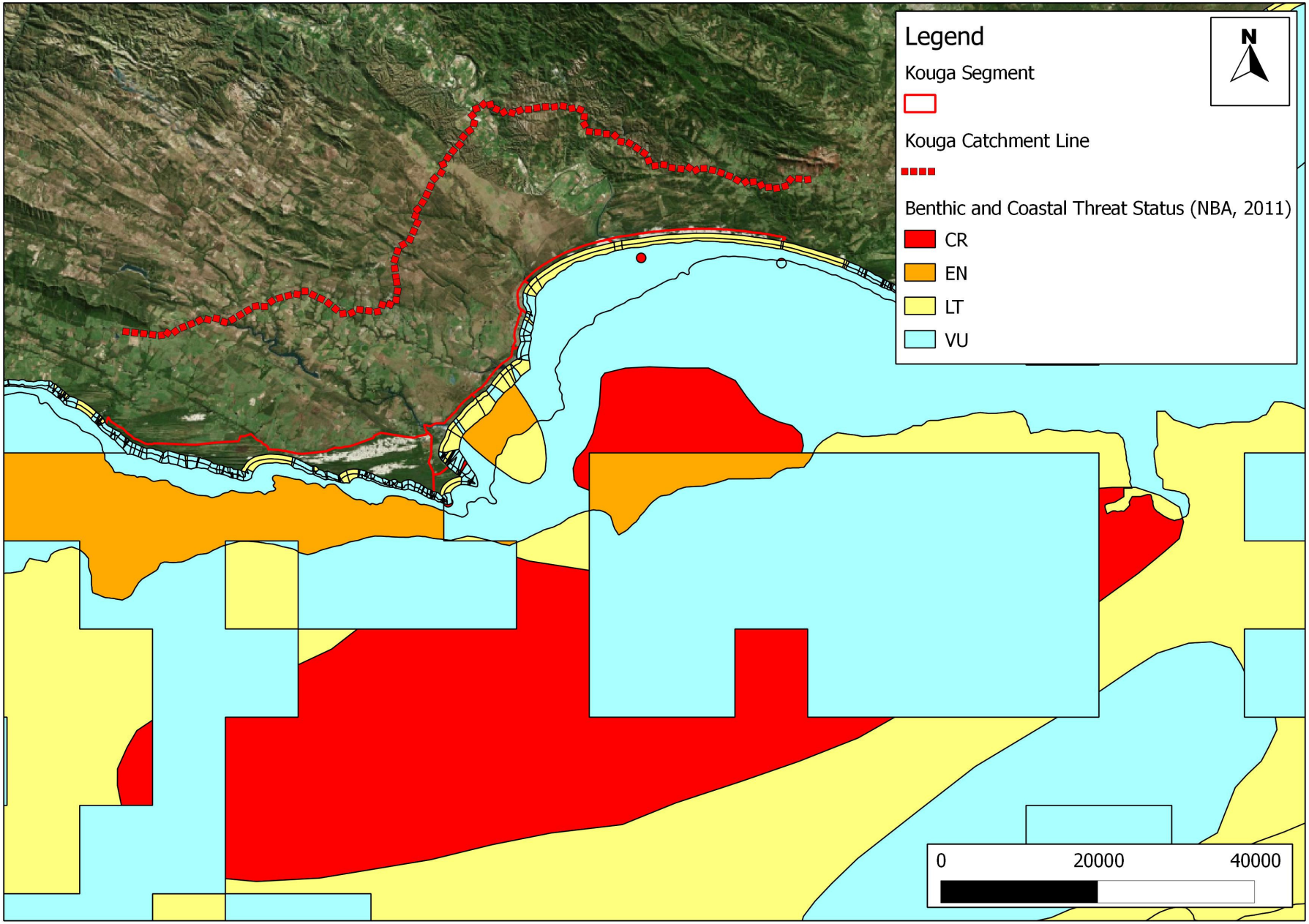


Figure 40: Benthic and coastal habitat types threat status (NBA, 2011).

5.1.2 Coastal Pollution

Coastal pollution includes effluent runoff, seepage or discharge; solid waste, air emissions, lighting, and noise and vibrations.

Effluent runoff, seepage and discharge can be via diffuse overland flow or groundwater seepage, or from point sources discharges (e.g. stormwater outlets or waste water treatment plant outfalls). Pollution along the coastline is a function of activities in the catchment area and not just the area directly adjacent thereto. Predominant land use types in the catchment of the Kouga LM are agriculture (cultivation and dairy), urban development in coastal nodes or towns, and natural or secondary natural areas. Associated pollutants are nutrients and bacteria from farming and domestic sewage, pesticides and insecticides from cultivated lands, high sediment loads from erosion in the catchment, litter and rubble from urban areas, and hydrocarbons from vehicles along access corridors. Sewage discharge also contains hormones and other pharmaceuticals.

Seepage and over flow of sewage from septic tanks, conservancy tanks and poorly maintained and/or over capacity waste water treatment plants and conveyance infrastructure (e.g. sewer lines and manholes) are primary pollution sources to the coastal zone. Solid waste on beaches can be from landward activities that end up on the beach from stormwater discharge, wind, and people littering on beaches. It can also be from boats and ships at sea, especially after strong winds and rough sea conditions where waste is brought on shore and collects along the driftline and in sheltered coves or bays. Industrial development in the coastal zone and its catchment is limited, with some light industrial activities related to agricultural processing and boat building in the St Francis and Humansdorp areas. Heavy metals and other industrial-related pollutants and poor air quality are therefore not expected to be a concern. Sources of light pollution are from chokka boats at sea, and residences in high density urban settlements (e.g. Jeffreys Bay, Aston Bay, Paradise Beach, and Cape St Francis). Noise pollution is concentrated in development nodes, and would be from typical urban activities such as traffic, events, and people. Noise and vibrations at sea that may impact on marine mammals and other species are from engines of fishing vessels, and bathymetric surveys; as well as intensive construction activities in the coastal zone that require blasting for example.

5.1.3 Coastal Development

Major towns within the coastal zone include St Francis Bay and Jeffreys Bay, with several coastal settlements/villages (e.g. Oyster Bay, Cape St Francis, Aston Bay, Paradise Beach, and Gamtoos River Mouth). Humansdorp occurs in the broader

catchment area[2] of the coastal zone. Land uses include agriculture and related processing industries, urban and industrial development, alternative energy (wind farms), conservation, and tourism-related facilities.

The coastal zone of the Kouga LM has significant eco-tourism potential, and offers an array of recreational opportunities as a result of its aesthetic appeal, rich biodiversity and archaeological and heritage resources. Watersports are a major activity, and the St Francis / Jeffreys Bay area has a well-established surf culture with international events. Recreational and commercial fishing are also prime activities along the entire coastline which hosts a diversity of marine species and habitats. The area between Oyster Bay and St Francis is a spawning area for squid (chokka), which is a major (but seasonal) employment activity in the area as well as the hake and pilchard fishing industry. The shoreline includes rocky shores, mixed shores and sandy beaches; providing many options for beach goers, hikers and cyclists to enjoy.

There is good access to popular beaches on the eastern side of Cape St Francis, especially in coastal nodes such as Jeffreys Bay and St Francis Bay. Access points to beaches (e.g. at public parking areas with amenities such as ablution facilities) in coastal nodes are not equally maintained which makes certain sections less utilised and some unsafe. An example is the sandy beach adjacent to the Pellsrus area in Jeffreys Bay.

Access to the coast between the Tsitsikamma Estuary mouth and west of Cape St Francis Point is limited except at Oyster Bay; a function of the physical terrain of the area, a sensitive and important biophysical environment, and land ownership along the coastal zone (i.e. large sections of the landward area comprise farmland and/or protected areas). This section of the coastline is not suited to high density development and its associated pressures, as resonated in the Kouga LM Spatial Development Framework Plan (SDF). Most of the area can be accessed on foot or by bicycle along the coastline and is well utilised by recreational and subsistence fishermen, hikers and cyclists.

The section that follows provides a description of the coastal zone in each of the 3 management themes, and identifies predominant risks/threats and opportunities for the area on a Segment basis. Management recommendations with responsibilities, timeframes, and performance indicators are provided in tabular format at the end of the Chapter.

[2] The catchment area of the coastal zone in the Kouga LM is considered to be from the coastline to the R102/N2, except in the vicinity of the Gamtoos estuary, where it extends further north to the R330.

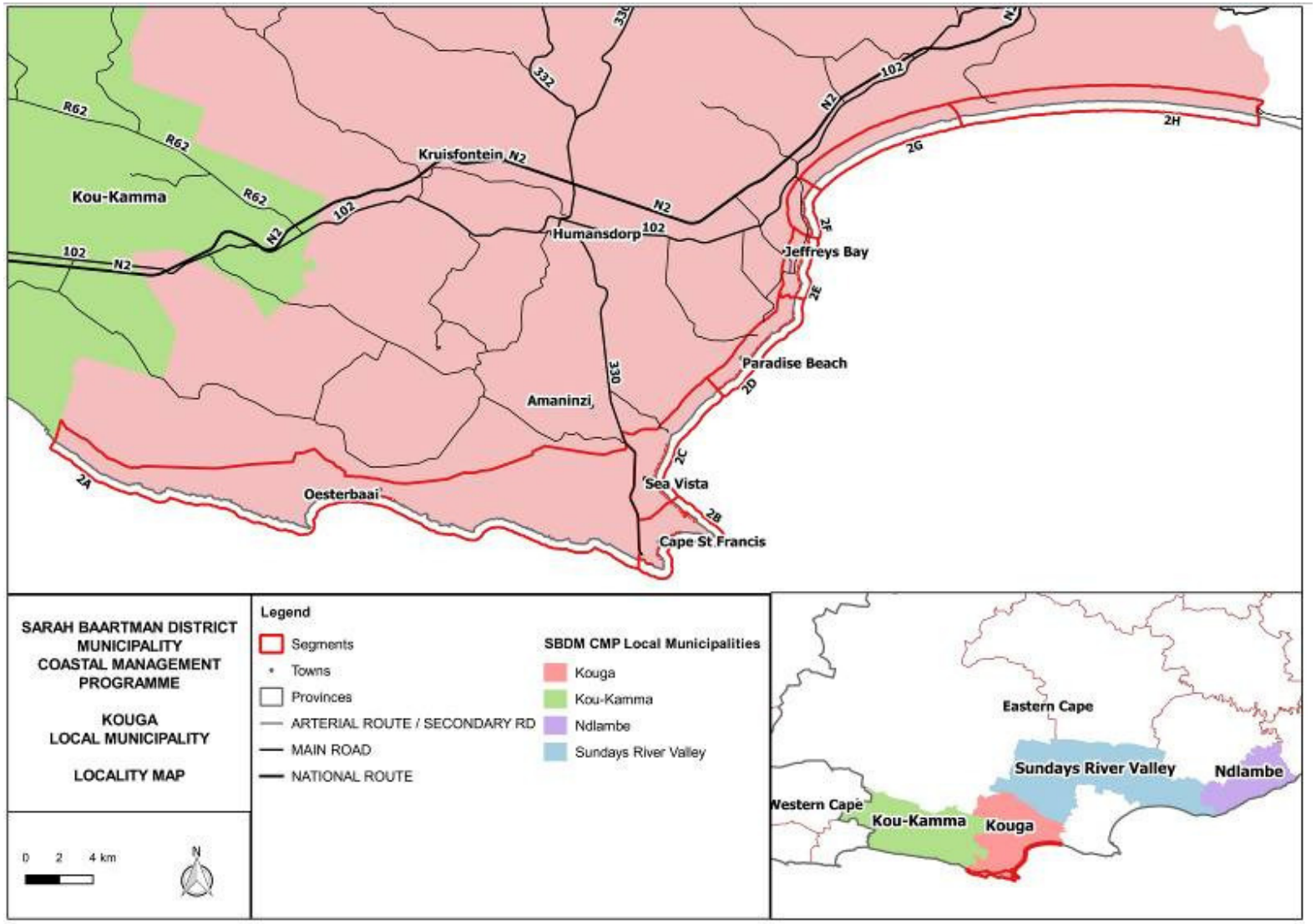


Figure 41: Locality plan of the Kouga Local Municipality showing the 8 segments (2A to 2H) and the extent of the study area covered in this CMPr.

5.2 Segment 2A: East of the Tsitsikamma River mouth to the western border of the Cape St Francis Settlement



Figure 42: Google Earth image of Segment 2A (outlined in red).

Natural, archaeological and cultural diversity and resource management

Description of key coastal habitats/processes/features:

Aquatic environment:

- Most of segment is part of the Tsitsikamma SWSA – surface water.
- NBA aquatic areas (Draft 2018):
  - Identified 4 pans and 2 vleis. However, likely to be far greater number of wetlands in the segment when fine-scale mapping/ground-truthing is done. For example, the Basic Assessment process (Public Process Consultants) and aquatic specialist study (D Vromans) done for the Rocky Coast development (Portions 78 and 79 of the Farm Ongegunde Vryheid No. 746, Cape St Francis) identified 5 coastal seeps, 2 peri-tidal seep and freshwater pools, and 8 inter-dunal wetland depressions.
  - Two rivers: Tsitsikamma and Klipdrif. However, at least 18 watercourses that drain into the marine environment are indicated on the 1:50 000 watercourse layer
- Stomatolites occur from Thyspunt to Cape St Francis
- Three estuaries (warm temperate):
  - Tsitsikamma Estuary: lower reaches are protected in the Huisklip Local Authority Nature Reserve. The ecological water requirements of the estuary have been determined. The Ecological Category of the estuary is rated as 'B', with the health condition of microalgae being 'fair', macrophytes, invertebrates and fish being 'good', and birds 'excellent'. The Biological State and mean Estuary Health State are both rated as 'good'. The estuary requires full protection, and a 'B' ecological category is recommended (Van Niekerk and Turpie, 2012).
  - Klipdrif Estuary: The Ecological Category of the estuary is rated as 'D', with the health condition of microalgae, macrophytes, invertebrates, fish and birds being 'fair'. The Biological State and mean Estuary Health State are both rated as 'fair'. A 'D' ecological category is recommended (Van Niekerk and Turpie, 2012).
  - Slang Estuary: The Ecological Category of the estuary is rated as 'D', with the health condition of microalgae, macrophytes, invertebrates, fish and birds being 'fair'. The Biological State and mean Estuary Health State are both rated as 'fair'. A 'D' ecological category is recommended (Van Niekerk and Turpie, 2012).

Terrestrial environment:

- VEGMAP (2018) Vegetation types: St Francis Dune Thicket, Southern Cape Dune Fynbos, Cape Seashore vegetation, Tsitsikamma Sandstone Fynbos
- Threatened Ecosystems (2011): none identified
- Forests: relatively large areas of the Segment are identified on DAFF's forest inventory as 'Southern Cape Afrotemperate Forest'
- Garden Route Initiative: almost the entire Segment is classified as a CBA. The land management objective is to maintain natural land, and to rehabilitate degraded land to natural or near natural land, and manage it for no further degradation.
- Threatened/protected plant species:
  - CREW database: large number of threatened plants have been recorded in the Segment, particularly in the Oyster Bay and Cape St Francis.
  - A cluster of *Aspalathus recurvispina* (critically endangered) was recorded in the vegetation specialist study done by Grobler (2018) for the Rocky Coast development.
- Dunefields:
  - Oyster Bay and Thysbaai dunefield: Mobile headland bypass dunefields in SW-NE orientation that transport marine sediment overland from Oyster Bay and Thysbaai to St Francis Bay, where sand enters just south of the Kromme Estuary mouth. Sand is transported by wind and water (as debris flow). Sand movement has been obstructed by development, and stabilisation of dunefields (e.g. by alien vegetation). These are the last two remaining examples of active large-scale mobile headland-bypass dunefields on the south coast of South Africa
  - High water table causes substantial interdune depression wetlands that form after rainfall.
  - Dune systems host Late Stone Age middens, and Early and Middle Stone Age implements have been found on fossil dunes in the area (McLachlan *et. al.*, 1994).

Protected Areas, Conservation Areas, and Stewardship Sites:

- Four PAs – Oyster bay PNR, Rebelsrus PNR, Franscois and Anelle Marits PNR and Sand River PNR. Rocky Coast Nature Reserve – in process of being formally declared a PA
- Conservation Areas: majority of the Segment is part of the Garden Route Biosphere Reserve, which extends from just east of Groot Brak in the west to the Van Stadens Estuary in the east
- Stewardship Sites: parts of the Sand River PNR

Archaeology and cultural diversity: A large number of archaeological sites have been identified on the SAHRIS database, especially between Oyster Bay and Cape St Francis, comprising predominantly middens, burial sites and stone tools.
Stone tools dating back between 200 000 to 1 000 000 years ago can be found in the vicinity of Thysbaai west of Seal Point, and in the extensive headland bypass dunefields between Oyster Bay and St Francis Bay. The area was inhabited by the Khoi and the San people in the last 10 000 years, as is evident from shell middens along the coast (Binneman, 1985).

Summary of archaeological importance of the Thypsunt area (The Heritage Portal, 2016):

- The Thyspunt area is regarded as a "Cultural Landscape" as defined by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) World Heritage Convention. The significance of the cultural landscape relates mainly to its superb natural heritage, pre-colonial heritage, setting and contribution to the wilderness qualities of the region
- The area is regarded as significant in terms of Late Stone Age pre-colonial archaeology, in particular the large quantity and variety and size of shell middens. Many of the middens are very well preserved and are in themselves archives of information about the identity and behaviour of pre-colonial people, as well as the environment in which they lived.
- While shell middens are relatively common, undisturbed middens are becoming increasingly rare. The large number of well-preserved middens is considered significant.
- The Late Stone Age heritage of the area is directly linked to the heritage of South Africans who are alive today. A high proportion of the middens are less than 2 000 years old, are pottery rich and associated with a time when Khoekhoen herders predominated the area.
- The Middle Stone Age and Early Stone Age material found on the fossil dunes is of potential scientific importance, especially if it is preserved *in situ* on palaeosols deep under shifting dunes in association with fossil bone. The potential exists for rare early human remains to be found in association.
- The St. Andrews Shack has living heritage and traditional significance.

Shipwrecks:

- President Reitz (1947), Panaghia (1938).

Resource use harvesting:

- Offshore petroleum and gas exploration polygon
- Commercial fisheries: Area between Oyster Bay and St Francis is a spawning area for squid (chokka), which is a major employment activity in the area as well as the hake and pilchard fishing industry
- Recreational fishing and bait collection



Figure 43: Overview of the mobile headland bypass dunefields between Oyster Bay and St Francis Bay.

Threats to natural/archaeological/heritage resource management:

- Informal access (pedestrian and vehicular) through dunes (vegetated and unvegetated): causes erosion and blow outs – especially in the village of Oyster Bay.
- Alien vegetation encroachment in coastal dunes: binds sand and reduces supply via headland bypass dunefields to St Francis Bay, uses groundwater, increases the risk of fire occurring, and the intensity of fires when they do occur, impacts on terrestrial biodiversity
- Oyster Bay village development in headland-bypass dunefield system:
    - Development in dynamic process areas – disruption of sand movement corridor
    - Cut off of sand supply across headland bypass dunefields to St Francis Bay, with beach erosion in the downwind bay
    - Development in sensitive archaeological area: destruction of artefacts
- Development of numerous residences along the coastline on private farms/reserves between Tsitsikamma and Cape St Francis – residences and access tracks often built in sensitive archaeological areas and biophysical environment. There appears to be inconsistent application of development guidelines/regulations along this section of coast.
- Ongoing development pressure in existing coastal nodes, and associated risk of destruction of coastal biodiversity and important archaeological and cultural/heritage sites if incorrectly positioned.
- Over-fishing/uncontrolled harvesting of coastal species by commercial operators, and recreational users
- Tsitsikamma Estuary: change in flow and pollution are considered medium pressures, and habitat loss low. Fishing effort is low. Bait collection occurs (Van Niekerk and Turpie, 2012).
- Klipdrif Estuary: change in flow, pollution and habitat loss are considered medium pressures. Fishing effort is low. Bait collection occurs (Van Niekerk and Turpie, 2012)
- Slang Estuary: change in flow, pollution and habitat loss are considered medium pressures. Fishing effort is low. Bait collection occurs (Van Niekerk and Turpie, 2012)
- Stromatolites required freshwater seepage – changes to natural groundwater flow regime and groundwater quality could impact on their formation and persistence.

Opportunities for natural/archaeological/heritage resource management:

- Development pressure / habitat modification in the coastal zone is relatively low and concentrated in development nodes. Opportunity to control development and limit environmental impact by applying and following regulatory processes
- A relatively large section of the segment is protected and/or occurs in conservancies and/or stewardship sites. Almost the whole Segment is part of a CBA.
- The coastal zone rich in archaeology and cultural/heritage and biodiversity, and is visually appealing. This presents opportunities for low impact, eco-tourism development if well managed.
- Diversity of habitats and relatively unspoilt coastal environment provides good opportunities for recreational use.
- Wind farm developments have socio-economic investment programmes for previously disadvantaged communities in the area
- Active environmental community groups in the area: i.e. Botanical Society, FOSTER



Figure 44: Overview of some of the existing informal footpaths (A to N) to the beach in the village of Oyster Bay. Sand management measures have already been put in place near 'A' and between 'L' and 'M'.

Coastal Pollution

Description and assessment (refer to Figure 45**):**

Catchment land use/land cover type:

- Predominantly agriculture and natural areas. Agriculture is considered to present a medium pollution risk
- Runoff from agriculture / groundwater flow to the coast: elevated nutrients and bacterial load from cattle manure.

Activities in the Segment:

- Land use/land cover type: predominantly natural area, with the urban node of Oyster Bay, and residences along the coast between the Tsitsikamma River and Oyster Bay, and the Rebelsrus area:
    - Seepage of sanitation effluent from septic tanks / conservancy tanks to the coastal zone presents a medium pollution risk, particularly where residences are situated close to the high water mark of the sea. Effluent may contain elevated nutrients, and pathogens.
- The coastline is used by hikers and cyclists, mostly accessing the trails at Cape St Francis and moving in a westerly direction. There are no ablution facilities at access areas in Cape St Francis or along the route.
- Solid waste: from ships/boats along coastline, and from landward domestic activities that end up on the beach via wind and surface runoff (especially stormwater outlets).
- Does muni remove solid waste from domestic areas?
- The St Francis Bay area is considered to be a high risk area for oil pollution from spills from ships/boats at sea
- Noise:
    - landward noise from general residential activities is regarded as low impact due to the small settlement and seasonal occupancy.
    - engines from fishing vessels
- Light pollution:
    - from residences along the coast, but regarded as low impact because of relatively low density development (apart from Oyster Bay village)
    - from chokka boats at sea

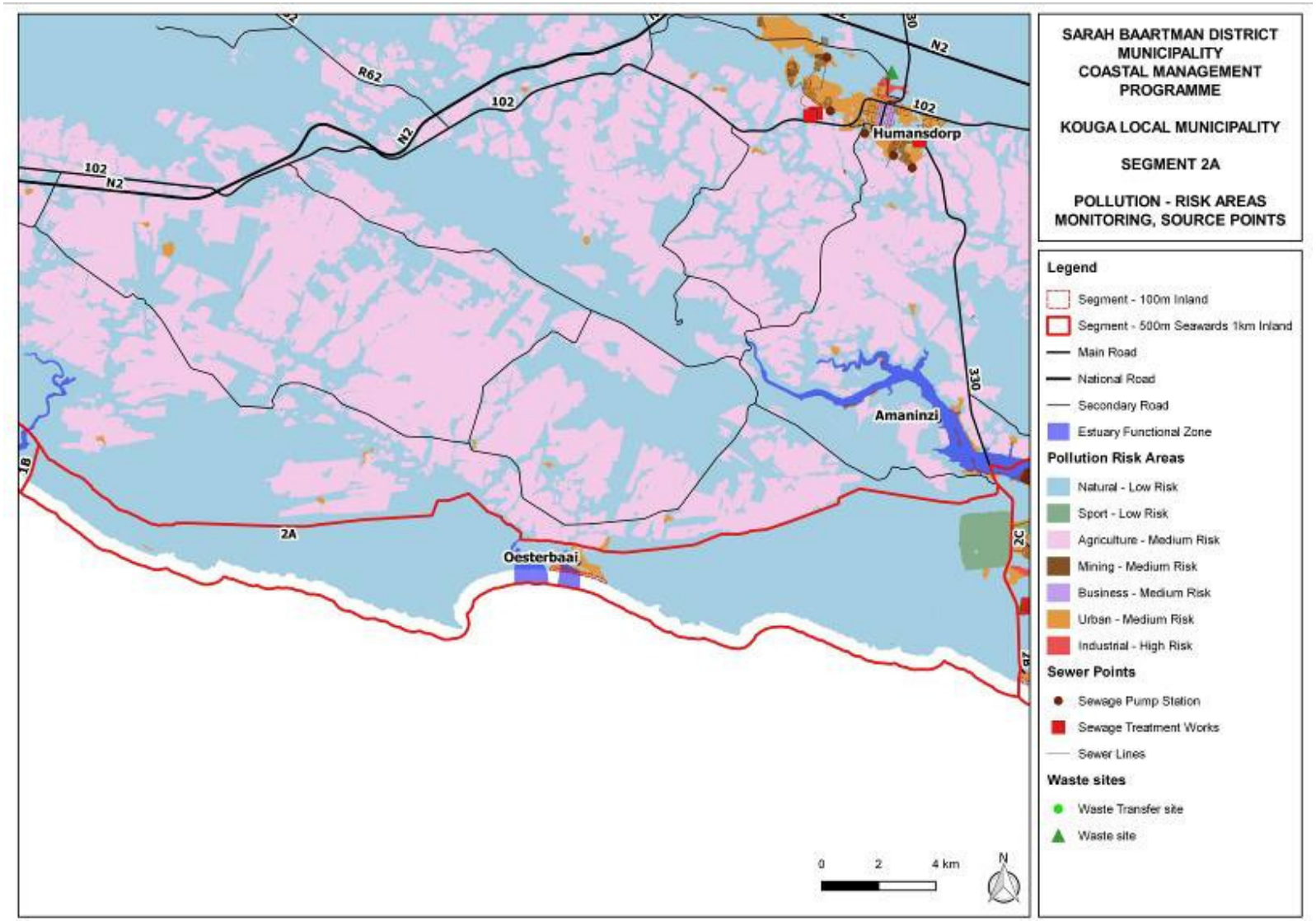


Figure 45: Pollution risk areas in Segment 2A based on land cover type and anticipated pollution risk, and known (based on available data) point sources of potential pollution.

Coastal Development

Description and Assessment:

- Recreational activities: fishing, cycling and walking trails, bird watching
- Existing land use/land cover types (refer to Figure 46):
  - Private coastal residences
  - Coastal nodes/settlements: Oyster Bay
  - Renewable energy projects – Gibson Bay and Kouga Wind Farms, Oyster Bay Wind Energy Facility
- Access to the coast:
  - Access by road at Oyster Bay
  - Access to the coastal zone between Cape St Francis and Oyster Bay is limited except on foot or by bicycle along the coastline from Cape St Francis.
  - Access to the coastal zone between Oyster Bay and the Tsitsikamma estuary is significantly limited to the general public
- Future development / desired spatial form
  - Kouga LM SDF (2015): Oyster Bay identified as a Rural Node, with sustainable rural development in the area surrounding the village. Thyspunt is considered to be a 'key focus area' for future development intensification
  - The DEDEAT issued a Directive in terms of Section 30A of NEMA for the SBDM to implement various drought mitigation projects so that the local municipalities can provide adequate water supply. Projects included in the Directive are approved in terms of the EIA Regulations, but approvals (if required) i.t.o. other legislation or regulations must still be obtained (e.g. Water Use Authorisations under the National Water Act, Forest Licence under the National Forest Act). The following projects are included in the Oyster Bay area:
    - A condition assessment of 2 existing boreholes, and refurbishment and re-commissioning (if possible)
    - Expansion and development of the existing borehole field around Oyster Bay. Equipping boreholes with pumps, and installation of conveyance infrastructure to connect boreholes to water treatment works
    - Install and commission a 1 Ml desalination plant at Oyster Bay. Note that desalination plants are seen as temporary interventions. Permanent facilities will need to be assessed by specialist studies and dispersion modelling, and may not operate without a Coastal Waters Discharge Permit from DEA: Oceans and Coasts (i.t.o. the NEM: ICMA)
    - Develop existing groundwater / springs at Rebelsrus and Mostertshoek, re-equip two springs with pumps. Replace and repair existing conveyance infrastructure damaged by fire
  - Environmental Impact Assessment process initiated for the Rocky Coast development on Ptn 78 and 79 of Farm Ongegund Vryheid No. 746
- Thuyspunt Nuclear Power Plant site included in segment. Owned by ESKOM for possible future power plant. The Kouga SDF makes recommendations for land use within the 5 km and 16 km radius of the site (note that the nuclear power plant was received environmental refusal from the DEA).
  - Any proposed changes to current land uses, in terms of standard rezoning procedures within the 16km monitoring and emergency zone, must be brought to the attention of Eskom Nuclear Sites Department at Koeberg Nuclear Power Station, for their consideration and comment
  - Urban expansion of Oyster Bay and Umzamowethu, which falls within the 0-5km zone should not be permitted
  - Institutional land uses such as prisons, old age homes and hospitals that may result in the concentration of a resident population should not be developed within 16km of the Thuyspunt site, because of potential evacuation difficulties.
  - No new food processing plants to be allowed to be developed within the 16km.
  - Agricultural activities to be monitored within 16km
- Kouga LM SDF identifies following development needs for Oyster Bay area:
  - Expand commercial activity in the vicinity of the community hall to promote sustainability and improved urban form.
  - Location of proposed new school, commercial activity and access corridor to Umzamowethu to form new focal point
  - Areas identified to accommodate housing demand in Umzamowethu, with specific reference to the municipal area north of Umzamowethu and privately owned land between Umzamowethu and the Oyster Bay access road

- Development issues/risks:
  - Oyster Bay:
    - Development of the coastal village in a dynamic process area (i.e. Oyster Bay Mobile headland bypass dunefield): sand inundation into the Slang Estuary, over residences, community facilities, roads and infrastructure.
    - Dune movement into the Slang Estuary caused the channel to move to the east, with resultant flooding and destruction of public amenities (e.g. ablution facilities), erosion of public open space used for parking at the western end of Brander Street, and erosion of private properties.
    - Wheelchair-friendly pedestrian access and controlled vehicular access to the beach needs to be reinstated (Illenberger, 2014)
    - Development of the village cut off of sand supply from Oyster Bay and Thysbaai to St Francis Bay, causing erosion of beaches in the downwind bay (i.e. at St Francis Bay). Impacts on public facilities (e.g. beach parking and ablution facilities), recreational use, tourism potential and property values. Expensive interventions are needed to protect landward structures and infrastructure from coastal erosion.
    - Informal pedestrian foot traffic to access the beach – trampling of vegetation exacerbates the risk of coastal erosion, and the likelihood of sand inundation of structures.
  - Development in proximity to the high water mark of the sea and/or in dynamic coastal process areas (e.g. dune corridors, coastal protection zone): disrupts sediment dynamics and leads to coastal erosion, sand deposition in public areas (e.g. car parks) that requires ongoing maintenance, and presents risks to landward development from storm surges associated with climate change. The latter results in coastal protection measures being implemented (largely on an ad hoc basis by individual landowners) which often worsens the problem by placing hard structures in dynamic areas.
  - Coastal access is limited (except at Oyster Bay village), especially by vehicle.

- Opportunities:
  - A dune management plan was done by Illenberger (2014) that addressed two aspects: removal of dunes encroaching on the Slang Estuary from the west and repairs to the area damaged by floods in 2011/2012 with dune stabilisation; and removal of the dune encroaching along Brander Street, private erfs along the landward side of Brander Street and Public Open Space on the seaward side of Brander Street and dune stabilisation to re-instate a coastal dune ridge along Brander Street. The plan recommended that dune management will be ongoing, and that sand removal will probably need to be done on a 10 yearly basis. Dune sand must be removed when the base of the dune ridge advances to within 10 m of Brander Street. The plan further recommended that the Slang channel will need to be moved to the west every few decades if this does not happen naturally (Illenberger, 2014). Environmental authorisation in terms of the EIA Regulations was needed to implement the recommendations, and a Basic Assessment application was submitted to the DEDEAT by Frank Silberbauer Consulting in 2014.
  - The Kouga LM has secured R20 million funding through the DEA's Environmental Protection and Infrastructure Programme (EPIP) for dune rehabilitation and coastal upgrades at St Francis Bay and Oyster Bay. Work in Oyster Bay will likely include creating vegetated berms and a protection wall to mitigate the risk of shifting dunes burying nearby houses and infrastructure, as well as establishment of ablution facilities and a mobile lifeguard tower at the beach, and a playground (Kouga Express, 2018).
  - Existing windfarm developments provide funding and support for community development in the area
  - Natural and archaeological/cultural/heritage environment and its rich diversity has significant tourism potential; as well as recreational, aesthetic and spiritual value to the local community
  - Established chokka fishing industry

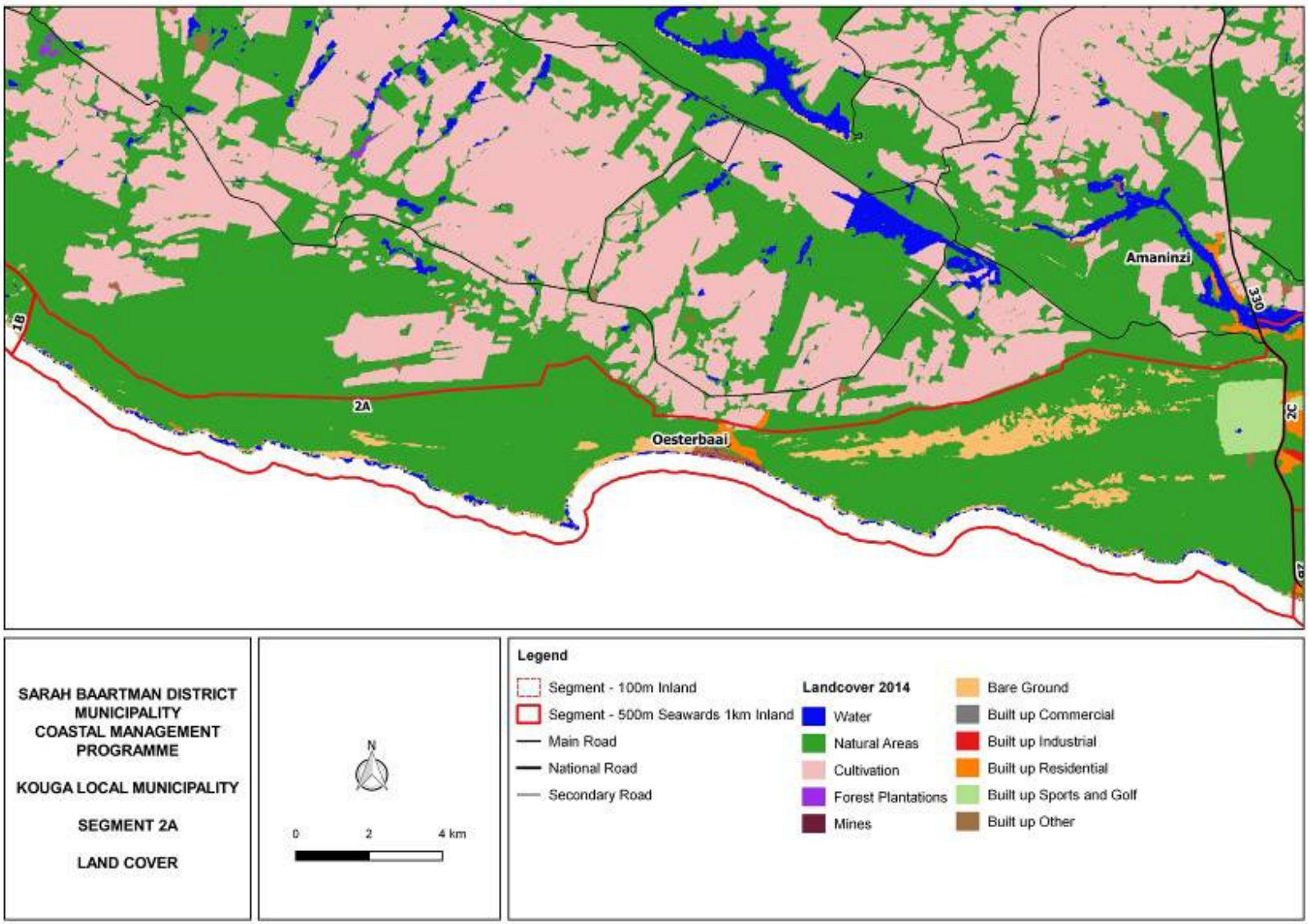


Figure 46: Land Cover map for Segment 2A (note that cattle rangelands are included under 'natural areas', and 'bare ground' is dunes).



Figure 47: Aerial images of Oyster Bay in 2013 and 2018 showing changes in dune and estuary dynamics in the area that was flood damaged by the Slang Estuary in 2011/2012, and after dune rehabilitation measures used.



Figure 48: Aerial images of Oyster Bay in 2013 and 2018 showing dune advancement in a NE direction.

5.3 Segment 2B: The western border of Cape St Francis Settlement to Romazini Valley

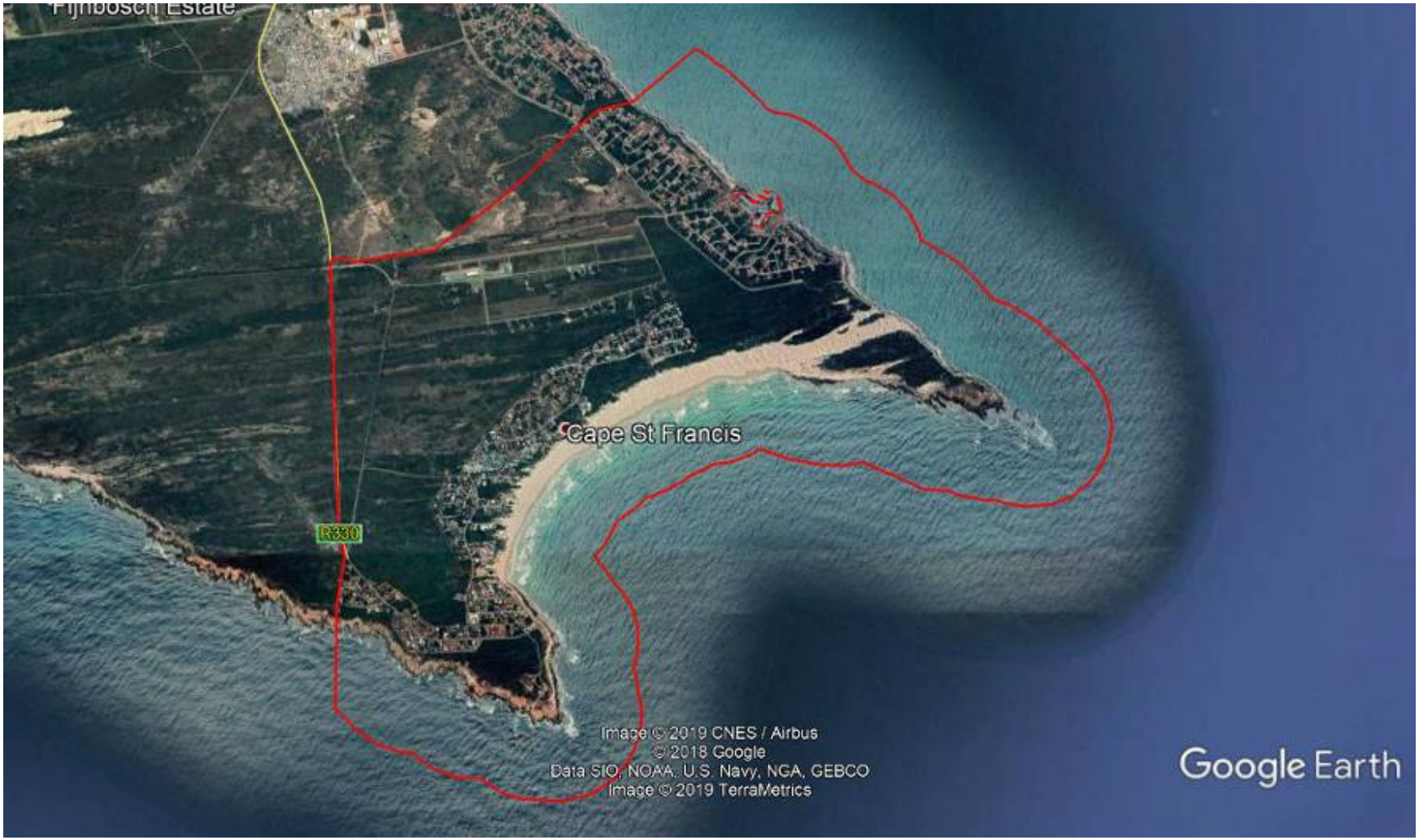


Figure 49: Google Earth image of Segment 2B (outlined in red).

Natural, archaeological and cultural diversity and resource management

Description of key coastal habitats/processes/features:

Aquatic environment:

- NBA aquatic areas (Draft 2018):
  - No wetlands and watercourses have been identified in the NBA. However, it is highly likely that wetlands will be identified in the segment when fine-scale mapping/ground-truthing is done. For example, the aquatic specialist study (B Colloty) done for the Basic Assessment process for the upgrades to the St Francis WWTW identified a number of ephemeral wetlands in the area surrounding the WWTW, that are part of inter-dune slack depressions.
- Stromatolites along the SW side of Seal Point

Terrestrial environment:

- VEGMAP (2018) Vegetation types: St Francis Dune Thicket, and Cape Seashore vegetation
- Threatened Ecosystems (2011): none identified
- Garden Route Initiative: all areas where the natural habitat has not been modified are classified as a CBA. The land management objective is to maintain natural land, and to rehabilitate degraded land to natural or near natural land, and manage it for no further degradation
- Threatened/protected plant species:
  - CREW database: threatened plants have been recorded in the Segment, predominantly in the northern and eastern sections, on the landward side of the Port, and at the Point.
- Dunefields:
  - Headland bypass dunefield over Cape St Francis point (mobile), and fixed retention ridge between Seal Point and Cape St Francis Point ('Shark Point'). Of the Oyster Bay, Santareme and Shark Point dunefields, only the latter is still operational supplying 7000 m^3 per year of sand to St Francis Bay (less than 10% of the pre-stabilisation sand supply is reaching St Francis Bay) (McLachlan *et. al.*, 1994).

Protected Areas, Conservation Areas, and Stewardship Sites:

- 4 Protected Areas: Irma Booysen Flora Reserve, Seal Point Local Authority Nature Reserve, Seal Bay Local Authority Nature Reserve, Cape St Francis Provincial Nature Reserve
- De facto Nature Reserve: Lighthouse Nature Reserve
- Conservation Areas: majority of the Segment is part of the Garden Route Biosphere Reserve, which extends from just east of Groot Brak in the west to the Van Stadens Estuary in the east

Archaeology and cultural diversity:

Archaeological sites have been identified in the Seal Point area (burial sites and middens).
Historical structures: Cape St Francis Lighthouse (1878)
Shipwrecks: Cape Recife (1929), Barcelona (1867) and Genesis.

Resource use harvesting:

- Recreational fishing and bait collection
- Commercial fisheries: Area between Oyster Bay and St Francis is a spawning area for squid (chokka), which is a major employment activity in the area as well as the hake and pilchard fishing industry
- Offshore petroleum and gas exploration polygon

Threats to natural/archaeological resource management:

- Informal pedestrian access over dunes (vegetated and unvegetated) to the beach: erosion, blow outs
- Alien vegetation encroachment in coastal dunes: binds sand and reduces supply via headland bypass dunefields to St Francis Bay, uses groundwater, increases the risk of fire occurring, and the intensity of fires when they do occur, impacts on terrestrial biodiversity
- Urban settlement expansion – loss of biodiversity (terrestrial and aquatic).
- Dune thicket mosaic vegetation type naturally occurring in the area requires fire for diversity and persistence – development interferes with the natural fire regime (i.e. fire is either precluded, or burns unseasonably, or at higher temperatures). A changed fire regime is generally at the expense of fynbos, and can cause bush encroachment and reduced diversity.
- Inappropriately placed development in coastal process areas – disrupts sediment dynamics, and results in coastal erosion
- Development in sensitive archaeological areas: destruction of artefacts
- Over-fishing/uncontrolled harvesting of marine resources by commercial operators, and recreational users

Opportunities for natural/archaeological resource management:

- Coastal zone rich in archaeology and biodiversity, and visually appealing – opportunities for low impact eco-tourism development
- A relatively large section of the segment is protected, particularly between Seal Point and Shark Point
- Active community groups / organisations in area that help with coastal management (e.g. FOSTER, WESSA, Conservation Outcomes, St Francis Property Owners, Botanical Society)

Coastal Pollution

Description and Assessment (refer to Figure 50**):**

Catchment land use/land cover type:

- Predominantly agriculture and natural areas. Agriculture is considered to present a medium pollution risk
- Runoff/groundwater flow from agricultural areas to the coastal zone: possible elevated nutrients and bacterial load from agricultural activities.

Activities in the Segment:

- Land use/land cover type: urban node of Cape St Francis and the Port development area, agriculture, and natural areas. Urban and agricultural land cover types are considered to present a medium pollution risk to the coastal zone.
- Sanitation effluent (may contain elevated nutrients and pathogens):
    - Seepage of sanitation effluent from septic tanks / conservancy tanks at residences that are not on the municipal bulk sanitation system presents a medium pollution risk, particularly where residences are situated close to the high water mark of the sea.
    - The St Francis Bay waste water treatment plant is situated in Segment 3, and is currently being upgraded and expanded. Treated effluent will be released to a tertiary wetland for further polishing, before entering the surrounding environment. Treated effluent would migrate through the sands and the shallow groundwater zone towards the coastal zone.
    - Leaks/overflow from bulk sewer lines and pumpstations that service residences near the Port.
- A closed landfill site is situated in Segment 3. The site has not yet been rehabilitated. Seepage of contaminants from buried waste may contain nutrients, metals, and pathogens. This would also migrate through sands and the shallow groundwater zone to the coast.
- Beaches in Cape St Francis are well utilised during peak season, and in the winter months because of good surfing conditions. The coastline is also well used by hikers and cyclists. There are insufficient ablution facilities in the segment, and those that exist need to be maintained.
- Waste: from ships along coastline, and from landward domestic activities that end up on the beach via wind and surface runoff (especially stormwater outlets). The closest solid waste disposal site is in Humansdorp, which increases the risk of dumping
- The St Francis Bay area is considered to be a high risk area for oil pollution from spills from ships/boats at sea.
- Boats in Port St Francis: hydrocarbon leaks/spills from engines
- Organic waste / effluent from fish factories in the Port.
- Noise:
    - landward noise from general residential activities is regarded as low impact due to the small settlement and seasonal occupancy.
    - engines from fishing vessels.
    - recreational aircraft at the St Francis landing strip
- Light pollution:
    - from residences along the coast, but regarded as low impact because of relatively limited development area.
    - from chokka boats at sea

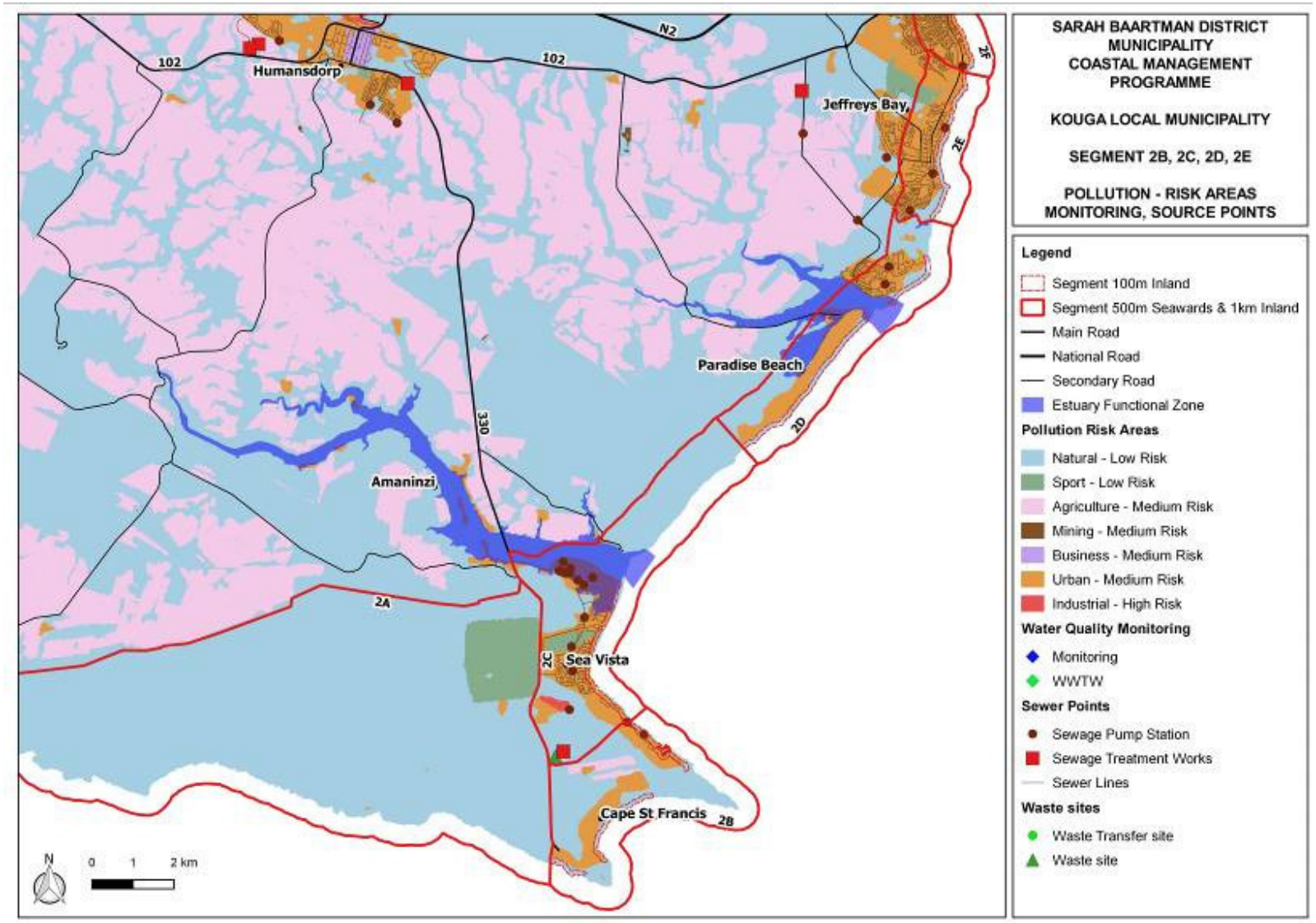


Figure 50: Pollution risk areas in Segments 2B to 2E based on land cover type and anticipated pollution risk, and known (based on available data) point sources of potential pollution.

Coastal Development

Description and Assessment

Recreational activities: surfing, fishing, cycling and walking trails, bird watching

Existing land use/land cover types (refer to Figure 51**):**

- Residential
- Resorts/tourist accommodation
- Marina: Port St Francis
- Airfield – grass landing strip for small aircraft
- Eco-tourism based economy
- Light industrial: boat building, seafood processing at the Port
- Agriculture

Access:

- Most of the coastline in this segment can be readily access by road or foot
- Established walking and cycling trails
- Parking at main beaches is available, but is inadequate in peak season especially along Seal Point Boulevard. Existing parking areas need to be upgraded

Future development / desired spatial form

- Kouga LM SDF (2015):
    - Cape St Francis is identified as a secondary node. Nodes are areas where higher intensity land uses and activities will be supported and promoted. Secondary nodes should fulfil the function of basic service delivery and port to the rural hinterland
    - R330 (Humansdorp and St Francis linkage): identified as a corridor. Corridors represent linkages between nodes and activity areas based on mobility advantages
- Possible aquaculture development
- Possible shark cage diving

Development issues/risks:

- Inappropriately placed development in coastal process areas, wetlands and low-lying areas; and with insufficient setbacks from the high water mark of the sea:
    - disrupts sediment dynamics, and results in erosion and/or sand accumulation in public facilities (e.g. parking areas) where ongoing maintenance is required
    - uncontrolled foot traffic from coastal residences to the beach: trampling of vegetation and destabilisation: results in blow-outs and in some instances, erosion / loss of coastal properties
    - storm surges damage coastal properties and infrastructure. To protect inappropriately placed structures, erosion protection measures are often implemented. Erosion protection measures need to be done holistically (i.e. not on an ad-hoc or piecemeal basis), and must consider natural processes. If not, this often exacerbates erosion, or creates problems further along the coast.
    - development in low-lying areas and wetlands prone to flooding
    - loss of wetlands and impacts on the coastal protection zone result in loss of ecosystem services provided by these environments – e.g. flood attenuation, buffering from storm surges and sea level rise.
- Insufficient beach parking along the Boulevard, and existing parking is in poor condition
- Traffic congestion during peak season, particularly between St Francis Way, and the parking lot near Barcelona Place.
- Insufficient ablution facilities, and existing facilities are in a poor condition
- Trails: in some areas, conflict (and safety risks) between cyclists and hikers has been reported.

Development issues/risks continued…

- The erosion and loss of beaches in St Francis Bay puts additional pressure on beaches at Cape St Francis during peak season, which elevates the traffic congestion and parking problems
- Fires: the frequency of fires is increasing, and presents a risk to residences and infrastructure
- Unemployment and poverty levels are relatively high in the area



Plate 2: A blow-out formed in a dune in front of residences in Cape St Francis, as a result of uncontrolled foot traffic.

Opportunities:

- Existing windfarm developments provide funding and support for community development in the area
- Natural and archaeological/cultural/heritage environment and its rich diversity has significant tourism potential; as well as recreational, aesthetic and spiritual value to the local community. Large sections of the Segment are protected, offering legal protection status to these important environments.
- A network of well-established walking and cycling trails
- Functional and efficient NSRI operates in the area, improving safety
- Lifesavers available on main beaches in season
- Established chokka fishing industry
- Established surf and watersports culture
- Established Port and Airfield: promotes accessibility, and supports tourism-related development.
- Established yacht-building industry

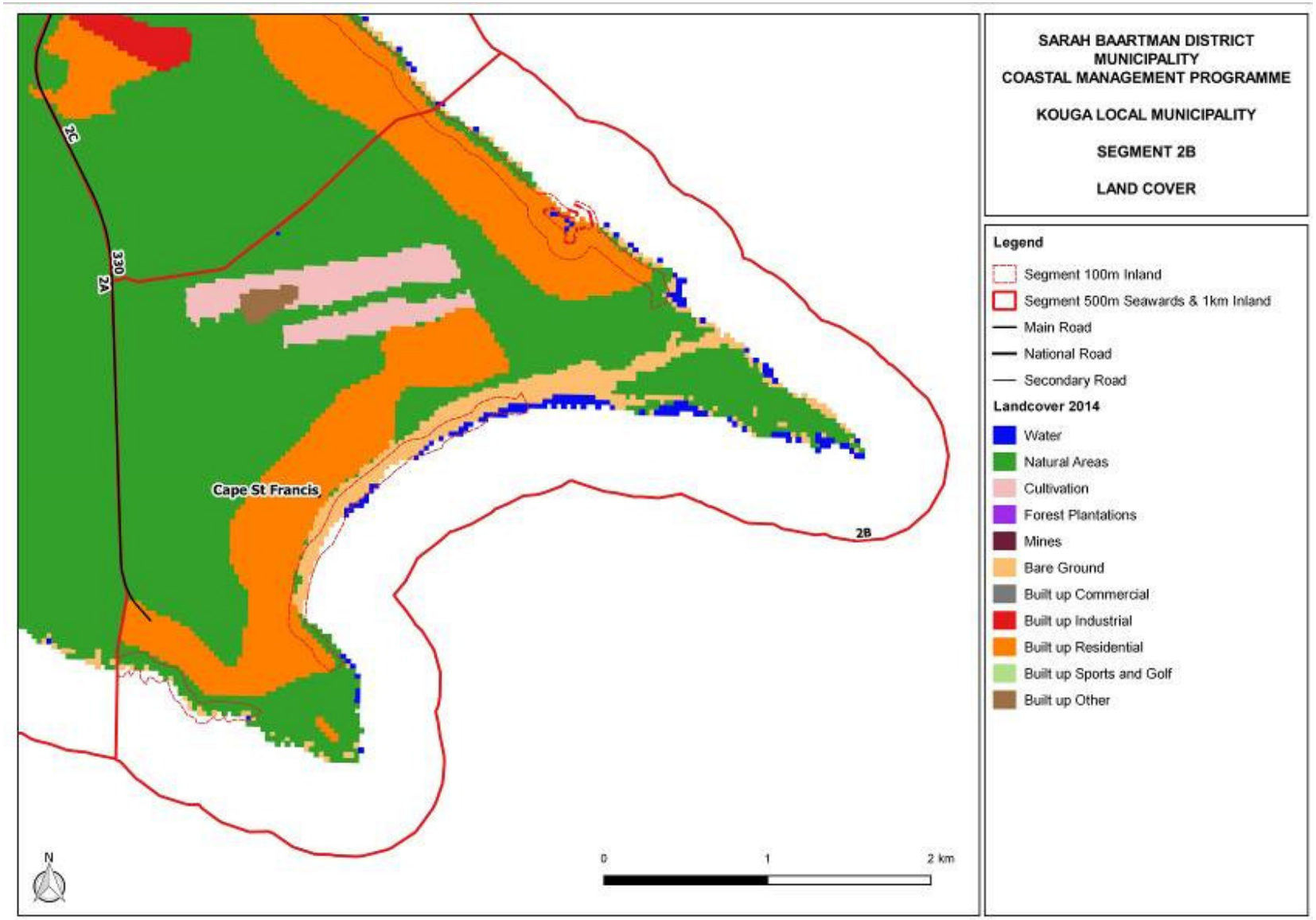


Figure 51: Land Cover map for Segment 2B (note that cattle rangelands are included under 'natural areas', and 'bare ground' is dunes).



Figure 52: Some identified coastal development issues in Segment 2B.

5.4 Segment 2C: Romazini Valley to the south-western edge of Paradise Beach

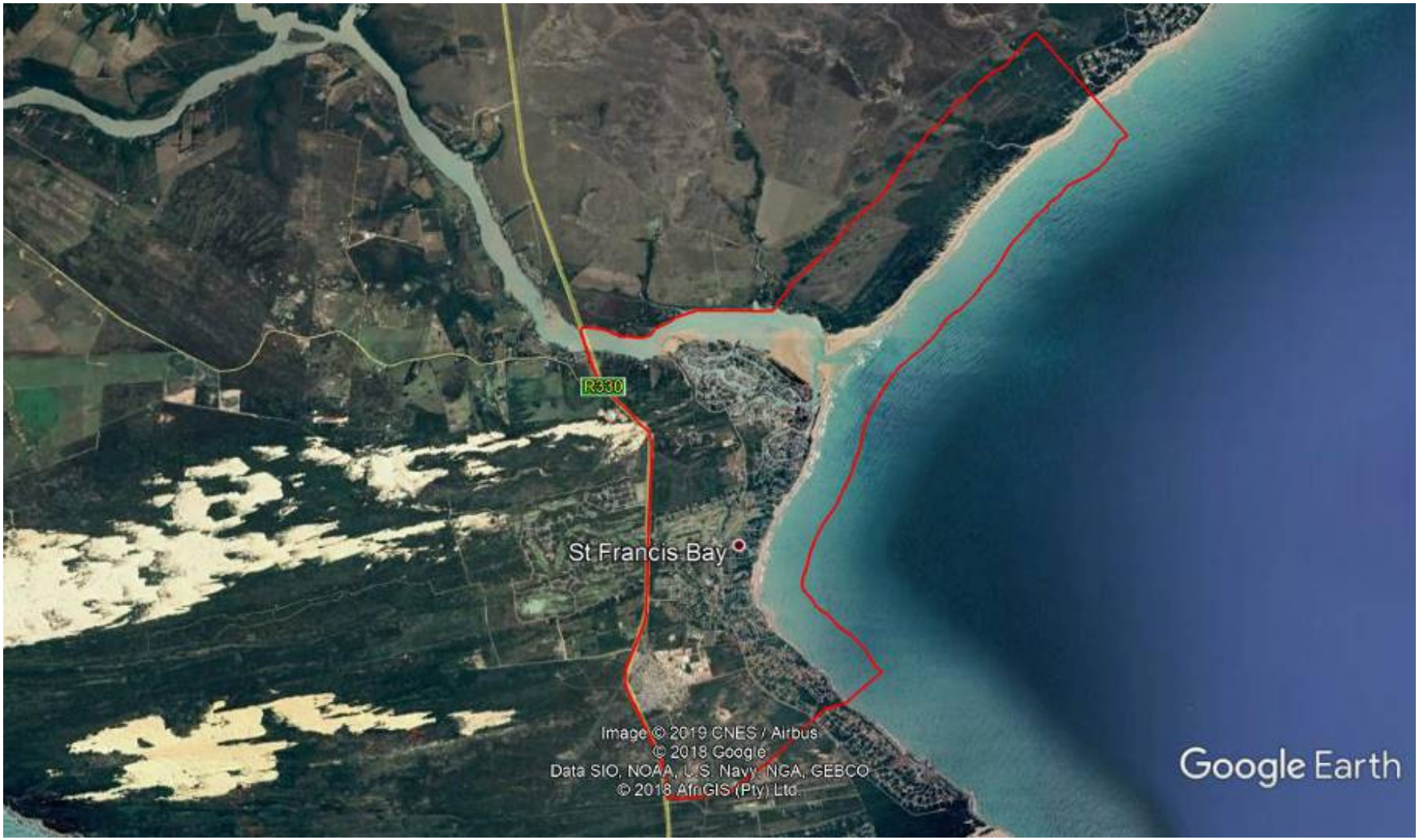


Figure 53: Google Earth image of Segment 2C (outlined in red).

Natural, archaeological and cultural diversity and resource management

Description of key coastal habitats/processes/features:

Aquatic environment:

- NBA aquatic areas (Draft 2018):
    - No wetlands are identified in the Segment, however a large number occur in the catchment of the coastal zone. Wetlands have been mapped between Sea Vista and the St Francis airfield by Colloty as part of the EIA process for the WWTW upgrade and expansion – these are described as ephemeral wetlands that accumulate surface water after rain. The number of wetlands present vary due to the water levels during any given time (i.e. during flooding the wetlands are connected and thus form one large wetland / waterbody. As the waters recede, the water bodies lose connectivity and thus more are evident). The wetlands correspond to interdunal slack depressions, formed in the depression between mobile dunes. As the dunes move, the wetland areas are then covered. After significant amount of rainfall, the wetlands will reappear in the new dune slacks, should the underlying soils / geology allow for the entrapment / retention of surface water (Scherman Colloty and Associates, 2015).
    - The Kromme and Geelhoutboom Rivers are identified as NFEPAs. Several non-perennial rivers are indicated in the Segment and its catchment on the 1:50 000 watercourse layer, most of which are tributaries of the Kromme River. Non-perennial watercourses in the headland bypass dunefield, including the Sand River and its tributaries, also occur.

One estuary (warm temperate):

- Kromme Estuary: permanently open system with a relatively undisturbed catchment area (Heymans, 1992). The total length of the Kromme River is approximately 95 km (Reddering and Esterhuysen, 1983). The last 14 km of the river, leading into the Indian Ocean, is tidal and is regarded as estuarine (Heymans, 1992). The estuary is a flood-tide dominated system, with deposition of marine sediment up to 5 km upstream of the mouth (Bickerton and Pierce, 1988).
- The Kromme estuary is an important nursery area for sub-adult Kob species, and has important macrophyte populations. The Ecological Category of the estuary is rated as 'D', with the health condition of microalgae, macrophytes, invertebrates, fish and birds all rated as 'fair condition'. The Biological State and mean Estuary Health State are rated as 'fair' and 'poor' respectively. The estuary requires partial protection, and a 'C' ecological category is recommended (Van Niekerk and Turpie, 2012).
- Siltation: The fluvial sediment yield of the Kromme is small, comprising mainly mud weathered from Bokkeveld slates. Similarly, sand input is small because of low erosion and weathering potential of quartzites. The Sand River in the lower reaches of the estuary is a minor source of sand. The Geeohoutboom River contributes some mud and to a lesser extent sand to the estuary (Bickerton and Pierce, 1988).

Terrestrial environment:

- VEGMAP (2018) Vegetation types: St Francis Dune Thicket, Sundays Mesic Thicket, Cape Seashore vegetation
- Threatened Ecosystems (2011): none identified in the Segment. However, Humansdorp Shale Rensoterveld and Albany Alluvial Vegetation in the immediate catchment are classified as 'endangered'.
- Garden Route Initiative: areas of the Segment that have not been modified are classified as a CBA. The land management objective is to maintain natural land, and to rehabilitate degraded land to natural or near natural land, and manage it for no further degradation. Process areas (e.g. non-perennial drainage areas) are ESAs.
- Threatened/protected plant species:
    - CREW database: threatened plants have been recorded throughout the Segment and its catchment.
- Dunefields and Sand River:
    - Fixed Retention ridge along shore – beach along St Francis coastline to Kromme Estuary mouth eroded
    - Oyster Bay / Thysbaai / Santareme dunefield: Mobile headland bypass dunefields in SW-NE orientation that transport marine sediment overland from Oyster Bay and Thysbaai to St Francis Bay, where sand enters just south of the Kromme Estuary mouth. Sand movement obstructed by development, and stabilization of dunefields (e.g. by alien vegetation).
    - The mobile dunefields are associated with extensive wetlands, which occur in the interdune "slack" areas. The eastern quarter of the Oyster Bay dunefield drains into the Sand River – an "episodic" river, which comprises largely shallow subsurface flow, save during flood episodes, when it carries runoff and subsurface flow from the dunes and surrounding farmland and other developed areas into the Kromme River. La Cock and Burkinshaw (1996) note that the Sand River has, over the last 200 years, migrated between St. Francis Bay and a point ~ 4 km upstream of the mouth of the Kromme River. These authors and others familiar with the site consider the Sand River system within the dunes and the broad matrix of wetlands with which it is linked between the dune field and the sea to be a unique feature, and one of a kind. Applications have been submitted to declare the system as a Ramsar wetland site (Day, 2011).
- The CAPE project has identified the lower Kromme River Valley as a priority corridor for the movement of plants and animals between the Kareedouw and Tsitsikamma Mountain ranges and the coast

Description of key coastal habitats/processes/features continued…

Protected Areas, Conservation Areas, and Stewardship Sites:

- Protected Areas: Kromensee Nature Reserve
- Conservation Areas: the Segment is part of the Garden Route Biosphere Reserve, which extends from just east of Groot Brak in the west to the Van Stadens Estuary in the east

Archaeology and cultural diversity:

- Three archaeological sites are identified on the SAHRIS site on the northern side of the Kromme Estuary.
- Dune systems host Late Stone Age middens, and Early and Middle Stone Age implements have been found on fossil dunes in the area (McLachlan *et. al.*, 1994).

Resource use harvesting:

- Kromme Estuary: recreational fishing, bait collection
- Coastline: recreational fishing, bait collection
- Commercial fisheries: Area between Oyster Bay and St Francis is a spawning area for squid (chokka), as well as the hake and pilchard fishing industry.
- Offshore petroleum and gas exploration polygon

Threats to natural/archaeological resource management:

- Kromme Estuary:
  - The Kromme Estuary is considered to be freshwater starved (Baird, 2003). Two major dams have been constructed in the catchment area of the Kromme Estuary (i.e. the Churchill Dam and the Mpofu Dam), which have the combined capacity of storing ~133% of the MAR of the Kromme River catchment area. Freshwater inflow into the Kromme Estuary is irregular and relatively low with a mean annual inflow rate of approximately 11 000 m^3. Numerous small dams are also situated on the tributaries of the Kromme River and these tend to restrict the water flow (Sale *et. al.,* 2009).
  - 6.50% of the catchment area is invaded by alien trees, which reduces annual water runoff by about 27.90 x 106 m^3/a (Chapman *et al.*, 1998).
  - Coastal development in dynamic process areas – e.g. marina canal system on the Kromme estuary, and development of residences within the estuarine functional zone. This interrupts dynamic ecological processes that drive biodiversity in the estuary. Structures and infrastructure are at risk of flooding/coastal inundation.
  - In-stream obstructions: N2 and other minor road crossings. Bridge structure over the Kromme obstructs tidal flow, and causes sediment build up. Sandbanks and muddy shoals grow, which can reduce the tidal prism or volume of tidal water in and out of an estuary mouth. The changes in substrate have caused the higher levels of marsh above the bridge to dry out, with loss of production to the estuary (Van Niekerk and Turpie, 2012)
  - Change in flow and pollution are considered high pressures on the estuary, and habitat loss medium. Fishing effort is high (Van Niekerk and Turpie, 2012).
  - Destruction of saltmarshes by trampling and boat traffic
  - Development of a large number of jetties creates localised changes to flow patterns, creates cumulative changes to estuarine habitat and diversity, and may impact on water quality. This is dependent on the design and location of the jetty.
  - Ad hoc stabilisation of properties that border the estuary, where erosion has occurred.
  - High boat traffic in peak season: increased turbidity, hydrocarbon pollution, impact on birds.
- Coastal/beach erosion in St Francis Bay:
  - Development of Oyster Bay stops sand flow into Oyster Bay dunefield.
  - Between 1917 and 1924, the then Department of Forestry attempted to stop migrating dunefields for agriculture by planting vegetation
  - Development of St Francis Bay township: foredunes behind the beach, downwind nose of the Oyster Bay dunefield and the northern flank of the Santareme dunefield all stabilised since 1964
  - Southern flank of Santareme dunefield stabilised to develop Santareme settlement
  - Only the Shark Point dunefield is still operational supplying 7000 m^3 per year of sand to St Francis Bay (less than 10% of the pre-stabilisation sand supply is reaching St Francis Bay) (McLachlan *et. al.*, 1994).
- Modification/loss of terrestrial biodiversity and archaeological sites by the development of urban settlements, and associated roads and services infrastructure
- Alien vegetation encroachment, and increased frequency and intensity of fires
- More regular occurrence of harmful algal blooms, which may lead to a possible change in species composition, diversity and physico-chemical parameters in the marine environment
- Over-fishing/uncontrolled harvesting by commercial operators, and recreational users

Opportunities for natural/archaeological resource management:

- Active community groups / organisations in area that help with coastal management (e.g. FOSTER, WESSA, Conservation Outcomes, St Francis Property Owners)
- The local community (headed by the SFPO) have developed a Vision for St Francis that guides what they would like the area to be by 2030 and how they plan to achieve it
- The natural environment provides opportunities for low-impact eco-tourism related development
- A reserve determination has been done for the Kromme and Seekoei catchments that advised on the quantity, quality and reliability of water needed to sustain both human use and aquatic ecosystems, to meet the requirements for economic development without seriously impacting on the long-term integrity of ecosystems (Scherman Colloty & Associates, April 2012).

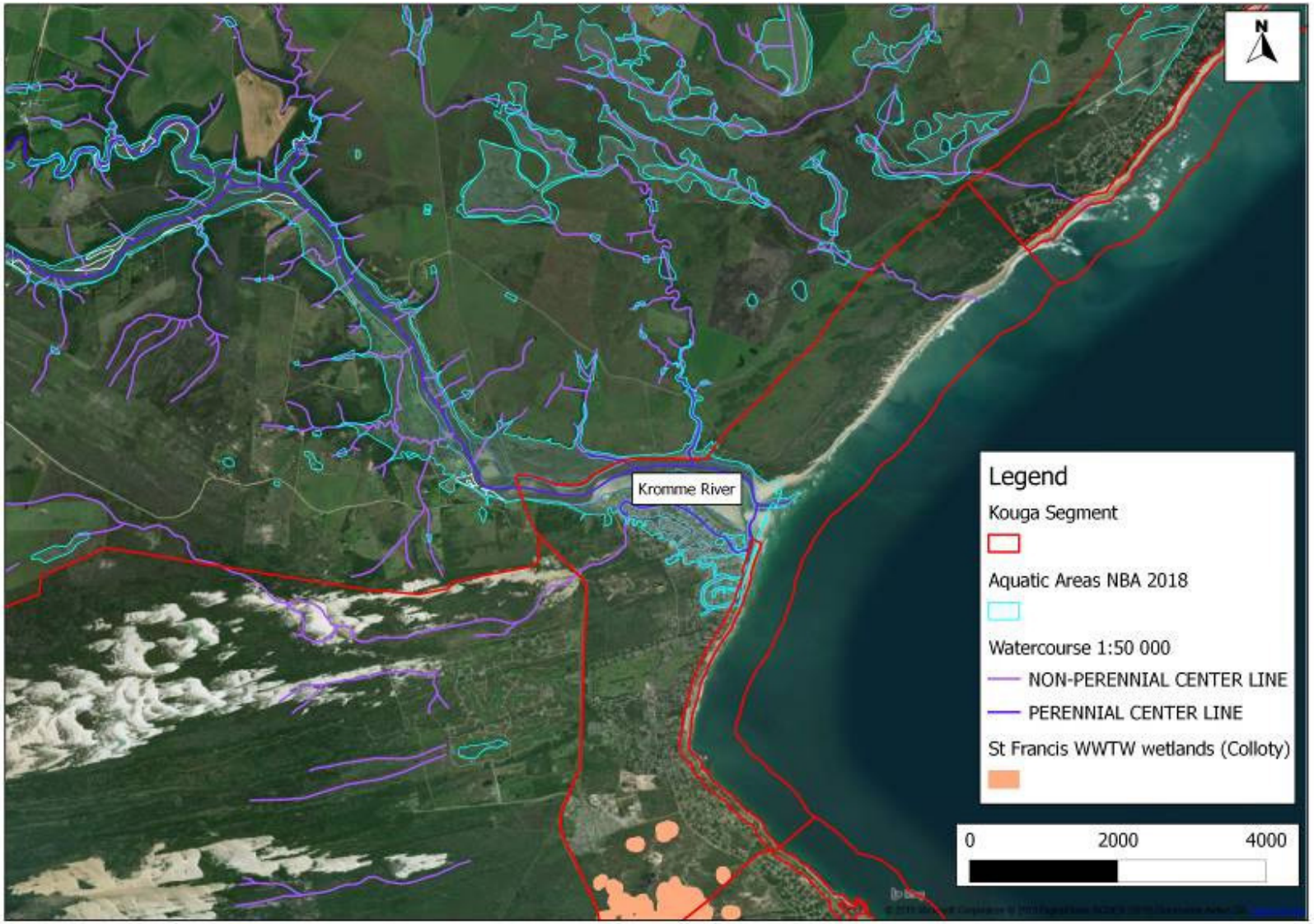


Figure 54: Watercourses and Wetlands in Segment 2c.

Coastal Pollution

Description and Assessment (refer to Figure 50**)**
Catchment land use/land cover type:

- Predominantly natural areas/open space, with some agriculture (croplands, dairy, beef, sheep), low density residential, and sport (e.g. golf course). Humansdorp town and industrial centre also fall within the greater catchment, which present a high pollution risk (although these are at a great distance from the coastal zone). Wind farms also occur, but pollution risk would mostly be restricted to construction phase.
- Typical pollutants associated with land use types: elevated nutrients, bacteria, pesticides, oils and grease, metals.
- Runoff and/or seepage into the groundwater zone would end up at the coast, and contribute to the deterioration of coastal water quality

Activities in the Segment:

- A large part of the Segment comprises urban areas and light industrial use. Sport (golf course), and institutional uses (i.e. closed landfill site and a waste water treatment plant) also occur. The pollution risk to the coastal zone is medium.
- A shallow groundwater table occurs in the St Francis Bay town that has good water quality. There are a number of boreholes where groundwater is abstracted to supply the town with potable water. Groundwater quality is at risk of pollution from urban activities (e.g. nutrients and bacteria from sewage)
- The St Francis Bay WWTW is currently being upgraded and expanded. The works was operating over capacity, especially during peak holiday periods. Treated effluent and sludge were discharged into the surrounding area in an uncontrolled fashion, impacting on wetlands and the groundwater environment. The WWTW is currently being expanded and upgraded to improve the treatment process and effluent quality. Upgrades include the installation of a tertiary wetland system for further polishing of effluent before it seeps into the surrounding area, to reduce impacts of treated effluent on the groundwater environment. Treated effluent would migrate through the sands and the shallow groundwater zone towards the coastal zone. If effluent quality is poor (i.e. because of malfunctioning of the works), this would contribute to coastal pollution.
- Seepage from residences that use septic/conservancy tanks into the estuary and marine environment.
- Surface runoff and/or seepage from settlements that are not connected to the municipal bulk sanitation system.
- Leaks/overflow from bulk sewer lines and pumpstations that service residences. Numerous pumpstations are situated within the estuarine functional zone of the Kromme estuary in the canals development. These present an elevated pollution risk considering their position in a dynamic coastal process area.
- A closed landfill site is situated in Segment 3. The site has not yet been rehabilitated. Seepage of contaminants from buried waste may contain nutrients, metals, and pathogens. This would also migrate through sands and the shallow groundwater zone to the coast
- The closest registered site being in Humansdorp. This increases the risk of dumping of solid waste
- The St Francis Bay area is considered to be a high risk area for oil pollution from spills from ships/boats at sea
- Waste: from ships along coastline, and from landward domestic activities that end up on the beach via wind and surface runoff (especially stormwater outlets).
- Noise:
    - landward noise from general residential activities: generally low impact but can increase in season and with events.
    - engines from fishing vessels.
- Light pollution:
    - from residences along the coast
    - from chokka boats at sea



Plate 3: Lights from chokka boats along the Cape St Francis coastline.

Coastal Development

Description and Assessment

Recreational use: surfing, fishing, birding, waterskiing, canoeing, boat cruisers, hiking and swimming
Kromme Estuary: Due to the relatively low freshwater inflows experienced in the Kromme Estuary, fishing and birding activities are compromised and could adversely affect tourism (Sale et al, 2009).

Existing land use/land cover types (see Figure 55**):**

- Residential
- Resorts/tourist accommodation
- Canals
- Eco-tourism based economy
- Light industrial: boat building
- Commercial/business centres
- Institutional (e.g. waste water treatment plant)
- Agriculture

Access:

- The southern side of the Kromme estuary is readily accessible by vehicle or foot. Access on the northern side is limited.
- Established walking and cycling trails
- Parking at main beaches is available, but require maintenance as a result of coastal erosion and/or sand inundation.

Future development / desired spatial form

- Kouga LM SDF (2015):
    - St Francis is identified as a secondary node. Nodes are areas where higher intensity land uses and activities will be supported and promoted. Secondary nodes should fulfil the function of basic service delivery and port to the rural hinterland
    - The SDF recommends that no additional development rights be granted / permitted on land that falls within the Kromme River development setback line (Figure 56)
- Possible aquaculture development
- Possible shark cage diving

Development issues/risks:

- Inappropriately placed development in dynamic coastal process areas, and with insufficient setbacks from the high water mark of the sea:
    - Undercutting / sand inundation of public parking areas and ablution facilities that occur in dynamic coastal process areas.
    - Undercutting of properties positioned along foredunes / in proximity to the high water mark of the sea. Revetments have been installed in areas for stabilisation, and ongoing maintenance is required.
    - Beach erosion, especially between Nevil Road and the Kromme estuary mouth.
    - Instability of the sand spit at the Kromme Estuary mouth, and possibility of flooding properties in the canals
- Public parking areas and ablution facilities need to be maintained
- Informal access paths to the beach: trampling of vegetation, erosion, sand inundation on public facilities
- Fires: the frequency of fires is increasing, and presents a risk to residences and infrastructure
- Urban expansion: The Kouga LM SDF recognises the demand for low income and subsidised housing in the greater St Francis area, as well as high intensity business (and expansion of the St Francis CBD).
- Low-lying areas of the town that are in the path of process areas are at risk of periodic flooding.
- Access to St Francis Bay and Cape St Francis is blocked periodically when the Sand River floods.

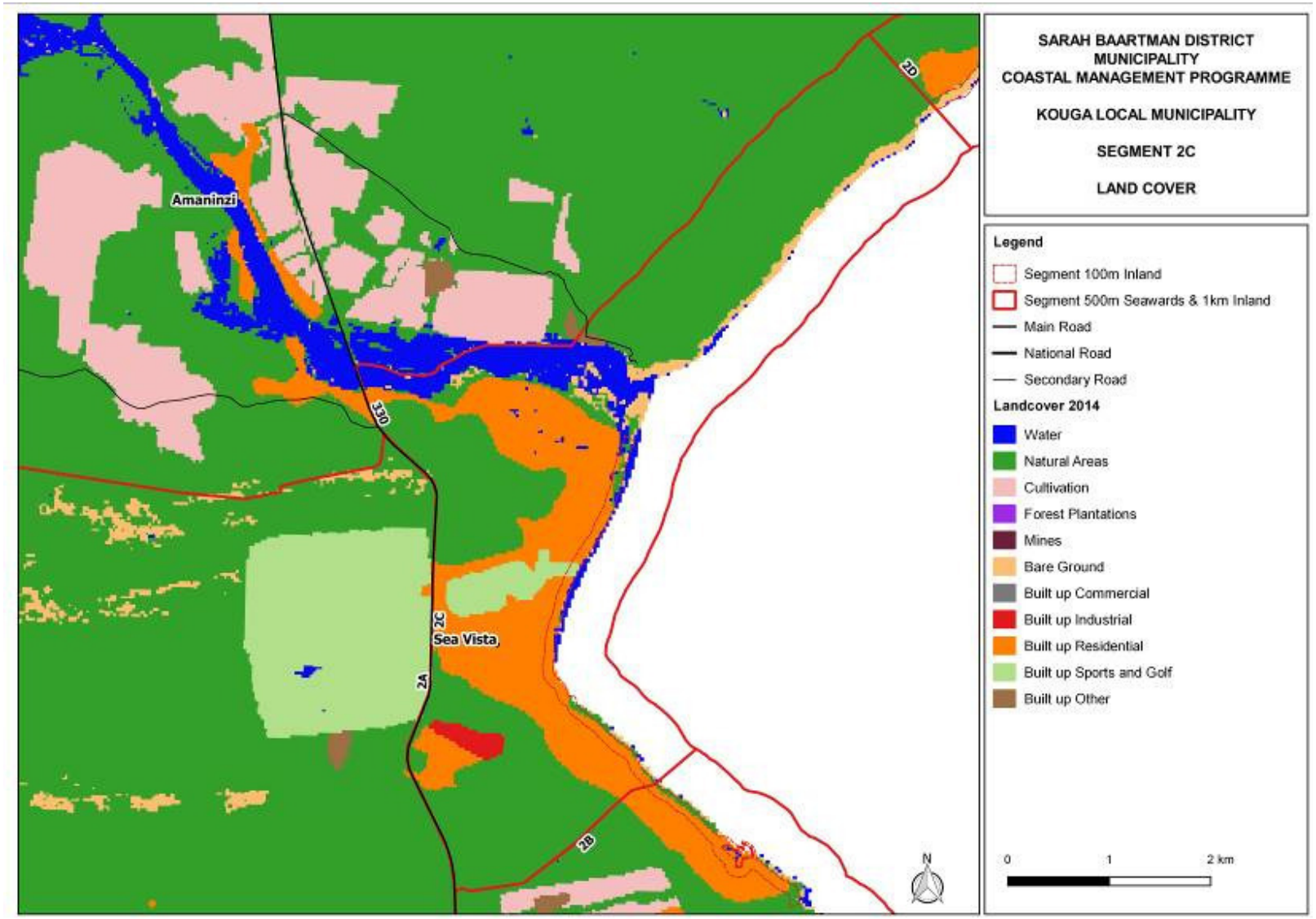


Figure 55: Land Cover map for Segment 2C (note that cattle rangelands are included under 'natural areas', and 'bare ground' is dunes).

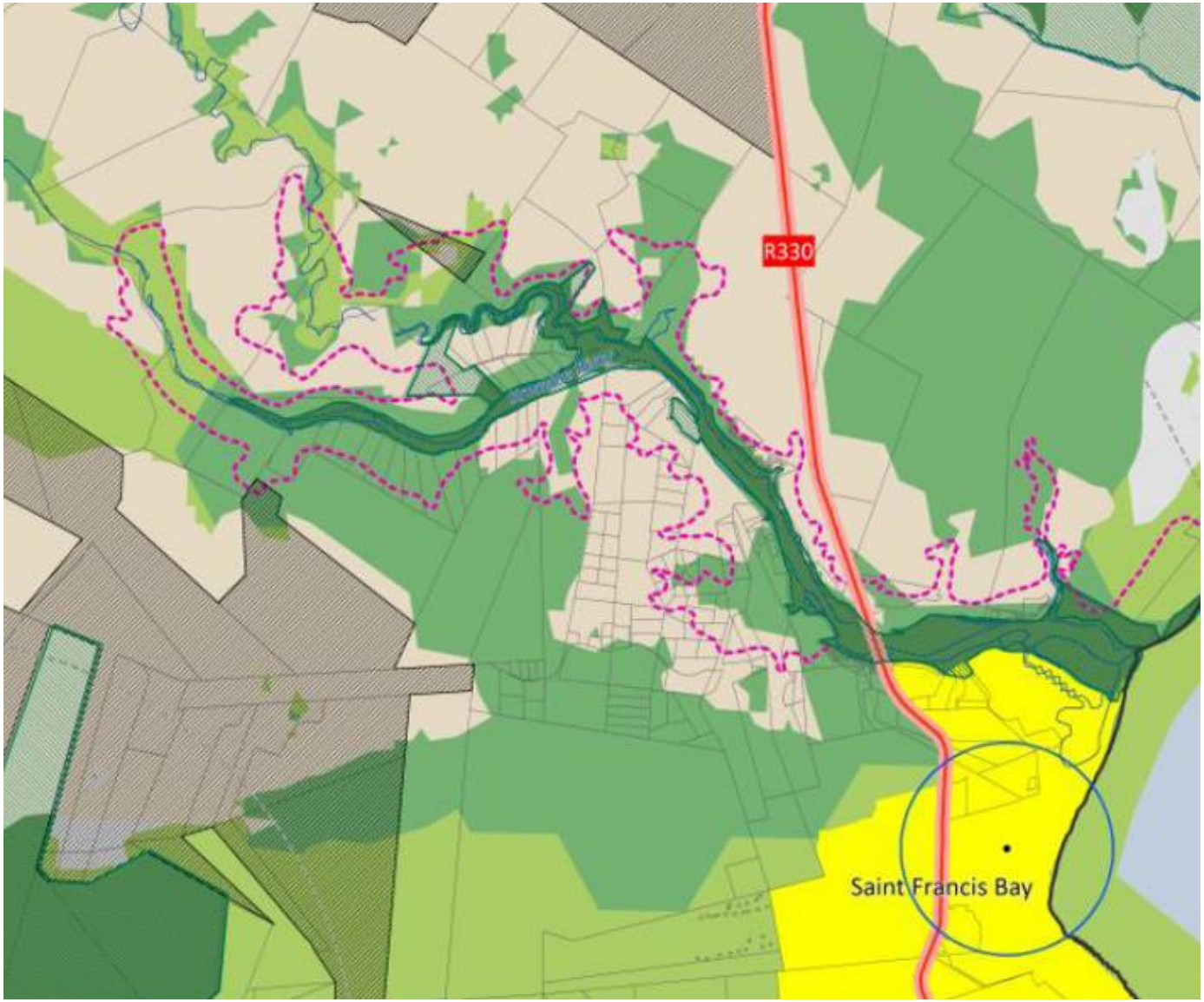


Figure 56: Extract from the Kouga SDF (2015) showing the recommended development setback line on the Kromme River (pink dashed line).



Figure 57: Coastal development issues between Romazini Valley and Harbour Road.



Figure 58: Coastal development issues between Nevil Road and the Golf Course.



Figure 59: Coastal development issues between the Golf Course and the canals.

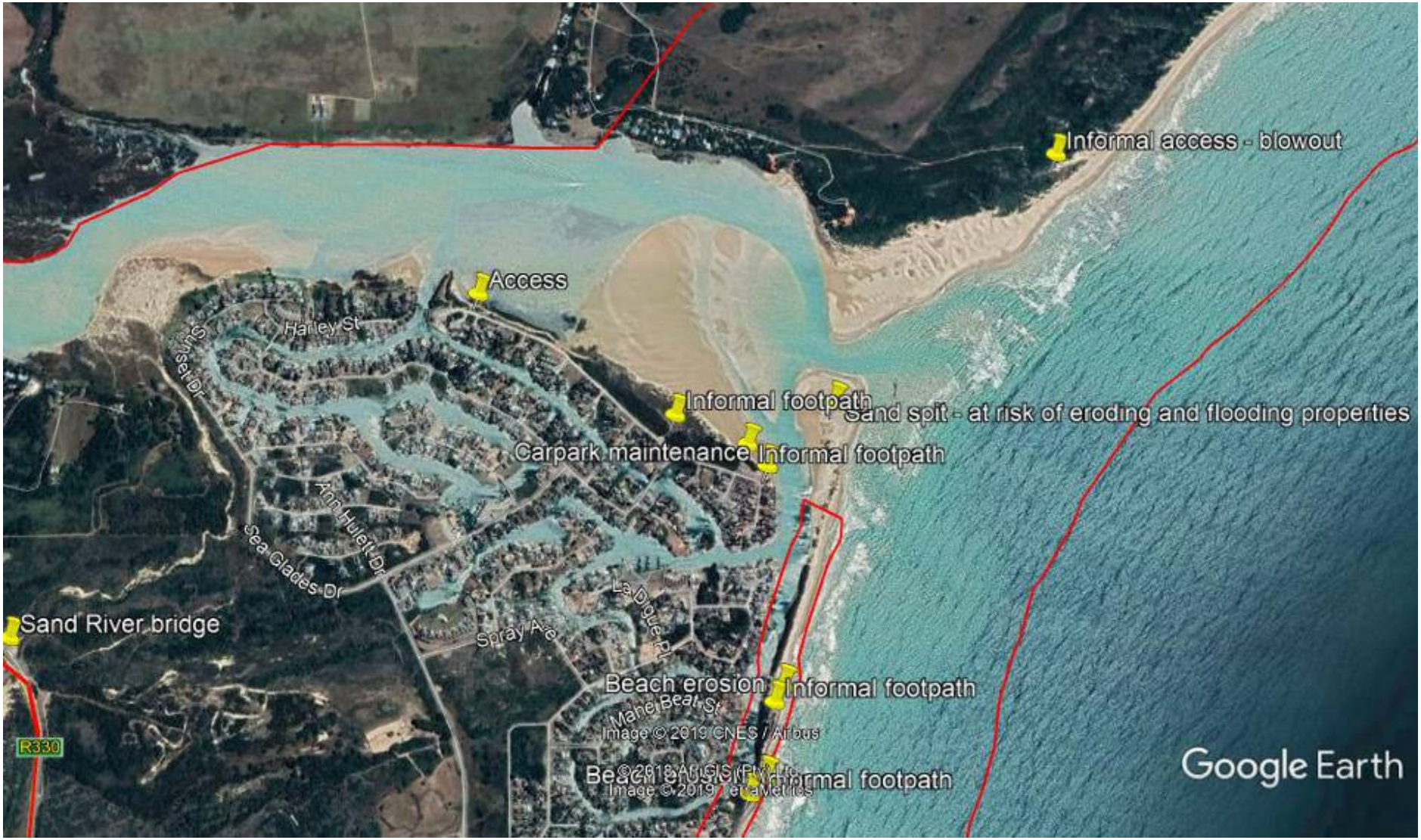


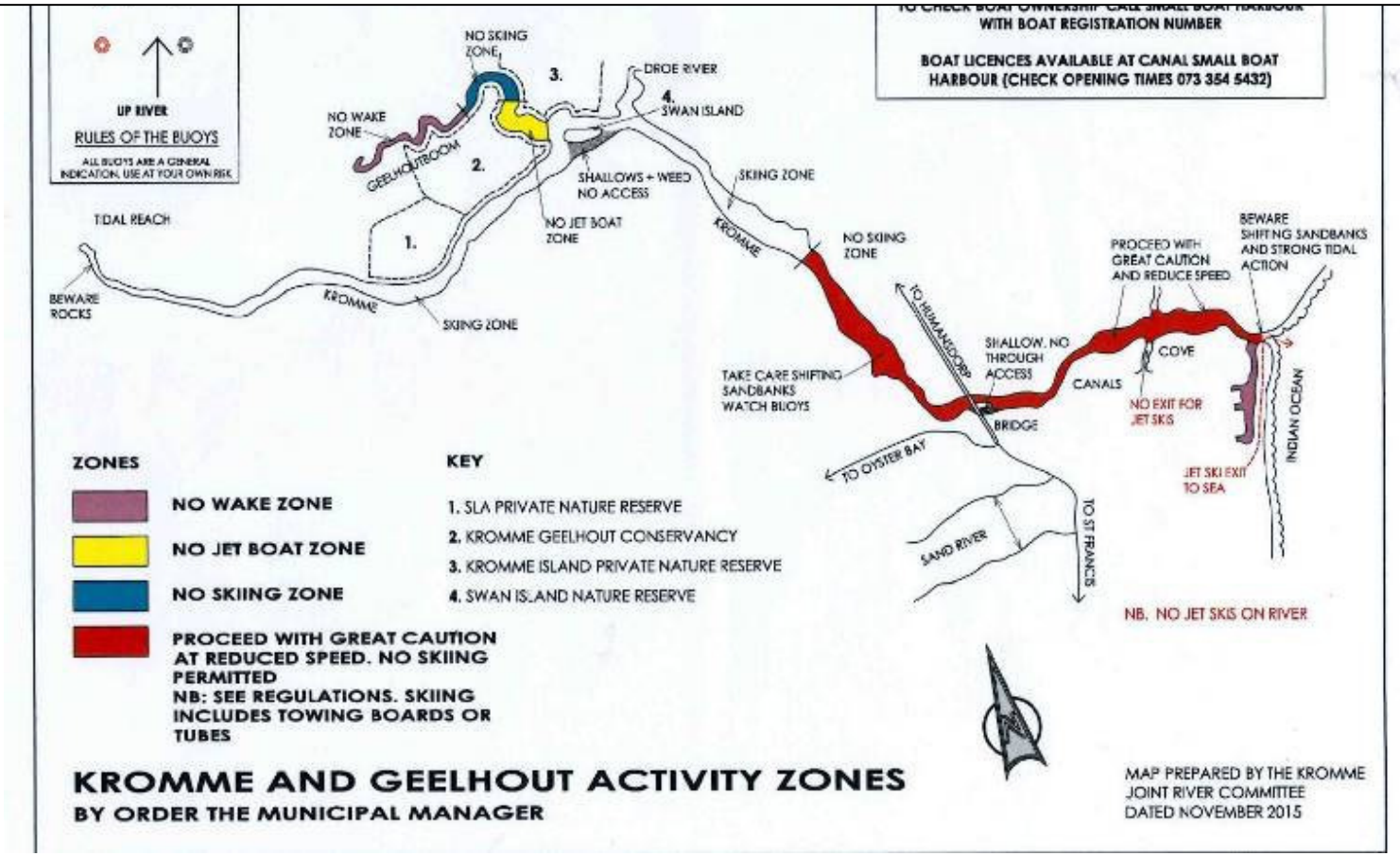
Figure 60: Coastal development issues in the vicinity of the Kromme estuary mouth.



Plate 4: Rock revetments used to protected houses along the St Francis Bay coastline from erosion.

Opportunities:

- An environmental assessment is underway by EoH to address coastal erosion and beach nourishment in St Francis Bay
- Existing windfarm developments provide funding and support for community development in the area
- The rich diversity of habitats and species in the Kromme provide significant recreational and eco-tourism development potential.
- A network of walking and cycling trails
- Functional and efficient NSRI operates in the area, improving safety
- Lifesavers available on main beaches in season
- Established chokka fishing industry
- Established surf culture and watersports culture
- Established yacht-building industry.
- The bridge over the Sand River has recently been re-built.
- Existing launch facilities at the Kromme Estuary.



5.5 Segment 2D: Western edge of Paradise Beach to north of Marina Martinique

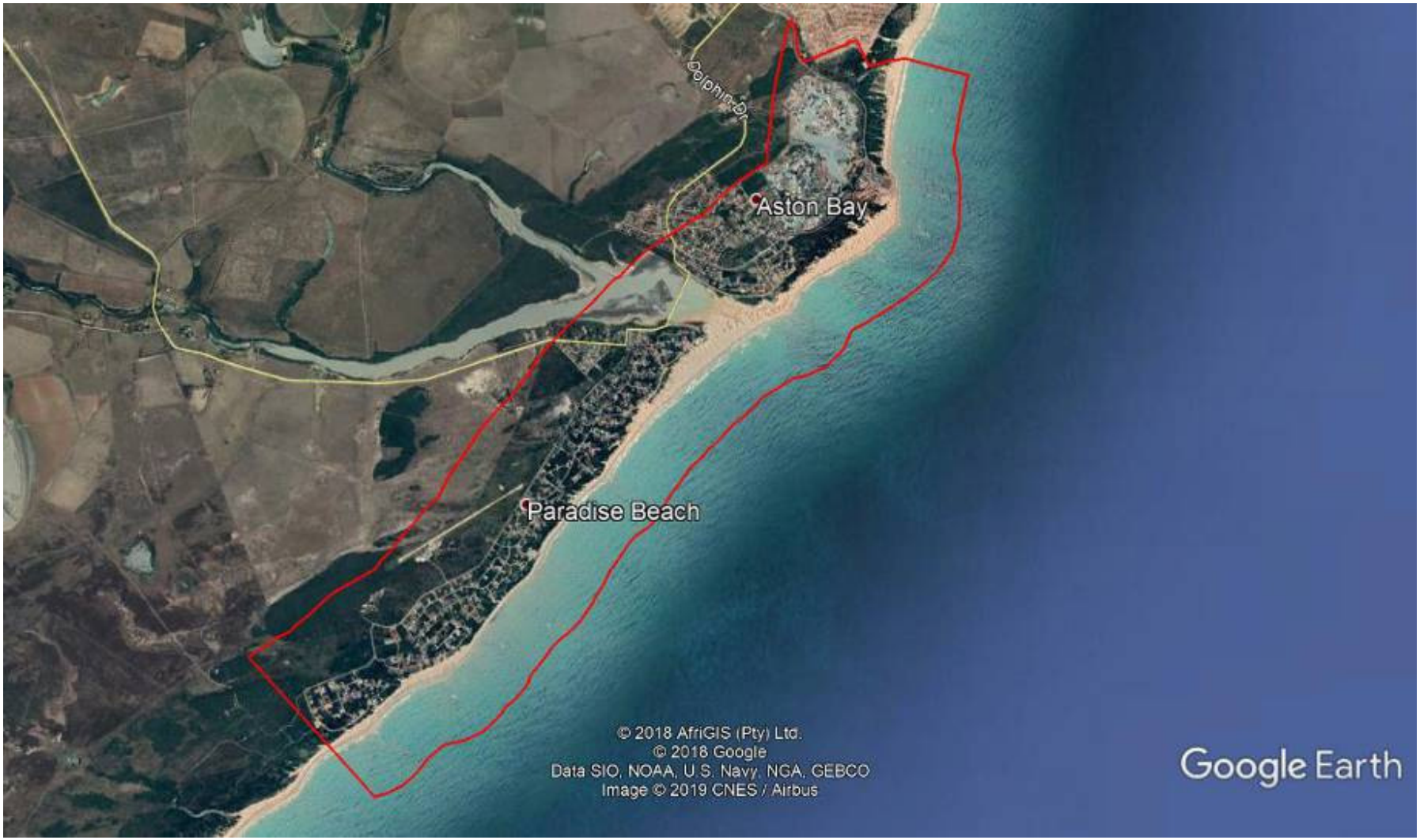


Figure 61: Google Earth image of Segment 2D (outlined in red).

Natural, archaeological and cultural diversity and resource management

Description of key coastal habitats/processes/features:

Aquatic environment:

- NBA aquatic areas (Draft 2018):
  - The Seekoei and Swart Rivers that drain into the Seekoei Estuary, the perennial river in Marina Martinique, and a non-perennial river just north of the Marina are identified as aquatic features in the Segment in the NBA. A number of wetlands and dams are mapped in the catchment, mostly associated with the Seekoei estuary. An additional non-perennial river is shown on the 1:50 000 watercourse map in the south-western part of the Segment, which drains into the coastal zone (see Figure 63).
  - Two Estuaries (warm temperate):
  - Seekoei Estuary: Temporarily open closed system. Part of the estuary is protected in the Seekoei River Nature Reserve. The ecological water requirements of the estuary have been determined. The health condition of microalgae, macrophytes, invertebrates, fish and birds all rated as 'poor condition'. The Biological State and mean Estuary Health State are rated as 'poor' and 'fair' respectively. The estuary requires partial protection, and a 'B' ecological category is recommended (Van Niekerk and Turpie, 2012). Wooldridge *et. al.* (2018) highlight that although the Habitat Health of the systems equates to a D (50), the Biotic Health is in a Category E (35). It is therefore believed that the Seekoei Estuary is on a trajectory of change to a Present Ecological Status of a Category E. Management intervention is urgently required to prevent further degradation. Fluvial sediment, mostly of fine-grained clay particles is deposited in the upper regions of the Seekoei estuary (Esterhuysen, 1982 *in* Bickerton and Pierce, 1988).
  - Unnamed micro-estuary north-east of Marina Martinique (corresponds with non-perennial river north of Marina Martinique identified in the NBA).

Terrestrial environment:

- VEGMAP (2018) Vegetation types: Sundays Mesic Thicket and Cape Seashore vegetation.
- Threatened Ecosystems (2011): none identified in the Segment, however Humansdorp Shale Renosterveld in the immediate catchment is 'endangered'
- Garden Route Initiative: The Seekoei Estuary and remnant natural areas in the Segment are classified as a CBA. The land management objective is to maintain natural land, and to rehabilitate degraded land to natural or near natural land, and manage it for no further degradation
- Dunes: The dunefield running along the shore is classified as a fixed retention ridge

Protected Areas, Conservation Areas, and Stewardship Sites:

- One PA – Seekoei River NR. Established in 1969 primarily as a waterfowl sanctuary (Coastal and Environmental Services, 2010).
- Conservation Areas: majority of the Segment is part of the Garden Route Biosphere Reserve, which extends from just east of Groot Brak in the west to the Van Stadens Estuary in the east

Archaeology and cultural diversity: none identified in the Segment. However, the coastline is regarded as a sensitive archaeological area, and development should not proceed without undertaking archaeological/heritage specialists in according with the Heritage Resources Act.

Resource use harvesting:

- Recreational fishing along the sandy beach.
- Bait collection and recreational fishing in the Seekoei estuary
- Small scale fisheries
- Commercial fishing operations in the marine environment
- Seawater abstraction into Marina Martinique canals – seawater is pumped daily into the canals, and is not a continuous through-flow system
- Possible future desalination plant at Paradise Beach (seawater abstraction)
- Offshore petroleum and gas exploration polygon

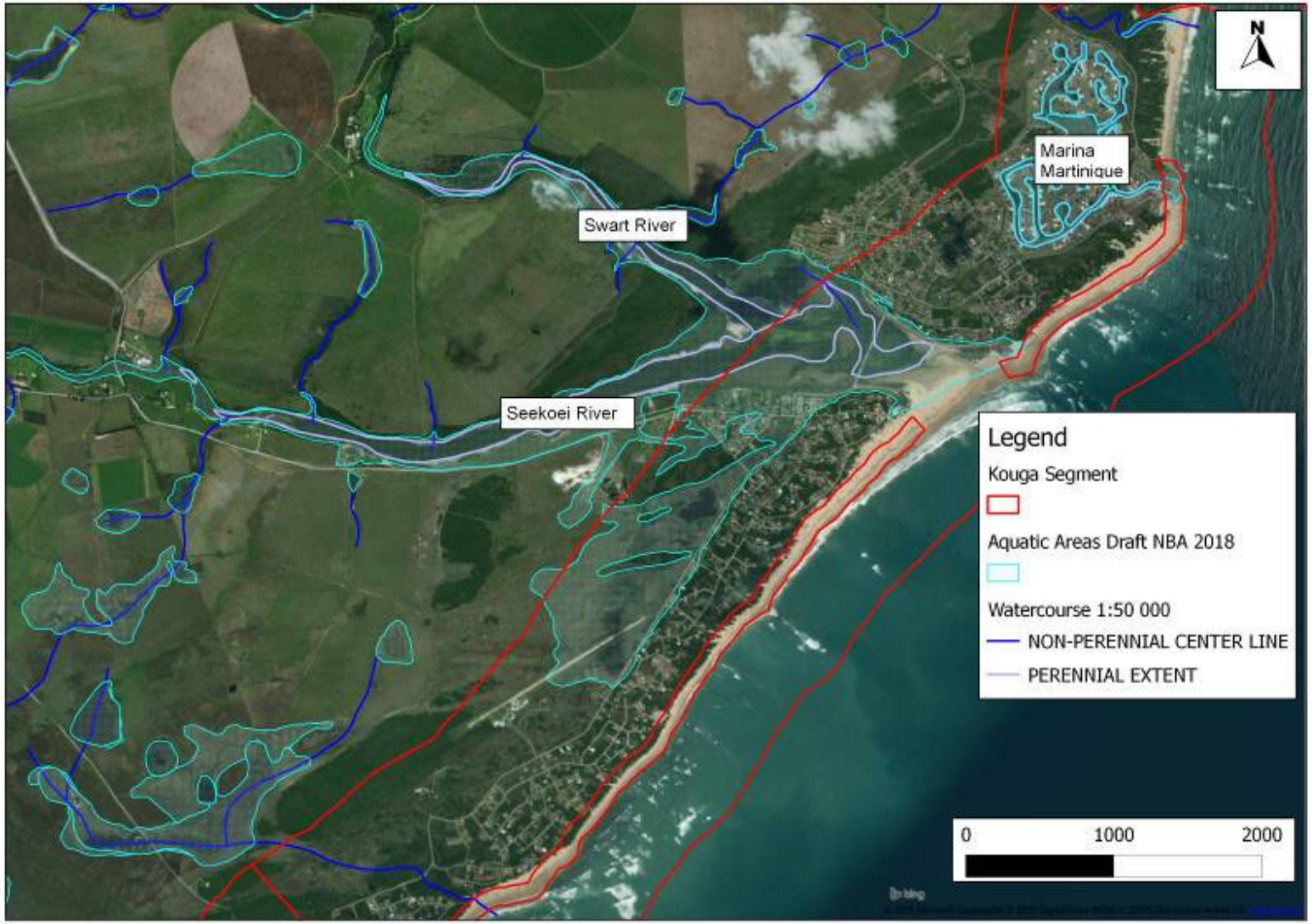


Figure 62: Watercourses and Wetlands in Segment 2D.

Threats to natural/archaeological resource management:

- Seekoei Estuary: damming upstream and reduced freshwater inflow: changes inlet dynamics and impacts on estuary functioning, physico-chemical status and biota. The estuary no longer functions as a healthy system. It has been extensively modified because of anthropogenic activities along the river-estuary-nearshore continuum. Estuarine health index score: 42 (Category D-moderately modified). The estuary is linked to a Provincial Nature Reserve, therefore should be Category A (near pristine) or highest attainable health status. Urgent management intervention is required to prevent further deterioration to the health of the estuary. Aspects that impact negatively on the structure and function of the estuary are (see Figure 63 and Figure 64):
    - Over abstraction of freshwater in the catchment by numerous farm dams along several tributaries – causes reduced (and sometimes no) freshwater baseflow to the estuary. This results in increased salinity, and sometimes hypersaline conditions, impacting on estuarine biodiversity and die-offs when salinity levels exceed 50 ppt
    - A reduced number and diversity of water birds has been observed on the estuary, mostly due to urban development
    - The causeway inhibits tidal action throughout the estuary and causes premature mouth closure. Tidal action is important for maintaining open mouth conditions, mixing, nutrient redistribution, and for regulating salinity levels.
    - Excessive damming of the Swart and Seekoei Rivers reduces the size and amplitude of small to medium floods, reducing scouring of accumulated sediments from the estuary. This is exacerbated by the causeway. Excessive sediment therefore accumulates, and fine sediments consolidate above the causeway. These fine sediments require floods of a greater magnitude to remove them.
    - Alien vegetation growth in the catchment and along the Seekoei and Swart Rivers further reduces freshwater inflow into the estuary
    - The carpark and communal centre in the former outflow mouth channel prevents the mouth from migrating to its natural location. This constrains the low tide during periods of low flow, maintaining high water levels in the estuary
    - The artificial location of the present mouth possibly increases marine sediment loading in to the lower estuary by tidal action and marine overwash of the berm during storm events
    - Freshwater wetlands in Paradise Beach have lost connectivity with the estuary due to poor road design and causeway construction. An example is a barrier wall built across an ephemeral wetland which has altered the nature and functioning of the wetland.
    - Housing development below the 5 m estuary contour line increases the flood risk to these properties
    - The estuary is occasionally artificially opened (i.e. when the water level is around +0.9 m Mean Sea Level (MSL)) to reduce over-wash of the causeway and damage to vehicles)). Artificial opening events lead to ineffective scouring of sediments from the estuary and are below the natural mouth breaching level of +2.0 to +2.5 m MSL for the Seekoei (Wooldridge *et al.*, 2018).
    - Change in flow and pollution are considered medium pressures on the estuary, and habitat loss high. Fishing effort is low, and bait collection takes place (Van Niekerk and Turpie, 2012)
    - Roads and infrastructure, and residential development within Seekoei Estuarine Functional Zone – loss of estuarine habitat, impact on functioning and structure of estuary
    - Obstructions in the catchment: Port Elizabeth/Humansdorp narrow gauge railway line, N2 across the Swart and Seekoei Rivers in the upper catchment. Humansdorp/Oyster Bay and Humansdorp/St Francis Bay roads across the upper catchment of the Seekoei River. A secondary road crosses the Seekoei River via a low-lying bridge at Aloe Ridge, ~5 km upstream from the mouth, and ~4.5 km upstream of the Swart Estuary mouth (Bickerton and Pierce, 1988).
    - With climate change, an increase in the frequency of storms is predicted, and an increase in the overwash of berms of temporary open closed estuaries.
- Informal pedestrian beach access to the beach over dunes in Paradise Beach and Aston Bay area (numerous) destabilises vegetation, and causes erosion and blow-outs
- Structures, parking, roads etc. positioned in dynamic coastal process areas results in coastal erosion. For example, the restaurant and parking area south-east of Marina Martinique. Rock revetments are used to prevent erosion of landward development.
- Alien vegetation in dunes – use more water than indigenous vegetation, impacts on local diversity, increase the frequency and intensity of fires, and hinders sand movement in dune corridors

Opportunities for natural resource management:

- The Seekoei Estuary has an approved Estuary Management Plan.
- A reserve determination has been done for the Kromme and Seekoei catchments that advised on the quantity, quality and reliability of water needed to sustain both human use and aquatic ecosystems, to meet the requirements for economic development without seriously impacting on the long-term integrity of ecosystems (Scherman Colloty & Associates, April 2012).



Figure 63: Development south of the Seekoei Estuary within dunes (yellow - Illenberger, 2009) and the estuarine functional zone (blue).



Figure 64: Development within and north-east of the Seekoei Estuary within dunes (yellow – Illenberger, 2009) and the estuarine functional zone (blue)

Coastal Pollution

Description and Assessment (refer to Figure 50**)**
Catchment land use/land cover type:

- Predominantly agriculture and natural areas. Agriculture is considered to present a medium pollution risk.
- Humansdorp town and industrial centre also fall within the greater catchment, which present a high pollution risk (although these are at a great distance from the coastal zone).
- Typical pollutants associated with land use types: elevated nutrients, bacteria, pesticides, oils and grease, metals.
- Runoff and/or seepage into the groundwater zone would end up at the coast, and contribute to the deterioration of coastal water quality.

Activities in the Segment:

- Land use/land cover type: predominantly urban and natural areas.
- Seepage from residences that use septic/conservancy tanks into the estuary and marine environment (residences south-west of Seekoei estuary are not on bulk sanitation system).
- Leaks/overflow from bulk sewer lines and pumpstations that service residences in Aston Bay and Marina Martinique. Two pumpstations are situated in Marina Martinique, which present an elevated pollution risk to the canals. Strydom and Lemley (2018) measured physico-chemical parameters and inorganic nutrients at 5 sites in Marina Martinique in 2016. Results indicated a well-mixed, homogenous environment. Salinity was slightly higher than 'normal' marine conditions (mean of 36.44 ± 0.02 recorded), and temperatures typical of a winter temperate area were noted. Dissolved oxygen concentrations were evenly distributed throughout the Marina, and were typical of well-oxygenated conditions, a result of wind-mixing and a lack of organic loading. pH measured was typical of seawater (i.e. values ranged from 7.69 to 8.34), due to no freshwater inputs from rivers. The primary source of nutrients into the canals is from seawater that is pumped into the system. Inorganic nutrient levels in the system were very low.
- The non-perennial drainage/estuary area north of Marina Martinique is contaminated by uncontrolled sewage flow/seepage/overflowing sewer pipes and pumpstations from urban areas upstream, which ends up in the coastal zone. Illegal dumping also occurs on the terrestrial fringe of the drainage area.
- Solid waste: from ships/boats along coastline, and from landward domestic activities that end up on the beach via wind and surface runoff (especially stormwater outlets)
- Oil pollution from ships and boats at sea
- Light pollution:
    - From residences along the coast
- Noise pollution:
    - Mostly from residential activities. Limited during the year, but will increase in peak seasons.



The non-perennial drainage area/estuary north of Marine Martinique is frequently polluted by sewerage from urban areas in the catchment.

Coastal Development

Description and Assessment

Recreational activities: walking, swimming fishing, bird watching

Existing development types:

- Predominant land cover type in Segment: Residential and Natural Areas (see Figure 65)
- Resorts/tourist accommodation
- Marina Martinique - canals
- Paradise Beach Airfield – landing strip for small aircraft
- Eco-tourism based economy

Access:

- Most of the coastline in this segment can be readily access by road or foot
- Parking to access the beach or estuary is available, but several parking areas are in dynamic coastal process areas and are subject to flooding/sand inundation
- Paradise Beach is accessed by means of a causeway across the Seekoei Estuary. The causeway is subject to flooding, which prevents access periodically. Alternate roads to Jeffreys Bay and Humansdorp do exist, but these are not in a good condition. Refer to development issues/risks below.

Future development / desired spatial form

- Kouga LM SDF (2015):
    - The Segment is part of the Jeffreys Bay primary node. Nodes are areas where higher intensity land uses and activities will be supported and promoted.
    - Desired spatial form: low to medium density residential areas north and west of Paradise Beach and Aston Bay settlements. Expansion of residential areas north of the existing Marina Martinique development.
- The DEDEAT issued a Directive in terms of Section 30A of NEMA for the SBDM to implement various drought mitigation projects so that the various local municipalities can provide adequate water supply. Projects included in the Directive are approved in terms of the EIA Regulations, but approvals (if required) i.t.o. other legislation or regulations must still be obtained (e.g. Water Use Authorisations under the National Water Act, Forest Licence under the National Forest Act). The following projects are included in the Paradise Beach/Jeffreys Bay area:
    - Equipping existing 4 boreholes with pumps, and installation of conveyance infrastructure to connect boreholes to water treatment works/networks
    - Re-use of treated effluent from the Jeffreys Bay WWTW (yield of ~2.5 Ml/day)
    - Install and commission a 1 Ml desalination plant at Paradise Beach. Note that desalination plants are seen as temporary interventions. Permanent facilities will need to be assessed by specialist studies and dispersion modelling, and may not operate without a Coastal Waters Discharge Permit from DEA: Oceans and Coasts (i.t.o. the NEM: ICMA)

Development issues/risks:

- Paradise Beach is accessed via a causeway across the Seekoei Estuary. The following problems regarding the causeway are highlighted by (Wooldridge *et. al.*, 2018):
    - At times, high water levels in the estuary flood the causeway. Estuary water is usually salty (becoming hypersaline on occasions) and this leads to serious damage (rust, malfunctioning electrical systems etc.) and associated repair cost to vehicles crossing. The situation is exacerbated under windy conditions
    - On occasions, the causeway is also very dangerous to drive when water levels overtop the causeway.
    - Pedestrians crossing the causeway are also at serious risk when water levels are high. The causeway is then closed to traffic, sometimes indefinitely. Closure of the causeway compels residents to use one of the alternate roads when they need to access business centres.
    - This makes access to amenities (e.g. hospitals, clinics) difficult for the general community, particularly the elderly. Domestic helpers including gardeners are also compromised when moving between their homes and workplace. Approximately 30 to 40 children cross the causeway on weekdays to meet the school bus at the collection point at the shopping centre in Aston Bay. Access to school for these learners is therefore also compromised by the status of the causeway.
    - Closure of the causeway will impact on residents of Paradise Beach, but also the region. For example, pedestrians, particularly those coming to Paradise Beach to obtain work, will be seriously compromised in terms of access. The residents of Aston Bay, Marina Martinique and others will have no alternate exit route should the road to Jeffreys Bay be temporarily blocked and/or damaged.
    - An increase in storminess and rise in sea level will result in an increase in overwashing of the berm of the Seekoei Estuary, which has implications for the causeway. The Estuary and Wetlands Management Committee (as recommended in the Seekoei Estuary EMP will need to apply an adaptive management approach as the situation changes in the future. By 2030, sea level will increase by about 1.5 cm; by 2050 sea level will increase by 45 cm compared to present. Management strategies will need to adaptive to these ongoing changes in climate (Wooldridge *et al.*, 2018).
- Inappropriately placed development in coastal process areas, wetlands and low-lying areas; the estuarine functional zone of the Seekoei Estuary; and with insufficient setbacks from the high water mark of the sea (for e.g. restaurants and parking area east of Marina Martinique where rock revetments have had to be used to protect landward structures and infrastructure, the car park and community centre at the Seekoei Estuary mouth, numerous structures and infrastructure in the Seekoei estuarine functional zone, numerous residences in the littoral active zone and dune system):
    - disrupts sediment dynamics, and results in erosion and/or sand accumulation in public facilities (e.g. parking areas and ablution facilities) where ongoing maintenance is required
    - storm surges/flooding damage coastal properties and infrastructure. To protect inappropriately placed structures, erosion protection measures are often implemented.
    - development in low-lying areas and wetlands prone to flooding
    - loss of wetlands and impacts on the coastal protection zone result in loss of ecosystem services provided by these environments – e.g. flood attenuation, buffering from storm surges and sea level rise.
- Uncontrolled foot traffic from coastal residences to the beach: trampling of vegetation and destabilisation: results in blow-outs and in some instances, erosion / loss of coastal properties. Using Google Earth images (2019), at least 53 footpaths were identified (see Figure 66).

Opportunities:

- The rich diversity of habitats and species in the Seekoei Estuary and marine environment, as well as the long sandy beach, provide significant recreational and eco-tourism development potential.
- Lifesavers available on main beaches in season
- Existing airfield for recreational aircraft – promotes accessibility of the area, and enhances tourism opportunities.
- Existing boat launching facilities at Paradise Beach and in the Seekoei Estuary.

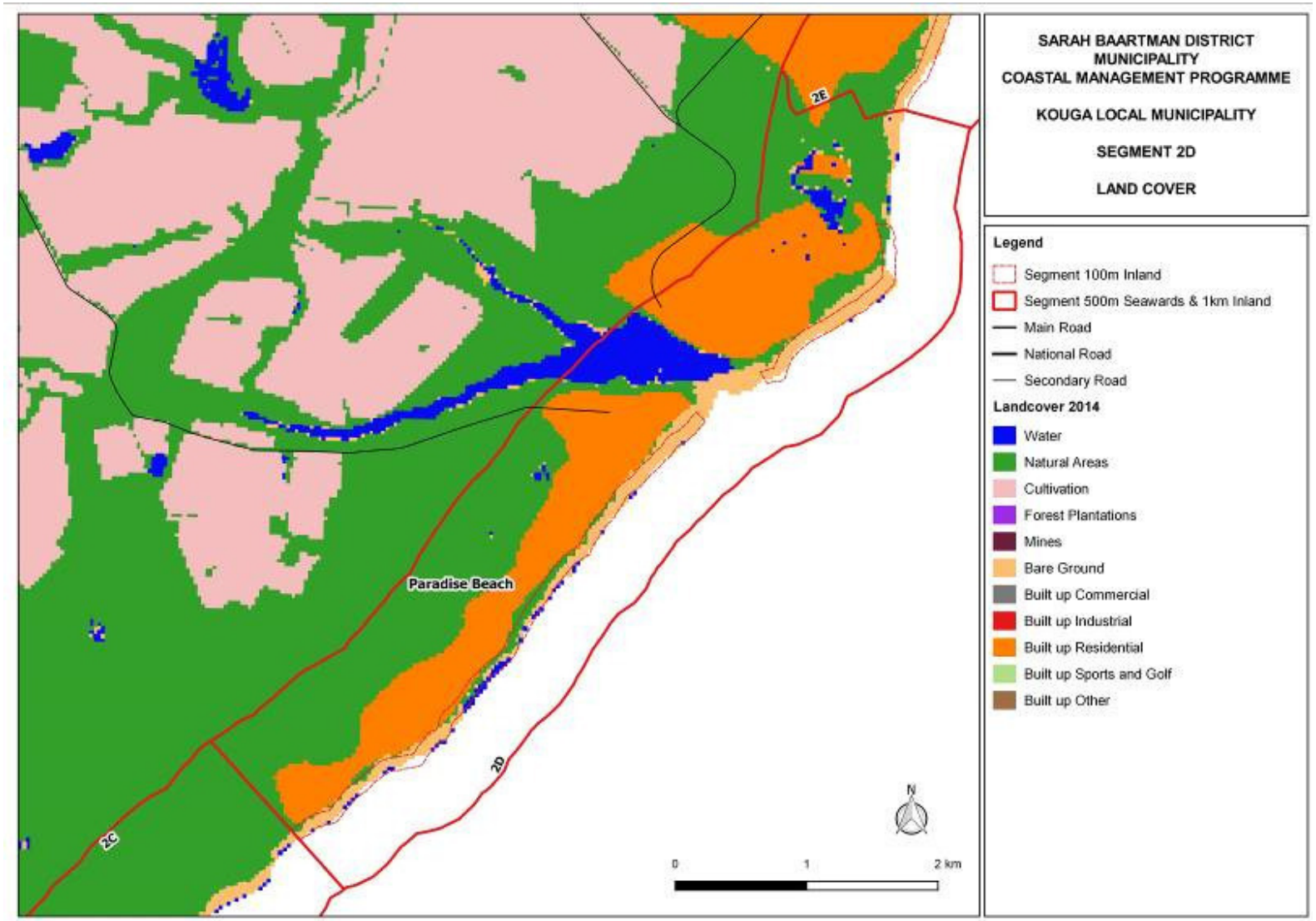


Figure 65: Land Cover map for Segment 2D (note that cattle rangelands are included under 'natural areas', and 'bare ground' is dunes.



Plate 5: Inappropriate placing of hard structures in dynamic dune and coastal process area near Marina Martinique.



Figure 66: Footpaths over dunes to the beach identified in a Google Earth image (2019) in Segment 2D.

5.6 Segment 2E: North of Marina Martinique to Noorsekloof Road



Figure 67: Google Earth image of Segment 2E (outlined in red).

Natural, archaeological and cultural diversity and resource management

Description of key coastal habitats/processes/features:

Aquatic environment (see Figure 68):

- NBA aquatic areas (Draft 2018):
  - No aquatic environments identified in the Segment. However, a number of wetlands occur in the catchment.
  - Six non-perennial rivers are identified on the 1:50 000 watercourse map that flow in a general west-east direction towards the coast. Their connection with the coast has been modified by development, and largely transformed into urban stormwater management systems that discharge onto the beach.

Terrestrial environment:

- VEGMAP (2018) Vegetation types: natural vegetation in most of the Segment has been modified by urban development. The pre-disturbance vegetation types for the area are Sundays Mesic Thicket (predominant), Cape Seashore vegetation, and Humansdorp Shale Renosterveld (minor portion on the south-western side of the Segment).
- Threatened Ecosystems (2011): a small section of the Segment is endangered (that corresponds with Humansdorp Shale Renosterveld), however this covers a relatively large section of the catchment area of the Segment.
- Dunefields: The dunefield running along the shore is classified as a fixed retention ridge

Protected Areas, Conservation Areas, and Stewardship Sites:

- One PA: Noorsekloof Nature Reserve
- Conservation areas: the Segment is part of the Garden Route Biosphere Reserve, which extends from just east of Groot Brak in the west to the Van Stadens Estuary in the east

Archaeology and cultural diversity:

Only one archaeological site is been identified in the Segment on the SAHRIS database.

Resource use harvesting:

- Commercial fishing, and launch areas
- Recreational fishing
- Possible aquaculture projects in the future
- Offshore petroleum and gas exploration polygon

Threats to natural/archaeological resource management:

- Commercial fisheries: DAFF's law enforcement office is not situated at the site where commercial fishing boats launch (corner of Diaz and St Croix Roads) which reduces the effectiveness of compliance monitoring.
- Alien vegetation encroachment in coastal dunes
- Informal pedestrian beach access over dunes – vegetation is trampled, causing erosion and blow outs
- Modification / alteration of natural drainage systems and loss of connectivity with the coast.
- Development in the littoral active zone / in dunefields: disrupts dynamic coastal processes and impacts on sediment dynamics.
- Expansion of urban settlements and associated infrastructure: biodiversity loss, and disruption of ecological processes

Opportunities for natural/archaeological resource management:

- Dolphin Beach – Blue Flag Status 2018
- The poaching risk in the area is relatively low
- The coastal zone in the area has a good diversity of habitats and species; and is rich in archaeological/heritage resources. This creates opportunities for low-impact eco-tourism development.

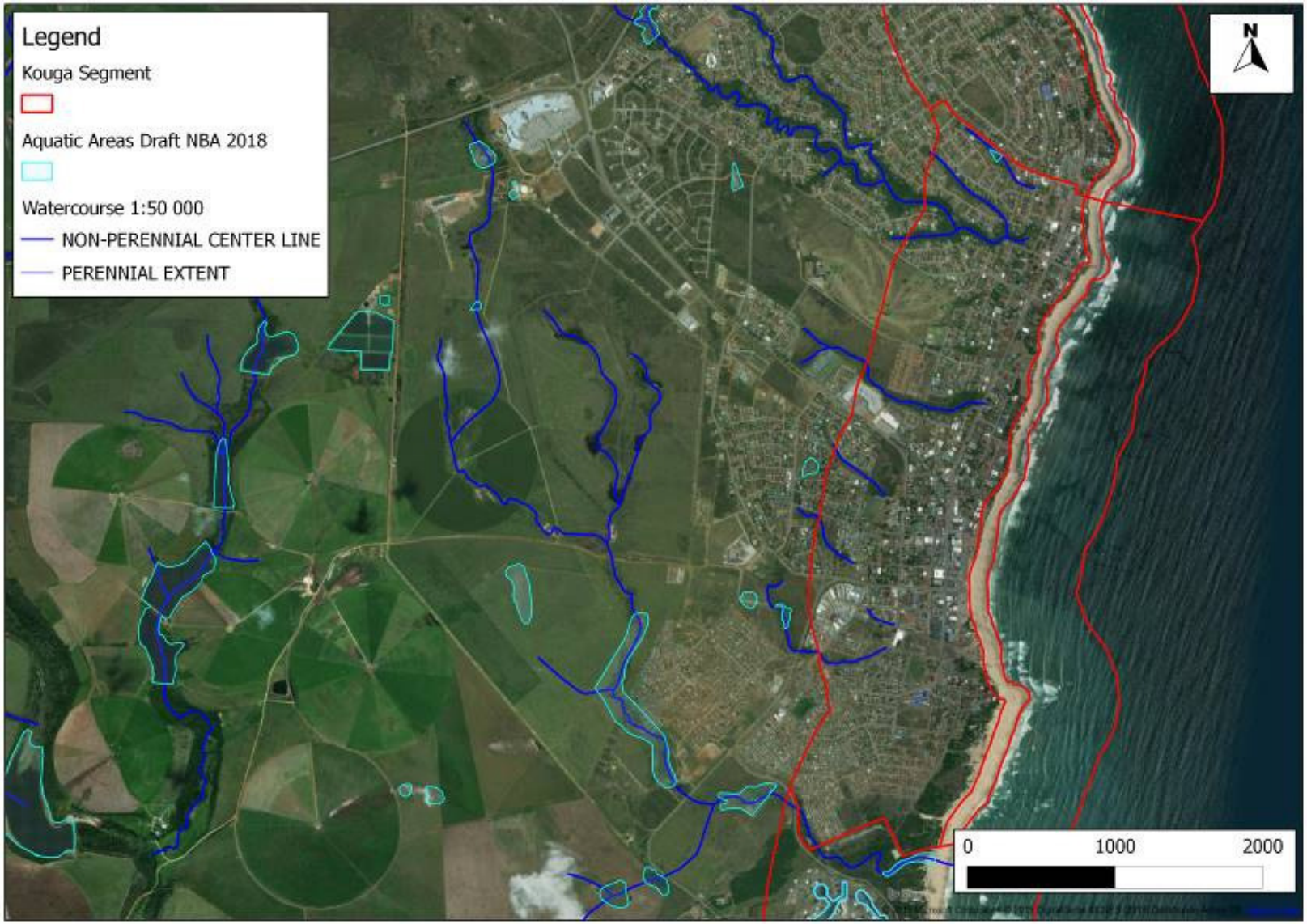


Figure 68: Watercourses and Wetlands in Segment 2E.

Coastal Pollution

Description and Assessment

Catchment land use/land cover type (refer to Figure 50):

- A combination of agriculture, urban development, and natural areas. Agriculture and urban development are considered to present a medium pollution risk.
- The Jeffreys Bay WWTW occurs in the catchment area. Treated effluent from the works is discharged to irrigated lands on a farm south of the works.
- Typical pollutants associated with land use types: elevated nutrients, bacteria, pesticides, oils and grease, metals.
- Runoff and/or seepage into the groundwater zone would end up at the coast, and contribute to the deterioration of coastal water quality.

Activities in the Segment: high density residential areas, commercial/business, tourism operations, light industry, sport and recreational use,

- Land use/land cover type: urban (predominant), sports (golf course), and natural areas
- Litter on beach from landward activities, and marine vessels
- Illegal dumping in public open spaces along the coast. There is no landfill site in Jeffreys Bay, which increases the risk of dumping.
- Lack of ablution facilities and no waste management at some public beaches – i.e. at the beach parking area in front of Pellsrus
- Stormwater discharge onto beaches. Stormwater picks up pollutants from urban and industrial activities, and litter, that ends up on the beach. Overflow from blocked sewage pipes and manholes discharges into stormwater systems. Periodically, sewage discharge onto beaches is captured by means of a berm to create a dam, which is then emptied by the municipality using honeysuckers.
- Residents in the Pellsrus area that live near the coast are in an area where sewage would gravity flow to from activities in the catchment (i.e. Pellsrus is at a natural low point and sewage from the Ocean View settlement would flow to the area). While the Ocean View settlement is relatively new, manholes over flow and pipes leak. Sewage discharges into a pond south of the intersection of Dolphin Drive and Northern Access Road. Overflowing sewer manholes and pipes result in sewage collecting at the surface along Dolphin Drive. At times, residences in Pellsrus have been inundated with sewage from leaking/blocked pipes. Sewage migrates onto the beach via the stormwater system. The pollution risk is exacerbated by some residents in Ocean View still being on the bucket system.
- Oil pollution from spills from ships/boats at sea
- Light pollution: From residences along the coast
- Noise pollution: Mostly from residential activities. Elevated in peak seasons



Stormwater discharge to public beaches.



Overflow of sewer manholes in Ocean View.

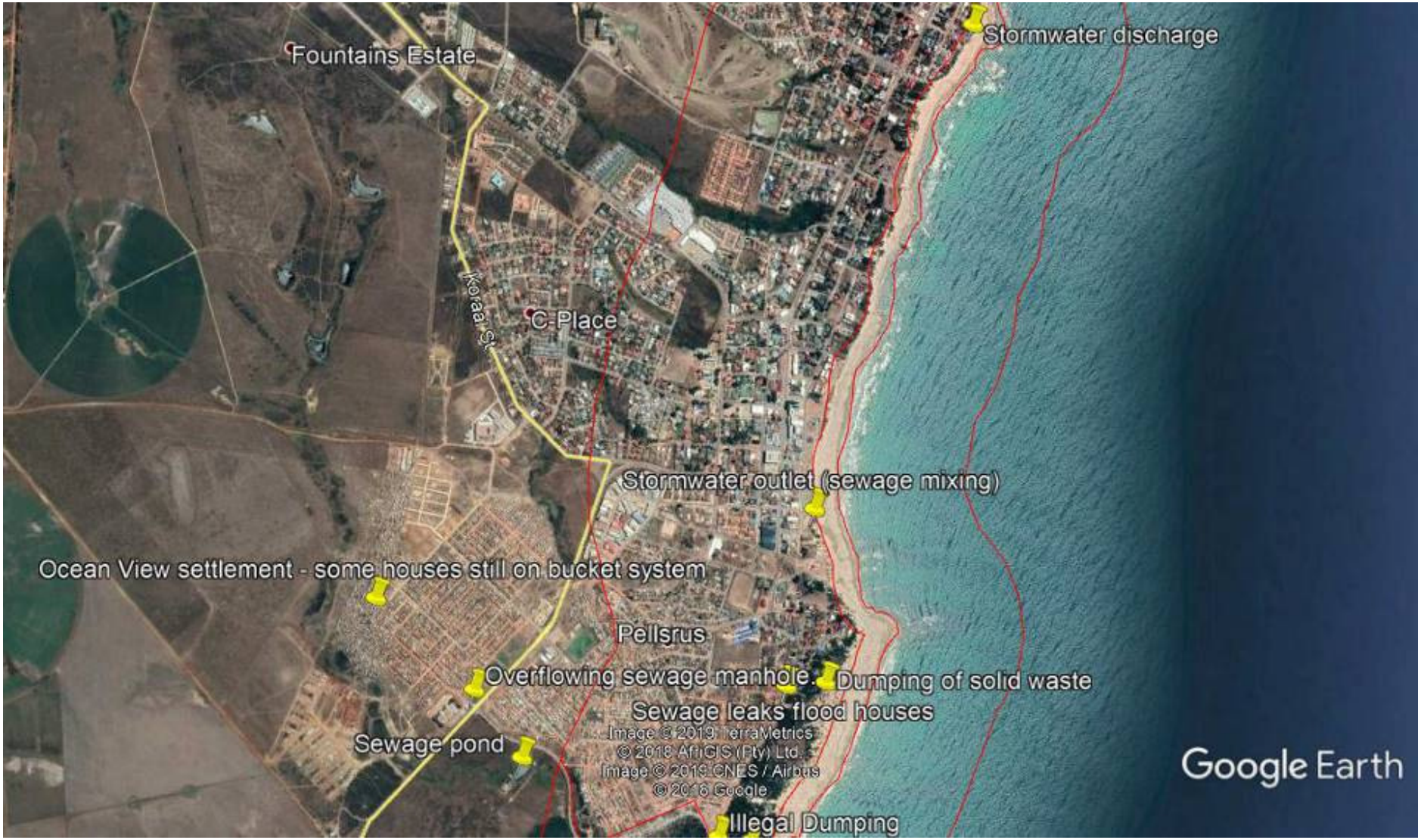


Figure 69: Some examples of areas in Segment 2E where pollution from sewage and solid waste are problematic.

Coastal Development

Description and Assessment

Recreational activities: surfing, walking, swimming fishing

Existing development types:

- Predominant land cover type in Segment: Built up areas (see Figure 70)
- Resorts/tourist accommodation
- The CBD is located within the Segment
- Eco-tourism based economy
- Light industrial and manufacturing

Access:

- The coastline is readily accessible by road or foot. Access in the southern part of the Segment near Pellsrus needs to be improved.
- Parking at beaches is available, but needs to be upgraded in the Pellsrus area. Only one parking area is found in the latter part of the Segment, and is has no facilities and is a safety risk (refer to Figure 71 that shows the concentration of facilities north of Pellsrus).

Future development / desired spatial form

- Kouga LM SDF (2015):
    - The Segment is part of the Jeffreys Bay primary node. Nodes are areas where higher intensity land uses and activities will be supported and promoted.
    - The SDF makes the following recommendations regarding desired development in the segment:
        - Acknowledge R102, St Francis Drive and Da Gama Road as the key access corridors to the greater Jeffreys Bay area.
        - Promote the demand for residential expansion and service delivery within Jeffreys Bay, increasing administrative, commercial and job creation functions of Jeffreys Bay.
        - Promote the redevelopment and upgrading of the Jeffreys Bay CBD to maintain its function within the greater Jeffreys Bay area.
        - Smaller commercial nodes along Da Gama Road and the R102 should complement the Central Business District
        - Expansion and urban upgrading of the Oceanview residential area is prioritised with future expansion to the west.
        - The Jeffreys Bay Golf Course is considered to be a ‘key focus area’ for future development intensification.
- The DEDEAT issued a Directive in terms of Section 30A of NEMA for the SBDM to implement various drought mitigation projects so that the various local municipalities can provide adequate water supply. Projects included in the Directive are approved in terms of the EIA Regulations, but approvals (if required) i.t.o. other legislation or regulations must still be obtained (e.g. Water Use Authorisations under the National Water Act, Forest Licence under the National Forest Act). The following projects are included in the Jeffreys Bay area:
    - Equipping existing 4 boreholes with pumps, and installation of conveyance infrastructure to connect boreholes to water treatment works/networks
    - Re-use of treated effluent from the Jeffreys Bay WWTW (yield of ~2.5 Ml/day)

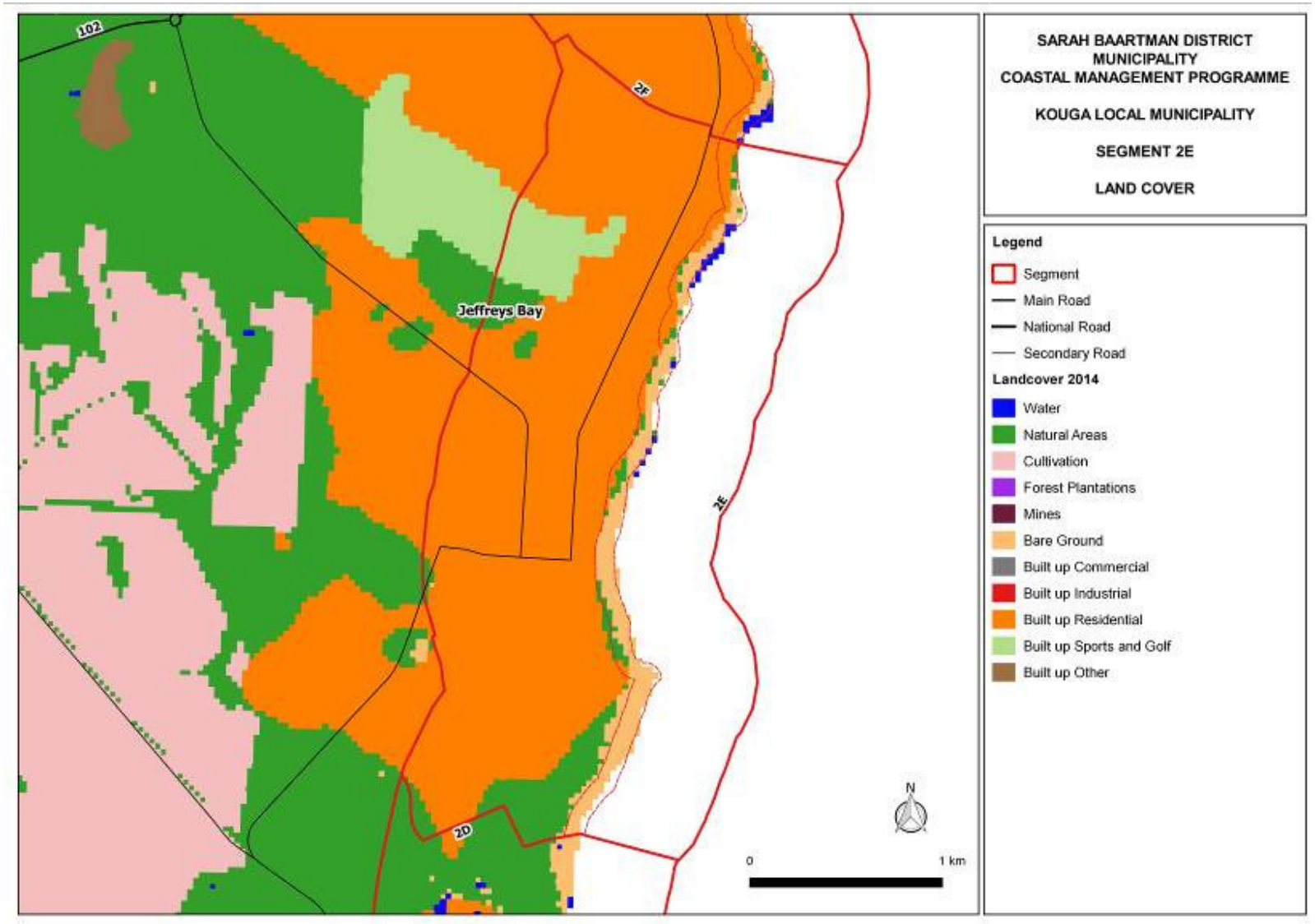


Figure 70: Land Cover map for Segment 2E (note that cattle rangelands are included under 'natural areas', and 'bare ground' is dunes.

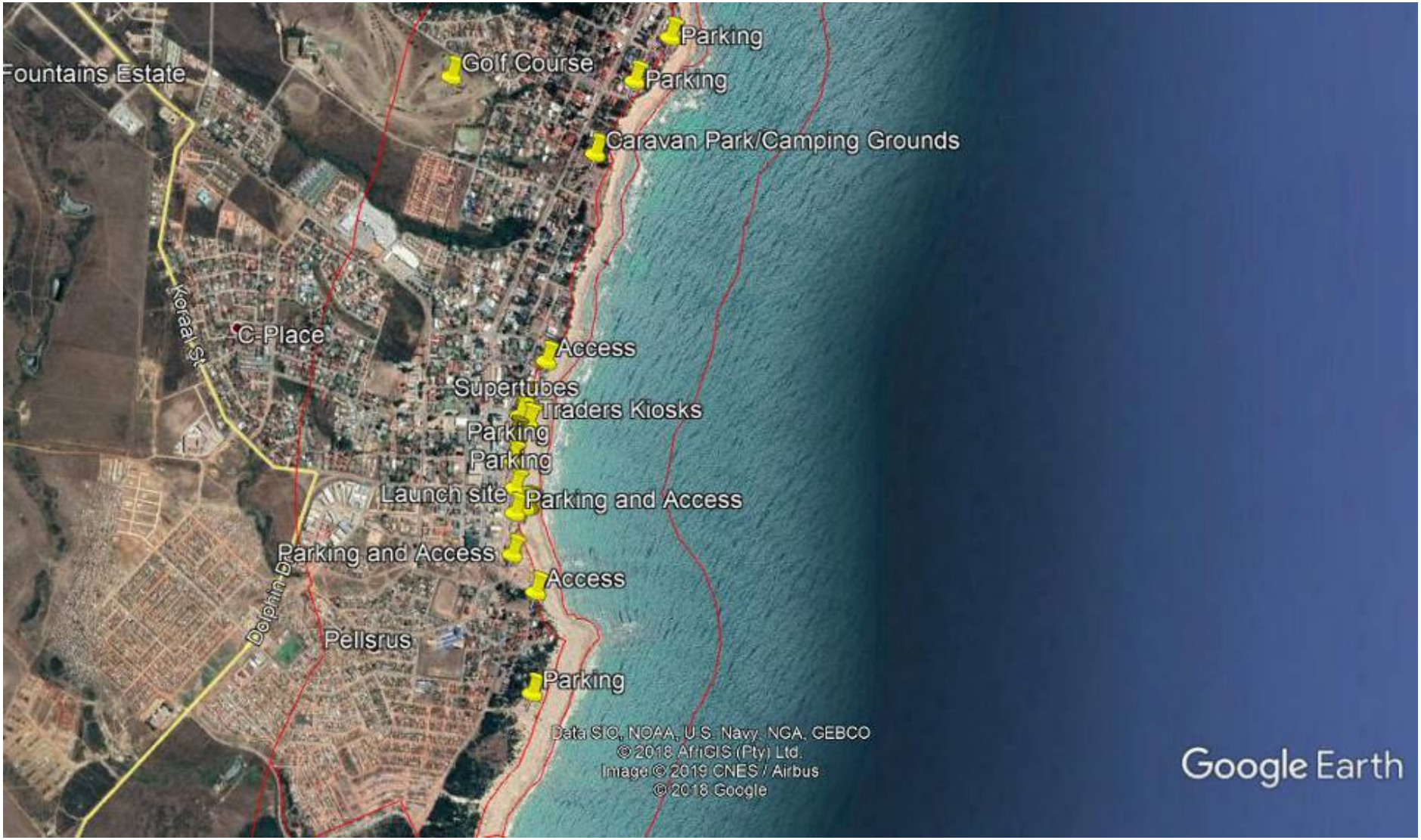


Figure 71: Parking and Access to beaches in Segment 2E.

Development issues/risks:

- Access and beach parking in the Pellsrus area is limited, and in a poor condition (see Figure 72. The parking lot just east of Duine Road and Snoek Street has no ablution or waste facilities, is used for dumping waste, and is unsafe.
- Poor coastal water quality as a result of sewage and stormwater discharge to the beach compromises recreational use and tourism opportunities.
- Old municipal services infrastructure that has not been designed to cope with current population numbers.
- A launch site is situated on the corner of Diaz and St Croix Street which is used by commercial and recreational fishermen (see Figure 72). The current status of the access point and launch site presents access and safety risks. Vehicles towing boats need to accelerate through sand to get into sea. The area is used by the public (surfers, beach goers etc).
  There is poor visibility at the access point (vegetated dune on either side of access onto beach) which makes is difficult for vehicles to see pedestrians and vice versa. Coupled with ineffective signage warning pedestrians, this presents a safety risk.
- Ablution facilities at the parking area on the corner of Diaz and St Croix Street is dilapidated and needs to be upgraded.
- Structures built in dynamic coastal process areas / dunes are at risk of storm surges and being undercut and eroded. Public parking and ablution facilities in dynamic areas need constant maintenance to remove sand.
- Pedestrian foot traffic over dunes to access the beach leads to coastal erosion.
- Insufficient public camping / caravan / picnic facilities.

Opportunities:

- World class surfing location attracts international and local tourists.
- Lifesavers available on main beaches in season.
- Existing boat launching facility.
- Good access to restaurants and other amenities required for tourism base.



Launch area for fishing boats at public beach on the corner of Diaz and St Croix Street.



Dumping in the poorly maintained beach parking area at Pellsrus.



Figure 72: Development within dunes (yellow - Illenberger, 2009) and pedestrian access path markers between the southern extent of the Segment and Woltemade Street. The parking area near Pellsrus that needs to be upgraded, and the launch site with safety risks is shown.



Figure 73: Coastal development issues at the beach near Pellsrus.



Plate 6: Coastal development issues at the launch site on the corner of Diaz and St Croix Street in Jeffreys Bay.



Figure 74: Development within dunes (yellow - Illenberger, 2009) and pedestrian access path markers between Drommedaris Street and Myrtle Road.



Figure 75: Development within dunes (yellow - Illenberger, 2009) and pedestrian access path markers between Petunia Avenue and Noorsekloof Road.

5.7 Segment 2F: Noorsekloof Road to south-western edge of Kabeljous estuary mouth



Figure 76: Google Earth image of Segment 2F (outlined in red).

Natural, archaeological and cultural diversity and resource management

Description of key coastal habitats/processes/features:

Aquatic environment:

- NBA aquatic areas (Draft 2018):
  - Identified 2 dams in the Segment, and dams in the catchment mostly associated with the Kabeljous River. The south-western edge of the Kabeljous Estuary extends into the Segment.
  - Four non-perennial drainage lines are identified on 1:50 000 watercourse layer, two of which are tributaries of the Kabeljous River to the north-east.
- One estuary: as above, a small portion of the Kabeljous Estuary extends into the Segment. This will be discussed under Segment 2G

Terrestrial environment:

- VEGMAP (2018) Vegetation types: natural vegetation in most of the Segment has been modified by urban development. The pre-disturbance vegetation types for the area are Sundays Mesic Thicket (predominant), and Cape Seashore vegetation
- Threatened Ecosystems (2011): none identified in the Segment, however Humansdorp Shale Renosterveld occurs in the catchment area and is 'endangered'.
- Dunefields: The dunefield running along the shore is classified as a fixed retention ridge

Protected Areas, Conservation Areas, and Stewardship Sites:

- No PAs or Stewardship Sites in the Segment
- Conservation Areas: the Segment is part of the Garden Route Biosphere Reserve, which extends from just east of Groot Brak in the west to the Van Stadens Estuary in the east

Archaeology and cultural diversity:

- Five archaeological sites are identified in the north-western corner of the Segment, adjacent to the Kabeljous Estuary, on the SAHRIS database
- Shell midden scatters recorded by specialists near the old caravan park and near Kabeljous Estuary, Stone Age tools found near Kabeljous Estuary

Resource use harvesting:

Recreational fishing
Bait collection
Offshore petroleum and gas exploration polygon

Threats to natural/archaeological resource management:

- Alien vegetation encroachment in coastal dunes.
- Development in dynamic process areas and dunes – disruption of sediment processes, coastal erosion; loss of dune habitat.
- Informal pedestrian beach access over dunes (mostly on the northern section of the segment in the area between the caravan park and the Kabejous estuary) – erosion, blow outs.
- Destruction of archaeological sites by development in coastal dune areas.
- Modification / alteration of natural drainage systems and loss of connectivity with the coast. Natural flow constrained to stormwater system with piped discharge along the coastline.
- Expansion of urban settlements and associated infrastructure: biodiversity loss, and disruption of ecological processes.

Opportunities for natural/archaeological resource management:

- The poaching risk in the area is relatively low
- The coastal zone in the area has a good diversity of habitats and species; and is rich in archaeological/heritage resources. This creates opportunities for low-impact eco-tourism development

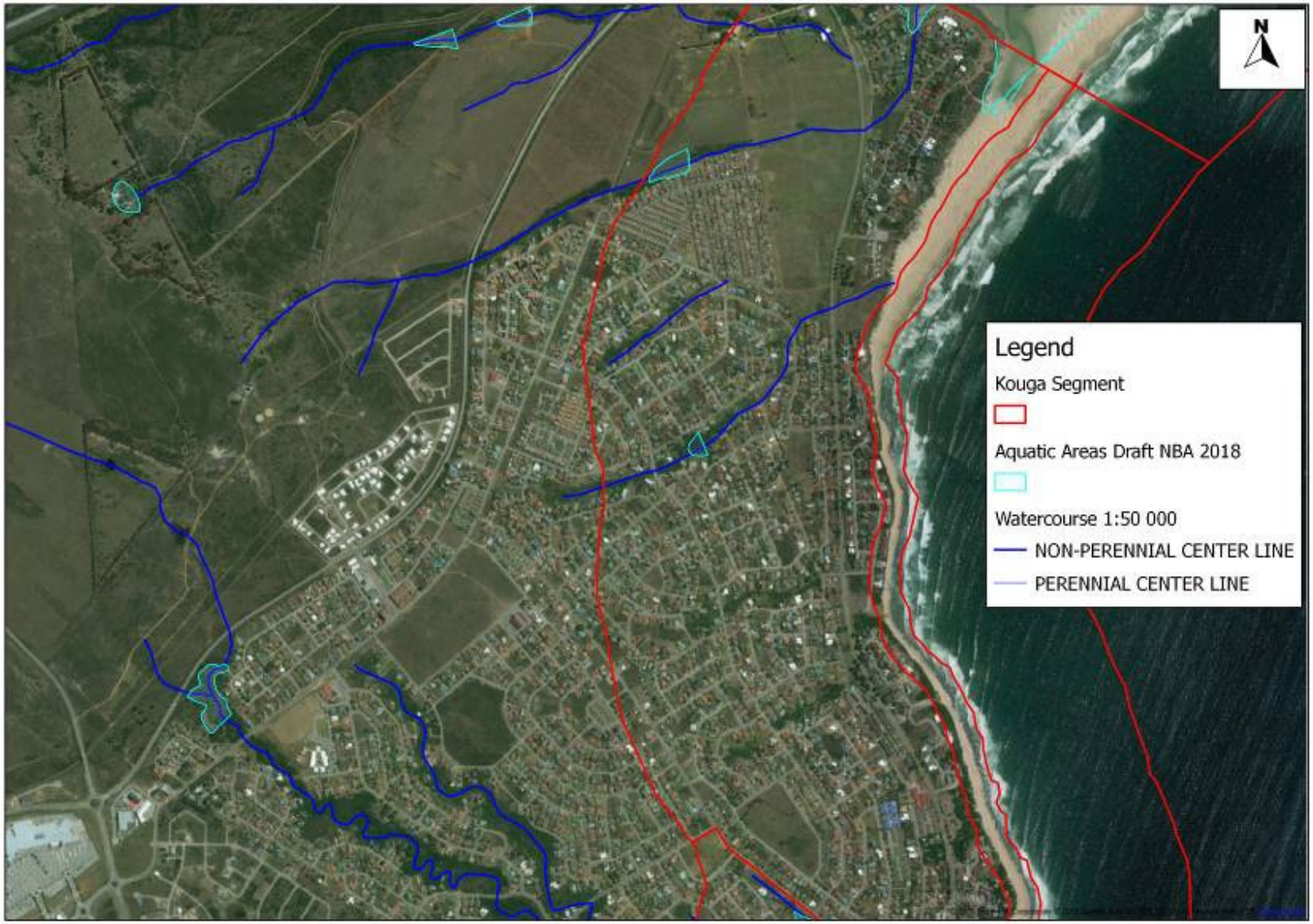


Figure 77: Watercourses and Wetlands in Segment 2F.

Coastal Pollution

Description and Assessment:

Catchment land use/land cover type:

- Predominantly natural areas and agriculture.
- Agriculture is considered a medium pollution risk from runoff/leachate from manure that may have elevated nutrient and bacterial concentrations.

Activities in the Segment:

- Land use/land cover type: predominantly urban built up areas, which pose a medium pollution risk.
- Residences within Kabeljous Estuarine Functional Zone, and with a setback from the high water mark of the sea of 10 m or less – sewage systems at risk of being damaged by high water table, flooding, storm surges etc., with overflow / spills into the estuary
- There are 3 sewer pumpstations in the Segment, and a network of bulk sewer lines. These pose a risk of leaks/overflow of sewage into the Kabeljous Estuary and/or the marine environment.
- Stormwater discharge onto beaches: stormwater may contain solid waste, hydrocarbons, metals, nutrients and pathogens that it picks up along its flowpath through developed areas.
- Litter from landward activities and ships at sea
- Oil pollution from spills from ships/boats at sea
- Light pollution: from residences along the coast
- Noise pollution: from general residential activities. Elevated during peak season

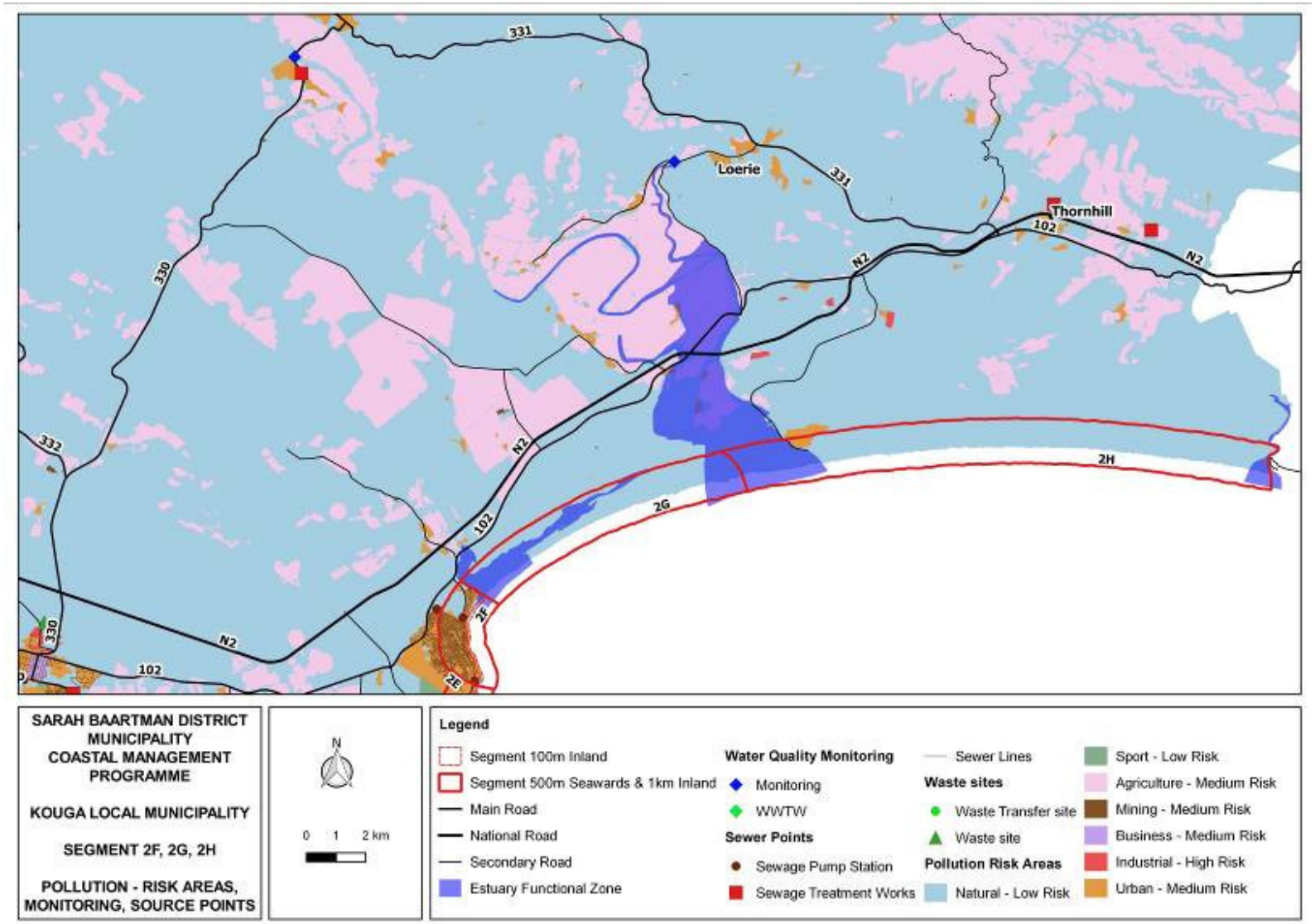


Figure 78: Pollution risk areas in Segments 2F to 2H based on land cover type and anticipated pollution risk, and known (based on available data) point sources of potential pollution.

Coastal Development

Description and Assessment

Recreational activities: surfing, walking, swimming, fishing

Existing development types:

- Predominant land cover type in Segment: Built up areas (residential) (see Figure 70)
- Resorts/tourist accommodation, including caravan park
- Public recreational areas (e.g. picnic and braai areas)
- Eco-tourism based economy

Access:

- The coastline is readily accessible by road or foot.
- Parking at beaches is available along the extent of the Segment. At the northern part of the Segment near the Kabeljous Estuary, vehicles park in grassed day camping/picnic areas. Consideration to be given to providing a dedicated parking area to maximise on public open space.
- Public pedestrian beach access is mostly via formal access points in this Segment, however numerous private residences along the frontal dune system have individual footpaths to the beach which destabilises dune vegetation and accelerates coastal erosion.

Future development / desired spatial form

- Kouga LM SDF (2015):
    - The Segment occurs just on the edge of the Jeffreys Bay primary node. Nodes are areas where higher intensity land uses and activities will be supported and promoted.
    - The SDF makes the following recommendations regarding desired development in the segment:
        - Expansion of existing nodes should not be permitted outside the delineated urban edge or outside the policy parameters as identified.

Development issues/risks:

- Stormwater discharge to the beach presents a possible pollution risk, and compromises recreational use and tourism opportunities.
- Old municipal services infrastructure that has not been designed to cope with current population numbers.
- Public pedestrian beach access is mostly via formal access points, however numerous private residences along the coast have individual footpaths to the beach which destabilises dune vegetation and accelerates beach erosion. On the northern side of the Segment, near the Kabeljous estuary, a number of informal pedestrian footpaths occur over dunes to the beach.
- Structures built in dynamic coastal process areas / dunes are at risk of storm surges and being undercut and eroded. Houses built in the dune system with little to no coastal vegetation and/or dune system remaining are at particular risk of storm surges – for example the area between Pine Road and the Kabeljous Caravan Park. Several residences have had to implement coastal protection measures on the seaward side of their properties for stabilisation.
- Roads and infrastructure, and residential development within Kabeljous Estuarine Functional Zone are at risk of flooding/inundation.

Opportunities:

- World class surfing location attracts international and local tourists.
- Lifesavers available on main beaches in season.
- Good fishing opportunities.
- Kabeljous Estuary: good birding opportunities
- Good access to restaurants and other amenities required for tourism base.



Plate 7: Attempts being made by individual landowners to rehabilitate dunes in front of houses by using access boardwalks, and signs to direct people off of dunes

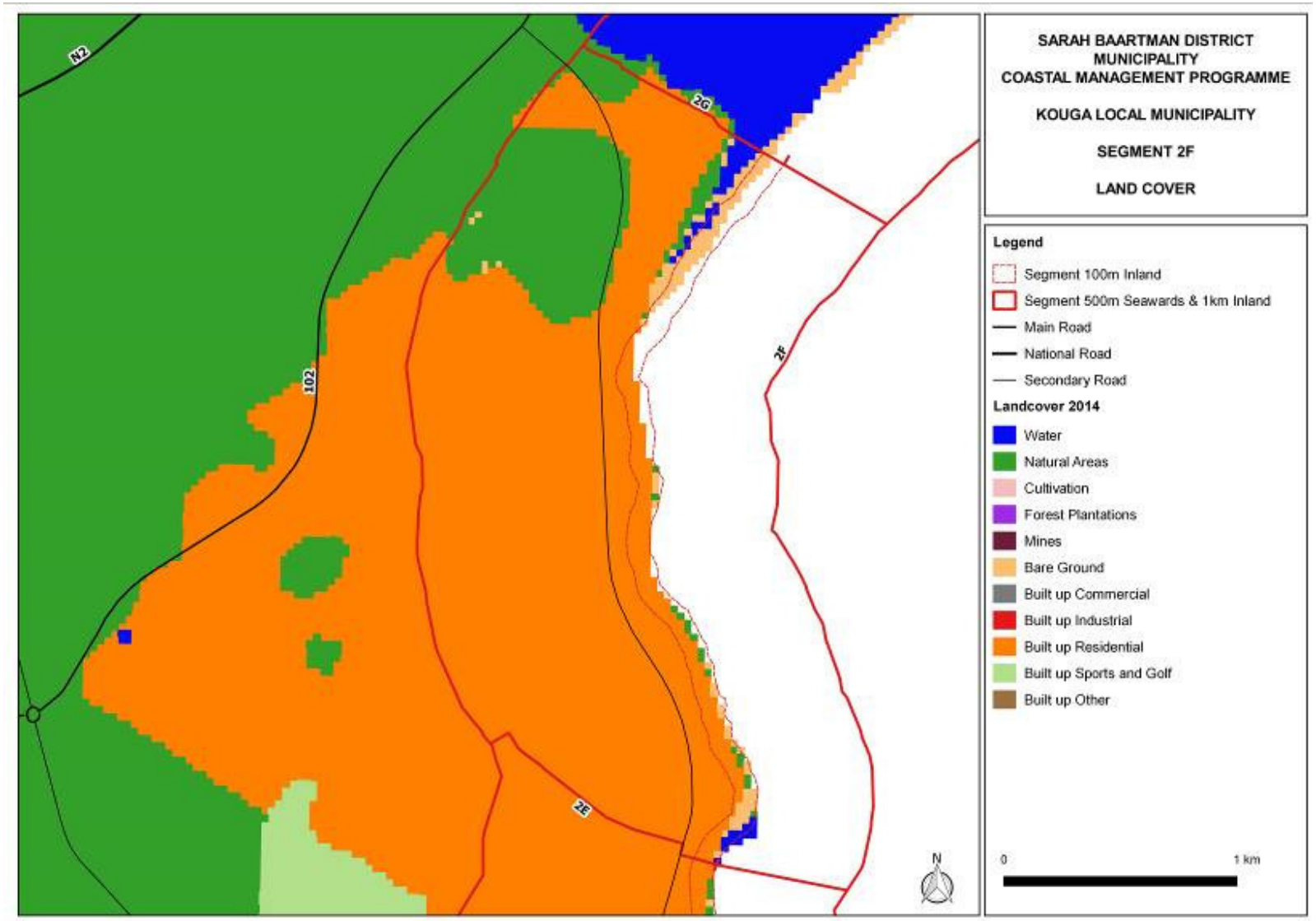


Figure 79: Land Cover map for Segment 2F (note that cattle rangelands are included under 'natural areas', and 'bare ground' is dunes).

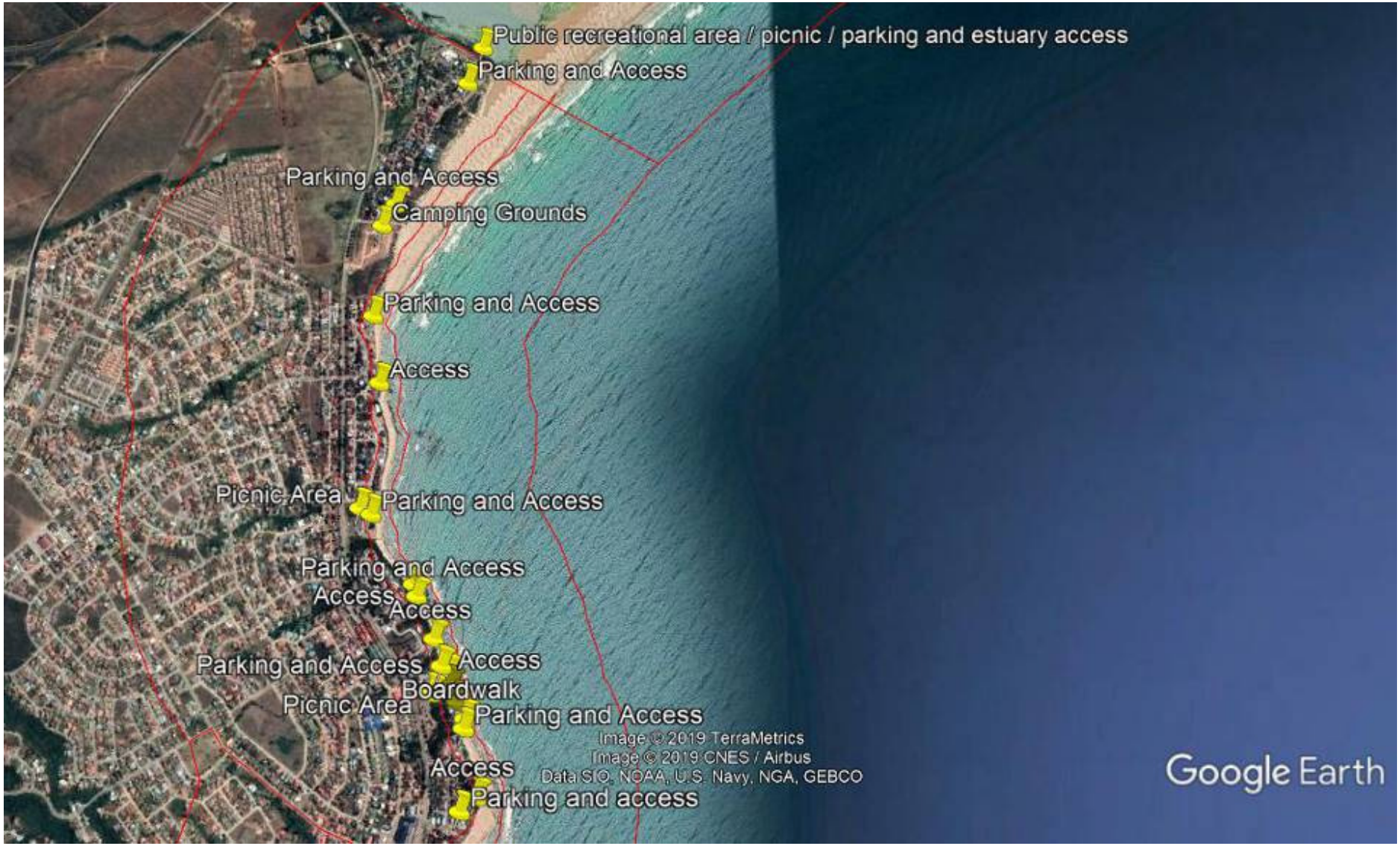


Figure 80: Public recreational areas, Parking and Access to beaches in Segment 2F.



Figure 81: Coastal development issues near the Kabeljous Estuary Mouth.



Figure 82: Development within dunes (yellow - Illenberger, 2009) and markers showing areas where informal access over dunes and/or access from private residences occurs.

5.8 Segment 2G: South-western edge of Kabeljous estuary mouth to western edge of Gamtoos River mouth

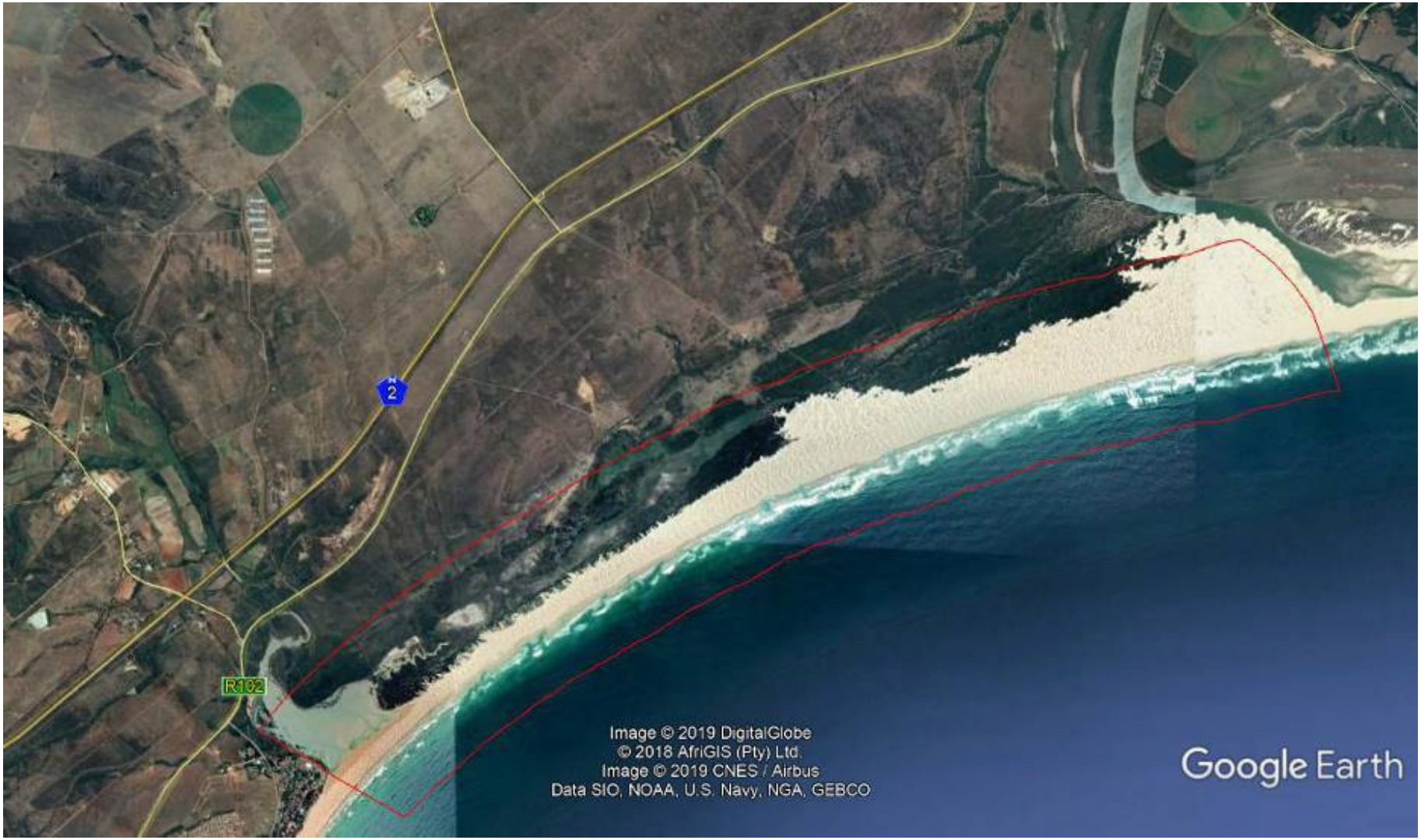


Figure 83: Google Earth image of Segment 2G (outlined in red).

Natural resource management

Description of key coastal habitats/processes/features:

Aquatic environment:

- NBA aquatic areas (Draft 2018):
  - The Papiesfontein wetland system is identified as being part of the greater Kabeljous Estuary system
  - Several marshes and pans identified in the catchment of the segment
  - Watercourses: The Kabeljous River is an FEPA. A network of non-perennial watercourses are shown on the 1:50 000 watercourse layer, all associated with the Kabeljous River.
  - Bickerton and Pierce (1988) support the recommendations by Heydorn and Tinley (1980) and Tinley (1985) that the coastline between the Kabeljous and Gamtoos Estuary mouths be prioritised for conservation because of the barrier vleis between the primary dunes and hinterland that form a rich wetland (known as the "Papiesfontein wetlands').
- Two estuaries (warm temperate):
  - Gamtoos (discussed in Segment 2H)
  - Kabeljous: The Kabeljous Estuary is a wide, shallow (~ 0.5 m deep) coastal lagoon (Bickerton and Pierce, 1988). Tidal action occurs to an old cause-way ~2.25 km upstream of the sea. A 100 – 200 m wide sandbar stretches 800 m across the estuary mouth, separating the estuary from the sea. The sandbar is only breached during floods, and therefore blocks freshwater discharge and tidal exchange for most of the year (Coastal and Environmental Services, 2010). The estuary provides an important nursery function for sub-adult kob species, and possibly juveniles. The Ecological Category of the estuary is rated as 'C', with the health condition of microalgae, macrophytes, invertebrates and fish being 'fair', and birds 'good'. The Biological State and mean Estuary Health State are both rated as 'fair'. A 'B' ecological category is recommended (Van Niekerk and Turpie, 2012). Siltation: There are two sources of land-derives sediment to the Kabeljous Estuary – fluvially-derived mud and pebbles enter the tidal head of the estuary from where they are distributed mostly by fluvial floods. Locally derived stormwater containing suspended clay particles floats on saline estuary water, and is wind dispersed (Reddering and Esterhuysen, 1984 *in* Bickerton and Pierce, 1988). The area surrounding the Kabeljous River is relatively undisturbed, making it a desirable habitat for water birds, especially during the dry months when the estuary is closed (Bickerton and Pierce, 1988). The wetland areas and associated channels immediately to the north-east of the lower reaches of the estuary are an important area for waders (Underhill *et al.*, 1980 *in* Coastal and Environmental Services, 2010). The estuary hosts a significant number of sea birds and waders, with 130 regularly occurring species. Species include Great Egret, Greater Flamingo, Lesser Flamingo, Goliath Heron, Osprey, African Fish-Eagle, Southern Pochard, White-faced Duck, Eurasian Curlew, Caspian Tern, Swift Tern, Sandwich Tern, Common Tern, Little Tern, Knysna Woodpecker, Green Wood-Hoopoe, Black Harrier, Olive Bush-Shrike and Grey-headed BushShrike, Common Whimbrel and Chestnut-banded Plover (SA Birding 2008 *in* Coastal and Environmental Services, 2010). The wader density along the Kabeljous system has been recorded as 35.1 / km and is the highest for any sandy beach along the eastern and southern Cape coastline (Coastal and Environmental Services, 2010).

Terrestrial environment:

- VEGMAP (2018) vegetation types: Cape Seashore vegetation, St Francis Dune Thicket, and Sundays Mesic Thicket (mostly associated with the river), with increasing distance inland. Most of the catchment area comprises Humansdorp Shale Renosterveld.
- Threatened ecosystems (2011): none identified in the catchment, however the catchment is critically endangered (associated with Humansdorp Shale Renosterveld)
- CREW database: a relatively large number of threatened plants have been recorded in the Segment and catchment area
- Dunefields: between Kabeljous Estuary and Gamtoos – fixed retention ridge, becoming mobile accretionary transgressive sheet dunefield. Just north of the mobile accretionary transgressive sheet dunefield is a vegetated dune that is not currently active.

Protected Areas, Conservation Areas, and Stewardship Sites

- One PA: Kabeljous River Nature Reserve
- Conservation Areas: the Segment is part of the Garden Route Biosphere Reserve, which extends from just east of Groot Brak in the west to the Van Stadens Estuary in the east
- Other Informal Protected Areas: Papiesfontein State-Owned land
- The entire area between the Kabeljous and Gamtoos Estuary has been highlighted as being of critical biodiversity / conservation value.

Archaeology and cultural diversity: Significant archaeological finds occur in the segment, including shell middens and scatters, pottery, stone tools, and burial sites.

Resource use harvesting:
Recreational fishing
Bait collection
Commercial fisheries
Offshore petroleum and gas exploration polygon (eastern extent of the polygon)

Threats to natural/archaeological resource management:

- Kabeljous Estuary:
  - Abstraction of freshwater: Numerous small dams on minor tributaries of the Kabeljous. Abstraction from the river for irrigation and domestic use, and lowering of the groundwater table leads to estuary deterioration as a result of decreased freshwater inflow.
  - Development in the floodpain of the Kabeljous River results in erosion and increased siltation to the estuary. Stagnant water bodies lead to encroachment of aquatic weeds.
  - Obstructions: dams, Port Elizabeth/Humansdorp narrow gauge railway line, and the old N2 cross the head of the estuary ~2 km upstream from the mouth; and the N2 ~2.5 km upstream of the mouth (Bickerton and Pierce, 1988).
  - Change in flow is considered a low pressure; and pollution and habitat loss are medium pressures. Fishing effort is low. Bait collection occurs (Van Niekerk and Turpie, 2012).
- Development pressure and urban expansion in sensitive coastal environment – impact on vegetation, wetlands, estuarine functioning, and archaeological sites. Of note is the proposals in the GAMKAB SDF that identifies the area between the Kabeljous and Gamtoos estuaries as a 'key focus area' for future development intensification

Opportunities for natural/archaeological resource management:

- The poaching risk in the area is relatively low
- The coastal zone in the area has a good diversity of habitats and species; and is rich in archaeological/heritage resources. This creates opportunities for low-impact eco-tourism development
- Funding from wind farm developments in the area, and partnerships with organisations (e.g. Conservation Outcomes) assists with biodiversity management and increasing conservation and stewardship areas
- Well documented information on the occurrence and importance of archaeological sites in the area

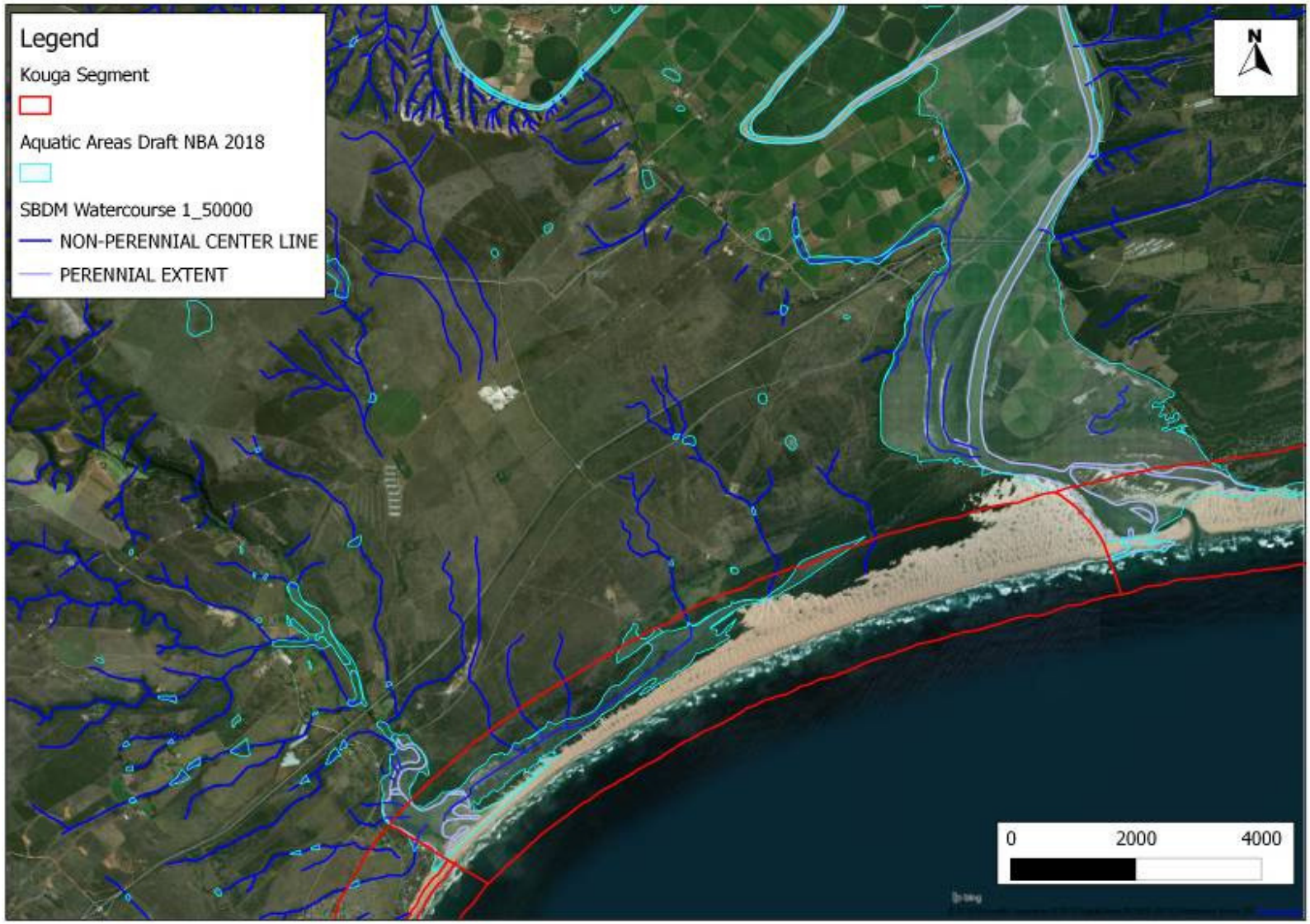


Figure 84: Watercourses and Wetlands in Segment 2G.

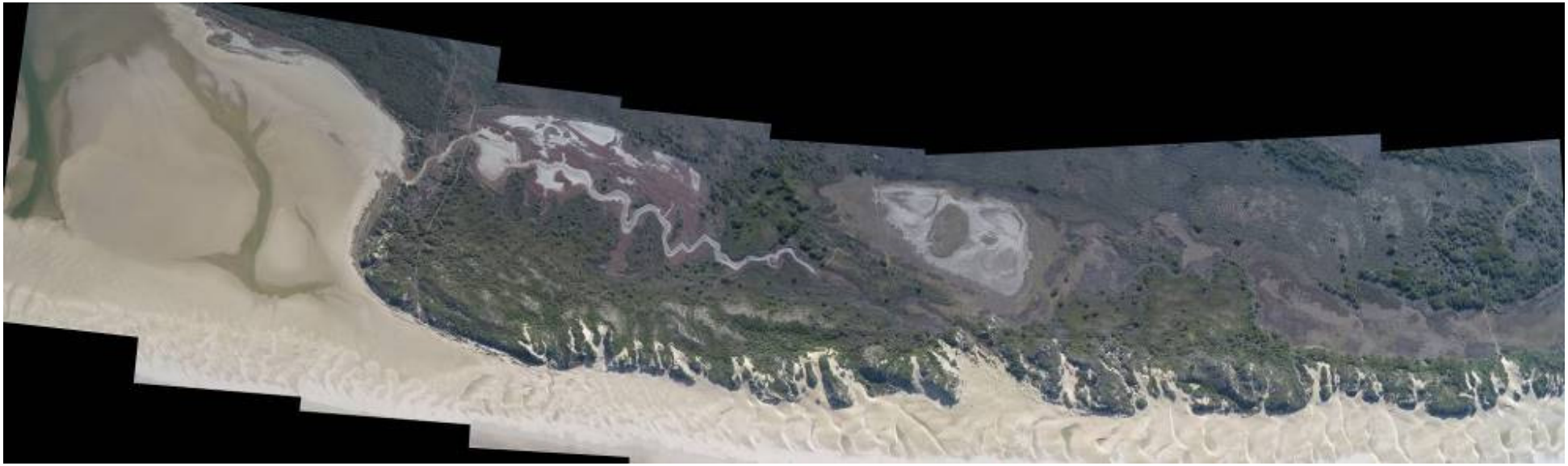


Figure 85: An aerial image (2018) of the Papiesfontein wetlands on the eastern side of the Kabeljous Estuary mouth.

Coastal Pollution

Description and Assessment:

Catchment land use/land cover type:

- Predominantly natural areas with a low pollution risk and agriculture with a medium pollution risk as a result of runoff/leachate from manure/fertilisers/pesticides used in grazing areas, at dairies, and cultivated lands.

Activities in the Segment:

- Little to no development in the coastal zone. Mostly natural areas. There is an old landfill site and quarry in the segment. No bulk sewer infrastructure.
- No formal stormwater discharge from urban areas into the coastal zone.
- Litter and oil pollution from ships at sea
- Light pollution: none from landward activities, and will mostly occur from vessels at sea, or lights from Blue Horizon Bay in the NMBM or Jeffreys Bay town.
- Noise pollution: little to none

Coastal Development

Description and Assessment

Recreational activities: fishing, hiking trails and beach walking, horse trails, bird watching

Existing development types:

- Predominant land cover in Segment: Natural areas and dunefields (see Figure 86)

Access:

- This section of coastline is not readily accessible, with one road leading off the R102. The beach can be accessed by the public on foot from the Kabeljous estuary (western side).

Future development / desired spatial form:

- Kouga SDF: The area north of the Kabeljous estuary to the Gamtoos is referred to as the 'GAMKAB area'. This area is considered to be a 'key focus area' for future development intensification. The Kouga Development Agency has developed a GAMKAB SDF which is approved by the Kouga LM. Identified key development parameters are:
    - Development restricted to low density residential and resort type developments with associated uses. Resorts / residential densities should not exceed 1.5 opportunity per 1 hectare.
    - Clustering should be promoted.
    - Linear or dispersed development and placing of units should be discouraged

***** Considering the high biodiversity and archaeological value and importance of the Papiesfontein wetlands and the coastal dune areas in this Segment, protection status of the area must be prioritised.**

Development issues/risks

Lack of bulk services and poor access

Opportunities:

- Good fishing opportunities.
- Kabeljous Estuary: good birding opportunities
- The Segment has high biodiversity and archaeological value, and presents significant opportunities for nature-based tourism. It is recommended for protection in several publications.

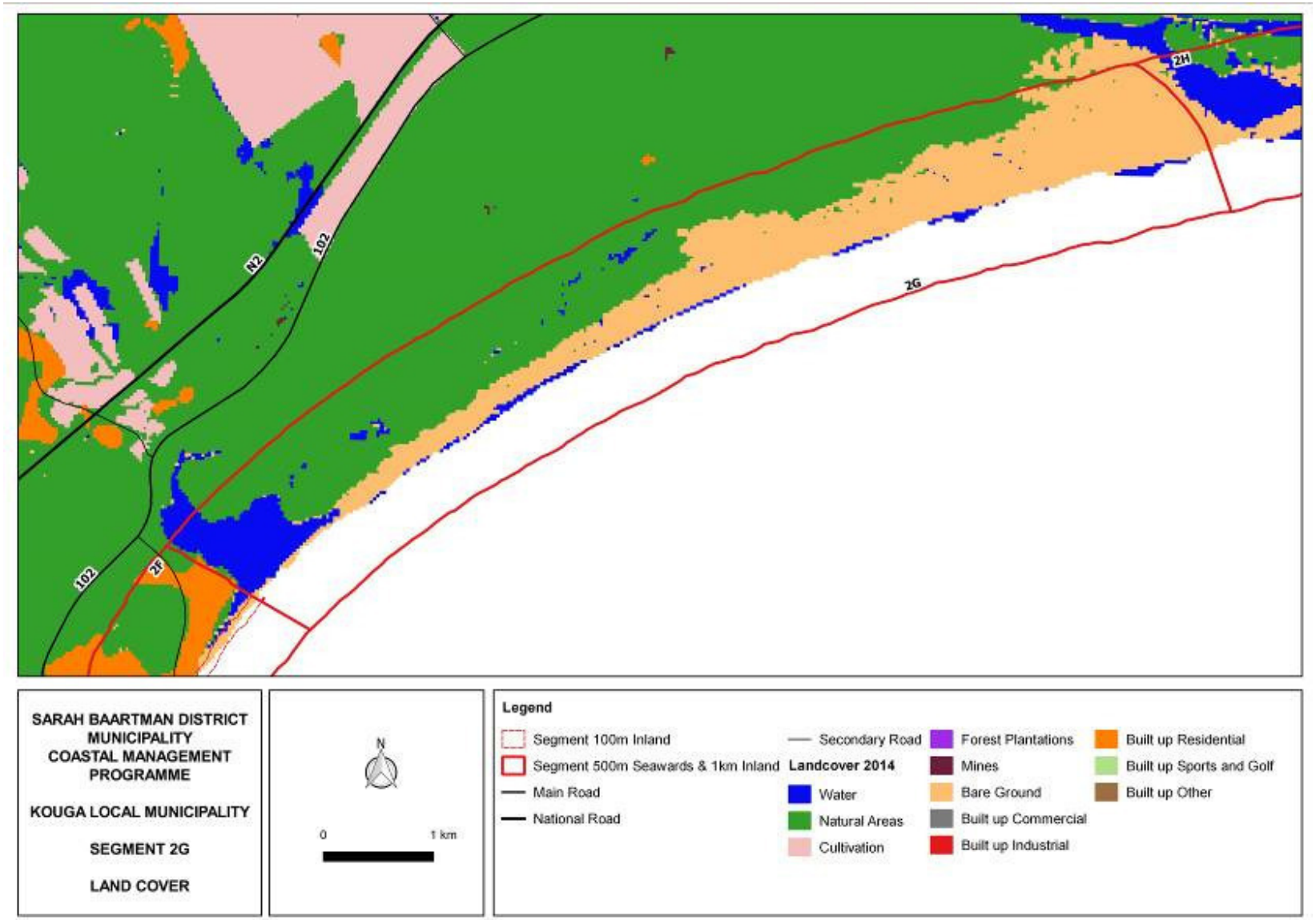


Figure 86: Land Cover map for Segment 2G (note that cattle rangelands are included under 'natural areas', and 'bare ground' is dunes).

5.9 Segment 2H: Western edge of Gamtoos River mouth to Van Stadens River mouth



Figure 87: Google Earth image of Segment 2H (outlined in red).

Natural resource management

Description of key coastal habitats/processes/features:

Aquatic environment:

- The eastern part of the segment is part of the Tsitsikamma Strategic Surface Water Source Area.
- NBA aquatic areas (Draft 2018):
  - Gamtoos and Van Stadens estuary wetlands occur in the Segment. Clusters of pans / marshes / vleis occur in the catchment.
  - Two NFEPA Rivers: Gamtoos and Van Stadens
  - A network of non-perennial drainage lines are identified in the 1:50 000 watercourse layer, some of which are associated with the Gamtoos and Van Stadens Rivers. Others drain directly to the coast.
- Two estuaries (warm temperate):
  - Van Stadens estuary: within the NMBM's jurisdiction
  - Gamtoos Estuary: The Gamtoos Estuary is a medium/large, permanently open, shallow mud-dominated turbid system, entering the sea through a dynamic coastal dunefield, with a shallow (< 1.5 m) tidal inlet when the estuary is not in flood. Historically however, the estuary has not always been open to the sea and has closed during droughts. The mouth position has shifted to the west, and has been in its current position since the 1980s. The previous opening on the eastern bank closed, forming what is referred to as the 'Gamtoos Lagoon' (Enviro-Fish (Pty) Ltd, 2007)). The physico-chemical and physical characteristics of the Gamtoos are suitable for the occurrence of Zambezi sharks. The estuary is an important nursery area for sub-adult and possibly juvenile kob species, and possibly juvenile Zambezi sharks. Larger systems such as the Gamtoos have more refuge areas and can normally recruit/restock individuals from within the system after a flood (compared to smaller estuaries that tend to need recruitment from the marine environment after a major resetting event). The Ecological Category of the estuary is rated as 'C', with the health condition of microalgae, macrophytes, and fish being 'fair', and invertebrates and birds 'good'. The Biological State and mean Estuary Health State are both rated as 'fair'. Partial protection is required, and an 'A' ecological category is recommended (Van Niekerk and Turpie, 2012). According to Underhill et al (1980) the Gamtoos Estuary can be considered among the most important estuaries for waders in the Western and Eastern Cape Provinces. McLachlan *et al.* (1979) note that the high density of birds along the estuary is directly related to the rich macrofauna of the area. Birds recorded in the estuary include the endangered African Black Oystercatcher and the rare (in South Africa) European Oystercatcher (Enviro-Fish (Pty) Ltd, 2007)). The estuary has a rich large-fish fauna dominated by dusky kob, spotted grunter, white sea-barbel, white steenbras and leervis. Large dusky kob use the estuary as a rest and feeding area, and this species, together with white steenbras, are mostly found in the lower reaches of the estuary. The mouth and lagoon with extensive wetlands are prime areas for a variety of bird species (Enviro-Fish (Pty) Ltd, 2007)). An Estuary Zonation Plan has been done for the Gamtoos Estuary in the Draft Estuarine Management Plan (Enviro-Fish Africa (Pty) Ltd, 2008)). This incorporates sanctuary and conservation zones, important biophysical features, rehabilitation zones, land use and planning provisions, infrastructure, and recreational activities. The 2 sanctuary zones are one that extends from the confluence of the Gamtoos lagoon to the mouth and including a 500 m section either side of the mouth; and another that incorporates the intertidal and supratidal saltmarshes and wetlands along the northern section of the lagoon. Wetlands and saltmarshes are important habitat types with unique vegetation composition, and provide vital habitat for invertebrate and vertebrate organisms, a source of materials for the estuarine food web, and serve as natural flood control areas. The remaining estuary water body and associated habitats and riparian buffer area of 100 m from MSL are proposed as conservation areas.

Terrestrial environment:

- VEGMAP (2018) Vegetation types: Predominantly Cape Seashore vegetation, with some St Francis Dune Thicket on the vegetated componenet of dunes
- Threatened Ecosystems (2011): none identified in the Segment. However, Endangered (Albany Alluvial Vegetation) and Vulnerable (Algoa Sandstone Fynbos) occur in the catchment
- Forests: Albany Forests of the Southern Coastal Group are identified on the eastern extent of the Segment, near the Van Stadens River
- Threatened/protected plant species:
  - CREW database: 2 occurrences of threatened plants identified in the catchment area
- Dunefields: mobile accretionary transgressive sheet dunefield along the seashore, flanked by vegetated or partially vegetated accretionary transgressive sheet dunefields that are currently not active

Protected Areas, Conservation Areas, and Stewardship Sites:

- One PA – most of the segment along the coastline is part of the Gamtoos River Mouth Local Nature Reserve
- Conservation Areas: the Segment is part of the Garden Route Biosphere Reserve, which extends from just east of Groot Brak in the west to the Van Stadens Estuary in the east

Key coastal habitats/processes/features cont…

- The Maitland-Gamtoos Coast IBA occurs in the segment. This is a 23 km coastal dunefield covering an area of ~1800 ha. The IBA may support at least 5%, and possibly up to 10%, of the global population of the African Black Oystercatcher. There is also suitable breeding habitat for Damara Tern (*Sterna balaenarum*), and the African Marsh Harrier (*Circus* ranivorus) has been recorded breeding at Gamtoos River Mouth. The surrounding forest/thicket mosaic areas host Southern Tchagra (*Tchagra* tchagra) and Grey Tit (*Parus afer*), and several other thicket and forest species, e.g. Knysna Turaco (*Tauraco* corythaix) and Forest Canary (*Crithagra scotops*) (BirdLife South Africa, 2015).
- Coastal zone is rich in shell middens and pottery

Resource use harvesting:

Recreational fishing
Bait collection
Commercial fishing

Threats to natural resource management:

- Gamtoos Estuary:
  - Change in flow, pollution and habitat loss are medium pressures. Fishing effort is high. Bait collection occurs (Van Niekerk and Turpie, 2012).
  - Alien vegetation in the riparian area, notably Prickly pear
  - Significant areas along the banks from the lagoon confluence to beyond Wacky Woods resort show signs of erosion and collapse. This is mostly due to wind and water erosion, loss of vegetation and destabilisation, and pedestrian and animal traffic along the top of the bank (Enviro-Fish Africa (Pty) Ltd, 2008))
- Dusky kob and white steenbras are vulnerable to being caught by fishermen in the coastal zone 500 m either side of the mouth of the Gamtoos Estuary
- Fishing competitions places strain on fish stocks, especially of threatened species.
- Alien vegetation in dunefields along the coast - impacts on biodiversity, increases fire risk and intensity, and increased water use
- Threats to birds in the IBA (BirdLife South Africa, 2015):
  - Illegal access by off-road vehicles to beaches, sand dunes and dune slacks causes nest destruction and high rates of chick and adult mortality of the African Black Oystercatcher (*Haematopus moquini*).
  - Plastic and solid waste pollution washing up on the coast causing birds to choke or entangled in nets and fishing line.
  - Alien vegetation is estimated to cover up to 70% of the coastal dunes, replacing indigenous dune vegetation and reducing available habits for the forest endemic birds found in the IBA
  - Wind farms on agricultural land adjacent to the IBA threaten birds moving inland from the IBA. Potential species at risk are the Secretary bird (*Sagittarius serpentarius*) and Denham's Bustards (*Neotis denhami*) that utilise the area outside the IBA but directly adjacent to it.
- Lack of active management of the Gamtoos Nature Reserve

Opportunities for natural resource management:

- The ecological water requirement of the Gamtoos Estuary has been determined
- Draft Estuarine Management Plan has been developed for the Gamtoos Estuary
- Annual beach clean-up events
- Ban on off-road vehicle driving on beaches – especially important for nesting oystercatchers
- Bird monitoring done by the St Francis Bay Bird Club and BirdLife Eastern Cape



Figure 88: Watercourses and Wetlands in Segment 2H.

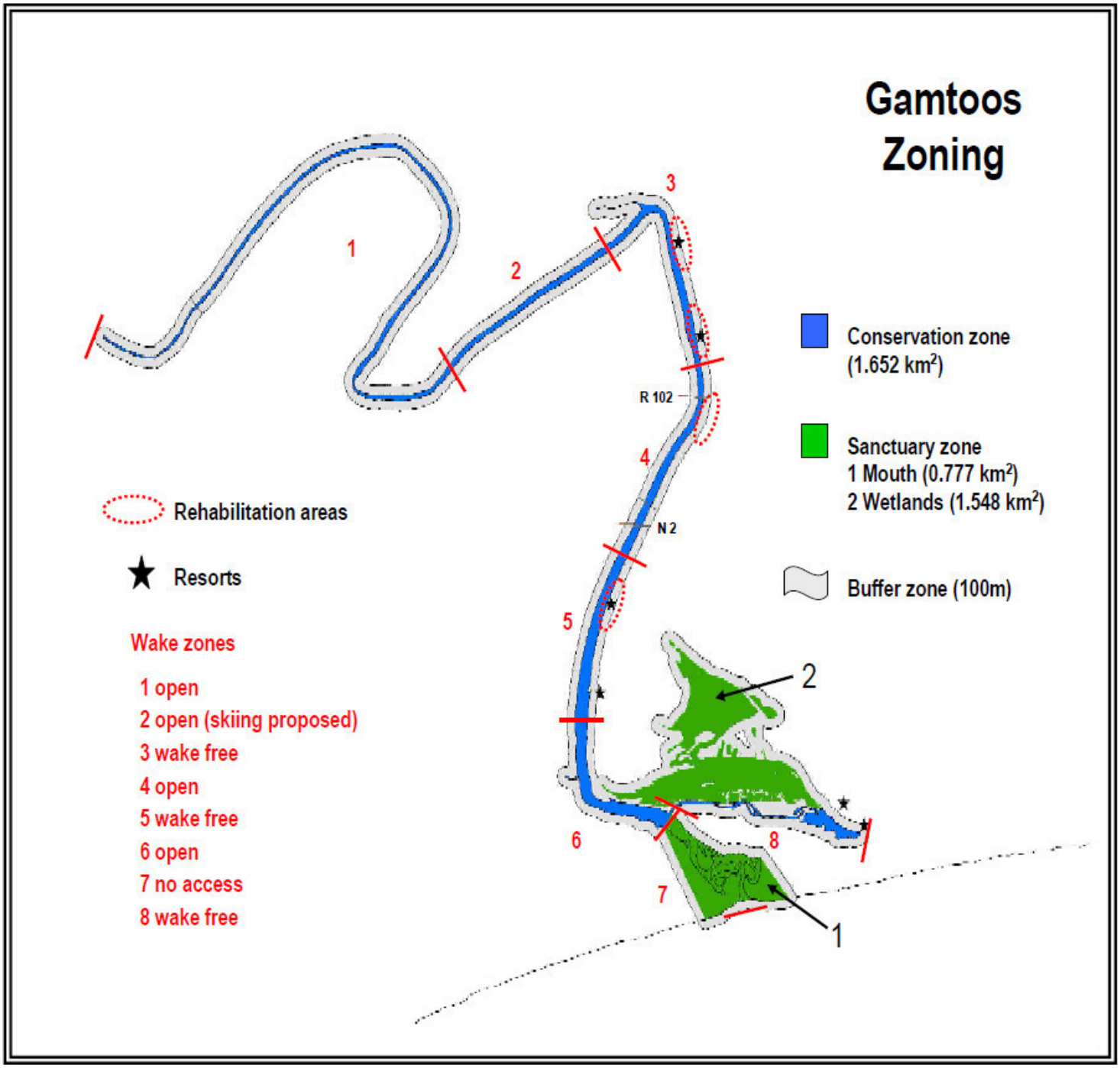


Figure 89: Gamtoos Estuary Zonation Plan, showing the proposed sanctuary areas, the conservation area inclusive of the 100 m riparian buffer zone, wake zones (including a preliminary skiing zone) and priority rehabilitation sites (Gamtoos Draft Estuarine Management Plan – Enviro-Fish Africa (Pty) Ltd, 2008).

Coastal Pollution

Description and assessment:

Catchment land use/land cover type:

- Predominantly agriculture and natural areas. Large parts of the Gamtoos Estuary and River are flanked by cultivated lands. Agriculture is considered to present a medium pollution risk as a result of runoff/leachate from manure/fertilisers/pesticides used in grazing areas, at dairies, and cultivated lands. Cultivated lands in the floodplain generally also result in elevated sediment loads in aquatic environments.
- Two sewage treatment works occur just outside the catchment near Thornhill, north of the N2.

Activities in the Segment:

- Land use/land cover type: predominantly natural area, with an urban node at the Gamtoos Estuary (Gamtoos Mouth Resort). A municipal camp site occurs at the mouth of the estuary, and 4 resort-type development in the middle to lower reaches of the estuary.
- Pollution of the Gamtoos Estuary from agriculture in the surrounding landscape has been an issue reported since 1983 (Marais, 1983). Significant nutrient inputs from agricultural activities in Loerie and Patensie have been measured. Runoff from the low-lying agricultural flats in the Loerie area is directed via a drainage pipe that discharges into the estuary 16.5 km from the mouth. In 1996, Pearce estimated that 75 kg of phosphorous, 129 kg of nitrate and 16 kg of nitrite entered the estuary from the surface agricultural drainage system annually. Total groundwater discharge also contributes significant levels of nutrients to the system. Pearce (1996) estimated that between 10 and 2 700 kg of nitrate-N, 1 and 89 kg of nitrite-N and 10 and 400 kg of phosphorous-P were contributed by total groundwater discharge to the estuary on an annual basis. These were viewed as conservative estimates, as they represent inputs from an area less than 20% of the total area adjacent to the estuary (Enviro-Fish (Pty) Ltd, 2007)).
- No municipal services are available to the Gamtoos Mouth Resort, other than provision of potable water. The sewage system is septic tanks and soak-aways, and solid waste is burnt in excavated pits
- The municipal camp site at the Gamtoos Estuary mouth uses conservancy tanks for sanitation. These are irregularly serviced by the Kouga LM. Solid waste is collected in bins, which are emptied on an ad-hoc basis by the municipality.
- Resorts: sewage is either via septic tanks or conservancy tanks. Solid waste is burnt on site, with some glass recycling taking place. The Ferry Hotel has conservancy tanks that are serviced by the municipality, but plan to install a treatment plant. Waste is removed by an independent waste removal company (Enviro-Fish Africa (Pty) Ltd, 2008).
- Solid waste:
    - Fishing line, hooks and plastic from recreational fishermen that utilise the sandy beach.
    - Waste from ships/vessels at sea
    - Solid waste from resorts and settlements
- Hydrocarbon pollution from boats on the estuary, and oil spills from ships at sea.
- Noise:
    - landward noise from residential activities is regarded as low impact due to the small settlement (at Gamtoos).
    - engines from fishing vessels.
- Light pollution:
    - from residences at Gamtoos, but regarded as low impact because of relatively limited development area.
    - from chokka boats at sea

Coastal Development

Recreational activities:
Fishing, bird watching
Gamtoos Estuary: fishing, swimming, power boating, wind surfing-sailing, canoeing, bird watching. Note: jet skiing and water skiing are prohibited

Existing development types:
- Predominant land cover type in Segment: Natural areas and dunefields, with small Built up area (residential) node at the Gamtoos estuary (i.e. Gamtoos Mouth Resort)
- Resorts/camping/hotel in the middle to lower reaches of the Gamtoos Estuary (e.g. Wacky Woods, The Ferry Hotel, Kingsway Caravan Park, Big Fish Camp and the Municipal camping site at the mouth) – boats generally make use of launch sites at these facilities to access the estuary
- Agriculture, with cultivated lands, poultry houses, cattle.

Access:
- The Gamtoos Estuary is accessible via a public road
- The remainder of the coastal zone is not readily accessible from vehicle access points, but can be accessed on foot along the sandy beach from the Gamtoos estuary in the west of the Van Stadens estuary in the east.
- Boat access to the Gamtoos estuary is from existing slipways / launch sites (see Figure 91)

Future development / desired spatial form:
Kouga LM SDF (2015): Gamtoos River Mouth is classified as a rural node.
- The Gamtoos River Mouth settlement is the only node on the coastal strip between the Kabeljous River and the Van Stadens River Mouth. Future development and expansion of this node should be limited and should only be supported based on strict environmental impact assessment procedures and studies. The environmental sensitivity of the area and accessibility of the facilities for day visitors should be preserved. Residential development should be restricted to the eastern side of the river mouth

Development issues/risks:
- lack of municipal services

Opportunities:
- Good fishing opportunities.
- The Segment has high biodiversity and archaeological value, and presents significant opportunities for nature-based tourism.

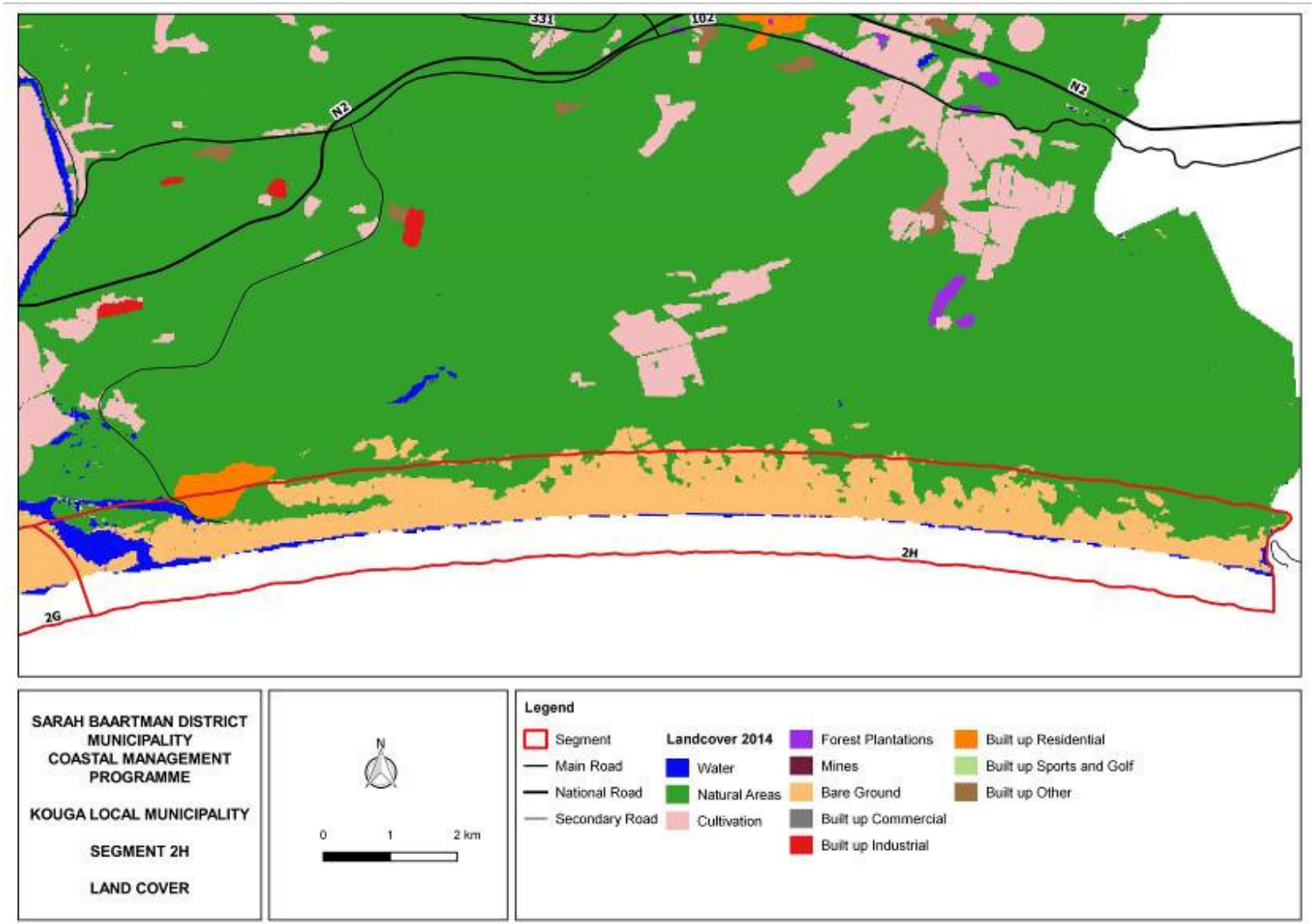


Figure 90: Land Cover map for Segment 2H (note that cattle rangelands are included under 'natural areas', and 'bare ground' is dunes).

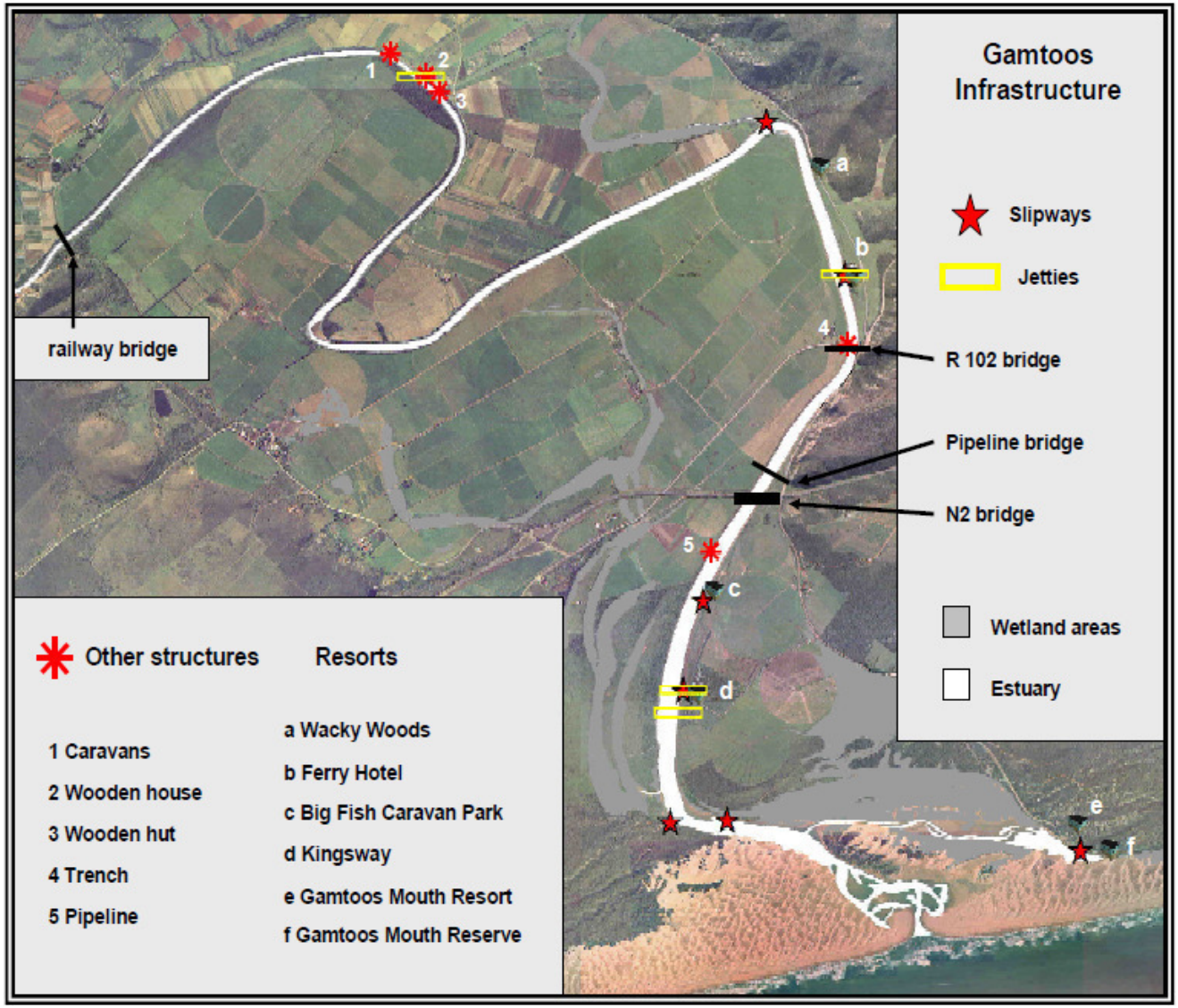


Figure 91: Resorts, structures and infrastructure in the Gamtoos Estuary (Gamtoos Draft Estuarine Management Plan – Enviro-Fish Africa (Pty) Ltd, 2008).

5.10 Management Recommendations for the Kouga Local Municipality

Table 5: Management Recommendations for the Kouga LM Coastal Zone

Segment	Recommendation/Implementation Strategy	Priority timeframe	Responsible agent(s)	Participating/Supporting agent(s)
	A. General			
Kouga LM	A1. Develop partnerships between the public and state authorities for integrated coastal zone management. Establish a Coastal Committee, with representatives from the state departments, ward councilors, industry, agriculture, commercial entities and the public. Within this framework, discuss best practice measures for coastal zone management.	Short term	SBDM, Kouga LM	DEA: Oceans and Coasts, DEDEAT, DWS, DAFF, farmers associations, industry, commercial operators, research institutions, community organisations, ward councilors, rate payers association representatives, Protected / Conservation Areas management etc.
	Performance Indicators: • Coastal Committee established and participants engaged • Schedule of annual meetings set up (to be held at least quarterly)			
Kouga LM	A2. Integration and co-ordination related to coastal zone management between the various spheres of government (e.g. the Sarah Baartman DM officials, Kouga LM officials, DAFF, DEDEAT, DEA, DWS) must be developed. Mandates and overlapping responsibilities to be defined and streamlined. This is especially important in compliance monitoring and enforcement. Currently a number of laws exist for coastal zone management, but enforcement is poor and uncoordinated between the various parties. Open and ongoing communication between the parties must be established by	Responsible person(s) from each sector selected for discussion forum: short term. Inception meeting to discuss roles and responsibilities and way forward: short term Quarterly meetings and information sharing: ongoing	Relevant state departments	Coastal Committee

	setting up a discussion forum that meets quarterly where an overview of pertinent information and activities related to the coastal zone are discussed (this can be linked to the Coastal Committee meetings – A1).			
	Performance Indicators: • Discussion forum members identified • Inception meeting held • Quarterly meetings held with meeting minutes and attendance register			
Kouga LM	A3. Adopt a catchment approach to managing the coastal zone – i.e. consider activities in the catchment that may impact on the coastal zone, rather than just the immediate area. This has relevance to storage, treatment and disposal of solid and liquid wastes (including effluent and runoff from farming and industrial operations); alien vegetation control, fire management, fencing, damming of watercourses and over-abstraction of surface water features, groundwater abstraction, obstructions in watercourses, development in floodplains, erosion and sedimentation management, managing ecological process areas etc.	Medium term	SBDM, Kouga LM	DEA: Oceans and Coasts, DEDEAT, DWS, DAFF, farmers associations, industry, commercial operators, research institutions, community organisations, ward councilors, rate payers association representatives, Protected / Conservation Areas management etc.
	Performance Indicators: • Item tabled for discussion at Coastal Committee • Catchment area defined, and activities identified • Stakeholders in the catchment area identified • Staff assigned to develop management plans for various activities in consultation with Coastal Committee and stakeholders in the catchment area			
Kouga LM	A4. Appoint and train extension staff to engage with landowners and provide support for sustainable land use and operations management in the catchment of the Kouga LM coastal zone.	Medium term	SBDM, Kouga LM	DEDEAT, DWS, DAFF, Coastal Committee members

	Performance Indicators: • Budget allocated for extension staff • Contracts set up, and extension staff appointed • Extension staff received training on aspects relevant to the area in which they are operating			
Kouga LM	A5. Facilitate information sharing by creating a page on the municipality's website where information on coastal features and coastal zone management is hosted for the public, planners, researchers, EAPs, government departments, parastatals etc. to access for planning, awareness, and informed decision making. Availability of information in a transparent fashion will facilitate a participatory and inclusive approach to coastal zone management where an attitude of collective responsibility is fostered.	Create website/link: Short term Information sharing: ongoing	SBDM, Kouga LM	Relevant state departments, Public, researchers, EAPs, specialists
	Performance Indicators: • Website/link created • Awareness of the availability of the website and how to upload and access information communicated			
Kouga LM	A6. The Kouga LM should meet annually with researchers at NMMU and Rhodes University for information sharing and to communicate 'research needs' – i.e. to develop implementation-based research that can assist in informed coastal zone management decisions. This can happen through the Coastal Committee, where researchers can be invited to participate in the forum.	Establish communication structure and network: Short term	SBDM, Kouga LM, Research institutions	Coastal Committee
	Performance Indicators: • Date set for first meeting for 2020 + research needs reflected on agenda			
Kouga LM	A7. Roles and responsibilities of all authorities involved in coastal zone management in the Kouga LM should be clearly defined and communicated to the public. A clear reporting structure with contact details must be provided so that the public can raise queries or report non-compliances (and so assist with	Define roles and responsibilities: Short term	SBDM, Kouga LM	Public, ward councillors

	compliance monitoring and general coastal zone management). This information can be communicated on the website mentioned in A5.			
	Performance Indicators: • Roles and responsibilities defined in a concise document • Information submitted to central portal and general public informed			
Kouga LM	A8. A system must be put in place where the effectiveness of the CMP and subsequent management plans is measured, and the implementation of recommendations of the program is recorded and reported. Support must be provided to the LM to implement the recommendations of the CMP (financial and resources) by state departments, business, and the public. A dedicated environmental officer in the LM and DM should be appointed to oversee implementation of the CMPr.	Short term and ongoing	SBDM, Kouga LM	Coastal Committee, business sector, public
	Performance Indicators: • Dedicated staff member in SBDM and LM assigned to oversee implementation of the CMPr • Annual plan of operations developed and in place for relevant municipal departments to implement recommendations of the CMP and subsequent management plans in daily operations. • Auditing system in place to monitor compliance with management plans. • Reporting structure in place via Coastal Committee			
Kouga LM	A9. Management plans, planning documents, policy etc. must be developed in consultation with the public. The public must be involved from the start, and not just comment on a draft document. The social and economic character of the community must be considered to determine how best to facilitate meaningful participation.	Ongoing	SBDM, Kouga LM, SANParks	DEA, DEDEAT, researchers, planners, EAPs, public.
	Performance Indicators: • Plans developed in consultation with local communities • Good relationships between public and state			

	• Local community has capacity to participate • Vision for coastal zone management encompasses broader community ideals			
Kouga LM	A10. The protection/management of CBAs and ESAs as identified in the GR Biodiversity Sector Plan and CBA Map; and the development of coastal management lines and regulations to give these effect will allow the Kouga LM to respond to and adapt to the impacts of climate change. Make sure that ecological infrastructure is protected and managed in development planning.	CBA maps are available Development coastal management lines and regulations: Short to Medium term Implementation: ongoing	SBDM, Kouga LM	DEA, DEDEAT, researchers, public, industry.
	Performance Indicators: • CBAs and ESAs managed in accordance with management objectives and recommended land use guidelines • Ecological infrastructure protected in development planning, and ecosystem services provided • Coastal management lines with land use guidelines developed; and regulations in place for implementation in development planning			
Kouga LM	A11. Ensure that the CMP is formally adopted by the SBDM and the Kouga LM, and that sufficient budget is set aside in the IDP and other funding mechanisms to implement recommendations.	Adoption: immediate IDP budget allocation: annually	SBDM, Kouga LM	Councillors, public
	Performance Indicators: • CMP adopted by Council • Projects for coastal zone management reflected in the IDP and other planning documents required for funding allocation			
Kouga LM	A12. Develop and implement training, and education and awareness programmes on the importance and value of biodiversity priority areas, archaeological sites and ecological process areas in the coastal zone. Incorporate skills development of local communities, especially women and children. The intention is to grow a community (representative of all people in the Kouga LM) that is aware of the importance and value of coastal ecosystems; and that is equipped with knowledge and skills needed for integrated coastal zone	Develop: Short term Implement: Medium term	SBDM, Kouga LM	DEDEAT, DWS, DAFF, coastal ecologists, archaeologists

	management, development, and opportunities. At the same time, the need for public accountability in their activities in the coastal zone can be emphasised to build a culture of self-regulation so people become part of the solution. Determine and prioritise where the programmes should be implemented/'rolled-out' for maximum impact (e.g. schools, development agencies, tourism industry, ward councillors). Include training of municipal officials involved in coastal zone management and in reviewing land use applications in the coastal zone. Make use of sign boards to promote awareness of these sensitive areas where they occur.			
	Performance Indicators: • Content material developed • Stakeholders to engage identified • Staff training needs and people that will receive training are identified, and training is implemented • Programme/schedule for implementation drafted, and dates set • Biodiversity priority areas well managed, and conflicting land uses not permitted • Local community empowered through skills development • Sign boards developed and in place			
B. Natural, archaeological, and cultural diversity and resource management				
Kouga LM	B1. As required by the ICMA, develop coastal management lines for the Kouga LM coastal zone to guide development. Prioritise the development of guidelines/regulations to support the implementation of coastal management lines	Appoint consultant: Short term Develop: medium term	SBDM, Kouga LM	DEA: Oceans and Coasts, DEDEAT, coastal scientists, public
	Performance Indicators: • Consultant appointed to develop coastal management lines for the Kouga LM • Coastal management lines developed and adopted.			

	• Regulations gazetted			
Kouga LM	B2. Incorporate biodiversity priority areas (e.g. CBAs and ESAs in CBA maps and systematic biodiversity plans/Bioregional Plans, the estuarine functional zone, river floodplains, wetlands, forests, and unique habitats) and areas with archaeological/cultural/heritage value into the municipal SDF and other planning documents to guide planning, and prevent destruction of these areas. For archaeological/cultural/heritage sites, a high sensitivity area of 200 m from the high water mark of the sea is recommended in the Kouga LM, especially in the area between Cape St Francis and the Tsitsikamma Estuary, and between the Kabeljous and Van Stadens Estuaries. Inappropriate development in these sensitive areas must not take place, and archaeological/heritage specialist studies must be done before land use change takes place. Make sure these areas are included on the website in A5.	Short term – i.e. in the next SDF review	SBDM, Kouga LM	Town planners, EAPs, biodiversity specialists, archaeologists, historians.
	Performance Indicators: • Biodiversity priority areas and archaeological/cultural/heritage sites are reflected as open space/high sensitivity areas in maps depicting desired spatial form of the Kouga LM in the next SDF review (2020) • Development in dynamic coastal process areas avoided • Land use guidelines must be developed for sensitive areas, and included in the SDF • Municipal officials responsible for reviewing land use change applications in sensitive areas have received training on these areas (link with A4)			
Kouga LM	B3. In development planning, make sure that ecological processes and drivers (e.g. riparian areas, sand movement corridors, animal movement paths, seed dispersion mechanisms, fire etc.) are adequately incorporated in the open space network by means of connected corridors that facilitate processes. Cognisance must be taken of the size of corridors and the functional aspects of the process areas. Advice from an ecological specialist will need to be sought in designing these corridors.	Short term	SBDM, Kouga LM	Ecological specialists, EAPs, town planners.

	Performance Indicators: • Ecological specialist appointed to advise on the designation and management of process corridors • Corridors designated on a map, and included in the SDF review • Management guidelines developed for corridors	Aquatic map and buffers developed: Short term Functioning and interconnectivity of systems: ongoing	Kouga LM	DWS, DEDEAT, aquatic specialists, EAPs, town planners, developers, public
Kouga LM	B4. Wetlands and watercourses must be protected, and their functionality maintained. The interconnectivity of aquatic environments with the groundwater environment and the coastal zone with regards to flow and freshwater requirements must be considered in development and conservation planning (especially for stormwater management planning in urban areas and water abstraction).	Wetland map and buffers developed: Short term Connectivity and functioning of systems: ongoing	SBDM, Kouga LM	DEDEAT, DWS, EAPs, town planners, aquatic specialists
	Performance Indicators: • Map of wetlands and watercourses available for the Kouga LM, and incorporated into the SDF (and included on the website – A5) • Required buffers determined to guide development planning • The functioning of aquatic systems is investigated and incorporated into development planning and design • Inter-relationships between surface and groundwater environment understood, and applied in development planning, especially applications for abstraction			
Kouga LM	B5. Consider fire dynamics required to maintain biodiversity in thicket/fynbos mosaic areas that often occur in coastal dune areas. Fire is necessary to maintain diversity and boundaries of vegetation types, but too frequent fires may also disrupt ecosystem quality and functioning and destroy lives, properties and infrastructure	Ongoing	SBDM, Kouga LM	DEDEAT, EAPs, town planners, ecological specialists, Fire Protection Association, farmers
	Performance Indicators: • In development planning and applications, fire as a driver of biodiversity persistence is adequately addressed • Controlled fires only used once required approvals are issued by the Fire Protection Association • Mechanisms in place to prevent and control unwanted / runaway fires • Fire Management Plan in place to prevent and control unwanted/run-away fires			

2A, 2B	B6 (link B2). Stromatolites are to be regarded as biodiversity priority areas. When planning activities in the coastal zone and catchment area, consideration must be given to the ecological drivers of these ecosystems to ensure their persistence. Groundwater abstraction and/or activities that may result in contamination of surface and groundwater flow to the coastal zone are relevant, as stromatolites require freshwater seepage. This can be addressed by the EAP, should an EIA process be required for the activity. The public must be made aware of the occurrence and importance of stromatolites, possibly by means of educational boards along the coast and as popular articles in local newspapers.	Stromatolites to be shown in biodiversity and spatial plans: Short term (i.e. in the next SDF review, and on SANBI's BGIS portal) Public awareness: short term	SBDM, Kouga LM	SAEON, SANBI, DEDEAT (Coastal Zone section), EAPs
	Performance Indicators: • Stromatolites included as biodiversity priority areas in the Kouga SDF and other planning documents (and on website – A5). • Management requirements documented and communicated.			
2G	B7. Management of the coastal area between the Kabeljous and Gamtoos estuaries must be prioritised to ensure conservation of the Papiesfontein wetlands, coastal dunefields and important archaeological sites.	Areas identified and engagements initiated: Short term Management actions in place: Medium term	SBDM, Kouga LM	Landowners, DEDEAT, Kouga Development Agency, DWS
	Performance Indicators: • Important areas spatially identified. • Engagement with relevant parties and landowners regarding management of sensitive areas done. • Management actions identified and implemented.			
2A, 2B, 2C	B8. The headland-bypass dunefields at Cape St Francis are the only remaining large active dunefields of this type, and should be protected. The dunefields are unique on a local, regional and global scale. These dunefields are globally significant, and should acquire world heritage status. The sand supply to these dunefields has been cut off; serious consideration should be given to re-instating	Dune management plan: short term Implementation of plan: medium term and ongoing	SBDM, Kouga LM	DEA: Oceans and Coasts, DEDEAT, SBDM, landowners

	their sand supplies, otherwise the areas of mobile dunes will gradually become smaller and the dunefields will become fossil (Illenberger, 2009).			
	Performance Indicators: • Dune management plan developed • Management actions implemented • Functional dunefield			
Kouga LM	B8. Potential changes in the rate and volume of sand moving alongshore needs to be understood to make informed decisions on how best to deal with coastal erosion. This is particularly relevant in the area between Oyster Bay and St Francis Bay, where severe beach erosion is experienced. Long term solutions to coastal erosion that work with nature and re-instate ecological processes must be investigated.	Medium term	SBDM, Kouga LM, DEA: Oceans and Coasts, DEDEAT, Researchers, SAEON	Public
	Performance Indicators: • Sand budget and sediment dynamics in the coastal zone between Oyster Bay and St Francis Bay determined and understood • Recommendations made for management of coastal processes and sediment dynamics to address coastal erosion			
Kouga LM	B9. Give priority to the control and removal of alien invasive vegetation in the coastal zone and the catchment areas. Prioritise: • areas that are part of a Strategic Water Source Area since alien invasive plants (AIPs) are known to utilise excess water (i.e. Segments 2A and 2H), • AIPs in active dunefields, as they reduce the area of mobile dunes (i.e. Segments 2A, 2B, 2C, 2G and 2H). • The estuarine functional zone, and catchment area Develop an AIP management plan for the coastal zone, and source budget for ongoing removal and control. Consult Working for Water and officials currently	Plan and budget: short term Clearing and control: ongoing	SBDM, Kouga LM	DEDEAT, DWS, public (for control on private land)

	using biocontrol agents for advice on best methods. A systematic approach to alien plant control must be taken, where the most effective method based on the specific species and situation is applied, and considering the objective of control.			
	Performance Indicators: • AIP management plan developed • Phasing plan for prioritised action developed • Budget secured for removal and control of AIPs • Implementation of plan			
Kouga LM	B10. Develop a database of archaeological, cultural, heritage and historic sites and artefacts in the coastal zone in consultation with archaeological specialists and historians, and the local community. Promote the protection, management and awareness of these areas/sites, and investigate how these areas can be included in a sustainable eco-tourism development plan for the LM. An archaeological/heritage 'high sensitivity zone' of 200 m from the high water mark of the sea must be indicated in SDFs.	Database: short term Protection of sites: short term Eco-tourism development plan short to medium term	SBDM, Kouga LM, Eastern Cape Heritage Resources Agency, archaeological specialists, historians, local community representatives	Tourism sector, DEDEAT, private landowners (where sites occur on private land)
	Performance Indicators: • Database of important sites developed and included on the website (A5) • A 200 m high sensitivity zone designated in the SDF and other planning documents • Management plan for archaeological sites developed • Implementation of management recommendations • Sites and recommendations included in training, and education and awareness programmes (link with A4)			
Kouga LM	B11. Assess and identify degraded coastal areas and develop rehabilitation plans for these. Link to community skills development by providing training on erosion control and management, alien invasive plant control and removal,	Medium term	SBDM, Kouga LM	DEDEAT, DWS, ecological specilaists, public

	rehabilitation methods etc			
	Performance Indicators: • Degraded areas spatially identified • Rehabilitation plan(s) complete • Local community received skills development training, and involved in implementation • Implementation plan in place			
Kouga LM	B12. An inventory of alien marine species must be developed as well as their threat to local species and contributing factors to their occurrence and spread. Potential prevention and control measures must be recommended and implemented.	Develop inventory: short term Implement recommendations: short to medium term	DAFF, DEDEAT, DEA	SBDM, Kouga LM, Researchers
	Performance Indicators: • Inventory complete • Action plan to implement prevention and control measures developed • Progress reporting to Coastal Committee on actions implemented on a quarterly basis			
Kouga LM	B13. Identify critical habitats for the recovery/persistence of key natural resources (e.g. spawning and nursery areas, key foraging areas). These areas must be protected.	Short term	DAFF, DEA, SBDM, Kouga LM	Marine specialists, research institutions
	Performance Indicators: • Critical habitats identified • Spatial information made available on information portal with supporting land use guidelines			
Kouga LM	B14. Disturbance caused by recreational users of the marine environment to marine mammals must be prevented by implementing the requirements of the Marine Living Resources Act that specifies that 'No person, except on the authority of a permit, shall approach closer than 300 m to any whale or dolphin or fail to proceed to a distance of 300 m should the whale or dolphin surface within 300 m. Contravention is punishable by fine or imprisonment'. This law	Develop communication material: Short term Implement (awareness and education): Short term and ongoing	SBDM, Kouga LM, DEDEAT	Water sports clubs, public, lifesavers

	should be communicated to the public, especially water sports and fishing clubs who are more likely to come into contact with marine mammals			
	Performance Indicators: • Communication material developed • Information made available via signage and education and awareness program			
Kouga LM	B15. The impact of noise and vibrations on marine mammals must be considered in development and construction in the coastal zone, and in activities in the marine environment (e.g. bathymetric surveys, gas exploration).	Ongoing	SBDM, Kouga LM, DEA, DEDEAT	Marine specialists
	Performance Indicators: • Set of method statements go guide construction in coastal zones with reference to impacts on marine mammals available • Sensitive areas / times for construction known, and a marine mammal observer appointed as part of the construction team to assist with development planning • Impact on marine mammals and other sensitive biota given due consideration in planning activities it the marine environment that cause noise and vibrations			
Kouga LM	B16. Enforce provisions of the Marine Living Resources Act for protection of marine biota pertaining to quotas, closed seasons, size limits, collection methods etc. To assist with compliance monitoring and enforcement to alleviate issues of illegal fishing (or contravention of permit conditions for legal fishing) and/or harvesting of other marine species: • Assign more fisheries/compliance officers • Make the necessary budget available to DAFF and environmental officers in the LM for effective policing (i.e. through sufficient equipment, vehicles, boats, skills development and training) • Facilitate the designation of peace officers and voluntary fishery control officers to increase visible policing	Short term	DEA, DAFF, DEDEAT, SBDM, Kouga LM	WESSA, public
	Performance Indicators: • Sufficient officers on the ground for compliance monitoring • Illegal activities timeously dealt with in terms of enforcement			

	• Number of illegal activities decreased • Mechanism in place for the designation of peace officers and voluntary fishery control officers. • Public involved with visible policing, and know who to report illegal activities to			
Kouga LM	B17. Fisheries management which is currently done at a national level needs to be amended to include regional-specific regulations due to the ecology of threatened fish species that are semi-resident in our estuaries and in the inshore environment. The current system of setting national bag and size limits is not effective. Rather, responsible behaviour of fishermen needs to be promoted via education and awareness programmes.	Education and awareness programme: Short term and ongoing	DAFF, DEA, SBDM, Kouga LM	Fisheries scientists, public
	Performance Indicators: • Regional-specific regulations developed • Education and public awareness program developed • List of priority people/organisations targeted for implementation identified • Communication strategy/workshops schedule set up			
Kouga LM	B18. Fishing competitions must implement a policy of 'catch and release', where no prizes are awarded to dead species. A permitting system must be developed for fishing competitions, where a permit with conditions indicating the requirement for catch and release has to be issued by the relevant authority.	Short term and ongoing	DAFF, SBDM, Kouga LM, fishing competition organisers	Sponsors, public
	Performance Indicators: • Permitting system developed and enforced • Permit includes conditions regarding the need to implement catch and release of species • Organisers of fishing competitions and sponsors engaged, and aware of the requirement for catch and release of species • Requirement implemented in competitions, and monitored by fisheries officers			
Kouga LM	B19. All surface and groundwater abstraction points must be registered, and a long-term monitoring plan instated. Over-abstraction must not take place.	Registration and monitoring: Short term and ongoing	SBDM, Kouga LM, SANParks, DWS	DEA, DEDEAT, water users
	Performance Indicators:			

	• Abstraction of groundwater done in accordance with recommendations of sustainable yields/pumping rates. • Aquifer not depleted. • Dependent ecosystems (e.g. wetlands) show no adverse impact (e.g. drying out). • Aquifer water quality not deteriorated (e.g. as a result of over-abstraction and saltwater intrusion) • Abstraction of surface water and impact on downstream dependent ecosystems avoided.			
Kouga LM	B19. Access available funds in existing programmes for coastal zone management (e.g. Working for the Coast)	Access funds: Short to Medium term	SBDM, Kouga LM	DEA, DEDEAT, SBDM
	Performance Indicators: • Available programmes and funding identified • List of projects identified, and proposals compiled • Funding obtained			
	Recommendations for Estuaries from the NBA, Estuary Management Plans and other publications:			
Kouga LM	B20. Create a 'Green Estuary Index' as a mechanism to encourage estuary management (as Blue Flag Beach status is used for beaches and marine waters).	Green Estuary Index set up: short term Implementation: medium term and ongoing	SBDM, Kouga LM	DEA, Research Institutions, Coastal Committee, tourism sector, ward councilors, public
	Performance Indicators: • Index developed • Indexed implemented, and rating applied at a national level			
Kouga LM	B21. Use the existing 'Estuarine Fish Community Index' as an environmental indicator to monitor estuarine health and biological integrity, and measure changes in estuaries (Whitfield and Harrison, 2008).	Baseline established and programme set up: short term Implementation: medium term	SBDM, Kouga LM	Research Institutions, Coastal Committee
	Performance Indicators: • Baseline for estuaries in the Kouga LM established • Biomonitoring programme set up • Biomonitoring programme implemented, and results shared on website (A5)			

Kouga LM	B22. Do an assessment of illegal structures/obstructions, damming of water, and groundwater abstraction in the catchment of all estuaries. Follow-up with the necessary compliance and enforcement, and rehabilitation (where required) process.	Inspection and assessment: Short term Compliance and enforcement: Short term and ongoing Rehabilitation: medium term and ongoing	SBDM, Kouga LM	DEDEAT, DWS, DEA (Oceans and Coasts), landowners
	Performance Indicators: • Assessment done and illegal structures and/or activities identified • Compliance and enforcement process initiated and underway			
Kouga LM	B23. Establish an Estuary and Wetland Management Committee for all estuaries and interconnected wetlands to advise the Kouga LM on the Health Status of these systems, and on appropriate management and action required to improve and maintain estuary health. Implement ongoing research and monitoring programmes (in consultation with local Universities) to help make informed decisions regarding estuarine health and functioning.	Committee established: Short term Research and monitoring programmes: Short term and ongoing	SBDM, Kouga LM	DEDEAT, DWS, DEA (Oceans and Coasts), local universities, coastal specialists, WESSA
	Performance Indicators: • Committee established • Meeting schedule for committee set up and communicated • Relationship with local universities established, and research/monitoring requirements identified • Research and monitoring programmes implemented			
Kouga LM	B24. Bathymetric surveys must be done in the Kromme, Seekoei, Kabeljous and Gamtoos estuaries to understand sedimentation processes and mouth dynamics.	Short term	SBDM, Kouga LM, DEA: Oceans and Coasts, DEDEAT, Researchers, SAEON	
	Performance Indicators: • Bathymetric surveys done, and report available.			

	• Frequency of surveys to be determined for management purposes.			
2A	B22. Plan for full protection status of the **Tsitsikamma Estuary**, and maintain the ecological category of 'B'. Focus on reducing existing pressures of the estuary – i.e. change in flow and pollution.	Medium term	SBDM, Kouga LM	DEA (Oceans and Coasts), DEDEAT, DWS, landowners in the catchment, estuarine specialists
	Performance Indicators: • Identify management requirements for the estuary required to address change in flow and pollution risks • Management recommendations implemented, and ecological category maintained in the subsequent review			
2C	B23. The Kouga SDF give the following recommendations for development at the **Kromme Estuary**: • A Strategic Environmental Assessment should be commissioned of the Lower Kromme River Valley and estuary and subsequently, a River Management Strategy be implemented by the Kouga Municipality. The SEA should outline detailed land use parameters for the Kromme River Valley and Estuary. • No additional development rights must be granted / permitted on land that falls within the development setback indicated in the SDF. This includes new dwelling units, rezoning, subdivisions, additional dwelling units, consent uses, boathouses, jetties, roads, agricultural activities, resorts. The steep slopes of the **Kromme and Geelhoutboom Rivers** upstream of their confluence must be protected from destruction as the substratum is highly prone to erosion (Bickerton and Pierce (1988).	Short term	SBDM, Kouga LM	DEDEAT, Estuarine Specialists, Public
	Performance Indicators: • SEA for Kromme Estuary and Lower Kromme River Valley developed, with land use guidelines • Recommendations of the SEA to be incorporated in SDF review • The recommended development setback line on the Kromme River is entrenched in the SDF and other planning documents			

	• Areas at risk of erosion identified, and rehabilitation measures implemented			
2D	B24. Plan to improve the current estuarine health index score of the **Seekoei Estuary** (D) to Category A (near pristine) or highest attainable health status. Urgent management intervention is required to prevent further deterioration to the health of the estuary.	Medium term	SBDM, Kouga LM	DEA (Oceans and Coasts), DEDEAT, DWS, landowners in the catchment, estuarine specialists
	Performance Indicators: • Identify management requirements for the estuary required to improve estuary health • Management recommendations implemented, and ecological category improved in the subsequent review			
2D	B25. Management priorities listed in the **Seekoei Estuary** Management Plan must be implemented – some of these pertain to 'Coastal Development' and are referenced thereunder): • Implement the Estuary Mouth and Maintenance Management Plan. This will help with safe crossing of the causeway by pedestrians and vehicles, and to maintain salinity levels below lethal levels for estuarine biota • Remove (or partly remove) the existing carpark and building (former swimming pool area) on the eastern side of the current mouth when the estuary is open • .Restore best attainable level of ecological functioning to improve the health of the Seekoei Estuary by reviewing and improving the confidence level of the Ecological Reserve study done in 2006. Provide more accurate information on the estuary freshwater requirements. • Develop a conservation management plan for the Paradise Beach wetlands, and restore connectivity of the wetlands and the estuary.	Medium term	SBDM, Kouga LM	DEA (Oceans and Coasts), DEDEAT, DWS, estuarine specialists
	Performance Indicators: • Seekoei Estuary Mouth and Maintenance Management Plan implemented. Optimal salinity levels for estuary biota are maintained • Existing carpark and building on eastern side of the mouth removed			

	• Freshwater requirements of the estuary determined • Conservation plan for the Paradise Beach wetlands developed, taking cognisance of connectivity with the Seekoei Estuary			
2H	B26. The **Draft Gamtoos Estuary** Management Plan must be finalized and adopted, and recommendations must be implemented. Specifics that are highlighted here include: • The existing municipal camp site at the Gamtoos mouth should be closed, and the area incorporated into the Protected Area (PA) to the east. • The Estuary Zone Management Plan in the Draft EMPr must be applied. • Removal of alien vegetation and bank stabilisation need to be prioritised in areas recommended for rehabilitation • A 100 m setback line around the riparian zone is recommended as a 'no development zone' to protect sensitive habitats and prevent erosion. This applies to agricultural activities as well. The setback line must be incorporated in the municipal SDF. • Recreational and subsistence fishing must be the only form of consumptive use on the estuary – i.e. no commercial fisheries to be considered	Medium term	SBDM, Kouga LM	DEA (Oceans and Coasts), DEDEAT, DWS
	Performance Indicators: • Draft Gamtoos Estuary Management Plan finalized and adopted, and recommendations implemented			
C. Coastal pollution				
Kouga LM	C1. Do an assessment of activities in the catchment to determine key contributors of pollution to rivers, estuaries and the coastal zone. The CMPr has identified and ranked possible pollution inputs from the catchment in each Segment using land cover data, and expected pollution types. This can be used as a guide. Link with A3 and A4 – identify high risk activities and engage with landowners / facility operators / institutions on how to prevent pollution	Identify activities: Short term Engagement: medium term and ongoing	SBDM, Kouga LM	Coastal Committee, DEDEAT, DWS, landowners in the catchment

	Performance Indicators: • Polluting activities identified, classified, and ranked			
Kouga LM	C2. Compile an inventory of stormwater discharge points to the beach. Implement litter traps where required and develop a cleaning and maintenance schedule to prevent solid waste on beaches. Erect signs for the public to not make contact with stormwater runoff/flow.	Short term	SBDM, Kouga LM	DEDEAT
	Performance Indicators: • Inventory compiled, and areas where litter traps are needed are identified • Litter traps installed • Cleaning and maintenance schedule developed, and implemented • Signs erected at public beaches/high use areas			
Kouga LM	C3. Consider alternative methods of storage/treatment/disposal of stormwater runoff rather than direct discharge to estuaries / the coastal zone	Assessment: short term Implementation: medium term	SBDM, Kouga LM	Coastal Committee, Specialist engineers
	Performance Indicators: • Report on feasibility of alternative options available			
Kouga LM	C4. A pollution monitoring network / water quality monitoring programme needs to be established and implemented to determine ecological impacts, safe utilization and recreational use of natural resources and the coastal zone. Sampling points should be focused at: public beaches, estuaries, stormwater discharge points, and outfall sewers. Consider where monitoring is already being done by other institutions (e.g. DWS) to avoid duplication. This can be a collaborative exercise where responsibility and budget is shared, but information is centralized and made available to the public.	Monitoring network established: Short term Implementation: medium term and ongoing	SBDM, Kouga LM	DWS, DEA, SAEON, Coastal Committee
	Performance Indicators: • Collaboration with various entities doing monitoring held to determine what is being done • Monitoring network established, with responsibilities, timeframes, variables etc.			

	• Monitoring implemented • Results shared on public platform (can use website as per A5)			
2A, 2D, 2E	C5 (link with C4). A long term monitoring plan for seawater quality must be set up, to determine impacts of a desalination plant (temporary or permanent) on the receiving environment, should this go ahead as planned for Oyster Bay and Paradise Beach (as per the Directive for drought emergency projects issued by the DEDEAT). A permanent desalination plant must not be developed until the necessary specialist studies have been done that will form part of a CWDP application (e.g. dispersion model).	Timeframes to be aligned with implementation of projects in the Directive	SBDM	Kouga LM, DEA: Oceans and Coasts, DWS
	Performance Indicators: • If a temporary desalination plant is established: long term monitoring is done in the coastal zone to determine change in water quality. • No permanent desalination plant established without the necessary specialist studies and permits/licences.			
Kouga LM	C6. Assess integrity of all sewer infrastructure situated within 100 m of the high water mark of the sea, the estuarine functional zone, and the 1:100 year floodline of rivers. If possible, relocate infrastructure to be situated outside of these risk areas. Where this is not practical, ensure that the necessary precautionary measures are in place to protect infrastructure from storm surges and prevent leaks/overflows of sewage into the coastal zone or rivers.	Assess status: Short term Implement required measures: Medium term	SBDM, Kouga LM	DEDEAT, DWS
	Performance Indicators: • Location of sewer infrastructure in 'risk areas' spatially identified • Assessment of status of infrastructure complete • Action plan for relocation/upgrading complete and communicated			
2C, 2D, 2E	C7. Assign sufficient budget in the IDP review to maintenance and upgrading of sewer infrastructure (WWTW, sewer lines, pumpstations etc.).	Short term	SBDM, Kouga LM	DWS, DEA
	Performance Indicators: • Budget allocated in the IDP			

Kouga LM	C8. An audit/inspection of the integrity of septic tanks and conservancy tanks used in residences along the coastline must be done to check for leaks/cracks, and where replacement is required.	Short term and ongoing	SBDM, Kouga LM	DWS, private residence owners
	Performance Indicators: • Inventory of residences compiled • Inspections done, and problem areas identified • Repair work/replacements done			
2C	C9 (link with C4). Ensure that groundwater monitoring in the area surrounding the St Francis WWTW is implemented to test whether treated effluent released via the artificial wetland is in line with applicable standards, and that groundwater quality in the surrounding area is not compromised. Results must be communicated to the DWS and the relevant persons in the Kouga LM to ensure that the necessary action is timeously taken should effluent not meet standards and/or if groundwater quality deteriorates.	Short term	SBDM, Kouga LM	DWS
	Performance Indicators: • Groundwater monitoring plan implemented • Results reported to DWS and Kouga LM, and action taken where required • Groundwater quality does not deteriorate	Short term and ongoing	Kouga LM	DWS
2C	C10. Apply to formally close the St Francis Bay landfill site, and implement rehabilitation measures.	Short term	SBDM, Kouga LM	DEDEAT
	Performance Indicators: • Landfill site closed, and area rehabilitated			
Kouga LM	C11. Establish general waste transfer stations/landfill sites to serve Cape St Francis, St Francis Bay, Paradise Beach, and Jeffreys Bay.	Planning and permitting: Short to Medium term Implementation: Medium to Long term	SBDM, Kouga LM	DEDEAT, DWS, public

	Performance Indicators: • Necessary licences and environmental approvals in place for waste sites • Budget allocated • Waste sites implemented			
Kouga LM	C12. An assessment of the number and types of bins in the coastal zone must be done. Bins must be covered and protected from rain and wind, and must be situated outside the tidal inundation zone. A 'cleaning schedule' should be developed as to frequency of emptying bins, and responsible persons. The provision of separate bins for recycling of waste should be considered at main beach nodes.	Short term	SBDM, Kouga LM	Public
	Performance Indicators: • Cleaning schedule developed • Roles and responsibilities defined • Suitable bins in place at beaches • Waste recycling receptacles available at high use beaches and events			
Kouga LM	C13. Solid waste from commercial fishing vessels/ships operating off the coastline washes up on the shoreline. It is difficult to control solid waste management on vessels at sea. It is recommended that the Kouga LM environmental and waste sectors meet with stakeholders (e.g. small boat harbour ports, DAFF, fishing rights holders, tourism vessels) to discuss how waste management can be improved on vessels when out at sea. This could be an agenda item at a Coastal Committee meeting where multiple stakeholders are present.	Stakeholder meeting: Short term Devise plan for improved waste management at sea: medium term Implement plan: medium term	SBDM, Kouga LM, St Francis Port, DAFF, holders of fishing rights/permits	
	Performance Indicators: • Stakeholder meeting held • Plan in place and implemented			

Kouga LM	C14. The education and awareness program referred to in A9 must be extended to include information on the importance of effective waste management in the Kouga LM by all waste producers (e.g. industry, government, individuals etc.). The Kouga LM needs to roll out a large number of education and awareness programs on waste management. These must be ongoing, and should focus on big waste producers (e.g. industry/commercial enterprises) to individual households. A waste management plan must be developed to guide the process.	Develop waste management plan: Short term Implement education and awareness programs: short term and ongoing	SBDM, Kouga LM	Private businesses and industries, NGOs, schools, tertiary institutions, churches, general public, ward councillors
	Performance Indicators: • Waste management plan developed • Education and awareness program schedule set up and implemented			
Kouga LM	C15. Domestic waste removal services must be provided to all community members in urban areas across the Kouga LM to avoid dumping.	Medium term	SBDM, Kouga LM	Public, ward councillors
	Performance Indicators: • All communities in urban areas in the Kouga LM are provided with waste collection services on at least a weekly basis			
Kouga LM	C16. Support existing initiatives and community groups with beach clean-ups throughout the year, especially after storm events and high seas where waste from vessels at sea is deposited onto the beach. A diary of events should be agreed to under the umbrella management of the Coastal Committee (where community representatives attend). Awareness of the event must be promoted and facilitated	Short term	SBDM, Kouga LM, community groups	DEDEAT
	Performance Indicators: • Regular beach clean-up events held • Diary of events for year published and communicated to communities • Support provided by the Kouga LM through extension staff, materials, collection and disposing/recycling of collected waste, and awareness campaigns			
Kouga	C17. Incentivise the reduction of environmentally 'unfriendly' food packaging	Short to medium term	SBDM, Kouga LM	Tourism sector, restaurants,

LM	(e.g. polystyrene take-away boxes) and plastic carrier bags in restaurants in Kouga LM through competitions/awareness programmes linked to tourism/events.			public
	Performance Indicators: • Competition/awareness programme and incentive mechanism established • Reduction in the amount of unsustainable food packaging used in the restaurant industry			
Kouga LM	C18. Land use planning and building regulation approval processes must consider the impact of light pollution from residences (private and tourism) along the coastline.	Medium term	SBDM, Kouga LM	Architects, town planners, public
	Performance Indicators: • Light pollution from residences along the coastline prevented/managed			
D. Coastal Development				
Kouga LM	D1. Make provision for responding to fires. Ensure budget is available to have enough fire-fighting vehicles, equipment and staff in urban nodes to respond to fires in the surrounding area	Short term	SBDM, Kouga LM	Farmers, Fire Protection Association
	Performance Indicators: • Sufficient firefighting services established and functional			
Kouga LM	D2. Upgrade medical and emergency services in urban nodes.	Medium term	SBDM, Kouga LM	
	Performance Indicators: • Sufficient medical and emergency services available to the local community, and for tourists/holiday makers.			
Kouga LM	D3. Create opportunities for local economic development to address the current unemployment problem. Compile an inventory and do a 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. Focus on sustainable, low-impact, non-consumptive development and creating	Short to Medium term, and ongoing	SBDM, Kouga LM	DEDEAT, industry, public, tourism associations

	employment opportunities through waste recycling and beneficiation, alternative water and energy supply, rehabilitation of open spaces, alien vegetation clearing and eco-tourism opportunities.			
	Performance Indicators: • Local economic development plan in place • Priority projects identified • Training and skills development needed by local community identified • Improved and sustained local economy; with social and environmental benefits (e.g. through waste beneficiation, alien plant clearing). • Reduced unemployment rate • Sustainable use of natural resources, with no loss of environmental integrity			
Kouga LM	D4. Development plans/upgrades must only be focused in areas identified as 'nodes' or 'development areas' within planning documents.	Ongoing.	SBDM, Kouga LM	DEDEAT, town planners, EAPs, developers
	Performance Indicators: • Development / urban expansion restricted to development nodes as per the Kouga SDF and other planning documents relevant to the area			
Kouga LM	D5. Development planning must consider dynamic coastal and aquatic process areas, important habitats, and sensitive archaeological areas. It is advised that these features be incorporated into future updates to planning documents for the area (e.g. the Kouga SDF). Risks associated with the position of current structures and infrastructure in these areas need to be assessed, and design mitigation measures implemented to prevent risks/hazards to the public and structures, and simultaneously to allow for coastal processes to continue. Where risks cannot be adequately addressed, structures should be 'set-back'. This will assist in protecting structures and infrastructure from possible impacts of climate change (e.g. flooding, sea-level rise, storm surges) and allow for ecosystem functioning. Typical high risk areas include: • Areas within 100 m of the highwater mark of the sea (in the absence of	Short term	SBDM, Kouga LM	Town Planners, EAPs, DEDEAT

	a coastal management line as required by the ICMA) • Sand process corridors • 1:100 year floodlines of rivers • Estuarine functional zones • Wetlands and their buffer areas • Critical biodiversity areas • Important archaeological sites • Areas below the coastal management line (to be determined)			
	Performance Indicators: • Information on the location and functioning of dynamic coastal systems, habitats, and sensitive areas available on information portal (A5) • Information incorporated in spatial planning documents • Design guidelines available to mitigate impacts and for adaptation to the risks posed by climate change			
Kouga LM	D6. Design regulations for buildings in the coastal zone should be developed that regulate building height, aesthetics, and lighting. Design measures that address risks associated with climate change must be provided.	Development of design regulations: short term Implementation: medium term	SBDM, Kouga LM	Public, specialists, DEDEAT
	Performance Indicators: • Design regulations developed and adopted			
Kouga LM	D7. A maintenance management plan must be developed for maintenance/repair works in sensitive coastal areas. The plan must be approved by the DEDEAT	Short term	SBDM, Kouga LM	DEDEAT, public
	Performance Indicators: • Maintenance management plan done, and EIA process undertaken			
Kouga LM	D8. It is crucial that various municipal directorates involved in the coastal zone, as well as private developers set aside sufficient budget for maintenance of structures and infrastructure.	Short term and ongoing	SBDM, Kouga LM, private developers	
	Performance Indicators:			

	• Maintenance budget reflected in development plans prior to becoming operational			
2A, 2D, 2E	D9. The conditions of the Directive issued by DEDEAT for drought emergency projects in the area must be implemented, and monitored by an ECO. Additional approvals needed in terms of legislation / regulations (other than the EIA Regulations) must be obtained (e.g. WULA, CWDP).	Timeframes to be aligned with implementation of projects in the Directive	SBDM	Kouga LM, DEA: Oceans and Coasts, DWS
	Performance Indicators: • ECO appointed, and oversees projects • Conditions of the Directive adhered to			
Kouga LM	D10. An investigation into the viability of developing aquaculture projects must be prioritised to alleviate pressure off natural resources and improve local economic development. The investigation must include a comparative assessment of socio-economic and environmental costs and benefits, based on local conditions. Priority should be given to projects that directly address local and affordable food security, and job creation; and that do not compromise environmental integrity and eco-tourism potential of the coastal environment.	Short term	DAFF, DEDEAT, SBDM, Kouga LM	Aquaculture commercial operators, researchers, public
	Performance Indicators: • Feasibility study done			
Kouga LM	D11. Assess the demand for and feasibility of using treated effluent and sludge from the St Francis Bay and Jeffreys Bay WWTWs for irrigation and composting.	Short term	SBDM, Kouga LM	Agricultural unions, Golf Courses
	Performance Indicators: • Determine if the quality of sludge and treated effluent is suitable for re-use • Feasibility study, and market demand study done			
Kouga LM	D12. Provision of renewable energy (e.g. solar geysers) and water harvesting (e.g. rain tanks) to urban settlements to be prioritised, especially when rolling out new settlements. Development applications to demonstrate how renewable energy and water saving has been incorporated into building design.	Short to Medium term	SBDM, Koukamma LM	DEA, DEDEAT, Developers

	Performance Indicators: • Renewable energy and water saving guidelines developed for LM to guide development applications • Roll-out plan for renewable energy and water saving provision to settlements developed • All new settlements implemented by the LM equipped with solar geysers and rainwater harvesting tanks.			
Kouga LM	D13. Communal food garden projects must be established in urban nodes to address food security, and sustainable development.	Medium term	SBDM, Kouga LM	Private entrepreneurs, public
	Performance Indicators: • Spaces where food gardens can be set up identified • Local communities engaged • Required training done • Food gardens set up and maintained			
2C	D14. The settlement of Sea Vista in St Francis Bay needs urgent upgrading, in line with the St Francis Property Owners Vision 2030	Medium term	SBDM, Kouga LM	St Francis Property Owners Association, ward councilors, DEDEAT
	Performance Indicators: • Sea Vista upgraded			
2E	D15. Sewage systems and stormwater infrastructure need to be upgraded and maintained in the Ocean View – Pellsrus area to prevent flooding of homes in lower lying areas, overflow of sewage into streets and public areas, and generally unhealthy living conditions.	Short term	SBDM, Kouga LM	DEDEAT, DWS, ward councillors
	Performance Indicators: • Upgrading and maintenance of sewage and stormwater infrastructure in the area between Ocean View and the coast • No further flooding of homes • No further sewage spills/leaks/overflow into public areas			
2A	D16. An audit of dune rehabilitation measures implemented in Oyster Bay (as per the management plan by Illenberger, and the approved Basic Assessment	Audit: short term. Implementation of	SBDM, Kouga LM	DEA: Oceans and Coasts, DEDEAT

	by Silberbauer) should be done to determine its effectiveness, and if any additional or different measures are needed.	management measures: ongoing		
	Performance Indicators: • Audit done, and recommendations made • Additional measures identified (if required), and implemented			
	Access			
Kouga LM	D17. Identify the current pedestrian access paths (formal and informal) over dunes to the beach in high use areas. Assess where formal controlled access can be created to reduce trampling of vegetation by foot traffic. Preliminary high use areas have been indicated in the relevant Segments in the CMPr as a guide, using aerial images. Establish appropriate formal access infrastructure that does not compromise coastal vegetation and sediment dynamics. Consider boardwalks along the coast to main beach access points to discourage ad hoc foot traffic along the coast, and promote recreational use and eco-tourism. Ensure that wheelchair-friendly access is created. Identified high risk areas are in Segments 2A, B, D, E and F.	Assess and identify access points: short term Establish access infrastructure: short to medium term	SBDM, Kouga LM	DEA: Oceans and Coasts, DEDEAT, public
	Performance Indicators: • Identify spatially where formalized access points are needed • Identify spatially where informal access areas need to be closed off, and rehabilitated • Design and establish formal access boardwalks • Close off inappropriate access points, and implement rehabilitation measures where required.			
2A	D18. Wheelchair-friendly pedestrian access and controlled vehicular access to the beach in Oyster Bay needs to be instated and maintained.			
	Performance Indicators: • Access to the beach in Oyster Bay available and maintained.	Short term	SBDM, Kouga LM	DEDEAT, public

2B	D19. Insufficient parking and traffic congestion along the Boulevard between St Francis Way and President Reitz Road in Cape St Francis must be addressed. Existing parking areas need to be maintained	Short term	SBDM, Kouga LM	DEDEAT, FOSTER
	Performance Indicators: • Additional parking developed in consultation with FOSTER and other relevant parties • Existing parking areas upgraded and maintained			
2D	D20. Upgrade the existing loop road between Paradise Beach and the Jeffrey's Bay-Humansdorp link road to a tarred surface (recommendation of the Seekoei Estuary EMP)	Planning and budget allocation: Short term Implementation: Medium term	SBDM, Kouga LM	DEDEAT, Coastal Committee
	Performance Indicators: • Loop road upgraded to a tarred surface			
2D	D21. Provide a new and alternative route for residents in Aston Bay and surrounding areas should the causeway across the Seekoei be flood-damaged or removed (future) (recommendation of the Seekoei Estuary EMP).	Planning and budget allocation: Short term Implementation: Medium term	SBDM, Kouga LM	DEDEAT, Coastal Committee
	Performance Indicators: • Alternative access road available for residents of Aston Bay (other than the existing causeway over the Seekoei estuary)			
2D	D22. Provide reasonable and safe public access between Paradise Beach and Aston Bay across the existing causeway by: • Maintain and upgrade the road (if necessary) across the causeway • Install splash reflectors on either side of the causeway to reduce the incidence of splash overwash on the tarred surface (recommendation of the Seekoei Estuary EMP)	Planning and budget allocation: Short term Implementation: Medium term	SBDM, Kouga LM	DEDEAT, Coastal Committee
	Performance Indicators: • Safe access provided over the existing causeway across the Seekoei Estuary			
2D	D23. Possible removal of the causeway over the Seekoei Estuary to be	Medium to Long term	SBDM, Kouga LM	DEDEAT, ward councilors, public

	considered after 2023 (and only if the management recommendations for reasonable access as above have been implemented) (recommendation of the Seekoei Estuary EMP)			
	Performance Indicators: • Investigate the viability of removing the existing causeway in 2023, with a decision made by 2024			
2D	D24. Remove (or partly remove) the existing carpark and building (former swimming pool area) on the eastern side of the current Seekoei mouth when the estuary is open (recommendation of the Seekoei Estuary EMP)	Planning and budget allocation: Short term Implementation: Medium term	SBDM, Kouga LM	DEDEAT, Coastal Committee
	Performance Indicators: • Carpark and building removed			
2E	D25. Prioritise upgrading beach access and parking areas, with ablution facilities near Pellsrus in Jeffreys Bay. The existing parking area near Manta/Snoek Streets needs urgent upgrading to improve recreational use and safety.	Short term	SBDM, Kouga LM	DEDEAT
	Performance Indicators: • Sufficient, safe and aesthetically pleasing access, parking and amenities provided for the public in the coastal zone near Pellsrus			
2F	D26. Informal parking areas along Kabeljauws Road at the Kabeljous Estuary (SW bank) needs to be upgraded, formalised, and maintained	Short term	SBDM, Kouga LM	DEDEAT
	Performance Indicators: • A formalised parking area is available at the Kabeljous Estuary • Informal parking areas are closed off, and the area rehabilitated			
	D27. Access to the coast for fishermen and other recreational users in the area between the Kabeljous and Van Stadens estuary mouths is limited. Low impact and controlled access should be considered in this area, with due consideration given to the carrying capacity of the sensitive coastal area.	Medium term	SBDM, Kouga LM	Coastal Committee, DEDEAT, public
	Performance Indicators: • Investigation done as to where additional access can be incorporated			

	• Carrying capacity of the coastal zone determined • If determined feasible, additional access points created.			
Kouga LM	D28. Communal jetties and shared slipways must be prioritised over single facilities on all estuaries/rivers.	Ongoing	SBDM, Kouga LM, DEDEAT	Coastal Committee
	Performance Indicators: • Unless no other practical option is available, only communal/shared facilities are approved by the relevant authority along estuaries and rivers			
	Ablution Facilities			
2A	D29. Ablution facilities in Oyster Bay: demolish structures that are at high risk of inundation by shifting dunes, and establish public ablution facilities in appropriate areas.	Short term	SBDM, Kouga LM	DEA: Oceans and Coasts, DEDEAT
	Performance Indicators: • High risk facilities identified • New facilities established in suitable areas • Inappropriate structures demolished, and the area rehabilitated			
2A	D30. Establish public ablution facilities in the parking area at the start of the hiking/cycling trail, on the western end of Maori Avenue (Cape St Francis village).	Short term	SBDM, Kouga LM	DEDEAT, FOSTER
	Performance Indicators: • Public ablution facilities established			
2B	D31. The existing ablution facility at the carpark at Seal Point Boulevard in Cape St Francis needs to be maintained.	Short term	SBDM, Kouga LM	DEDEAT, FOSTER
	Performance Indicators: • Existing ablution facilities maintained			
2B	D32. In peak season, the number of ablution facilities in Cape St Francis is insufficient. Additional facilities should be established in high use/parking areas, possibly at the end of St Francis Way and at parking areas along the Wildside	Ongoing	SBDM, Kouga LM	DEDEAT, FOSTER

	Trail on the southern side of the Segment. If the area cannot accommodate more permanent ablution facilities, chemical loos should be hired in peak season.			
	Performance Indicators: • Sufficient ablution facilities available in peak season at public beaches in Cape St Francis			
2E	D33. Ablution facilities at the parking area on the corner of Diaz and St Croix Street in Jeffreys Bay are dilapidated and need to be upgraded	Short term	SBDM, Kouga LM	DEDEAT
	Performance Indicators: • Ablution facilities upgraded			
	Signage			
Kouga LM	D34. Erect aesthetically pleasing sign boards along trails, and at public parking areas that display information on environmental and archaeological/historical features of the area. Signage must serve the following purposes: • Education and awareness on the value of coastal ecosystems • Promote responsible and accountable behavior • Identify rules and regulations applicable to the area • Enhance safety • Promote eco-tourism and recreational use of coastal ecosystems Suggested areas for signs: • Oyster Bay: at new public parking area (when established) • Along the walking/cycling trail between Thyspunt and Cape St Francis • Public parking areas in Cape St Francis and St Francis Bay • Public parking areas at the mouth of the Seekoei Estuary • Public parking area in front of Marina Martinique • Public parking area (upgraded) and camping grounds at Pellsrus	Areas identified and signs designed: short term Signs in place: short to medium term	SBDM, Kouga LM	DEDEAT, Coastal Committee

	• Boat launching area in Jeffreys Bay • Beach access points near the Jeffreys Bay and Kabeljauws Caravan Park • At boardwalk access points (to be established) • At the proposed formal parking area at the Kabeljous Estuary mouth • Public access and launch sites on the Gamtoos Estuary A standard must be developed for the visual quality and content of signs.			
	Performance Indicators: • Areas where signs should be erected identified • Signs designed • Signs in place			
2E	D35. Erect signs at the boat launch facility at the corner of Diaz Road and St Croix Street (Jeffreys Bay), and improve visibility to prevent safety risks between vehicles towing boats and pedestrians.	Short term	SBDM, Kouga LM	DEDEAT, DAFF, fishing companies/subsistence fisheries/fishing clubs, public
	Performance Indicators: • Current safety risk at the existing boat access and launch facility addressed by means of signage, awareness, and improving visibility			
	Safety			
2A	D36. Implement mobile lifeguard towers at the Oyster Bay beach, especially in peak season	Short term and ongoing	SBDM, Kouga LM	DEDEAT, lifesaving clubs
	Performance Indicators: Mobile lifeguard towers available in peak season, with trained lifeguards			
Kouga LM	D37. Implement municipal patrolling of beaches to promote safety. Train a cadre of coast guards.	Employ and train coast guards: Short term Increased patrolling: ongoing	SBDM, Kouga LM	
	Performance Indicators: • Coast guards employed and trained • Increased patrolling of the coastal zone			

2E	D38. Implement measures to improve public safety at beaches in the Pellsrus area	Short term and ongoing	SBDM, Kouga LM	DEDEAT, public
	Performance Indicators: • The local community feels safe when using the beach in front of Pellsrus • Reduced crime statistics on the public beach			
	Eco-Tourism and Recreational Activities			
Kouga LM	D39. Focus on low impact, sustainable eco-tourism development that does not conflict with existing 'brands' or 'cultures' that work in the area (e.g. Jeffreys Bay and St Francis surf culture, St Francis water sports capital). Promote water sports and outdoor / adventure activities (e.g. promote the existing 'surf culture', fishing, coastal hikes, cycling, bird watching etc.). Train local guides to run nature-based tours.	Eco-tourism plan: Short term Implementation of the plan: medium term and ongoing	SBDM, Kouga LM	DEDEAT, Coastal Committee, ward councilors, public
	Performance Indicators: • Eco-tourism and recreational use plan developed for the Kouga LM, that identifies priority projects and interventions, and that guides officials in land use planning and decision making (by means of land use guidelines) • Priority projects identified that provide opportunities for local entrepreneurs to establish eco-tourism related businesses • Training and support provided to local entrepreneurs			
	D40. Events most be hosted in areas that have adequate parking and ablution facilities to accommodate large numbers of people and vehicles	Short term and ongoing	SBDM, Kouga LM	Tourism businesses, public
	Performance Indicators: • Areas where events can be accommodated are identified • If sufficient areas not available, the required upgrades are instated to enable events.			
Kouga LM	D41. Beautify public open spaces and rehabilitate degraded state-owned land using local plant species.	Degraded areas identified: Short term Rehabilitation: ongoing	SBDM, Kouga LM	DEDAET, public
	Performance Indicators:			

	• Areas in need of rehabilitation identified and prioritised • Rehabilitation plan developed • Rehabilitation implemented and maintained			
Kouga LM	D42. Establish and maintain public camping facilities. Existing municipal-owned public campsites/resorts are: • Oyster Bay Resort • Pellsrus Camping Resort • Jeffreys Bay Caravan Park • Kabeljauws Holiday Resort • Gamtoos River Mouth camp site (recommendation in the Draft Gamtoos EMP to decommission this camp site and incorporate the land in the PA to the east) Public camping/caravan facilities are needed in the St Francis Bay/Cape St Francis area, and Oyster Bay. Key features to consider would be: • Architectural theme to reduce visual impact • Low impact, small footprint • Structures and infrastructure to be setback outside of dynamic coastal process areas • Provision of services and solid waste management	Existing camping areas maintained: Short term Additional public camping areas established: Medium term	SBDM, Kouga LM	DEDEAT, Coastal Committee, public
	Performance Indicators: • Existing camping facilities maintained • Additional camping facilities established, and maintained			
Kouga LM	D43. The number of activities and boats on estuaries must be regulated and monitored in peak times to ensure the recreational carrying capacity is not exceeded.	Ongoing	SBDM, Kouga LM	DEDEAT, DAFF, public

	Performance Indicators: • Activities on estuaries are regulated and monitored in peak season by means of a permitting system • Carrying capacity of individual estuaries determined and updated on a 5 yearly basis			
2D to 2G	D44. Develop an Aquatic Safety Zone Plan to inform activities in the coastal zone and avoid conflict/safety risks for various users (e.g. surfing, fishing, boating etc.). Take cognisance of existing plans (e.g. the Activity Zone map for the Kromme and Geelhoutboom Rivers developed by the Kromme River Joint Committee (November, 2015) and the Zonation Plan in the Draft Gamtoos Estuary Management Plan).	Short term	SBDM, Kouga LM	DEDEAT, Tourism Association, Sports Clubs, WESSA, NSRI, ward councilors, public
	Performance Indicators: • Aquatic Safety Zone Plan developed • Plan adopted by Council • Public awareness of Plan			
Kouga LM	D45. Development setback lines as referred to in the EIA Regulations and listed activities need to be approved and endorsed by the Provincial MEC for them to have effect, and be used in land use planning. The inclusion of setback lines in SDFs must therefore ensure adequate engagement with relevant state departments, and required approvals. The lines cannot be developed on an ad hoc basis along the coastline. Note that development setback lines are not the same as coastal management lines.	Short to Medium term	SBDM, Kouga LM, DEDEAT	Planners, EAPs, public
	Performance Indicators: • Development setback lines established for the Kouga LM, and approved by the MEC			
Kouga LM	D46. Incorporate beach/water safety awareness and training into school curricular from a young age via workshops and extra-curricular training	Short term and ongoing	SBDM, KougaLM	Schools
	Performance Indicators: • Safety training and awareness incorporated into the local school's annual			

	curricular			
Kouga LM	D47. Development in SWSAs and major aquifer areas must consider possible impacts on these important water resources in land use planning (e.g. related to stormwater management, abstraction, flow modification, water quality impacts).	Ongoing	SBDM, Kouga LM, DWS	DEDEAT, EAPs, engineers, planners
	Performance Indicators: • Impacts of development on SWSAs and major aquifers given due consideration in the land use planning process, and impacts avoided/managed through careful placement and design.			