

**Fauna Biodiversity Assessment for the Proposed Kingsburgh
Extension Nine Development, KwaZulu-Natal**

Performed for Dan's Spares cc.



Draft Report

Prepared by Harvey Ecological

August 2018

DECLARATION OF INDEPENDENCE BY THE SPECIALIST CONSULTANT

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I, James Harvey declare that I

- am an independent specialist consultant in this application;
- do not have and will not have any vested interest (either business, financial, personal or other) in the undertaking of the proposed activity, other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2010;
- will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- declare that there are no circumstances that may compromise my objectivity in performing such work;
- have appropriate expertise in conducting biodiversity assessments;
- will provide the competent authority with access to all information at my disposal regarding this application, whether such information is favourable to the applicant or not;
- declare that all the particulars furnished by me in this form are true and correct;
- realise that a false declaration is an offence in terms of regulation 71 of the EIA Regulations, 2010 and is punishable in terms of section 24F of the National Environmental Management Act, 1998 (Act 107 of 1998); and
- will comply with all the requirements as indicated in the National Environmental Management Act, 1998 (Act 107 of 1998) and Environmental Impact Assessment Regulations, 2010.



Signature of the specialist consultant

James Harvey

Name of specialist consultant

25 August 2018

Date

EXPERTISE

James Harvey has sixteen years experience with biodiversity-related work and twelve years experience in ecological consulting in sub-Saharan Africa. He is experienced and knowledgeable concerning species identification, ecology, conservation issues and methods for performing biodiversity surveys, and has performed biodiversity work widely in South Africa.

1. INTRODUCTION

Harvey Ecological was commissioned by Dan's Spares cc, to conduct a faunal assessment of the property for the proposed Kingsburgh Extension 9 development.

The objectives of the assessment were to:

- Perform an assessment of the vertebrate faunal communities (mammals, birds, reptiles and amphibians occurring within the study area, with particular emphasis on rare and threatened species and sensitive communities; and
- Provide comment and recommendations concerning the effect of the development on these faunal groups occurring on or adjacent to the site.

2. METHODS AND BACKGROUND

2.1 Study site and proposed development

The proposed development is located in Kingsburgh, to the south of Durban. The client intends to develop portions of Erfs 2954, 2955 and 2956 of Kingsburgh Extension 9 (central point 30°04'13.33" S and 30°51'23.42" E) in Shulton Park, in the eThekweni Municipality (Figure 1). The proposed developments will comprise 60m² double story simplexes, together with associated infrastructure.

The development proposals are as follows:

Erf 2954: Proposed 192 units and 288 parking bays with a building coverage of 5760m². The remaining open space area on the property will be 17 566m². Access will be via 4, Vaughan Goodwin Road, Shulton Park.

Erf 2955: Proposed 92 units and 139 parking bays with a building coverage of 2760m². The remaining open space area on the property will be 25 028m². Access will be via 26 Boekenhout Drive, Shulton Park.

Erf 2956: Proposed 106 units and 159 parking bays with a building coverage of 3180m². The remaining open space area on the property will be 30 375m². Access will be via 61 Karridale Drive, Shulton Park.

Note that only portions of each of these Erven are proposed for development, following vegetation assessments and discussions with eThekweni Municipality's Environmental Planning and Climate Protection Department (Styles 2018). These are indicated in Figure 1, and hereafter referred to as the 'footprints', while the full property is referred to as the 'study area'.

Water and power for the developments will be provided by the Municipality and sewage will be disposed into the existing trunk sewer which runs through the valley below the developments.

The central portion of the area (Erf 2957) is also owned by the client but is zoned open space. There will be no disturbance on this area with the exception of the sewer lines and possible stormwater discharge.



Figure 1. Aerial view of study site.

2.1 Survey Methods

The following methods were used:

- Desktop information relating to the fauna groups assessed was collated from literature, databases, previous studies and other sources, and high level strategic plans relating to faunal biodiversity were interrogated.
- The site was investigated using google-earth, and all areas requiring examination during the site visit were identified.
- A site visit was performed over 26 July, 2018. The purpose of this survey was to evaluate the diversity, condition and suitability of habitats present within the study area for supporting various faunal species. The assessment aimed to evaluate the footprints of the proposed development, as well as broadly assess the remainder of the study area and adjacent areas.

- All rare and threatened species or sensitive communities occurring or potentially occurring were identified (see next section) and the importance of the study area for these species was evaluated.

Limitations and assumptions

- The purpose of the field assessment was not to perform a biodiversity species inventory, given the fact that most faunal species are fairly cryptic and not easily detected within a short space of time. However, the techniques outlined above are considered adequate for the scope of this assessment.

2.2 Rare And Threatened Species

Using available information, all species considered of conservation importance that could occur on site were identified and are discussed. These are divided into two categories:

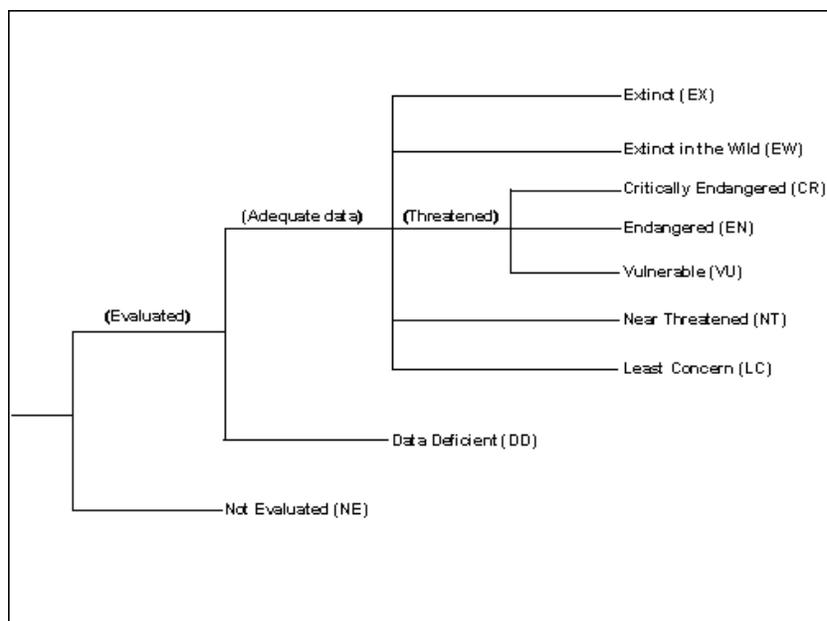
1) Red Data Species: Species that have been classified as under threat or potentially under threat, according to the International Union for the Conservation of Nature (IUCN) Redlisting system (See Box 1 and definitions below).

2) Other notable species: These species have not been classified as Threatened or Near Threatened according to published Red Data Books, but are considered notable for various reasons:

- Naturally rare
- Localised distributions
- Specialised habitat requirements
- May be close to threatened and their Red Data status could be re-evaluated in a forthcoming conservation assessment of the fauna group

Box 1: The Red List and Red Data Species.

The Red List and Red Data species system is an approach developed by the International Union for the Conservation of Nature (IUCN) for evaluating the conservation status of species and in particular for identifying and documenting those species most in need of conservation attention (IUCN 2008). In this system, species are evaluated against a series of objective criteria (available at iucn.org), and based on those criteria are placed in one of eight categories (see below). Species that fall within the Threatened and Near Threatened categories are known as Redlisted or Red Data Species.



Structure of IUCN Categories (from iucn.org)

IUCN Categories

Extinct – there is no reasonable doubt that the last individual of the species has died

Extinct in the Wild – the species no longer occurs in the wild, and is only found in cultivation or in captivity

Critically Endangered – the species is considered to be facing an extremely high risk of extinction in the wild, based on IUCN criteria

Endangered – the species is considered to be facing a very high risk of extinction in the wild, based on IUCN criteria

Vulnerable – the species is considered to be facing a high risk of extinction in the wild, based on IUCN criteria

Near Threatened – when evaluated against IUCN criteria, does not qualify for a Threatened category but is close to qualifying for or is likely to qualify in one of those categories in the near future

Least Concern – when evaluated against IUCN criteria, does not qualify for any category as Threatened or Near Threatened. Widespread and abundant species fall in this category

Data Deficient – there is inadequate information regarding the species' population size, distribution or threats for an assessment to be made

3. RESULTS

3.1 Site Characteristics and Habitat Diversity and Quality

The study area sits within a generally undulating topography, with altitude ranging between 10-60masl. A small number of stream lines dissect the area, and drain to the south. The area falls within the Indian Ocean Coastal Belt Biome, and is broadly defined as KwaZulu-Natal Coastal Belt (Mucina & Rutherford, 2006), in its natural state, a mosaic of subtropical forest with grassland in higher-lying areas. This vegetation type is considered Endangered.

In terms of fauna, the site can be broken into the following broad habitat types:

- Coastal forest – dense forest fills the valleys and extends up the slopes, where it intergrades with more recently forested areas on the higher slopes that have mosaics of alien vegetation (Figure 2 and 3).
- Alien plant-infested areas – extensive areas, primarily within the erven footprints of dense alien invasives, presumably where grassland was previously present (Figure 4 and 5)
- Grassland – a single, small (0.15ha), degraded, isolated piece of grassland is present within Erf 2954 (Figure 6).
- Aquatic systems – aquatic systems are limited within the study area. None are present within the proposed footprints. There are a few small, low gradient streams, in the valleys, with shallow rocky beds (Figure 7). There is little overhanging vegetation and fringing alien infestations are widespread. These streams have existing effluent input pipes releasing effluent into them.

Overview of footprint habitats

Erf 2954

This footprint consists primarily of dense alien vegetation, some of which has recently been cleared. It holds a small, isolated piece of grassland within its centre, and a portion of lower quality woody vegetation infiltrated with alien vegetation on the western edge.

Erf 2955

This footprint consists primarily of dense alien vegetation, with isolated indigenous trees within it. An area of lower quality woody vegetation is present along the western edge.

Erf 2956

Much of this footprint is covered by forest, although this is infiltrated by patches of alien vegetation. A relatively narrow section along the western edge is covered by uniform dense alien vegetation.



Figure 2 and 3. Indigenous forest in good condition, and forest infiltrated by alien vegetation, both on Z2956.



Figure 4 and 5. Dense, alien dominated thicket, widespread on 2954 and 2955.



Figure 6 and 7. Isolated grassland remnant on 2954, and a shallow, rocky stream in the central portion of the study area.

3.2 Strategic biodiversity planning

EKZN Wildlife Minset database

Minset

The minset database shows that the Erven 2954,2956 and 2957 fall within a ‘Critical Biodiversity Priority Area (Type 3 Optimal)’ (CBA3), while Erf 2955 falls within CBA3 and Biodiversity Areas, as based on the C-Plan Irreplaceability analyses (Figure 8) (EKZNW 2010).. These are defined as follows:

- CBA 3 Optimal areas are areas identified through systematic conservation planning software that represent the best localities out of a potentially larger selection of available Planning Units that are optimally located to meet both the conservation target but also the criteria defined within the Decision Support Layers. Using C-Plan, these areas are identified through the MINSET analysis process and reflect the negotiable sites with an Irreplaceability score of less than 0.8. Even though these areas may display a lower Irreplaceability value or selection frequency score than CBA1 and CBA2, it must be noted that these areas, together with the above two categories, collectively reflect the minimal reserve design required to meet the Systematic Conservation Plans targets and as such, they are also regarded as CBA areas.
- Areas identified as Biodiversity Areas (BAs) represent the natural and/or near natural environmental areas (i.e. non-transformed areas) not identified within the optimisation software output. Whilst it is preferred that development be focussed within these areas, this still has to be conducted in an informed and sustainable manner. Important species and ecosystem services can still be associated with these PU’s and should be accounted for in the EIA process.

Interrogation of these areas shows that no vertebrate fauna contribute specifically to these minset classifications. This does not preclude the presence of sensitive vertebrate fauna however, as these tools are derived and employed at a relatively coarse scale; faunal communities were looked at in greater detail during this study and are discussed in the following sections.

SEA

The SEA modelled the distribution of 255 red data and endemic species in KwaZulu-Natal, and allows for the prediction of potential occurrence of these priority species. Two vertebrate species are listed as potentially occurring within the study area – Pickersgill’s Reed Frog *Hyperolius pickersgilli*.and KwaZulu (Black-headed) Dwarf Chameleon *Bradypodion melanocephalum*. These two species are expected to be absent from the footprints – see following sections.

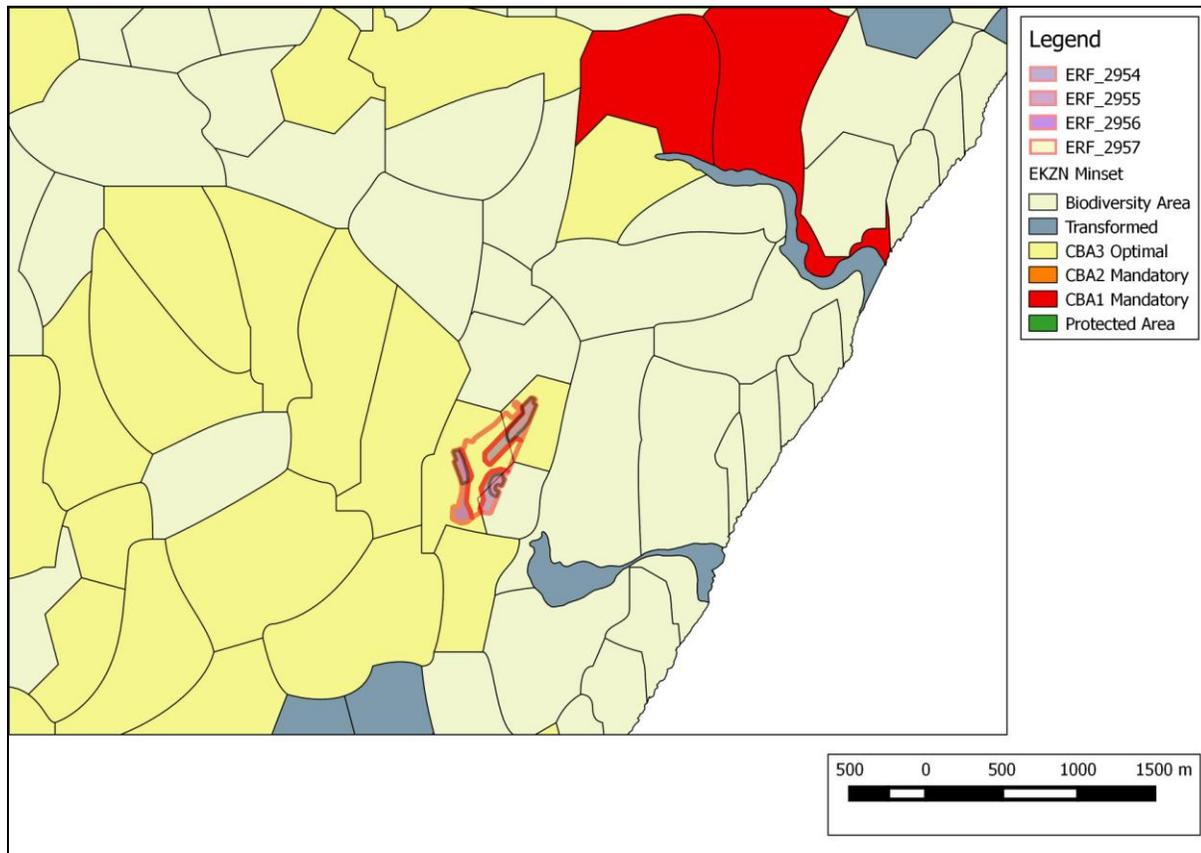


Figure 8. View of proposed development site overlain with the EKZNW Minset spatial dataset (EKZNW 2010).

Threatened Ecosystems

The Biodiversity Act (Act 10 of 2004) provides for listing threatened or protected ecosystems, in one of four categories: Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Protected, classified as such if satisfying one or more of six defining criteria. The purpose of listing threatened ecosystems is primarily to reduce the rate of ecosystem and species extinction. This includes preventing further degradation and loss of structure, function and composition of threatened ecosystems. Note: the data represents the original extent of listed ecosystems; in other words, natural areas which have been converted to agriculture, mining and urban areas have been included.

The study area falls within the junction of two threatened ecosystems – Interior South Coastal Grassland (KZN7) and Southern Coastal Grasslands (KZN18). Both ecosystems are listed as Critically Endangered. Both are classified based on Criterion F - Priority areas for meeting explicit biodiversity targets as defined by a systematic biodiversity plan, in this case, EKZNW's C-Plan. Relevant vertebrate faunal features contributing to the value of these areas for the broader study area are Pickersgill's Reed Frog *Hyperolius pickersgilli* and KwaZulu (Black-headed) Dwarf Chameleon *Bradypodion melanocephalum*. These two species are expected to be absent from the footprints – see following sections.

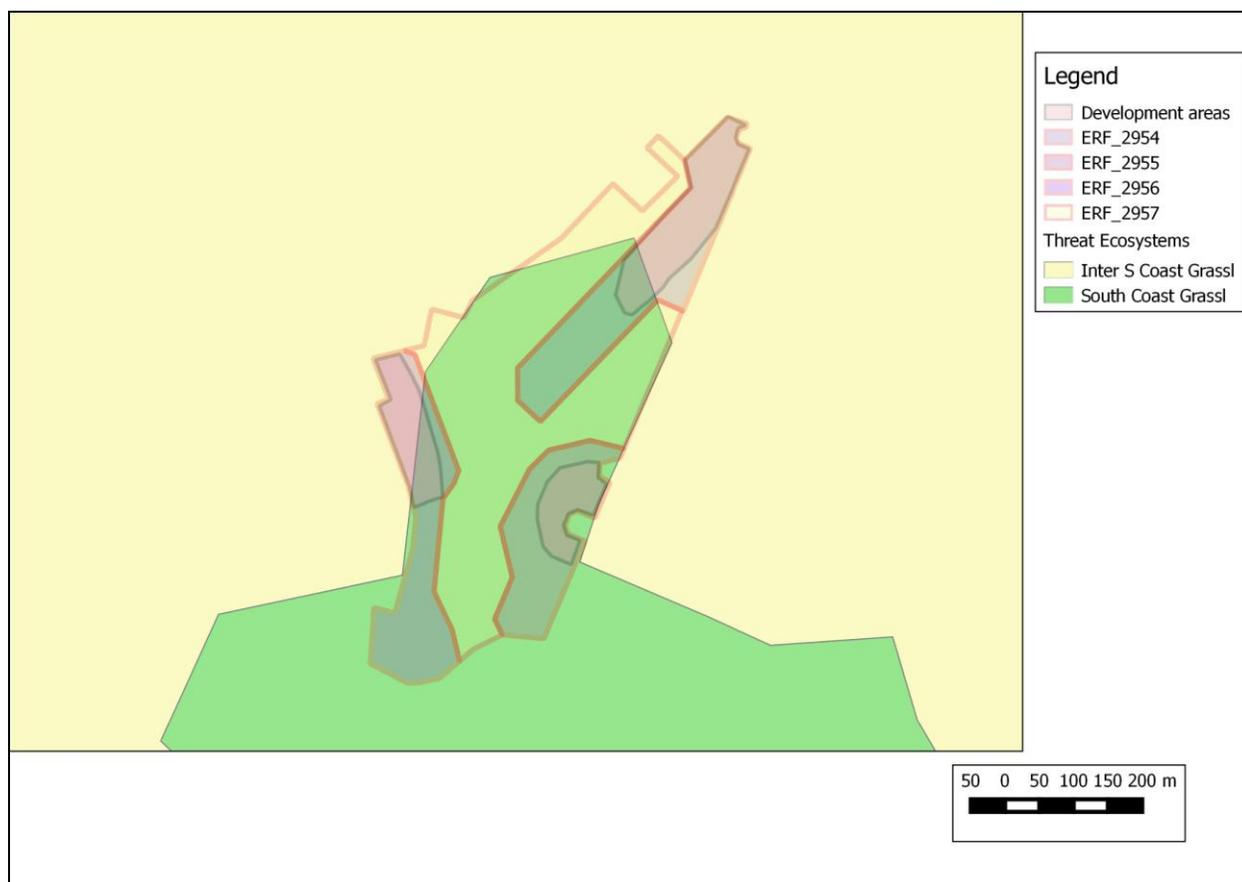


Figure 8. View of proposed development site overlain with the National Threatened Ecosystems dataset.

D'MOSS

D'MOSS is a system of open spaces that incorporates areas of high biodiversity value linked together in a viable network of open spaces within the eThekweni municipal area. Apart from contributing to the attainment of provincial and national biodiversity conservation targets, D'MOSS provides a range of ecosystem goods and services to all residents of Durban, including the formation of soil, erosion control, water supply and regulation, climate regulation, cultural and recreational opportunities, raw materials for craft and building, food production, pollination, nutrient cycling and waste treatment (www.durban.gov.za)

The map of the D'MOSS system shows that the bulk of the site falls within D'MOSS areas (Figure 13).

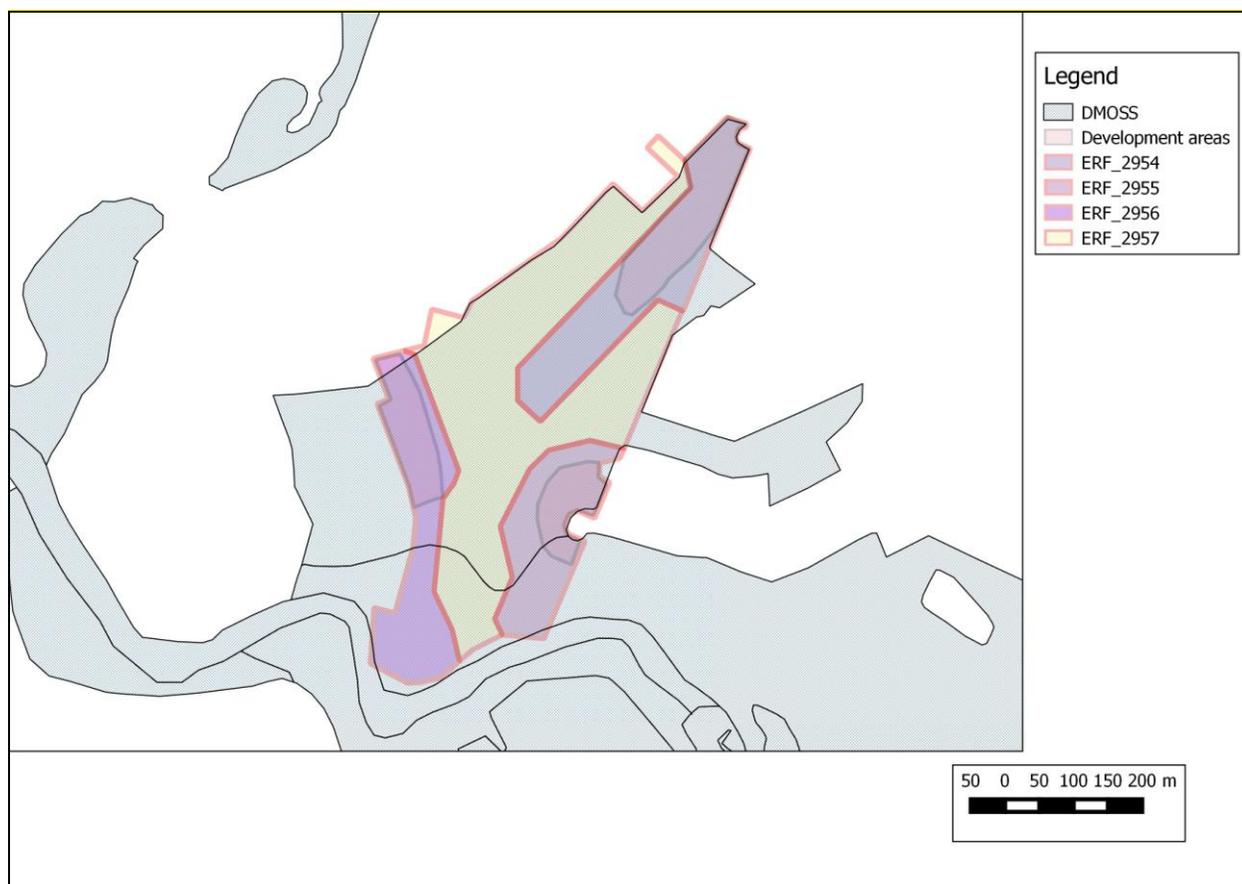


Figure 8. View of proposed development site overlain with the D'MOSS dataset.

Important Bird and Biodiversity Areas

Important Bird and Biodiversity Areas (IBAs) are sites of global significance for bird conservation, identified nationally through multi-stakeholder processes using globally standardised, quantitative and scientifically agreed criteria (Marnewick et al. 2015). The criteria for the identification of IBAs are based on the presence of 1) threatened species, 2) assemblages of restricted-range and biome-restricted species, and 3) large concentrations of congregatory species, referred to collectively as IBA 'trigger' species. The study site does not fall within or close to any IBAs.

3.3 Mammals

3.3.1 Diversity

Approximately fifty-five species of mammal are known to occur or likely to occur within the region (Friedmann & Daly 2004, Skinner & Chimimba 2005, Monadjem *et al.* 2010), although only a portion of these are expected to be present within the study site. The community is expected to consist primarily of a small number of rodents, shrews and small carnivores, several species of bats, and small number of antelope species. Very few species are expected to occur within the Erven footprints 2954 and 2955,

(primarily generalist species), given the limited habitats available and the degraded nature of much of the footprints. A number may utilise wooded portions of 2956, and particularly, the remainder of the study site.

3.3.2 Rare and Threatened Species

Four species of conservation importance are known to occur in the broader region (Child et al. 2016 2004; Monadjem *et al.* 2010), (Table 1). Some or all of these may be present within the forested areas of the study site. Erven footprints 2954 and 2955 are not expected to support any of these species. The wooded portion of the 2956 footprint may however support some these species, as will the remainder of the study site.

Table 1. Rare and threatened mammals occurring or likely to occur within the broader study area. (EN = Endangered, VU = Vulnerable, NT = Near Threatened, DD = Data Deficient)

English Name	Scientific name	RD Status	Occurrence in footprints	Occurrence elsewhere on or adjacent to study site	Comments
Dark-footed Forest Shrew	<i>Myosorex cafer</i>	RD – VU	Erven footprints 2954 and 2955 will not be utilized by the species. May utilise wooded portions of Erf 2956.	May occur throughout forested areas.	Forest and rank grassland.
Natal Red Duiker	<i>Cephalopus natalensis</i>	RD – NT	Erven footprints 2954 and 2955 will not be utilized by the species. May utilise wooded portions of Erf 2956.	May occur throughout forested areas.	Coastal and lowland forest.
Blue Duiker	<i>Philantomba monticola</i>	RD – VU	Erven footprints 2954 and 955 will not be utilized by the species. May utilise wooded portions of Erf 2956.	May occur throughout forested areas.	Occurs in a variety of forest types.
Damara Woolley Bat	<i>Kerivoula argentata</i>	RD – NT	Erven footprints 2954 and 2955 will not be utilized by the species. May utilise wooded portions of Erf 2956.	May occur throughout forested areas.	Primarily associated with riverine and coastal forest in South Africa.

3.4 Birds

3.4.1 Diversity

The study area falls within a broader area that supports a high diversity of species, with over 250 species recorded in the pentad that incorporates the site (Pentad 3000_3050; 9km x 9km in extent) (Harrison et al. 1996, SABAP2 2017), The study site will not support the full complement of these species, given the limited diversity of habitats present. However a good diversity of species that reflects the habitats available will utilise the study area, primarily comprised of forest and woodland specialists and habitat generalists that are capable of utilising degraded and secondary habitats. The footprint areas of Erf 2954 and 2955 hold a low diversity of species and have very few habitat specialists, given their very limited diversity of habitats and disturbed nature, while richness and number of specialists will be somewhat higher in the forested portions of the Erf 2956 footprint and particularly the remainder of the study area.

3.4.2 Rare and Threatened Species

A number of rare and threatened bird species have been recorded within the pentad that includes the site (Harrison et al. 1996, SABAP2 2018, Taylor et al. 2015) (Table 2). The majority of these species will not occur within the study area or the proposed footprints. Two species, Crowned Eagle (recorded overhead during the site visit) and Spotted Ground-Thrush may occur with some regularity within the study area. They will be mostly absent from the footprints, however the wooded of Erf 2956 may be utilised to some degree by these two species.

Table 2. Rare and threatened birds occurring or likely to occur within the broader study area. (EN = Endangered, VU = Vulnerable, NT = Near Threatened, DD = Data Deficient)

English Name	Scientific name	RD Status	Occurrence in footprints	Occurrence elsewhere on or adjacent to study site	Comments
Great White Pelican	<i>Pelecanus onocrotalus</i>	RD – VU	Habitat is not present within the study area. Will not occur within the footprint.	Habitat is not present within the study area. Will not occur	Open waterbodies.
Pink-backed Pelican	<i>Pelecanus rufescens</i>	RD – VU	Habitat is not present within the study area. Will not occur within the footprint.	Habitat is not present within the study area. Will not occur	Open waterbodies.
Black Stork	<i>Ciconia nigra</i>	RD – VU	Habitat is not present within the study area. Will not occur within the footprint.	Habitat is not present within the study area. Will not occur	Breeds in mountainous areas. Forages in adjacent open habitats, particularly along rivers.
Crowned Eagle	<i>Stephanoeatus coronatus</i>	RD – VU	Erven footprints 2954 and 2955 unlikely to be utilized by the species. Expected to forage over wooded portions of 2956.	Recorded during the site visit. Likely to forage over the study area and could potentially breed there.	Primarily associated with forest and other densely wooded habitats.
Lanner Falcon	<i>Falco biarmicus</i>	RD – VU	Habitat is not present. Will not occur within the footprint.	Unlikely to breed on site, may forage occasionally over the site	Breeds in mountainous areas or tall trees, utilizes surrounding natural habitats.
Grey Crowned Crane	<i>Balearica regulorum</i>	RD – EN	Habitat is not present within the study area. Will not occur within the footprint.	Habitat is not present within the study area. Will not occur.	Open, grassy wetlands.
Half-collared Kingfisher	<i>Alcedo semitorquata</i>	RD – NT	Habitat is not present within the study area. Will not occur within the footprint.	Habitat is not present within the study area. Will not occur.	Streams and coastal lakes in good condition
Mangrove Kingfisher	<i>Halcyon senegaloides</i>	RD – EN	Habitat is not present within the study area.	Habitat is not present within the study area. Will	Coastal river mouths

			Will not occur within the footprint.	not occur.	
Spotted Ground-Thrush	<i>Zoothera natalensis</i>	RD - EN	Will be absent from the majority of the footprints. May occasionally utilise the wooded portion of Erf Z956, although habitat is suboptimal	This species may utilise forest in better condition, primarily in the lower valleys of the study area.	Restricted to closed canopy coastal forest. There are several SABAP2 records of this species within the pentad.

3.5 Amphibians

3.5.1 Diversity

The study area sits within a broader area that supports high amphibian species diversity (Minter *et al.* 2004). In a biogeographical context, the study area primarily falls within a region that has been described in terms of amphibian fauna as the 'Maputaland assemblage' (Alexander *et al.* 2004), an area characterised by high species diversity within a national context, although with a fairly low level of endemism. Richness locally is high, with at least 20 species recorded from the Quarter Degree Cell (QDC) and surrounding areas (Minter *et al.* 2004). Most frogs are tied to some degree to aquatic habitats for part of their life-cycle, and will use seasonal or permanent wetlands, slow flowing streams and other waterbodies for breeding. However, they also require adjacent terrestrial habitats for foraging, sheltering (particularly during the dry season) and to facilitate dispersal between breeding sites.

Diversity and quality of aquatic habitats are fairly low within the study area and are absent from the footprint. The amphibian fauna present will be relatively species poor, with few breeding species present. The footprints' value for amphibians will be particularly low, given the lack of and distance from aquatic habitats, and the largely degraded quality of terrestrial habitats available.

3.5.2 Rare and Threatened Species

The site falls within an area that is known to support several conservation important species (Branch & Harrison 2005, Measey 2011) (Table 3). However, all of these species will be absent or rare from the study area, and the footprints in particular. Although the Endangered Pickersgill's Reed Frog is highlighted in strategic plans for the broader area, it will not be present within the footprints, and rare or likely absent from any part of the study area.

Table 3. Rare and threatened amphibians occurring or likely to occur within the broader study area. (EN = Endangered, VU = Vulnerable, NT = Near Threatened, DD = Data Deficient)

English Name	Scientific name	RD Status	Occurrence in footprints	Occurrence elsewhere on or adjacent to study site	Comments
Spotted Shovel-nosed Frog	<i>Hemisus guttatus</i>	RD - NT	No suitable habitat present. Will not occur within the footprints.	Potential breeding habitat is not present within the study area. Historically recorded in nearby Doon Heights area and may possibly utilise the southern edge of study area.	Breeds in standing and slow-moving aquatic systems, and moves widely in adjacent terrestrial habitats.
Pickersgill's Reed Frog	<i>Hyperolius pickersgilli</i>	RD - EN	No suitable habitat present. Will not occur within the footprints.	Potential breeding habitat is not present within the study area. Historically recorded in Kingsburgh area and may possibly utilise the southern edge of study area, but likely rare or absent.	Highly restricted, breeding in very densely vegetated coastal wetlands, and utilizes adjacent vegetated habitats. Highly threatened by habitat loss and fragmentation
Kloof Frog	<i>Natalobatrachus bonebergi</i>	RD - EN	No suitable habitat present. Will not occur within the footprints.	No suitable habitat is present. Will not occur within the study area.	A patchy and localized endemic. Restricted to riparian forest along rocky streams.
Power's Reed Frog	<i>Hyperolius poweri</i>	Rare; requires re-evaluation	No suitable habitat present. Will not occur within the footprints.	No suitable habitat is present. Will not occur within the study area.	A rare species that may require conservation protection. Breeds in wetlands with dense, emergent vegetation and utilizes adjacent terrestrial habitats

3.6 Reptiles

3.6.1 Diversity

In a national context, the broader region's reptile diversity is high, and the QDC and adjacent areas are in line with that, with at least 43 reptile species recorded (Bates et al. 2014). Six of these won't occur, as they are grassland species or require sandy soils, and no such quality habitat is available, however, it is likely that a fair proportion of the remainder are present in the study area. Diversity is expected to be low within the Erven 2954 and 2955 footprints, given the limited and highly modified habitat available, but somewhat higher in the forested portion of the Erf 2956 footprint.

3.6.2 Rare and Threatened Species

Five Red Data reptile species are known from the area (Bates *et al.* 2014) (Table 4). However, none of these are expected to occur within the bulk of the footprints, and most will not be present within the broader study area. Two species may occur, possibly within the forested portion of the Erf 2956 footprint, but primarily in the mature forest within the valleys. Although the Vulnerable KwaZulu Dwarf Chameleon is highlighted in strategic plans for the broader area, it will not be present within the footprints, and rare and local or absent from any part of the study area.

Table 4. Rare and threatened reptiles occurring or likely to occur within the broader study area. (EN = Endangered, VU = Vulnerable, NT = Near Threatened, DD = Data Deficient)

English Name	Scientific name	RD Status	Occurrence in footprints	Occurrence elsewhere on or adjacent to study site	Comments
Large-scaled Grass Lizard	<i>Chamaesaura macrolepis</i>	RD - NT	Grassland is inadequate in extent and quality, will not occur	Adequate grassland habitat is not present, and this species will not occur.	Localised grassland specialist in eastern South Africa.
Black-headed (Kwazulu) Dwarf Chameleon	<i>Bradypodion melanocephalum</i>	RD - VU	Despite historical records from nearby (ca 1km) to the east of the site, habitat available is currently highly suboptimal. Expected to be absent from the footprint.	Likely to be absent from the majority of the site. May possibly still be present on the southern periphery, along the Little Amanzimtoti River, but this is some distance from the footprint.	The coastal population of KDC occurs mainly long river valleys, mostly in rank, tall-grass areas that are burnt infrequently, reedbeds and riparian vegetation associated with wetlands and drainage lines, and along or near ecotones between forest and grassland . While they will utilise alien plants within a matrix of indigenous vegetation, they are rare or absent in areas that are heavily invaded by alien plants.
Green Mamba	<i>Dendroaspis angusticeps</i>	RD - VU	Likely absent from 2954, 2955. Possibly present in the wooded portion of 2956, although habitat not optimal.	May occur in better quality forest, particularly in the lower valleys.	Restricted to coastal KZN and northern Eastern Cape and confined to coastal forest.
Natal Back Snake	<i>Macrelaps microlepidotus</i>	RD - NT	Likely absent from Z954, Z955. Possibly present in the wooded portion of Z956, although habitat not optimal.	May occur in better quality forest, particularly in the lower valleys.	Confined to forest and occasionally grassland. A South African endemic with a fairly localised distribution.
Durban Dwarf Burrowing Skink	<i>Scelotes inornatus</i>	RD - CR	Soil and vegetation are not suitable – will not occur.	Although there are nearby records, the site has hard, clayey soils, unsuitable to this species, and it will not occur.	A highly localised endemic to the central KwaZulu-Natal coast, occurring in forest and adjacent grassland on sandy soils.

4. CONCLUSIONS AND RECOMMENDATIONS

This assessment determined that much of the proposed footprint areas are currently of low value for faunal biodiversity, but there are areas of higher biodiversity value within a portion of the Erf 2956 footprint, and particularly elsewhere within the study area. These areas potentially support some sensitive species and semi-pristine faunal communities. If those areas are adequately protected however, fauna is unlikely to be substantially negatively affected by this development. The following recommendations are made:

- Although forming part of the D'MOSS, from a faunal perspective, the Erven 2954 and 2955 footprints are highly disturbed and of limited value in their current state. The grassland patch within Erf 2954 is too small, degraded and isolated to support any grassland species. It is perhaps possible that they could be rehabilitated to some useful state, but this would take substantial investment and time. They are therefore considered acceptable for development, provided the final development footprints do not extend beyond those provisional footprints provided.
- The Erf Z2956 footprint is not ideal for development, given that much of it is forested, and contributes to the ecological functioning of the DMOSS zone, and may support sensitive vertebrate species. It would be preferable to reduce and restrict any development footprint to the northern and north-western portion if possible.
- Areas away from the infrastructure footprints should be managed appropriately and not disturbed in order to maintain the biodiversity they support.
- Care must be taken to minimise the impacts of installing and operating sewer lines within the forest areas outside of the footprints.
- With the proposed levelling, and an increase in impermeable surfaces within the infrastructure footprint area, there will likely be a change in the amounts and temporal patterns of stormflow runoff. This has the potential to negatively impact the receiving drainagelines and forested slopes, through increased rates of erosion, sedimentation and introduction of contaminants from the footprint areas. An appropriate stormflow management plan must be designed and implemented to ensure that the forested slopes below the footprints are not eroded or otherwise impacted
- During construction and operation, all efforts must be made to minimise sediment input, pollution and disturbance to areas away from the infrastructure footprint area - no waste or materials of any kind must be allowed to enter the surrounding areas during construction or operation.
- An alien plant control programme (including monitoring) should be designed and implemented for areas adjacent to the proposed infrastructure footprint area. This needs to be implemented by appropriately qualified personnel, as approved by EPCPD.

7. REFERENCES

Alexander, G.A., J.A. Harrison, D.H. Fairbanks and R.A. Navarro. Biogeography of the Frogs of South Africa, Lesotho and Swaziland. In: Minter, L.R., M. Burger, J.A. Harrison, H.H. Braack, P.J. Bishop & D. Kloefder. (EDS.) 2004. *Atlas and Red Data Book of the Frogs of South Africa, Lesotho and Swaziland*. 9SI/MAB SERIES Smithsonian Institute, Washington, U.S.A.

Bates, M.F., Branch, W.R., Bauer, A.M., Burger, M., Marais, J., Alexander, G.J. & de Villiers, M. 2014. *Atlas and Red List of the Reptiles of South Africa, Lesotho and Swaziland*. South African National Biodiversity Institute, Pretoria.

Child M.F., Roxburgh L., Do Linh San E., Raimondo D. & Davies-Mostert H.T., editors. 2016. *The Red List of Mammals of South Africa, Swaziland and Lesotho*. South African National Biodiversity Institute and Endangered Wildlife Trust, South Africa.

EKZNW (2010) Terrestrial Systematic Conservation Plan: Minimum Selection Surface (MINSET). Unpublished GIS Coverage [tscp_minset_dist_2010_wll.zip], Biodiversity Conservation Planning Division, Ezemvelo KZN Wildlife, P. O. Box 13053, Cascades, Pietermaritzburg, 3202.

Friedmann, Y. & B. Daly (2004). *Red Data Book of Mammals of South Africa: A Conservation Assessment*. South Africa, Conservation Specialist Breeding Group, Endangered Wildlife Trust.

Marnewick, M.D., Retief, E.F., Theron, N.T., Wright, D.R. & Anderson, T.A. 2015. *Important Bird and Biodiversity Areas of South Africa*. Johannesburg: BirdLife South Africa.

Minter, L.R., M. Burger, J.A. Harrison, H.H. Braack, P.J. Bishop & D. Kloefder. (EDS.) 2004. *Atlas and Red Data Book of the Frogs of South Africa, Lesotho and Swaziland*. 9SI/MAB SERIES Smithsonian Institute, Washington, U.S.A.

Measey, G.J. (Ed.) 2011. Ensuring a future for South Africa's frogs: a strategy for conservation research. *SANBI Biodiversity Series* 19. South African National Biodiversity Institute, Pretoria.

Monadjem, A., P.J. Taylor, F.P.D. Cotterill & M.C. Schoeman. 2010. *Bats of Southern and Central Africa: A biogeographic and taxonomic synthesis*. Wits University Press, Johannesburg.

Mucina, L. & M.C. Rutherford. 2006. The Vegetation of South Africa, Lesotho and Swaziland. *Strelitzia*: (19).

South African Bird Atlas Project 2. Available at <http://sabap2.adu.org.za/>

Skinner, J.D. & C.T. Chimimba. 2005. *The Mammals of the Southern African Subregion*. Cambridge University Press, Capetown.

Styles, D. 2018. Reassessment of Vegetation on Erven 2954, 2955 and 2956 Kingsburgh. Report.

Taylor, M.R., Peacock, F. & R.M. Wanless. 2015. *The 2015 Eskom Red Data Book of Birds of South Africa, Lesotho and Swaziland*. Birdlife South Africa, Johannesburg.