WILD TOMORROW FUND

Proposed Construction of a Donor House & Associated Infrastructure, Ukuwela Nature Reserve

Terrestrial Ecological Assessment

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DETAILS OF SPECIALIST CONSULTANT

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Confidentiality Statement

TERRESTRIAL ECOLOGICAL ASSESSMENT FOR LODGES PROPOSED AT THE GREATER UKUWELA NATURE RESERVE, UMKHANYAKUDE DISTRICT MUNICIPALITY, KWAZULU-NATAL PROVINCE
DRAFT REPORT

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SPECIALISTS DECLARATION

I, Mark Summers as the appointed independent specialist, in terms of the 2014 EIA Regulations, hereby declare that I:

- act as the independent specialist in this application;
- 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;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014 and any specific environmental management Act;
- declare that there are no circumstances that may compromise my objectivity in performing such work;
- have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- will comply with the Act, Regulations and all other applicable legislation;
- have no, and will not engage in, conflicting interests in the undertaking of the activity;
- have no vested interest in the proposed activity proceeding;
- undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- all the particulars furnished by me in this specialist input/study are true and correct; and
- realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of specialist:

Name of specialist: Mark Summers
Date: October 2021

SPECIALISTS DECLARATION

I, Jake Alletson as the appointed independent specialist, in terms of the 2014 EIA Regulations, hereby declare that I:

- act as the independent specialist in this application;
- 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;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014 and any specific environmental management Act;
- declare that there are no circumstances that may compromise my objectivity in performing such work;
- have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- will comply with the Act, Regulations and all other applicable legislation;
- have no, and will not engage in, conflicting interests in the undertaking of the activity;
- have no vested interest in the proposed activity proceeding;
- undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- all the particulars furnished by me in this specialist input/study are true and correct; and
- realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of specialist:

Name of specialist: Jake Alletson
Date: October 2021

TERMS OF REFERENCE

The study was to adhere to the following:

- Adherance to the content requirements of Terrestrial Plant and Animal Species Protocols, as per Government Notice No. 1150 of 30 October 2020.
- Adherence to all appropriate best practice guidelines, relevant legislation and authority requirements.
- Provide a thorough overview of all applicable legislation, guidelines.
- Cumulative impact identification and assessment
- Identification of sensitive areas to be avoided.
- Assessment of the significance of the proposed development during the Pre-construction, Construction, Operation, Decommissioning Phases and Cumulative impacts. Potential impacts should be rated in terms of the direct, indirect and cumulative.
    - Direct impacts: are impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity. These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.
    - Indirect impacts: of an activity are indirect or induced changes that may occur as a result of the activity. These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken, or which occur at a different place as a result of the activity.
    - Cumulative impacts: are impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities. Cumulative impacts can occur from the collective impacts of individual minor actions over a period of time and can include both direct and indirect impacts.
- Comparative assessment of alternatives (if alternatives provided).
- Implications of specialist findings for the proposed development (e.g. permits, licenses etc.).
- Specify if any further assessment will be required.
- Include an Impact Statement, concluding whether project can be authorised or not.
- Recommend mitigation measures in order to minimise the impact of the proposed development.

Specific issues to be addressed are as follows:

- Review existing ecological information available;
- Determine the general ecological state of the proposed sites, determine the occurrence of any red data and/or vulnerable species, or any sensitive species requiring special attention;
- Provide a detailed description of the baseline environment; and
- Provide mitigation measures to prevent and/or mitigate any environmental impacts that may occur due to the proposed project.

ASSUMPTIONS AND LIMITATIONS

The following assumptions, limitations, uncertainties are listed regarding the ecological assessment of the site:

- The study was undertaken in summer and winter, however good rains have meant that vegetation could still be identified by leaves and remnant flowers;
- No bulbs were identified, and it is likely due to late season sampling;
- Rare and threatened plant species are, by their nature, usually very difficult to locate and can be easily missed.
- It must be assumed and accepted that many plant species, in particular geophytes and annuals, will be absent from the visible species assemblage;
- The assessment area was limited to the Donor House, Tented Camp, Managers House and FreeMe Site;
- This study has only focused on the identification of flora and faunal species that may occur on site, or that were noted on site during fieldwork. Night time surveying was not undertaken.
- Faunal assessments dealing with reptiles and birds are best undertaken during the warmer months of the year, as these species brumate or migrate during the winter months. Sampling occurred in summer (February 2021) and winter (July 2021). Migratory bird species have left the area; therefore,

a decreased species assemblage was expected during the winter months. However, faunal activity is still dependent on weather conditions experienced on the day of sampling.

- Paucity in the data due to late season sampling is expected.

ACRONYMS

ADU	Animal Demographic Unit
AIS	Alien and Invasive species
BA	Basic Assessment
CBA	Critical Biodiversity Area
CARA	Conservation of Agricultural Resources Act (Act No. 43 of 1983)
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DFFE	Department of Environment, Forestry and Fisheries
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECA	Environment Conservation Act (Act No. 73 of 1989
ECO	Environmental Control Officer
EDTEA	Economic Development, Tourism and Environmental Affairs
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMPr	Environmental Management Programme
ESA	Ecological Support Area
GIS	Geographical Information System
GUNR	Greater Ukuwela Nature Reserve
IUCN	International Union for Conservation of Nature
NEMA	National Environmental Management Act National Environmental Management Act, (Act No. 107 of 1998)
NEM:BA	National Environmental Management: Biodiversity Act
NEM:PAA	National Environmental Management: Protected Areas Act of 2003
NFA	National Forests Act (Act No. 84 of 1998)
NFEPA	National Freshwater Ecosystem Priority Areas
PA	Protected Area
POC	Potential of Occurence
SABAP2	South African Bird Atlas Project 2
SANBI	South African National Biodiversity Institute
SCC	Species of conservation concern
SEA	Strategic Environmental Assessment
ToPS	Threatened and Protected Species
ToR	Terms of Reference
TSCP	Terrestrial Systematic Conservation Plan
WTF	Wild Tomorrow Fund

GLOSSARY

Definitions	
Alternative	Alternatives can refer to any of the following but are not limited to: alternative sites for development, alternative projects for a particular site, alternative site layouts, alternative designs, alternative processes and alternative materials.
Biodiversity	The diversity of genes, species and ecosystems, and the ecological and evolutionary processes that maintain that diversity.
Biodiversity offset	Conservation measures designed to remedy the residual negative impacts of development on biodiversity and ecological infrastructure, once the first three levels of the mitigation hierarchy have been explicitly considered (i.e. to avoid, minimize and rehabilitate / restore impacts). Offsets are the last resort form of mitigation, only to be implemented if nothing else can mitigate the impact.

Definitions	
Biodiversity priority areas	Features in the landscape that are important for conserving a representative sample of ecosystems and species, for maintaining ecological processes, or for the provision of ecosystem services. These are identified using a systematic spatial biodiversity planning process and include the following categories: Protected Areas, Critically Endangered and Endangered ecosystems, Critical Biodiversity Areas, Ecological Support Areas, and Focus Areas for land-based Protected Area expansion.
Category 1a Listed Invasive Species	Species listed by notice in terms of section 70(1)(a) of the act, as a species that must be combatted or eradicated. These species are contained in Notice 3 of the AIS list, which is referred to as the National List of Invasive Species. Landowners are obliged to take immediate steps to control Category 1a species.
Category 1b Listed Invasive Species	Species listed by notice in terms of section 70(1)(a) of the act, as species that must be controlled or 'contained'. These species are contained in Notice 3 of the AIS list, which is referred to as the National List of Invasive Species. However, where an Invasive Species Management Programme has been developed for a Category 1b species, then landowners are obliged to "control" the species in accordance with the requirements of that programme.
Category 2 Listed Invasive Species	Species which require a permit to carry out a restricted activity e.g. cultivation within an area specified in the Notice or an area specified in the permit, as the case may be. Category 2 includes plant species that have economic, recreational, aesthetic or other valued properties, notwithstanding their invasiveness. It is important to note that a Category 2 species that falls outside the demarcated area specified in the permit, becomes a Category 1b invasive species. Permit-holders must take all the necessary steps to prevent the escape and spread of the species.
Category 3 Listed Invasive Species	A species listed by notice in terms of section 70(1)(a) of the act, as species which are subject to exemptions in terms of section 71(3) and prohibitions in terms of section 71A of the act, as specified in the notice. Category 3 species are less-transforming invasive species which are regulated by activity. The principal focus with these species is to ensure that they are not introduced, sold or transported. However, Category 3 plant species are automatically Category 1b species within riparian and wetland areas.
CBA Maps	A map of Critical Biodiversity Areas and Ecological Support Areas based on a systematic biodiversity plan.
Connectivity	The spatial continuity of a habitat or land cover type across a landscape.
Corridor	A relatively narrow strip of a particular type that differs from the areas adjacent on both sides.
Critical Biodiversity Areas	Areas required to meet biodiversity targets of representivity and persistence for ecosystems, species and ecological processes, determined by a systematic conservation plan. They may be terrestrial or aquatic, and are mostly in a good ecological state. These areas need to be maintained in a natural or near-natural state, and a loss or degradation must be avoided. If these areas were to be modified, biodiversity targets could not be met.
Cumulative impact	Past, current and reasonably foreseeable future impacts of an activity, considered together with the impact of the proposed activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities.
Ecological condition	An assessment of the extent to which the composition, structure and function of an area or biodiversity feature has been modified from a reference condition of natural.
Ecological infrastructure	Naturally functioning ecosystems that generate or deliver valuable ecosystem services, e.g. mountain catchment areas, wetlands, and soils.
Ecological process	The functions and processes that operate to maintain and generate biodiversity.
Ecological Support Areas	An area that must be maintained in at least fair ecological condition in order to support the ecological functioning of a CBA or protected area, or to generate or deliver ecosystem services, or to meet remaining biodiversity targets for ecosystem types or species when it is not possible or necessary to meet them in

Definitions	
	natural or near natural areas. It is one of five broad categories on a CBA map, and a subset of biodiversity priority areas.
Ecosystem resilience	The ability of an ecosystem to maintain its functions (biological, chemical, and physical) in the face of disturbance or to recover from external pressures.
Ecosystem threshold	The tipping point where ongoing disturbance or change results in an irreversible change in its composition, structure and functioning. Surpassing ecosystem thresholds diminishes the quality and quantity of ecosystem services provided, rapidly reduces the ability of the ecosystem to sustain life, and results in less resilient ecosystems.
Ecosystem services	The benefits that people obtain from ecosystems, including provisioning services (such as food and water), regulating services (such as flood control), cultural services (such as recreational benefits), and supporting services (such as nutrient cycling, carbon storage) that maintain the conditions for life on Earth.
Edge	The portion of an ecosystem or cover type near its perimeter, and within which environmental conditions may differ from interior locations in the ecosystem.
Endemic	Restricted or exclusive to a particular geographic area and occurring nowhere else. Endemism refers to the occurrence of endemic species.
Exempted Alien Species	An alien species that is not regulated in terms of this statutory framework - as defined in Notice 2 of the AIS List.
Forbs	Herbaceous plants with soft leaves and non-woody stems.
Fragmentation	The breaking up of a habitat or cover type into smaller, disconnected parcels, often associated with, but not equivalent to, habitat loss.
Geophyte	Perennial plants having underground organs, such as bulbs, corms or tubers.
Hotspot	An area characterised by high levels of biodiversity and endemism, and that faces significant threats to that biodiversity.
Habitat	The area of an environment occupied by a species or group of species, due to the particular set of environmental conditions that prevail there.
Habitat loss	Conversion of natural habitat in an ecosystem to a land use or land cover class that results in irreversible change to the composition, structure and functional characteristics of the ecosystem concerned.
Prohibited Alien Species	An alien species listed by notice by the Minister, in respect of which a permit may not be issued as contemplated in section 67(1) of the act. These species are contained in Notice 4 of the Alien Invasive Species List, which is referred to as the List of Prohibited Alien Species.
Mitigate	The implementation of practical measures to reduce adverse impacts or enhance beneficial impacts of an action.
"No-Go" option	The “no-go” development alternative option assumes the site remains in its current state, e.g. there is no construction of a WEF and associated infrastructure in the proposed project area.
Patch	A surface area that differs from its surroundings in nature or appearance.
Red List	A publication that provides information on the conservation and threat status of species, based on scientific conservation assessments.
Rehabilitation	Less than full restoration of an ecosystem to its pre-disturbance condition.
Restoration	To return a site to an approximation of its condition before alteration.
Riparian	The land adjacent to a river or stream that is, at least periodically, influenced by flooding.
Runoff	Non-channelized surface water flow.
Succulent	Plants that have some parts that are more than normally thickened and fleshy, usually to retain water in arid climates or soil conditions.
Species of special / conservation concern	Species that have particular ecological, economic or cultural significance, including but not limited to threatened species.
Systematic biodiversity conservation planning	Scientific methodology for determining areas of biodiversity importance involving: mapping biodiversity features (such as ecosystems, species, spatial components of ecological processes); mapping a range of information related to these biodiversity features and their condition (such as patterns of land and

Definitions	
	resource use, existing protected areas); setting quantitative targets for biodiversity features, analysing the information using GIS; and developing maps that show spatial biodiversity priorities. Systematic biodiversity planning is often called 'systematic conservation planning' in the scientific literature.
Threatened ecosystems	An ecosystem that has been classified as Critically Endangered, Endangered or Vulnerable, based on analysis of ecosystem threat status. A threatened ecosystem has lost, or is losing, vital aspects of its structure, composition or function. The Biodiversity Act makes provision for the Minister or Environmental Affairs, or a provincial MEC of Environmental Affairs, to publish a list of threatened ecosystems.
Threatened species	A species that has been classified as Critically Endangered, Endangered or Vulnerable, based on a conservation assessment using a standard set of criteria developed by the IUCN for determining the likelihood of a species becoming extinct. A threatened species faces a high risk of extinction in the near future.

COMPLIANCE WITH SPECIES SPECIFIC PROTOCOLS AS PER GN. 1150 OF 30 OCTOBER 2020

Requirements of Animal and Plant Species Protocol – GN. 1150 30 October 2020 for Very High or High Site Sensitivity	**Section of specialist report addressing requirement**
This report must include as a minimum the following information:	
Contact details and relevant experience as well as the SACNASP registration number of the specialist preparing the assessment including a curriculum vitae;	**Appendix 7**
A signed statement of independence by the specialist;	**See Specialist Declaration on page vii and viii**
A statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	**See Section 3: Site Visit and Sampling Methodology**
A description of the methodology used to undertake the site sensitivity verification, impact assessment and site inspection, including equipment and modelling used where relevant;	**Section 3, Section 4 and Section 5**
A description of the mean density of observations/number of sample sites per unit area and the site inspection observations;	**Section 6 and Section 7**
A description of the assumptions made and any uncertainties or gaps in knowledge or data;	**See Assumptions and Limitations**
Details of all SCC found or suspected to occur on site, ensuring sensitive species are appropriately reported;	**Section 6 and Section 7**
The online database name, hyperlink and record accession numbers for disseminated evidence of SCC found within the study area;	**Section 6**
The location of areas not suitable for development and to be avoided during construction where relevant;	**Section 8**
A discussion on the cumulative impacts;	**Section 8**
Impact management actions and impact management outcomes proposed by the specialist for inclusion in the Environmental Management Programme (EMPr);	**Section 8**
A reasoned opinion, based on the findings of the specialist assessment, regarding the acceptability or not of the development and if the development should receive approval or not, related to the specific theme being considered, and any conditions to which the opinion is subjected if relevant; and	**Section 8.9 and Section 9**
A motivation must be provided if there were any development footprints identified as per paragraph above that were identified as having "low" or "medium" terrestrial animal species sensitivity and were not considered appropriate.	**Section 1**

1. INTRODUCTION

SiVEST SA (Pty) Ltd, has been appointed by Wild Tomorrow Fund to undertake a terrestrial biodiversity assessment in relation to the proposed development within the Greater Ukuwela Nature Reserve (GUNR) located in the Big 5 False Bay Local Municipality (KZN273) section of the Umkhanyakude District Municipality (DC27) near the town of Hluhluwe, KwaZulu-Natal.

The Greater Ukuwela Nature Reserve has been registered as an Ezemvelo KZN Wildlife Biodiversity Stewardship Site and as such is proclaimed as a Protected Area as defined within the National Environmental Management: Protected Areas Act of 2003 (NEMPAA), as amended.

Please note, although a site inspection showed site sensitivity to be medium to low, a full Terrestrial Impact Assessment was undertaken as species of conservation concern (SCC) occur on affected sites; as per section 4.6 of the Plant / Animal Species Protocols of Government Notice No. 1150 of 30 October 2020, "*Where SCC are found on site or have been confirmed to be likely present, a Terrestrial Plant / Animal Species Specialist Assessment must be submitted in accordance with the requirements specified for "very high" and "high" sensitivity in this protocol*."

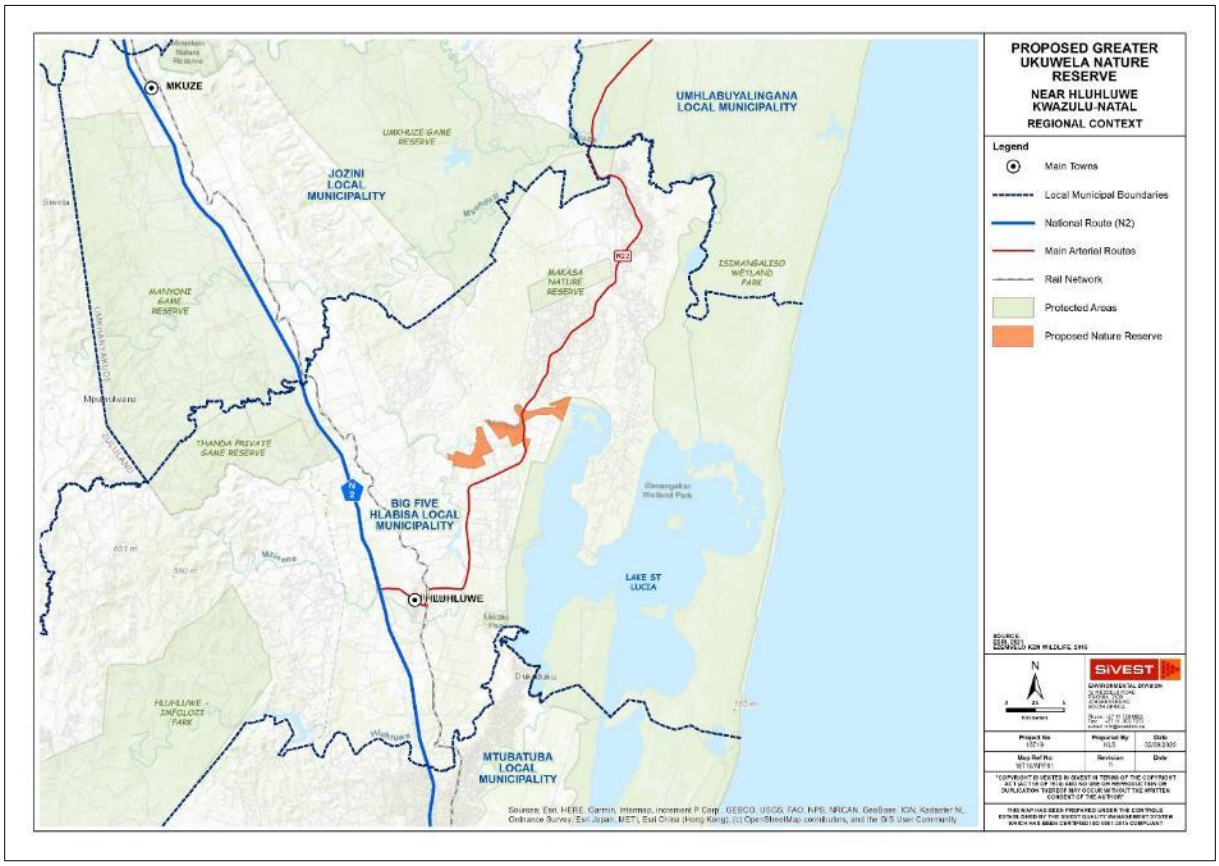

Figure 1: Regional context.

2. PROJECT BACKGROUND BACKGROUND

Wild Tomorrow Fund (WTF) are proposing the construction of a donor house, management house, tented camp, access roads and in conjunction with FreeMe, a facility on the recently proclaimed GUNR, neighbouring the Mun-Ya-Wana and Isimangaliso Wetland Park. The GUNR comprises of two property portions, with Ukuwela in the west (540.8ha) and Mfuleni in the east (742.3ha). Historically, both properties have had various farming activities occur, such as livestock farming, and cultivation of pineapple and sisal. The current land use is conservation, and over time rehabilitation of the historical farming areas through direct management and natural rehabilitation has taken place.

The proposed development is to include the following components:

- A Donor House
- Decking, Terraces, Landscaping and Walkways
- A Reserve Office Complex
- A Tented Camp
- A Managers House
- Various internal access roads / tracks for reserve management / game viewing (Gravel Roads Proposed)
  The following sevices are anticipated:
- Potable water provision will be via a municipal source;
- On site sewer treatment will be required (Septic Tank and Soakaway System); and
- Electrical supply will be via Eskom.

As such, this Terrestrial Ecological Report has assessed various aspects of the terrestrial ecology and provided recommendations. A similar report has been prepared for the aquatic ecosystems.

In terms of the ecological assessment, fieldwork was focused on areas where developments are planned.

3. REGULATIONS GOVERNING THIS REPORT & LEGISLATION

The following legislation was consulted:

- Conservation of Agricultural Resources Act (Act No. 43 of 1983) (CARA)as amended in 2001;
- Environment Conservation Act (Act No. 73 of 1989) (ECA), Amendment Notice No. R1183 of 1997;
- International Union for Conservation of Nature (IUCN).
- National Environmental Management Act, Act No. 107 of 1998 (NEMA);
- National Forests Act (Act No. 84 of 1998) (NFA);
- Terrestrial Plant and Animal Species Protols, Government Notice No. 1150 of 30 October 2020;
- National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEM:BA);
- National Environmental Management: Protected Areas Act of 2003 (NEM: PAA)

4. SITE VISIT AND SAMPLING METHODOLOGY

The site visit was undertaken on the 26th February by Liandra Scott-Shaw and on 8th July 2021 by Mark Summers and Jake Alletson. On both site inspections, the weather was warm with low winds. The study was undertaken in Summer and Winter, however good rains on the Maputaland Coastal Plain have meant that vegetation could still be identified by leaves and remnant flowers.

4.1. Vegetation Sampling

A random vegetation sampling technique and “hotspot1” assessment technique was utilised, which focused the sampling effort on areas with natural vegetation or where the vegetation was dominated by indigenous species (i.e. not comprising a large proportion of alien invasive plant species). Individual plant species observed during the assessment were recorded to give an indication of species diversity and the overall species assemblage.

The sampling procedure proposed for this study is satisfactory for providing a general overview and rapid assessment of the plant diversity and assemblages that occur on site. This methodology allows

[1] **Hotspot in this context refers to areas in the landscape, such as rocky outcrops and wetlands that supply refugia to plant species that would otherwise not exist in said landscape due to disturbance**.

sufficient information to be gathered to make the necessary inferences as to the ecological state of the receiving environment and to assess the possible impacts that may be imparted as a result of the proposed activities.

4.2. Faunal Sampling

The following methodology was used when sampling:

- Taxa specific lists were compiled with the use of databases such as the Animal Demographic Unit (ADU) Virtual Museum. These lists were compared with species seen on site visits.
- All site data was collated for the general area with a focus on the various alternatives presented, which gave an overall site assessment;
- Verification of fauna on site was done per taxa with a focus on movement, foraging, nesting and sites.
- Point count bird surveys, with a clear view of the surrounding vegetation, and walk through surveys were conducted in all of the habitat types around proposed development sites. Birds were identified visually or by their vocalisation.
- Active searches for reptiles and amphibians were conducted within habitats likely to harbour or be important for species.

The sampling procedure proposed for this study is satisfactory for providing a general overview and rapid assessment of the faunal diversity and assemblages that occur on site. This methodology allows sufficient information to be gathered to make the necessary inferences as to the ecological state of the receiving environment and to assess the possible impacts that may be imparted as a result of the proposed activities as well as the provision for rehabilitation recommendations and landscape management plans.

4.3. Permit / Licence requirements

In terms of the National Forests Act, 1998 (Act No. 84 of 1998) and Government Notice 1339 of 6 August 1976 (promulgated under the Forest Act, 1984 (Act No. 122 of 1984) for protected tree species), the removal, relocation or pruning of any protected plants; or, 3 or more indigenous trees whose crowns are largely contiguous will require a Department of Agriculture, Fisheries and Forestry (DAFF) license.

Protected indigenous plants in general are controlled under the relevant provincial Ordinances or Acts dealing with nature conservation. In KZN the relevant statute is the 1974 Provincial Nature Conservation Ordinance. In terms of this Ordinance, a permit must be obtained from Ezemvelo KZN Wildlife to remove or destroy any plants listed in the Ordinance.

For a full list of legistation requirements, please contact the Specialist.

5. DESKTOP ASSESSMENT

One of the major advantages that technology has provided is the access to information. As a result of this and the ongoing pursuance of environmental knowledge, databases which can be interrogated to provide general information regarding the site have been developed.

This information in turn potentially predicts what may occur on the site and the site's value from a regional / provincial perspective in terms of conservation and biodiversity.

The caveat here is that the majority of these databases are created at a **landscape level**. In addition, the factors which are often utilised to determine many of the outputs are related to abiotic characteristics, such as rainfall, temperature, soil types, underlying geology, elevation and aspect.

The result, therefore, is the development of a database that provides a preliminary assessment of the area, which still requires **substantial ground-truthing** to illustrate the various components that comprise the landscape. The field survey may highlight areas of conservation significance and

biodiversity richness as well as provide information regarding the *status quo;* and what consequences or concerns may be generated as a result of development.

A number of databases have been interrogated in the process of undertaking the Desktop Analysis. A summary of the methodology utilised for the generation of each of the databases has been tabulated below, with the description of the table available in **Appendix 8**.

Table 1: Databases Consulted in the Terrestrial Ecological Assessment

Database
Ezemvelo KZN Wildlife C-Plan & SEA Database
• Irreplaceability Analysis
• Critical Biodiversity Areas
• Ecological Support Areas
• Landscape Corridors
• Local Corridors
South African National Biodiversity Institute: Plants of South Africa
Bio Resource Units (BRU)
Environmental Potential Atlas
Mucina and Rutherford National Vegetation Types
KwaZulu – Natal Vegetation Types (KZN VT)
National Freshwater Ecosystem Priority Areas (NFEPA)
South African Bird Atlas Project 2
Animal Demographic Unit
• ReptileMAP
• FrogMAP
• MammalMAP
• LepiMAP

5.1. Department of Forestry, Fisheries and Environment (DFFE) Screening Tool

Plant and animal sensitivity were identified as “Medium” by the Screening Tool for all of the proposed accommodation types at GUNR. Terrestrial biodiversity was noted to be “Very High” at all of the sites due to the sites occuring within GUNR.

The following sensitivities were identified by the DFFE Online Screening Tool, and have been interrogated in the assessment below:

Table 2: Environmental sensitivity themes

Donor House				
Theme	Very High Sensitivity	High Sensitivity	Medium Sensitivity	Low Sensitivity
Agriculture Theme			X	
Animal Species Theme			X	
Aquatic Biodiversity Theme				X
Archaeological and Cultural Heritage Theme				X
Civil Aviation Theme		X		
Defence Theme				X
Paleontology Theme	X			
Plant Species Theme			X	
Terrestrial Biodiversity Theme	X			
FreeMe				
Theme	Very High Sensitivity	High Sensitivity	Medium Sensitivity	Low Sensitivity
Agriculture Theme		X		
Animal Species Theme			X	
Aquatic Biodiversity Theme				X

Archaeological and Cultural Heritage Theme				X
Civil Aviation Theme		X		
Defence Theme	X			
Paleontology Theme	X			
Plant Species Theme			X	
Terrestrial Biodiversity Theme	X			
Tented Camp				
Theme	Very High Sensitivity	High Sensitivity	Medium Sensitivity	Low Sensitivity
Agriculture Theme			X	
Animal Species Theme			X	
Aquatic Biodiversity Theme				X
Archaeological and Cultural Heritage Theme				X
Civil Aviation Theme		X		
Defence Theme				X
Paleontology Theme	X			
Plant Species Theme			X	
Terrestrial Biodiversity Theme	X			
Managers House				
Theme	Very High Sensitivity	High Sensitivity	Medium Sensitivity	Low Sensitivity
Agriculture Theme		X		
Animal Species Theme			X	
Aquatic Biodiversity Theme				X
Archaeological and Cultural Heritage Theme	X			
Civil Aviation Theme		X		
Defence Theme				X
Paleontology Theme	X			
Plant Species Theme			X	
Terrestrial Biodiversity Theme	X			

Table 3: DFFE sensitivities potentially occurring on combined sites for GUNR.

Animal	Plant	Terrestrial Biodiversity
Reptilia-*Pelusios castanoides*	Sensitive species 1252	Greater Ukuwela Nature Reserve
Reptilia-*Pelusios rhodesianus*	Sensitive species 174	Vulnerable ecosystem
Reptilia-*Kinixys natalensis*		Protected Areas Expansion Strategy
Mammalia-*Acinonyx jubatus*	*Pristimera delagoensis var. delagoensis*	Critical biodiveristy area 1
Mammalia-*Lycaon pictus*	*Rytigynia celastroides var. australis*	
Mammalia-*Nesotragus moschatus zuluensis*	*Sclerochiton apiculatus*	
Mammalia-*Ourebia ourebi ourebi*	*Searsia kwazuluana*	
Sensitive species 7	Sensitive species 738	
Insecta-*Deloneura millari millari*	*Oxygonum dregeanum subsp. streyi*	
Insecta-*Hypolycaena lochmophila*	*Pavonia dregei*	
Insecta-*Iolaus lulua*		

Insecta-*Teriomima zuluana*		
Invertebrate-*Arytropteris basalis*		

5.2. Desktop vegetation description

5.2.1. *C-Plan Biodiversity Features / Species within Project Area*

The desktop analysis indicated that the site is classified as Irr1 (i.e. These planning units are referred to as totally irreplaceable and the conservation of the features within them is critical to meet conservation targets) and the Minset analysis mirrors the C-Plan data with the area being deemed as requiring protection. It must be noted that the developable area has been moved outside of CBA Irreplaceable areas, exept for the western portion of the FreeMe site and a portion of the main tent at the Tented Camp. (**Figure 2, Figure 3, Figure 4 and Figure 5**). Please note that the Tented Camp intersects a CBA Irreplaceable area, however this is likely as a result of the grid based mapping.

In terms of the SEA and C-Plan data generated, through the physical characteristics that are present on site, a number of groups have been identified as potentially present on the site, and these groups are wholly significant in terms of conservation significance or parts thereof. **Table 4** and **Table 5** below identify which groups and species are significant.

Table 4. SEA Data taken from Ezemvelo KZN Wildlife

YES	NO
Protected Grasslands	Protected Forests
Important Vegetation Community	Frogs
Wetlands	Blue Swallow
Protected Ecosystems and Communities	Wattled Crane
Birds	Mammals
Invertebrates	Oribi
Protected Species	Medicinal Plants
Protected Landscapes	Reptiles
	Plants

Table 5. TSCP Minset Data taken from Ezemvelo KZN Wildlife

Species name	Type
Maputaland Coastal Thicket	Vegetation Type
Tembe Sandy Bushveld	Vegetation Type
Western Maputaland Clay Bushveld	Vegetation Type
Edouardia conulus	Mollusc
Orthoporoides corrugatus	Millipede
Zinophora laminata	Millipede
Diceros bicornis minor	Mammal
Bradypodion setaroi	Reptile
Teriomima zuluana	Butterfly

Figure 2: CBA Map of the Donor House

Figure 3: CBA map of the Tented Camp

Figure 4: CBA map of the Managers House.

Figure 5: CBA map of FreeMe.

5.2.2. Bio Resource Units (BRU)

The Bioresource unit for the site is as follows:

TUa1 – Mzinene

Bioresource Group 23: "SandyBush and Palm Veld".

Vegetation pattern: The vegetation consists of bushed grassland, bushland, bushland thicket and woodland thicket.

Indicator Species: *Acacia burkei* (Black Monkey Thorn), *Terminalia sericea* (Silver Cluster-Leaf).

The rainfall average is 727 mm per annum. The mean temperature is 21.4^{0}C and the climate rating is C5, moderately restricted growing season due to low tempertaures, frost and / or moisture stress. The erosion rating for the site is 2.8, which translates to a very high erosion risk.

There are two perennial rivers, one of which is the Mzinene River. There is also one non-perennial river.

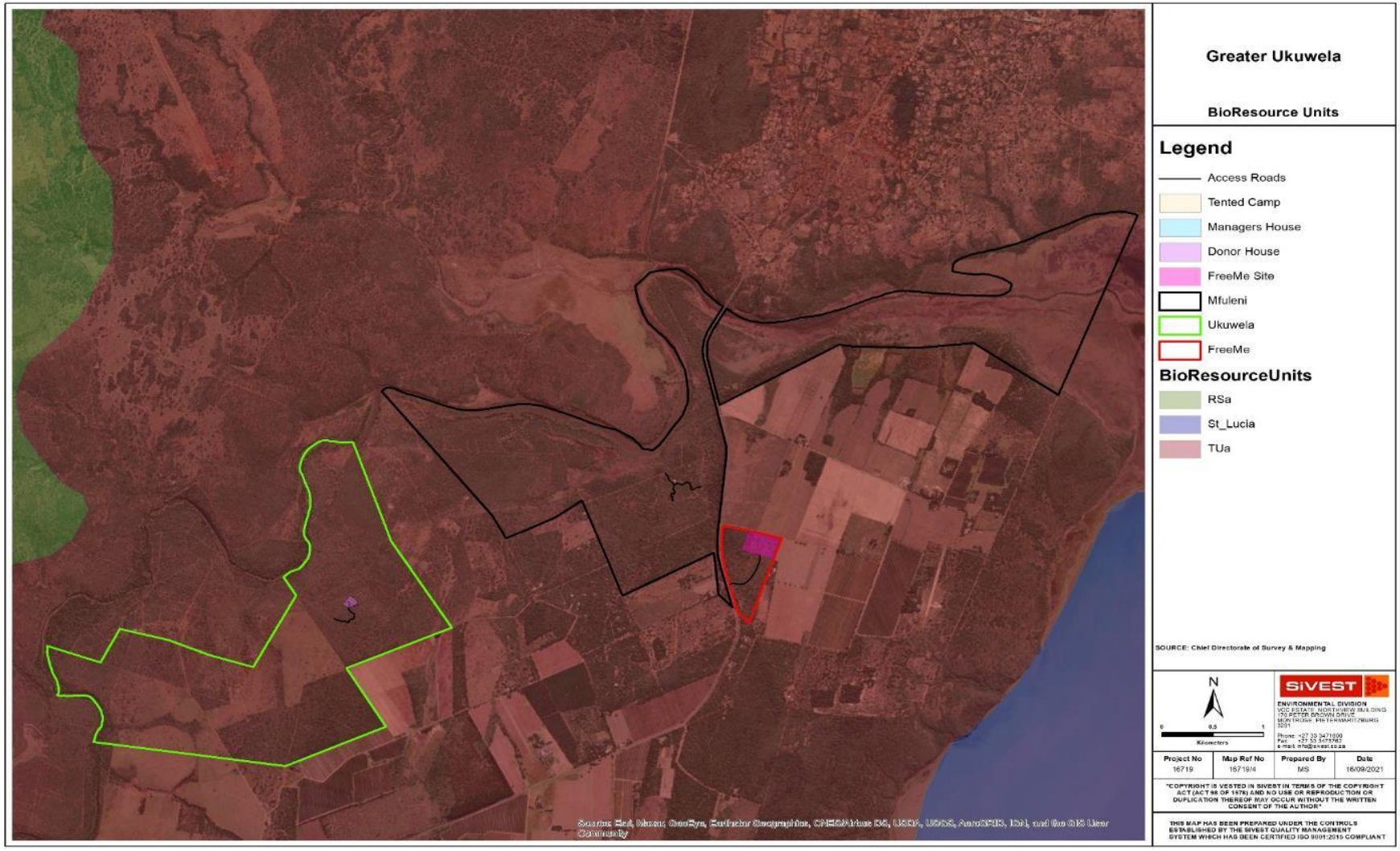

Figure 6: BRU Map

5.2.3. Environmental Potential Atlas

The ENPAT data provides the following information about the geology for the site:
The geology of the site is comprising of the following:

- Donor House – Siltstone, with concretionary and shelly horizons, of the St. Lucia Formation, marine siltstone with shelly concretions of the Mzinene Formation, Zululand Group, and argillaceous sand of the Muzi Formation.
- FreeMe – Argillaceous sand of the Muzi Formation, and red dune cordon sand of the Berea Formation.
- Tented Camp – Argillaceous sand of the Muzi Formation.
- Managers House – Siltstone, with concretionary and shelly horizons, of the St. Lucia Formation, marine siltstone with shelly concretions of the Mzinene Formation, Zululand Group, and argillaceous sand of the Muzi Formation.

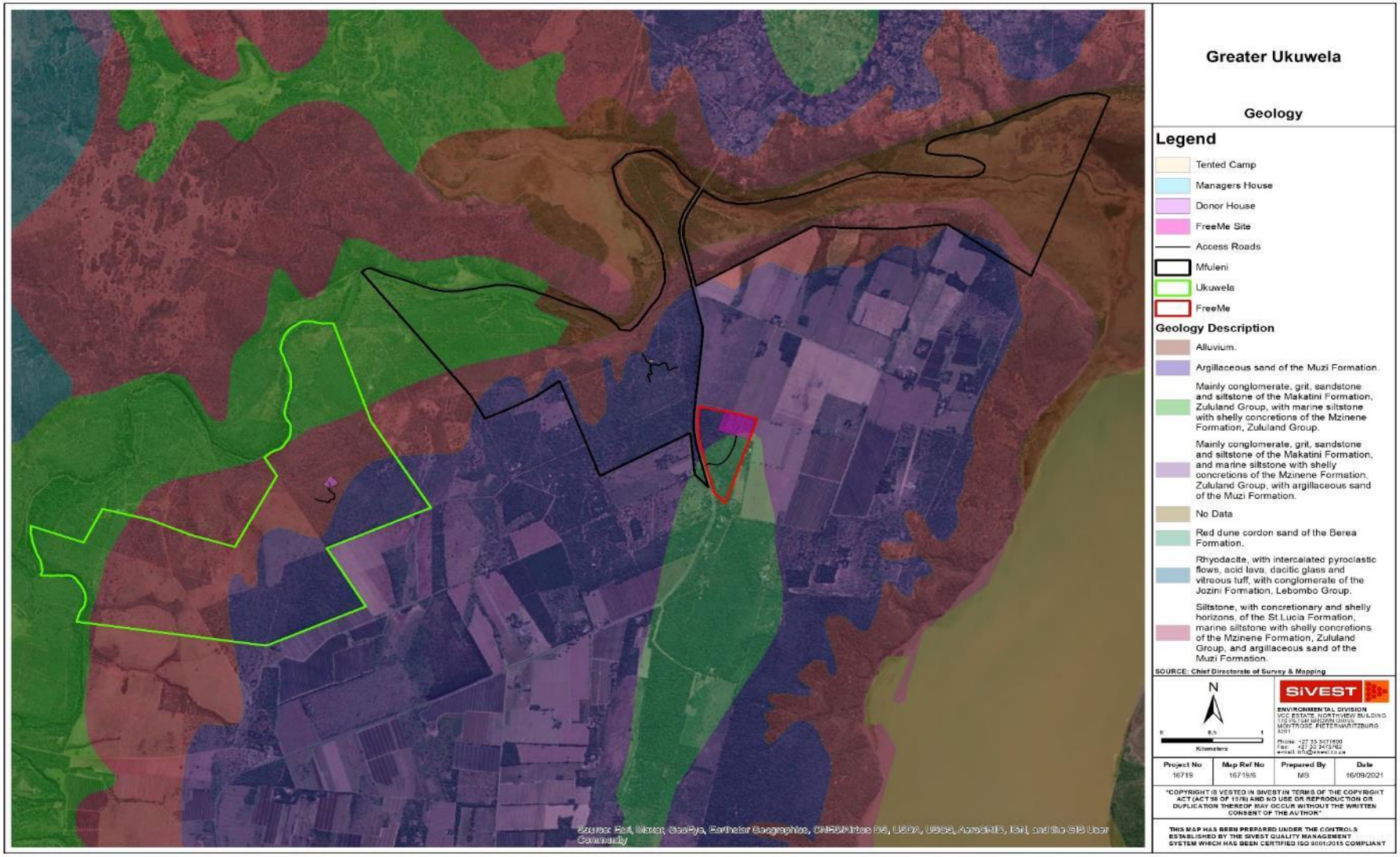

Figure 7: Geology Map

The ENPAT data provides the following information about the soils for the site:

- Donor House – Prismacutanic and/or pedocutanic diagnostic horizons dominant, B horizons mainly not red
- FreeMe – Red-yellow apedal, freely drained soils; yellow, high base status, usually < 15% clay; and red-yellow apedal, freely drained soils; red, high base status, > 300 mm deep (no dunes)
- Tented Camp – Red-yellow apedal, freely drained soils; yellow, high base status, usually < 15% clay
- Managers House – Prismacutanic and/or pedocutanic diagnostic horizons dominant, B horizons mainly not red

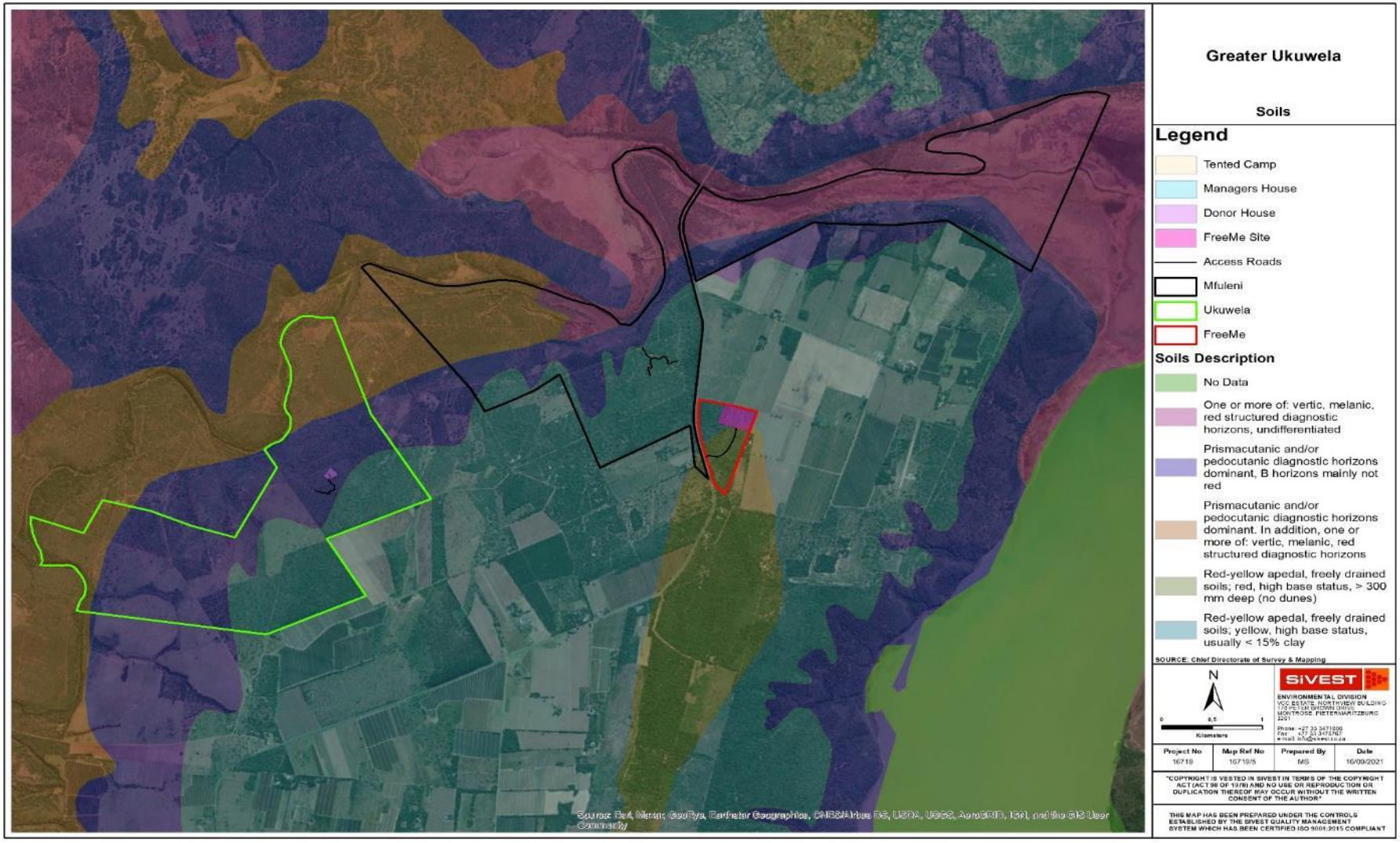

Figure 8: Soils Map

5.2.4. Mucina and Rutherford's Vegetation and VegMap 2018

Three vegetation types are predicted to occur on site by Mucina and Rutherford (2006) and VegMap 2018. In this case Mucina and Rutherford (2006) and VegMap 2018 is the same, except for the Maputaland Coastal Belt (CB1) which has been upgraded to Maputaland Pallid Sandy Bushveld (SVi 25) in VegMap 2018. The vegetation types predicted to occur on site are outline below.

SVl 20 Western Maputaland Clay Bushveld:

Distribution KwaZulu-Natal Province: Maputaland region immediately east of the Lebombo Mountains, eastwards to the western edge of the SVl 18 Tembe Sandy Bushveld. From the Ndumo Game Reserve on the Mozambique border, through the Makatini Flats south to Mkhuze Game Reserve, with a narrower extension to just east of the town Hluhluwe. Altitude 20–200 m.

Vegetation & Landscape Features Comprises a mixed but mainly compound leaved short (5–10 m) woodlands and wooded grasslands. It occurs on the crests, upper and midslopes of gently undulating terrain. This vegetation unit is dissected by two large alluvial floodplains associated with the Mkuze and Phongolo Rivers. FOa 1 Lowveld Riverine Forest and woodland dominate these alluvial soils and numerous small floodplains associated with smaller streams.

Important Taxa Tall Tree: *Acacia nigrescens* (d). Small Trees: *Acacia nilotica* (d), *A. tortilis* subsp. *heteracantha* (d), *Bolusanthus speciosus* (d), *Acacia gerrardii*, *A. grandicornuta*, *A. luederitzii* var. *retinens*, *A. senegal* var. *rostrata*, *Spirostachys africana*, *Ziziphus mucronata*. Tall Shrubs: *Dichrostachys cinerea* (d), *Gymnosporia senegalensis* (d), *Azima tetracantha*, *Cadaba natalensis*, *Carissa bispinosa* subsp. *bispinosa*, *C. tetramera*, *Ehretia rigida* subsp. *rigida*, *Euclea divinorum*, *Galpinia transvaalica*, *Grewia caffra*, *Salvadora angustifolia*. Low Shrubs: *Abutilon austro-africanum*, *Dicliptera clinopodia*, *Maerua edulis*. Graminoids: *Bothriochloa insculpta* (d), *Dactyloctenium australe* (d), *Panicum maximum* (d), *Themeda triandra* (d), *Aristida congesta*, *Digitaria didactyla*, *D. eriantha* subsp. *eriantha*, *Eragrostis rigidior*, *E. superba*, *Panicum coloratum*, *Sehima galpinii*, *Sporobolus fimbriatus*, *S. nitens*, *Urochloa mosambicensis*. Herbs: *Asystasia gangetica*, *Chascanum hederaceum*, *Crossandra greenstockii*, *Hibiscus pusillus*.

Conservation Vulnerable. Target 19%. About 11% statutorily conserved in the Greater St Lucia Wetland Park (Mkhuze) and Ndumo Game Reserve. A significant proportion (34%) has been transformed—almost all by cultivation. Alien plant infestations are locally severe and include *Opuntia* species.

SVl 18 Tembe Sandy Bushveld:

Distribution KwaZulu-Natal Province: Part of the Maputaland lowveld, east of the Pongola River. Strip of land between the Mozambique border and the Tembe Elephant Park in the north extending south as far as the surrounds of the confluence of the Mkuze and Msunduzi Rivers. Sandwiched between the SVl 20 Western Maputaland Clay Bushveld in the west and CB 1 Maputaland Coastal Belt in the east. Isolated patch found east of the town of Hluhluwe. Altitude 40–140 m.

Vegetation & Landscape Features Extensive flat plains to slightly undulating in places with open to closed woodland with canopy 5–10 m tall, dominated by leguminous woody species and *Terminalia sericea*, with species-rich shrub layer and grassy undergrowth (*Panicum*, *Perotis*, *Urelytrum agropyroides*, *Hyperthelia dissoluta* and *Diheteropogon* species).

Important Taxa Tall Trees: *Acacia burkei*, *Sclerocarya birrea* subsp. *caffra*. Small Trees: *Terminalia sericea* (d), *Afzelia quanzensis*, *Albizia adianthifolia*, *A. versicolor*, *Clausena anisata*, *Combretum molle*, *Diospyros inhacaensis*, *Ozoroa engleri*, *O. obovata* var. *elliptica*, *Spirostachys africana*, *Tabernaemontana elegans*, *Vepris lanceolata*, *Zanthoxylum capense*. Tall Shrubs: *Strychnos madagascariensis* (d), *Coddia rudis*, *Crotalaria monteiroi*, *Dichrostachys cinerea*, *Euclea natalensis*, *Gardenia volkensii*, *Grewia caffra*, *Monanthotaxis caffra*, *Rhus gueinzii*, *Strychnos spinosa*. Low Shrubs: *Corchorus junodii*, *Indigofera inhambanensis*. Woody Climber: *Landolphia kirkii*. Herbaceous Climber: *Cissampelos hirta*. Graminoids: *Panicum maximum* (d), *Aristida stipitata* subsp. *graciliflora*, *Digitaria*

eriantha subsp. *eriantha*, *Diheteropogon amplectens*, *Eragrostis moggii*, *Hyperthelia dissoluta*, *Perotis patens*, *Pogonarthria squarrosa*, *Urelytrum agropyroides*. Herb: *Oxygonum delagoense*. Succulent Herb: *Aloe parvibracteata*. Semiparasitic Herb: *Striga junodii*.

Biogeographically Important Taxa (Maputaland endemics) Small Tree: *Dialium schlechteri*. Tall Shrubs: *Cussonia arenicola*, *Lagynias monteiroi*, *Synaptolepis kirkii*, *Tarenna junodii*. Low Shrub: *Rhus kwazuluana*. Succulent Shrub: *Aloe marlothii* subsp. *orientalis*. Woody Climbers: *Acridocarpus natalitius* var. *linearifolius*, *Albertisia delagoensis*, *Prionostemma delagoensis* var. *delagoensis*. Herbs: *Aneilema arenicola*, *Pelargonium tongaense*. Geophytic Herbs: *Aspidoglossum delagoense*, *Crinum acaule*. Succulent Herb: *Crassula maputensis*.

Endemic Taxa Low Shrub: *Pavetta vanwykiana*. Herb: *Cleome bororensis*.

Conservation Least threatened. Target 19%. Some 17% statutorily conserved, almost all in the Tembe Elephant Park. The Manqakulane people have established the Tshanini Game Reserve south of Tembe. About 8% has been transformed mainly by cultivation. Erosion is very low.

SVl 25 Maputaland Pallid Sandy Bushveld:

Distribution KwaZulu-Natal Province: on the coastal plain in the Maputaland region east of the Pongola River. North of the Mkuzi River it is aligned with the Muzi swamp and its water catchment and to the south it extends to near the town of Hluhluwe sandwiched between SV1 18 Tembe Sandy Bushveld and CB 1 Maputaland Coastal Belt. This unit surrounds most of the Muzi Palm Veld and Wooded Grassland. Altitude 10 - 90 m, mostly between 40 – 80 m.

Vegetation & Landscape Features On ancient coastal dune cordons on gently undulating terrain. Open to closed evergreen woodland with canopy 5 to 10 m tall and bushlands.

Important Taxa None given

Biogeographically important Taxa None given

Endemic Taxa None given

Conservation Statutorily conserved in Tembe Elephant Park and Isimangaliso Wetland Park (Ozabeni Section). Also conserved in Tshanini Game Reserve and Makasa Game Reserve.

Remarks The unit extends to the Maputaland part of southern Mozambique. It differs from SV1 18 Tembe Sandy Bushveld in the generally higher clay content of the soils and higher water table and lower evaporation rates arising from its proximity to the east coast.

The *Sclerocarya birrea-Strychnos madagascariensis* closed woodland described by Gauris *et. al.* (2004) is a plant community common along the western (drier) boundary of the vegetation type. Small unmapped fragments of Eastern Maputaland Pallid Sandy Bushveld occur embedded Muzi Palm Veld and Wooded Grassland.

Further to notes is that the areas where the proposed infrastructure has been placed is historically disturbed and is currently zoned as transformed land (

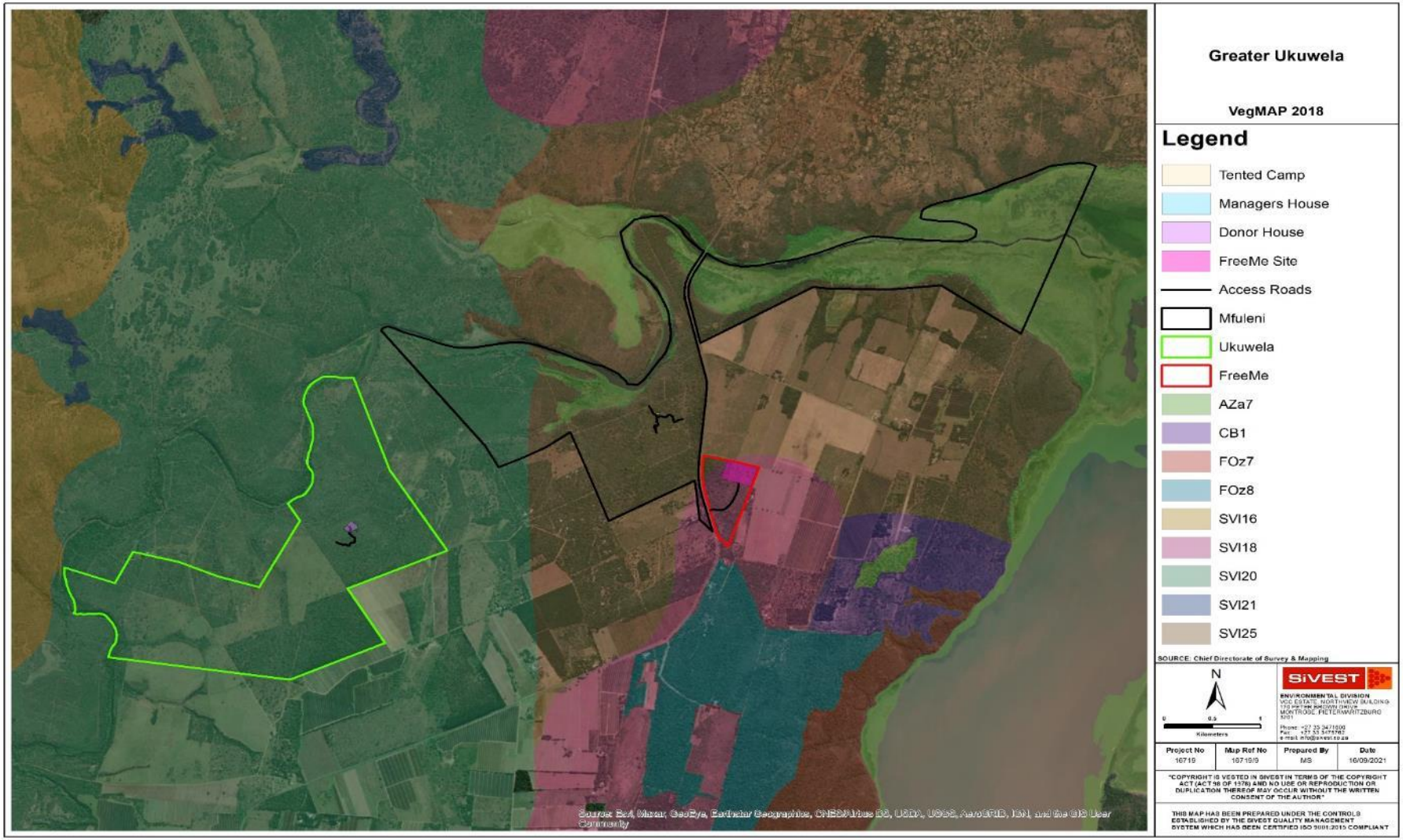

Figure 9: VegMap 2018 vegetation types.

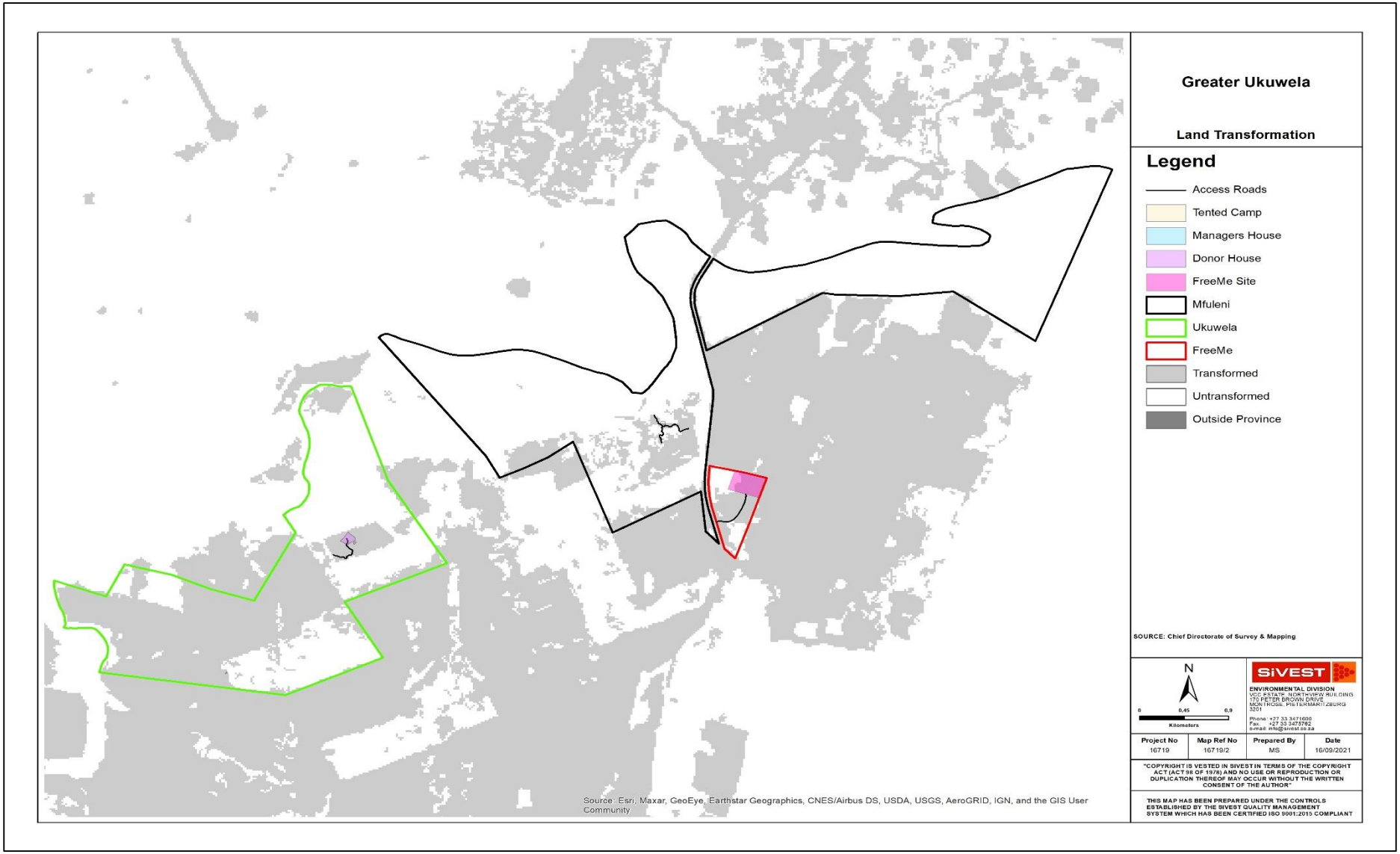

Figure 10: Land transformation.

5.2.5. National Freshwater Ecosystem Priority Areas (NFEPA) - SAIIAE

No wetlands or rivers are shown to intersect the proposed lodges and access roads, however the Mzinene River floodplain and Lake St Lucia occur within the GUNR boundary.

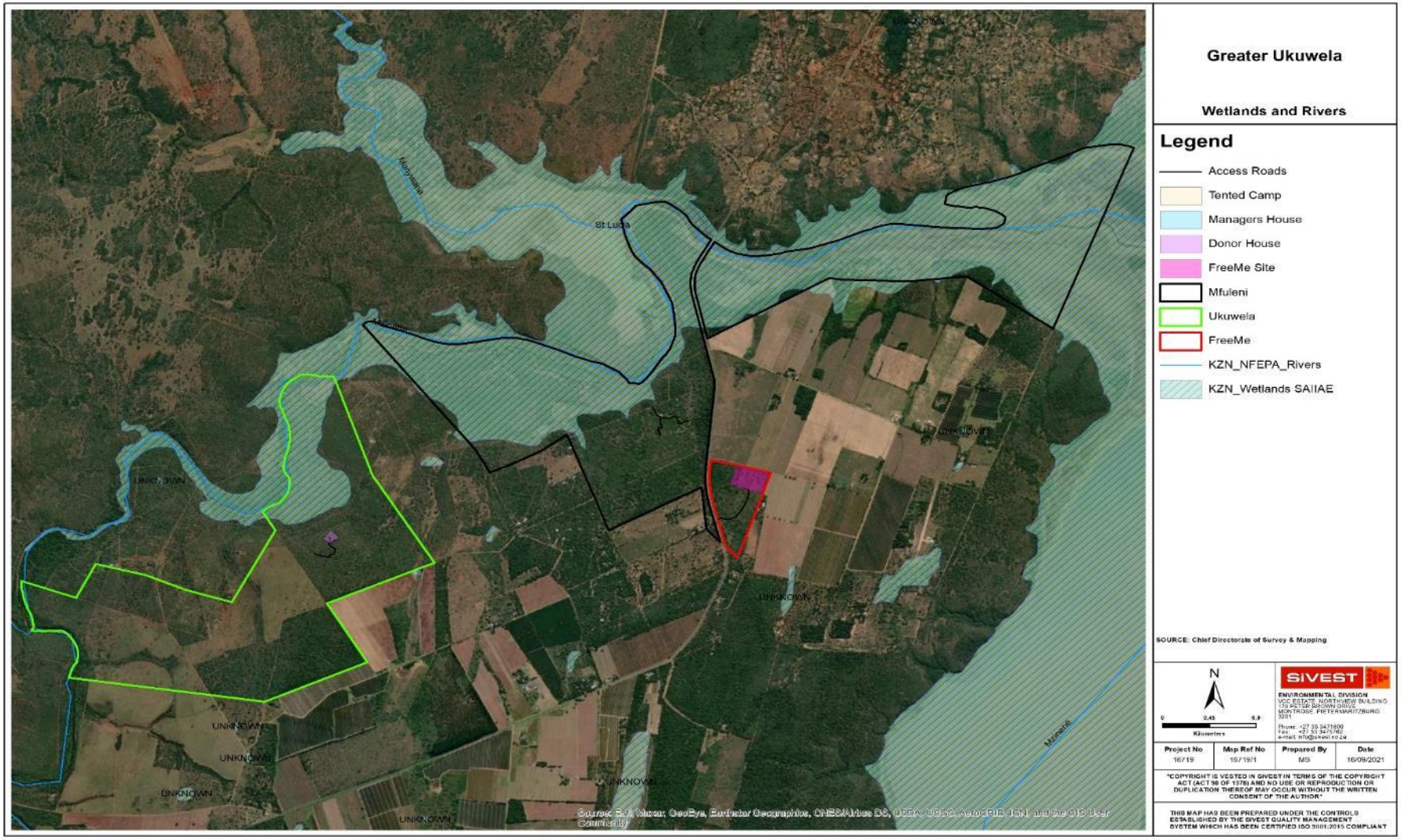

Figure 11: NFEPA / SAIIAE Wetland Map

5.3. Desktop faunal description

Databases allow for the rapid assessment of species which are predicted to occur in an area. These databases are compiled using verified citizen science observations, as well as correlating species and their habitat requirements and assigning the result to a habitat type. This results in species predicted for an area. These databases are continually updated and verified by the Animal Demographic Unit at the Fitzpatrick Institude of African Ornithology, University of Cape Town. This may often result in a wide paucity in data as no previous observations have been made in an area, resulting in no predicted data for that species in that area. This means that verification of faunal data is essential in filling in gaps that may occur at desktop level. Desktop data for the area around GUNR is seen as relatively accurate due to high and recent reporting rates and full protocols achieved within the study area for the various Animal Demographic Unit and South African Bird Atlas Project databases.

5.3.1. Critically Biodiverse Areas

Critical Biodiversity Areas (CBAs) can be divided into two subcategories, namely *Irreplaceable* and *Optimal*. Each of these can in turn be subdivided into additional subcategories. The CBA categories are based on the optimised outputs derived using systematic conservation planning software, with the Planning Units (PU) identified representing the localities for which the conservation targets for one or more of the biodiversity features contained within can be achieved.

Please see Section 5.2.1 for a description of the CBA within the study site.

5.3.2. South African Bird Atlas Project 2

The South African Bird Atlas Project 2 (SABAP 2) Database was queried to determine which bird species have been recorded within the greater study area. Please note that the data represents a minimum presence ratio, which indicates species that have been recored in the area. This does not mean that other species do not occur in the pentad. Further to this, a good guidline to use for an accurate estimate of minimum presence ratio, is if more than 7-10 cards have been submitted for a pentad. Pentad 2750_3220 has had 43 cards submitted while pentad 2750_3215 has had 23 cards submitted, meaning that data for both pentads is considered to be accurate.

The complete list includes 327 species as listed in **Appendix 2**. Conservation status is given for Red Data Species on a Regional Basis as per the 2015 Eskom Red Data Book of Birds of South Africa (Taylor, 2015), where 30 potential Red Data species occur in the study area (**Table 6**). No Red Data avian species were identified during the assessment, however a number of species of conservation concern are predicted to occur on site and have been historically recorded.

Table 6: Red Data avifaunal species predicted to occur on site (LC = Least Concerned, NT = Near Threatened, VU = Vulnerable, EN = Endangered, FP = Full Protocol (% recording occurence of the species in the pentad), FPn = Full Protocol number).

Scientific Name	Common Name	RD (Regional, Global)	FP	FPn	fp_last
Gyps africanus	White-backed Vulture	CR, CR	27.439	13	18/10/2020
Trigonoceps occipitalis	White-headed Vulture	CR, CR	9.0909	2	12/03/2013
Circaetus fasciolatus	Southern Banded Snake Eagle	CR, NT	10.643	7	14/10/2020
Polemaetus bellicosus	Martial Eagle	EN, EN	2.27275	1	06/12/2011
Gyps coprotheres	Cape Vulture	EN, EN	4.5455	1	25/02/2021
Torgos tracheliotos	Lappet-faced Vulture	EN, EN	4.5455	1	03/04/2009
Terathopius ecaudatus	Bateleur	EN, EN	17.2949	9	05/01/2020
Aquila rapax	Tawny Eagle	EN, LC	5.76495	3	12/02/2013

Scientific Name	Common Name	RD (Regional, Global)	FP	FPn	fp_last
Circus ranivorus	African Marsh Harrier	EN, LC	2.439	1	31/12/2008
Ephippiorhynchus senegalensis	Saddle-billed Stork	EN, LC	0	0	00/01/1900
Mycteria ibis	Yellow-billed Stork	EN, LC	19.90025	12	18/10/2020
Calidris ferruginea	Curlew Sandpiper	LC, NT	5.9313	4	18/10/2020
Crithagra citrinipectus	Lemon-breasted Canary	NT , LC	8.3703	6	23/11/2018
Phoenicopterus roseus	Greater Flamingo	NT, LC	0	0	00/01/1900
Rostratula benghalensis	Greater Painted-snipe	NT, LC	2.439	1	25/11/2008
Coracias garrulus	European Roller	NT, LC	8.0377	4	26/11/2016
Leptoptilos crumeniferus	Marabou Stork	NT, LC	1.2195	1	07/06/2015
Phoeniconaias minor	Lesser Flamingo	NT, NT	0	0	00/01/1900
Sagittarius serpentarius	Secretarybird	VU, EN	9.0909	2	03/04/2009
Smithornis capensis	African Broadbill	VU, LC	2.439	1	09/04/2011
Podica senegalensis	African Finfoot	VU, LC	5.76495	3	10/08/2018
Nettapus auritus	African Pygmy Goose	VU, LC	4.71175	3	05/01/2020
Microparra capensis	Lesser Jacana	VU, LC	4.878	2	24/11/2009
Caprimulgus natalensis	Swamp Nightjar	VU, LC	7.3171	3	21/11/2015
Pelecanus onocrotalus	Great White Pelican	VU, LC	1.2195	1	25/11/2008
Pelecanus rufescens	Pink-backed Pelican	VU, LC	1.2195	1	09/04/2011
Ciconia nigra	Black Stork	VU, LC	2.439	1	22/10/2010
Sterna caspia	Caspian Tern	VU, LC	4.878	2	09/04/2011
Stephanoaetus coronatus	Crowned Eagle	VU, NT	16.2417	9	08/09/2020
Cinnyris neergaardi	Neergaard's Sunbird	VU, NT	7.1508	5	22/07/2019

5.3.3. Important Bird Areas

The iSimangalisio Wetland Park Important Bird Area (SA128) occurs within 10km of the GUNR, as defined by BirdLife South Africa (2018). The IBA underwent an assessment in 2014, which showed that the threat score to the IBA was very high and the condition score of the IBA was unfavourable. Pressures to the IBA in the main were related to land use activities such as agricultural expansion, biological resource use, climate change and pollution (Birdlife SA, 2016). This combined with the sensitivity of the system, have resulted in the IBA being fully protected. It should be noted that the protection of land around the IBA (such as GUNR) provides important buffers around the IBA, potentially reducing pressure on the IBA.

Figure 12: Important Bird Areas – iSimangaliso Wetland Park.

5.3.4. ReptileMAP

The Animal Demographic Unit's (ADU) ReptileMAP predicts that 65 reptile species occur within the greater study area. These are listed in **Appendix 3**, with Nile Crocodile (*Crocodylus niloticus*) seen during the assessment, and four species of conservation concern potentially occur within the study area (**Table 8**).

Table 7: Red List Reptile species predicted to occur within the study area.

Scientific name	Common name	Red list category	Number of records	Last recorded
Chamaesaura macrolepis	Large-scaled Grass Lizard	Near Threatened (SARCA 2014)	1	15/06/1900
Lycophidion pygmaeum	Pygmy Wolf Snake	Near Threatened (SARCA 2014)	3	12/12/2015
Crocodylus niloticus	Nile Crocodile	VU (SARCA 2014); LC (global, IUCN 2019)	15	25/12/2015
Dendroaspis angusticeps	Green Mamba	Vulnerable (SARCA 2014)	2	09/11/2007

5.3.5. FrogMAP

The ADU's FrogMAP predicts that 43 species of amphibians occur within the greater study area. The full list of amphibians predicted to be within the study area can be found in **Appendix 4**. No species were seen during the assessment, and no species of conservation concern were predicted to occur.

5.3.6. MammalMAP

The ADU's MammalMAP predicts that 92 species of mammal occur within the study area (full list in **Appendix 5**). Five mammals were seen, with one species of mammal of conservation concern, being the Leopard (*Panthera* pardus), being seen on site by Jake Alletson (**Table 8**).

Table 8: Red List Mammal species predicted to occur within the study area.

Scientific name	Common name	Red list category	Number of records	Last recorded
Ourebia ourebi	Oribi	Endangered	2	31/12/2011
Lycaon pictus	African wild dog	Endangered (2016)	1	17/03/2017
Hypsugo anchietae	Anchieta's Pipistrelle	Near Threatened	6	
Miniopterus schreibersii	Schreibers's Long-fingered Bat	Near Threatened	1	08/11/2014
Cephalophus natalensis	Red Duiker	Near Threatened (2016)	18	16/03/2021
Leptailurus serval	Serval	Near Threatened (2016)	4	08/03/2014
Crocuta crocuta	Spotted Hyaena	Near Threatened (2016)	2	30/07/2016
Petrodromus tetradactylus	Four-toed Elephant Shrew	Near Threatened (2016)	4	15/11/2016
Paraxerus palliatus	Red Bush Squirrel	Near Threatened (2016)	6	11/02/2018
Acinonyx jubatus	Cheetah	Vulnerable (2016)	30	25/12/2015
Panthera pardus	Leopard	Vulnerable (2016)	210	25/02/2017
Smutsia temminckii	Ground Pangolin	Vulnerable (2016)	2	
Loxodonta africana	African Bush Elephant	Vulnerable A2a (2008)	22	31/12/2012

5.3.7. LepiMAP

According to the ADU's LepiMAP, 412 species of Lepidoptera are predicted to occur within the greater study area (full list in **Appendix 6**). No species were seen during the assessment, and no species of conservation concern were predicted to occur.

6. RESULTS OF FIELD ASSESSMENT

6.1. Vegetation Description

The GUNR is bordered by the Mzinene River and the Mun-Ya-Wana to the north, pineapple farming to the south and Lake St Lucia to the east, resulting in a variety of historical land uses. The GUNR is currently zoned as a Nature Reserve and is rehabilitating from many years of livestock, pineapple, cotton and sisal farming that occurred on the properties. The area is currently utilised for conservation with plains game inhabiting the GUNR. Some alien and invasive species were identified in the assessment, however this is related to historical agricultural processes and the establishment of fast replicating species, however the majority of the sites is classified as natural.

According to Mucina and Rutherford 2006 and VegMap 2018, the site is classified as Western Maputaland Clay Bushveld (Vulnerable), Tembe Sandy Bushveld (Least Concerned) and Maputaland Pallid Sandy Bushveld (statutorily conserved). Upon undertaking the groundtruthing exercise it was found that the site is transformed from natural due to historical agricultural practices and as such, is impacted by bush encroachment and some alien invasive species. Although species representative of the three vegetation types present at GUNR occur, further rehabilitation and restoration is required to be representative vegetation types. Species diversity was estimated to be medium. No site alternatives were given for the four proposed accommodation types and access roads, however a previous feasibility assessment, undertaken by John Richardson, had recommended that infrastructure be placed within previously transformed areas and outside of CBA: Irreplaceable areas, which the WTF had done prior to this assessment taking place.

A total of 37 plant species were recorded during the field survey, of which 6 were alien. Two plant species fall under the KwaZulu-Natal Nature Conservation Management Act were noted within the development footprint (*Asparagus spp., Aloe ferox*).

6.1.1. Donor House

Vegetation associated north-west facing slope of the Donor House site comprised of a well developed but relatively dense stand of trees up to 3m in height, a sparse shrub layer of up to 1.5m in height and an herbaceous and graminoid layer up to 1m in height (**Plate 1**Error! Reference source not found.). Diversity at the Donor House was estimated to be low to medium due transformation and recovering from agriculture.

Tree species identified in the north-west facing slope of the donor site included but were not limited to Sickle Bush (*Dichrostachys cinerea*), Buffalo Thorn (*Ziziphus mucronata*), Sweet Thorn (*Acacia nilotica*) and Guarri (*Euclea divinorum*, **Plate 2**).

The dominant graminoid component of the Donor House site was noted to be Berea grass (*Dactyloctenium australe*, **Plate 2**).

The dominant alien and invasive species present at the Donor House was the Potato creeper (*Solanum seaforthianum*) and Cotton (*Gossypium hirsutum*), **Plate 3**.

Plate 1: Vegetation component of the Donor House.

Plate 2: *Dichrostachys cinerea* trees with *Dactyloctenium australe* grass dominating the ground cover of the area.

Plate 3: Solanum seaforthianum and Gossypium hirsutum are the dominant alien and invasive species at the Donor House.

6.1.2. Tented Camp

The Tented Camp site is dominated by a large Broadpod Robust Thorn (*Vachellia robusta subsp. robusta*, **Plate 4**), interspersed with Sickle Bush and Marula (*Sclerocarya birrea*, protected under the National Forest Act, **Plate 5**). Further species to note was the presence of the *Asparagus* genus, which is provincially protected under the Natal Nature Conservation Ordinance (**Plate 6**). No other species of conservation concern were noted at the Tented Camp.

Plate 4: *Vachellia robusta subsp. robusta* dominating the Tented Camp area.

Plate 5: Nationally protected protected *Sclerocarya birrea*.

Plate 6: Provincially protected *Asparagus*.

Roads leading to the Tented Camp are dominated the similar vegetation makeup of the Donor house, with the inclusion of species such as Weeping Boer-Bean (*Scotia brachypetala*) and further Marula trees. The grass component is dominated by Guinea Grass (*Panicum maximum*) and Weeping Love Grass (*Eragrostis curvula*).

Plate 7: Vegetative component on the access roads.

6.1.3. Managers House

The woody component at the managers house is dominated by a tree and grass layer (trees up to 3m in height, **Plate 8**). Trees comprised of a stand of Tamboti (*Spirostachys africana*), Sweet Thorn, Buffalo thorn, Sickle Bush, Puzzle Bush (*Ehretia rigida*) and White Stem Guarri (*Euclea daphnoides*) (

Plate 9). The graminoid component comprised of Weeping Love Grass, Guinea Grass and False Panicum (*Brachiaria deflexa*).

Plate 8: Vegetation component of the Managers House.

Plate 9: Tamboti grove in proximity to the proposed Managers House.

6.1.4. FreeMe Site

The FreeMe site is heavily transformed and is in the process of recovering. There are however native species such as Marula, Duiker Berry (*Sclerocroton integerrimum*) and Green Monkey-Orange (*Strychnos spinosa*), with Straw Everlasting (*Helichrysum krausii*) dominating the grass / herbaceous layer (**Plate 10**). Alien and invasive species included Queen of the Night (*Cereus jaracaru*) and Parrafin Bush (*Chromolaena ordorata*).

Plate 10: The dominant vegetation present at the FreeMe Site.

Plate 11: Alien and invasive *Chromolaena odorata.*

6.1.5. Species identified by the DFFE Screening Tool.

No species highlighted in the DFFE Screening tool were identified on site. It must be noted that bulbs may not have been identified due to the sampling season.

6.1.6. Vegetation Assessment

Within the context of this vegetation assessment, conservation importance is broadly defined as the importance of the encountered vegetation communities as a whole, and the role these areas will fulfill in the preservation and maintenance of biodiversity in the local area. Biodiversity maintenance and importance are a function of the specific biodiversity attributes and noteworthiness of the vegetation communities in question and the biotic integrity and future viability of these features.

The biodiversity noteworthiness of the system is a function of the following:

- species richness/diversity;
- rarity of the system;
- conservation status of the system (endangered, least concern etc.);
- habitat (real or potential) for Red Data Species; and
- presence of unique and/or special features,

The integrity and future viability of the system is a function of the following:

- Extent of buffer around the system;
- Connectivity of system to other natural areas in the landscape;
- Level of alteration to indigenous vegetation communities within the system;
- Level of invasive and pioneer species encroachment system; and
- Presence of hazardous and/or obstructive boundaries to fauna.

The scores for each function of biodiversity maintenance were determined according to the scoring system shown in **Table 9** below. The scores were totaled and averaged to determine the biodiversity maintenance services score. Thereafter, the overall scores were rated according to the rating scale in **Table 10** below.

6.1.7. Vegetation Biodiversity Assessment

In terms of assessing the impacts of a proposed development on the receiving environment, it is vital that the current state of the environment is assessed, and the level at which it contributes currently, is considered and recorded.

It is bearing this in mind that we have developed an assessment matrix which will assist in determining the current biodiversity and conservation value of the various vegetation types that were encountered during the field survey (SiVEST, 2013). In addition, we need to consider the biodiversity noteworthiness of the receiving environment (i.e. does the environment hold any rare species, protected species and unique landscape features) as well as the functional integrity and future sustainability of the vegetation types in the immediate vicinity of the development. The final condition score of each landscape is calculated adding the Biodiversity noteworthiness score with the Functional integrity and Sustainability score. It must be noted that the two scores are weighted 50:50% respectively.

Table 9. Biodiversity maintenance services score sheet (Template and Description)

	Scores				
Biodiversity Noteworthiness	**0**	**1**	**2**	**3**	**4**
Diversity	Low	Med-Low	Medium	Med-High	High
Rarity	Low	Med-Low	Medium	Med-High	High
Conservation Status	Least Concern	Near-Threatened	Vulnerable	Endangered	Critically Endangered
Red Data	No	-	-	-	Yes
Uniqueness / Special features	None	Med-Low	Medium	Med-High	High
Integrity & Future Viability	**0**	**1**	**2**	**3**	**4**
Buffer	Low	Med-Low	Medium	Med-High	High
Connectivity	Low	Med-Low	Medium	Med-High	High
Alteration	>50%	25-50%	5-25%	1-5%	<1%
Invasive/pioneers	>50%	25-50%	5-25%	1-5%	<1%
Size	<1 ha	1 – 2 ha	3 - 10 ha	10 – 15 ha	>15 ha

Table 10. Rating Scale for Biodiversity Maintenance services based on Assessment scores

Score:	**0-0.8**	**0.9-1.6**	**1.7-2.4**	**2.5-3.2**	**3.3-4.0**
Rating of the likely extent to which a service is being performed	Low	Moderately Low	Intermediate	Moderately High	High

A total of 37 plant species were recorded during the field survey, of which 6 were alien. One plant species fall under the KwaZulu-Natal Nature Conservation Management Act (*Asparagus spp*) and one species falls under the National Forest Act as a protected species (*Sclerocarya birrea*).

Please note, the Biodiversity Noteworthiness and Future Integrity assessments have been combined for both the preferred and alternative options as the vegetation on both sites is similar.

<u>Biodiversity noteworthiness</u>

In terms of the vegetation classifications that were identified from the aerial photography and ground truthed on site, the following assessment was made in terms of the noteworthiness of the vegetation that would be immediately impacted upon by the proposed Development.

Table 11. Biodiversity noteworthiness of the Donor House.

	Scores				
Biodiversity Noteworthiness	**0**	**1**	**2**	**3**	**4**
Diversity			✓		
Rarity			✓		
Conservation Status			✓		
Red Data Species					✓
Uniqueness / Special features	✓				
OVERALL VALUE	Total Score/number of categories is 10 / 5= **2**				

Table 12. Biodiversity noteworthiness of the Tented Camp.

	Scores				
Biodiversity Noteworthiness	**0**	**1**	**2**	**3**	**4**
Diversity		✓			
Rarity		✓			
Conservation Status	✓				
Red Data Species					✓
Uniqueness / Special features	✓				
OVERALL VALUE	Total Score/number of categories is 6 / 5= **1.2**				

Table 13. Biodiversity noteworthiness of the Managers House.

	Scores				
Biodiversity Noteworthiness	**0**	**1**	**2**	**3**	**4**
Diversity			✓		
Rarity			✓		
Conservation Status			✓		
Red Data Species					✓
Uniqueness / Special features	✓				
OVERALL VALUE	Total Score/number of categories is 10 / 5= **2**				

Table 14. Biodiversity noteworthiness of the FreeMe Site.

	Scores				
Biodiversity Noteworthiness	**0**	**1**	**2**	**3**	**4**
Diversity		✓			
Rarity		✓			
Conservation Status	✓				
Red Data Species					✓
Uniqueness / Special features	✓				
OVERALL VALUE	Total Score/number of categories is 6 / 5= **1.2**				

Functional Integrity and Sustainability

The Functional Integrity and Sustainability speaks to the impact of the proposed activity on the receiving environment. It also speaks to the likelihood that it will be of significance, and whether there are significant mitigation and or amelioration measures that are required to be put in place to ensure that the impacts are manageable, and will not prove deleterious to the vegetation type as a whole.

Table 15. Future Integrity and viability of the Donor House.

	Scores				
Integrity & Future Viability	**0**	**1**	**2**	**3**	**4**
Buffer		✓			
Connectivity					✓
Alteration			✓		
Invasive/pioneers			✓		
Size		✓			
OVERALL VALUE	Total Score/number of categories is 10 / 5= **2**				

Table 16. Future Integrity and viability of the Tented Camp.

	Scores				
Integrity & Future Viability	**0**	**1**	**2**	**3**	**4**
Buffer		✓			

Connectivity					✓
Alteration			✓		
Invasive/pioneers			✓		
Size	✓				
OVERALL VALUE	Total Score/number of categories is 9 / 5= **1.8**				

Table 17. Future Integrity and viability of the Managers House.

	Scores				
Integrity & Future Viability	**0**	**1**	**2**	**3**	**4**
Buffer		✓			
Connectivity					✓
Alteration			✓		
Invasive/pioneers			✓		
Size	✓				
OVERALL VALUE	Total Score/number of categories is 9 / 5= **1.8**				

Table 18. Future Integrity and viability of the FreeMe Site.

	Scores				
Integrity & Future Viability	**0**	**1**	**2**	**3**	**4**
Buffer	✓				
Connectivity			✓		
Alteration				✓	
Invasive/pioneers			✓		
Size			✓		
OVERALL VALUE	Total Score/number of categories is 9 / 5= **1.8**				

Table 19: Summary of Biodiversity Noteworthiness and Future Integrity and Viability of each site

	Biodiversity Noteworthiness		Future Integrity and Viability	
Site	**Score**	**Level**	**Score**	**Level**
Donor House	2	Intermediate	2	Intermediate
Tented Camp	1.2	Low	1.8	Intermediate
Managers House	2	Intermediate	1.8	Intermediate
FreeMe Site	1.2	Low	1.8	Intermediate

6.2. Faunal Description

6.2.1. Avifauna

Avifauna is described for the whole GUNR as birds are mobile; therefore, presence is noted for the entire reserve. A total of 47 bird species were seen during the sampling period, however SABAP predicts 327 species to occur on site. A full list of species avifauna can be found in **Appendix 2**, while the Protected Area Management Plan for GUNR has completed lists of avifauna present on site (Conservation Outcomes, 2021). Species seen were in flight and foraging within existing vegetation. This assumes that these birds were using the sample site as a viable home range and movement corridor, which is understandable as GUNR has riverine, valley bushveld and grassland habitat, surrounded by other protected areas. Additionally, the suite of birds seen tend to occupy the above mentioned vegetation types. The sampling period time of the year was likely a limiting factor in species richness as migratory avifauna would no longer be present during July. No species of conservation concern were identified during the assessment.

A wide variety of species of conservation concern are predicted to occur, breed and on site (**Table 20**). It should be noted that the GUNR Ecologist has noted Martial Eagle (*Polemaetus bellicosus*) nesting in proximity to the Mzinene River during the 2020 / 2021 nesting season.

It is expected that the proposed development will result in negligible loss of habitat for species of conservation concern.

Plate 12: Common Ostrich (*Struthio camelus*) seen on site.

6.2.2. Herpetofauna

Herpetofauna include both reptiles and amphibians. While only one species of conservation concern, the Nile Crocodile (*Crocodylus niloticus*) was seen on site (**Plate 13**), **Table 20** predicts that four species of conservation concern will occur at GUNR. Habitat is available for a variety of reptile species at GUNR, with these species predicted to increase in abundance with the protection offered by the reserve.

No amphibians were noted on the site inspection, however there is abundant habitat provided in the wetlands and Mzinene River for aphibians.

Plate 13: Nile Crocodile seen in a reserve in the area.

6.2.3. Mammals

Five mammal species were seen during the site assessment. They were Impala (*Aepyceros melampus*), Nyala (*Tragelaphus angasii*), Giraffe (*Giraffa giraffa giraffa*), Hippopotamus (*Hippopotamus amphibius*, **Plate 14**) and the Vulnerable Leopard (observed by Jake Alletson, *Panthera pardus*). No further species of conservation concern were identified during the assessment, however there is available habitat at GUNR for 12 mammals of conservation concern to occur on site (**Table 20**).

Many of the iconic species are transient species coming from surrounding protected areas, and temporarily utilize GUNR as an ecological corridor and for foraging. It is expected that the proposed development will result in negligible loss of habitat for species of conservation concern.

Plate 14: *Hippopotamus amphibius* seen in the Mzinene River.

6.2.4. Butterflies

No butterfly or moth species of conservation concern were noted on site.

6.2.5. Other Species

No invertebrates predicted to occur on site by the DFFE screening tool, TSCP Minset or species of conservation concern were identified on site.

6.2.6. Faunal Probability of Occurrence

Fauna POC Assessment Summary

The potential occurrence of fauna of conservation significance for the study area were highlighted at a desktop level by investigating:

1) Biodiversity features for the study area highlighted in the Provincial Terrestrial Systematic Conservation Plan or CPLAN (EKZNW, 2010);
2) Species records found in the South African Bird Atlas Project 2 (SABAP2) database;
3) Species intersected with the DFFE Screening Tool;
4) Available species records (ADU, 2020); and
5) Professional experience regarding rare/threatened amphibian species, reptiles and small mammals and their habitat requirements in KZN.

The findings of the desktop faunal potential of occurrence (POC) assessment have been summarised in terms of potential mammals, avifauna (birds), amphibians, reptiles and invertebrates of conservation concern (i.e. Red-Dated Listed Species: CR: Critically Endangered, EN: Endangered, VU: Vulnerable, NT: Near Threatened). Note that species of Least Concern (LC), endemic species and species with restricted ranges have been excluded from the assessment, with the focus being on Red-Data Listed (threatened) species.

Table 20: Faunal probability of occurrence.

Group	Scientific Name	Common Name	Threat Status (regional, global)	Habitat Requirements / Preferences (IUCN, 2017)	Requirements Met	POC
Avifauna	*Calidris ferruginea*	Curlew Sandpiper	LC, NT	It shows a preference for open grassland with marshy, boggy depressions and pools.	Yes - along Mzinene River	Likely - last recorded in October 2020
	Caprimulgus natalensis	Swamp Nightjar	VU, LC	Grassland adjoining swamps, lagoons and rivers	Yes - in proximity to Mzinene River	Likely - last reported in November 2015
	Ciconia nigra	Black Stork	VU, LC	Species inhabits old, undisturbed, open forests from sea-level up to mountainous regions. It forages in shallow streams, pools, marshes, flood-plains, pools in dry riverbeds where there are stands of reeds or long grass	Yes - riparian vegetation along Mzinene River	Potentially likely although last report was from October 2010.
	Cinnyris neergaardi	Neergaard's Sunbird	VU, NT	Woodland, especially dry, dense forest on sandy soil. It also inhabits coastal scrubland and has been recorded in isolated trees in clearings and villages	Yes - woodland present	Likely - last reported in July 2019
	Circaetus fasciolatus	Southern Banded Snake Eagle	CR, NT	It is confined mainly to dense coastal and riverine forest, also ranging into adjacent marshes and floodplains, and also further inland in similar forest patches to riverine habitats. Anthropogenic habitats adjacent to forest used for foraging and the species may nest in plantations of introduced Eucalyptus spp.	Yes - riverine habitat and floodplains present	Likely - last reported date in October 2020.
	Coracias garrulus	European Roller	NT, LC	Open woodlands, perching on open dead branches, on telephone poles and powerlines	Yes - habitat present	Likely - observer seen this species in general area
	Crithagra citrinipectus	Lemon-breasted Canary	NT , LC	Species is found in lowland palm savannas, clearings in dry woodland, grassland, gardens, road verges and edges of cultivation, invariably below 750 m. It is strongly associated with Ilala palms Hyphaene natalensis over most of its range.	Yes - Ilala palms present	Likely - species has been seen in area by observer
	Ephippiorhynchus senegalensis	Saddle-billed Stork	EN, LC	Inhabits extensive fresh, brackish or alkaline wetlands in open, semi-arid areas and savanna, with relatively high abundances of fish and with large trees nearby for nesting and roosting (although it avoids deeply forested areas). Suitable habitats include shallow freshwater marshes, wet grasslands, the margins of large or small rivers, lake shores, pans and flood-plains.	Yes - habitats present along Mzinene River.	Possible - variety of habitats available
	Gyps africanus	White-backed Vulture	CR, CR	Primarily a lowland species of open wooded savanna, particularly areas of Acacia. It requires tall trees for nesting, but has also been recorded nesting on electricity pylons in South Africa. A gregarious species congregating at carcasses, in thermals and at roost sites. It nests in loose colonies.	Yes - open wooded savanna present	High - observer has seen individuals around Ulundi
	Gyps coprotheres	Cape Vulture	EN, EN	Flies long distances over open country, although usually found near steep terrain, where it breeds and roosts on cliffs.	Yes - potential cliff nesting available in Lebombos	Likely - last recorded in February 2021
	Trigonoceps occipitalis	White-headed Vulture	CR, CR	Prefers mixed, dry woodland at low altitudes, avoiding semi-arid thornbelt areas. It generally avoids human habitation.	Yes - habitat type present	Possible, species last recorded in March 2013 in Pentad
	Leptoptilos crumeniferus	Marabou Stork	NT, LC	It inhabits open dry savannas, grasslands, swamps, riverbanks, lake shores and receding pools where fish are concentrated, typically foraging in and around fishing villages	Yes - habitat present	Possible - species last noted in June 2015
	Microparra capensis	Lesser Jacana	VU, LC	Species shows a preference for shallow water around the edges of permanent and seasonally flooded wetlands, with areas of sparse sedge (Rhynchosporia, Eliocharis, Cyperus and Juncus spp.), aquatic grasses (Leersia and Hemarthria spp.) and stands of floating vegetation such as water-lilies (Nymphaea and Nymphoides spp.)	Yes - habitat present along Mzinene River and lake St Lucia.	Likely along Mzinene River, however species last noted in November 2009.
	Mycteria ibis	Yellow-billed Stork	EN, LC	Species inhabits a variety of wetlands with shallow water 10-40 cm deep for feeding and sandbanks or trees for roosting. It frequents large swamps, the margins of rivers and lakes, lagoons, large marshes, small pools flooded grassland, alkaline lakes, reservoirs, waterholes and rice-paddies, less commonly foraging on marine mudflats, in tidal pools along beaches or in estuaries. The species generally avoids areas of large-scale flooding and is rare in forested areas.	Yes - habitat present along Mzinene River	Possible - species last noted in Actober 2020
	Nettapus auritus	African Pygmy Goose	VU, LC	Species inhabits permanent or temporary marshes, inland deltas, shallow lakes, flood-plains, slow-flowing rivers and occasionally coastal lagoons. Preference for deep clear waters abundant emergent and aquatic vegetation, especially water-lilies (Nymphaea spp.).	Yes - habitat present along Mzinene River	Possible - species last noted in January 2020
	Pelecanus onocrotalus	Great White Pelican	VU, LC	Inland waters, marine intertidal.	Yes - potentially present along entrance to Lake St Lucia	Potentially likely along St Lucia estuary
	Pelecanus rufescens	Pink-backed Pelican	VU, LC	Prefers to feed in quiet backwaters and weed-grown lagoons where there is shallow water and emergent vegetation, generally avoiding steep, vegetated lake margins. It shows a preference for freshwater lakes, swamps, large slow-flowing rivers, and seasonal pools	Yes - potentially present along entrance to Lake St Lucia and Mzinene River	Potentially likely along St Lucia estuary
	Phoeniconaias minor	Lesser Flamingo	NT, NT	Breeds on large undisturbed alkaline and saline lakes, salt pans or coastal lagoons, usually far out from the shore, after seasonal rains have provided the flooding necessary to isolate remote breeding sites from terrestrial predators and the soft muddy material for nest building	Yes - potentially present along entrance to Lake St Lucia	Possible along the Mzinene mudbanks.
	Phoenicopterus roseus	Greater Flamingo	NT, LC	When not breeding, the sub-Saharan African population tends to disperse among the alkaline-saline lakes and wetlands of eastern and southern Africa	Yes - potentially present along entrance to Lake St Lucia	Possible along the Mzinene mudbanks.
	Podica senegalensis	African Finfoot	VU, LC	Occurs in forest and wooded savanna along permanent streams, along secluded thickly wooded rivers, on the edges of pools, lakes and dams with well-vegetated banks	Yes - Mzinene River present	Likely - along Mzinene River
	Polemaetus bellicosus	Martial Eagle	EN, VU	It inhabits open woodland, wooded savanna, bushy grassland, thornbush and, in southern Africa, more open country and even subdesert, from sea level to 3,000 m	Yes - bushy grassland present	Likely - Reserve Ecologist confirmed nest in 2020/2021 nesting season.
	Rostratula benghalensis	Greater Painted-snipe	NT, LC	Species shows a preference for recently flooded areas in shallow lowland freshwater temporary or permanent wetlands	Yes - along Mzinene River if flooding of floodplain occurs	Potentially likely along Mzinene River
	Sagittarius serpentarius	Secretarybird	VU, VU	The species inhabits grasslands, ranging from open plains to lightly wooded savanna, but is also found in agricultural areas and sub-desert. It ranges from sea-level to 3,000 m	Yes - lightly wooded savanna present	Potentially likely
	Smithornis capensis	African Broadbill	VU, LC	Lowland evergreen and sand forest, also along riparian drainage lines	Yes - riparian drainage lines present	Likely - observer seen this species in general area
	Stephanoaetus coronatus	Crowned Eagle	VU, NT	It inhabits forest, woodland, savanna and shrubland, as well as some modified habitats, such as plantations and	Yes - habitat present along Mzinene River	Likely - last recorded sighting

Group	Scientific Name	Common Name	Threat Status (regional, global)	Habitat Requirements / Preferences (IUCN, 2017)	Requirements Met	POC
				secondary growth, and can persist in small forest fragments including urban greenspace forests		in September 2020
	Sterna caspia	Caspian Tern	VU, LC	Wetlands (inland), Marine Neritic, Marine Intertidal, Marine Coastal/Supratidal, Artificial/Aquatic & Marine	Yes - habitat present along St Lucia	Likely, species regularly seen along St Lucia Estuary.
	Terathopius ecaudatus	Bateleur	EN, NT	Inhabits open country, including grasslands, savanna and subdesert thornbush from sea level to 4,500 m but generally below 3,000 m	Yes - habitat present	Likely - species often seen in the area
	Torgos tracheliotos	Lappet-faced Vulture	EN, EN	Species inhabits dry savanna, arid plains, deserts and open mountain slopes. It builds solitary nests (containing just one egg), often in Acacia (its distribution sometimes being limited by these trees' distribution) but also in Balanites and Terminalia.	Yes - habitat present	Potentially likely flying over the area, however approx. 5700 mature individuals reduce chance of presence.
Mammals	*Acinonyx jubatus*	Cheetah	Vulnerable	Savanna, shrubland, grassland, desert	Yes - savanna woodlands and open grassland present	Transient - break outs from Phinda
	Cephalophus natalensis	Red Duiker	Near Threatened (2016)	Inhabits evergreen forest, tropical/subtropical forest patches, coastal scrub, and riverine thickets.	Yes - habitat present	Present and last recorded in March 2021
	Crocuta crocuta	Spotted Hyaena	Near Threatened	Present in all habitats including semi-desert, savanna and open woodland, dense dry woodland, and even montane habitats.	Yes - savanna woodlands and open grassland present	Likely, seen in camera trap survey in 2017
	Leptailurus serval	Serval	Near Threatened (2016)	Associated with mesic grasslands and wetlands within alpine, montane and sub-montane regions, typically occurring in dense vegetation in close proximity to water.	Yes - habitat present	Likely, seen on patrol 2017
	Loxodonta africana	African Bush Elephant	Vulnerable A2a (2008)	Forest, Savanna, Shrubland, Grassland, Wetlands (inland), Desert	Yes - most habitat types present	Not recorded on property
	Nesotragus moschatus zuluensis	Suni	Endangered	In northern KZN, they occur in dry woodland, bushveld and thickets on sand or clay soils	Yes - habitat present	Present – confirmed in 2018 on camera trap
	Lycaon pictus	African Wild Dog	Endangered	Range of habitats including short-grass plains, semi-desert, bushy savannas and upland forest	Yes - habitat present	Potentially likely - transient species break outs from Mkhuze
	Ourebia ourebi	Oribi	Endangered	Savanna woodlands, floodplains and other open grasslands, from around sea level to about 2,000 m asl.	Yes - habitat present	Potentially likely however last case recorded in 2011
	Panthera pardus	Leopard	Vulnerable	Forest, Savanna, Shrubland, Grassland, Rocky areas (eg. inland cliffs, mountain peaks), Desert	Yes - habitat present	Present, seen on site by Jake Alletson
	Paraxerus palliatus	Red Bush Squirrel	Near Threatened (2016)	This species has been recorded from a variety of habitat types including dry or moist evergreen forests, woodlands, riverine forest and thickets.	Yes - habitat present	Present, last recorded in Novemebr 2021
	Petrodromus tetradactylus	Four-toed Elephant Shrew	Near Threatened (2016)	Occurs in forest, dense woodlands, and thickets	Yes - habitat present	Likely, seen in 2017 by C. Wright
	Pipistrellus anchietae	Anchieta's Pipistrelle	Near Threatened (2016)	Dry and moist savanna; in KZN associated with afromontane forest, coastal forest and bushveld.	Yes - habitat preference present	Likely
	Smutsia temminckii	Ground Pangolin	Vulnerable (2016)	Found in dense forest, open and closed savanna, grassland. Limited to protected areas in South Africa.	Yes - habitat present	Potentially likely, however extremely secretive
Reptiles	*Chamaesaura macrolepis*	Large-scaled Grass Lizard	Near Threatened (SARCA 2014)	Occurs in the savanna, Indian Ocean Coastal Belt and Grassland Biomes in dry, open, sandy grasslands near the coast and on the Lebombo Mountains	Yes, sandy soils present	Potentially likely, however no recent recordings
	Crocodylus niloticus	Nile Crocodile	VU (SARCA 2014); LC (global, IUCN 2019)	Marine and inland water bodies	Yes - habitat present along the Mzinene River	Present, seen by author
	Dendroaspis angusticeps	Green Mamba	Vulnerable (SARCA 2014)	Inhabits coastal bush and forest, moist savanna and evergreen hill forest, and in agricultural areas including coconut and cashew plantations	Yes - habitat present	Potentially likely, last recorded in 2013
	Kinixys natalensis	KwaZulu-Natal Hinged-back Tortoise	Vulnerable (2018)	dry rocky habitat in thornveld, valley bushveld, dry thicket or bushveld savanna at elevations between 50 and 1,200 m and is generally absent from coastal regions, deep sand and forest	Yes - habitat present	Potentially likely
	Lycophidion pygmaeum	Pygmy Wolf Snake	Near Threatened (SARCA 2014)	Inhabits lowland forests, grasslands, and mesic savanna habitats.	Yes - habitat present	Potentially likely, last recorded in 2015
	Pelusios rhodesianus	Variable Hinged Terrapin	Vulnerable (SARCA 2014)	Aquatic to terrestrial	Yes - Mzinene River	Potentially likely
Invertebrates	*Zinophora laminata*	Laminate Large Spined Millipede	Near Threatened	The species inhabits grasslands and savanna in the Lowveld Bioregion. It occurs in Northern Zululand Sourveld, Zululand Lowveld and Zululand Coastal Thornveld	Yes - coastal thornveld present	Potentially likely
	Orthoporoides corrugatus	Unknown	No information	No information	No information	No information
	Deloneura millari millari	Millar's buff	Least Concern	habitat consists of coastal bush and moist savannah, larvae possibly feed on cyanobacteria	Yes	Potentially likely
	Hypolycaena lochmophila	Coastal hairstreak	Vulnerable	Shady areas of coastal or lowland dry, sandy forest.	No - dry sandy forest not present	Unlikely
	Iolaus lulua	White spotted saphire	Vulnerable	Restricted to the forested coastal dunes of northern KwaZulu-Natal and sandy lowland forests from False Bay to Kosi Bay, inland to the Ndumu and Lebombo foothills	No - habitat not present	Unlikely
	Teriomima zuluana	Zulu Buff	Vulnerable	Found in coastal lowland forest, on the edges, or in the understory, of forest/thicket in the Indian Ocean Coastal Belt.	No - habitat not present	Unlikely

7. IMPACT ASSESSMENT

The nature of the activity is that it has the potential to cause negative environmental effects. However, if mitigation measures for the activity are correctly implemented and the rehabilitation is successful, minimal disturbance of environment will be seen (**See Appendix 9 for Methodology**).

The potential impacts of the proposed development mainly related to loss of recovering vulnerable vegetation types (SVl 20 Western Maputaland Clay Bushveld) and plant and animal species of conservation concern. The loss of floral and faunal species of conservation concern is limited as the development aims to avoid vulnerable vegetation types, protected plant species and faunal species are likely to move away during construction. Terrestrial and aquatic faunal species, which are present on GUNR are likely to be impacted on during construction of the accommodation facilities. Consequently, loss of terrestrial fauna and flora will be on a localised scale and can be largely mitigated against, provided mitigation measures are implemented. The impact assessment focuses on each of each of the accommodation types proposed for the GUNR.

7.1. Planning and design phase impacts

No planning or design phase impacts were identified.

7.2. Construction phase impacts

7.2.1. Indigenous natural vegetation

Loss, degradation or fragmentation of vegetation through direct clearing.

7.2.2. Transformation of habitat for flora

Hard transformation of the access roads and concrete works for structures will result in a marginal reduction in flora.

7.2.3. Erosion related impacts

Vegetation binds and protects the soil surface, and when removed, increases erosion potential. This may lead to water and wind removing vital topsoil, potentially clogging roadsides, drainage lines wetlands and watercourses through sedimentation.

7.2.4. Habitat transformation and fragmentation for fauna

Much of the area was previously under agriculture and is in the process of recovering through active management and natural rehabilitation. Continued transformation of vegetation in the area could result in a marginal reduction in flora and fauna for the area. Further disturbance of the soil surface leads to the establishment of alien invasive plant species. Continued transformation of the land results in habitat fragmentation, where edge effects decrease suitable habitat for a wide range of fauna in the area. This leads to an overall indirect decline in faunal diversity.

7.3. Operation phase impacts

7.3.1. Erosion related impacts for operation phase

Erosion potential is increased in areas where vegetation has been removed. Hard transformation may increase water velocity in steeper areas and may result in a loss of topsoil and the erosion of drainage lines. This will aid in alien and invasive plant establishment and vegetation rehabilitation will be compromised as the loss of topsoil will delay rehabilitation efforts.

7.3.2. Biodiversity loss due to operation phase

Biodiversity loss during operation is expected to be minimal, if soil layers are maintained and vegetation re-establishment is achieved.

7.3.3. Vegetation

Establishment and spread of alien invasive plant species due to disturbance vectors.

7.4. Decomission phase impacts

Decomissioning phase impacts are anticipated to be the same as the construction and operation phase impacts. Therefore mitigation measures for the construction and operation phase must be followed should decommissioning of the proposed infrastructure be undertaken.

7.5. No-go alternative.

Please note that a No-Go option would be the status quo. This is not supported by the Ecologist as the need to provide tourism facilities to assist in the operations and overall protection of the GUNR outweighs any potential loss in biodiversity.

7.6. Overall impact rating

The overall negative impact of the proposed project is expected to be a negative low pior to mitigation measures being implemented (22.6) with a post mitigation score of 15.9. A relatively limited area will be lost to development. This will result in the loss of some indigenous plants, but little anticipated impact on any floral or faunal species of conservation concern.

7.7. Impacts identified for all phases and proposed accommodation

Table 21: Impact descriptions for all accommodation / lodges

Impact	Description	Mitigation
Construction Phase		
Indigenous natural vegetation	Loss, degradation or fragmentation of vegetation through direct clearing	• A site specific Environmental Management Programme needs to be developed for the construction phase. It is assumed that the operation of the facilties will be in line with the overall management for the area. • An Environmental Control Officer (ECO) needs to be appointed for the duration of construction. • Footprint of the activity needs to be strictly adhered to. • Sensitive areas need to be demarcated clearly before construction commences. • Areas outside of the construction zone are to be designated as “no-go areas.” • Permits for the removal and relocation of plants (DAFF for Sclerocarya birrea and EKZNW for Asparagus spp.) must be in place before any construction can commence; • Translocation plan should inform the relocation of indigenous plants; including storing protected plants within an onsite plant storage area or for rehabilitation purposes. To be decided upon by the DAFF / EKZNW permit requirements; • Vegetation clearance in the construction phase is to be removed in a phased approach, as and when it becomes necessary as vegetation harbours fauna. • The appointed ECO should do a site walk through prior to construction commencing to search for breeding and nesting fauna. Should these be identified, a search and rescue operation by a suitably qualified person, must be undertaken before construction commences.

Transformation of habitat for flora	Hard transformation of proposed access roads and accommodations will result in a marginal reduction in flora. The access roads being a linear activity will result in the disturbance of the soil surface, and this often leads to the establishment of alien invasive plant species.	• Servitude widths need to be a strictly adhered to.
		• Where possible, indigenous vegetation needs to be retained.
		• Clearance for construction should be done in a phased approach, and rehabilitation should be done as soon as work has ceased along the section of routing.
		• Where possible, construction should occur in the dry season to prevent soil loss through stormwater erosion.
		• Where possible, manual clearance of the vegetation should be done so as to prevent the unnecessary movement of machinery in no-go areas.
		• The contractor should implement an alien invasive control programme, particularly in areas where soil disturbance occurs.
		• Soil stockpiles need to be grassed with an indigenous species mix or covered with shadecloth to prevent soil loss through wind and water erosion. Species include:
		  ○ *Panicum maximum;*
		  ○ *Digiteria eriantha;*
		  ○ *Chloris gayana;*
		  ○ *Dactylectenum austral.*
		• Strictly no trapping or hunting of fauna is allowed.
		• All open excavations need to be checked on a daily basis and any fauna that may be stranded will have to be caught and released by a qualified person.

Impact	Description	Mitigation
Construction Phase		
		• Rehabilitation should take place as soon as construction is complete. • Strictly no littering. The contractor should highlight this at daily toolbox talks and site clean-ups should occur on a daily occasion. All waste to be removed off site and disposed of in an acceptable manner. • A mix of indigenous grass species, should be used for rehabilitation.
Erosion related impacts	Vegetation binds and protects the soil surface, and when removed, increases erosion potential. This may lead to water and wind removing vital topsoil and blocking up drains and eventually clogging roadsides and drainage lines.	• All stormwater outflows must be protected with reno-mattresses and gabion baskets where applicable to reduce the effect of erosion on the access road. • Where possible, indigenous vegetation needs to be retained. • Vegetation should be cleared only when construction occurs in that section of the routing. • Soil stockpiles need to be grassed with an indigenous mix or covered with shadecloth to prevent soil loss through wind and water erosion. • Rehabilitation should take place as soon as construction is complete. • In areas of higher gradient, access roads should have erosion berms to prevent soil loss. • Construction activities should be limited to the winter months to prevent loss of soil to water runoff. • Wettling of the soil surface should occur when working in dusty conditions.
Habitat transformation and fragmentation for fauna	Continued transformation of vegetation in the area will result in a marginal reduction in flora and fauna for the area. Disturbance of the soil surface and a leads to the establishment of alien invasive plant species. Continued transformation of the land results in habitat fragmentation, where edge effects decrease suitable habitat for a wide range of fauna in the area. This leads to an overall indirect decline in faunal dversity.	• Construction footprint needs to be a strictly adhered to. • Areas outside of the construction zone must be demarcated as “no-go” areas. • Clearance of land and vegetation is not allowed, unless clearance occurs within the authorised project area. • Where possible, indigenous vegetation needs to be retained. • Manual clearance of alien and invasive vegetation should be done so as to prevent the unnecessary movement of machinery in no-go areas. • An alien and invasive control programme should implemented, particularly in areas where soil disturbance has occured. • Soil stockpiles need to be returned to the excavations, with the subsoil being placed first, followed by the topsoil. • Monthly ECO auditing should occur during rehabilitation of the site. Once rehabilitation is complete, one three month, and one six month follow up audit should be conducted to assess the state of rehabilitation.

Impact	Description	Mitigation
Operation Phase		
Erosion related impacts for operation phase	Erosion is currently occurring on the access road. The preferred routing access road us likely to have high erosion potential should proper stormwater control measures not be in place.	• All stormwater outflows must be protected with reno-mattresses and gabion baskets where applicable, to reduce the effect of erosion on the access road. • Where possible, indigenous vegetation needs to be returned as soon as construction ceases. • Soil stockpiles need to be grassed with an indigenous mix and rehabilitated to prevent soil loss through wind and water erosion before operation phase begins. • Rehabilitation should take place as soon as construction is complete. • Operation phase should only begin once the ECO has deemed rehabilitation successful and mitigation measures have been implemented. • A biannual check of the area should take place for the appearance of erosion gullies, and if gullies develop, will need to be rehabilitated immediately.
Biodiversity loss due to operation phase	Biodiversity could be lost if rehabilitation measures are not implemented. This can be partly mitigated if rehabilitation is successful.	• A post construction monitoring programme is recommended to ensure that rehabilitation efforts are successful and that edge effects are reduced. • Monthly monitoring of these sensitive areas should take place during the first year after construction to ensure that rehabilitation is successful. • Six monthly checks of the area should take place for the emergence of invader species.
Vegetation	Establishment and spread of alien invasive plant species due to disturbance vectors	• Implement Alien Invasive Management Plan. • Rehabilitate disturbed areas.

7.8. Impact scoring

The SiVEST Impact Scoring Methodology can be found in Appendix 9, which details the method used in assessing impacts. The impact assessments in Tables 22 to 25 below should be read in conjunction with Appendix 9.

Table 22: Assessment of Impacts – Donor House

Nature of Impact	Spatial extent		Probability		Reversibility		Irreplaceable loss of resources		Duration		Intensity / Magnitude		Significance without mitigation	Significance with mitigation
	Without	With	Without	With	Without	With	Without	With	Without	With	Without	With		
Construction Phase														
Indigenous natural vegetation	1	1	3	2	1	1	2	2	2	2	2	2	18	16

Transformation of habitat for flora	1	1	3	2	2	1	3	2	3	2	3	2	36	16
Erosion related impacts	1	1	3	2	2	1	2	2	2	2	2	2	20	16
Habitat transformation and fragmentation for fauna	1	1	2	2	1	1	1	1	1	1	2	1	12	7
Operation Phase														
Erosion related impacts for operation phase	2	1	3	2	1	1	2	2	3	3	2	1	22	18
Biodiversity loss due to operation phase	2	1	3	2	2	1	3	2	3	3	2	2	26	18
Vegetation loss to alien and invasive establishment	1	1	3	2	2	2	3	2	3	3	2	2	24	20
Overall impact significance													22.6 Low	15.9 Low

Table 23: Assessment of Impacts – Tented Camp

Nature of Impact	Spatial extent		Probability		Reversibility		Irreplaceable loss of resources		Duration		Intensity / Magnitude		Significance without mitigation	Significance with mitigation
	Without	With	Without	With	Without	With	Without	With	Without	With	Without	With		

Construction Phase														
Indigenous natural vegetation	**1**	**1**	**3**	**2**	**1**	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**18**	**16**
Transformation of habitat for flora	**1**	**1**	**3**	**2**	**2**	**1**	**3**	**2**	**3**	**2**	**3**	**2**	**36**	**16**
Erosion related impacts	**1**	**1**	**3**	**2**	**2**	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**20**	**16**
Habitat transformation and fragmentation for fauna	**1**	**1**	**2**	**2**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**1**	**12**	**7**
Operation Phase														
Erosion related impacts for operation phase	**2**	**1**	**3**	**2**	**1**	**1**	**2**	**2**	**3**	**3**	**2**	**1**	**22**	**18**
Biodiversity loss due to operation phase	**2**	**1**	**3**	**2**	**2**	**1**	**3**	**2**	**3**	**3**	**2**	**2**	**26**	**18**
Vegetation loss to alien and invasive establishment	**1**	**1**	**3**	**2**	**2**	**2**	**3**	**2**	**3**	**3**	**2**	**2**	**24**	**20**
Overall impact significance													**22.6**	**15.9**
													Low	**Low**

Table 24: Assessment of Impacts – Managers House

Nature of Impact	Spatial extent		Probability		Reversibility		Irreplaceable loss of resources		Duration		Intensity / Magnitude		Significance without mitigation	Significance with mitigation
	Without	With	Without	With	Without	With	Without	With	Without	With	Without	With		
Construction Phase														
Indigenous natural vegetation	1	1	3	2	1	1	2	2	2	2	2	2	18	16
Transformation of habitat for flora	1	1	3	2	2	1	3	2	3	2	3	2	36	16
Erosion related impacts	1	1	3	2	2	1	2	2	2	2	2	2	20	16
Habitat transformation and fragmentation for fauna	1	1	2	2	1	1	1	1	1	1	2	1	12	7
Operation Phase														
Erosion related impacts for operation phase	2	1	3	2	1	1	2	2	3	3	2	1	22	18
Biodiversity loss due to operation phase	2	1	3	2	2	1	3	2	3	3	2	2	26	18
Vegetation loss to alien and invasive establishment	1	1	3	2	2	2	3	2	3	3	2	2	24	20

Overall impact significance	**22.6**	**15.9**
	Low	**Low**

Table 25: Assessment of Impacts – FreeMe Site

Nature of Impact	Spatial extent		Probability		Reversibility		Irreplaceable loss of resources		Duration		Intensity / Magnitude		Significance without mitigation	Significance with mitigation
	Without	With	Without	With	Without	With	Without	With	Without	With	Without	With		
Construction Phase														
Indigenous natural vegetation	1	1	3	2	1	1	2	2	2	2	2	2	18	16
Transformation of habitat for flora	1	1	3	2	2	1	3	2	3	2	3	2	36	16
Erosion related impacts	1	1	3	2	2	1	2	2	2	2	2	2	20	16
Habitat transformation and fragmentation for fauna	1	1	2	2	1	1	1	1	1	1	2	1	12	7
Operation Phase														
Erosion related impacts for operation phase	2	1	3	2	1	1	2	2	3	3	2	1	22	18
Biodiversity loss due to	2	1	3	2	2	1	3	2	3	3	2	2	26	18

operation phase														
Vegetation loss to alien and invasive establishment	**1**	**1**	**3**	**2**	**2**	**2**	**3**	**2**	**3**	**3**	**2**	**2**	**24**	**20**
Overall impact significance													**22.6**	**15.9**
													Low	**Low**

7.9. Impact Statement

The proposed development will result in a minor loss of biodiversity at a site level. However this loss can be largely mitigated against, provided the mitigation measures are implemented. Erosion potential is low due to slight slopes associated with the surrounding area. The largest threat to the site is the establishment of alien and invasive vegetation which is prevalent in the drainage lines and recovering farmlands in the area. Careful monitoring for alien and invasive species is required throughout the construction and operation phase.

All of the proposed lodges / accommodation facilities and associated infrastructure are supported by the Ecologist. Overall loss of biodiversity, establishment of alien and invasive vegetation and erosion potential can be mitigated against to result in a low overall impact. No fatal flaws have been identified and the Ecologist supports the proposed development provided the mitigation measures are implemented.

8. CONCLUSIONS

It is important to mention that additional species may have been overlooked during the field survey because of the plant life history characteristics exhibited by certain plant species during this time of the season. Some species, especially the plants which have underground bulbs, may not have emerged due to variations in their life strategies. However, it is the Specialist's opinion that the vegetation that was recorded from the site assessment provides enough information in order for inferences and extrapolations as to the quality, and the likely impacts associated with a development of this nature, to be made.

A total of 37 plant species were recorded during the field survey, of which 6 were alien. One plant species falls under the KwaZulu-Natal Nature Conservation Management Act (Asparagus spp) and one species falls under the National Forest Act as a protected species (Sclerocarya birrea).

According to Mucina and Rutherford 2006 and VegMap 2018, the site is classified as Western Maputaland Clay Bushveld (Vulnerable), Tembe Sandy Bushveld (Least Concerned) and Maputaland Pallid Sandy Bushveld (statutorily conserved). Upon undertaking the groundtruthing exercise it was found that the site is transformed from the natural state due to historical agricultural practices and as such, is impacted by bush encroachment and some alien invasive species. However, recovery is occuring. Although species representative of the three vegetation types present at GUNR occur, further rehabilitation and restoration of the historically disturbed GUNR is required to be representative of these vegetation types. Species diversity was estimated to be low to medium according to the vegetation assessment. No site alternatives were given for the four proposed accommodation types and access roads, however a previous feasibility assessment, undertaken by John Richardson, had recommended that infrastructure be placed within previously transformed areas and outside of CBA: Irreplaceable areas, which the WTF had done prior to this assessment taking place.

When development does take place and indigenous plants will need to be removed or relocated, permits for their removal will need to be obtained from DAFF and Ezemvelo KZN Wildlife. The removal should occur during their dormant growth period months and with due care informed by a Translocation Plan, preferably complied by a qualified botanist or similarly qualified individual.

The plants should be relocated into areas with the same aspect, soil conditions and elevation to ensure that the relocations are successful. In addition, the plants should be placed into good-sized holes that are at least twice the size of underground organs. It is very important for survival for underground organs not to be damaged and for plants to be watered for a period of time. Bulbs, however, are able to withstand a relatively high level of disturbance, given their survival strategy of storing the required reserve resources in the bulb. These species will likely re- generate following their excavation and replacement. Any applicable approvals/permits/consents/licenses relating to the environment should be in place prior to any site clearing and development. Good housekeeping and management of the construction impacts will see no or very limited impact on the environment.

From a faunal perspective, the study area has a medium to high conservation value. This is based on the potential for this site to harbour some species of conservation importance, which are present on site and within the surrounding reserves, which may use GUNR as a viable home range or as transient species utilising an ecological corridor. Habitat for foraging is abundant throughout the whole reserve, and so faunal species can move to adjacent areas during construction. This is unlikely to affect the status of species of conservation concern. It is not aniticipated that the proposed construction will have a long term negative effect on the fauna of the area. The fauna of the site is directly dependent on the vegetation of the site, and the careful management of the vegetation (and soil) will benefit the fauna of the area.

The overall area is transformed but is recovering from many years of farming activities and therefore currently has a medium conservation value. Although species identified in the DFFE Screening Tool may be present on site (including species as per the POC table, **Table 20**), the type of construction limits the overall loss in habitat for these species, especially if mitigation measures are implemented. Further to this, species identified in the TSCP Minset dataset mirror that of the DFFE Screening Tool.

Ecological corridors, CBA: Irreplaceable areas and threatened ecosystems will ultimately benefit from the increase in revenue generated from the four facilities proposed for GUNR. Even though there may be site specific impacts, these can largely be mitigated against and the overall objective of conserving the fauna, flora and ecosystems is achieved.

The ecologist has no objection to the development provided all mitigation measures can be agreed and achieved are implemented.

9. RECOMMENDATIONS

Should any development take place the following is recommended but not limited to:

- ✓ Permits for the removal and relocation of plants (DAFF for *Sclerocarya birrea* and EKZNW for *Asparagus spp.*) must be in place before any construction can commence;
- ✓ Translocation plan should inform the relocation of indigenous plants; including storing protected plants within an onsite plant storage area or for rehabilitation purposes. To be decided upon by the DAFF / EKZNW permit requirements;
- ✓ The appointed ECO should do a site walk through prior to construction commencing to search for breeding and nesting fauna. Should these be identified, a search and rescue operation by a suitably qualified person, must be undertaken before construction commences;
- ✓ Rehabilitation must occur once construction is complete in the relevant area;
- ✓ Community outreach regarding poaching of fauna should be undertaken particularly with Contractors on site;
- ✓ Rehabilitation of vegetation communities would improve faunal diversity across the site;
- ✓ An Alien Invasive Control Programme must be implemented;
- ✓ Erosion control measures must be implemented;
- ✓ Construction must occur in a phased approach;
- ✓ Care must be taken that veld fires are not started by construction activities.
- ✓ No biodiversity offset plan is recommended.

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Appendix 1 Species list (for complete list please refer to the Greater Ukuwela Nature Reserve Protected Areas Management Plan)

Scientific Name	Common Name	Growth Form	Origin	Ecological status
Apodytes dimidiata E.Mey. ex Arn. subsp. dimidiata	White Pear	Tree	Indigenous	
Asparagus spp.	Asparagus	Herb	Indigenous	EKZNW Plant Permit
Brachiaria deflexa (Schumach.) C.E.Hubb. ex Robyns	False Panicum	Grass	Indigenous	
Cereus jamacaru DC.	Queen Of The Night	Succulent	Exotic	Invader Category 1b
Chromolaena odorata (L.) R.M.King & H.Rob.	Triffid Weed	Bush	Exotic	Invader Category 1b
Coddia rudis (E.Mey. ex Harv.) Verdc.	Small bone apple	Shrub	Indigenous	
Combretum molle R.Br. ex G.Don	Velvet Bushwillow	Tree	Indigenous	
Commiphora neglecta I.Verd.	Green-stemmed Corkwod	Tree	Indigenous	
Dactyloctenium australe Steud.	L.m. Grass	Grass	Indigenous	
Dichrostachys cinerea (L.) Wight & Arn.	Sickle bush	Tree	Indigenous	
Ehretia rigida (Thunb.) Druce	Puzzle bush	Tree	Indigenous	
Eragrostis curvula (Schrad.) Nees	African Love Grass	Grass	Indigenous	
Euclea daphnoides Hiern	White Guarri	Tree	Indigenous	
Euclea divinorum Hiern	Magic Guarri	Tree	Indigenous	
Gossypium hirsutum L.	Cotton	Herb	Exotic	
Gymnosporia senegalensis (Lam.) Loes.	Red Spike-Thorn	Tree	Indigenous	
Helichrysum kraussii Sch.Bip.	Straw Everlasting	Herb	Indigenous	
Hyphaene coriacea Gaertn.	Ilala Palm	Palm	Indigenous	
Lantana camara L.	Tick berry	Shrub	Exotic	Invader Category 1b
Melinis repens (Willd.) Zizka	Natal red top	Grass	Indigenous	
Panicum maximum Jacq	Guinea grass	Grass	Indigenous	
Phoenix reclinata Jacq.	Wild Date Palm	Palm	Indigenous	
Sansevieria hyacinthoides (L.) Druce	Mother-in-law's-tongue	Herb	Indigenous	
Schotia brachypetala Sond.	Weeping Boer-bean	Tree	Indigenous	
Sclerocarya birrea (A.Rich.) Hochst. subsp. caffra (Sond.) Kokwaro	Marula tree	Tree	Protected	DAFF Pemrit
Sclerocroton integerrimus Hochst	Duiker Berry	Tree	Indigenous	
Searsia pentheri	Crow berry	Tree	Indigenous	
Senegalia schweinfurthii (Brenan & Exell) Seigler & Ebinger var. schweinfurthii	River Climbing Thorn	Creeper	Indigenous	
Solanum seaforthianum Andrews var. disjunctum O.E.Schulz	Potato Creeper	Creeper	Exotic	Invader Category 1b
Spirostachys africana Sond.	Tamboti	Tree	Indigenous	

Scientific Name	Common Name	Growth Form	Origin	Ecological status
Strychnos spinosa Lam. subsp. spinosa	Spiny Monkey Apple	Tree	Indigenous	
Trichilia emetica subsp. emetica	Natal mahogany	Tree	Indigenous	
Vachellia karroo (Hayne) Banfi & Gallaso	Karoo Thorn	Tree	Indigenous	
Vachellia nilotica (L.) P.J.H.Hurter & Mabb. subsp. kraussiana (Benth.) Kyal. & Boatwr.	Scented Thorn	Tree	Indigenous	
Vachellia robusta (Burch.) Kyal. & Boatwr. subsp. robusta	Splendid Thorn	Tree	Indigenous	
Vachellia xanthophloea (Benth.) P.J.H.Hurter (= Acacia xanthophloea)	Fever tree	Tree	Indigenous	
Urochloa mosambicensis (Hack.) Dandy	Bushveld Signal Grass	Grass	Indigenous	
Zanthoxylum capense (Thunb.) Harv.	Small knobwood	Tree	Indigenous	
Ziziphus mucronata Willd. subsp. mucronata	Buffalo thorn	Tree	Indigenous	

Appendix 2 SABAP2 Species List

Scientific Name	Common Name	Red List Status (Regional, Global)	fp	fpn	fp last
Gyps africanus	White-backed Vulture	CR, CR	27.439	13	18/10/2020
Trigonoceps occipitalis	White-headed Vulture	CR, CR	9.0909	2	12/03/2013
Circaetus fasciolatus	Southern Banded Snake Eagle	CR, NT	10.643	7	14/10/2020
Polemaetus bellicosus	Martial Eagle	EN, EN	2.27275	1	06/12/2011
Gyps coprotheres	Cape Vulture	EN, EN	4.5455	1	25/02/2021
Torgos tracheliotos	Lappet-faced Vulture	EN, EN	4.5455	1	03/04/2009
Terathopius ecaudatus	Bateleur	EN, EN	17.2949	9	05/01/2020
Aquila rapax	Tawny Eagle	EN, LC	5.76495	3	12/02/2013
Circus ranivorus	African Marsh Harrier	EN, LC	2.439	1	31/12/2008
Ephippiorhynchus senegalensis	Saddle-billed Stork	EN, LC	0	0	00/01/1900
Mycteria ibis	Yellow-billed Stork	EN, LC	19.90025	12	18/10/2020
Calidris ferruginea	Curlew Sandpiper	LC, NT	5.9313	4	18/10/2020
Crithagra citrinipectus	Lemon-breasted Canary	NT , LC	8.3703	6	23/11/2018
Phoenicopterus roseus	Greater Flamingo	NT, LC	0	0	00/01/1900
Rostratula benghalensis	Greater Painted-snipe	NT, LC	2.439	1	25/11/2008
Coracias garrulus	European Roller	NT, LC	8.0377	4	26/11/2016
Leptoptilos crumeniferus	Marabou Stork	NT, LC	1.2195	1	07/06/2015
Phoeniconaias minor	Lesser Flamingo	NT, NT	0	0	00/01/1900
Sagittarius serpentarius	Secretarybird	VU, EN	9.0909	2	03/04/2009
Smithornis capensis	African Broadbill	VU, LC	2.439	1	09/04/2011
Podica senegalensis	African Finfoot	VU, LC	5.76495	3	10/08/2018
Nettapus auritus	African Pygmy Goose	VU, LC	4.71175	3	05/01/2020
Microparra capensis	Lesser Jacana	VU, LC	4.878	2	24/11/2009
Caprimulgus natalensis	Swamp Nightjar	VU, LC	7.3171	3	21/11/2015
Pelecanus onocrotalus	Great White Pelican	VU, LC	1.2195	1	25/11/2008
Pelecanus rufescens	Pink-backed Pelican	VU, LC	1.2195	1	09/04/2011
Ciconia nigra	Black Stork	VU, LC	2.439	1	22/10/2010
Sterna caspia	Caspian Tern	VU, LC	4.878	2	09/04/2011
Stephanoaetus coronatus	Crowned Eagle	VU, NT	16.2417	9	08/09/2020
Cinnyris neergaardi	Neergaard's Sunbird	VU, NT	7.1508	5	22/07/2019

Scientific Name	Common Name	Red List Status (Regional, Global)	fp	fpn	fp last
Apalis flavida	Yellow-breasted Apalis	LC	46.0643	30	18/10/2020
Apalis ruddi	Rudd's Apalis	LC	36.9734	26	18/10/2020
Apalis thoracica	Bar-throated Apalis	LC	4.71175	3	06/07/2016
Recurvirostra avosetta	Pied Avocet	LC	2.27275	1	05/01/2020
Turdoides jardineii	Arrow-marked Babbler	LC	3.49225	2	02/08/2019
Lybius torquatus	Black-collared Barbet	LC	49.22395	30	18/10/2020
Stactolaema leucotis	White-eared Barbet	LC	19.1796	14	08/09/2020
Trachyphonus vaillantii	Crested Barbet	LC	24.1131	12	18/10/2020
Tricholaema leucomelas	Acacia Pied Barbet	LC	13.63635	6	25/02/2021
Batis fratrum	Woodward's Batis	LC	2.439	1	04/12/2010
Batis molitor	Chinspot Batis	LC	53.7694	32	18/10/2020
Merops apiaster	European Bee-eater	LC	27.051	17	25/02/2021
Merops persicus	Blue-cheeked Bee-eater	LC	9.5898	7	15/01/2020
Merops pusillus	Little Bee-eater	LC	24.27935	13	18/10/2020
Euplectes orix	Southern Red Bishop	LC	24.7783	16	18/10/2020
Ixobrychus minutus	Little Bittern	LC	4.878	2	22/10/2010
Laniarius ferrugineus	Southern Boubou	LC	46.2306	31	18/10/2020
Phyllastrephus terrestris	Terrestrial Brownbul	LC	28.7694	21	08/09/2020
Pycnonotus tricolor	Dark-capped Bulbul	LC	79.9335	50	25/02/2021
Emberiza flaviventris	Golden-breasted Bunting	LC	35.80935	19	18/10/2020
Emberiza tahapisi	Cinnamon-breasted Bunting	LC	13.6364	3	05/01/2020
Chlorophoneus olivaceus	Olive Bushshrike	LC	7.3171	3	08/09/2020
Chlorophoneus sulfureopectus	Orange-breasted Bushshrike	LC	57.76055	37	18/10/2020
Malaconotus blanchoti	Grey-headed Bushshrike	LC	27.7716	15	18/10/2020
Chlorophoneus viridis	Gorgeous Bushshrike	LC	62.4723	40	18/10/2020
Lissotis melanogaster	Black-bellied Bustard	LC	19.56765	10	18/10/2020
Turnix sylvaticus	Common Buttonquail	LC	10.47675	6	18/10/2020
Buteo buteo	Common Buzzard	LC	23.39245	14	25/02/2021
Kaupifalco monogrammicus	Lizard Buzzard	LC	4.5455	1	12/02/2013
Camaroptera brachyura	Green-backed Camaroptera	LC	68.23725	43	18/10/2020

Scientific Name	Common Name	Red List Status (Regional, Global)	fp	fpn	fp last
Crithagra mozambica	Yellow-fronted Canary	LC	70.34365	43	18/10/2020
Crithagra sulphurata	Brimstone Canary	LC	5.9313	4	11/06/2020
Thamnolaea cinnamomeiventris	Mocking Cliff Chat	LC	19.4013	9	18/10/2020
Cisticola chiniana	Rattling Cisticola	LC	73.83595	45	18/10/2020
Cisticola erythrops	Red-faced Cisticola	LC	5.76495	3	04/12/2010
Cisticola galactotes	Rufous-winged Cisticola	LC	9.7561	4	29/11/2019
Cisticola juncidis	Zitting Cisticola	LC	16.40795	10	29/11/2019
Cisticola natalensis	Croaking Cisticola	LC	19.0133	13	29/11/2019
Fulica cristata	Red-knobbed Coot	LC	6.09755	5	29/11/2019
Microcarbo africanus	Reed Cormorant	LC	20.0665	13	23/11/2018
Phalacrocorax lucidus	White-breasted Cormorant	LC	20.9534	12	18/10/2020
Centropus burchellii	Burchell's Coucal	LC	46.0643	30	18/10/2020
Centropus grillii	Black Coucal	LC	4.5455	1	03/12/2010
Cursorius temminckii	Temminck's Courser	LC	0	0	00/01/1900
Rhinoptilus chalcopterus	Bronze-winged Courser	LC	9.0909	2	12/02/2013
Amaurornis flavirostra	Black Crake	LC	15.18845	9	29/08/2015
Sylvietta rufescens	Long-billed Crombec	LC	42.23945	26	25/02/2021
Corvus albus	Pied Crow	LC	19.0133	13	09/10/2020
Chrysococcyx caprius	Diederik Cuckoo	LC	28.2705	18	18/10/2020
Chrysococcyx cupreus	African Emerald Cuckoo	LC	9.4235	6	11/11/2019
Chrysococcyx klaas	Klaas's Cuckoo	LC	20.0665	13	18/10/2020
Clamator jacobinus	Jacobin Cuckoo	LC	14.85585	7	05/01/2020
Cuculus clamosus	Black Cuckoo	LC	7.1508	5	14/10/2020
Cuculus solitarius	Red-chested Cuckoo	LC	36.8071	25	18/10/2020
Aviceda cuculoides	African Cuckoo-Hawk	LC	0	0	00/01/1900
Campephaga flava	Black Cuckooshrike	LC	14.13525	9	08/09/2020
Anhinga rufa	African Darter	LC	16.40795	10	05/08/2017
Oena capensis	Namaqua Dove	LC	22.7273	5	05/01/2020
Streptopelia senegalensis	Laughing Dove	LC	29.87805	15	09/07/2018
Streptopelia capicola	Cape Turtle Dove	LC	45.0665	24	18/10/2020

Scientific Name	Common Name	Red List Status (Regional, Global)	fp	fpn	fp last
Streptopelia semitorquata	Red-eyed Dove	LC	56.54105	36	18/10/2020
Turtur chalcospilos	Emerald-spotted Wood Dove	LC	77.16185	46	18/10/2020
Turtur tympanistria	Tambourine Dove	LC	20.23285	14	14/10/2020
Dicrurus adsimilis	Fork-tailed Drongo	LC	56.92905	32	25/02/2021
Dicrurus ludwigii	Common Square-tailed Drongo	LC	30.1552	23	14/10/2020
Anas undulata	Yellow-billed Duck	LC	9.7561	8	09/10/2020
Dendrocygna bicolor	Fulvous Whistling Duck	LC	4.878	2	09/04/2011
Dendrocygna viduata	White-faced Whistling Duck	LC	35.25495	22	05/01/2020
Sarkidiornis melanotos	Knob-billed Duck	LC	2.439	1	09/04/2011
Thalassornis leuconotus	White-backed Duck	LC	12.1951	5	29/11/2019
Circaetus cinereus	Brown Snake Eagle	LC	3.49225	2	28/10/2014
Circaetus pectoralis	Black-chested Snake Eagle	LC	9.2572	5	06/07/2016
Haliaeetus vocifer	African Fish Eagle	LC	22.33925	14	09/10/2020
Hieraaetus pennatus	Booted Eagle	LC	2.439	1	21/11/2015
Hieraaetus wahlbergi	Wahlberg's Eagle	LC	18.3481	9	25/02/2021
Lophaetus occipitalis	Long-crested Eagle	LC	5.9313	4	02/08/2019
Bubo africanus	Spotted Eagle-Owl	LC	18.1818	4	18/10/2020
Egretta alba	Great Egret	LC	11.8625	8	29/03/2018
Ardea intermedia	Intermediate Egret	LC	9.7561	4	23/11/2018
Bubulcus ibis	Western Cattle Egret	LC	28.2705	18	09/10/2020
Egretta garzetta	Little Egret	LC	11.8625	8	09/10/2020
Eremomela usticollis	Burnt-necked Eremomela	LC	3.49225	2	10/12/2009
Falco amurensis	Amur Falcon	LC	4.5455	1	15/04/2014
Lagonosticta rhodopareia	Jameson's Firefinch	LC	4.5455	1	06/12/2011
Lagonosticta rubricata	African Firefinch	LC	14.85585	7	05/08/2017
Lagonosticta senegala	Red-billed Firefinch	LC	9.2572	5	15/01/2020
Lanius collaris	Southern Fiscal	LC	34.7561	19	25/02/2021
Bradornis pallidus	Pale Flycatcher	LC	5.9313	4	11/11/2019
Melaenornis pammelaina	Southern Black Flycatcher	LC	34.7561	19	30/05/2020
Sigelus silens	Fiscal Flycatcher	LC	9.2572	5	09/07/2018

Scientific Name	Common Name	Red List Status (Regional, Global)	fp	fpn	fp last
Muscicapa adusta	African Dusky Flycatcher	LC	15.0222	8	30/05/2020
Muscicapa caerulescens	Ashy Flycatcher	LC	23.89135	17	14/10/2020
Muscicapa striata	Spotted Flycatcher	LC	13.80265	7	12/03/2013
Terpsiphone viridis	African Paradise Flycatcher	LC	30.54325	19	18/10/2020
Trochocercus cyanomelas	Blue-mantled Crested Flycatcher	LC	18.1264	14	08/09/2020
Dendroperdix sephaena	Crested Francolin	LC	49.22395	30	18/10/2020
Scleroptila shelleyi	Shelley's Francolin	LC	7.1508	5	21/11/2015
Corythaixoides concolor	Grey Go-away-bird	LC	4.5455	1	28/10/2014
Alopochen aegyptiaca	Egyptian Goose	LC	54.49	30	25/02/2021
Plectropterus gambensis	Spur-winged Goose	LC	36.4745	23	25/02/2021
Accipiter tachiro	African Goshawk	LC	15.6874	12	14/10/2020
Tachybaptus ruficollis	Little Grebe	LC	20.23285	14	18/10/2020
Andropadus importunus	Sombre Greenbul	LC	75.5543	49	18/10/2020
Chlorocichla flaviventris	Yellow-bellied Greenbul	LC	52.16185	35	18/10/2020
Tringa nebularia	Common Greenshank	LC	21.45235	15	18/10/2020
Guttera pucherani	Crested Guineafowl	LC	33.48115	24	18/10/2020
Numida meleagris	Helmeted Guineafowl	LC	23.39245	14	18/10/2020
Chroicocephalus cirrocephalus	Grey-headed Gull	LC	4.878	2	09/04/2011
Polyboroides typus	African Harrier-Hawk	LC	15.0222	8	18/10/2020
Prionops plumatus	White-crested Helmetshrike	LC	9.2572	5	18/10/2020
Ardea cinerea	Grey Heron	LC	29.1574	17	18/10/2020
Ardea goliath	Goliath Heron	LC	9.2572	5	29/08/2015
Ardea melanocephala	Black-headed Heron	LC	4.87805	4	29/11/2019
Ardea purpurea	Purple Heron	LC	12.1951	5	31/12/2012
Butorides striata	Striated Heron	LC	25.3326	13	29/03/2018
Egretta ardesiaca	Black Heron	LC	2.439	1	31/12/2008
Nycticorax nycticorax	Black-crowned Night Heron	LC	9.0909	2	29/08/2015
Prodotiscus regulus	Brown-backed Honeybird	LC	4.878	2	08/09/2020
Indicator indicator	Greater Honeyguide	LC	8.204	5	18/10/2020
Indicator minor	Lesser Honeyguide	LC	2.27275	1	03/12/2010

Scientific Name	Common Name	Red List Status (Regional, Global)	fp	fpn	fp last
Indicator variegatus	Scaly-throated Honeyguide	LC	14.30155	10	08/09/2020
Upupa africana	African Hoopoe	LC	44.1796	25	18/10/2020
Bycanistes bucinator	Trumpeter Hornbill	LC	14.13525	9	18/10/2020
Tockus alboterminatus	Crowned Hornbill	LC	24.7783	16	18/10/2020
Tockus leucomelas	Southern Yellow-billed Hornbill	LC	4.5455	1	12/03/2013
Bostrychia hagedash	Hadada Ibis	LC	75.2217	47	25/02/2021
Plegadis falcinellus	Glossy Ibis	LC	4.878	2	09/04/2011
Threskiornis aethiopicus	African Sacred Ibis	LC	4.71175	3	05/01/2020
Vidua chalybeata	Village Indigobird	LC	8.0377	4	07/01/2010
Vidua funerea	Dusky Indigobird	LC	2.439	1	31/12/2008
Actophilornis africanus	African Jacana	LC	39.46785	22	18/10/2020
Ceryle rudis	Pied Kingfisher	LC	27.7716	15	18/10/2020
Alcedo cristata	Malachite Kingfisher	LC	19.4013	9	25/02/2021
Halcyon albiventris	Brown-hooded Kingfisher	LC	70.34365	43	18/10/2020
Halcyon chelicuti	Striped Kingfisher	LC	20.9534	12	25/02/2021
Halcyon senegalensis	Woodland Kingfisher	LC	4.5455	1	06/12/2011
Ispidina picta	African Pygmy Kingfisher	LC	8.204	5	18/10/2020
Megaceryle maxima	Giant Kingfisher	LC	6.98445	4	29/08/2015
Elanus caeruleus	Black-winged Kite	LC	9.2572	5	28/10/2014
Milvus aegyptius	Yellow-billed Kite	LC	46.9512	29	18/10/2020
Milvus migrans	Black Kite	LC	0	0	00/01/1900
Vanellus armatus	Blacksmith Lapwing	LC	28.8248	15	18/10/2020
Vanellus coronatus	Crowned Lapwing	LC	35.0887	21	25/02/2021
Vanellus lugubris	Senegal Lapwing	LC	15.18845	9	25/02/2021
Vanellus melanopterus	Black-winged Lapwing	LC	2.439	1	10/04/2011
Vanellus senegallus	African Wattled Lapwing	LC	22.33925	14	09/10/2020
Calendulauda sabota	Sabota Lark	LC	5.76495	3	09/07/2018
Mirafra africana	Rufous-naped Lark	LC	40.133	26	18/10/2020
Mirafra rufocinnamomea	Flappet Lark	LC	5.76495	3	12/02/2013
Macronyx capensis	Cape Longclaw	LC	0	0	00/01/1900

Scientific Name	Common Name	Red List Status (Regional, Global)	fp	fpn	fp last
Macronyx croceus	Yellow-throated Longclaw	LC	50.27715	30	18/10/2020
Ceuthmochares australis	Green Malkoha	LC	7.3171	3	14/10/2020
Lonchura cucullata	Bronze Mannikin	LC	27.9379	16	02/08/2019
Lonchura nigriceps	Red-backed Mannikin	LC	7.3171	3	21/11/2015
Delichon urbicum	Common House Martin	LC	2.439	1	04/12/2010
Riparia cincta	Banded Martin	LC	4.878	2	09/04/2011
Riparia paludicola	Brown-throated Martin	LC	14.6341	6	23/11/2018
Riparia riparia	Sand Martin	LC	9.7561	4	23/11/2018
Ploceus intermedius	Lesser Masked-weaver	LC	24.61195	15	25/02/2021
Gallinula chloropus	Common Moorhen	LC	9.7561	4	23/11/2018
Colius striatus	Speckled Mousebird	LC	48.00445	29	18/10/2020
Urocolius indicus	Red-faced Mousebird	LC	40.85365	24	18/10/2020
Acridotheres tristis	Common Myna	LC	41.4634	17	09/10/2020
Nicator gularis	Eastern Nicator	LC	31.92905	21	18/10/2020
Caprimulgus fossii	Square-tailed Nightjar	LC	4.878	2	23/11/2018
Caprimulgus pectoralis	Fiery-necked Nightjar	LC	41.18625	26	25/02/2021
Anastomus lamelligerus	African Openbill	LC	4.5455	1	06/03/2010
Oriolus larvatus	Black-headed Oriole	LC	24.27935	13	08/09/2020
Struthio camelus	Common Ostrich	LC	2.439	1	21/11/2015
Asio capensis	Marsh Owl	LC	2.439	1	25/11/2008
Strix woodfordii	African Wood Owl	LC	36.5854	15	14/10/2020
Tyto alba	Western Barn Owl	LC	2.439	1	11/06/2020
Buphagus erythrorynchus	Red-billed Oxpecker	LC	46.11975	24	25/02/2021
Pavo cristatus	Indian Peafowl	LC	4.878	2	29/11/2019
Treron calvus	African Green Pigeon	LC	17.6275	11	18/10/2020
Anthus cinnamomeus	African Pipit	LC	24.7783	16	14/10/2020
Anthus lineiventris	Striped Pipit	LC	9.0909	2	12/02/2013
Charadrius hiaticula	Common Ringed Plover	LC	2.439	1	29/11/2019
Charadrius marginatus	White-fronted Plover	LC	0	0	00/01/1900
Charadrius pecuarius	Kittlitz's Plover	LC	19.0133	13	25/02/2021

Scientific Name	Common Name	Red List Status (Regional, Global)	fp	fpn	fp last
Charadrius tricollaris	Three-banded Plover	LC	32.64965	19	18/10/2020
Pluvialis squatarola	Grey Plover	LC	0	0	00/01/1900
Glareola pratincola	Collared Pratincole	LC	19.5122	8	09/10/2020
Prinia subflava	Tawny-flanked Prinia	LC	37.5277	23	05/01/2020
Dryoscopus cubla	Black-backed Puffback	LC	63.3592	39	18/10/2020
Pytilia melba	Green-winged Pytilia	LC	31.8182	7	18/10/2020
Quelea erythrops	Red-headed Quelea	LC	4.878	2	04/12/2010
Quelea quelea	Red-billed Quelea	LC	34.92235	20	18/10/2020
Cossypha heuglini	White-browed Robin-Chat	LC	9.4235	6	09/05/2020
Cossypha humeralis	White-throated Robin-Chat	LC	20.0665	13	14/10/2020
Cossypha natalensis	Red-capped Robin-Chat	LC	39.2461	27	14/10/2020
Coracias caudatus	Lilac-breasted Roller	LC	18.6807	11	23/11/2018
Eurystomus glaucurus	Broad-billed Roller	LC	4.878	2	09/10/2018
Actitis hypoleucos	Common Sandpiper	LC	20.6208	10	25/02/2021
Tringa glareola	Wood Sandpiper	LC	15.52105	11	18/10/2020
Tringa stagnatilis	Marsh Sandpiper	LC	12.1951	5	23/11/2018
Psalidoprocne pristoptera	Black Saw-wing	LC	30.7095	20	25/02/2021
Rhinopomastus cyanomelas	Common Scimitarbill	LC	33.3703	17	18/10/2020
Cercotrichas leucophrys	White-browed Scrub Robin	LC	51.3304	30	18/10/2020
Cercotrichas quadrivirgata	Bearded Scrub Robin	LC	15.6874	12	18/10/2020
Cercotrichas signata	Brown Scrub Scrub Robin	LC	2.439	1	08/09/2020
Anas smithii	Cape Shoveler	LC	0	0	00/01/1900
Lanius collurio	Red-backed Shrike	LC	22.89355	11	05/01/2020
Lanius minor	Lesser Grey Shrike	LC	0	0	00/01/1900
Gallinago nigripennis	African Snipe	LC	4.878	2	09/04/2011
Gymnoris superciliaris	Yellow-throated Bush Sparrow	LC	25.49885	14	18/10/2020
Passer diffusus	Southern Grey-headed Sparrow	LC	38.08205	20	25/02/2021
Passer domesticus	House Sparrow	LC	16.40795	10	23/11/2018
Accipiter melanoleucus	Black Sparrowhawk	LC	14.6341	6	02/08/2019
Accipiter minullus	Little Sparrowhawk	LC	5.9313	4	08/09/2020

Scientific Name	Common Name	Red List Status (Regional, Global)	fp	fpn	fp last
Platalea alba	African Spoonbill	LC	18.5144	10	18/10/2020
Pternistis natalensis	Natal Spurfowl	LC	10.80935	8	29/11/2019
Cinnyricinclus leucogaster	Violet-backed Starling	LC	18.5144	10	30/05/2020
Creatophora cinerea	Wattled Starling	LC	4.5455	1	19/09/2010
Lamprotornis nitens	Cape Starling	LC	58.8692	31	25/02/2021
Notopholia corrusca	Black-bellied Starling	LC	37.8603	25	14/10/2020
Onychognathus morio	Red-winged Starling	LC	9.4235	6	09/10/2020
Himantopus himantopus	Black-winged Stilt	LC	21.45235	15	09/10/2020
Calidris minuta	Little Stint	LC	4.87805	4	29/11/2019
Saxicola torquatus	African Stonechat	LC	8.204	5	06/07/2016
Ciconia ciconia	White Stork	LC	0	0	00/01/1900
Ciconia episcopus	Woolly-necked Stork	LC	35.4213	23	14/10/2020
Chalcomitra amethystina	Amethyst Sunbird	LC	5.9313	4	05/01/2020
Chalcomitra senegalensis	Scarlet-chested Sunbird	LC	47.83815	28	08/09/2020
Cinnyris bifasciatus	Purple-banded Sunbird	LC	49.5565	32	18/10/2020
Cinnyris mariquensis	Marico Sunbird	LC	9.7561	4	02/08/2019
Cinnyris talatala	White-bellied Sunbird	LC	52.5499	31	18/10/2020
Cyanomitra olivacea	Olive Sunbird	LC	4.71175	3	09/10/2018
Cyanomitra veroxii	Grey Sunbird	LC	28.9357	22	08/09/2020
Hedydipna collaris	Collared Sunbird	LC	29.49	19	08/09/2020
Cecropis abyssinica	Lesser Striped Swallow	LC	54.102	34	18/10/2020
Cecropis cucullata	Greater Striped Swallow	LC	3.49225	2	05/01/2020
Cecropis semirufa	Red-breasted Swallow	LC	20.23285	14	18/10/2020
Hirundo albigularis	White-throated Swallow	LC	2.439	1	26/11/2016
Hirundo rustica	Barn Swallow	LC	53.7694	32	18/10/2020
Hirundo smithii	Wire-tailed Swallow	LC	17.6275	11	09/10/2020
Pseudhirundo griseopyga	Grey-rumped Swallow	LC	7.3171	3	04/12/2010
Porphyrio madagascariensis	African Swamphen	LC	13.08205	9	29/11/2019
Apus affinis	Little Swift	LC	27.3836	19	18/10/2020
Apus caffer	White-rumped Swift	LC	9.4235	6	09/10/2020

Scientific Name	Common Name	Red List Status (Regional, Global)	fp	fpn	fp last
Cypsiurus parvus	African Palm Swift	LC	17.9601	13	09/10/2020
Tachymarptis melba	Alpine Swift	LC	4.878	2	02/08/2019
Tchagra australis	Brown-crowned Tchagra	LC	20.78715	11	05/01/2020
Tchagra senegalus	Black-crowned Tchagra	LC	46.45235	26	25/02/2021
Anas capensis	Cape Teal	LC	4.87805	4	17/12/2016
Anas erythrorhyncha	Red-billed Teal	LC	20.23285	14	18/10/2020
Anas hottentota	Blue-billed Teal	LC	5.9313	4	05/01/2020
Chlidonias hybrida	Whiskered Tern	LC	7.3171	3	09/04/2011
Burhinus capensis	Spotted Thick-knee	LC	14.30155	10	08/09/2020
Burhinus vermiculatus	Water Thick-knee	LC	30.0443	16	18/10/2020
Turdus libonyanus	Kurrichane Thrush	LC	23.72505	16	11/11/2019
Pogoniulus bilineatus	Yellow-rumped Tinkerbird	LC	25.4435	20	09/10/2020
Pogoniulus pusillus	Red-fronted Tinkerbird	LC	41.18625	26	18/10/2020
Anthoscopus caroli	Grey Penduline Tit	LC	5.76495	3	09/04/2011
Parus niger	Southern Black Tit	LC	42.23945	26	18/10/2020
Myioparus plumbeus	Grey Tit-Flycatcher	LC	14.13525	9	08/09/2020
Apaloderma narina	Narina Trogon	LC	12.1951	5	11/11/2019
Tauraco porphyreolophus	Purple-crested Turaco	LC	66.85145	41	18/10/2020
Hypargos margaritatus	Pink-throated Twinspot	LC	30.7095	20	08/09/2020
Mandingoa nitidula	Green Twinspot	LC	2.439	1	09/10/2018
Gypohierax angolensis	Palm-nut Vulture	LC	4.5455	1	12/02/2013
Motacilla aguimp	African Pied Wagtail	LC	37.02885	20	18/10/2020
Motacilla capensis	Cape Wagtail	LC	4.71175	3	06/07/2016
Acrocephalus baeticatus	African Reed Warbler	LC	4.878	2	07/06/2015
Acrocephalus gracilirostris	Lesser Swamp Warbler	LC	14.6341	6	09/04/2011
Bradypterus baboecala	Little Rush Warbler	LC	7.3171	3	24/11/2009
Phylloscopus trochilus	Willow Warbler	LC	10.47675	6	09/10/2018
Amandava subflava	Orange-breasted Waxbill	LC	4.878	2	24/11/2009
Estrilda astrild	Common Waxbill	LC	38.74725	24	18/10/2020
Estrilda perreini	Grey Waxbill	LC	12.1951	5	30/05/2020

Scientific Name	Common Name	Red List Status (Regional, Global)	fp	fpn	fp last
Uraeginthus angolensis	Blue Waxbill	LC	41.2417	20	18/10/2020
Amblyospiza albifrons	Thick-billed Weaver	LC	19.1796	14	02/08/2019
Ploceus bicolor	Dark-backed Weaver	LC	31.3747	24	14/10/2020
Ploceus cucullatus	Village Weaver	LC	39.63415	23	18/10/2020
Ploceus ocularis	Spectacled Weaver	LC	41.9069	24	18/10/2020
Ploceus subaureus	Yellow Weaver	LC	26.8293	11	30/05/2020
Ploceus velatus	Southern Masked Weaver	LC	8.204	5	11/06/2020
Ploceus xanthops	Golden Weaver	LC	4.878	2	21/11/2015
Ploceus xanthopterus	Southern Brown-throated Weaver	LC	9.7561	4	17/12/2016
Zosterops anderssoni	Southern Yellow White-eye	LC	2.439	1	08/09/2020
Zosterops senegalensis	Northern Yellow White-eye	LC	19.5122	8	02/08/2019
Zosterops virens	Cape White-eye	LC	42.07315	25	18/10/2020
Vidua macroura	Pin-tailed Whydah	LC	34.92235	20	25/02/2021
Vidua paradisaea	Long-tailed Paradise Whydah	LC	12.58315	6	05/01/2020
Euplectes albonotatus	White-winged Widowbird	LC	20.6208	10	09/07/2018
Euplectes ardens	Red-collared Widowbird	LC	5.76495	3	29/03/2018
Euplectes axillaris	Fan-tailed Widowbird	LC	23.39245	14	09/10/2020
Phoeniculus purpureus	Green Wood Hoopoe	LC	22.50555	15	08/09/2020
Campethera abingoni	Golden-tailed Woodpecker	LC	47.1175	30	18/10/2020
Dendropicos namaquus	Bearded Woodpecker	LC	4.71175	3	30/05/2020
Dendropicos fuscescens	Cardinal Woodpecker	LC	24.61195	15	18/10/2020
Calamonastes stierlingi	Stierling's Wren-Warbler	LC	4.5455	1	12/02/2013
Philomachus pugnax	Ruff	LC	4.71175	3	18/10/2020
Cisticola fulvicapilla	Neddicky	LC	9.2572	5	05/08/2017
Nilaus afer	Brubru	LC	8.0377	4	18/10/2020
Ortygospiza fuscocrissa	Quailfinch	LC	2.439	2	29/11/2019
Scopus umbretta	Hamerkop	LC	32.31705	17	30/05/2020

Appendix 3 ReptileMAP Species List

Scientific name	Common name	Red list category	Number of records	Last recorded
Acanthocercus atricollis	Southern Tree Agama	Least Concern (SARCA 2014)	6	29/12/2017
Acontias plumbeus	Giant Legless Skink	Least Concern (SARCA 2014)	7	13/03/2014
Afroedura marleyi	Marley's Flat Gecko	Least Concern (SARCA 2014)	8	30/06/2006
Afrotyphlops bibronii	Bibron's Blind Snake	Least Concern (SARCA 2014)	1	15/06/1900
Afrotyphlops schlegelii	Schlegel's Beaked Blind Snake	Least Concern (SARCA 2014)	8	24/04/2017
Amblyodipsas polylepis polylepis	Common Purple-glossed Snake	Least Concern (SARCA 2014)	9	16/12/2016
Aparallactus capensis	Black-headed Centipede-eater	Least Concern (SARCA 2014)	4	28/06/2006
Atractaspis bibronii	Bibron's Stiletto Snake	Least Concern (SARCA 2014)	2	19/12/2017
Bitis arietans arietans	Puff Adder	Least Concern (SARCA 2014)	12	14/08/2018
Boaedon capensis	Brown House Snake	Least Concern (SARCA 2014)	6	02/01/2018
Broadleysaurus major	Rough-scaled Plated Lizard	Least Concern (SARCA 2014)	2	11/10/2012
Chamaeleo dilepis	Common Flap-neck Chameleon	Least Concern (SARCA 2014)	7	15/01/2020
Chamaesaura macrolepis	Large-scaled Grass Lizard	Near Threatened (SARCA 2014)	1	15/06/1900
Crocodylus niloticus	Nile Crocodile	VU (SARCA 2014); LC (global, IUCN 2019)	15	27/08/2017
Crotaphopeltis hotamboeia	Red-lipped Snake	Least Concern (SARCA 2014)	6	08/01/2015
Dasypeltis scabra	Rhombic Egg-eater	Least Concern (SARCA 2014)	6	02/11/2016
Dendroaspis angusticeps	Green Mamba	Vulnerable (SARCA 2014)	2	14/04/2013
Dipsadoboa aulica	Marbled Tree Snake	Least Concern (SARCA 2014)	10	23/01/2017
Dispholidus typus viridis	Northern Boomslang	Not evaluated	1	25/12/2015
Duberria variegata	Variegated Slug-eater	Least Concern (SARCA 2014)	6	15/11/2017
FAMILY Gekkonidae	Unidentified Gekkonidae		1	26/04/2012
Gracililima nyassae	Black File Snake	Least Concern (SARCA 2014)	1	06/06/2018
Hemidactylus mabouia	Common Tropical House Gecko	Least Concern (SARCA 2014)	28	11/02/2018
Homopholis wahlbergii	Wahlberg's Velvet Gecko	Least Concern (SARCA 2014)	10	01/04/2017
Kinixys zombensis	Eastern Hinged Tortoise	Least Concern (SARCA 2014)	15	15/08/2018
Leptotyphlops distanti	Distant's Thread Snake	Least Concern (SARCA 2014)	2	06/03/2001
Limaformosa capensis	Common File Snake	Least Concern (SARCA 2014)	1	02/11/2016
Lycodonomorphus obscuriventris	Floodplain Water Snake	Least Concern (SARCA 2014)	1	24/02/2011
Lycophidion capense capense	Cape Wolf Snake	Least Concern (SARCA 2014)	4	28/06/2006
Lycophidion pygmaeum	Pygmy Wolf Snake	Near Threatened (SARCA 2014)	3	12/12/2015

Scientific name	Common name	Red list category	Number of records	Last recorded
Lygodactylus capensis	Common Dwarf Gecko	Least Concern (SARCA 2014)	17	10/02/2018
Meroles squamulosus	Common Rough-scaled Lizard	Least Concern (SARCA 2014)	5	27/02/2017
Naja annulifera	Snouted Cobra	Least Concern (SARCA 2014)	10	22/08/2016
Naja mossambica	Mozambique Spitting Cobra	Least Concern (SARCA 2014)	2	10/01/2015
Naja subfulva	Brown Forest Cobra		14	19/09/2018
Nucras ornata	Ornate Sandveld Lizard	Least Concern (SARCA 2014)	2	06/01/2016
Pachydactylus maculatus	Spotted Gecko	Least Concern (SARCA 2014)	3	02/08/2008
Pachydactylus vansoni	Van Son's Gecko	Least Concern (SARCA 2014)	1	15/06/1900
Pelomedusa galeata	South African Marsh Terrapin	Not evaluated	1	09/11/2007
Pelusios castanoides	Yellow-bellied Hinged Terrapin	Least Concern (SARCA 2014)	3	03/05/2015
Pelusios sinuatus	Serrated Hinged Terrapin	Least Concern (SARCA 2014)	14	11/02/2018
Pelusios subniger	Black-bellied Hinged Terrapin	Least Concern (SARCA 2014)	3	10/11/2018
Philothamnus hoplogaster	South Eastern Green Snake	Least Concern (SARCA 2014)	2	27/02/2017
Philothamnus natalensis	Eastern Natal Green Snake	Least Concern (SARCA 2014)	1	20/01/2015
Philothamnus semivariegatus	Spotted Bush Snake	Least Concern (SARCA 2014)	3	15/11/2013
Prosymna stuhlmannii	East African Shovel-snout	Least Concern (SARCA 2014)	5	03/01/2018
Psammophis mossambicus	Olive Grass Snake	Least Concern (SARCA 2014)	5	19/12/2017
Pseudaspis cana	Mole Snake	Least Concern (SARCA 2014)	2	17/07/1986
Python natalensis	Southern African Python	Least Concern (SARCA 2014)	8	10/02/2018
Scelotes bidigittatus	Lowveld Dwarf Burrowing Skink	Least Concern (SARCA 2014)	6	17/11/2016
Scelotes mossambicus	Mozambique Dwarf Burrowing Skink	Least Concern (SARCA 2014)	7	17/05/2016
Stigmochelys pardalis	Leopard Tortoise	Least Concern (SARCA 2014)	4	12/02/2015
Telescopus semiannulatus semiannulatus	Eastern Tiger Snake	Least Concern (SARCA 2014)	8	20/04/2016
Tetradactylus africanus	Eastern Long-tailed Seps	Least Concern (SARCA 2014)	3	17/08/2017
Thelotornis capensis capensis	Southern Twig Snake	Least Concern (SARCA 2014)	5	10/10/2017
Thelotornis capensis subsp. ?	Southern Twig Snake (subsp. ?)		1	10/11/2007
Trachylepis depressa	Eastern Coastal Skink	Least Concern (SARCA 2014)	16	26/11/2017
Trachylepis margaritifera	Rainbow Skink	Least Concern (SARCA 2014)	7	29/10/2017
Trachylepis striata	Striped Skink	Least Concern (SARCA 2014)	11	10/02/2018
Trachylepis varia sensu lato	Common Variable Skink Complex	Least Concern (SARCA 2014)	3	01/03/2017

Scientific name	Common name	Red list category	Number of records	Last recorded
Trachylepis varia sensu stricto	Common Variable Skink		1	11/02/2018
Varanus albigularis albigularis	Rock Monitor	Least Concern (SARCA 2014)	5	04/10/2015
Varanus niloticus	Water Monitor	Least Concern (SARCA 2014)	4	21/11/2015
Xenocalamus transvaalensis	Speckled Quill-snouted Snake	Least Concern (SARCA 2014)	6	19/12/2017
Zygaspis arenicola	Maputoland Dwarf Worm Lizard		6	17/10/2018

Appendix 4 FrogMAP Species List

Scientific name	Common name	Red list category	Number of records	Last recorded
Afrixalus aureus	Golden Leaf-folding Frog	Least Concern (2013)	6	05/01/2018
Afrixalus delicatus	Delicate Leaf-folding Frog	Least Concern (2013)	4	05/01/2018
Afrixalus fornasinii	Greater Leaf-folding Frog	Least Concern (2013)	9	09/03/2016
Breviceps carruthersi	Carruthers' Rain Frog	Not listed	1	17/10/2018
Breviceps mossambicus	Mozambique Rain Frog	Least Concern	1	28/01/2015
Cacosternum boettgeri	Common Caco	Least Concern (2013)	1	30/07/2016
Cacosternum nanum	Bronze Caco	Least Concern (2013)	1	06/02/2015
Chiromantis xerampelina	Southern Foam Nest Frog	Least Concern (2013)	12	10/02/2018
Hemisus marmoratus	Mottled Shovel-nosed Frog	Least Concern	9	10/02/2018
Hyperolius argus	Argus Reed Frog	Least Concern	6	06/03/2017
Hyperolius marmoratus	Painted Reed Frog	Least Concern (IUCN ver 3.1, 2013)	26	10/02/2018
Hyperolius marmoratus taeniatus	Painted Reed Frog (subsp. taeniatus)	Least Concern (IUCN ver 3.1, 2013)	7	27/11/2019
Hyperolius pusillus	Water Lily Frog	Least Concern	15	10/02/2018
Hyperolius tuberilinguis	Tinker Reed Frog	Least Concern	8	05/01/2018
Kassina senegalensis	Bubbling Kassina	Least Concern	10	05/01/2018
Leptopelis mossambicus	Brownbacked Tree Frog	Least Concern	8	26/12/2015
Leptopelis natalensis	Forest Tree Frog	Least Concern	2	05/01/2018
Phlyctimantis maculatus	Redlegged Kassina	Least Concern ver 3.1 (2013)	13	10/02/2018
Phrynobatrachus mababiensis	Dwarf Puddle Frog	Least Concern (IUCN, 2014)	6	05/01/2018
Phrynobatrachus natalensis	Snoring Puddle Frog	Least Concern (IUCN, 2013)	10	10/02/2018
Phrynomantis bifasciatus	Banded Rubber Frog	Least Concern	8	05/01/2018
Poyntonophrynus fenoulheti	Northern Pygmy Toad	Least Concern	1	04/11/1994
Ptychadena anchietae	Plain Grass Frog	Least Concern	10	10/02/2018
Ptychadena mascareniensis	Mascarene Grass Frog	Least Concern	2	17/01/2012
Ptychadena mossambica	Broadbanded Grass Frog	Least Concern	3	07/01/2015
Ptychadena nilotica	Nile Grass Frog	Least Concern	5	10/02/2018
Ptychadena oxyrhynchus	Sharpnosed Grass Frog	Least Concern	11	14/04/2018
Ptychadena porosissima	Striped Grass Frog	Least Concern	1	24/02/2011
Pyxicephalus edulis	African Bull Frog	Least Concern	9	20/03/2018
Schismaderma carens	Red Toad	Least Concern	19	15/09/2018

Scientific name	Common name	Red list category	Number of records	Last recorded
Sclerophrys capensis	Raucous Toad	Least Concern	2	30/03/2013
Sclerophrys garmani	Olive Toad	Least Concern (IUCN, 2016)	21	10/02/2018
Sclerophrys gutturalis	Guttural Toad	Least Concern (IUCN, 2016)	7	18/11/2015
Strongylopus fasciatus	Striped Stream Frog	Least Concern	1	21/06/1984
Tomopterna cryptotis	Tremelo Sand Frog	Least Concern	3	12/11/2013
Tomopterna krugerensis	Knocking Sand Frog	Least Concern	4	02/11/2016
Tomopterna natalensis	Natal Sand Frog	Least Concern	1	21/11/1998
Xenopus laevis	Common Platanna	Least Concern	8	05/01/2018
Xenopus muelleri	Tropical Platanna	Least Concern	2	24/02/2011

Appendix 5 MammalMAP Species List

Scientific name	Common name	Red list category	Number of records	Last recorded
Acinonyx jubatus	Cheetah	Vulnerable (2016)	30	25/12/2015
Aepyceros melampus	Impala	Least Concern	16	08/11/2017
Aethomys ineptus	Tete Veld Aethomys	Least Concern (2016)	16	02/03/2011
Atilax paludinosus	Marsh Mongoose	Least Concern (2016)	3	08/06/2018
Canis adustus	Side-striped Jackal	Least Concern (2016)	4	10/08/2016
Canis mesomelas	Black-backed Jackal	Least Concern (2016)	1	01/01/1991
Caracal caracal	Caracal	Least Concern (2016)	3	04/01/2013
Cephalophus natalensis	Red Duiker	Near Threatened (2016)	18	16/03/2021
Chaerephon pumilus	Little Free-tailed Bat	Least Concern (2016)	10	23/11/2015
Chlorocebus pygerythrus	Vervet Monkey	Least Concern (2016)	6	04/06/2016
Chlorocebus pygerythrus pygerythrus	Vervet Monkey (subspecies pygerythrus)	Least Concern (2008)	2	15/11/2013
Connochaetes taurinus	Blue Wildebeest	Least Concern (ver 3.1, 2017)	4	10/02/2018
Connochaetes taurinus taurinus		Least Concern (2016)	4	01/07/1997
Crocidura flavescens	Greater Red Musk Shrew	Least Concern (2016)	1	06/03/1973
Crocidura fuscomurina	Bicolored Musk Shrew	Least Concern (2016)	17	21/03/2011
Crocidura hirta	Lesser Red Musk Shrew	Least Concern (2016)	19	22/03/2011
Crocidura silacea	Lesser Gray-brown Musk Shrew	Least Concern (2016)	4	22/05/2010
Crocuta crocuta	Spotted Hyaena	Near Threatened (2016)	2	30/07/2016
Cryptomys hottentotus	Southern African Mole-rat	Least Concern (2016)	1	04/12/1974
Dendromus melanotis	Gray African Climbing Mouse	Least Concern (2016)	5	25/05/2016
Dendromus mystacalis	Chestnut African Climbing Mouse	Least Concern (2016)	7	02/05/2010
Dendromus sp.	African Climbing Mice		4	02/03/2010
Epomophorus sp.	Epauletted Fruit Bats		3	16/03/2016
Epomophorus wahlbergi	Wahlberg's Epauletted Fruit Bat	Least Concern (2016)	6	
Equus quagga	Plains Zebra	Least Concern (2016)	17	28/06/2017
FAMILY Soricidae	Unidentified Soricidae (Shrew)		2	15/09/2018
Genetta maculata	Common Large-spotted Genet	Least Concern	5	25/05/2018
Genetta tigrina	Cape Genet (Cape Large-spotted Genet)	Least Concern (2016)	2	01/01/1991
Gerbilliscus leucogaster	Bushveld Gerbil	Least Concern (2016)	4	04/03/2010
Gerbilliscus sp.	Gerbils		1	17/09/2018

Scientific name	Common name	Red list category	Number of records	Last recorded
Giraffa giraffa giraffa	South African Giraffe	Least Concern (2016)	10	10/02/2018
Grammomys dolichurus	Common Grammomys	Least Concern (2016)	1	22/10/1974
Grammomys sp.	Thicket Rats		1	22/01/1986
Graphiurus (Graphiurus) murinus	Forest African Dormouse	Least Concern	3	09/08/2015
Herpestes sanguineus	Slender Mongoose	Least Concern (2016)	6	25/11/2017
Hippopotamus amphibius	Common Hippopotamus	Least Concern (2016)	72	20/06/2017
Hipposideros caffer	Sundevall's Leaf-nosed Bat	Least Concern (2016)	6	19/08/2011
Hypsugo anchietae	Anchieta's Pipistrelle	Near Threatened	6	
Hystrix africaeaustralis	Cape Porcupine	Least Concern	7	25/05/2018
Ichneumia albicauda	White-tailed Mongoose	Least Concern (2016)	3	08/08/2016
Lemniscomys rosalia	Single-Striped Lemniscomys	Least Concern (2016)	18	22/03/2011
Leptailurus serval	Serval	Near Threatened (2016)	4	08/03/2014
Lepus saxatilis	Scrub Hare	Least Concern	1	07/11/2015
Loxodonta africana	African Bush Elephant	Vulnerable A2a (2008)	22	31/12/2012
Lycaon pictus	African wild dog	Endangered (2016)	1	17/03/2017
Mastomys natalensis	Natal Mastomys	Least Concern (2016)	30	02/03/2011
Mellivora capensis	Honey Badger	Least Concern (2016)	20	06/03/2017
Miniopterus natalensis	Natal Long-fingered Bat	Least Concern (2016)	2	
Miniopterus schreibersii	Schreibers's Long-fingered Bat	Least Concern	1	41951
Mops (Mops) condylurus	Angolan Free-tailed Bat	Least Concern	2	
Mungos mungo	Banded Mongoose	Least Concern (2016)	3	25/09/2015
Mus (Nannomys) minutoides	Southern African Pygmy Mouse	Least Concern	36	24/03/2011
Myotis bocagei	Rufous Hairy Bat	Data Deficient	1	37854
Neoromicia capensis	Cape Serotine	Least Concern (2016)	2	
Neoromicia nana	Banana Pipistrelle	Least Concern	8	
Neotragus moschatus	Suni	Least Concern (2016)	14	06/10/2017
Nycteris thebaica	Egyptian Slit-faced Bat	Least Concern (2016)	3	25/07/1984
Orycteropus afer	Aardvark	Least Concern (2016)	1	22/08/2015
Otolemur crassicaudatus	Brown Greater Galago	Least Concern (2016)	8	16/10/2016
Otomys angoniensis	Angoni Vlei Rat	Least Concern (2016)	1	29/07/1992

Scientific name	Common name	Red list category	Number of records	Last recorded
Ourebia ourebi	Oribi	Endangered	2	31/12/2011
Panthera leo	Lion	Least Concern (2016)	19	11/03/2013
Panthera pardus	Leopard	Vulnerable (2016)	210	25/02/2017
Papio ursinus	Chacma Baboon	Least Concern (2016)	69	01/07/2006
Paracynictis selousi	Selous' Mongoose	Least Concern (2016)	1	25/03/2010
Paraxerus palliatus	Red Bush Squirrel	Near Threatened (2016)	6	11/02/2018
Paraxerus palliatus tongensis	Tonga Red Squirrel	Not Evaluated (2016)	3	14/11/2016
Petrodromus tetradactylus	Four-toed Elephant Shrew	Near Threatened (2016)	4	15/11/2016
Phacochoerus africanus	Common Warthog	Least Concern (2016)	15	26/05/2018
Pipistrellus (Pipistrellus) hesperidus	Dusky Pipistrelle	Least Concern	4	
Potamochoerus larvatus koiropotamus	Bush-pig (subspecies koiropotamus)	Least Concern (2016)	1	22/04/2015
Raphicerus campestris	Steenbok	Least Concern (2016)	2	01/07/1997
Rattus rattus	Roof Rat	Least Concern	1	27/02/1983
Redunca arundinum	Southern Reedbuck	Least Concern (2016)	8	03/11/2017
Redunca fulvorufula	Mountain Reedbuck	Least Concern	2	01/07/1997
Rhinolophus darlingi	Darling's Horseshoe Bat	Least Concern (2016)	4	
Rhinolophus simulator	Bushveld Horseshoe Bat	Least Concern (2016)	3	
Saccostomus campestris	Southern African Pouched Mouse	Least Concern (2016)	8	18/07/2018
Scotophilus dinganii	Yellow-bellied House Bat	Least Concern (2016)	3	
Scotophilus viridis	Green House Bat	Least Concern (2016)	10	20/01/2008
Smutsia temminckii	Ground Pangolin	Vulnerable (2016)	2	
Steatomys pratensis	Common African Fat Mouse	Least Concern (2016)	10	22/03/2011
Suncus infinitesimus	Least Dwarf Shrew	Least Concern (2016)	5	14/03/2010
Suncus lixus	Greater Dwarf Shrew	Least Concern (2016)	10	24/03/2011
Sylvicapra grimmia	Bush Duiker	Least Concern (2016)	6	19/12/2014
Syncerus caffer	African Buffalo	Least Concern (2008)	4	30/11/2014
Tadarida aegyptiaca	Egyptian Free-tailed Bat	Least Concern (2016)	1	
Thallomys paedulcus	Acacia Thallomys	Least Concern (2016)	1	16/11/1925
Thryonomys swinderianus	Greater Cane Rat	Least Concern (2016)	3	04/10/2016
Tragelaphus angasii	Nyala	Least Concern (2016)	20	18/02/2018

Scientific name	Common name	Red list category	Number of records	Last recorded
Tragelaphus scriptus	Bushbuck	Least Concern	1	20/01/2014
Tragelaphus strepsiceros	Greater Kudu	Least Concern (2016)	8	29/10/2017

Appendix 6 LepiMAP Species List

Family	Scientific name	Common name	Red list category	Number of records	Last recorded
ADELIDAE	*Ceromitia trigoniferella*		Not listed	1	21/11/2009
COSSIDAE	*Azygophleps leopardina*		Not listed	1	21/03/2016
COSSIDAE	*Azygophleps pusilla*		Not listed	1	15/11/2014
CRAMBIDAE	*Crocidolomia pavonana*		Not listed	1	17/11/2014
CRAMBIDAE	*Palpita unionalis*		Not listed	1	22/06/2018
CRAMBIDAE	*Pygospila tyres*		Not listed	1	07/12/2017
CRAMBIDAE	*Spoladea recurvalis*		Not listed	2	16/08/2016
CRAMBIDAE	*Viettessa margaritalis*		Not listed	1	07/12/2017
DREPANIDAE	*Gonoreta opacifinis*		Not listed	1	28/04/2012
EREBIDAE	*Achaea catella*		Not listed	1	14/03/2021
EREBIDAE	*Achaea lienardi*		Not listed	5	04/04/2017
EREBIDAE	*Amata simplex*		Not listed	1	15/09/2018
EREBIDAE	*Amerila bauri*		Not listed	2	01/08/2017
EREBIDAE	*Amerila lupia*		Not listed	1	28/08/2016
EREBIDAE	*Amphicallia bellatrix*		Not listed	1	28/01/2016
EREBIDAE	*Anoba atriplaga*		Not listed	3	12/02/2018
EREBIDAE	*Antiophlebia bracteata*		Not listed	1	19/08/2016
EREBIDAE	*Aroa discalis*		Not listed	2	14/03/2021
EREBIDAE	*Calesia xanthognatha xanthognatha*		Not listed	1	20/11/2016
EREBIDAE	*Cerocala vermiculosa*		Not listed	4	05/08/2017
EREBIDAE	*Cometaster pyrula*		Not listed	2	23/03/2016
EREBIDAE	*Cyana rhodostriata*		Not listed	1	01/09/2016
EREBIDAE	*Cyligramma latona*		Not listed	5	14/11/2017
EREBIDAE	*Diota rostrata*		Not listed	8	09/01/2018
EREBIDAE	*Dysgonia angularis*		Not listed	2	15/08/2016
EREBIDAE	*Eilema distigmata*		Not listed	3	20/11/2016
EREBIDAE	*Eilema sanguicosta*		Not listed	2	28/10/2016
EREBIDAE	*Entomogramma pardus*		Not listed	1	19/02/2018
EREBIDAE	*Erebus walkeri*		Not listed	3	19/01/2017
EREBIDAE	*Eublemma anachoresis*		Not listed	1	19/08/2016

Family	Scientific name	Common name	Red list category	Number of records	Last recorded
EREBIDAE	*Euchromia amoena*		Not listed	4	18/09/2018
EREBIDAE	*Euproctis bicolor*		Not listed	2	09/12/2017
EREBIDAE	*Fodina embolophora*		Not listed	1	26/11/2016
EREBIDAE	*Galtara nepheloptera*		Not listed	1	11/02/2018
EREBIDAE	*Gracilodes caffra*		Not listed	3	12/06/2017
EREBIDAE	*Grammodes stolida*		Not listed	1	03/10/2015
EREBIDAE	*Hypopyra capensis*		Not listed	2	04/04/2017
EREBIDAE	*Laelia clarki*		Not listed	1	09/12/2017
EREBIDAE	*Maxera nigriceps*		Not listed	1	08/06/2017
EREBIDAE	*Mocis conveniens*		Not listed	1	08/07/2018
EREBIDAE	*Nodaria nodosalis*		Not listed	1	21/11/2009
EREBIDAE	*Ophiusa tirhaca tirhaca*		Not listed	1	22/11/2016
EREBIDAE	*Palasea albimacula*		Not listed	2	09/12/2017
EREBIDAE	*Plecopterodes moderata*		Not listed	1	20/10/2007
EREBIDAE	*Secusio discoidalis*		Not listed	2	14/03/2021
EREBIDAE	*Secusio strigata*		Not listed	4	15/09/2018
EREBIDAE	*Sphingomorpha chlorea*		Not listed	4	02/08/2017
EREBIDAE	*Thyretes caffra*		Not listed	6	06/08/2020
EREBIDAE	*Tytroca metaxantha*		Not listed	1	15/08/2016
EREBIDAE	*Utetheisa pulchella*		Not listed	3	12/11/2016
EREBIDAE	*Amata sp.*			5	24/11/2016
EREBIDAE	*Asura sp.*			3	28/10/2016
EREBIDAE	*Automolis sp.*			1	20/11/2016
EREBIDAE	*Chiromachla leuconoe*			1	19/06/2017
EREBIDAE	*Cyana sp.*			1	21/11/2009
EREBIDAE	*Egybolis vaillantina*			1	18/07/2019
EREBIDAE	*Eublemma sp.*			1	13/08/2016
EREBIDAE	*Grammodes sp.*			1	07/12/2017
EREBIDAE	*Laelia sp.*			1	14/08/2016
EREBIDAE	*Nyctemera sp.*			1	19/06/2017

Family	Scientific name	Common name	Red list category	Number of records	Last recorded
EREBIDAE	*Parafodina pentagonalis*			1	22/03/2016
EREBIDAE	*Tegiapa goateri*			2	26/11/2016
EREBIDAE	*Teracotona sp.*			1	28/10/2016
EREBIDAE	*Thyretes sp.*			1	21/03/2016
EUPTEROTIDAE	*Hemijana variegata*		Not listed	1	28/10/2016
EUPTEROTIDAE	*Poloma angulata*		Not listed	1	09/11/2014
EUTELIIDAE	*Caligatus angasii*		Not listed	1	19/03/2013
EUTELIIDAE	*Marathyssa albidisca*		Not listed	1	26/11/2016
GEOMETRIDAE	*Chiasmia subcurvaria*		Not listed	2	19/09/2018
GEOMETRIDAE	*Acanthovalva bilineata*		Not Threatened (NT) [not an IUCN category]	1	29/04/2012
GEOMETRIDAE	*Ascotis reciprocaria*		Not Threatened (NT) [not an IUCN category]	1	12/08/2016
GEOMETRIDAE	*Chiasmia amarata*		Not Threatened (NT) [not an IUCN category]	1	21/11/2009
GEOMETRIDAE	*Chionopora tarachodes*		Not Threatened (NT) [not an IUCN category]	1	11/02/2018
GEOMETRIDAE	*Chlorerythra rubriplaga*		Not Threatened (NT) [not an IUCN category]	1	22/08/2016
GEOMETRIDAE	*Chlorissa albistrigulata*		Not Threatened (NT) [not an IUCN category]	1	22/11/2009
GEOMETRIDAE	*Chlorissa attenuata*		Not Threatened (NT) [not an IUCN category]	1	15/11/2014
GEOMETRIDAE	*Eucrostes rhodophthalma*		Not Threatened (NT) [not an IUCN category]	1	21/11/2009
GEOMETRIDAE	*Heterorachis devocata devocata*		Not Threatened (NT) [not an IUCN category]	2	07/12/2017
GEOMETRIDAE	*Isturgia spissata*		Not Threatened (NT) [not an IUCN category]	1	29/04/2012
GEOMETRIDAE	*Isturgia supergressa*		Not Threatened (NT) [not an IUCN category]	1	20/11/2016
GEOMETRIDAE	*Mixocera frustratoria*		Not Threatened (NT) [not an IUCN category]	1	08/02/2018
GEOMETRIDAE	*Neurotoca notata*		Not Threatened (NT) [not an IUCN category]	1	08/06/2017
GEOMETRIDAE	*Palaeaspilates inoffensa*		Not Threatened (NT) [not an IUCN category]	1	20/08/2016
GEOMETRIDAE	*Petovia marginata*		Not Threatened (NT) [not an IUCN category]	1	22/10/2006
GEOMETRIDAE	*Scopula sanguinisecta*		Not Threatened (NT) [not an IUCN category]	1	16/09/2018

Family	Scientific name	Common name	Red list category	Number of records	Last recorded
GEOMETRIDAE	*Scopula vestalis*		Not Threatened (NT) [not an IUCN category]	1	22/03/2016
GEOMETRIDAE	*Traminda viridaria*		Not Threatened (NT) [not an IUCN category]	2	08/05/2010
GEOMETRIDAE	*SUBFAMILY ENNOMINAE*			1	06/08/2016
GEOMETRIDAE	*Eulycia sp.*			1	09/12/2017
GEOMETRIDAE	*Prasinocyma sp.*			1	07/12/2017
GEOMETRIDAE	*Scopula sp.*			1	08/05/2010
GEOMETRIDAE	*Zamarada sp.*			4	07/12/2017
GEOMETRIDAE	*Zeuctoboarmia sp.*			1	26/11/2016
HESPERIIDAE	*Abantis venosa*	Veined skipper	Least Concern (SABCA 2013)	1	03/05/2015
HESPERIIDAE	*Acleros mackenii mackenii*	Macken's dart	Least Concern (SABCA 2013)	1	19/04/2008
HESPERIIDAE	*Afrogegenes letterstedti*	Brown dodger	Least Concern (SABCA 2013)	4	29/07/2018
HESPERIIDAE	*Borbo borbonica borbonica*	Olive-haired swift	Least Concern (SABCA 2013)	1	18/04/1985
HESPERIIDAE	*Borbo detecta*	Rusty swift	Least Concern (SABCA 2013)	2	02/10/2016
HESPERIIDAE	*Borbo fatuellus fatuellus*	Long-horned swift	Least Concern (SABCA 2013)	8	08/07/2021
HESPERIIDAE	*Borbo lugens*	Lesser-horned swift	Least Concern (SABCA 2013)	1	30/09/2016
HESPERIIDAE	*Coeliades forestan forestan*	Striped policeman	Least Concern (SABCA 2013)	4	21/11/2009
HESPERIIDAE	*Coeliades keithloa*	Red-tab policeman	Least Concern (SABCA 2013)	1	16/03/1952
HESPERIIDAE	*Coeliades lorenzo*	Lorenzo red-tab policeman	Least Concern (SABCA 2013)	1	27/10/1975
HESPERIIDAE	*Coeliades pisistratus*	Two-pip policeman	Least Concern (SABCA 2013)	5	15/09/2018
HESPERIIDAE	*Eagris nottoana nottoana*	Rufous-winged elfin	Least Concern (SABCA 2013)	5	09/08/2017
HESPERIIDAE	*Eretis umbra umbra*	Small marbled elf	Least Concern (SABCA 2013)	2	05/11/2004
HESPERIIDAE	*Gegenes pumilio gambica*	Dark dodger	Least Concern (SABCA 2013)	5	08/05/2010
HESPERIIDAE	*Gomalia elma elma*	Green-marbled skipper	Least Concern (SABCA 2013)	17	17/09/2018
HESPERIIDAE	*Kedestes callicles*	Pale ranger	Least Concern (SABCA 2013)	12	11/02/2018
HESPERIIDAE	*Kedestes macomo*	Macomo ranger	Least Concern (SABCA 2013)	5	18/01/2011
HESPERIIDAE	*Larsenia gemella*	Twin swift	Least Concern (SABCA 2013)	6	08/07/2021
HESPERIIDAE	*Leucochitonea levubu*	White-cloaked skipper	Least Concern (SABCA 2013)	2	02/11/1975
HESPERIIDAE	*Netrobalane canopus*	Buff-tipped skipper	Least Concern (SABCA 2013)	4	05/05/2015
HESPERIIDAE	*Parnara monasi*	Water watchman	Least Concern (SABCA 2013)	2	11/02/2018

Family	Scientific name	Common name	Red list category	Number of records	Last recorded
HESPERIIDAE	*Parosmodes morantii morantii*	Morant's orange	Least Concern (SABCA 2013)	1	24/05/1989
HESPERIIDAE	*Pelopidas mathias*	Black-branded swift	Least Concern (SABCA 2013)	1	27/04/2012
HESPERIIDAE	*Pelopidas thrax*	White-branded swift	Least Concern (SABCA 2013)	4	26/04/2012
HESPERIIDAE	*Platylesches moritili*	Honey hopper	Least Concern (SABCA 2013)	7	14/03/2021
HESPERIIDAE	*Platylesches neba*	Flower-girl hopper	Least Concern (SABCA 2013)	4	10/09/2013
HESPERIIDAE	*Pyrrhiades anchises anchises*	One-pip policeman	Least Concern (SABCA 2013)	1	26/03/1977
HESPERIIDAE	*Sarangesa motozi*	Forest elfin	Least Concern (SABCA 2013)	23	08/07/2021
HESPERIIDAE	*Sarangesa phidyle*	Small elfin	Least Concern (SABCA 2013)	11	02/04/2017
HESPERIIDAE	*Sarangesa seineri durbana*	Dark elfin	Least Concern (SABCA 2013)	6	14/09/2018
HESPERIIDAE	*Spialia confusa confusa*	Confusing sandman	Least Concern (SABCA 2013)	31	13/10/1979
HESPERIIDAE	*Spialia delagoae*	Delagoa sandman	Least Concern (SABCA 2013)	7	27/07/2016
HESPERIIDAE	*Spialia depauperata australis*	Wandering sandman	Least Concern (SABCA 2013)	1	12/12/1934
HESPERIIDAE	*Spialia dromus*	Forest sandman	Least Concern (SABCA 2013)	8	10/07/2017
HESPERIIDAE	*Spialia ferax*	Striped sandman	Least Concern (SABCA 2013)	1	08/06/2015
HESPERIIDAE	*Spialia spio*	Mountain sandman	Least Concern (SABCA 2013)	5	02/11/2016
HESPERIIDAE	*Tagiades flesus*	Clouded flat	Least Concern (SABCA 2013)	19	08/07/2021
HESPERIIDAE	*Zophopetes dysmephila*	Palm-tree night-fighter	Least Concern (SABCA 2013)	6	21/12/2017
HESPERIIDAE	*SUBFAMILY HESPERIINAE*			2	24/08/2016
HESPERIIDAE	*FAMILY HESPERIIDAE*	Unidentified HESPERIIDAE		1	27/04/2013
HESPERIIDAE	*Afrogegenes sp.*			18	06/07/2021
HESPERIIDAE	*Afrogegenes ocra*	Yellow dodger		1	25/07/2017
HESPERIIDAE	*Borbo sp.*			3	05/07/2018
HESPERIIDAE	*Platylesches sp.*			3	14/03/2021
LASIOCAMPIDAE	*Sena prompta*			1	15/11/2014
LIMACODIDAE	*Chrysopoloma isabellina*		Not listed	1	15/12/2015
LIMACODIDAE	*Parapluda invitabilis*		Not listed	1	07/12/2017
LYCAENIDAE	*Actizera lucida*	Rayed blue	Least Concern (SABCA 2013)	2	06/08/2017
LYCAENIDAE	*Alaena amazoula amazoula*	Yellow zulu	Least Concern (SABCA 2013)	6	11/10/2008
LYCAENIDAE	*Aloeides aranda*	Yellow russet	Least Concern (SABCA 2013)	5	30/09/2016

Family	Scientific name	Common name	Red list category	Number of records	Last recorded
LYCAENIDAE	*Aloeides damarensis mashona*	Damara russet	Least Concern (SABCA 2013)	6	05/09/1979
LYCAENIDAE	*Aloeides taikosama*	Dusky russet	Least Concern (SABCA 2013)	41	31/08/2017
LYCAENIDAE	*Aloeides trimeni trimeni*	Brown russet	Least Concern (SABCA 2013)	1	13/10/1979
LYCAENIDAE	*Anthene amarah amarah*	Black-striped ciliate blue	Least Concern (SABCA 2013)	40	16/03/2021
LYCAENIDAE	*Anthene definita definita*	Steel-blue-ciliate blue	Least Concern (SABCA 2013)	1	11/10/2008
LYCAENIDAE	*Anthene larydas*	Spotted ciliate blue	Least Concern (SABCA 2013)	15	14/03/2021
LYCAENIDAE	*Anthene lemnos lemnos*	Large ciliate blue	Least Concern (SABCA 2013)	2	06/01/1979
LYCAENIDAE	*Anthene liodes bihe*	Light ciliate blue	Least Concern (SABCA 2013)	1	09/05/2010
LYCAENIDAE	*Anthene livida livida*	Pale ciliate blue	Least Concern (SABCA 2013)	4	20/10/2007
LYCAENIDAE	*Anthene millari*	Estcourt ciliate blue	Least Concern (SABCA 2013)	11	20/10/2007
LYCAENIDAE	*Anthene minima minima*	Little ciliate blue	Least Concern (SABCA 2013)	5	20/11/2002
LYCAENIDAE	*Anthene princeps*	Lebombo ciliate blue	Least Concern (SABCA 2013)	9	23/11/2010
LYCAENIDAE	*Anthene talboti*	Savanna ciliate blue	Least Concern (SABCA 2013)	1	04/04/1992
LYCAENIDAE	*Aphnaeus hutchinsonii*	Hutchinson's high-flier	Least Concern (SABCA 2013)	14	11/10/2008
LYCAENIDAE	*Axiocerses amanga amanga*	Bush scarlet	Least Concern (SABCA 2013)	21	07/12/2011
LYCAENIDAE	*Axiocerses tjoane tjoane*	Eastern scarlet	Least Concern (SABCA 2013)	42	15/10/2016
LYCAENIDAE	*Azanus jesous*	Topaz babul blue	Least Concern (SABCA 2013)	44	19/09/2018
LYCAENIDAE	*Azanus mirza*	Pale babul blue	Least Concern (SABCA 2013)	10	05/10/2016
LYCAENIDAE	*Azanus moriqua*	Black-bordered babul blue	Least Concern (SABCA 2013)	37	17/09/2018
LYCAENIDAE	*Azanus natalensis*	Natal babul blue	Least Concern (SABCA 2013)	19	15/09/2018
LYCAENIDAE	*Azanus ubaldus*	Velvet-spotted babul blue	Least Concern (SABCA 2013)	4	27/02/2017
LYCAENIDAE	*Baliochila aslanga*	Natal mottled buff	Least Concern (SABCA 2013)	42	12/04/2018
LYCAENIDAE	*Baliochila lipara*	Lipara mottled buff	Least Concern (SABCA 2013)	2	19/04/2008
LYCAENIDAE	*Brephidium metophis*	Tinktinkie pygmy blue	Least Concern (SABCA 2013)	1	21/10/2007
LYCAENIDAE	*Cacyreus lingeus*	Bush bronze	Least Concern (SABCA 2013)	5	10/09/2013
LYCAENIDAE	*Chilades trochylus*	Grass jewel blue	Least Concern (SABCA 2013)	7	11/10/2008
LYCAENIDAE	*Chloroselas mazoensis*	Purple gem	Least Concern (SABCA 2013)	7	20/04/2008
LYCAENIDAE	*Chloroselas pseudozeritis pseudozeritis*	Brilliant gem	Least Concern (SABCA 2013)	18	27/11/2011
LYCAENIDAE	*Cigaritis ella*	Ella's silverline	Least Concern (SABCA 2013)	28	23/11/2010

Family	Scientific name	Common name	Red list category	Number of records	Last recorded
LYCAENIDAE	*Cigaritis natalensis*	Natal silverline	Least Concern (SABCA 2013)	19	01/10/2016
LYCAENIDAE	*Cnodontes penningtoni*	Pennington's buff	Least Concern (SABCA 2013)	9	11/10/2008
LYCAENIDAE	*Crudaria leroma*	Silver-spotted grey	Least Concern (SABCA 2013)	2	05/12/2010
LYCAENIDAE	*Cupidopsis cissus cissus*	Meadow blue	Least Concern (SABCA 2013)	1	20/08/1979
LYCAENIDAE	*Cupidopsis jobates jobates*	Tailed meadow blue	Least Concern (SABCA 2013)	8	27/02/2017
LYCAENIDAE	*Deudorix antalus*	Brown playboy	Least Concern (SABCA 2013)	17	06/07/2021
LYCAENIDAE	*Eicochrysops hippocrates*	White-tipped ash blue	Least Concern (SABCA 2013)	8	20/04/2008
LYCAENIDAE	*Eicochrysops messapus mahallakoaena*	Cupreous ash blue	Least Concern (SABCA 2013)	25	14/03/2021
LYCAENIDAE	*Euchrysops barkeri*	Pale smoky blue	Least Concern (SABCA 2013)	7	20/04/2008
LYCAENIDAE	*Euchrysops dolorosa*	Sabie smoky blue	Least Concern (SABCA 2013)	9	26/05/1979
LYCAENIDAE	*Euchrysops malathana*	Grey smoky blue	Least Concern (SABCA 2013)	7	25/02/2017
LYCAENIDAE	*Euchrysops osiris*	Osiris smoky blue	Least Concern (SABCA 2013)	10	29/04/2012
LYCAENIDAE	*Euchrysops subpallida*	Ashen smoky blue	Least Concern (SABCA 2013)	5	21/10/2007
LYCAENIDAE	*Hypolycaena buxtoni buxtoni*	Buxton's hairstreak	Least Concern (SABCA 2013)	30	27/04/2012
LYCAENIDAE	*Hypolycaena lochmophila*	Coastal hairstreak	Least Concern (SABCA 2013)	51	18/03/2017
LYCAENIDAE	*Hypolycaena philippus philippus*	Purple-brown hairstreak	Least Concern (SABCA 2013)	72	14/03/2021
LYCAENIDAE	*Iolaus alienus alienus*	Brown-line sapphire	Least Concern (SABCA 2013)	5	15/09/1976
LYCAENIDAE	*Iolaus diametra natalica*	Natal yellow-banded sapphire	Least Concern (SABCA 2013)	13	27/11/2011
LYCAENIDAE	*Iolaus lulua*	White spotted sapphire	Least Concern (SABCA 2013)	17	07/12/2011
LYCAENIDAE	*Iolaus mimosae rhodosense*	Mimosa sapphire	Least Concern (SABCA 2013)	14	25/02/2011
LYCAENIDAE	*Iolaus pallene*	Saffron sapphire	Least Concern (SABCA 2013)	23	20/10/2007
LYCAENIDAE	*Iolaus sidus*	Red-line sapphire	Least Concern (SABCA 2013)	24	21/03/2016
LYCAENIDAE	*Iolaus silarus silarus*	Straight-line sapphire	Least Concern (SABCA 2013)	6	01/04/2017
LYCAENIDAE	*Iolaus trimeni*	Protea sapphire	Least Concern (SABCA 2013)	2	14/10/1979
LYCAENIDAE	*Lachnocnema bibulus*	Common woolly legs	Least Concern (SABCA 2013)	25	16/09/2016
LYCAENIDAE	*Lachnocnema durbani*	Grassland woolly legs	Least Concern (SABCA 2013)	24	11/10/2008
LYCAENIDAE	*Lachnocnema laches*	Southern pied woolly legs	Least Concern (SABCA 2013)	5	06/12/2011
LYCAENIDAE	*Lampides boeticus*	Pea blue	Least Concern (SABCA 2013)	20	15/09/2018
LYCAENIDAE	*Lepidochrysops glauca*	Silvery giant cupid	Least Concern (SABCA 2013)	4	14/10/1979

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LYCAENIDAE	*Lepidochrysops patricia*	Patrician giant cupid	Least Concern (SABCA 2013)	13	11/10/2008
LYCAENIDAE	*Lepidochrysops plebeia plebeia*	Twin-spot giant cupid	Least Concern (SABCA 2013)	11	14/10/1979
LYCAENIDAE	*Leptomyrina gorgias gorgias*	Lilac-based black-eye	Least Concern (SABCA 2013)	3	20/10/2007
LYCAENIDAE	*Leptomyrina hirundo*	Tailed black-eye	Least Concern (SABCA 2013)	35	26/01/2018
LYCAENIDAE	*Leptotes brevidentatus*	Short-toothed zebra blue	Least Concern (SABCA 2013)	1	21/10/1983
LYCAENIDAE	*Leptotes pirithous pirithous*	Common zebra blue	Least Concern (SABCA 2013)	36	27/04/2013
LYCAENIDAE	*Leptotes pulchra pulchra*	Sesbania zebra blue	Least Concern (SABCA 2013)	1	28/04/2012
LYCAENIDAE	*Myrina dermaptera dermaptera*	Lesser fig tree blue	Least Concern (SABCA 2013)	1	20/10/2007
LYCAENIDAE	*Myrina silenus ficedula*	Common fig tree blue	Least Concern (SABCA 2013)	4	11/10/2008
LYCAENIDAE	*Oraidium barberae*	Dwarf blue	Least Concern (SABCA 2013)	13	29/04/2012
LYCAENIDAE	*Ornipholidotos peucetia penningtoni*	Southern large glasswing	Least Concern (SABCA 2013)	7	22/11/2009
LYCAENIDAE	*Pentila tropicalis tropicalis*	Spotted buff	Least Concern (SABCA 2013)	29	14/03/2021
LYCAENIDAE	*Pseudonacaduba sichela sichela*	Dusky line blue	Least Concern (SABCA 2013)	11	23/11/2009
LYCAENIDAE	*Stugeta bowkeri tearei*	Bowker's marbled sapphire	Least Concern (SABCA 2013)	4	11/10/2008
LYCAENIDAE	*Tarucus sybaris sybaris*	Dotted pierrot	Least Concern (SABCA 2013)	5	19/04/2008
LYCAENIDAE	*Teriomima zuluana*	Zulu yellow buff	Least Concern (SABCA 2013)	38	02/10/2017
LYCAENIDAE	*Tuxentius melaena melaena*	Black pie	Least Concern (SABCA 2013)	30	06/07/2021
LYCAENIDAE	*Deudorix dariaves*	Black-and-orange playboy	Least Concern (SABCA 2013)	18	26/04/2012
LYCAENIDAE	*Deudorix dinochares*	Apricot playboy	Least Concern (SABCA 2013)	11	14/10/1979
LYCAENIDAE	*Deudorix dinomenes dinomenes*	Orange playboy	Least Concern (SABCA 2013)	56	26/05/1989
LYCAENIDAE	*Deudorix diocles*	Orange-barred playboy	Least Concern (SABCA 2013)	1	01/05/1977
LYCAENIDAE	*Deudorix vansoni*	Small playboy	Least Concern (SABCA 2013)	25	20/04/2008
LYCAENIDAE	*Zintha hintza hintza*	Hintza pierrot	Least Concern (SABCA 2013)	1	28/04/2005
LYCAENIDAE	*Zizeeria knysna knysna*	African grass blue	Least Concern (SABCA 2013)	20	14/03/2021
LYCAENIDAE	*Zizina otis antanossa*	African clover blue	Least Concern (SABCA 2013)	2	30/04/2012
LYCAENIDAE	*Zizula hylax*	Tiny grass blue	Least Concern (SABCA 2013)	26	06/07/2021
LYCAENIDAE	*Anthene lasti*	Last's hairtail		1	22/04/1978
LYCAENIDAE	*Axiocerses sp.*			1	15/10/2016
LYCAENIDAE	*Baliochila sp.*			1	07/05/2015
LYCAENIDAE	*Deloneura millari millari*	Millar's large buff		19	21/11/2010

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LYCAENIDAE	*Lachnocnema sp.*			1	03/12/2010
LYCAENIDAE	*Lepidochrysops sp.*			1	15/10/2016
LYCAENIDAE	*Leptotes sp.*			20	14/03/2021
LYCAENIDAE	*Tuxentius sp.*			1	24/08/2016
LYCAENIDAE	*Virachola sp.*			1	10/09/2013
METARBELIDAE	*Salagena tessellata*		Not listed	1	22/09/2017
METARBELIDAE	*Lebedodes sp.*			1	09/12/2017
NOCTUIDAE	*Acontia guttifera*		Not listed	1	14/11/2017
NOCTUIDAE	*Agoma trimenii*		Not listed	1	21/12/2015
NOCTUIDAE	*Androlymnia torsivena*		Not listed	1	09/01/2018
NOCTUIDAE	*Brevipecten cornutus*		Not listed	1	26/09/2016
NOCTUIDAE	*Heraclia africana*		Not listed	2	10/01/2018
NOCTUIDAE	*Heraclia superba superba*		Not listed	1	07/12/2011
NOCTUIDAE	*Sommeria culta*		Not listed	5	14/03/2021
NOCTUIDAE	*Trisulana berenice*		Not listed	1	19/11/2017
NOCTUIDAE	*Agrotis sp.*			2	20/08/2016
NOCTUIDAE	*Heraclia sp.*			2	10/11/2014
NOCTUIDAE	*Pseudozarba sp.*			1	07/12/2017
NOLIDAE	*Earias biplaga*		Not listed	3	13/08/2016
NOTODONTIDAE	*Amyops ingens*		Not listed	1	15/03/2016
NOTODONTIDAE	*Anaphe reticulata*		Not listed	1	22/01/2015
NOTODONTIDAE	*Antheua tricolor*		Not listed	1	29/11/2016
NOTODONTIDAE	*Pseudorethona albicans*		Not listed	1	14/11/2017
NYMPHALIDAE	*Acraea acara acara*	Acara acraea	Least Concern (SABCA 2013)	18	16/03/2021
NYMPHALIDAE	*Acraea aganice aganice*	Dark wanderer	Least Concern (SABCA 2013)	2	09/05/2010
NYMPHALIDAE	*Acraea aglaonice*	Clear-spotted acraea	Least Concern (SABCA 2013)	11	03/01/2009
NYMPHALIDAE	*Acraea anemosa*	Broad-bordered acraea	Least Concern (SABCA 2013)	5	20/11/2014
NYMPHALIDAE	*Acraea axina*	Little acraea	Least Concern (SABCA 2013)	8	03/07/2010
NYMPHALIDAE	*Acraea boopis boopis*	Rainforest acraea	Least Concern (SABCA 2013)	1	30/01/1993

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NYMPHALIDAE	*Acraea natalica*	Black-based acraea	Least Concern (SABCA 2013)	13	16/03/2021
NYMPHALIDAE	*Acraea neobule neobule*	Wandering donkey acraea	Least Concern (SABCA 2013)	10	10/05/2018
NYMPHALIDAE	*Acraea nohara nohara*	Light red acraea	Least Concern (SABCA 2013)	1	20/10/2007
NYMPHALIDAE	*Acraea oncaea*	Window acraea	Least Concern (SABCA 2013)	34	22/01/2017
NYMPHALIDAE	*Acraea petraea*	Blood-red acraea	Least Concern (SABCA 2013)	4	11/10/1985
NYMPHALIDAE	*Acraea rabbaiae perlucida*	Southern clear-wing acraea	Least Concern (SABCA 2013)	6	23/10/1975
NYMPHALIDAE	*Acraea satis*	East coast acraea	Least Concern (SABCA 2013)	3	15/06/1996
NYMPHALIDAE	*Amauris albimaculata albimaculata*	Layman	Least Concern (SABCA 2013)	16	06/07/2021
NYMPHALIDAE	*Amauris niavius dominicanus*	Southern friar	Least Concern (SABCA 2013)	17	14/12/2010
NYMPHALIDAE	*Amauris ochlea ochlea*	Novice	Least Concern (SABCA 2013)	22	19/09/2018
NYMPHALIDAE	*Bicyclus anynana anynana*	Squinting bush brown	Least Concern (SABCA 2013)	34	08/07/2021
NYMPHALIDAE	*Bicyclus safitza safitza*	Black-haired bush brown	Least Concern (SABCA 2013)	38	14/03/2021
NYMPHALIDAE	*Brakefieldia perspicua perspicua*	Marsh patroller	Least Concern (SABCA 2013)	9	16/03/2021
NYMPHALIDAE	*Byblia anvatara acheloia*	African joker	Least Concern (SABCA 2013)	19	18/05/2016
NYMPHALIDAE	*Byblia ilithyia*	Spotted joker	Least Concern (SABCA 2013)	52	26/05/2018
NYMPHALIDAE	*Cassionympha cassius*	Rainforest dull brown	Least Concern (SABCA 2013)	3	25/03/1978
NYMPHALIDAE	*Catacroptera cloanthe cloanthe*	Pirate	Least Concern (SABCA 2013)	1	20/09/1979
NYMPHALIDAE	*Charaxes brutus natalensis*	White-barred charaxes	Least Concern (SABCA 2013)	16	31/10/2016
NYMPHALIDAE	*Charaxes candiope*	Green-veined charaxes	Least Concern (SABCA 2013)	21	15/09/2018
NYMPHALIDAE	*Charaxes castor flavifasciatus*	Giant charaxes	Least Concern (SABCA 2013)	8	11/10/2008
NYMPHALIDAE	*Charaxes cithaeron cithaeron*	Blue-spotted charaxes	Least Concern (SABCA 2013)	7	01/09/2016
NYMPHALIDAE	*Charaxes etesipe tavetensis*	Eastern savanna charaxes	Least Concern (SABCA 2013)	2	02/04/1988
NYMPHALIDAE	*Charaxes ethalion ethalion*	Satyr charaxes	Least Concern (SABCA 2013)	12	31/10/2016
NYMPHALIDAE	*Charaxes jahlusa argynnides*	Pearl-spotted charaxes	Least Concern (SABCA 2013)	38	17/09/2018
NYMPHALIDAE	*Charaxes phaeus*	Demon charaxes	Least Concern (SABCA 2013)	2	09/02/1990
NYMPHALIDAE	*Charaxes saturnus saturnus*	Foxy charaxes	Least Concern (SABCA 2013)	24	11/10/2016
NYMPHALIDAE	*Charaxes varanes varanes*	Pearl charaxes	Least Concern (SABCA 2013)	42	15/09/2018
NYMPHALIDAE	*Charaxes wakefieldi*	Forest queen	Least Concern (SABCA 2013)	6	20/01/2014
NYMPHALIDAE	*Charaxes zoolina*	Club-tailed charaxes	Least Concern (SABCA 2013)	75	14/03/2021
NYMPHALIDAE	*Coenyra hebe*	Zulu shadefly	Least Concern (SABCA 2013)	63	18/09/2018

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NYMPHALIDAE	*Danaus chrysippus orientis*	African plain tiger	Least Concern (SABCA 2013)	47	16/03/2021
NYMPHALIDAE	*Euphaedra neophron neophron*	Gold-banded forester	Least Concern (SABCA 2013)	15	19/03/2021
NYMPHALIDAE	*Eurytela dryope angulata*	Golden piper	Least Concern (SABCA 2013)	40	14/03/2021
NYMPHALIDAE	*Eurytela hiarbas angustata*	Pied piper	Least Concern (SABCA 2013)	4	11/10/2008
NYMPHALIDAE	*Hamanumida daedalus*	Guineafowl	Least Concern (SABCA 2013)	20	29/04/2012
NYMPHALIDAE	*Hypolimnas anthedon wahlbergi*	Variable diadem	Least Concern (SABCA 2013)	17	07/07/2021
NYMPHALIDAE	*Hypolimnas deceptor deceptor*	Deceptive diadem	Least Concern (SABCA 2013)	1	15/10/1978
NYMPHALIDAE	*Hypolimnas misippus*	Common diadem	Least Concern (SABCA 2013)	33	14/03/2021
NYMPHALIDAE	*Junonia hierta cebrene*	Yellow pansy	Least Concern (SABCA 2013)	40	22/08/2016
NYMPHALIDAE	*Junonia natalica natalica*	Brown commodore	Least Concern (SABCA 2013)	10	16/03/2021
NYMPHALIDAE	*Junonia oenone oenone*	Dark blue pansy	Least Concern (SABCA 2013)	54	14/03/2021
NYMPHALIDAE	*Junonia terea elgiva*	Soldier pansy	Least Concern (SABCA 2013)	6	06/07/2021
NYMPHALIDAE	*Libythea labdaca laius*	African snout	Least Concern (SABCA 2013)	2	21/11/2010
NYMPHALIDAE	*Melanitis leda*	Common evening brown	Least Concern (SABCA 2013)	32	08/07/2021
NYMPHALIDAE	*Neptis goochii*	Streaked sailer	Least Concern (SABCA 2013)	21	08/07/2021
NYMPHALIDAE	*Neptis jordani*	Jordan's sailer	Least Concern (SABCA 2013)	2	19/04/2008
NYMPHALIDAE	*Neptis saclava marpessa*	Spotted sailer	Least Concern (SABCA 2013)	28	08/07/2021
NYMPHALIDAE	*Paralethe dendrophilus indosa*	Bush beauty	Least Concern (SABCA 2013)	1	25/03/1978
NYMPHALIDAE	*Pardopsis punctatissima*	Polka dot	Least Concern (SABCA 2013)	6	21/04/2014
NYMPHALIDAE	*Phalanta eurytis eurytis*	Forest leopard	Least Concern (SABCA 2013)	7	06/07/2021
NYMPHALIDAE	*Phalanta phalantha aethiopica*	African leopard	Least Concern (SABCA 2013)	29	14/03/2021
NYMPHALIDAE	*Physcaeneura panda*	Dark-webbed ringlet	Least Concern (SABCA 2013)	32	29/09/2016
NYMPHALIDAE	*Protogoniomorpha anacardii nebulosa*	Clouded Mother-of-pearl	Least Concern (SABCA 2013)	7	15/09/2018
NYMPHALIDAE	*Protogoniomorpha parhassus*	Common Mother-of-pearl	Least Concern (SABCA 2013)	9	21/09/2014
NYMPHALIDAE	*Pseudacraea boisduvalii trimenii*	Boisduval's false acraea	Least Concern (SABCA 2013)	13	08/12/2015
NYMPHALIDAE	*Pseudacraea lucretia tarquinea*	False chief	Least Concern (SABCA 2013)	5	25/07/2018
NYMPHALIDAE	*Sevenia boisduvali boisduvali*	Boisduval's tree nymph	Least Concern (SABCA 2013)	42	14/03/2021
NYMPHALIDAE	*Sevenia natalensis*	Bronze tree nymph	Least Concern (SABCA 2013)	54	17/03/2021
NYMPHALIDAE	*Telchinia cabira*	Yellow-banded telchinia	Least Concern (SABCA 2013)	2	12/10/1985
NYMPHALIDAE	*Telchinia encedon encedon*	White-barred telchinia	Least Concern (SABCA 2013)	25	15/09/2018

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NYMPHALIDAE	*Telchinia esebria*	Dusky telchinia	Least Concern (SABCA 2013)	19	10/07/2017
NYMPHALIDAE	*Telchinia rahira rahira*	Marsh telchinia	Least Concern (SABCA 2013)	6	25/11/2010
NYMPHALIDAE	*Telchinia serena*	Dancing telchinia	Least Concern (SABCA 2013)	37	06/07/2021
NYMPHALIDAE	*Vanessa cardui*	Painted lady	Least Concern (SABCA 2013)	22	18/09/2018
NYMPHALIDAE	*Ypthima asterope asterope*	African three-ring	Least Concern (SABCA 2013)	2	29/04/2012
NYMPHALIDAE	*Ypthima impura paupera*	Impure three-ring	Least Concern (SABCA 2013)	7	20/09/1979
NYMPHALIDAE	*Charaxes varanes vologeses*	Pearl charaxes		1	14/03/2021
NYMPHALIDAE	*Phalanta sp.*			1	22/08/2016
NYMPHALIDAE	*Sevenia sp.*			1	27/05/2016
NYMPHALIDAE	*Ypthima sp.*			1	28/04/2012
PAPILIONIDAE	*Graphium angolanus angolanus*	Angola white lady	Least Concern (SABCA 2013)	4	17/12/2010
PAPILIONIDAE	*Graphium antheus*	Large striped swordtail	Least Concern (SABCA 2013)	43	14/03/2021
PAPILIONIDAE	*Graphium colonna*	Mamba swordtail	Least Concern (SABCA 2013)	48	14/03/2021
PAPILIONIDAE	*Graphium leonidas leonidas*	Veined swordtail	Least Concern (SABCA 2013)	22	14/03/2021
PAPILIONIDAE	*Graphium morania*	White lady	Least Concern (SABCA 2013)	21	14/01/2018
PAPILIONIDAE	*Graphium policenes policenes*	Small striped swordtail	Least Concern (SABCA 2013)	10	08/03/2017
PAPILIONIDAE	*Graphium porthaon porthaon*	Cream striped swordtail	Least Concern (SABCA 2013)	32	15/10/2016
PAPILIONIDAE	*Papilio constantinus constantinus*	Shade swallowtail	Least Concern (SABCA 2013)	53	14/03/2021
PAPILIONIDAE	*Papilio dardanus cenea*	Mocker swallowtail	Least Concern (SABCA 2013)	53	06/07/2021
PAPILIONIDAE	*Papilio demodocus demodocus*	Citrus swallowtail	Least Concern (SABCA 2013)	72	17/03/2021
PAPILIONIDAE	*Papilio nireus lyaeus*	Narrow green-banded swallowtail	Least Concern (SABCA 2013)	37	14/03/2021
PIERIDAE	*Colotis euippe omphale*	Southern round-winged orange tip	Least Concern (LC)	69	06/07/2021
PIERIDAE	*Afrodryas leda*	Autumn-leaf vagrant	Least Concern (SABCA 2013)	47	14/12/2017
PIERIDAE	*Appias epaphia contracta*	Diverse Albatross White	Least Concern (SABCA 2013)	43	11/02/2018
PIERIDAE	*Appias sabina phoebe*	Sabine albatross white	Least Concern (SABCA 2013)	2	24/11/2016
PIERIDAE	*Belenois aurota*	Pioneer caper white	Least Concern (SABCA 2013)	22	28/09/2015
PIERIDAE	*Belenois creona severina*	African caper white	Least Concern (SABCA 2013)	99	06/07/2021
PIERIDAE	*Belenois gidica abyssinica*	African veined white	Least Concern (SABCA 2013)	79	16/03/2021
PIERIDAE	*Belenois thysa thysa*	False dotted border	Least Concern (SABCA 2013)	18	03/01/2009

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PIERIDAE	*Catopsilia florella*	African migrant	Least Concern (SABCA 2013)	24	19/09/2018
PIERIDAE	*Colotis annae annae*	Scarlet tip	Least Concern (SABCA 2013)	103	06/07/2021
PIERIDAE	*Colotis antevippe gavisa*	Red tip	Least Concern (SABCA 2013)	35	29/04/2012
PIERIDAE	*Colotis auxo auxo*	Sulphur orange tip	Least Concern (SABCA 2013)	144	08/07/2021
PIERIDAE	*Colotis calais calais*	Topaz arab	Least Concern (SABCA 2013)	4	08/06/2015
PIERIDAE	*Colotis celimene amina*	Lilac tip	Least Concern (SABCA 2013)	2	14/04/1977
PIERIDAE	*Colotis erone*	Coast purple tip	Least Concern (SABCA 2013)	3	04/11/2015
PIERIDAE	*Colotis evagore antigone*	Small orange tip	Least Concern (SABCA 2013)	50	01/08/2016
PIERIDAE	*Colotis evenina evenina*	African orange tip	Least Concern (SABCA 2013)	2	11/10/2008
PIERIDAE	*Colotis ione*	Bushveld purple tip	Least Concern (SABCA 2013)	29	16/03/2021
PIERIDAE	*Colotis pallene*	Bushveld orange tip	Least Concern (SABCA 2013)	90	16/10/2016
PIERIDAE	*Colotis regina*	Queen purple tip	Least Concern (SABCA 2013)	8	11/10/2008
PIERIDAE	*Colotis vesta argillaceus*	Southern veined arab	Least Concern (SABCA 2013)	62	06/07/2021
PIERIDAE	*Dixeia charina charina*	African ant-heap white	Least Concern (SABCA 2013)	34	06/07/2021
PIERIDAE	*Dixeia doxo parva*	Black-veined ant-heap white	Least Concern (SABCA 2013)	24	10/12/1991
PIERIDAE	*Dixeia pigea*	Small ant-heap white	Least Concern (SABCA 2013)	8	15/09/2018
PIERIDAE	*Dixeia spilleri*	Sulphur ant-heap white	Least Concern (SABCA 2013)	53	17/09/2018
PIERIDAE	*Eronia cleodora*	Vine-leaf vagrant	Least Concern (SABCA 2013)	78	06/07/2021
PIERIDAE	*Eurema brigitta brigitta*	Broad-bordered grass yellow	Least Concern (SABCA 2013)	45	06/07/2021
PIERIDAE	*Eurema desjardinsii regularis*	Angled grass yellow	Least Concern (SABCA 2013)	2	08/05/2010
PIERIDAE	*Eurema hecabe solifera*	Lowveld yellow	Least Concern (SABCA 2013)	41	14/03/2021
PIERIDAE	*Leptosia alcesta inalcesta*	African wood white	Least Concern (SABCA 2013)	50	06/07/2021
PIERIDAE	*Mylothris agathina agathina*	Eastern dotted border	Least Concern (SABCA 2013)	41	06/07/2021
PIERIDAE	*Mylothris rueppellii haemus*	Twin dotted border	Least Concern (SABCA 2013)	1	04/01/1994
PIERIDAE	*Nepheronia argia variegata*	Large vagrant	Least Concern (SABCA 2013)	49	08/07/2021
PIERIDAE	*Nepheronia buquetii buquetii*	Buquet's vagrant	Least Concern (SABCA 2013)	51	06/07/2021
PIERIDAE	*Pinacopteryx eriphia eriphia*	Zebra white	Least Concern (SABCA 2013)	42	02/10/2016
PIERIDAE	*Pontia helice helice*	Southern meadow white	Least Concern (SABCA 2013)	2	17/09/2018
PIERIDAE	*Teracolus eris eris*	Banded gold tip	Least Concern (SABCA 2013)	43	17/09/2018
PIERIDAE	*Teracolus subfasciatus*	Lemon traveller	Least Concern (SABCA 2013)	7	01/08/1908

Family	Scientific name	Common name	Red list category	Number of records	Last recorded
PIERIDAE	*Colotis sp.*			2	16/03/2016
PIERIDAE	*Colotis euippe mediata*	Smoky orange tip		2	28/04/2005
PIERIDAE	*Eurema floricola floricola*	Malagasy Grass Yellow		2	14/03/2021
PYRALIDAE	*Endotricha erythralis*		Not listed	1	14/08/2016
PYRALIDAE	*Tegulifera oblunata*		Not listed	1	26/09/2016
PYRALIDAE	*Loryma basalis*			2	15/08/2016
SATURNIIDAE	*Argema mimosae*		Not listed	3	13/12/2016
SATURNIIDAE	*Bunaea alcinoe*		Not listed	1	30/09/2015
SATURNIIDAE	*Epiphora mythimnia*		Not listed	2	23/11/2016
SATURNIIDAE	*Heniocha apollonia*		Not listed	1	18/09/2014
SATURNIIDAE	*Ludia delagorguei*		Not listed	2	17/03/2018
SATURNIIDAE	*Melanocera menippe*		Not listed	1	31/01/2014
SATURNIIDAE	*Pseudobunaea tyrrhena*		Not listed	2	27/01/2016
SATURNIIDAE	*Urota sinope*		Not listed	2	14/11/2017
SATURNIIDAE	*Usta terpsichore*		Not listed	1	21/11/2009
SATURNIIDAE	*FAMILY SATURNIIDAE*	Unidentified SATURNIIDAE		4	28/10/2016
SATURNIIDAE	*Cirina forda*			2	21/09/2017
SCYTHRIDIDAE	*FAMILY SCYTHRIDIDAE*	Unidentified SCYTHRIDIDAE		1	19/08/2016
SPHINGIDAE	*Acherontia atropos*		Not listed	2	03/11/2014
SPHINGIDAE	*Agrius convolvuli convolvuli*		Not listed	1	02/10/2015
SPHINGIDAE	*Batocnema africana*		Not listed	2	28/01/2016
SPHINGIDAE	*Daphnis nerii*		Not listed	1	06/04/2016
SPHINGIDAE	*Euchloron megaera*		Not listed	2	23/03/2016
SPHINGIDAE	*Hippotion celerio*		Not listed	2	23/01/2016
SPHINGIDAE	*Leucostrophus alterhirundo*		Not listed	4	14/03/2021
SPHINGIDAE	*Nephele comma*		Not listed	3	03/04/2017
SPHINGIDAE	*Oligographa juniperi*		Not listed	6	08/02/2018
SPHINGIDAE	*Theretra capensis*		Not listed	1	28/12/2014
SPHINGIDAE	*FAMILY SPHINGIDAE*	Unidentified SPHINGIDAE		2	28/10/2016
SPHINGIDAE	*Hippotion sp.*			1	18/11/2014

Family	Scientific name	Common name	Red list category	Number of records	Last recorded
SPHINGIDAE	*Leucostrophus sp.*			1	26/11/2015
SPHINGIDAE	*Nephele sp.*			1	05/05/2016
URANIIDAE	*Urapteroides recurvata*		Not listed	2	27/11/2014

Appendix 7 CV's of specialists

Appendix 8
Desktop Assessment Methodology and Information

EZEMVELO KZN WILDLIFE C-PLAN & SEA DATABASE

The C-Plan is a systematic conservation-planning package that runs with the GIS software ArcGIS, and which analyses biodiversity features and landscape units. C-Plan is used to identify a national reserve system that will satisfy specified conservation targets for biodiversity features (*Ezemvelo KZN Wildlife*, 2010). Biodiversity features can be land classes or species, and targets that are set within area units either for land classes, or as numbers of occurrences of species for species locality data sets (*Ezemvelo KZN Wildlife*, 2010). These units or measurements are used as **surrogates** for un-sampled data. The C-Plan is an effective conservation tool when determining priority areas at a **regional level** and is being used in South Africa to identify areas of high conservation value. The SEA (Goodman, 2004) modelled the distribution of a selection of 255 red data and endemic species that have the potential to occur in the area.

Irreplaceability Analysis

The following is referenced from Goodman (2004): "The first product of the conservation planning analysis in C-Plan is an irreplaceability map of the planning area, in this case the province of KwaZulu-Natal. This map is divided into grid cells called 'Planning Units'.

Each planning unit has associated with it an 'Irreplaceability Value', which is a reflection of the planning units' importance with respect to the conservation of biodiversity. Irreplaceability reflects the planning unit's ability to meet set 'targets' for selected biodiversity 'features'. The irreplaceability value is scaled between 0 and 1.

Irreplaceability value – 0. Where a planning unit has an irreplaceability value of 0, all biodiversity features recorded here are conserved to the target amount, and there is unlikely to be a biodiversity concern with the development of the site. This of course will be subject to ground truthing to determine the biodiversity features at a finer scale.

Irreplaceability value – 1. These planning units are referred to as totally irreplaceable and the conservation of the features within them is critical to meet conservation targets. (EIA very definitely required and depending on the nature of the proposal authorisation is unlikely to be granted).

Irreplaceability value > 0 but < 1. Some of these planning units are still required to meet biodiversity conservation targets. If the value is high (e.g. 0.9) then most units are required (few options available for alternative choices). If the value is low, then many options are available for meeting the biodiversity targets. (EIA required and depending on the nature of the proposed development, permission could be granted)."

The irreplaceability units have been optimised further to create various subcategories called *Critical Biodiversity Areas* and *Ecological Support Areas* (*Ezemvelo* KZN Wildlife, 2014).

Critical Biodiversity Areas

The Critical Biodiversity Areas (CBAs) can be divided into two subcategories, namely *Irreplaceable* and *Optimal*. Each of these can in turn be subdivided into additional subcategories (**Table 26**).

The CBA categories are based on the optimised outputs derived using systematic conservation planning software, with the Planning Units (PU) identified representing the localities for which the conservation targets for one or more of the biodiversity features contained within can be achieved.

The distribution of the biodiversity features is not always applicable to the entire extent of the PU, but is more often than not confined to a specific niche habitat e.g. a forest or wetland reflected as a portion of the PU in question. In such cases, development could be considered within the PU if special mitigation measures are put in place to safeguard this feature(s) and if the nature of the development is commensurate with the conservation objectives. Obviously this is dependent on a site by site, case by case, basis.

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. Within the C-Plan MINSET analysis this does not mean they are of a lower biodiversity value however, only that there are more alternate options available within which the features located within can be met. The determination of the spatial locality of these PU's is driven primarily by the Decision Support Layers.

Table 26. Summary of CBA Categories (from *Ezemvelo* KZN Wildlife, Biodiversity Spatial Planning Terms).

Category	C-Plan	MARXAN (statistical modelling package)	Expert Input/ Desktop	Biodiversity Sector and Regional Plans
CBA: Irreplaceable (SCA)	Irreplaceability = 1	No equivalent		CBA: Irreplaceable
CBA: High Irreplaceable (SCA)	Irreplaceability Score >= 0.8 and <1.0	Selection frequency value = 80% –100%		CBA: Irreplaceable
CBA: Irreplaceable Expert Input			Expert input	CBA: Irreplaceable
CBA: Irreplaceable Linkage			Desktop and expert input	CBA: Irreplaceable
CBA: Optimal (SCA)	Irreplaceability Score > 0 and < 0.8	"Best" solution from MARXAN runs less the identified CBA High Irreplaceability areas		CBA: Optimal
CBA: Optimal, High Degradation	Irreplaceability Score > 0 and < 0.8	"Best" solution from MARXAN runs less the identified CBA High Irreplaceability areas	Field Assessment	CBA: Optimal
CBA: Optimal Low Degradation	Irreplaceability Score > 0 and < 0.8	"Best" solution from MARXAN runs less the identified CBA High Irreplaceability areas	Field Assessment	CBA: Optimal
CBA: Optimal Expert Input			Expert input	CBA: Optimal

Ecological Support Areas

Ecological Support Areas (ESAs) are required to support and sustain the ecological functioning of Critical Biodiversity Areas (CBAs). For terrestrial and aquatic environments, these areas are functional but are not necessarily pristine natural areas. They are however, required to ensure the persistence and maintenance of biodiversity patterns and ecological processes within the CBAs, and contribute significantly to the maintenance of Ecological Infrastructure[2] (EI).

Landscape Corridors

A series of bio-geographic corridors were developed in KZN to facilitate evolutionary, ecological and climate change processes to create a linked landscape for the conservation of species in a fragmented landscape.

Local Corridors

Corridors were developed at a district scale to create fine scale links within the landscape that facilitate ecological processes and ensure persistence of critical biodiversity features.

BIO RESOURCE UNITS (BRU)

A Bioresource Unit is a demarcated area in which the environmental conditions such as soil, vegetation, climate and, to a lesser degree, terrain form, are sufficiently similar to permit uniform recommendations

[2] **A term referring to areas in the landscape which provide significant Ecosystem Services which contribute positively to the economy and human welfare. Examples include 'Flood mitigation' and 'Good Water Quality' (provided both by wetlands and well maintained water catchments). Ecological infrastructure is the stock of functioning ecosystems that provides a flow of essential system services to human communities – services such as the provision of fresh water, climate regulation and soil formation. Ecological infrastructure includes features such as healthy mountain catchments, rivers, wetlands, and nodes and corridors of natural grassland habitat which together form a network of interconnected structural elements within the landscape. If this ecological infrastructure is degraded or lost, the flow of ecosystem services will diminish and ecosystems will become vulnerable to shocks and disturbances, such as the impacts of climate change, unsustainable land use change and natural disasters like floods and droughts. It is important to note that when ecological infrastructure is degraded or fails, the direct monetary cost to society and government is often very high. Ecological infrastructure is, therefore, the nature-based equivalent of hard infrastructure, and is just as important for providing the vital services that underpin social development and economic activity.**

of land use and farm practices to be made, to assess the magnitude of crop yields that can be achieved, to provide a framework in which an adaptive research programme can be carried out, and to enable land users to make correct decisions (Camp, 1998).

The environmental factors defined in a BRU should give an indication of habitat suitability for both plant and animal species. On the other hand, knowing the habitat requirements of any particular species, it should be possible to map locations suitable for such species. There are 590 BRUs in KwaZulu-Natal.

Environmental Potential Atlas

The following is referenced from the Department of Environmental Affairs and Tourism (2007): The Environmental Potential Atlas (ENPAT) developed from a single map of Gauteng to a complete spatial data set of the entire South Africa.

ENPAT was updated in July 2001 and is used by the National Department of Environmental Affairs and Tourism and various provincial environmental management departments as a decision-making tool in the process of environmental impact assessments. ENPAT includes the decision-making parameters such as: high-risk development category indications and potential impacts are linked to the 1:250 000 spatial databases on national and provincial level.

The main purpose of ENPAT is to proactively indicate potential conflicts between development proposals and critical or sensitive environments. ENPAT can also be used for development planning since it indicates the environment's potential for development.

ENPAT consists of two distinct, parallel sets of information: natural or environmental characteristics, and social-economic factors. The environmental character maps depict geology, land types, soils, vegetation, and hydrology. The socio-economic factors consist of land cover, cadastral aspects and infrastructure, land use and culture.
These two sets of information are combined and assessed in terms of their potential or latent environmental sensitivity. Sensitivity is assigned based on the ability of a resource to absorb change or impact. A value of **0** indicates a **low sensitivity** - thus a high ability to accept change and a value of **1** indicates a **high sensitivity**, or a low ability to accept change. Areas of low sensitivity are thus available or suitable for development.

Mucina and Rutherford National Vegetation Types

Mucina and Rutherford (2006**)** present an up-to-date and comprehensive overview of the vegetation of South Africa and the two small neighbouring countries of Lesotho and eSwatini. This account is based on vegetation survey using appropriate tools of contemporary vegetation mapping and vegetation description. They aimed at drawing a new vegetation map that depicts the complexity and **macro-scale** ecology and reflects the level of knowledge of the vegetation of the region. This is an extensive account of the vegetation of a complex and biologically intriguing part of the world, offering not only insights into structure and dynamics of the vegetation cover, but containing a wealth of base-line data for further vegetation- ecological, biogeographical, and conservation-oriented studies. The map and the descriptive account of the vegetation of South Africa, Lesotho and Swaziland offers a powerful decision-making tool for conservationists, land and resource planners, and politicians as well as the interested public at large.

KwaZulu – Natal Vegetation Types (KZN VT)

The KZN VT was created to provide an accurate representation of the **historical extent** of the vegetation types present in KZN with the most current available information. A key issue of concern is our current lack of knowledge regarding the historical extents of both our wetland and forest biomes. Almost all vegetation mapping conducted currently only displays the current extent of the feature in question. As such, no true understanding as to rates of loss and or minimum required habitat areas required to ensure persistence can be accurately determined. This issue further influences our understanding of the grassland/savannah/bushland matrix within which these features reside. The KZN

VT map has undergone several changes since the publication of the Mucina and Rutherford (2006) national vegetation types.

Ezemvelo KZN Wildlife has, in association with various government departments, NGOs, Working Groups and Forums, municipalities and parastatals, refined the KZN VT to develop an accurate representation of the extent of the vegetation types present. As a result of the finer scale mapping and classification, KZN VT map has in some cases identified new vegetation types and or subtypes within the vegetation types identified at national level. These changes have been peer reviewed and adopted by the National Vegetation Committee, and have been incorporated into the revised South African Vegetation map.

National Freshwater Ecosystem Priority Areas (NFEPA)

NFEPA was a three-year partnership project between South African National Biodiversity Institute (SANBI), CSIR, Water Research Commission (WRC), Department of Environmental Affairs (DEA), Department of Water Affairs (DWA), Worldwide Fund for Nature (WWF), South African Institute of Aquatic Biodiversity (SAIAB) and South African National Parks (SANParks) (Van Deventer *et al.,* 2010). NFEPA map products provide strategic spatial priorities for conserving South Africa's freshwater ecosystems and supporting sustainable use of water resources. These strategic spatial priorities are known as Freshwater Ecosystem Priority Areas, or FEPAs.

FEPA maps and supporting information form part of a comprehensive approach to sustainable and equitable development of South Africa's scarce water resources. They provide a single, nationally consistent information source for incorporating freshwater ecosystem and biodiversity goals into (two) 2 planning and decision-making processes. For integrated water resource management, the maps provide guidance on how many rivers, wetlands and estuaries, and which ones, should remain in a natural or near-natural condition to support the water resource protection goals of the National Water Act (Act No. 36 of 1998; RSA, 1998a). FEPA maps are therefore directly applicable to the National Water Act, feeding into Catchment Management Strategies, classification of water resources, reserve determination, and the setting and monitoring of resource quality objectives. FEPA maps are also directly relevant to the National Environmental Management: Biodiversity Act (Act No. 10 of 2004; RSA, 2004) (hereafter referred to as the Biodiversity Act), informing both the listing of threatened freshwater ecosystems and the process of bioregional planning provided for by this Act. FEPA maps support the implementation of the National Environmental Management: Protected Areas Act (Act No. 57 of 2003; RSA, 2003) (hereafter referred to as the Protected Areas Act) by informing the expansion of the protected area network. They also inform a variety of other policies and legislation that affect the management and conservation of freshwater ecosystems, including at the municipal level.
FEPAs are strategic spatial priorities for conserving freshwater ecosystems and supporting sustainable use of water resources. FEPAs were determined through a process of systematic biodiversity planning and were identified using a range of criteria for conserving ecosystems and associated biodiversity of rivers, wetlands and estuaries.

FEPAs are often tributaries and wetlands that support hard-working large rivers, and are an essential part of an equitable and sustainable water resource strategy. FEPAs need to stay in a good condition to manage and conserve freshwater ecosystems, and to protect water resources for human use. This does not mean that FEPAs need to be fenced off from human use, but rather that they should be supported by good planning, decision-making and management to ensure that human use does not impact on the condition of the ecosystem. The current and recommended condition for all river FEPAs is A or B ecological category (Nel et al, 2011). Wetland FEPAs that are currently in a condition lower than A or B should be rehabilitated to the best attainable ecological condition.

Appendix 8 Impact Methodology

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) METHODOLOGY

The Environmental Impact Assessment (EIA) Methodology assists in evaluating the overall effect of a proposed activity on the environment. Determining of the significance of an environmental impact on an environmental parameter is determined through a systematic analysis.

Determination of Significance of Impacts

Significance is determined through a synthesis of impact characteristics which include context and intensity of an impact. Context refers to the geographical scale (i.e. site, local, national or global), whereas intensity is defined by the severity of the impact e.g. the magnitude of deviation from background conditions, the size of the area affected, the duration of the impact and the overall probability of occurrence. Significance is calculated as shown in **Table 1**.

Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

Impact Rating System

The impact assessment must take account of the nature, scale and duration of effects on the environment and whether such effects are positive (beneficial) or negative (detrimental). Each issue / impact is also assessed according to the various project stages, as follows:

- Planning;
- Construction;
- Operation; and
- Decommissioning.

Where necessary, the proposal for mitigation or optimisation of an impact should be detailed. A brief discussion of the impact and the rationale behind the assessment of its significance has also been included.

The significance of Cumulative Impacts should also be rated (As per the Excel Spreadsheet Template).

Rating System Used to Classify Impacts

The rating system is applied to the potential impact on the receiving environment and includes an objective evaluation of the possible mitigation of the impact. Impacts have been consolidated into one (1) rating. In assessing the significance of each issue the following criteria (including an allocated point system) is used:

Table 27: Rating of impacts criteria

ENVIRONMENTAL PARAMETER		
A brief description of the environmental aspect likely to be affected by the proposed activity (e.g. Surface Water).		
ISSUE / IMPACT / ENVIRONMENTAL EFFECT / NATURE		
Include a brief description of the impact of environmental parameter being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted upon by a particular action or activity (e.g. oil spill in surface water).		
EXTENT (E)		
This is defined as the area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment of a project in terms of further defining the determined.		
1	Site	The impact will only affect the site
2	Local/district	Will affect the local area or district
3	Province/region	Will affect the entire province or region
4	International and National	Will affect the entire country
PROBABILITY (P)		
This describes the chance of occurrence of an impact		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).
REVERSIBILITY (R)		
This describes the degree to which an impact on an environmental parameter can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures
2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES (L)		
This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		

1	No loss of resource.	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.
DURATION (D)		
This describes the duration of the impacts on the environmental parameter. Duration indicates the lifetime of the impact as a result of the proposed activity.		
1	Short term	The impact and its effects will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase (0 – 1 years), or the impact and its effects will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact and its effects will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10 – 50 years).
4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered transient (Indefinite).
INTENSITY / MAGNITUDE (I / M)		
Describes the severity of an impact (i.e. whether the impact has the ability to alter the functionality or quality of a system permanently or temporarily).		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/ component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very high	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired (system collapse). Rehabilitation and remediation often impossible. If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.
SIGNIFICANCE (S)		

Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. This describes the significance of the impact on the environmental parameter. The calculation of the significance of an impact uses the following formula:

Significance = (Extent + probability + reversibility + irreplaceability + duration) x magnitude/intensity.

The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.

Points	Impact Significance Rating	Description
5 to 23	Negative Low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
5 to 23	Positive Low impact	The anticipated impact will have minor positive effects.
24 to 42	Negative Medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
24 to 42	Positive Medium impact	The anticipated impact will have moderate positive effects.
43 to 61	Negative High impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
43 to 61	Positive High impact	The anticipated impact will have significant positive effects.
62 to 80	Negative Very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
62 to 80	Positive Very high impact	The anticipated impact will have highly significant positive effects.