BOTANICAL SURVEY OF A PORTION OF FARM BUFFELSFONTEIN 204/7 AT HEROLDS BAY, GEORGE

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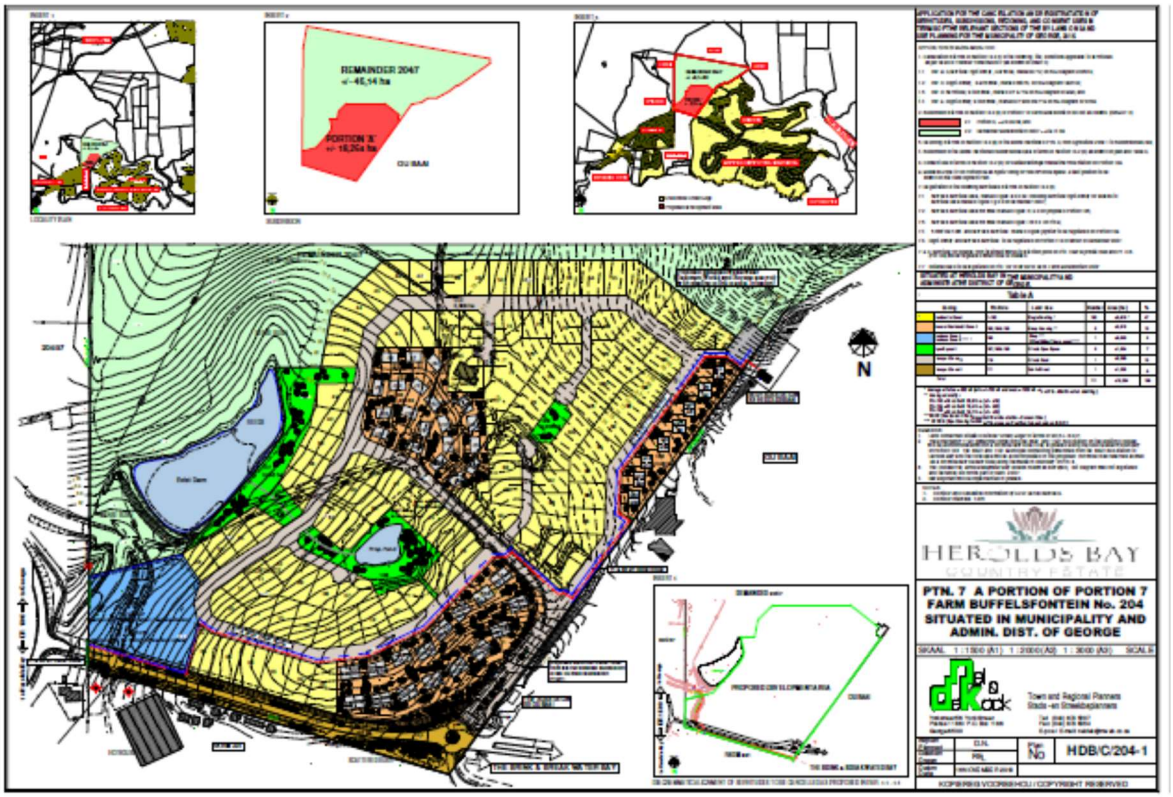
1 INTRODUCTION

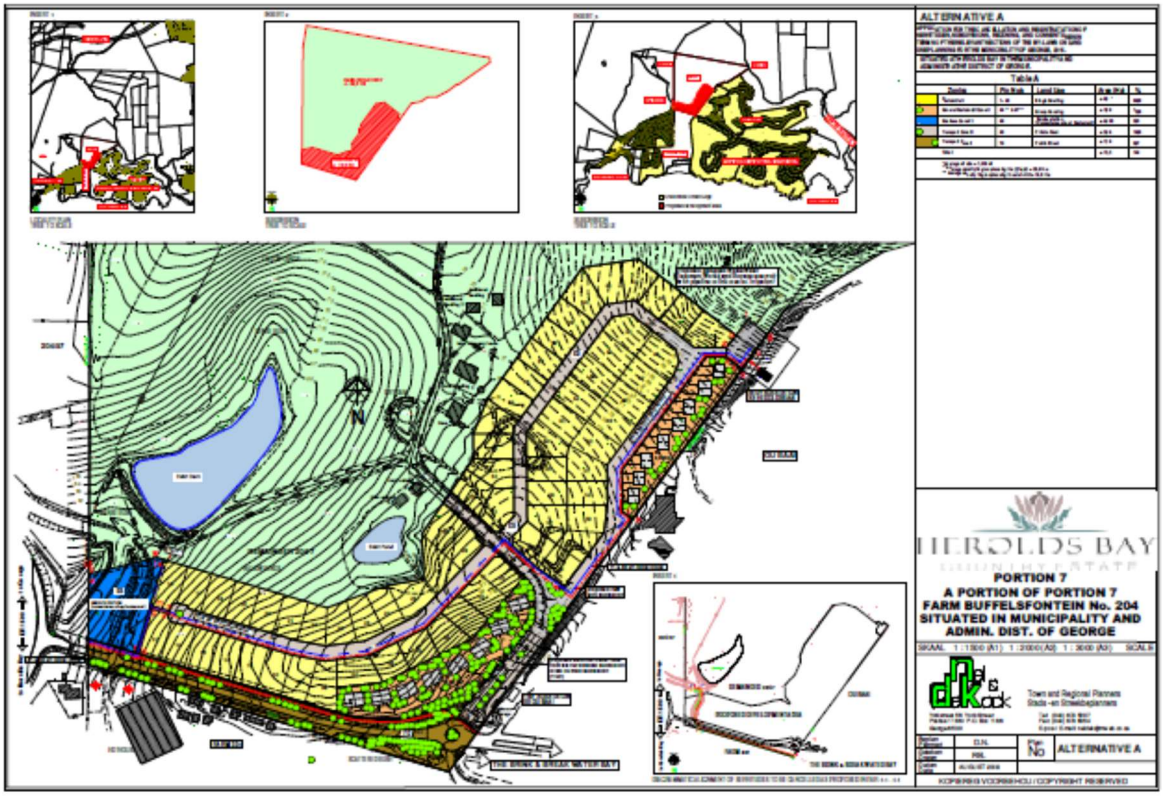
This report investigates the botanical aspects of a portion of Portion 7 of Farm Buffelsfontein 204, directly north of Herolds Bay (see Map 1). The project comprises a mixed-use development, which includes single residential erven, group housing, a business area, roads and associated infrastructure. The proposed development will be located in the southern part of the farm (19.26 ha), while farming activities will continue on the remainder of the farm (46.14 ha). The site is located on top of the coastal shelf southwest of George. While indigenous forest was recorded in the valley on the eastern side of the farm, the remainder is covered by pastures and alien forests. The layout options as currently presented do not encroach onto the indigenous forest. The alien forest patches consist mainly of black wattle (*Acacia mearnsii*) and gums.

Map 1 Satellite photo showing the location of the subject property (outlined in red) directly north of Herolds Bay and southwest of George.

2 PROJECT DESCRIPTION

The southern part of Portion 7 of Farm Buffelsfontein 204, which borders onto Herolds Bay, has been earmarked for the project. The project comprises a mixed-use development, which includes single residential erven, group housing, a business area, roads and associated infrastructure. Two layout proposals are presented, namely Plan HDB/C/204-1 (19.26 ha) and Alternative A (12.2 ha) (see Map 2).





Map 2 Alternative layout plans for the proposed development and associated infrastructure.

3 TERMS OF REFERENCE

The terms of reference for this study are as follows:

✓ Contextualization of the study area in terms of important biophysical characteristics and

the latest available conservation planning information (including but not limited to vegetation, CBA's, threatened ecosystems, any Red List information, sensitive and protected areas).

- ✓ Undertake a site visit and ground-truth biodiversity information. Where required, undertake baseline surveys and/or studies to supplement the information base and inform the assessment.
- ✓ Describe and map important biodiversity at the site and its surroundings, from both pattern and ecological process perspectives. Additionally, describe areas or features off site that could be indirectly impacted by the proposed land use.
- ✓ Note the condition of affected ecosystems and levels of degradation, including infestation by invasive alien species.

4 METHODOLOGY

A botanical survey of the site was undertaken on 8 March 2019 by Mark Berry, the appointed independent specialist (see CV attached). A qualitative assessment of the type and condition of affected vegetation on site, disturbances and presence of alien species, Species of Conservation Concern and protected species was carried out. Plant species not identified in the field, were collected or photographed and identified at the Compton Herbarium at Kirstenbosch. Mucina & Rutherford's 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. Brownlie's (2005), CapeNature and other relevant guidelines for biodiversity assessments were taken into account in the assessment.

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 threatened (if present) were mapped using Easy GPS v2.5 software on an iPhone. Accuracy is given as ±6 m.
4. Identification of the vegetation types and communities (if discernible) on the site. This would include trying to establish the known range of a vegetation type and whether or not it is vulnerable (VU), endangered (EN) or critically endangered (CR).

5. Identify any potential links with adjacent/nearby significant vegetation remnants.

5 LIMITATIONS TO THE STUDY

Since fieldwork was carried out in autumn, flowering plants that only flower at other times of the year (e.g. winter - spring) may have been missed. However, due to the transformed state of the site, no follow-up botanical surveys are needed. The overall confidence in the completeness and accuracy of the botanical findings is considered to be good.

6 LOCALITY & SITE DESCRIPTION

The study site is located on the coastal shelf 1 km north of the coastline and 6 km southwest of George in the Southern Cape. The area proposed for development is slightly undulating with a small, but steep valley on the north-eastern side. The coastal shelf, which rises to about 200 m above sea level, is incised by the Gwaing and Maalgate Rivers to the east and west of Herolds Bay, respectively. The landscape south and southwest of George has been largely transformed by agricultural activities and coastal developments, with only the incised river valleys still intact. Very little natural vegetation remains. Considerable alien infestation (notably black wattle, gums and pine) was noted on and around the site. The entire site proposed for development has been transformed into pastures and alien forests.

Afrotemperate forest species were recorded in the steep valley on the north-eastern side of the site, as well as sporadic occurrences in the alien forests. The alien forests comprise predominantly black wattle, gums and pine. The latter (except for gums which are allelopathic) provides a suitable nursery plant effect for the establishment of indigenous forest species in the understorey. No significant wetland areas were recorded. According to the 3322 Oudtshoorn 1:250 000 geological map, the site is underlain by Maalgaten Granite (George pluton), a pre-Cape intrusive rock formation.

7 BIOGEOGRAPHICAL CONTEXT

The study site is located in a coastal fynbos-forest environment on the Southern Cape coastal plain. The indigenous species recorded on site are typical forest and coastal thicket species, such as *Cassine peragua, Rapanea melanophloeos*, *Podocarpus cf. latifolius* and *Searsia lucida*. The 2012 Vegetation Map of South Africa classifies the main vegetation type found in the area as Garden Route Granite Fynbos (see Map 3). This vegetation unit occurs as three blocks from Botterberg (south of Robinson Pass) in the west to Hoogekraal Pass (west of Karatara) in the east (Mucina & Rutherford 2006). The site occurs in the largest block between Groot Brak and Wilderness. Due to its transformed state, Garden Route Granite Fynbos is listed

as Endangered in the National List of Threatened Ecosystems, with only 30% still left (DEA 2011). In CapeNature's 2016 threat status assessment its status has been elevated to Critically Endangered (Pool-Stanvliet *et al.* 2017).

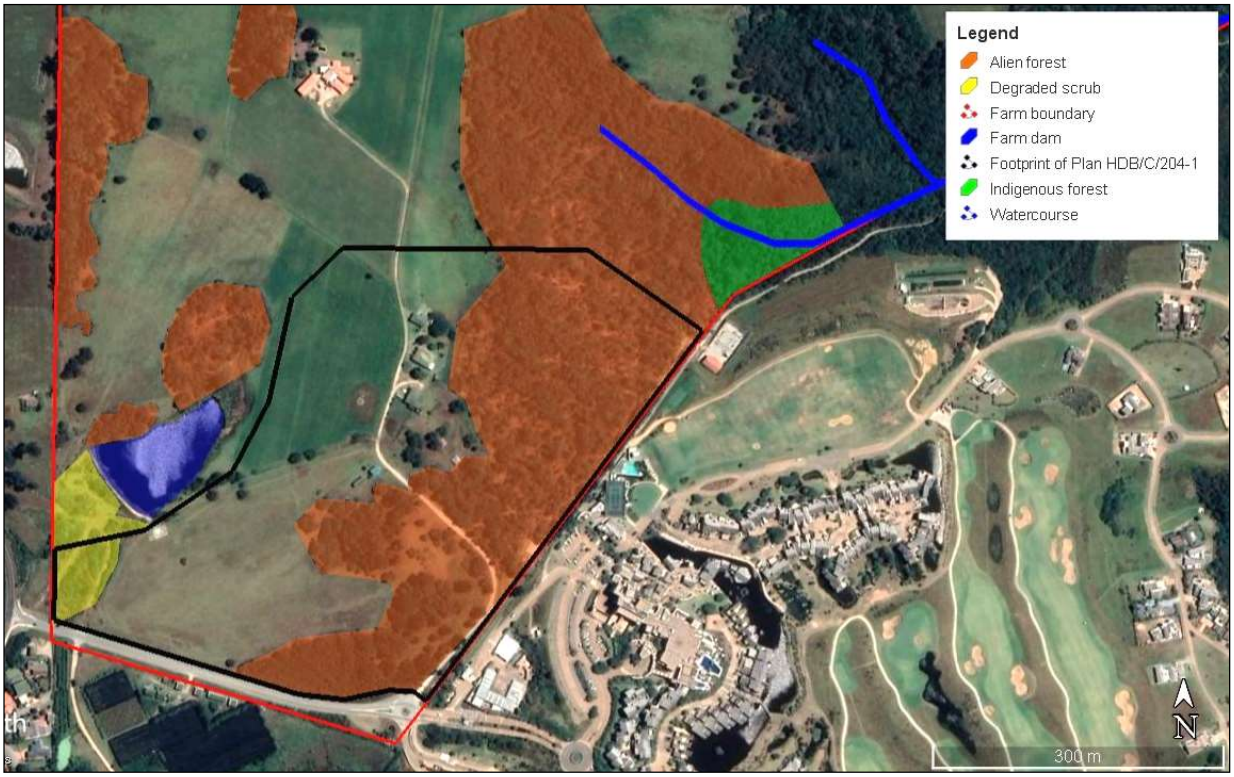
Map 3 Extract of the 2012 SA Vegetation Map (obtained from Cape Farm Mapper), showing the subject property (outlined in red) inside Garden Route Granite Fynbos. Also found in the general area are Groot Brak Dune Strandveld and Southern Afrotemperate Forest.

Also found in the general area, according to the vegetation map, are Southern Afrotemperate Forest and Groot Brak Dune Strandveld. The former does in fact enter the property from the

eastern side along the small valley. Southern Afrotemperate Forest typically comprises tall evergreen tree species, including yellowwoods, saffron, candlewood, ironwood, false ironwood, etc. It is mainly found in the Western and Eastern Cape Provinces, with the largest complex found in the Southern Cape between Mossel Bay in the west and Humansdorp in the east (Mucina & Rutherford 2006). It grows on sheltered (fire-protected) slopes, plateaux, coastal scarps and valleys. Southern Afrotemperate Forest is still well represented in the larger area, with about 97% remaining (Mucina & Rutherford 2006).

8 VEGETATION & FLORA

The study site is largely transformed, with the proposed development footprints entirely transformed or invaded by woody aliens. Apart from the pastures and alien forests, several farm dwellings, sheds and a large farm dam were also noted (see Map 4; Photos 1-4). The recorded biodiversity therefore presents no constraints to the proposed development. Concern is expressed about the presence of dense stands of black wattle as it presents a significant fire risk.



Map 4 Satellite photo showing the botanical features of the site. The development footprint of Plan HDB/C/204-1, which is the larger of the two proposed footprints, has been outlined in black.

Photo 1 Farm dam surrounded by black wattle, blue gums and pastures (kikuyu).

Photo 2 Alien forest on the eastern side of site, with coppicing southern blue gum.

Photo 3 Slope covered with pines, black wattle and the fern *Pteridium aquilinum*.

Photo 3 Looking down into the small valley, with a southern blue gum trunk in the foreground.

The following indigenous tree and shrub species were recorded in the understorey of the alien forest and indigenous forest in the valley on the north-eastern side (see Photo 4), namely *Cassine peragua* (dominant in the indigenous forest), *Robsonodendron eucleiforme*, *Gymnosporia buxifolia*, *Pterocelastrus tricuspidatus*, *Podocarpus cf. latifolius*, *Diospyros dichrophylla*, *Searsia lucida*, *Rapanea melanophloeos, Canthium inerme, Passerina falcifolia*, *Grewia occidentalis*, *Carissa bispinosa*, *Erica scabriuscula*, *Halleria lucida*, *Osteospermum moniliferum*, *Nidorella ivifolia*, *Helichrysum petiolare*, *H. cymosum*, *Asparagus setaceus*, *A. cf. aethiopicus*, *Rubus rigidus*, *Lantana* sp, and *Cliffortia strobilifera* (damp areas). Herbaceous species, creepers and hemicryptophytes recorded, include *Carpobrotus edulis, Secamone alpini*, *Cynanchum ellipticum*, *Crassula sarmentosa*, *Rhynchosia caribaea*, *Pteridium aquilinum*, *Eragrostis curvula* and *Cyperus* sp. No bulbs were recorded. *Typha capensis* populates the wet areas around the farm dam. The degraded scrub below the dam comprises *Searsia lucida*, *Diospyros dichrophylla*, a few *Gymnosporia buxifolia*, *Grewia occidentalis* and a host of aliens, such as black wattle, rooikrans and cut down pines.

Invasive aliens are abundant throughout the site, including black wattle (*Acacia mearnsii*), rooikrans (*A. cyclops*), pines, southern blue gum (*Eucalyptus globulus*), caster-oil plant (*Ricinus communis*), bugweed (*Solanum mauritianum*), khaki weed (*Tagetes minuta*) and paspalum grass (*Paspalum* sp). Black wattle, along with southern blue gum in a few places, dominates all the alien forests. The pastures are covered by kikuyu and other pasture weeds/grasses. The presence of dense stands of black wattle is indicative of past disturbances or agricultural activities. It poses a serious fire risk and threat to the indigenous forest and fynbos outside the property to the east. In terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) Alien and Invasive Species List (2016), the harbouring of black wattle on a property is prohibited without a permit.

Species of Conservation Concern and protected tree species

No species of Species of Conservation Concern[1] or regional endemics were recorded on site. All the recorded species are widespread and common. A few small *Podocarpus cf. latifolius* (protected tree species) were recorded in the proximity of the indigenous forest outside the proposed development footprint. Seedlings can be expected in the alien forest.

9 CONSERVATION STATUS & CRITICAL BIODIVERSITY AREAS

With only 30% (dated estimate from Mucina & Rutherford 2006) still remaining, Garden Route Granite Fynbos is poorly represented and currently listed as Critically Endangered in the 2017

[1] The Red List of South African Plants (Raimondo *et al*. 2009) has assessed all plant species in South Africa, and all indigenous species are now technically Red Data Book species, and thus it is preferable to use the term Species of Conservation Concern to refer to species that are listed as either Threatened or Rare.

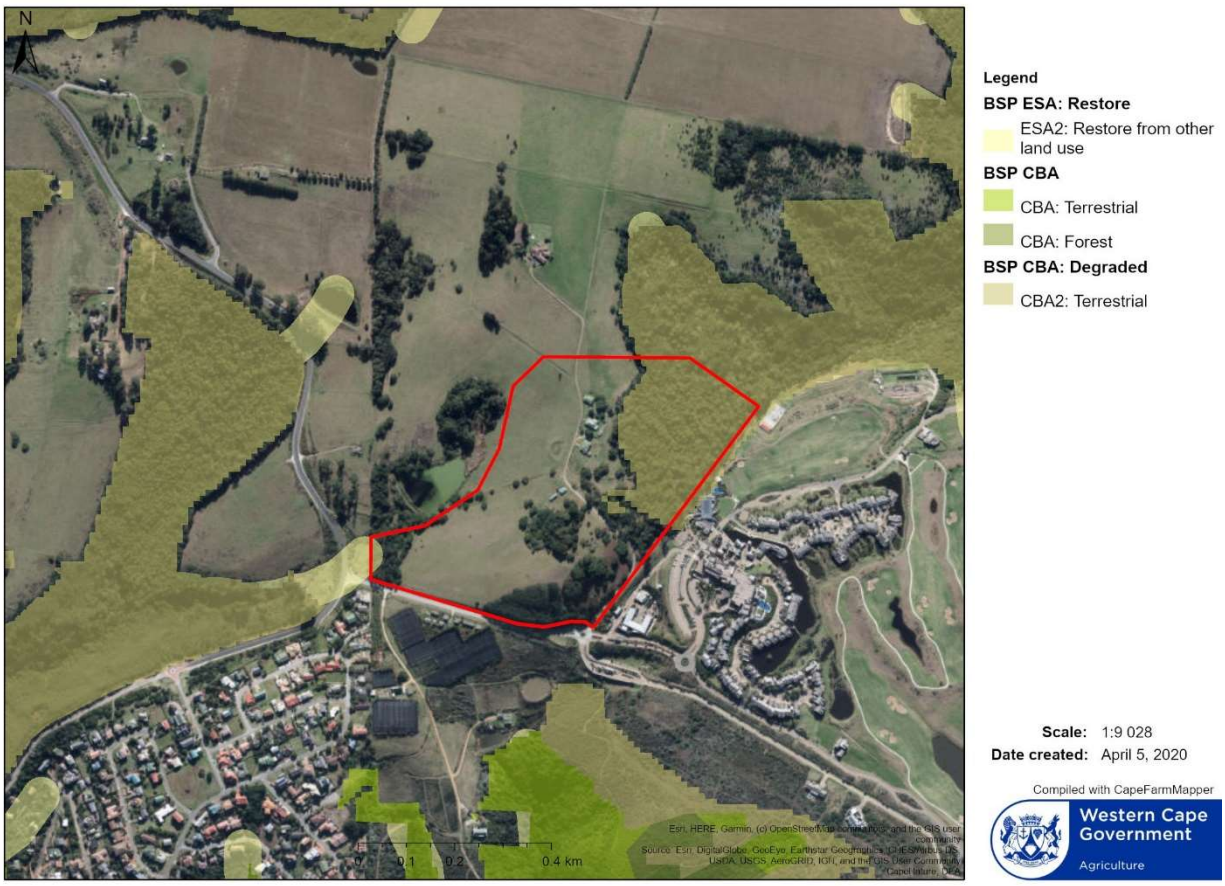
Western Cape Biodiversity Spatial Plan (Pool-Stanvliet *et al.* 2017). Much of it has been transformed by farming activities, pine plantations and urban development, with remnants "largely confined to isolated pockets on steeper slopes" (Mucina & Rutherford 2006). Only 1% of Garden Route Granite Fynbos is formally protected in the Garden Route National Park. Therefore, its protection should remain a priority in the coastal areas. Please note that no fynbos remains on site. Southern Afrotemperate Forest, on the other hand, is still well represented in the larger area, with 97% still remaining (Mucina & Rutherford 2006). Nearly 60% of the original area of Southern Afrotemperate Forest is formally conserved in the Garden Route National Park, Table Mountain National Park and numerous nature reserves. Only a small portion of forest has been transformed for plantations. Indigenous forest in the area is expected to become more extensive in the deeper valleys to the east of the study area and along the Gwaing River valley.

With regards to the biodiversity network, Map 5 shows that the proposed development footprint intrudes into an area mapped as degraded CBA2: Terrestrial. As discussed above, this area comprises an alien forest, dominated by black wattle and southern blue gum, and has currently little value to serve or function as a terrestrial CBA (critical biodiversity area). However, the indigenous forest which is located lower down in the valley should be protected and suitably buffered from the development by means of a fire belt, with the surrounding aliens cleared. A buffer width of 25-30 m is recommended to be determined by a fire safety specialist. The clearing of the aliens will serve to enhance its value as a mapped CBA.

The CBA's in the larger area appear to coincide with wooded areas (whether alien or not), the Gwaing River itself, and remaining tracts of fynbos next to the Oubaai Golf Estate. Ecological Support Areas (ESA's), which are associated with the main drainage courses, extend further along the drainage courses from the above CBA's. Only the tip of an ESA in the western corner of the site will be affected by the development. Allowance must be made on this side for drainage coming from the farm dam. It must be noted that all the ESA's in the area are significantly degraded or transformed, but still function as drainage corridors. With the recommendations above, the impact of the proposed development on the biodiversity network is expected to be minimal.

CBA's are areas that are required to meet biodiversity targets for species, ecosystems or ecological processes and infrastructure (Pool-Stanvliet *et al.* 2017). These are areas of high biodiversity and ecological value and need to be kept in a natural or near-natural state, with no further loss of habitat or species. Only low-impact, biodiversity-sensitive land uses are considered appropriate. ESA's are not essential for meeting biodiversity targets, but play an important role in supporting the functioning of protected areas and CBA's (Pool-Stanvliet *et al.*

2017). They include features such as regional climate adaptation corridors, water source and recharge areas, riparian habitat surrounding rivers or wetlands, and endangered vegetation.



Map 5 Biodiversity network map. The outlined area in red represents the Plan HDB/C/204-1 development footprint, which is the larger of the two proposed footprints.

10 CONCLUSION & RECOMMENDATIONS

Due to the transformed state of the site (for both proposed development footprints), there will be no direct impact on biodiversity. No significant fynbos or forest elements remain on site, except for the indigenous forest lower down in the small valley on the north-eastern side. Although the proposed development encroaches onto a mapped CBA, it is not expected to impact on the CBA network significantly. The affected CBA comprises an alien forest dominated by black wattle and southern blue gum. Unless the aliens are cleared its potential for rehabilitation is very slim.

From a biodiversity perspective, there is no objection to the proposed development. No uncertainties or gaps in the information provided above have been identified. As a condition of approval, the alien forests should be cleared of all alien trees and the indigenous forest and watercourses suitable buffered from development related impacts. The timeframe for alien clearing (and suggested monitoring protocol) is unknown at this point in time and will probably

depend on the owner's budget and needs. The small copses of alien trees above the farm dam and next to the farm houses could perhaps be retained (except for black wattle). In any event, a firebreak (25-30 m wide to be determined by a fire safety specialist) is needed between the development and the indigenous forest. This will also aid in safeguarding the property and adjacent properties from wildfires. The cleared areas could potentially be cultivated and/or restored to fynbos. It is a legal requirement for landowners to clear alien vegetation on their land.

REFERENCES

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Mucina, L. & Rutherford, M.C. (eds) 2006. The vegetation of South Africa, Lesotho and Swaziland. *Strelitzia* 19. South African National Biodiversity Institute, Pretoria.

Pool-Stanvliet, R., Duffell-Canham, A., Pence, G. & Smart, R. 2017. The Western Cape Biodiversity Spatial Plan Handbook. Stellenbosch: CapeNature.

DECLARATION OF INTEREST BY SPECIALIST

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/to be performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity; or
  - am not independent, but another specialist that meets the general requirements set out in Regulation 13 have 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, am fully aware of and meet all of the requirements and that failure to comply with any the requirements may result in disqualification;
- have disclosed/will disclose, to the applicant, the Department and interested and affected parties, all material information that have 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;
- have ensured/will ensure that information containing all relevant facts in respect of the application was/will be distributed or was/will be made available to interested and affected parties and the public and that participation by interested and affected parties was/will be facilitated in such a manner that all interested and affected parties were/will be provided with a reasonable opportunity to participate and to provide comments;
- have ensured/will ensure that the comments of all interested and affected parties were/will be considered, recorded and submitted to the Department in respect of the application;
- have ensured/will ensure the inclusion of inputs and recommendations from the specialist reports in respect of the application, where relevant;
- have kept/will keep a register of all interested and affected parties that participate/d in the public participation process; and
- am aware that a false declaration is an offence in terms of regulation 48 of the 2014 NEMA EIA Regulations.

Signature of the specialist:

Mark Berry Environmental Consultants cc

Name of company:

15 March 2019

Date:

CURRICULUM VITAE

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LANGUAGES: Proficient in speaking, reading and writing English and Afrikaans

QUALIFICATIONS: BSc (1988) University of Stellenbosch (majored in Botany and Zoology)
BSc-Hons in Botany (1991) University of Stellenbosch
MSc in Botany (1993) Nelson Mandela Metropolitan University
PhD in Botany (2000) Nelson Mandela Metropolitan University

CAREER SUMMARY: **1997-2005:** Employed as an environmental specialist at **Planning Partners**, a multi-disciplinary consultancy specialising in town and regional planning, environmental planning and landscape architecture.
Started **Mark Berry Environmental Consultants** in **June 2005**.

EXPERIENCE:

Environmental Impact Assessments (EIA's) for residential, commercial, industrial, agricultural and civil engineering projects. EIA applications include the upgrading of Murray's Bay Harbour at Robben Island; an abalone farm near Saldanha; several bulk sewer and stormwater pipelines; the upgrading of access to and restoration of an archaeological site (Klipgat Cave) near De Kelders; the rehabilitation of the flood-damaged Koringlands River in Swellendam; a regional shopping mall in Hawston; low-cost housing projects; and cell phone masts in the Mossel Bay area.

With a PhD in the botanical field, I regularly undertake **biodiversity assessments** of fynbos, strandveld, renosterveld, thicket and karoo vegetation types as part of the EIA application process. For my PhD I have assessed the impact of informal settlement on the coastal vegetation and flora of the south-eastern Cape coastal zone.

Environmental Management Plans (EMP's) for a wide range of activities, including golf estates, residential and commercial developments, wineries, bulk municipal infrastructure, a harbour and several borrow-pits/quarries.

Environmental Control Officer (ECO) on construction sites, including residential and commercial developments, the upgrading of a harbour and other civil engineering projects.

CONFERENCES & PUBLISHED PAPERS: The impact of informal housing settlements on coastal vegetation. *The Naturalist,* Eastern Province Branch of the Wildlife Society of Southern Africa, Vol 37(1) 1993.

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Impact of cutting and collecting of firewood associated with informal settlement in the south-eastern Cape coastal zone. *South African Journal of Botany* 71 (2): 2005.

South-eastern Cape vegetation and the impacts of informal settlements. Annual SAAB congress held at Wits, Johannesburg in 1994.

Informal settlements in the south-eastern Cape coastal region and associated environmental impacts. First International Geography Congress held at University of Durban-Westville in 1995.

EXAMINER:

Between 2000 and 2006 I have acted as 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.

PROFESSIONAL MEMBERSHIP:

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

REFERENCES:

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