BIODIVERSITY SURVEY: VACANT SITE IN SEDGEFIELD

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Mark Berry Environmental Consultants Pr Sci Nat (reg. no. 400073/98) PhD in Botany
Tel: 083 286-9470, Fax: 086 759-1908, E-mail: markberry@webafrica.org.za

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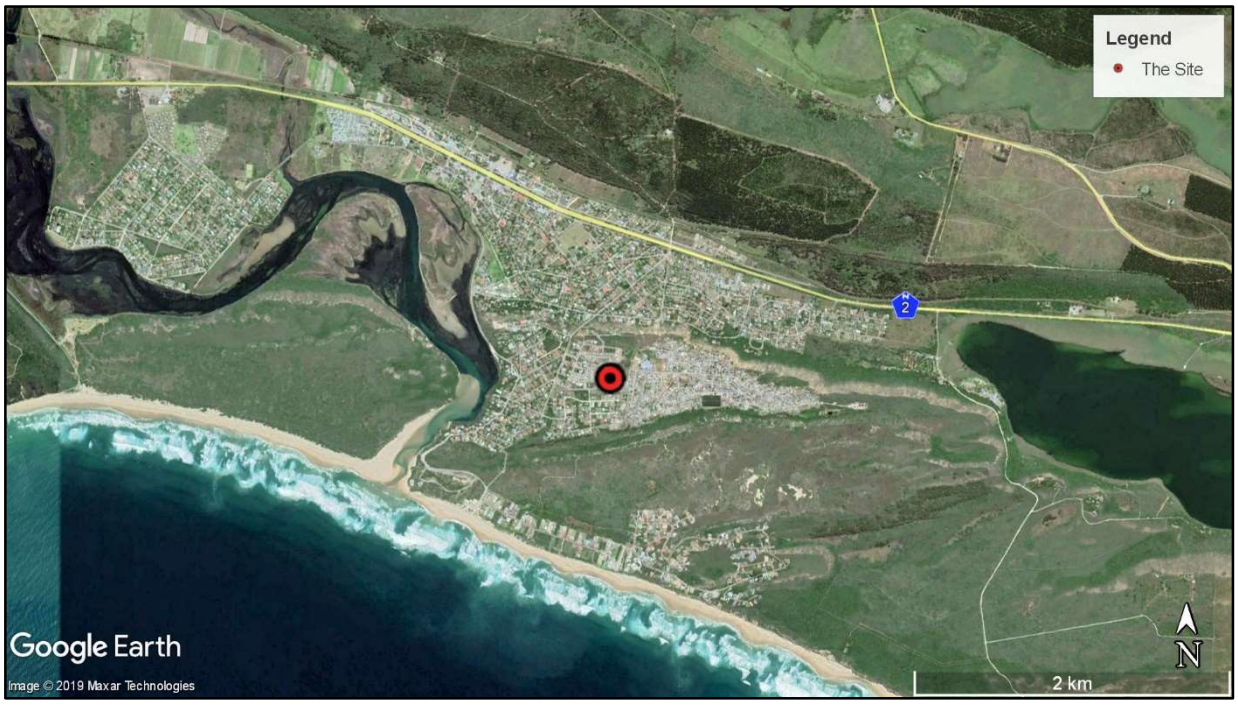
1 INTRODUCTION

This report investigates the biodiversity aspects of a vacant site (2.72 ha) inside Sedgefield, earmarked for infill development (see Map 1). It comprises several municipal erven, including Erven 3860, 3861, 3919-3923, 4938, 4939 and 5010, and remainder Erf 1635. The aim of the study, which was requested by Sharples Environmental Services (EAP), is to determine the biodiversity value of the site and to recommend mitigation measures to soften the impact imposed by future development. Although partly covered by indigenous vegetation, the site does not form part of the Sedgefield biodiversity network.



Map 1 Satellite photo showing the position of site (red marker) inside Sedgefield.

2 PROPOSED LAND USE

No development proposals have been presented, but it is assumed that the site will be allocated to residential and/or commercial use which will be consistent with the surrounding land uses.

3 TERMS OF REFERENCE

- Identify and describe biodiversity patterns at a community and ecosystem level (main vegetation type, plant communities and threatened/vulnerable ecosystems), at species level (Species of Conservation Concern, protected species, presence of alien species) and in terms of significant landscape features;
- Describe the sensitivity of the site and its immediate surroundings;

- Map the distribution and infestation levels of invasive alien plants;
- Identify the botanical constraints and potential development opportunities of the site;
- Review the relevant biodiversity plans compiled in terms of the National Environmental Management Biodiversity Act (Act 10 of 2004);
- Adhere to the Department of Environmental Affairs & Development Planning (DEA&DP) and CapeNature guidelines for biodiversity studies in the Western Cape.

4 METHODOLOGY

A botanical survey of the site was undertaken on 28 December 2019 by Mark Berry (see CV attached). A qualitative assessment of the type and condition of affected vegetation on site, disturbance and presence of alien species, Species of Conservation Concern and protected tree species was carried out. Plant species not identified in the field, were collected and/or photographed and identified at the office and Compton (Kirstenbosch) Herbarium. The 2012 South African Vegetation Map and the latest floristic taxonomic literature and reference books were used for the purpose of this specialist study. Any plants classified as rare or endangered in the Red List of South African Plants online database are highlighted. The assessment follows Brownlie's (2005), CapeNature and other relevant guidelines for biodiversity assessments.

The following information was recorded during the site visit:

1. The condition of the vegetation. Is the vegetation either disturbed or degraded? A disturbed or degraded area could range from agricultural fields (fallow land), or areas previously disturbed by construction activities, to an area that has been severely eroded or degraded as a result of bad land management or alien infestation.
2. The species diversity. This refers to the numbers of different indigenous plant species occurring on site. Indigenous fauna observed was also noted.
3. Species of Conservation Concern, as well as protected tree species occurring on site. This would include rare, vulnerable, endangered or critically endangered species. Species listed as vulnerable were mapped using Easy GPS v2.5 software on an iPhone. Accuracy is given as ±4 m.
4. Identification of the vegetation type(s) and communities (if discernible) on the site. This would include trying to establish the known range of a vegetation type and whether or not this vegetation type is vulnerable (VU), endangered (EN) or critically endangered (CR).

5 LIMITATIONS TO THE STUDY

Since fieldwork was carried out in the summer season, flowering plants that only flower at other times of the year (e.g. winter to spring), such as certain bulbs (Iridaceae and Orchidaceae), may

have been missed. The overall confidence in the completeness and accuracy of the botanical findings is however considered to be moderate to good.

6 LOCALITY & SITE DESCRIPTION

The site (2.72 ha) is located in the eastern part of Sedgefield, on the boundary between Kingfisher Creek and Smutsville (see Map 2). The area is characterised by east-west orientated longitudinal dunes between Sedgefield Lagoon to the west and Groenvlei to the east (see Photo 1). It forms part of the so-called Garden Route Lakes District. Apart from a small dune cutting across the northern part of the site, it is relatively flat, sandy and covered with vegetation and grass (see Photo 2). It is bound by roads, residential areas and a small commercial/retail centre. The beach is located 1 km away to the south, and the lagoon 700 m away to the west. The coastal strip between Wilderness and Knysna is largely untransformed, with the presence of several protected areas, including the Garden Route National Park, Goukamma Nature Reserve and the Wilderness Lakes Ramsar Site.

Map 2 Satellite photo showing the study site (outlined in red) in context with its surroundings.

Mucina & Rutherford's (2006) description of the climate for Knysna Sand Fynbos. It is even throughout the year, with slight peaks in autumn and spring (Mucina & Rutherford 2006). Mean daily maximum and minimum temperatures are 27.3°C and 7.3°C for February and July, respectively (Mucina & Rutherford 2006). Frost incidence is two or three days per year.

Photo 1 A section of the Sedgefield dune system behind the site to the north.

Photo 2 Exposed dune surface in the northern part of site.

Rainfall in the region ranges from 670 to 1 090 mm per annum (average = 852 mm) as per

According to the 3322 Oudtshoorn 1:250 000 geological map, the area is underlain by fixed dunes and aeolian sand (see Photo 3). Aeolian sand was deposited on the coastal plain at various stages (Toerien 1979). In Sedgefield the sand has been fixed by dune vegetation and development. The youngest of the aeolian sand occurs in a narrow coastal strip of migrating dunes, which bars some of the river mouths (Toerien 1979).

7 BIOGEOGRAPHICAL CONTEXT

Being located in the Southern Cape (Garden Route area) in close proximity to the coast, the site occurs in a typical coastal fynbos/thicket environment. This is confirmed by the presence of mainly dune thicket species, such as *Searsia laevigata*, *Maytenus procumbens, Pterocelastrus tricuspidatus* and *Olea exasperata*. According to the 2012 South African Vegetation Map, the site and its surrounding area have been mapped as Southern Cape Dune Fynbos. The latter occurs in dune areas (usually associated with large estuaries) between Wilderness in the west and St Francis Bay in the east, with a few smaller patches further away towards Mossel Bay and East London (Mucina & Rutherford 2006).

Map 3 Extract of the 2018 beta SA Vegetation Map (Source: Cape Farm Mapper), showing the position of the site (encircled in red) inside Goukamma Dune Thicket.

Subsequently the dune vegetation south of the N2 has been re-mapped as Goukamma Dune Thicket (see Map 3 above). The latter stretches along the coast from Wilderness to Keurboomstrand. The vegetation is characterised by its often impenetrable thicket structure, dominated by sclerophyllous shrubs, such as *Pterocelastrus tricuspidatus, Sideroxylon inerme* and *Tarchonanthus littoralis* (see Photo 3). Typical fynbos species, such as ericas and proteas, are noticeably absent.

Photo 3 Dune thicket recorded on site.

8 VEGETATION & FLORA

The site shows considerable disturbance in places, with some parts significantly disturbed or transformed (see Map 4). The area behind (on northern side) the commercial/retail centre (see Photo 4), as well as the south-western corner are covered by mainly alien vegetation and grasses. There is also evidence (manholes) of a service line running through the southern part of the site. Other disturbances noted are footpaths, construction activities (built walls on the dune), minor dumping of building waste and alien infestation. Despite the disturbances, fair quality dune thicket elements still remain. Structurally, it can be described as a mid-high to tall closed shrubland following Campbell's (1981) classification. The taller shrubs/trees reach over 2 m in height. Evidence of dune rehabilitation was noted in the northern part of the site (see Photo 5).

Map 4 Aerial photograph showing the biodiversity attributes of the site.

Photo 4 Disturbed area behind the commercial/retail centre.

Photo 5 Rehabilitated dune surface.

Prominent indigenous tree and shrub species recorded include *Metalasia cf. muricata* (not in flower, see Photo 6), *Helichrysum dasyanthum, H. teretifolium, H. cymosum, Osteospermum moniliferum, Felicia echinata, Tarchonanthus littoralis, Tetragonia fruticosa, Pelargonium capitatum, Grewia occidentalis, Carissa bispinosa, Passerina cf. montivaga*, *Anthospermum aethiopicum, Muraltia squarrosa* (on top of dune), *Salvia africana-lutea, Phylica cf. axillaris*, *Olea exasperata, Searsia glauca, S. laevigata, S. crenata, Cussonia thyrsiflora, Colpoon compressum, Cassine peragua, Mystroxylon aethiopicum, Maytenus procumbens, M. oleoides, Apodytes dimidiata, Pittosporum viridiflorum, Sideroxylon inerme, Pterocelastrus tricuspidatus, Zanthoxylum capense, Asparagus aethiopicus* and *Agathosma apiculata*. Several of these species are important Southern Cape Dune Fynbos species.

Succulents and creepers recorded include *Mesembryanthemum aitonis, Carpobrotus* sp, *Secamone alpini, Cynanchum obtusifolium, Asparagus asparagoides* and *Rhoicissus digitata*. Hemicryptophytes recorded include *Restio leptocladus, Ehrharta villosa*, *Cyperus brevis* and *Hellmuthia membranacea*. Alien species recorded (mainly inside the disturbed areas) include *Acacia saligna* (port jackson), *A. cyclops* (rooikrans), *Pinus* sp, *Ricinus communis* (castor-oil plant) and *Chenopodium albens* (white goosefoot). With the exception of *Chenopodium albens*, all these are listed invasive aliens. In terms of the National Environmental Management:

Biodiversity Act (Act 10 of 2004) Alien and Invasive Species List (2016), the harbouring of *Ricinus communis* (Category 2 invader) on a property requires a permit.

Photo 6 *Metalasia cf. muricata* dominated dune slope.

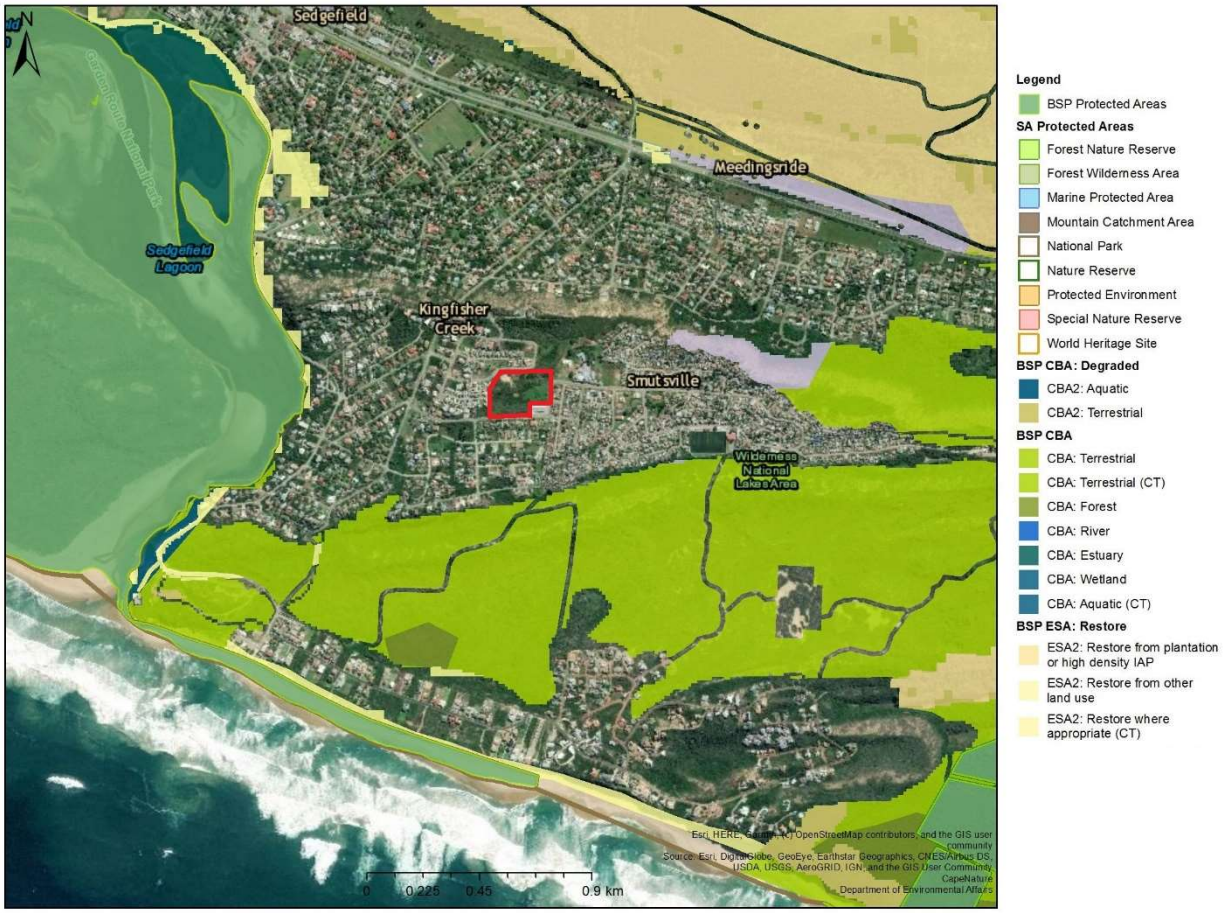
No Species of Conservation Concern or regional endemics were recorded on site. Two protected tree species (in terms of the National Forests Act 84 of 1998) were recorded, namely *Sideroxylon inerme* (milkwood) and *Pittosporum viridiflorum* (kasuur) (see Map 4). The removal of these trees requires a permit from the Department of Forestry.

9 CONSERVATION STATUS & BIODIVERSITY NETWORK

Being well represented in the larger area, Southern Cape Dune Fynbos is not listed as a threatened vegetation type (DEA 2011). However, the Western Cape Biodiversity Spatial Plan Handbook (Pool-Stanvliet *et al.* 2017) has recently recommended a rating of Vulnerable. According to Mucina & Rutherford (2006), 83% of Southern Cape Dune Fynbos is still left. More than 16% is formally conserved in the Goukamma and Huisklip Nature Reserves, as well as the Garden Route National Park (Mucina & Rutherford 2006). Agricultural activities, plantations, alien plant infestation and coastal developments are threats to this vegetation type.

The site is not included in Sedgefield's biodiversity network (see Map 5). The closest mapped critical biodiversity areas (CBA's) and protected areas are located further away to the south

(longitudinal dune system) and to the west (Sedgefield Lagoon). It is assumed that the site is not considered important to meet local conservation targets. Curiously, the longitudinal dune to the north of the site, which connects the CBA to the northeast of the site with the Sedgefield Lagoon, is also not included in the biodiversity network, except for its eastern portion.



Map 5 Biodiversity network map (Source: Cape Farm Mapper), with the study site outline in red.

CBA's are defined as areas in a natural condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure (Pool-Stanvliet *et al.* 2017). These sites are selected for meeting national targets for species, habitats and ecological processes (Pool-Stanvliet *et al.* 2017). Many of these areas support known occurrences of threatened plant species, and/or may be essential elements of designated ecological corridors.

10 CONCLUSION & RECOMMENDATIONS

According to the 2012 South African Vegetation Map, the site has been mapped as Southern Cape Dune Fynbos. The vegetation is dominated by sclerophyllous shrubs, such as *Pterocelastrus tricuspidatus, Sideroxylon inerme*, *Olea exasperata* and *Tarchonanthus littoralis*. Typical fynbos species, such as ericas and proteas, are noticeably absent. Subsequently, the vegetation has been re-mapped as Goukamma Dune Thicket (see 2018 beta vegetation map).

As noted earlier, the site shows considerable disturbance, with some parts significantly disturbed or transformed, the presence of a service route, footpaths, construction activities, minor dumping of building waste and alien infestation. Despite this, fair quality dune thicket elements still remain. No Species of Conservation Concern or regional endemics were recorded. Two protected tree species were recorded, namely *Sideroxylon inerme* and *Pittosporum viridiflorum*.

Given the disturbed state of large parts of the site and its exclusion from the local biodiversity network, one can argue for its suitability for development. Perhaps a portion including the dune and some of the protected trees can be set aside as an open space, but its value in the biodiversity network will remain questionable given the transformed state of the surrounding area. The potential impact on vegetation type *per se* is also not of a great concern. Conservation efforts should rather be directed to the longitudinal dune to the north of the site.

Lastly, alien control, especially port jackson and rooikrans, will be important in the open space. A sustained effort will be required to control it. One-year old seedlings can be hand-pulled, preferably when soil is wet after a rainfall. If left to grow, removal becomes more difficult and costly. The use of heavy plant, such as bush cutters or D9 Caterpillar, for alien clearing is not recommended. Port jackson stumps must be treated with herbicides to prevent coppicing.

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CV OF SPECIALIST

M.G. (Mark) BERRY
ENVIRONMENTAL CONSULTANT & BIODIVERSITY SPECIALIST

Address: 14 Alvin Crescent, Somerset West, 7130, Western Cape
Tel: 083 286-9470 **Fax:** 086 759-1908 **E-mail:** markberry@webafrica.org.za

PROFESSIONAL STATEMENT

Environmental assessment professional and biodiversity specialist with over 20 years of experience mainly in the Western Cape Province, but also in the Northern Cape and Eastern Cape. Experience in Environmental Impact Assessments (EIA's), biodiversity assessments, Environmental Management Programmes (EMPr's), Environmental Control Officer (ECO) duties and environmental due diligence investigations.

WORK EXPERIENCE

1989-1990 Nature Conservation Officer in the South African Air Force, based at Langebaan Road Air Force Base

1997-2005 Employed as principal environmental specialist at Planning Partners, a multi-disciplinary consultancy specialising in town and regional planning, environmental planning and landscape architecture. Duties included the conducting of EIA's, compiling EMPr's, ECO duties, biodiversity surveys and status quo environmental assessments for spatial development frameworks.

2000-2006 Examiner for the Board of Control for Landscape Architects (BOCLA), responsible for the setting up and marking of the Environmental Planning Section of exam paper.

2005-current Started Mark Berry Environmental Consultants in June 2005. Responsibilities include office management, seeking tenders, conducting EIA's, compiling EMPr's, construction site environmental audits, biodiversity surveys, etc. A relationship is maintained with previous employer, and, among other, undertook land-use surveys and reporting for the Eskom's site safety reports for three proposed nuclear power plants in the Western and Eastern Cape Provinces.

QUALIFICATIONS

- BSc (1988) University of Stellenbosch
- BSc-Hons in Botany (1991) University of Stellenbosch
- MSc in Botany (1993) Nelson Mandela Metropolitan University
- PhD in Botany (2000) Nelson Mandela Metropolitan University.

PROFESSIONAL MEMBERSHIP

Professional member (reg. no. 400073/98) of the South African Council for Natural Scientific Professions (SACNASP).

REFERENCES

Dr John Manning (Compton Herbarium, Kirstenbosch)
Phone: (021) 799-8660, e-mail: J.Manning@sanbi.org.za

Warren Manuel (Environmental Manager at Mossel Bay Municipality)
Phone: (044) 606-5163, e-mail: wmanuel@mosselbay.gov.za

John Sharples (Sharples Environmental Services, George)
Phone: (044) 873-4923, e-mail: john@sescc.net

Andrew Cleghorn (civil engineer and branch manager at Knight Piesold (Pty) Ltd)
Phone: (021) 555-0400, e-mail: acleghorn@knightpiesold.com

Prof Eileen Campbell (Department of Botany, Nelson Mandela Metropolitan University)
Phone: (041) 504-2329, e-mail: Eileen.Campbell@nmmu.ac.za

DECLARATION OF INDEPENDENCE

I Mark Gerald Berry, as the appointed Specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that I :

- in terms of the general requirement to be independent:
  - **other than fair remuneration for work performed in terms of this application, have no business, financial, personal or other interest in the development proposal or application and that there are no circumstances that may compromise my objectivity**; or
  - am not independent, but another specialist (the "Review Specialist") that meets the general requirements set out in Regulation 13 has been appointed to review my work (Note: a declaration by the review specialist must be submitted);
- in terms of the remainder of the general requirements for a specialist, have throughout this EIA process met all of the requirements;
- have disclosed to the applicant, the EAP, the Review EAP (if applicable), the Department and I&APs all material information that has or may have the potential to influence the decision of the Department or the objectivity of any report, plan or document prepared or to be prepared as part of the application; and
- am aware that a false declaration is an offence in terms of Regulation 48 of the EIA Regulations, 2014 (as amended).

Signature of the Specialist: 

Name of Company: Mark Berry Environmental Consultants

Date: 13 January 2020