EnviroAfrica
Environmental Planning and Impact Assessment Consultants
Omgewingsbeplanning en Impakbeoordeling Konsultante

19 August 2013

TO WHOM IT MAY CONCERN

16/3/1/1/E2/14/2026/13: PROPOSED UPGRADE OF PIET SE BOS AND GROTTO BEACH AREA, HERMANUS

There were a number of questions that were raised by Interested and Affected Parties during the public participation process that we had to refer to the relevant officials in the Overstrand Municipality with regard to the proposed upgrading of Piet se Bos and Grotto beach area. These are the responses that were obtained for your information.

Question 1:

I have read under "Project Location & Description" what is intended in regard to the Upgrade of Wetlands. I would like to know what has motivated this Wetlands upgrade – what is wrong with what is there now and what is its budgeted cost?

Answer: Overstrand Municipality have an environmental management section that oversees the conservation in the municipal area and plan which areas need to be rehabilitated to improve biodiversity. The present state of the area was compromised many years ago when the original wetland area was filled in. The current system is dysfunctional and does not ensure proper filtering of the river that enters the Blue Flag beach, which is one of the requirements for the implementation and retention of a Blue Flag Programme The Overstrand Municipality is currently busy with an Environmental Management Plan for Fernkloof Nature Reserve and the municipality is of the intention to include this area into the management plan and Environmental Framework for the municipality.

The upgrade is in the planning stage and once environmental authorization is obtained can the upgrade process be put out to tender and only then will the costs be known.

Question 2:

What exactly is the idea behind the establishment of an Amphitheatre. I was under the impression that Hermanus has a site where such open air theatre functions can be held. Is that not so?

Answer: There is an increase in the growth of tourism in Hermanus as well as a younger population who requires amenities and activities according to their needs. The Forest Theatre is situated in the Hemel-and-Aarde valley within a rural area which caters for specific events such as single performances.

Question 3:

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Bernard de Witt

What were the reasons why the Municipality has decided to use this area so close to a Flue Flag Beach for use for an Amphitheatre? It seems that possibly a consideration was that it was a way to use the rubble and builders material that will be removed during the "upgrade" of the Wetland re-establishment. Is that correct?

Answer: The existing rubble that was used to fill in the original wetland will be removed to restore the current function of the system and only suitable rubble will be used, where necessary, with the development of the amphitheatre. Unsuitable rubble will be removed to the most suitable landfill site. The removed material could also be used for a number of other fill applications in the area, for instance to rehabilitate the washed away banks of the Grotto car park at the Kleinrivier Lagoon. We are sure that there are other uses for the excavated material as well, but the Municipality has decided that to use it for an amphitheatre offers an enhanced use of the area from which income can be generated to offset the cost of registering a Blue Flag Beach. Note that the use is in keeping with the concept of the Blue Flag Beach.

Question 4:

What alternative locations have been considered by the Municipality to cater for such events and what process was followed to proceed with the development in this location

Answer: There are no suitable sites available with existing facilities. The municipality is not looking for an area where an amphitheatre can be constructed, but is looking at the upgrading and rehabilitation of the Piet se Bos area. A feasible option that the municipality has come up with is an amphitheatre that will meet the requirement under the Integrated Coastal Management Act, which requires that coastal areas be made more accessible to the general public.

Question 5:

To what specific type of event has the Municipality in mind to be staged in this proposed Amphitheatre. This will give an idea of the additional facilities that have to be provided for such events.

Answer: The municipality has in mind plays, classical performances or suitable musical events as per request, under strict conditions such as suitability, time limits and conditions of the temporary removable infrastructure that has to be put in place by the individual organisers

Question 6

Who is the target market to which these events will be directed. What is the proposed entrance fee for a typical event.

Answer: The broader community spectrum. The entrance fee will be determined by the individual organisers and dependent on the event.

Question 7

What is the budgeted cost of the Amphitheatre and what is the anticipated income that is to be generated from the staging of events.

Answer: The cost of the amphitheatre can only be determined when the tenders for the upgrading of the area have been finalised. The anticipated income to be generated will be dependent on the type of event and agreements reached between the municipality and individual organisers.

Question 8

How often is it intended to be put to use (no of uses per month over each month of the full year)

Answer: This can only be determined once requests for use of the amphitheatre are submitted by individual organisers.

Question 9:

What are the proposed operating times and on which days of the week will such events be staged

Answer: This will once again be dependent upon request, but all performances will end before 12:00 pm.

Question 10

What is the MAXIMUM no of visitors that are to be accommodated (seated and standing) in this Amphitheatre.

Answer: An absolute maximum of 340 persons.

Question 11:

How is it proposed that such visitors will arrive, park there

Answer: The existing road network is deemed adequate and the current parking at the Grotto area makes provision for all types of vehicles.

Question 12:

How will such additional persons be accommodated in the existing parking areas, when such available parking as is currently there has already proven to be quite tight during the high season

Answer: The existing parking is deemed adequate and when necessary, Overstrand municipal traffic officials will deal with the traffic flow.

Question 13:

What considerations have been given to the existing road system being able to handle the additional traffic

Answer: The existing road network is deemed adequate and the current parking at the Grotto area makes provision for all types of vehicles. The existing parking is deemed adequate and when necessary, Overstrand municipal traffic officials will deal with the traffic flow.

Question 14:

What loudspeaker and amplification system is envisaged – location, height and direction of loudspeakers and wattage

Answer: This is not known at the moment as it will be dependent on the individual event and organiser requirements, but will be approved by the municipality for each event.

Question 15:

What lighting system is envisaged – location, height and direction of all spot lights and their type and wattage

Answer: The municipal lighting will be flood lighting. The individual lighting is not known at the moment as it will be dependent on the individual event and organiser requirements.

Question 16:

How is it envisaged to attenuate the sound emanating for events being held in the amphitheatre and to what extent

Answer: This will only be attended to in detail once the business plan for the amphitheatre is drawn up

Question 17:

How will the sewerage be disposed – I hope not into the sea at Grotto beach!

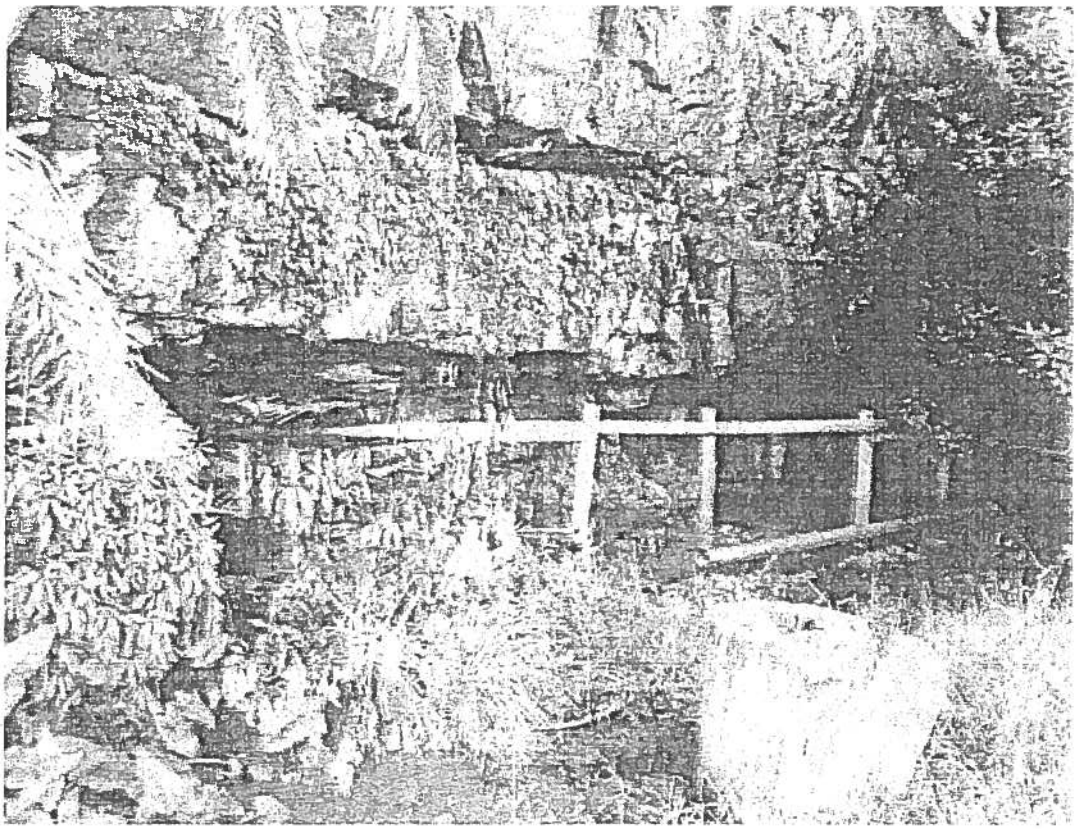
Answer: It will be linked to the existing sewage reticulation system in the Grotto area and in addition portable toilet facilities may also be a condition in individual instances for organisers of events, depending on the requirement.

APPENDIX G

SPECIALIST REPORTS

FRESHWATER IMPACT ASSESSMENT FOR THE REHABILITATION OF THE PIET SE BOS WETLAND, GROTTO BEACH, HERMANUS

MAY 2013



Prepared By:

Ms Toni Belcher and Mr Dana Grobler

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Email: dana@bluescience.co.za

Project number: P058-Apr13 (BlueScience)

1. EXECUTIVE SUMMARY

The Overstrand Local Municipality is considering the potential to re-develop the Piet se Bos (Grotto Beach) area. It is their intention to upgrade and develop Piet se Bos (Grotto) area by means of establishing a restaurant, open air theatre and the partial rehabilitation of the degraded wetland system. The proposal has triggered various environmental requirements that need to be addressed in order to ensure sustainable development.

A landscape plan is proposed for the development of the site. The proposed re-development of the Piet se Bos area provides an ideal opportunity to restore some of the lost functionality of the original wetland and to formalise the protection of remnants of the wetland areas. It is however unrealistic to expect that the full functionality of the original wetland area would be restored to its original condition prior to the infilling of the current picnic area. The objective should be to create a diversity of wetland habitats that would allow for improved wetland ecosystem functionality while being aesthetically pleasing and being aligned to the Municipality's development plan.

The existing remnant wetland area has been assessed and its habitat integrity and functionality determined. In this context, specific conditions have been provided to ensure that the implementation of the proposed development plan is done in such a way as to ensure that the restoration and rehabilitation of a portion of the original wetland area is optimised in a sustainable way. It should also be recognised that this rehabilitation work will need to be undertaken in a phased and progressive manner that is responsive to the wetland's recovery.

The final 'on-site' design will be informed by the opportunities that are exposed once clearing and excavation commences, additionally following the flooding of the re-established wetland area. This, together with exposure of the soil substrates, will inform the planting and features plan for the wetland.

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2. BACKGROUND AND QUALIFICATIONS OF SPECIALIST CONSULTANTS

Contact details: PO Box 455, Somerset Mall, 7137

Name: Mr Dana Grobler and Ms Antonia Belcher

Profession: Mr Dana Grobler (Environmental Scientist – *Pr. Sci. Nat 400058/93*) and Ms Antonia Belcher (Aquatic Scientist *Pr. Sci. Nat.* 400040/10);

Fields of Expertise: Specialist in environmental water requirements, river and wetland monitoring and reporting.

Relevant work experience (Ms Antonia Belcher):

Due to Ms Belcher's involvement in the development and implementation of the River Health Programme as well as the Resource Directed Measures (RDM) directorate of the Department of Water Affairs in the Western Cape, she has been a key part of the team that has undertaken six catchment or area wide 'state-of-river' assessments as well as routine monitoring and specialised assessments of rivers and wetlands in all the major catchments in the Western Cape.

Relevant publications:

- Belcher, A. 2012. Freshwater Assessment for the Proposed Fourth Kloof Diversion Scheme.
- Belcher, A. 2012.Freshwater Assessment for the Proposed Enlargement of the Brakleegte and Rietvlei dams on Farm De Rietvalley 150, Robertson.
- Belcher, A. 2011. Freshwater Assessment: Mapoteng Water Supply Infrastructure Project Environmental Management Plan.
- Belcher, A. 2010. Freshwater Assessment for the Proposed Dam at L'Ormarins, Portions 1 and 4 of Farm 1206, Riebeeksrivier, in the District of Malmesbury.
- Belcher, A. 2010. Freshwater Assessment for the Proposed Dam at L'Ormarins, Franshoek
- Belcher, A. 2010. Freshwater Assessment for the Proposed Storm Water Rehabilitation Work at Zevenwacht.
- Belcher, A. 2009. Freshwater Assessment for the Proposed Raising of Lushof Dam, Prince Alfred Hamlet.
- Belcher, A. 2009. Freshwater Assessment input into the Environmental Management Plan for Moorreesburg and Malmesbury.
- Belcher, A. 2008. Ecological Assessment of the Vlermuiskelderskloof Spruit. Proposed construction of an instream dam, Farm 143 Portion 4, Napier.
- Belcher, A. 2007. Assessment of the Proposed Second Hiking Route on the Whale Route, De Hoop Nature Reserve: Impacts to Freshwater Ecosystems, Cape Nature.

Relevant work experience (Mr Dana Grobler):

- Freshwater impact assessments and water use authorisation applications for various solar and other renewal energy projects in South Africa;
- Feasibility study phase of the regional integration of the bulk water supply systems of the Knysna and Bitou municipalities. Subcontractor to Aurecon for the Ecological Reserve and water environmental aspects;

- Development of RDM curriculum for a Master degree programme at University of science institutions in South Africa. Module 9 – Implementation, system operations and management to give effect to environmental water requirements;
- Low level helicopter survey and video recording of rivers of the Stellenbosch local municipal area and the Berg River;
- IWETS – Implementation of **W**ater **E**ducation, **T**raining and **S**kills development in South Africa. Research team member and South African representative of a Dutch/DBSA funded research project (2011-2012);
- Technical team member for various water use license applications in the Western Cape Province, South Africa (2010 – 2012);
- Project manager and technical team member for the Free State River Health monitoring programme (2011 – 2013); and
- Project manager for the classification of water resources in the Olifants Doorn Water Management Area, Western Cape, South Africa (2010 – 2012). The study included economic, ecological and social aspects of water use and management in the catchment.

2.1 DECLARATION OF INDEPENDENCE (MR DANA GROBLER)

I, Dana Grobler, as the appointed independent specialist hereby declare that I:

- act/ed as the independent specialist in this application;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management Act;
- have and will not have no vested interest in the proposed activity proceeding;
- have disclosed, to the applicant, EAP and competent authority, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management Act;
- am fully aware of and meet the responsibilities in terms of NEMA, the Environmental Impact Assessment Regulations, 2010 (specifically in terms of regulation 17 of GN No. R. 543) and any specific environmental management Act, and that failure to comply with these requirements may constitute and result in disqualification;
- have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- have ensured that the names of all interested and affected parties that participated in terms of the specialist input/study were recorded in the register of interested and affected parties who participated in the public participation process;
- have provided the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not; and
- am aware that a false declaration is an offence in terms of regulation 71 of GN No. R. 543.

Note: The terms of reference is included in the following section.

Signature of the specialist:

Mr Dana Grobler
Date: 07 May 2013

2.2 DECLARATION OF INDEPENDENCE (MS ANTONIA BELCHER)

I, Antonia Belcher, as the appointed independent specialist hereby declare that I:

- act/ed as the independent specialist in this application;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management Act;
- have and will not have no vested interest in the proposed activity proceeding;
- have disclosed, to the applicant, EAP and competent authority, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management Act;
- am fully aware of and meet the responsibilities in terms of NEMA, the Environmental Impact Assessment Regulations, 2010 (specifically in terms of regulation 17 of GN No. R. 543) and any specific environmental management Act, and that failure to comply with these requirements may constitute and result in disqualification;
- have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
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- have ensured that the names of all interested and affected parties that participated in terms of the specialist input/study were recorded in the register of interested and affected parties who participated in the public participation process;
- have provided the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not; and
- am aware that a false declaration is an offence in terms of regulation 71 of GN No. R. 543.

Note: The terms of reference is included in the following section.

Signature of the specialist:

Ms Antonia Belcher
Date: 07 May 2013

3. TERMS OF REFERENCE

Interpretation of the terms of reference and work conducted

1. ***Freshwater Assessment***
   - Conduct a situation assessment based existing information for the area and the detail on the proposed development, as well as a site assessment. Delineate the site's water bodies and determine aquatic ecosystem present state as well as ecological importance and sensitivity;
   - Evaluate the proposed development activities and their potential impacts for the various alternatives provided, and propose mitigation measures for the development. Describe the potential impacts, the significance of those impacts, and weigh and rank each impact during the project life cycle stages, according to the assessment, ranking, weighting and scaling criteria as laid out in the EIA Regulations and any Terms of Reference for the proposed dam development. Evaluate potential impact of the development against regional conservation targets;
   - Compile recommendations for rehabilitation of the wetland area;
   - Write up findings and recommendations for EIA process; and
   - Review of documentation and liaison with client.

2. ***Water Use Application***
   - Collate all relevant information for the water use authorisation application. Compile licence application forms and additional supporting documentation to the freshwater assessment that would be required for the water use application; and
   - Review of documentation and liaison with DWA and the client.

4. LIMITATIONS AND ASSUMPTIONS OF THE STUDY

Limitations and uncertainties often exist within the various techniques adopted to assess the condition of ecosystems. The following techniques and methodologies were utilized to undertake this study:

- Analysis of the freshwater ecosystems was undertaken according to nationally developed methodologies as defined by WET Health Series developed for the Water Research Commission. This level is considered to be sufficient for the project.
- Recommendations are made with respect to the adoption of buffer zones within the development site, based on the wetlands/river's functioning and site characteristics.

These recommendations are based on professional opinion due to the lack of a formal methodology for buffer zone determination within South Africa.

5 USE OF THIS REPORT

This report reflects the professional judgment of its authors. The full and unedited content of this should be presented to the client. Any summary of these findings should only be produced in consultation with the authors.

6 STUDY OVERVIEW

6.1. OVERVIEW OF THE PROJECT AND STUDY AREA

The Overstrand Local Municipality is considering the potential to re-develop the Piet se Bos (Grotto Beach) area. It is their intention to upgrade and develop Piet se Bos (Grotto) area by means of establishing a restaurant, open air theatre and the partial rehabilitation of the degraded wetland system. The proposal has triggered various environmental requirements that need to be addressed in order to ensure sustainable development.

The Overstrand Municipality has subsequently issued a call for proposals, and has appointed an EIA practitioner, EnviroAfrica, to assist with the environmental authorisation processes for the development potential of the Piet se Bos area. It is a requirement of the appointment that a wetland scientist be appointed to consider the proposed development and wetland rehabilitation.

Figure 1a provides a topographic map of the Piet se Bos area and Figure 1b provides a Google Earth image of the area. The Piet se Bos area is located at Grotto Bay and surrounded with residential developments towards the north east and west. In the north, 12th Street forms the border of the Piet se Bos area and the southern border is defined by Grotto Road that runs parallel to the beach.

The area in which the existing picnic facility (with fixed braai stands) and open lawn was established was most likely an extended wetland are in the past. This area was filled in with building rubble, restricting the wetland areas to the northern and eastern borders of the original wetland. At the same time as the infilling of the original wetland area occurred, the flow of water to the wetland was confined to a canal and covered with concrete slabs. This canal diverts water around the filled in area towards the south-east, where it discharges onto the beach via a pipe onto the beach.

The topography of the Piet se Bos site has a moderate gradient from the west to the east on the infilled area, with a steep to very steep embankment on the northern boundary and a dune/berm separating the infilled area from the beach.

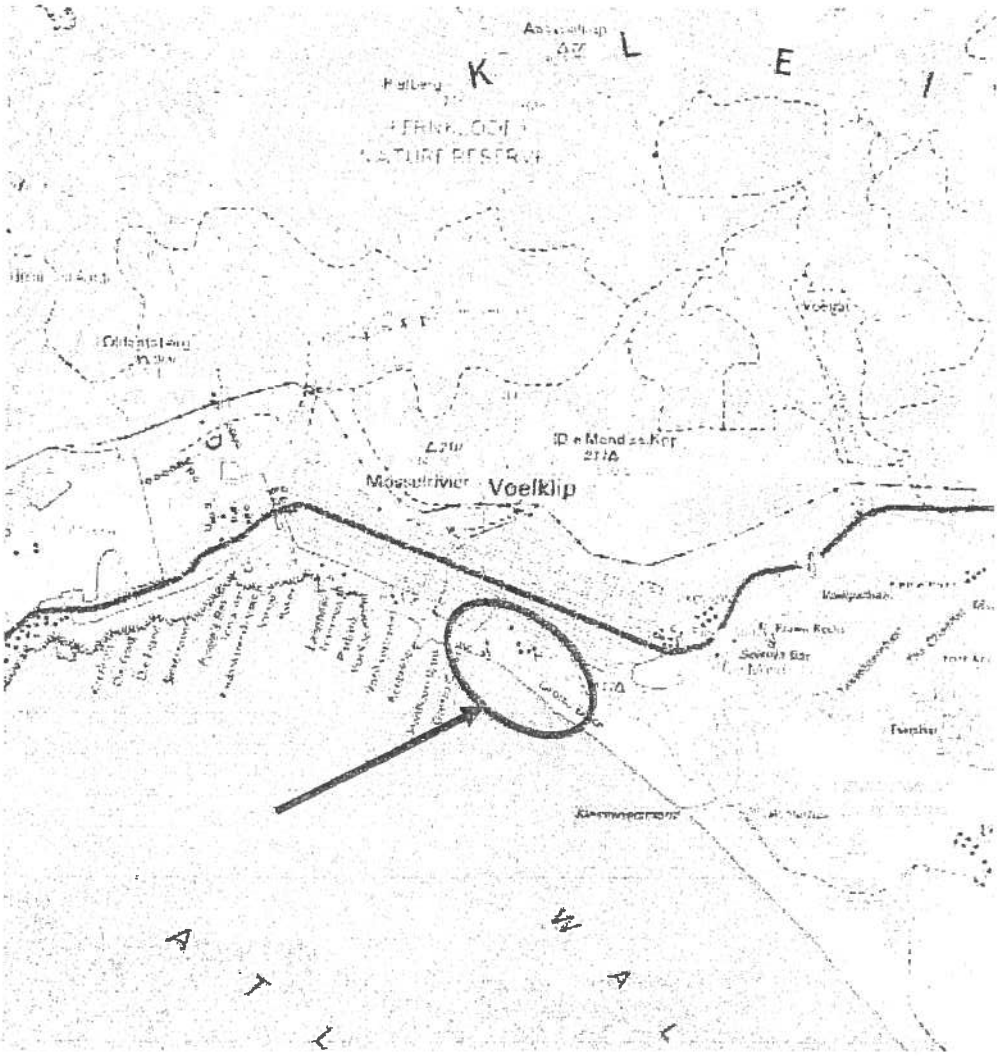


Figure 1a: Piet se Bos wetland and surrounding area – Grotto Beach, Hermanus (3419AD - Stanford)

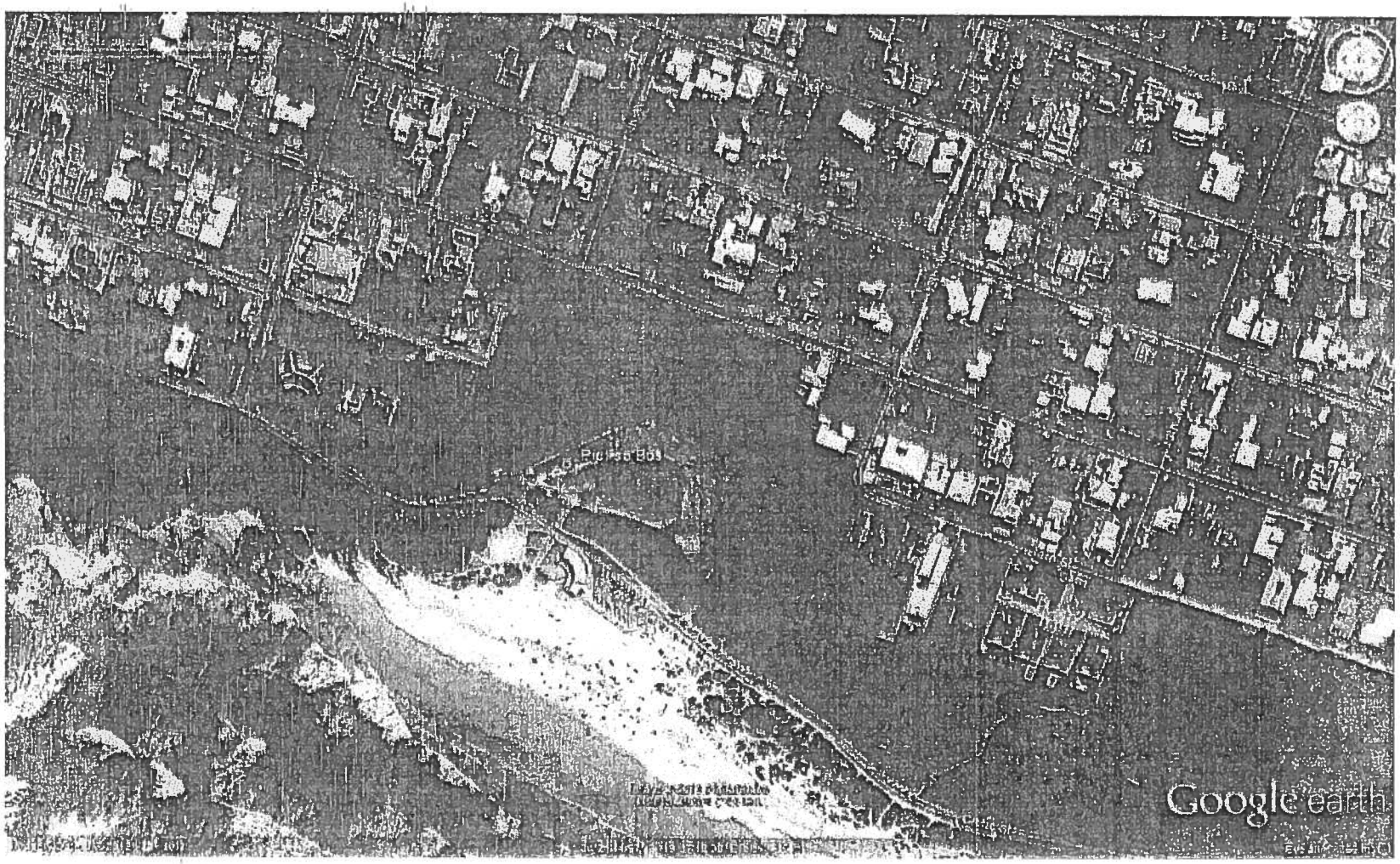


Figure 1b: Piet se Bos wetland and surrounding area – Grotto beach Hermanus (Google Earth 2013)

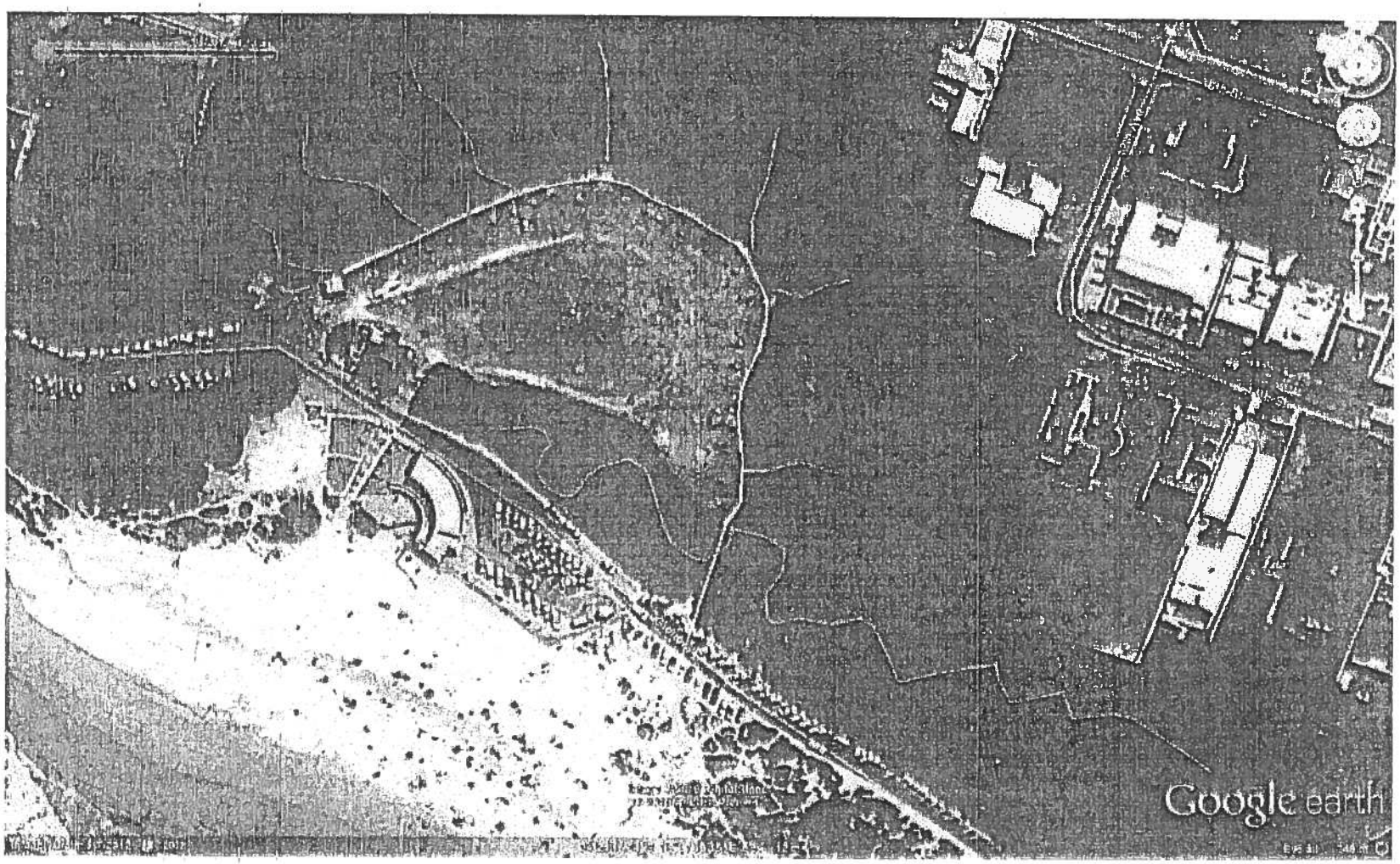


Figure 2: Satellite image of the Piet se Bos area indicating freshwater features (Google earth, 2013). Yellow lines represent the concrete slabs covering the canal, red – berm across a historic river channel, and blue lines the general drainage from north to south and east to west into the Piet se Bos wetland area.

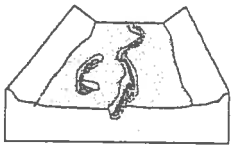
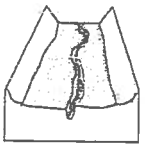
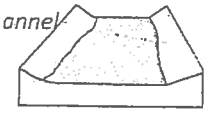
7. WETLAND ASSESSMENT

WET-EcoServices and WET-Health were utilised to assess the benefits and services supplied by the Piet se Bos wetland as well as to determine the integrity of the ecological processes for the wetland. Ecological Importance and Sensitivity assessments were also utilised to contextualise results for the water feature.

7.1. WETLAND CHARACTERISATION

According to Table 1, the Piet se Bos wetland can be characterised as a hill slope seepage that is not connected to any stream channel. The wetland also occurs with the Overberg Dune Strandveld vegetation type, which typifies the surrounding vegetation.

Table 1: Wetland hydro-geomorphic types typically supporting inland wetlands in South Africa

Hydro-geomorphic types	Description	Source of water maintaining the wetland[1]	
		Surface	Sub-surface
Floodplain 	Valley bottom areas with a well defined stream channel, gently sloped and characterized by floodplain features such as oxbow depressions and natural levees and the alluvial (by water) transport and deposition of sediment, usually leading to a net accumulation of sediment. Water inputs from main channel (when channel banks overspill) and from adjacent slopes.	***	*
Valley bottom with a channel 	Valley bottom areas with a well defined stream channel but lacking characteristic floodplain features. May be gently sloped and characterized by the net accumulation of alluvial deposits or may have steeper slopes and be characterized by the net loss of sediment. Water inputs from main channel (when channel banks overspill) and from adjacent slopes.	***	*/***
Valley bottom without a channel 	Valley bottom areas with no clearly defined stream channel, usually gently sloped and characterized by alluvial sediment deposition, generally leading to a net accumulation of sediment. Water inputs mainly from channel entering the wetland and also from adjacent slopes.	***	*/***

Hillslope seepage linked to a stream channel 	Slopes on hillsides, which are characterized by the colluvial (transported by gravity) movement of materials. Water inputs are mainly from sub-surface flow and outflow is usually via a well defined stream channel connecting the area directly to a stream channel.	*	***
Isolated Hillslope seepage 	Slopes on hillsides, which are characterized by the colluvial (transported by gravity) movement of materials. Water inputs mainly from sub-surface flow and outflow either very limited or through diffuse sub-surface and/or surface flow but with no direct surface water connection to a stream channel.	*	***
Depression (includes Pans) 	A basin shaped area with a closed elevation contour that allows for the accumulation of surface water (i.e. it is inward draining). It may also receive sub-surface water. An outlet is usually absent, and therefore this type is usually isolated from the stream channel network.	*/***	*/***

[1] Precipitation is an important water source and evapotranspiration an important output

Wetland

Water source: * Contribution usually small

*** Contribution usually large

*/*** Contribution may be small or important depending on local circumstances

7.2. HISTORICAL ASSESSMENT OF WETLAND

Figures 3a to 3c provide an historical review of the modifications to Piet se Bos wetland and its surrounding area. As early as 1938 (Figure 3a, top) the surrounding land was already being urbanized. It would appear that the wetland itself at this time was still largely natural. In the following aerial photograph (Figure 3a, bottom), taken in 1961, there has been an increase in the surrounding residential development and that there is some impact to the wetland area with a clear path to the wetland area and infilling or clearing of the inner vegetation within the wetland. Progressive aerial photographs after this indicate an increased disturbance of the inner portion of the wetland area (Figures 3b and c).

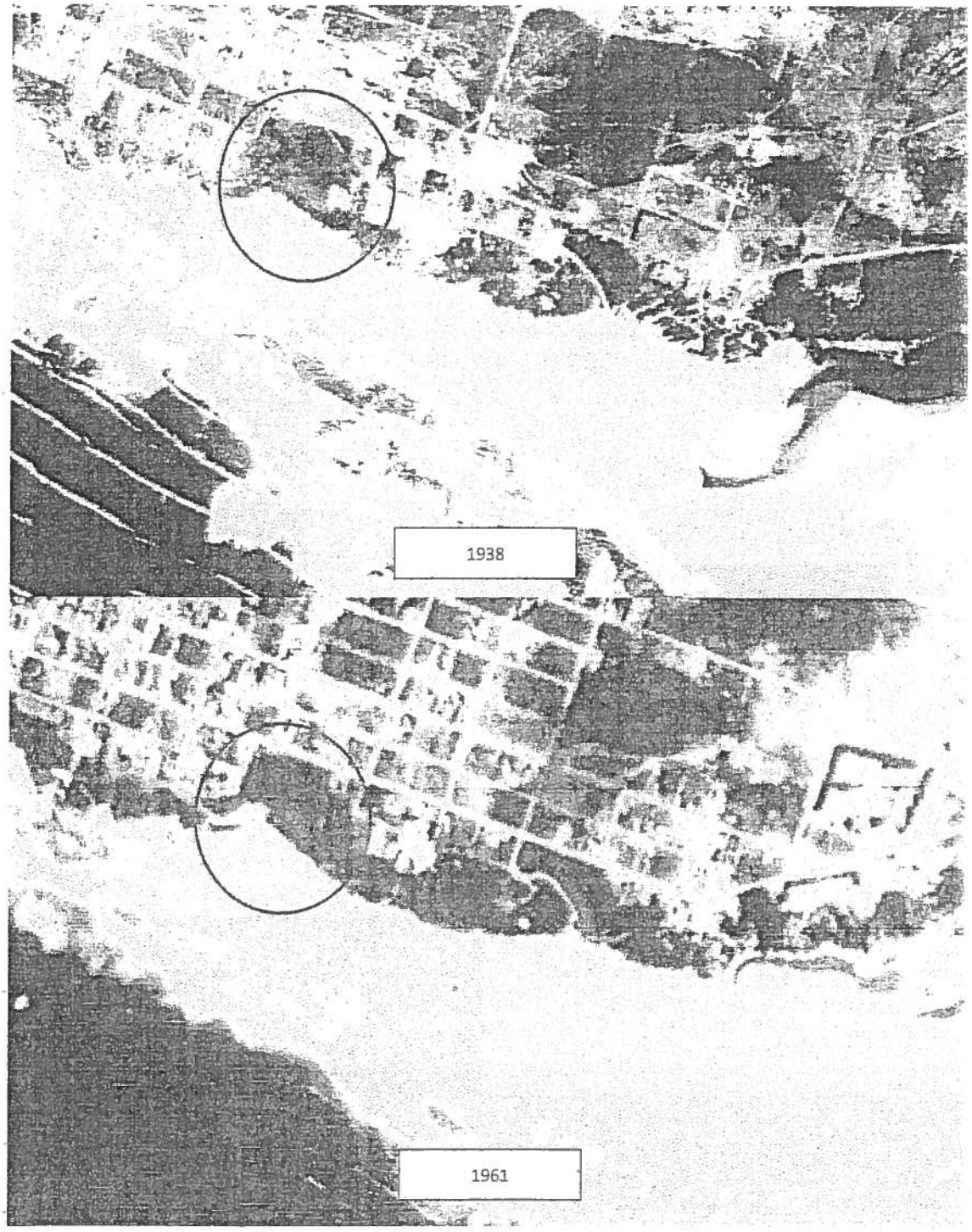


Figure 3a: Aerial photographs taken of the Grotto Beach and wetland area taken in 1938 (top) and 1961 (bottom)

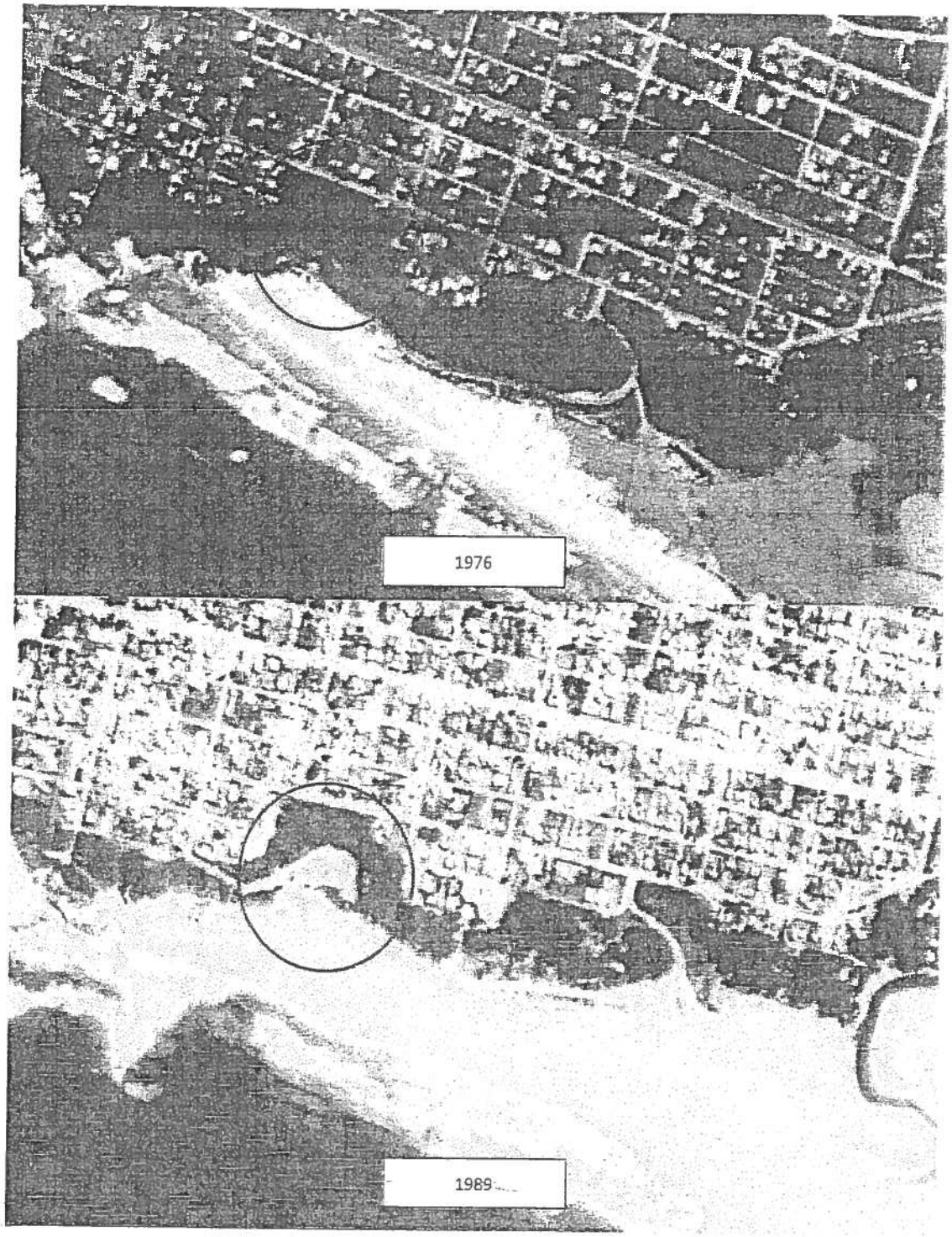


Figure 3b: Aerial photographs taken of the Grotto Beach and wetland area taken in 1976 (top) and 1989 (bottom)

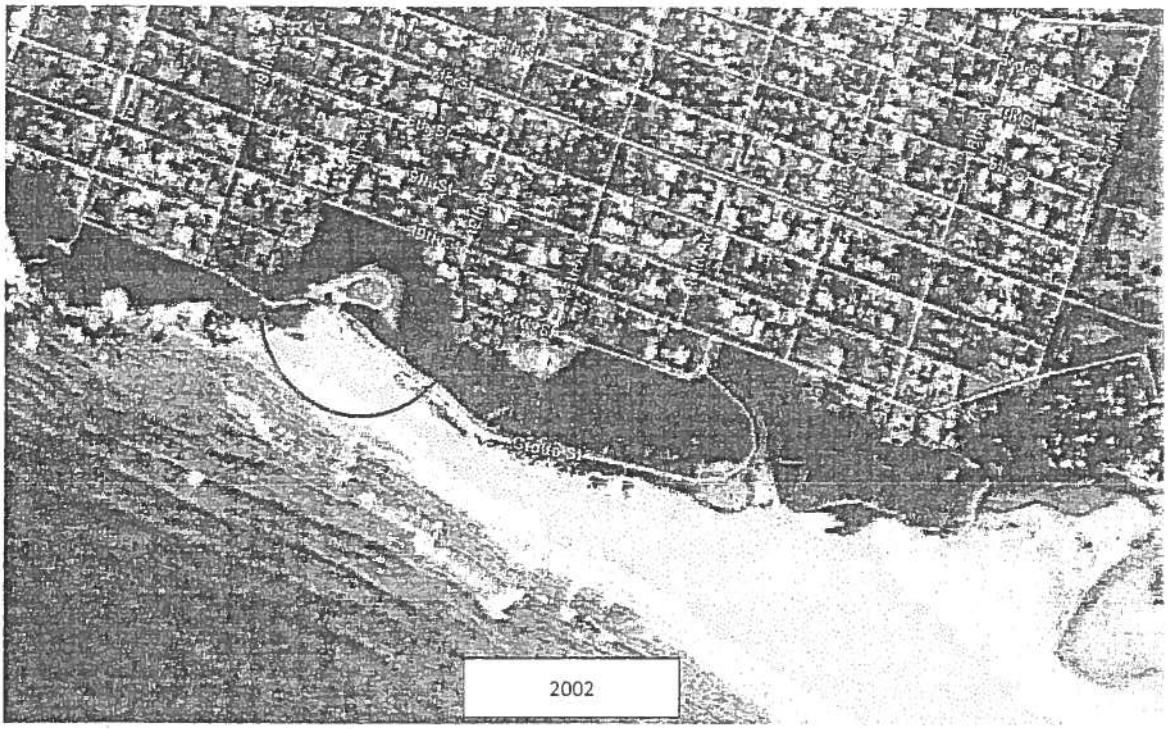


Figure 3c: Google Earth image of Grotto Beach and the wetland area for 2002

7.3. WETLAND INTEGRITY ASSESSMENT

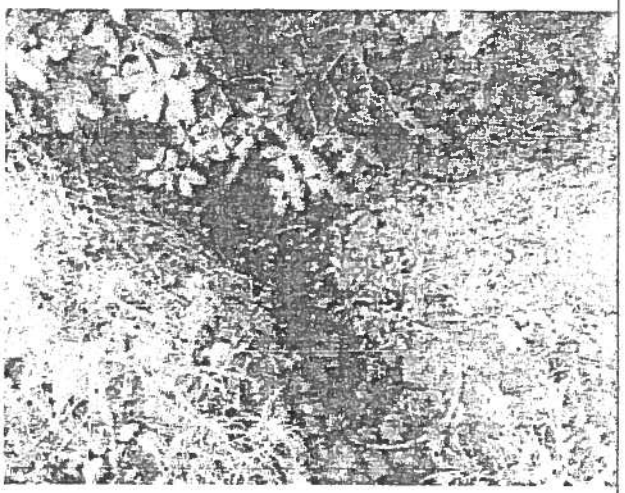
The existing wetland area consists of micro habitats along the bottom of the cliffs and steep slopes which drain water from the northern and eastern part of the site (Figures 4 and 5). These micro habitats receive water for most of the year but are currently isolated from the once bigger wetland area that would have existed in the lower lying, shallower areas of the picnic area before it was filled in. The wetland would have most likely been dominated by bulrushes *Typha capensis* and common reeds *Phragmites australis,* depending on the depth and duration of the various habitats inundation with water and the salinity levels of the soils.

The main portion of the wetland area has deteriorated over time and was filled in between 1976 and 1989 to create a recreational area (picnic area). Most of the wetland functionality was lost with the infilling.

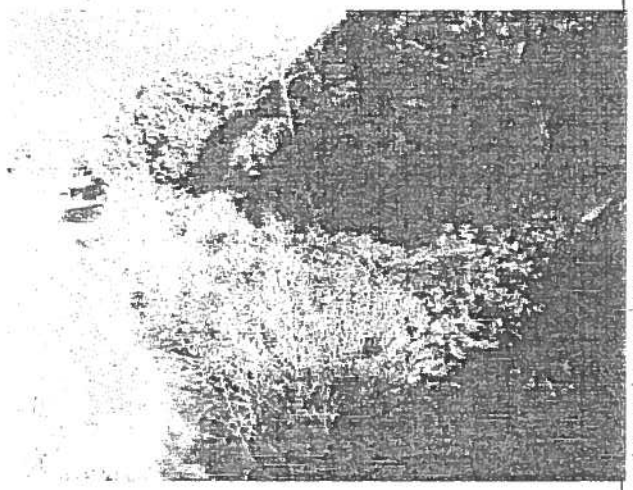
The Present Ecological Status (PES) Method (DWAF 2005) was used to establish the integrity of the remaining wetlands in the study area and was based on the modified Habitat Integrity approach developed by Kleynhans (DWAF, 1999; Dickens *et al*, 2003). Table 2 displays the criteria and results from the assessment of the habitat integrity of the wetland. These criteria were selected based on the

assumption that anthropogenic modification of the criteria and attributes listed under each selected criterion can generally be regarded as the primary causes of the ecological integrity of a wetland.

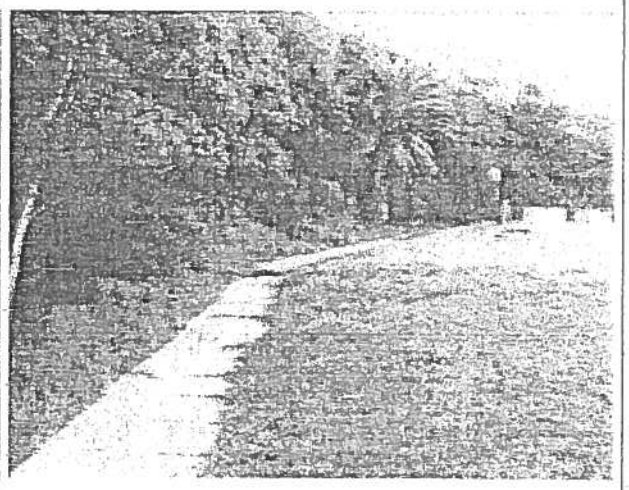
4a: Drainage from the steep slopes (north of the area)



4b: Drainage from the steep slopes (north of the area)

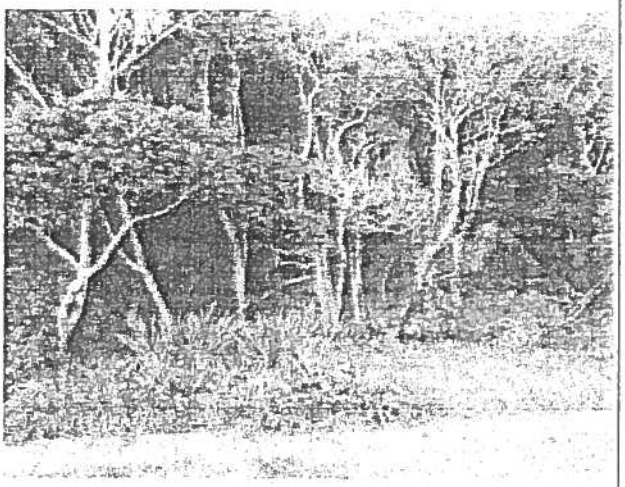


4c: Canalised drainage covered with concrete slabs

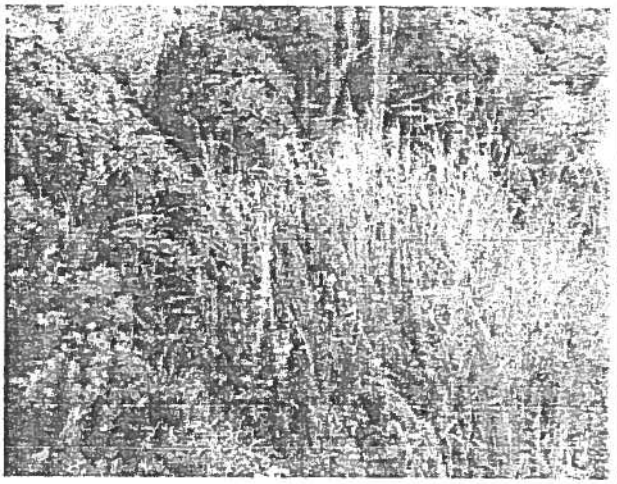


4d: Canalised drainage covered with concrete slabs

Figure 4: Drainage of water from the steep slopes and canalised canal with concrete slabs

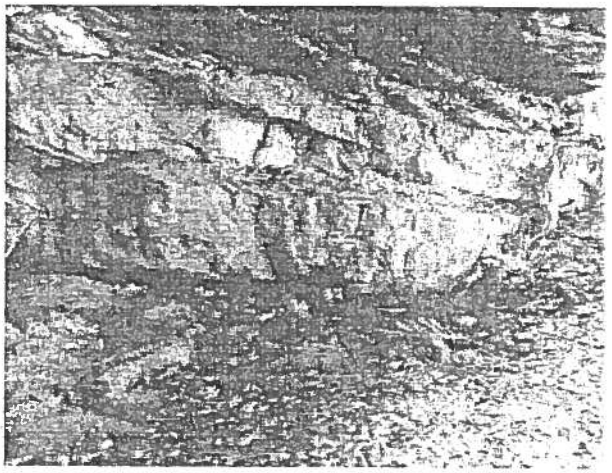


5a: *Watsonia spp.* and *Wachendorfia thyrsiflora*



5b: *Typha capensis*

5c: *Zanthedeschia spp*



5d: Overhanging rock formations

Figure 5: Wetland plants and micro habitats along the northern and eastern borders of the Piet se Bos picnic area

Table 2: Habitat integrity assessment criteria for palustrine wetlands (Dickens *et al*, 2003)

Criteria & Attributes	Relevance
Hydrologic	
Flow Modification	Consequence of abstraction, regulation by impoundments or increased runoff from human settlements or agricultural land. Changes in flow regime (timing, duration, frequency), volumes, velocity which affect inundation of wetland habitats resulting in floralistic changes or incorrect cues to biota. Abstraction of groundwater flow to wetland.
Permanent Inundation	Consequence of impoundment resulting in destruction of natural wetland habitat and cues for wetland biota.
Water Quality	
Water Quality Modification	From point or diffuse sources. Measure directly by laboratory analysis or assessed indirectly from upstream agricultural activities, human settlements and industrial activities. Aggravated by volumetric decrease in flow delivered to the wetland.
Sediment Load Modification	Consequence of reduction due to entrapment by impoundments or increase due to land use practices such as overgrazing. Cause of unnatural rates of erosion, accretion or infilling of wetlands and change in habitats.
Hydraulic/Geomorphic	
Canalisation	Results in desiccation or changes to inundation patterns of wetland and thus changes in habitats. River diversions or drainage.
Topographic Alteration	Consequence of infilling, ploughing, dykes, trampling, bridges, roads, railway lines and other substrate disruptive activities that reduce or change wetland habitat directly in inundation patterns.
Biota	
Terrestrial Encroachment	Consequence of desiccation of wetland and encroachment of terrestrial plant species due to changes in hydrology or geomorphology. Change from wetland to terrestrial habitat and loss of wetland functions.
Indigenous Vegetation Removal	Direct destruction of habitat through farming activities, grazing or firewood collection affecting wildlife habitat and flow attenuation functions, organic matter inputs and increases potential for erosion.
Invasive Plant Encroachment	Affects habitat characteristics through changes in community structure and water quality changes (oxygen reduction and shading).
Alien Fauna	Presence of alien fauna affecting faunal community structure.
Over utilisation of Biota	Overgrazing, over fishing, etc.

Table 3: Wetland habitat integrity assessment (score of 0=critically modified to 5=unmodified)

Criteria & Attributes	Score
Hydrologic	
Flow Modification	2.5
Permanent Inundation	3.5
Water Quality	
Water Quality Modification	4
Sediment Load Modification	4
Hydraulic/Geomorphic	
Canalisation	2
Topographic Alteration	1.5
Biota	
Terrestrial Encroachment	2
Indigenous Vegetation Removal	2.5
Invasive Plant Encroachment	2.5
Alien Fauna	4.5
Over utilisation of Biota	4.5
Total Mean	**3.04**
Category	**Largely natural to moderately modified**

Table 4: Relation between scores given and ecological categories

Scoring Guidelines Per Attribute*	Interpretation of Mean* of Scores for all Attributes: Rating of Present Ecological Status Category (PESC)
Natural, unmodified - score=5.	Within general acceptable range **CATEGORY A** >4; Unmodified, or approximates natural condition.
Largely natural - score=4.	**CATEGORY B** >3 and ≤4; Largely natural with few modifications, but with some loss of natural habitats.
Moderately modified- score=3.	**CATEGORY C** >2 and ≤3; moderately modified, but with some loss of natural habitats.
Largely modified - score=2.	**CATEGORY D** ≤2; largely modified. A large loss of natural habitats and basic ecosystem functions has occurred.
	OUTSIDE GENERALLY ACCEPTABLE RANGE
Seriously modified - rating=1.	**CATEGORY E** >0 and <2; seriously modified. The losses of natural habitats and basic ecosystem functions are extensive.
Critically modified - rating=0.	**CLASS F** 0; critically modified. Modifications have reached a critical level and the system has been modified completely with an almost complete loss of natural habitat.

7.4. ECOSYSTEM SERVICES SUPPLIED BY WETLAND

The assessment of the ecosystem services supplied by the identified wetlands was conducted according to the guidelines as described by Kotze *et* al (2005). An assessment was undertaken that examines and rates the services listed in Table 5. The characteristics were scored according to the general levels of services provided. It is important to manage the wetlands to ensure that they can continue to provide the valued goods and services:

Table 5: Goods and services assessment results for wetland (low = 0; high = 4)

Goods and services	Score
Flood attenuation	1
Stream flow regulation	1
Sediment trapping	2
Phosphate trapping	2
Nitrate removal	2
Toxicant removal	1.5
Erosion control	2.5
Carbon storage	1.5
Maintenance of biodiversity	3
Water supply for human use	1.5
Natural resources	1
Cultivated foods	1
Cultural significance	1
Tourism and recreation	3
Education and research	2

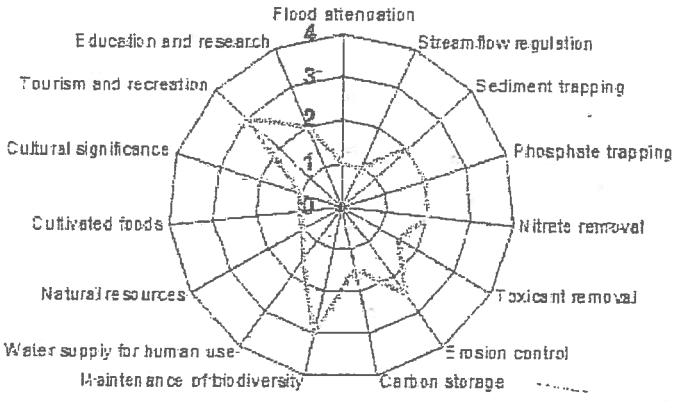


Figure 6: Ecosystem services provided by the wetland areas

8.1. DESCRIPTION OF THE ACTIVITY

The Overstrand Local Municipality is considering the potential to re-develop the Piet se Bos (Grotto Beach) area. It is their intention to upgrade and develop Piet se Bos (Grotto) area by means of establishing a restaurant, open air theatre and the partial rehabilitation of the degraded wetland system which can be accessed via a boradwalk.

Figure 7: Proposed layout plan for the rehabilitated wetland area

8.2. LEGAL REQUIREMENTS

The following Acts, regulations and ordinances are applicable to the development:

THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT NO. 107 OF 1998)

The EIA process followed is in compliance with NEMA, as amended, and the EIA Regulations promulgated under this Act (Government Notice No.'s R.543, 544, 545 and 546 of 2010). The proposed development involves 'listed activities', as defined by NEMA. Listed activities are activities, which may have potentially detrimental impacts on the environment and therefore require environmental authorisation from the relevant authorising body. The proposed development occurs in the Western Cape Province and thus DEA&DP is the responsible regulatory authority.

NATIONAL WATER ACT, 1998 (ACT NO. 36 OF 1998)

The National Water Act guides the management of water in South Africa as a common resource. The Act aims to regulate the use of water and activities, which may impact on water resources through the categorisation of 'listed water uses' encompassing water abstraction and flow attenuation within catchments as well as the potential contamination of water resources, where the Department of Water Affairs (DWA) is the administering body in this regard.

The listed water use activities in Part 4, Section 21 of the National Water Act that are of relevance to the proposed development are:

- Section 21(c): Impeding or diverting the flow of water in a watercourse; and
- Section 21(i): Altering the bed, banks, course or characteristics of a watercourse.

In terms of the definitions provided, activities included under Sections 21(c) and 21(i) are (amongst others) the construction of roads, bridges, culverts and structures for slope stabilisation and erosion protection. Infilling of floodplains or any other development activity within the 1 in 100 year flood line are also considered by DWA to be a Section 21(i) activity.

The defined water use activities may require the approval of DWA in the form of a Water Use Licence authorisation. Government Gazette No. 26187 of 26 March 2004 provides for General Authorisations for certain specified activities which then do not require a licensing process. There are restrictions on the extent and scale of listed activities for which General Authorisations apply. These would have to be considered in detail to determine whether the proposed activities could be covered by General Authorisations or not.

Section 22(3) of the National Water Act allows for a responsible authority (DWA) to dispense with the requirement for a Water Use Licence if it is satisfied that the purpose of the Act will be met by the grant of a licence, permit or authorisation under any other law.

OVERBERG CRITICAL BIODIVERSITY AREAS

The Critical Biodiversity Areas (CBA) map for the Overberg District Municipality aims to guide sustainable development by providing a synthesis of biodiversity information to decision makers. It serves as the common reference for all multi-sectoral planning procedures, advising which areas can be lost to development, and which areas of critical biodiversity value and their support zones should be protected against any impacts.

The CBA map indicates areas of land as well as aquatic features which must be safeguarded in their natural state if biodiversity is to persist and ecosystems are to continue functioning. Ecological Support Areas (ESAs) are supporting zones required to prevent the degradation of Critical Biodiversity Areas and Protected Areas. Those areas of natural vegetation identified on the map as Other Natural Areas are sufficiently extensive at this stage that they may withstand some loss through conversion of their natural state, and undergo development. Areas that have been irreversibly transformed through development (e.g. urban development, plantation, agriculture) are referred to as No Natural Areas Remaining and no longer contribute to the biodiversity of the area but may still play an important role in supporting ecological processes.

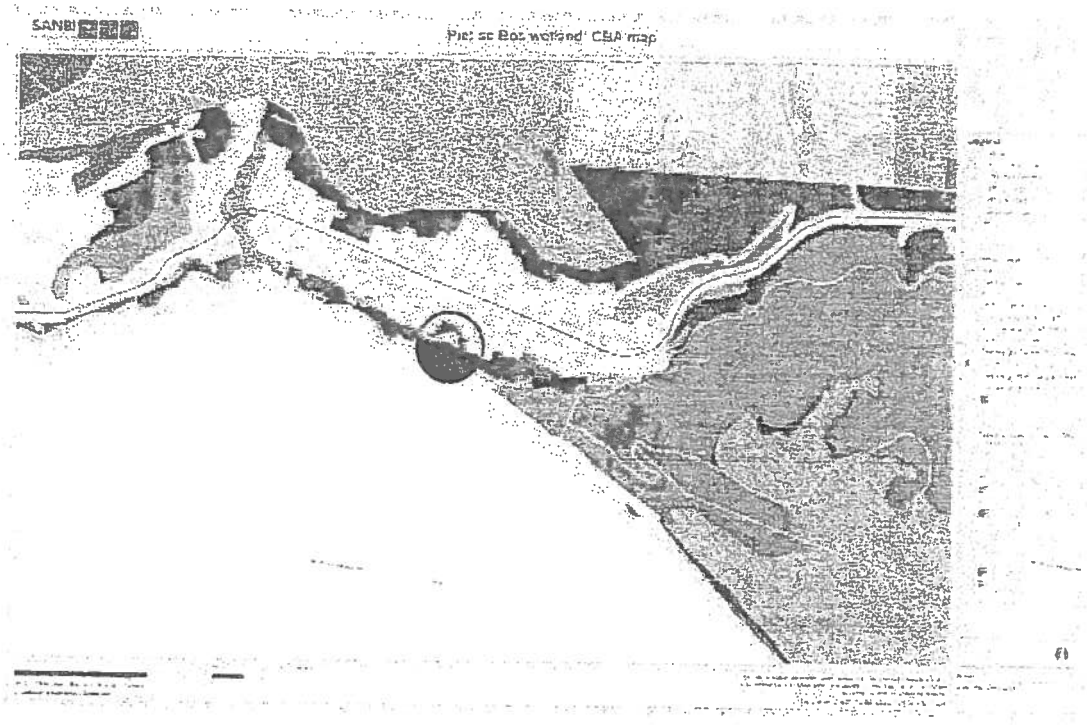


Figure 10: Overstrand Municipality Critical Biodiversity Map for the area