

# BIODIVERSITY SURVEY: PROPOSED WALVIS STREET EXTENSION, MOSSEL BAY

August 2020



## TABLE OF CONTENTS

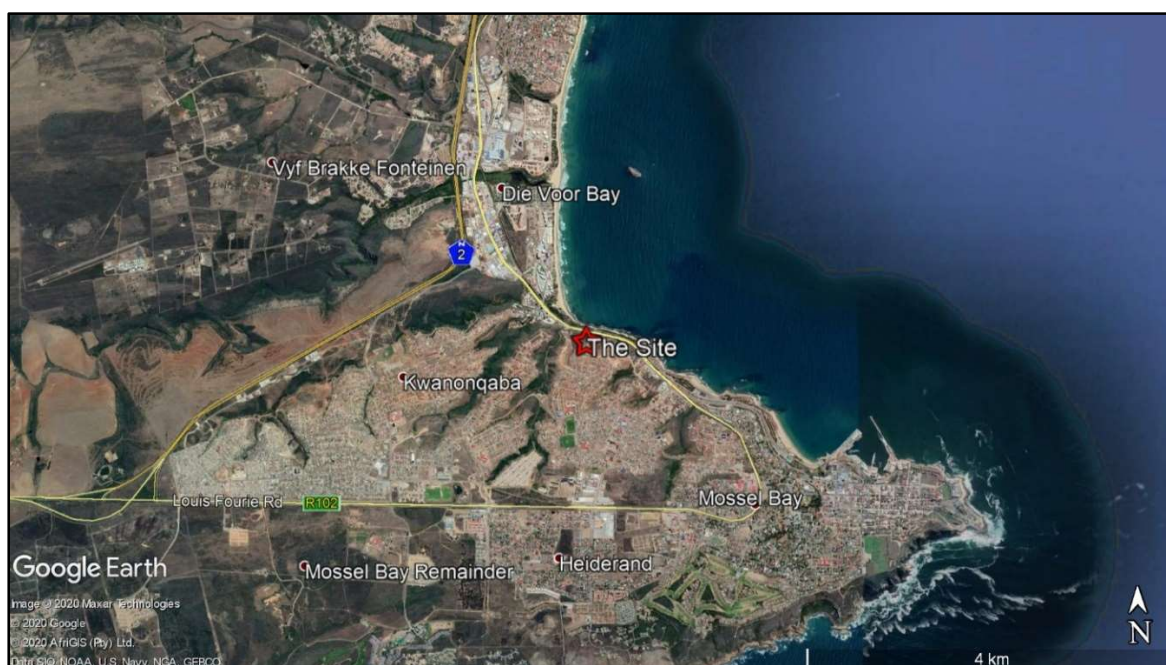
1	INTRODUCTION .....	2
2	PROPOSED PROJECT .....	2
3	TERMS OF REFERENCE .....	4
4	METHODOLOGY .....	4
5	LIMITATIONS TO THE STUDY .....	5
6	LOCALITY & SITE DESCRIPTION.....	5
7	BIOGEOGRAPHICAL CONTEXT .....	7
8	VEGETATION & FLORA .....	10
9	CONSERVATION STATUS & BIODIVERSITY NETWORK.....	14
10	IMPACT ASSESSMENT .....	15
11	CONCLUSION & RECOMMENDATIONS .....	18
	REFERENCES .....	19

### APPENDICES

CV OF SPECIALIST  
DECLARATION OF INDEPENDENCE

## 1 INTRODUCTION

This report investigates the biodiversity aspects of a proposed extension route for Walvis Street in Mossel Bay (see Map 1). The proposed route, which runs parallel to Louis Fourie Road (R102), is located on the hill slope below Isinyoka. The vegetation present comprises a mixture of renosterveld and valley thicket. Valley thicket is probably the dominant type. The aim of the study, which was requested by Sharples Environmental Services (EAP), is to determine the biodiversity value of the site and to identify mitigation measures to ameliorate the impact. The main concerns are that the route runs through an area containing a mapped threatened vegetation type, watercourses and associated wetlands, and an area mapped as a critical biodiversity area (CBA). The site forms part of a narrow coastal biodiversity corridor that runs from Hartenbos Heuwels south-eastwards towards Cape St. Blaize (The Point).



**Map 1** Satellite photo showing the position of the proposed extension road (indicated by a red symbol) in Mossel Bay.

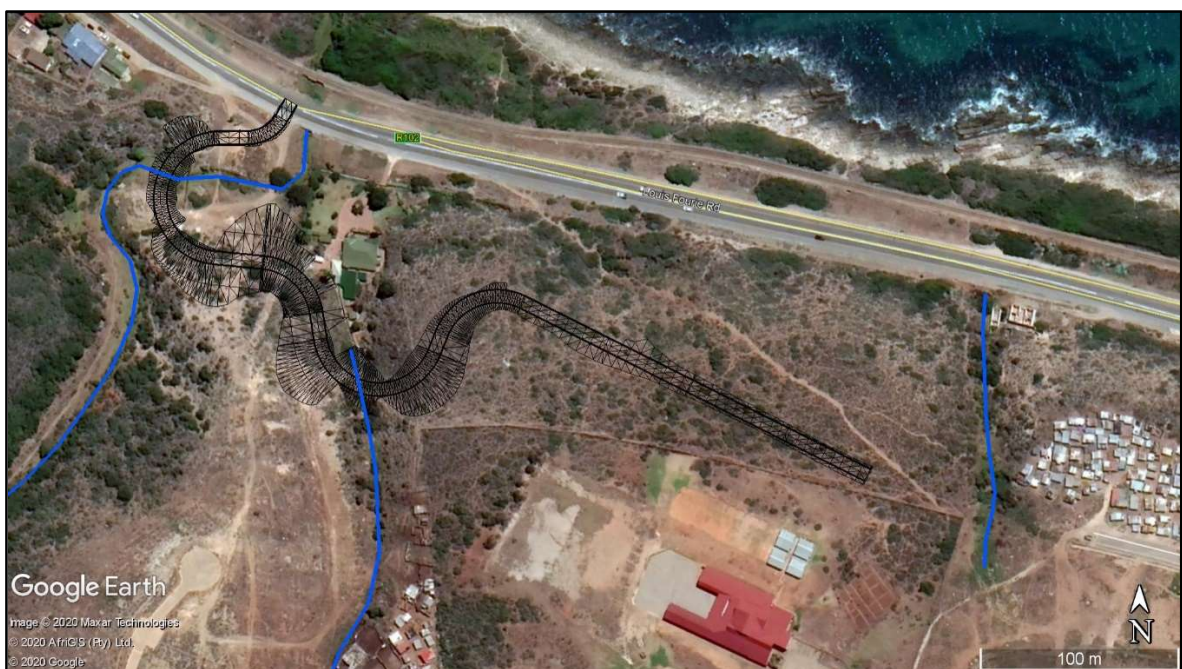
## 2 PROPOSED PROJECT

Mossel Bay Municipality has identified the need to extend the existing Walvis Street to link up with Louis Fourie Road. The proposed extension is about 600 m in length and situated on the southern side of Louis Fourie Road, Mossel Bay (see Map 2). The extension falls within the boundaries of Asazani/Isinyoka, which will gain access to Louis Fourie Road. The area surrounding the proposed extension is currently being developed. The proposed extension will be 6.4 m wide (tared surface) with a cross section of 2 x 3.2 m lanes and 2 x 1.2 m gravel sidewalks. The extension will go through a hilly environment and traverses three watercourses

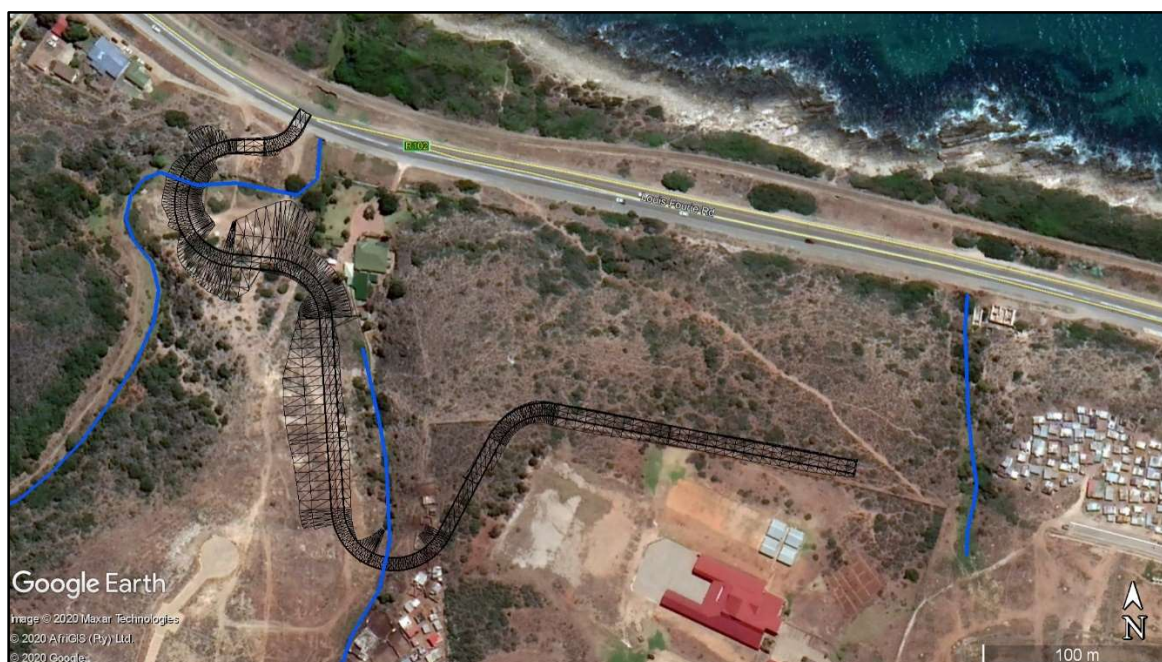
before reaching Louis Fourie Road. The extension will intersect with Louis Fourie Road between the Park Crescent intersection and Hall Street intersection. Access to the housing development on the southern side of Walvis Street will be provided along Walvis Street. Alternative alignments are shown on Maps 3 and 4.



**Map 2** Proposed extension of Walvis Street (preferred alternative).



**Map 3** Second alternative.



**Map 4** Third alternative.

### 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 16 and 17 June 2020 by Mark Berry (see CV attached). The author was accompanied by Sandra Falanga (a local representative of CREW) who shared some of her local knowledge of the area. A qualitative assessment of the type and condition of the vegetation on site, disturbance, and presence of alien species and Species of Conservation Concern was carried out. Plant species not identified in the field, were collected and/or photographed and identified at the office. 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  $\pm 4$  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 middle of winter, flowering plants that only flower at other times of the year (e.g. spring to autumn), 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 proposed extension (600 m) is located on the edge of an elevated coastal platform in Mossel Bay, south of Diaz Beach (see Map 5). The route starts at  $\pm 50$  masl and ends at 12 masl on Louis Fourie Road, passing through a steep valley and then down a steep, rocky ridge at the western end (see Photos 1 & 2). It is backed by a school and a township development. Informal dwellings and livestock (goat) farming were also noted in the immediate area of the site.

While the coastal strip between Mossel Bay and Glentana is almost fully developed, strips of natural vegetation remains on the steeper slopes and small valleys where development is not deemed feasible. The study site is located in such a strip with the side facing the township area and school on northern side degraded by pedestrian activities and grazing (goats). An informal

track runs up the side of the hill slope giving easy access to the top part of the hill from Louis Fourie Road. While the proposed extension passes through mostly transformed or degraded vegetation, the adjacent vegetation on the southern side is of a good quality. Some alien infestation was noted.



**Map 5** Satellite photo showing the proposed extension road (red) in context with its surroundings.



**Photo 1** The proposed route passes through this steep valley before running down a rocky ridge on western side.



**Photo 2** Rocky ridge on the western side of the proposed extension route.

Rainfall in the region ranges from 350 mm in the west to 750 mm per annum in the east, with about 40% of the rain falling in summer (October-March) and 60% in the winter (April-September) as per Mucina & Rutherford's (2006) description of the climate for Groot Brak Dune Strandveld. It is even throughout the year, with slight peaks in March and October/November (Mucina & Rutherford 2006). Mean daily maximum and minimum temperatures are 26.8°C and 7.7°C for February and July, respectively (Mucina & Rutherford 2006). According to the 3422 AA Mossel Bay 1:50 000 geological map, the site is underlain by Table Mountain Group sandstone (Baviaanskloof Formation), with tallus on the foot slope directly above Louis Fourie (see Photo 3).

## **7 BIOGEOGRAPHICAL CONTEXT**

According to the 2012 South African Vegetation Map, the site lies on the boundary between Groot Brak Dune Strandveld, North Langeberg Sandstone Fynbos and Central Coastal Shale Band Vegetation (see Map 6). In the more recent 2018 beta version of the Vegetation Map, the site falls entirely inside Hartenbos Dune Thicket. The latter stretches from Vermaaklikheid in the west to Glentana in the east, extending up a few river valleys along the way.





**Photo 3** Exposed Table Mountain Group sandstone on the steep slope above Louis Fourie Road, with a population of *Euphorbia heptagona*.

North Langeberg Sandstone Fynbos is associated with the northern slopes of the Langeberg, as well as the Aasvoëlberg hills from Albertinia to Mossel Bay (Mucina & Rutherford 2006). Groot Brak Dune Strandveld stretches from the Gouritz mouth in the west to Victoria Bay in the east (Mucina & Rutherford 2006). The latter, which is easy to spot with its impenetrable, thorny thicket structure, typically occurs on stabilised dunes and steep coastal slopes. Central Coastal Shale Band Vegetation is a linear, flat feature, comprising various fynbos shrublands (Mucina & Rutherford 2006). It traverses the entire length of the Langeberg, with shorter bands in a few other areas, including a strip west of Mossel Bay (Mucina & Rutherford 2006).

During the site survey it was found that the vegetation on site can best be described as a Southern Cape (= Gouritz) Valley Thicket remnant, with a strong renosterveld influence along the top part of the site (edge of the coastal plateau). The rockiness and north-facing aspect of the site provide an ideal habitat for valley thicket. Biogeographically important and endemic species recorded include *Aloe arborescens*, *Euphorbia mammillaris*, *Azima tetraacantha*, *Gasteria carinata* and *Haworthia chloracantha*. The latter is both a Southern Cape Valley Thicket and Mossel Bay Shale Renosterveld endemic. Southern Cape Valley Thicket is mainly found in the river valleys of the Goekoe River, with the largest patch in the Gouritz River Valley.

Unmapped patches are also found along the Groot Brak, Klein Brak and the Kaaimans River (easternmost limit) (Mucina & Rutherford 2006).



**Legend**

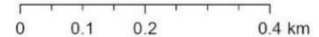
**VEGMAP 2012**

FFs 15 North Langeberg Sandstone Fynbos

FFb 4 Central Coastal Shale Band Vegetation

FS 9 Groot Brak Dune Strandveld

AZd 3 Cape Seashore Vegetation



Scale: 1:9 028

Date created: July 22, 2020

Compiled with CapeFarmMapper



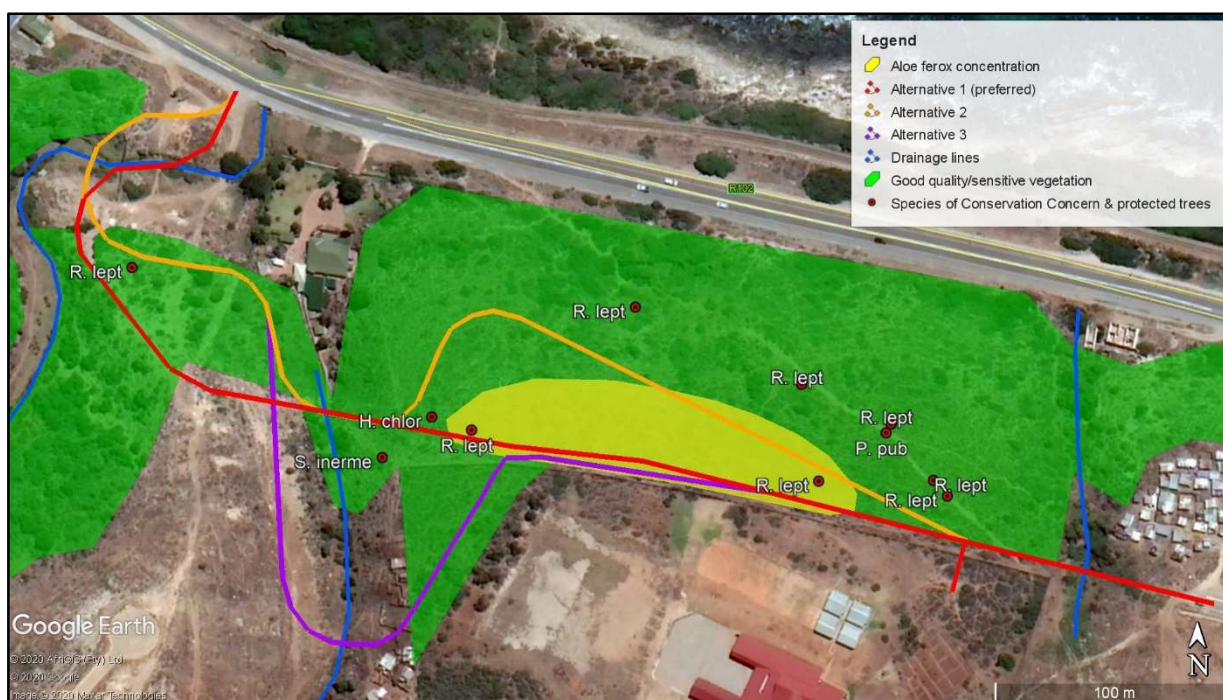
**Western Cape Government**

Agriculture

**Map 6** Extract of the 2012 SA Vegetation Map, showing the proposed extension road (red line) on the boundary between Groot Brak Dune Strandveld, North Langeberg Sandstone Fynbos and Central Coastal Shale Band Vegetation.

## 8 VEGETATION & FLORA

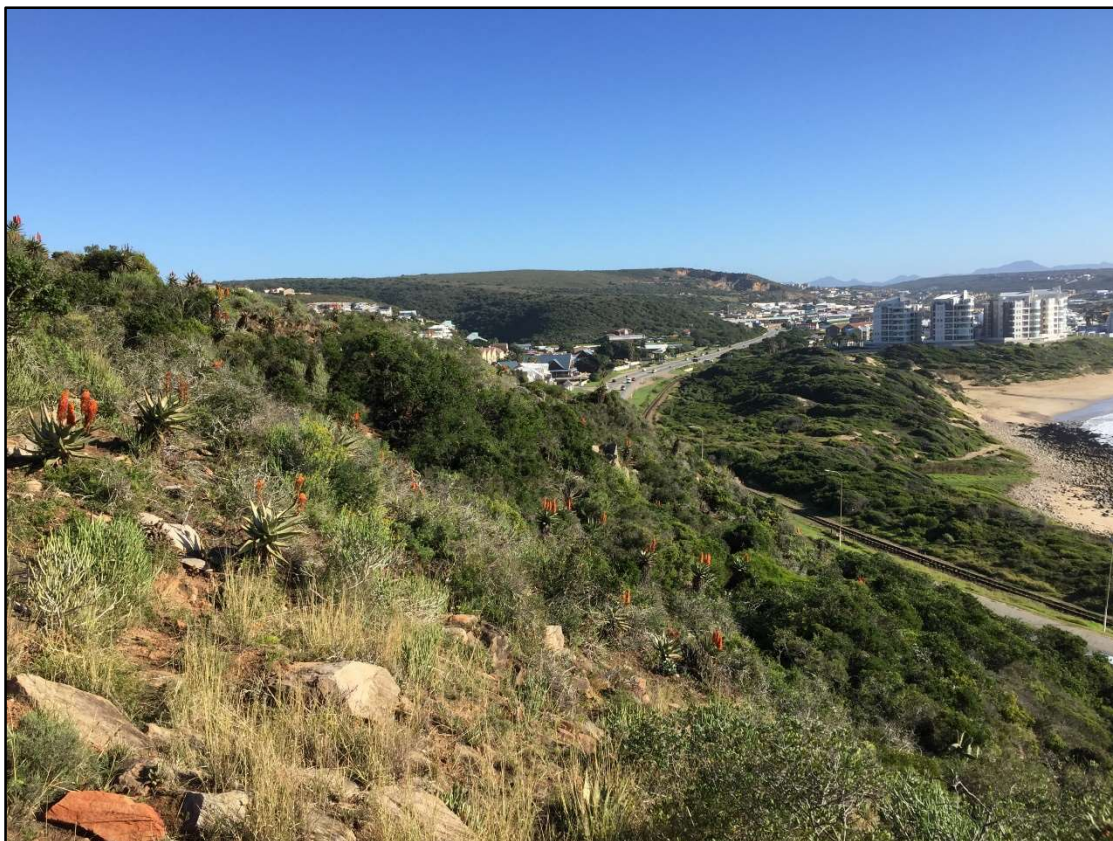
The vegetation on the steep part of the site (directly above Louis Fourie Rd and largely below the proposed road extension) comprises thicket (see Map 7 & Photo 4). The top (more level) parts show a strong renosterveld influence, suggesting that the thicket was bordered by renosterveld (extending westwards) before it was transformed by past agricultural activities and more recently, urban development. The thicket component is in a good condition, with a few footpaths crossing it. Impact of goat grazing is also visible. The top part of the site is degraded from pedestrian movement and grazing activities, especially the eastern (Walvis St) end and western end where the proposed road drops down a rocky ridge and crossing a watercourse before meeting Louis Fourie (see Photos 5-8). Earthworks for municipal services are currently underway here. A notable presence of alien species was also noted in the valley bottom on western side. Structurally, the thicket can be described as a mid-high to tall (1-3 m) closed shrubland following Campbell's (1981) classification.



**Map 7** Aerial photograph showing the biodiversity attributes of the site, with the three route options shown schematically. Please note that the spatial extent of the options is significantly greater than shown.

Low trees and shrubs recorded, include *Elytropappus rhinocerotis* (on the upper parts), *Eriocephalus africanus* (common), *Felicia filifolia*, *F. hirsuta*, *Helichrysum cf. asperum*, *Pteronia incana*, *Nidorella ivifolia*, *Chrysocoma ciliata*, *Sideroxylon inerme*, *Pterocelastrus tricuspidatus*, *Gymnosporia capitata*, *Lauridia tetragona*, *Azima tetracantha*, *Euclea undulata* (common), *Diospyros dichrophylla* (common), *Searsia pallens* (common), *S. pterota*, *Schotia afra*, *Indigofera nigromontana*, *Leonotis ocymifolia*, *Carissa bispinosa*, *Apodytes dimidiata*, *Clutia daphnoides*, *Roepera morgsana* (common), *Asparagus striatus*, *Asparagus* sp, *Lycium* sp,

*Solanum tomentosum*, *Hermannia lavandulifolia*, *Polygala pubiflora*, *P. myrtifolia*, *Barleria pungens*, *Exomis microphylla* (dominant in the proposed extension corridor) and *Pelargonium fruticosum*.



**Photo 4** View down slope below the proposed road extension route.

A large number of succulent species were recorded predominantly on the steep, rocky slope above Louis Fourie, including *Aloe ferox* (dominant in a few places; see Photo 6), *A. arborescens*, *Adromischus maculata*, *Cotyledon orbiculata*, *Gasteria carinata*, *Haworthia chloracantha* var. *denticulifera*, *Crassula perforata*, *C. muscosa*, *C. cf tetragona*, *C. cultrata*, *C. capitella* ssp. *thyrsiflora*, *Anacampseros lanceolata*, *Euphorbia mauritanica*, *Euphorbia heptagona*, *Orbea variegata*, *Huernia barbata* var. *barbata*, *Cynanchum viminalis*, *Ruschia leptocalyx*, *R. lineolata*, *Delosperma litorale*, *Drosanthemum parvifolium*, *Mesembryanthemum aitonis*, *Glottiphyllum longum*, *Carpobrotus edulis*, *Curio radicans*, *C. ficoides* and *Crassothonna alba*. Well over 100 *Aloe ferox* plants were observed inside the proposed road strip below the school site.

Creepers recorded include *Kedrostis nana*, *Pelargonium peltatum*, *Rhoicissus digitata* and *Cynanchum obtusifolium*. Hemicryptophytes and geophytes recorded include *Commelina* sp, *Cheilanthes hirta*, *Oxalis pes-caprae*, *Ledebouria cf revoluta* and *Moraea polyanthos*.



**Photo 5** View of the Walvis Street end (eastern end) of the proposed extension, with a squatter settlement directly below. Insert: *Orbea variegata*



**Photo 6** The proposed route runs through this patch of *Aloe ferox* below the school site.



**Photo 7** Degraded ridge on western side from which the extension route descends to the valley at western end.  
Insert: *Haworthia chloracantha* var. *denticulifera*



**Photo 8** Valley at the western end, still flanked by good quality vegetation (thicket).

Four Species of Conservation Concern were recorded on site, namely *Polygala pubiflora* (Vul), *Hermannia lavandulifolia* (Vul), *Haworthia chloracantha* var. *denticulifera* (En) and *Ruschia leptocalyx* (En). *Polygala pubiflora* is a regional endemic, mostly found in renosterveld remnants. It is still frequently encountered (by the author and others) in the Mossel Bay area, but never in large numbers, usually only a few plants here and there. It is difficult to spot when not in flower. *Hermannia lavandulifolia* is still well represented in the Mossel Bay area and is frequently encountered. *Haworthia chloracantha* var. *denticulifera* is very rare and this is the first observation of the species by the author. According to the online Red List of South African Plants<sup>1</sup>, “*Haworthia chloracantha* is threatened<sup>1</sup> by ongoing habitat loss to road construction, quarrying and coastal development, particularly in the area between Mossel Bay and the Groot Brak River, with many subpopulations known through historical collections now extinct”. It is also targeted by succulent collectors. *Ruschia leptocalyx*, another regional endemic, is still frequently encountered in vegetation remnants between the Hartenbos Heuwels and The Point.

A few milkwoods (*Sideroxylon inerme*), a protected tree species in terms of the National Forests Act (Act 84 of 1998), were recorded on site, one in close proximity to the proposed route. The removal of these trees requires a permit from the Department of Forestry.

Alien invasive species recorded include *Harrisia martini* (1b), *Opuntia ficus-indica* (1b), *Cestrum laevigatum* (1b), *Lantana camara* (1b), *Sesbania punicea* (1b), *Senna didymobotrya* (1b), *Agave americana* (3), *Atriplex semibaccata* and *Pennisetum clandestinum* (kikuyu, 1b in protected areas and wetlands in which it does not already occur). The latter, along with *Senna didymobotrya* and *Sesbania punicea*, is especially dominant in the valley bottom on western side. Apart from *Atriplex semibaccata*, all these species are listed invasives in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) Alien and Invasive Species List (2016). The listing categories are indicated in brackets.

## 9 CONSERVATION STATUS & BIODIVERSITY NETWORK

Mossel Bay Shale Renosterveld is the most threatened vegetation type found on site and is listed as Endangered (DEA 2011). About 41% of Mossel Bay Shale Renosterveld is still left, while 0% is currently protected (DEA 2011). A large percentage of it has been transformed in the past for pastures and croplands (Mucina & Rutherford 2006). This rating was reaffirmed in the Western Cape Biodiversity Spatial Plan Handbook (Pool-Stanvliet *et al.* 2017). With regards to Southern Cape Valley Thicket, 35% has been transformed by agriculture (Mucina &

<sup>1</sup> <http://redlist.sanbi.org/species.php?species=2215-4007>

Rutherford 2006). Very little of it is conserved in the Pauline Bohnen Nature Reserve. Pool-Stanvliet *et al.* (2017) recommend that Southern Cape Valley Thicket be listed as Vulnerable.

The proposed extension road runs along the edge of a terrestrial critical biodiversity area (CBA) and through three mapped aquatic CBA's and/or ecological support areas associated with the watercourses (see Map 8). The terrestrial CBA forms part of a minor coastal biodiversity corridor (albeit fragmented) that runs between the Hartenbos Heuwels and Cape St. Blaize. The reasons for its importance, along with the aquatic CBA's, include the presence of a threatened vegetation type (albeit the wrong type), its contribution to ecological processes, water resource protection and wetlands. Apart from providing a backbone to the local biodiversity network, the corridor serves as an important passage along which fauna can migrate between the vegetation remnants. The proposed road will contribute to the erosion of the corridor, but the significance thereof is difficult to assess given the urban context and encroaching township development.

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. Loss of designated CBA's is therefore not recommended. With the proposed road running alongside and through a CBA network one can expect an impact on its functionality despite its degraded state.

## **10 IMPACT ASSESSMENT**

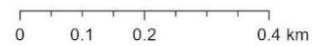
The site represents one of the last valley bushveld remnants bordering on the coastline in the Mossel Bay area. The impact involves the removal of thicket/renosterveld in a  $\pm 10$  m wide strip over  $\pm 440$  m, a total area of about 4600 m<sup>2</sup>. The remainder of the route, i.e. the Walvis Street end and the valley bottom at the western end approaching Louis Fourie, has already been transformed or significantly degraded. The impact will be greater for Alternative 2, which also cuts through the toe of a rocky ridge at the western end of the route. The impact of Alternative 3 will probably be the same as for Alternative 1. The impact will involve considerable roadworks and the constant movement of construction vehicles through the area. During this phase great care must be exercised to avoid the unnecessary disturbance of the adjacent vegetation. Given the disturbed/transformed state of parts of the site, the impact on vegetation type is of a moderate to high concern. The impact is slightly lessened by the fact that the proposed extension follows an already disturbed passage next to the school boundary, which is used as a pedestrian route. Table 1 below summarises the impact on vegetation type, habitat and the CBA network for the three route options.





**Legend**

- |                                   |                  |
|-----------------------------------|------------------|
| <b>BSP ESA: Restore</b>           | ESA: Terrestrial |
| ESA2: Restore from other land use | <b>BSP CBA</b>   |
| <b>BSP ESA</b>                    | CBA: Terrestrial |
| ESA: Aquatic                      | CBA: Wetland     |



Scale: 1:9 028

Date created: July 22, 2020

Compiled with CapeFarmMapper



**Map 8** Biodiversity network map, with the proposed road extension shown in red.

The impact on the biodiversity (CBA) network has already been discussed under Section 9. As stated above, one can expect an impact on its functionality. Fortunately, the proposed road is positioned on the southern edge of the CBA, but has to cross the corridor at its western end to reach Louis Fourie. This impact cannot be avoided or easily mitigated by means of rerouting or other measures.

**Table 1** Impact on vegetation type, habitat and the CBA network.

Mitigation	Extent	Duration	Intensity	Probability of occurrence	Significance – Alternative 1 (preferred route option)	Significance – Alternative 2	Significance – Alternative 3	Confidence
Without mitigation	Limited to site	Perm	Med-high	High	Med-high (-)	High (-)	Med-high (-)	Med-high
With mitigation	Limited to site	Perm	Med-high	High	Med (-)	Med-high (-)	Med (-)	Med-high
<b>Mitigation measures:</b> <ul style="list-style-type: none"> <li>Align the proposed road directly next to the school boundary in order to minimise disturbance to good quality vegetation.</li> <li>Remove topsoil from the renosterveld/thicket areas to be disturbed and use it for the rehabilitation of disturbed areas after construction has been completed.</li> <li>Fence off the construction area in the renosterveld/thicket areas. Contain disturbance to the fenced-off construction area.</li> <li>Consider search and rescue of bulbs and succulents inside the construction area for use in the rehabilitation of disturbed areas.</li> <li>Control aliens as a long-term management requirement.</li> </ul>								

Four recorded Species of Conservation Concern were recorded in the area, with at least three being directly affected by the proposed alignment. Of greatest concern is the *Haworthia chloracantha* var. *denticulifera* population in close proximity to the route near the north-western corner of the school site. The other affected threatened species are still reasonably well represented on site and in the larger Mossel Bay area. The impact can be mitigated by moving the road for the preferred route option up against the school boundary at this point, thereby avoiding some of the recorded *Ruschia leptocalyx* and *H. chloracantha* var. *denticulifera*. At the north-western corner of the school site the proposed road should be swung to the south closer to the school boundary to avoid or minimise the impact on the haworthia. It is uncertain what the viability is for its transplantation, but it is best to try and avoid this as a mitigation option. The impact will be the same for Alternative 2, and less for Alternative 3 which avoid the haworthia population. A large population of *Aloe ferox* (100-200 plants) directly below the school site will also be affected. Transplanting them, provided that it is done with care and the roots intact, is feasible. Due to a considerable presence of succulents in the construction area, it is recommended that the affected plants be searched and rescued and replanted in the adjacent areas after construction. Table 2 below summarises the impact on Species of Conservation Concern.

It is assumed that the disturbed areas outside the road and sidewalks be rehabilitation at the end of the construction phase. In all likelihood, many of the species which originally occurred along the route will return, including the aliens. As an indirect impact, soil disturbance caused by earthworks will provide ideal conditions for the establishment of invasive alien species. The

presence of aliens in the area, such as *Harrisia martini*, *Opuntia ficus-indica*, *Cestrum laevigatum* and *Lantana camara*, will exacerbate this impact. As an operational phase impact, alien control will be required along the road reserves as an ongoing management requirement.

**Table 2** Impact on Species of Conservation Concern.

Mitigation	Extent	Duration	Intensity	Probability of occurrence	Significance – Alternative 1 (preferred route option)	Significance – Alternative 2	Significance – Alternative 3	Confidence
Without mitigation	Limited to site	Perm	Med-high	High	High (-)	High (-)	Med-high (-)	Med-high
With mitigation	Limited to site	Perm	Med-high	High	Med (-)	Med-high (-)	Med (-)	Med-high
<p><b>Mitigation measures:</b></p> <ul style="list-style-type: none"> <li>• Give consideration to the protection of <i>Haworthia chloracantha</i> var. <i>denticulifera</i> (an endangered succulent) and other threatened species by moving the proposed road closer to the school boundary, especially at the north-western corner of school site. If this cannot be achieved the significance will remain high.</li> <li>• Search and rescue affected succulent and bulb species inside the construction area, such as the <i>Aloe ferox</i> population below the school site. Ensure that the latter be rescued with the roots intact. The searched and rescued plants must be replanted in the adjacent disturbed areas after completion of construction activities.</li> </ul>								

## 11 CONCLUSION & RECOMMENDATIONS

The vegetation on site can be described as a Southern Cape Valley Thicket remnant, with a strong renosterveld (Mossel Bay Shale Renosterveld) influence along the top part of the site. It represents one of the last valley bushveld remnants bordering on the coastline in the Mossel Bay area. The thicket component is in a good condition, while the renosterveld has been degraded (severely in places) by pedestrian activities and grazing. Mossel Bay Shale Renosterveld is currently listed as Endangered, while Southern Cape Valley Thicket is also recommended for a threatened status in The Western Cape Biodiversity Spatial Plan Handbook. The vegetation on site is therefore highly conservation worthy, despite its condition.

Given the disturbed/transformed state of parts of the site, notably the Walvis Street end and the valley bottom at the western end approaching Louis Fourie Road, the impact posed by the proposed Walvis Street extension on vegetation type is of a moderate to high concern. The impact is lessened by the fact that the proposed extension follows an already disturbed passage next to the school boundary, which is used as a pedestrian route. Alternative 1, along with Alternative 3, are preferred, while Alternative 2 should be avoided. The proposed road also runs along the edge of a terrestrial critical biodiversity area (CBA) and through three mapped aquatic CBA's and/or ecological support areas associated with the watercourses. The terrestrial CBA

forms part of a minor coastal biodiversity corridor that runs between the Hartenbos Heuwels and Cape St. Blaize (The Point).

At least three recorded Species of Conservation Concern will be directly affected by the project. Of greatest concern is the *Haworthia chloracantha* var. *denticulifera* population in close proximity to the route near the north-western corner of the school site. The other affected threatened species are still reasonably well represented on site and in the larger Mossel Bay area. The impact for Alternative 1 can be mitigated by moving the road up against the school boundary, thereby avoiding some of the recorded *Ruschia leptocalyx* and *H. chloracantha* var. *denticulifera*. If this cannot be achieved the impact will remain highly significant. Alternative 3 is preferred, followed by Alternative 1. Alternative 2 should be avoided.

From a biodiversity perspective, it is difficult to recommend Alternative 1, which is the preferred option. With mitigation it can possibly be considered. The following mitigation measures should be considered, if the project is allowed to proceed:

- Align the proposed road directly next to the school boundary in order to minimise disturbance to good quality vegetation.
- Give consideration to the protection of *Haworthia chloracantha* var. *denticulifera* (an endangered succulent) and other threatened species by moving the proposed road closer to the school boundary, especially at the north-western corner of school site.
- Remove topsoil from the renosterveld/thicket areas to be disturbed and use it for the rehabilitation of disturbed areas after construction has been completed.
- Fence off the construction area in the renosterveld/thicket areas. Contain disturbance to the fenced-off construction area.
- Search and rescue affected succulent and bulb species inside the construction area, such as the *Aloe ferox* population below the school site. Ensure that the latter be rescued with the roots intact. The searched and rescued plants must be replanted in the adjacent disturbed areas after completion of construction activities.
- Control aliens as a long-term management requirement.

## REFERENCES

Brownlie, S. 2005. Guideline for involving biodiversity specialists in EIA processes: Edition 1. CSIR Report No ENV-S-C 2005 053 C. Republic of South Africa, Provincial Government of the Western Cape, Department of Environmental Affairs & Development Planning, Cape Town.

Campbell, B.M., Cowling, R.M., Bond, W. & Kruger, F.J. 1981. Structural characterization of vegetation in the Fynbos Biome. *S. Afr. Nat. Sci. Prog. Report* No. 52.

DEA 2011. National List of Ecosystems that are threatened and in need of protection. *Government Gazette* No. 34809, Government Notice No. 1002. National Printer, Pretoria.

Manning, J. & Goldblatt, P. 2012. Plants of the Greater Cape Floristic Region 1: the Core Cape flora, *Strelitzia* 29. SANBI, Pretoria.

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. CapeNature, Stellenbosch.

## 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@sesc.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:

11 August 2020