

**FLORAL, FAUNAL, WETLAND AND AQUATIC  
ASSESSMENT AS PART OF THE ENVIRONMENTAL  
ASSESSMENT AND AUTHORISATION PROCESS FOR THE  
PROPOSED COMMISSIEKRAAL COLLIERY, KWAZULU-  
NATAL PROVINCE**

Prepared for

**SLR Consulting (Africa) (Pty) Ltd.**

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**Section C: Faunal Assessment**

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# 1. INTRODUCTION

## 1.1 Background

Scientific Aquatic Services (SAS) was appointed to conduct a faunal and floral ecological investigation as well as an investigation of the wetland and aquatic resources associated with a proposed new underground coal mine and related surface infrastructure to support a mining operation on the farm Commissiekraal 90HT, hereafter referred to as “subject property”. The subject property is located approximately 28 km north of Utrecht in the eMadlangeni Local Municipality and the Amajuba District Municipality, KwaZulu-Natal. The main land uses at the time of assessment include agriculture, primarily livestock grazing with minor dryland crops, forestry, conservation and tourism.

This report, after consideration and description of the ecological integrity of the subject property, must guide the proponent, authorities and Environmental Assessment Practitioner (EAP), by means of recommendations, as to the most appropriate way forward for further assessment of botanical impacts associated with the proposed development as well as to define the suitability of the subject property for the intended land use, which in this case is the proposed mining development, from a floral ecological point of view.



## **1.2 Assumptions and Limitations**

The following assumptions and limitations are applicable to this report:

- The ecological assessment is confined to the subject property and does not include the neighbouring and adjacent properties; these were however considered as part of the desktop assessment;
- Due to the nature and habits of most faunal taxa it is unlikely that all species would have been observed during a site assessment of limited duration. Therefore, site observations are compared with literature studies where necessary, and the use of camera traps were employed to increase observation time;
- With ecology being dynamic and complex, some aspects (some of which may be important) may have been overlooked. It is, however, expected that most floral communities have been accurately assessed and considered; and
- Sampling by its nature, means that not all individuals are assessed and identified. Some species and taxa on the Subject property may therefore been missed during the assessment. Sampling by its nature, means that not all individuals are assessed and identified. Some species and taxa on the Subject property may therefore been missed during the assessment. However this study and the level of effort undertaken is deemed adequate to ensure that decisions can be made based on sufficiently reliable information and observations.

## **1.3 Indemnity and Terms of use of this Report**

The findings, results, observations, conclusions and recommendations given in this report are based on the author's best scientific and professional knowledge as well as available information. The report is based on survey and assessment techniques which are limited by time and budgetary constraints relevant to the type and level of investigation undertaken and SAS CC and its staff reserve the right to modify aspects of the report including the recommendations if and when new information may become available from ongoing research or further work in this field, or pertaining to this investigation.

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## **1.4 General Site Survey**

Three site visits were undertaken during April 2013, December 2013 and February 2014 to determine the ecological status of the subject property and the surrounding areas. A reconnaissance 'drive around' followed by a thorough 'walk through' on foot was undertaken to determine the general habitat types found throughout the subject property and, following this, specific study sites or areas were selected that were considered to be representative of the habitats found within the subject property. Special emphasis was placed on areas that may potentially support faunal Species of Conservation Concern (SCC). Sites were investigated on foot in order to identify the occurrence of the dominant faunal communities, species and habitat diversities. The presence of any faunal inhabitants of the subject property was also assessed through direct visual observation or identifying such species through calls, tracks, scats, burrows and other methods as described in the methodology.

The faunal categories covered in this assessment are mammals, avifauna, reptiles, amphibians, general invertebrates, spiders and scorpions.

## **2. ASSESSMENT APPROACH**

### **2.1 Faunal Assessment Methodology**

It is important to note that due to the nature and habits of fauna, varied stages of life cycles, seasonal and temporal fluctuations along with other external factors, it is unlikely that all faunal species will have been recorded during the site assessment. The presence of human habitation within and nearby the subject property and the associated anthropogenic activities may have an impact on faunal behaviour and in turn the rate of observations. In order to increase overall observation time within the study area, as well as increasing the likelihood of observing shy and hesitant species, camera traps were strategically placed throughout the study area. Sherman traps were also used to increase the likelihood of capturing and observing small mammal species, notably small nocturnal mammals.



## 2.2 Mammals

Small mammals are unlikely to be directly observed in the field because of their nocturnal/crepuscular and cryptic nature. A simple and effective solution to this problem is to use Sherman traps. A Sherman trap is a small aluminium box with a spring-loaded door (Figure 1). Once the animal is inside the trap, it steps on a small plate that causes the door to snap shut, thereby capturing the individual. In the event of capturing a small mammal during the night, the animal would be photographed and then set free unharmed early the following morning. Traps were baited with a universal mixture of oats, peanut butter, and fish paste.



**Figure 1: Baited Sherman traps set out within the subject property.**

Medium and larger faunal species were recorded during the field assessment with the use of visual identification as well as where, spoor, call, or dung samples can be positively identified. Furthermore, motion sensitive infrared camera traps were used to capture medium to large mammal species (Figure 2). These cameras were placed along trails and near suitable habitat areas and left for the full duration of the field site visit. Specific attention was given to RDL mammal species listed in the KwaZulu-Natal Nature Conservation Management Act (Act No 5 of 1999) in conjunction with the IUCN, 2015.



Figure 2: Digital Camera traps set out within the subject property.

### **2.3 Avifauna**

The Southern African Bird Atlas Project 2 database (<http://sabap2.adu.org.za/>) lists for the Quarter Degree Square (QDS) 2730AD (Appendix B) was compared with the recent field survey of avifaunal species identified on the study area. Field surveys were undertaken utilising a pair of Bushnell 10x50 binoculars and bird call identification techniques were utilised during the assessment in order to accurately identify avifaunal species. Specific attention was given to RDL avifaunal species listed in the KwaZulu-Natal Nature Conservation Management Act (Act No 5 of 1999) in conjunction with the IUCN, 2015.

### **2.4 Reptiles**

Reptiles were physically identified during the field survey. Mountainous and rocky outcrop areas and fallen dead trees were inspected whilst all reptiles encountered were identified. The data gathered during the assessment along with the habitat analysis provided an accurate indication of which reptile species are likely to occur on the study area. Specific attention was given to RDL reptile species listed in the KwaZulu-Natal Nature Conservation Management Act (Act No 5 of 1999) report in conjunction with the IUCN, 2015.

### **2.5 Amphibians**

Identifying amphibian species is done by the use of direct visual identification along with call identification technique. Amphibian species flourish in and around wetland and riparian areas; which were widespread throughout the subject property. It is unlikely that all amphibian species will have been recorded during the site assessments, due to their cryptic nature and habits, varied stages of life cycles and seasonal and temporal fluctuations within the



environment. The data gathered during the assessment along with the habitat analysis provided an accurate indication of which amphibian species are likely to occur within the subject property as well as the surrounding area. Specific attention was given to RDL amphibian species listed in the KwaZulu-Natal Nature Conservation Management Act (Act No 5 of 1999) report in conjunction with the IUCN, 2015.

## **2.6 Invertebrates**

A list of visually identified and observed general invertebrate species was compiled during the field survey. However, due to their cryptic nature and habits, varied stages of life cycles, seasonal and temporal fluctuations within the environment, it is unlikely that all invertebrate species will have been recorded during the site assessment period. Nevertheless, the data gathered during the general invertebrate assessment along with the habitat analysis provided an accurate indication of which invertebrate species are likely to occur on the study area at the time of survey. Specific attention was given to RDL invertebrate species listed in the KwaZulu-Natal Nature Conservation Management Act (Act No 5 of 1999) report in conjunction with the IUCN, 2015.



**Figure 3: Picture of an emergency box as used in the subject property.**

## 2.7 Arachnids

Suitable undisturbed habitats, such as rocky areas where spiders and scorpions are likely to reside were searched. Rocks were overturned and inspected for signs of these species. Specific attention was paid to searching for Mygalomorphae arachnids (Trapdoor and Baboon spiders) as well as potential SCC scorpions within the subject property.

## 2.8 Red Data Species Assessment

### Species of Conservational Concern Sensitivity Index Score (SCCSIS)

The term SCC in the context of this report refers to all RD (Red Data) and IUCN (International Union for the Conservation of Nature) listed faunal species, as well as protected species of relevance to the project. The lists below are all specified in legislation with the exception of the IUCN, which is the oldest and largest global environmental organisation. It should be noted that some species or families considered threatened on a national level may not be considered threatened on a provincial level due to various factors such as stable local population trends; for these species provincial status took precedence.

The following legislative and international listings were used during the SCC consideration:

- I. **Provincial conservation:** protected species listed in the KwaZulu-Natal Nature Conservation Management Act (Act No 5 of 1999),
- II. **National conservation:** National Environmental Management Act (Act 107 of 1998) (NEMA) and National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA), and
- III. **Global conservation:** Protected species under International Union for the Conservation of Nature (IUCN). Organisms that fall into the *Extinct in the Wild (EW)*, *critically endangered (CR)*, *Endangered (EN)*, *Vulnerable (VU)* *Least Concern (LC)*, and *Data deficient (DD)* categories of ecological status.

Given the restrictions of field assessments to identify all the faunal species that possibly occur on a particular property, the SCCSIS has been developed to provide an indication of the potential faunal SCC that could reside in the area, while simultaneously providing a quantitative measure of the subject property's value in terms of conserving faunal diversity. The SCCSIS is based on the principles that when the knowledge of a species' historical distribution is combined with a field assessment that identifies the degree to which the subject property supports a species' habitat and food requirements, interpretations can be made about the probability of that particular species residing within the subject property. Repeating this



procedure for all the potential faunal SCC of the area and collating this information then provides a sensitivity measure of the property that has been investigated. The detailed methodology to determine the SCCSIS of the property is presented below:

The probability of Occurrence (POC): Known distribution range (D), habitat suitability of the site (H) and availability of food sources (F) on the site were determined for each of the species. Each of these variables is expressed a percentage (where 100% is a perfect score). The average of these scores provided a POC score for each species. The POC value was categorised as follows:

- **0-20%** = **Low;**
  - **21-40%** = **Low to Medium;**
  - **41-60%** = **Medium;**
  - **61-80%** = **Medium to High and**
  - **81-100%** = **High**
- POC = (D+H+F)/3**

Total Species Score (TSS): Species with POC of more than 60% (High-medium) were considered when applying the SCCSIS. A weighting factor was assigned to the different IUCN categories, providing species with a higher conservation status, a higher score. This weighting factor was then multiplied with the POC to calculate the TSS for each species. The weighting as assigned to the various categories is as follows:

- **Data Deficient** = **0.2;**
  - **Rare** = **0.5;**
  - **Near Threatened** = **0.7;**
  - **Vulnerable** = **1.2;**
  - **Endangered** = **1.7 and**
  - **Critically Endangered** = **2.0.**
- TSS = (IUCN weighting\*POC) where POC > 60%**

Average Total Species (Ave TSS) and Threatened Taxa Score (Ave TT): The average of all TSS potentially occurring on the site is calculated. The average of all the Threatened taxa (TT) (Near threatened, Vulnerable, Endangered and Critically Endangered) TSS scores are also calculated. The average of these two scores (Ave TSS and Ave TT) was then calculated in order to add more weight to threatened taxa with POC higher than 60%.

$$\text{Ave} = \text{Ave TSS [TSS/No of Spp]} + \text{Ave TT [TT TSS/No of Spp]}/2$$



**SCCSIS:** The average score obtained above and the sum of the percentage of species with a POC of 60% or higher of the total number of SCC listed for the area was then calculated. The average of these two scores, expressed as a percentage, gives the RDSIS for the area investigated.

$$\text{SCCSIS} = \text{Ave} + [\text{Spp with POC} > 60\% / \text{Total no Of Spp} * 100] / 2$$

### SCCSIS interpretation:

**Table 1: SCCSIS value interpretation with regards to faunal SCC importance on the subject property.**

SCCSIS Score	SCCSIS mammal importance
0-20%	Low
21-40%	Low-Medium
41-60%	Medium
60-80%	High-Medium
81-100%	High

Recommendations will be developed to address and mitigate impacts associated with the proposed development. These recommendations will also include general management measures which apply to the proposed development as a whole. Mitigation measures will be developed to address issues in all phases throughout the life of the operation from planning, through construction, operation and through to after care and maintenance.

## 3. FAUNAL ASSESSMENT RESULTS

After investigation it is evident that four primary habitat units exist within the subject property, namely:

- Wetland habitat;
- Montane Grassland;
- Northern Afrotropical Forest; and
- Secondary Grassland.

Each of these habitat units are capable of supporting a variety of faunal species, more so as many species will utilise all of the habitat in conjunction for breeding and foraging purposes. Furthermore, it must be noted that the Wetland and Afrotropical habitat units are considered to be specialised habitats, providing habitat to species that will not occur in the other areas within the subject property. For this reason, they are considered to have the highest sensitivity. The Montane grassland, with its rocky features provides ideal habitat to a number of reptile and invertebrate species, of which some may only occur within this habitat unit of the subject



property. The secondary grassland, although transformed by agricultural activities, provides suitable foraging habitat to a number of avifaunal species, including a number of SCC.

### 3.1 Mammals

Mammal species, listed below in table 2, were observed during the field assessments through direct observations, spoor and dung as well as the use of motion triggered infrared camera traps set up at localities of perceived high species use in the subject property.

**Table 2: Mammal species recorded during the field surveys as well as their 2015 IUCN status.**

Scientific Name	Common Name	IUCN
<i>Potamochoerus larvatus</i>	Bushpig	LC
<i>Tragelaphus scriptus</i>	Bushbuck	LC
<i>Felis serval</i>	Serval	LC
<i>Cercopithecus mitis labiatus</i>	Samango monkey	VU
<i>Sylvicapra grimmia</i>	Common Duiker	LC
<i>Aonyx capensis</i>	African Clawless Otter	LC
<i>Lepus saxatilis</i>	Scrub hare	LC
<i>Cynictis penicillata</i>	Yellow mongoose	LC
<i>Papio ursin</i>	Chacma Baboon	LC
<i>Galerella sanguinea</i>	Slender mongoose	LC
<i>Hystrix africaeaustralis</i>	South African Porcupine	LC
<i>Caracal caracal</i>	Caracal	LC
<i>Mastomys natalensis</i>	Natal multimammate mouse	LC
<i>Acomys spinosissimus</i>	Southern African Spiny Mouse	LC

As can be seen from Table 2, the subject property is still capable of providing suitable habitat to a number of mammal species. Although thorough site visits were conducted on three occasions, it remains possible that certain mammal species may not have been detected; notably those that are secretive, well camouflaged, or who are fossorial by nature. Many of the fossorial species' circadian rhythms are still determined by the outside photoperiod, and so will avoid detection or coming to the surface during the daylight hours, when predation risks are considered to be at their highest. For this reason, these species are not always easily identified, and so signs thereof, habitat suitability as well as historical distribution ranges need to be assessed in order to determine species prevalence for an area.

Burrows and mole hills were identified through the subject property, indicating the presence of fossorial species within the subject property. Taking into consideration historical distribution ranges as well as habitat suitability, it is likely that *Cryptomys hottentotus* (African Mole Rat) inhabits the subject property.



Furthermore, it is possible that *Chrysoxalax villosus* (Rough-haired Golden Mole), *Amblysomus hottentotus* (Hottentot Golden Mole) and *Chlorotalpa sclateri* (Sclater's Golden Mole) may also inhabit the subject property. These species are very difficult to detect, and their known distribution and inherent population spread have not been fully ascertained. Therefore, it can be inferred that due to the proximity of the subject property to known populations, observed signs of mole activity as well as habitat suitability, it is possible that these species may be located within the subject property. *Cryptomys hottentotus* (African Mole Rat), *Amblysomus hottentotus* (Hottentot Golden Mole) and *Chlorotalpa sclateri* (Sclater's Golden Mole) are listed as Least Concern by the IUCN, whilst *Chrysoxalax villosus* (Rough-haired Golden Mole) is listed as Vulnerable. The above mentioned fossorial species will most likely inhabit the secondary grasslands as well as the fringe areas surrounding the wetland habitat units. *Chlorotalpa sclateri* (Sclater's Golden Mole) will most likely inhabit the Afrotemperate Forest and forested kloofs.

*Cercopithecus mitis labiatus* (Samango Monkey) was observed within the Afrotemperate Forest, and is listed as Vulnerable by the IUCN due to habitat fragmentation and a resultant isolation of subpopulations. This species is endemic to South Africa and has no dispersal between subpopulations, which makes it a high risk species in terms of habitat loss and disturbance. The proposed mining activities and resultant edge effects are may result in the loss of already limited and isolated habitat for this species within the area. It is possible that ancillary impacts from mining activities and associated disturbances from the increased human presence could result in a further decline of population numbers as a result of habitat modification and increased poaching/ hunting pressures.

Other mammal species that will be impacted through the loss or modification of the habitats within the subject property as a result of proposed mining are *Mystromys albicaudatus* (White-tailed Mouse) and *Leptailurus serval* (Serval). These species utilise the wetland and wetland fringe habitats, notably *Mystromys albicaudatus* which requires black loam soils with good vegetation cover. *Leptailurus serval* (Serval) also utilises riparian habitat alongside streams and rivers, and will range up into the montane grasslands in search of prey. *Mystromys albicaudatus* is listed as Endangered whilst *Leptailurus serval* is listed as Least Concern by the IUCN.

Of particular concern is that many of the SCC listed above are noted to have decreasing population trend as a result of habitat fragmentation and/or loss. The increased presence of humans and associated impacts are likely to speed up the decreasing population trend currently experienced by many of these species. As a result, mining activities within the subject property is likely to have a negative impact on faunal species within the area, most notably on



the SCC species which are already limited in distribution and numbers due to human impacts and habitat loss.



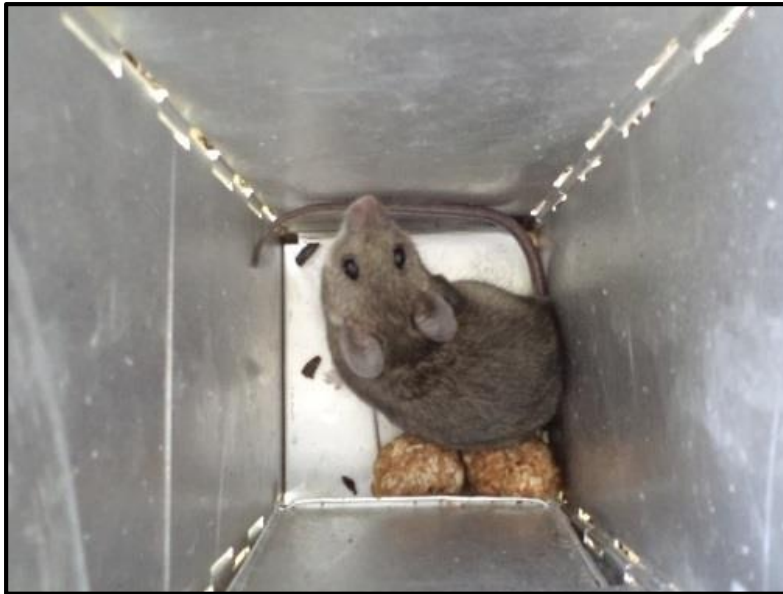


Figure 4: *Mastomys natalensis* (Natal multimammate mouse) captured in a Sherman trap within the subject property.

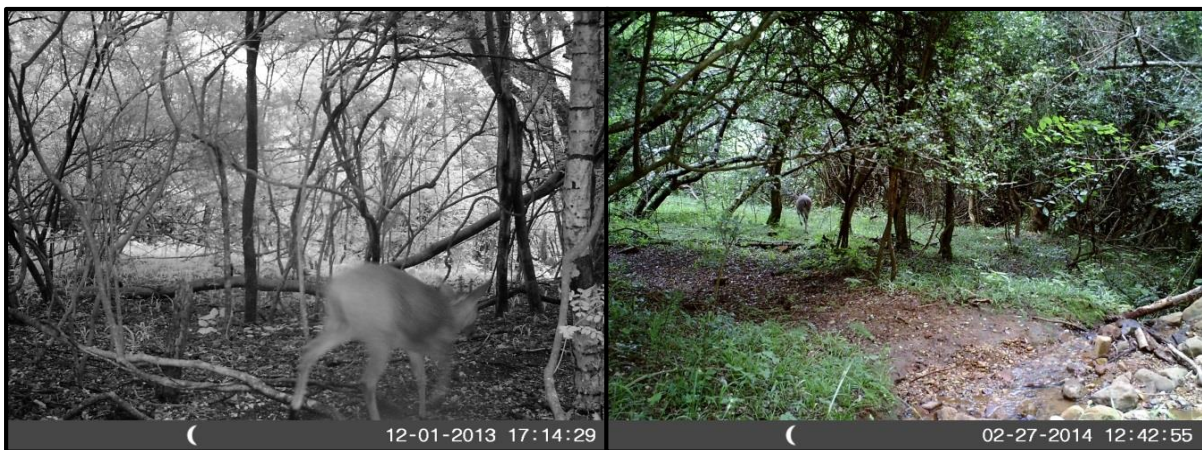


Figure 5: Digital trail camera footage of *Sylvicapra grimmia* (Common Duiker) on the left and *Tragelaphus scriptus* (Bushbuck) on the right



Figure 6: Digital trail camera footage of *Hystrix africaeaustralis* (South African Porcupine) on the left and *Potamochoerus larvatus* (Bush pig) on the right.



### 3.1.1 Avifauna

One avifaunal SCC was identified within the subject property during the 2013 assessments, namely a possible breeding pair of *Sagittarius serpentarius* (Secretary birds), presented in Figure 7 below. Verbal communication with local inhabitants indicated that other avifaunal SCC such as *Anthropoides paradiseus* (Blue Cranes), *Balearica regulorum* (Grey Crowned Cranes), *Geronticus calvus* (Southern Bald Ibis) and *Tyto capensis* (Grass Owls) utilise the subject property. Subsequently during the 2014 assessments, *Anthropoides paradiseus* (Blue Cranes), *Balearica regulorum* (Grey Crowned Cranes), *Geronticus calvus* (Southern Bald Ibis) were observed within the subject property. *A. paradiseus* and *B. regulorum* are suspected to breed within the secondary grassland next to the cultivated fields and earth dam below the homestead. The loss of these areas will result in a direct loss of habitat for these species, both for breeding and foraging purposes.

The subject property falls within the Grasslands IBA (IBA SA125) which extends across three provinces, namely KwaZulu-Natal, Mpumalanga and the Freestate. This large IBA covers several catchments, containing many perennial rivers and wetlands. These habitat units combined with the grasslands within the IBA provide suitable habitat to many Crane and grassland specialist species. Grasslands throughout southern Africa are under severe pressure as a result of habitat transformation from agriculture and mining. As a result, many habitat specialist species are currently being displaced and as a result are being compressed into increasingly diminishing suitable habitat. The result of this is an increase in competition for resources and breeding habitat, leading to intra-specific species competition, with a net loss of overall species numbers. As such, mining developments and placement of mining infrastructure needs to be increasingly scrutinized, ensuring that sensitive habitats are being conserved whilst suitably managing the increasing demand for natural resources. Suitable mining methods must be used so as to minimise and reduce the impacts of mining activities on the receiving environment, thereby conserving the remaining sensitive habitat units and the species that breed and forage within them. The wetlands, montane grassland and to a degree the secondary grassland habitat units all provide suitable habitat to a number of avifaunal SCC, and as such as far as possible need to be conserved.

Thus, the subject property is considered sensitive in terms of avifaunal habitat, not only for habitat and foraging purposes but for breeding also, and the proposed mining development may pose a significant threat to avifaunal SCC should mining activities and subsequent edge effects affect sensitive faunal habitat such as primary grasslands, wetlands, riparian zones and forests.



**Table 3: Avifaunal species recorded during the field surveys as well as their 2015 IUCN status.**

Scientific Name	Common Name	IUCN
<i>Hirundo cucullata</i>	Greater Striped Swallow	LC
<i>Numida meleagris</i>	Helmeted Guinea fowl	LC
<i>Buteo buteo</i>	Steppe buzzard	LC
<i>Streptopelia capicola</i>	Cape Turtle Dove	LC
<i>Stigmatopelia senegalensis</i>	Laughing dove	LC
<i>Platalea alba</i>	African Spoonbill	LC
<i>Fulica cristata</i>	Red Knobbed Coot	LC
<i>Alopochen aegyptiaca</i>	Egyptian Goose	LC
<i>Coturnix coturnix</i>	Common quail	LC
<i>Vanellus armatus</i>	Blacksmith Plover	LC
<i>Lanius collaris</i>	Southern Fiscal Shrike	LC
<i>Motacilla capensis</i>	Cape wagtail	LC
<i>Hirundo albigularis</i>	White throated swallow	LC
<i>Elanus caeruleus</i>	Black-Shouldered Kite	LC
<i>Anthus cinnamomeus</i>	African pipit	NYBA
<i>Mirafrā africana</i>	Rufous-naped Lark	LC
<i>Certhilauda semitorquata</i>	Eastern Long-billed Lark	LC
<i>Bubulcus ibis</i>	Cattle Egret	LC
<i>Hirundo rustica</i>	Barn swallow	LC
<i>Vidua macroura</i>	Pin-tailed Whydah	LC
<i>Prina subflava</i>	Tawny flanked prina	LC
<i>Prinia hypoxantha</i>	Drakensberg Prinia	LC
<i>Pycononotus tricolor</i>	Darked Capped BulBul	LC
<i>Campicoloides bifasciatus</i>	Buff-streaked chat	LC
<i>Prinia flavicans</i>	Black-chested Prinia	LC
<i>Apus apus</i>	Common swift	LC
<i>Riparia cincta</i>	Banded martin	LC
<i>Camaroptera brachyura</i>	Green-backed Bleating Warbler	LC
<i>Myrmecocichla formicivora</i>	Ant-eating chat	LC
<i>Lophaetus occipitalis</i>	Long crested eagle	LC
<i>Chalcomitra amethystina</i>	Amethyst Sunbird	LC
<i>Lioptilus nigricapillus</i>	Bush blackcap	LC
<i>Anthropoides paradiseus</i>	Blue Crane	VU
<i>Sagittarius serpentarius</i>	Secretary Bird	VU
<i>Ardea melanocephala</i>	Black headed heron	LC
<i>Balearica regulorum</i>	Grey Crowned Crane	VU
<i>Geronticus calvus</i>	Southern Bald Ibis	VU
<i>Buteo rufofuscus</i>	Jackal Buzzard	LC
<i>Macronyx capensis</i>	Cape longclaw	LC
<i>Anthus leucophrys</i>	Plain backed pipit	LC
<i>Buteo trizonatus</i>	Forest buzzard	LC
<i>Pternistis swainsonii</i>	Swainson's Francolin	LC
<i>Batis molitor</i>	Chinspot batis	LC



Scientific Name	Common Name	IUCN
<i>Falco amurensis</i>	Amur falcon	LC
<i>Bostrychia hagedash</i>	Hadedda ibis	LC
<i>Quelea quelea</i>	Red-billed Quelea	LC
<i>Threskiornis aethiopicus</i>	Sacred ibis	LC
<i>Cisticola juncidis</i>	Zitting cisticola	LC
<i>Passer melanurus</i>	Cape sparrow	LC
<i>Euplectes progne</i>	Long tailed Widowbird	LC
<i>Ploceus velatus</i>	Southern Masked Weaver	LC

LC = Least concerned, NYBA = Not yet been assessed by the IUCN, VU = Vulnerable

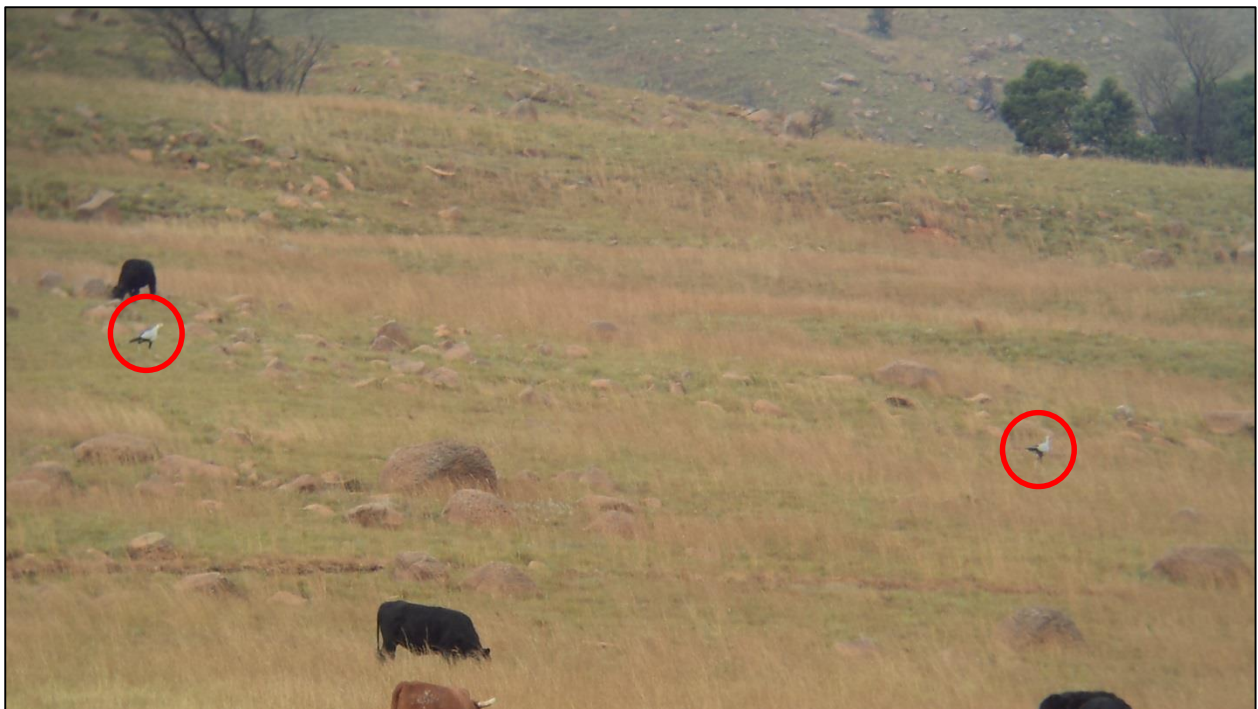


Figure 7: *Sagittarius serpentarius* (Secretarybird) encountered within the subject property (red circles).



Figure 8: *Geronticus calvus* (Southern Bald Ibis) on the left and *Balearica regulorum* (Grey Crowned-crane) on the right.

### 3.2 Amphibians

Three common amphibian species were identified during the field assessment, whilst no amphibian SCC were noted. Below listed in table 4 are amphibian species that were observed during the site assessments, whilst table 5 below indicated species that have been recorded previously for the QDS 2730AD as part of the South African Frog Atlas Project (SAFAP).

**Table 4: Amphibian species recorded during the field surveys as well as their 2015 IUCN status.**

Scientific Name	Common Name	IUCN
<i>Tomopterna natalensis</i>	Natal Sand Frog	LC
<i>Phrynobatrachus natalensis</i>	Snoring Puddle Frog	LC
<i>Amietia angolensis</i>	Common River Frog	LC

LC = Least concerned, NYBA = Not yet been assessed by the IUCN.

**Table 5: Amphibian species previously recorded within the QDS 2730AD.**

Scientific Name	Common Name	IUCN Status	QDS
<i>Breviceps mossambicus</i>	Mozambique Rain Frog	Least Concern	2730AD
<i>Vandijkophrynus garipeensis</i>	Karoo Toad	Least Concern	2730AD
<i>Amietophrynus gutturalis</i>	Gutteral Toad	Least Concern	2730AD
<i>Cacosternum boettgeri</i>	Common Caco	Least Concern	2730AD
<i>Cacosternum nanum</i>	Bronze Caco	Least Concern	2730AD
<i>Heleophryne natalensis</i>	Natal Cascade Frog	Least Concern	2730AD
<i>Hyperolius marmoratus taeniatus</i>	Painted Reed Frog	Least Concern	2730AD
<i>Kassina senegalensis</i>	Bubbling Kassina	Least Concern	2730AD
<i>Ptychadena porosissima</i>	Striped Grass Frog	Least Concern	2730AD
<i>Amietia angolensis</i>	Common River Frog	Least Concern	2730AD
<i>Amietia fuscigula</i>	Cape River Frog	Least Concern	2730AD
<i>Semnodactylus wealii</i>	Rattling Frog	Least Concern	2730AD
<i>Strongylopus fasciatus</i>	Striped Stream Frog	Least Concern	2730AD
<i>Strongylopus grayii</i>	Clicking Stream Frog	Least Concern	2730AD
<i>Tomopterna natalensis</i>	Natal Sand Frog	Least Concern	2730AD

The Giant Bullfrog (*Pyxicephalus adspersus*), which is a SCC may occur within the subject property, although none were identified within or in the vicinity of the subject property. However the subject property does fall within the distribution range of this species. *P. adspersus* are known to occur within and nearby riparian and wetland zones, where they remain in cocoons submerged underground during the winter periods, preferably in sandy soils, and only emerge at the start of the rainy season. They breed in shallow waters and can occupy temporary floodplains and rapidly drying pool areas. *P. adspersus* are also known to travel vast distances and may utilise wetlands as migratory corridors. A second amphibian species of concern within the subject property is *Hemisus guttatus* (Spotted Shovel-nosed Frog) which is listed as Vulnerable. This species inhabits grasslands and savannah areas, and breeds within seasonal



pans, swampy areas and in pools near rivers. Thus it is considered likely that the aforementioned two species may occur within the subject property, as the subject property falls within their distribution ranges and contains suitable habitat for both these species.

Thus, the subject property is considered to be sensitive in terms of amphibian SCC habitat, not only for habitat and foraging purposes but for breeding also. As such the proposed mining development may pose a significant threat to amphibian conservation should mining activities and subsequent edge effects affect sensitive amphibian habitat such as primary grasslands, wetlands and riparian zones.



**Figure 9: *Tomopterna natalensis* (Natal Sand Frog) on the left and *Amietia angolensis* (Common River Frog) on the right observed within the subject property.**

### **3.3 Reptiles**

Three reptile species were identified during the assessment listed below in table 6. Other common species that might be present on the subject property include the Brown House Snake (*Lamprophis capensis*), the Tropical House Gecko (*Hemidactylus mabouia*) and Aurora snake (*Lamprophis aurora*). The majority of the subject property provides excellent habitat for a high diversity of reptile species as numerous rocky outcrops are scattered throughout grasslands and hillslopes. Consideration needs to be given that there is a possibility that *Homoroselaps dorsalis* (Striped Harlequin Snake) may be located within the subject property. The subject property does fall within the distribution range of this species; however they are a very secretive species and not easily observed within the field. There have been no records of this species being observed within the subject property, nor within the neighbouring areas. However, suitable habitat for this species does occur within the subject property. This species has been listed as Near Threatened by the IUCN, and as such it is recommended that the sensitive habitat areas be excluded from development.

It is likely that the subject property will be capable of supporting a fairly abundant and diverse range of reptile species. As such, development of any mining infrastructure in the sensitive areas is likely to result in a loss of reptile species and their associated habitat.

**Table 6: Reptile species recorded during the field surveys as well as their 2015 IUCN status.**

Scientific Name	Common Name	IUCN
<i>Trachylepis punctatissima</i>	Montane Speckled Skink	LC
<i>Cordylus vittifer</i>	Common Girdled Lizard	NYBA
<i>Psammophylax rhombeatus</i>	Spotted Grass Snake	NYBA

### 3.4 Invertebrates

The invertebrate assessment conducted was a general assessment with the purpose of identifying common species and taxa located within the subject property. As such, the invertebrate assessment will not be an indication of the complete invertebrate diversity potential of the study and surrounding areas. Representatives of commonly encountered families in the Insecta class that were observed during the assessment are listed in the table below.

No invertebrate SCC were encountered during the site assessment. However, a high probability exists that protected invertebrates such as the *Dingana alaedeus* (Wakkerstroom Widow Butterfly), which is protected under the Kwazulu-Natal Nature Conservation Management Amendment Act, 1999 No. 5 of 1999, will be encountered within the subject property. As such, due to the relatively intact habitat within the subject property as well as the subject property's geographical position, it can be considered sensitive and the proposed mining development may pose a significant threat to invertebrate conservation.

**Table 7: General results from invertebrate collecting during the assessment of the subject property.**

Order	Family	Scientific Name	Common Name	IUCN 2014
Lepidoptera	Pieridae	<i>Belenois aurota</i>	Brown-veined White	NYBA
		<i>Eurema hecabe</i>	Common grass Yellow	NYBA
		<i>Beleonis creona</i>	African Common White	NYBA
	Nymphalidae	<i>Junonia hierta</i>	Yellow pansy	LC
		<i>Hypolimnas misippus</i>	Common Diadem	NYBA
		<i>Junonia orithya</i>	Blue Pansy	NYBA
		<i>Danaus chrysippus</i>	African Monarch	NYBA
		<i>Leptotes pirithous</i>	Common Blue	NYBA
Isoptera	Termitidae	<i>Odontotermes latericus</i>	Harvester Termites	NYBA
Thysanura	Lepismatidae	<i>Ctenolepisma longicaudata</i>	Fishmoth	NYBA
Diptera	Calliphoridae	<i>Chrysomya chloropyga</i>	Copper tail blow fly	NYBA
		<i>Musca domestica</i>	House fly	NYBA
Orthoptera	Acrididae	<i>Cannula gracilis</i>	Grass mimicking Grasshopper	NYBA



Order	Family	Scientific Name	Common Name	IUCN 2014
		<i>Acrida acuminata</i>	Common stick grasshopper	NYBA
		<i>Ancanthacris ruficornis</i>	Garden locust	NYBA
		<i>Oedaleus</i> sp	Yellow Wings	NYBA
	Gryllidae	<i>Gryllus bimaculatus</i>	Common garden cricket	NYBA
	Anostomatidae	<i>Onosandrus</i> sp	King Crickets	NYBA
	Pyrgomorphidae	<i>Phymateus morbillosus</i>	Common milkweed locust	NYBA
		<i>Zonocerus elegans</i>	Elegant grasshopper	NYBA
Hymenoptera	Apidae	<i>Apis mellifera scutellata</i>	African honey bee	NYBA
	Vespidae	<i>Belanogaster junceus</i>	Paper wasp	NYBA
	Termitidae	<i>Odontotermes latericus</i>	Harvester Termites	NYBA
Phasmatodea	Bacillidae	<i>Maransis rufolineatus</i>	Grass stick insect	NYBA
Coleoptera	Coccinellidae	<i>Hippodamia variegata</i>	Spotted amber ladybird	NYBA
		<i>Harmonia axyridis</i>	Harlequin ladybird	NYBA
	Meloidae	<i>Mylabris oculata</i>	CMR Bean beetle	NYBA
	Tenebrionidae	<i>Gonopus tibialis</i>	Darkling Beetle	NYBA
		<i>Mylabris burmeisteri</i>	Felt Blister Beetle	NYBA
		<i>Decapotoma lunata</i>	Lunate Blister Beetle	NYBA
	Scarabaeidae	<i>Garreta nitens</i>	Green Dung Beetle	LC
	Lycidae	<i>Lycus melanurus</i>	Hook winged net winged beetle	NYBA
Phasmatodea	Heteronemiidae	<i>Maransis rufolineatus</i>	Grass stick insect	NYBA
Mantodea	Mantidae	<i>Sphodromantis lineola</i>	African Praying mantis	NYBA
		<i>Epioscoppmantis chalybea</i>	Ground mantis	NYBA
Spirostreptida	Spirostreptidae	<i>Archispirostreptus</i> sp	African millipede	NYBA
Scolopendromorpha	Scolopendridae	<i>Scolopendra morsitans</i>	Red-headed centipede	NYBA
Hemiptera	Pentatomidae	<i>Nezara viridula</i>	Green Vegetable Bug	NYBA

### 3.5 Arachnids

One spider species was identified during the initial assessment namely *Olurunia ocellata* (Grass Funnel Web Spider). In addition one scorpion species was identified, namely *Opisthacanthus validus* (Figure 10). Neither of these species is protected under the National Environmental Management: Biodiversity Act (Act No. 10 of 2004) or listed in the KwaZulu-Natal Nature Conservation Management Act (Act No 5 of 1999). The majority of the subject property provides excellent habitat for a high diversity of arachnid/scorpion species as numerous rocky outcrops are scattered throughout the rocky grasslands and along the hillslopes.

Thus, the rocky areas are considered sensitive in terms of arachnid habitat provision and the proposed mining development may pose a to arachnid species conservation should the mining activities and subsequent edge effects affect these habitat units.





Figure 10: *Opisthacanthus validus* observed during the site assessment.

## 4 FAUNAL SCC ASSESSMENT

The SCCIS provides a quantitative measure of the subject property's value in terms of conserving faunal diversity. The SCCIS is based on the principles that when the knowledge of a species' historical distribution as well as conservation status, in this case for the KwaZulu Natal Province, is combined with a field assessment that identify the degree to which the subject property is able to support a species in terms of a species' habitat, distribution and food requirements. Interpretations can then be made about the probability of that particular species residing within the subject property. Repeating this procedure for all the potential faunal SCC of the area and collating this information then provides a sensitivity measure of the subject property that has been investigated.

During the field assessments and in conjunction with communication with land owners, farm workers and other people living in and around the subject property it is evident that the subject property is utilised by a number of avifaunal SCC, for foraging and for breeding. Avifaunal SCC that are known and expected to occur within the study area are listed below in table 8. These species all utilise the montane grasslands, secondary grasslands and wetlands for breeding and foraging purposes. Furthermore, the wetlands within the subject property are



also likely to provide habitat to both *Pyxicephalus adspersus* and *Hemisus guttatus*. Within the afrotemperate forests of the subject property, the *Cercopithecus mitis labiatus* was observed. This species has seen a large decrease in population numbers due mainly to habitat fragmentation as a result of habitat transformation and destruction. Many of the remaining populations of *C. mitis labiatus* are isolated to such a point that natural dispersal between populations no longer occurs. With so few remaining habitat areas for *C. mitis labiatus* any further loss of viable habitat areas may impact heavily on the overall survivability of this species.

The subject property also occurs within the Grasslands IBA (SA125). This IBA is of particular importance as it denoted the grassland and wetland areas that provide habitat for a number of SCC. Avifaunal species listed below in table 8 are all important species regionally, and are threatened as a result of habitat modification and loss. The loss or modification of the grassland and wetland habitat units will have a negative impact on avifaunal SCC within the subject property, and is likely to have a knock on population impact on a regional scale.

**Table 8: Species with a POC of >60%**

Scientific Name	Common Name	IUCN Status	POC %
<i>Chrysospalax villosus</i>	Rough-haired Golden Mole	VU	65.00
<i>Sagittarius serpentarius</i>	Secretary Bird	NT	100.00
<i>Anthropoides paradiseus</i>	Blue Crane	VU	100.00
<i>Balearica reguloru,</i>	Grey Crowned Crane	VU	100.00
<i>Tyto capensis</i>	Grass Owl	VU	70.00
<i>Hemisus guttatus</i>	Spotted Shovel-Nosed Frog	VU	68.33
<i>Pyxicephalus adspersus</i>	Giant Bullfrog	VU	61.67
<i>Geronticus calvus</i>	Southern Bald Ibis	VU	100.00
<i>Mystromys albicaudatus</i>	White-tailed Mouse	EN	66.67
<i>Cercopithecus mitis labiatus</i>	Samango Monkey	VU	100.00

VU = Vulnerable, NT = Near Threatened, EN = Endangered.

The species listed in the table above were then used to calculate the SCCSIS for the site, the results of which are presented in the following table.



**Table 9: SCCSIS scoring**

<b>Species of Conservational Concern Sensitivity Index Score</b>			
Average Total Species Score			<b>98</b>
Average Threatened Taxa Score			<b>98</b>
Average (Ave TSS + Ave TT/2)			<b>98</b>
% Species greater than 60% POC			<b>12%</b>
SCCSIS of Site			<b>55%</b>

The SCCSIS assessment of the subject property's potential faunal SCC yielded a score of 55%, indicating that the subject property has a moderate importance with regards to faunal SCC within the region. All species with a POC of 60% or more have an increased probability of either permanently or occasionally inhabiting the subject property, whilst species with a score of 100% were observed and confirmed to occur within the subject property. The species listed above will most likely inhabit the wetland, afrotemperate forest and montane grassland habitats, with some of the avifaunal species utilising the secondary grasslands for foraging and breeding purposes. Placement of any mining infrastructure within the sensitive habitat areas will result in the loss of faunal habitat as well as faunal species within the subject property, notably the above mentioned SCC.



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## **APPENDIX A**

**KwaZulu-Natal Nature Conservation Management Act (Act No 5 of 1999)**



**Appendix A1: Specially protected indigenous animals listed in Schedule 4 of the KwaZulu-Natal Nature Conservation Management Act (Act No 5 of 199**

**SCIENTIFIC NAME**

**ENGLISH NAME**

**MAMMALS**

<i>Amblysomus marleyi</i>	Marley's golden mole
<i>Chrysospalax villosus</i>	Rough haired golden mole
<i>Cloetis percivali</i>	Short eared trident bat
<i>Scotoecus albofuscus</i>	Thomas's house bat
<i>Otomops martiensseni</i>	Large eared free tailed bat
<i>Chaerephon ansorgei</i>	Ansorge's free tailed bat
<i>Proteles cristatus</i>	Aardwolf
<i>Lycaon pictus</i>	Wild dog
<i>Mellivora capensis</i>	Ratel
<i>Poecilogale albinucha</i>	Striped weasel
<i>Aonyx capensis</i>	Clawless otter
<i>Lutra maculicollis</i>	Spotted necked otter
<i>Felis serval</i>	Serval
<i>Felis lybica</i>	African wildcat
<i>Diceros bicornis</i>	Black rhinoceros
<i>Orycteropus afer</i>	Antbear
<i>Ourebia ourebia</i>	Oribi
<i>Neotragus moschatus</i>	Suni
<i>Manis temminckii</i>	Pangolin

**BIRDS**

All <i>Pelecanus</i> species	all Pelicans
<i>Botaurus stellaris</i>	Bittern
<i>Ciconiidae</i> : all species	all Storks
<i>Geronticus calvus</i>	Bald ibis
<i>Polemaetus bellicosus</i>	Martial eagle
<i>Terathopius ecaudatus</i>	Bateleur
<i>Torgos tracheliotus</i>	Lappetfaced vulture
<i>Trigonoceps occipitalis</i>	White-headed vulture
<i>Gyps coprotheres</i>	Cape vulture
<i>Gyps africanus</i>	White-baked vulture
<i>Gypaetus barbatus</i>	Bearded vulture



<i>Gypohierax angolensis</i>	Palmnut vulture
<i>Necrosyrtes monachus</i>	Hooded vulture
<i>Sarothrura ayresi</i>	<i>White-winged flufftail</i>
Gruidae: all species	all Cranes
<i>Neotis denhami</i>	Stanley's bustard
<i>Columba delegorguei</i>	Delegorgue's pigeon
<i>Poicephalus robustus</i>	Cape parrot
<i>Scotopelia peli</i>	Pel's fishing owl
<i>Bucorvus leadbeateri</i>	Ground hornbill
<i>Stactolaema olivacea</i>	Green barbet
<i>Mirafra ruddi</i>	Rudd's barbet
<i>Hirundo atrocaerulea</i>	Blue swallow
<i>Zoothera guttata</i>	Spotted thrush
Buphagidae: all species	all Oxpeckers
<i>Spermestes fringilloides</i>	Pied mannikin

### **REPTILES**

<i>Dermochelys coriacea</i>	Leatherback turtle
<i>Pelusios rhodesianus</i>	Black bellied terrapin
<i>Pelusios castanoides</i>	Yellow bellied terrapin
<i>Python sebae</i>	African rock python
<i>Bitis gabonica</i>	Gaboon viper
<i>Scelotes guentheri</i>	Gunther's burrowing skink
<i>Cryptoblepharus boutonii</i>	Bouton's coral rag skink
<i>Tetradactylus breyeri</i>	Breyer's longtailed seps
<i>Cordylus giganteus</i>	Giant sungazer
<i>Pseudocordylus spinosus</i>	Spiny crag lizard
<i>Pseudocordylus langi</i>	Lang's crag lizard
All <i>Bradypodion</i> species	all dwarf Chamaeleons

### **AMPHIBIANS**

<i>Hyperolius pickersgilli</i>	Pickersgill's reed frog
<i>Leptopelis xenodactylus</i>	Long toed tree frog
<i>Arthroleptella ngongoniensis</i>	Mist belt chirping frog
<i>Cacosternum poyntoni</i>	Poynton's caco



**BUTTERFLIES AND MOTHS**

<i>Stygionympha wichgrafii grisea</i>	Greyish wichgraf's brown
<i>Ornipholidotos peucitia penningtoni</i>	Pennington's white mimic
<i>Durbania amalosa albescens</i>	Amakosa rocksitter
<i>Lolaus lulua</i>	White spotted sapphire
<i>Lepidocrysops ketsi leucomacula</i>	White blotched ketsi blue
<i>Orahrysops Ariadne</i>	Karkloof blue
<i>Hrysoritis orientalis</i>	Eastern opal
<i>Callioratis maillari</i>	Millar's tiger mouth

**DRAGONFLIES**

<i>Pseudagrion umsingaziense</i>	Umsingazi sprite
<i>Syncordulia gracilis</i>	Yellow synordulia
<i>Urothemis Luciana</i>	St Lucia basker

**FRUIT CHAFERS**

<i>Ichneustoma nasula</i>
<i>Lamellothyrea descarpentriesi</i>
<i>Elsphinis pumila</i>
<i>Acrothyrea rufofemorata</i>
<i>Eudicella trimeni</i>

**MOLLUSCS**

<i>Laevicaulis haroldi</i>
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**ONYCOPHORANS**

<i>Opisthopatus roseus</i>
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**Appendix A2: Protected indigenous animals listed in Schedule 5 of the KwaZulu-Natal Nature Conservation Management Act (Act No 5 of 1999)**

<b><u>SCIENTIFIC NAME</u></b>	<b><u>ENGLISH NAME</u></b>
<b><u>MAMMALS</u></b>	
<i>Crocidura maquassiensis</i>	Makwassie musk shrew
<i>Suncus lixus</i>	Greater dwarf shrew
<i>Suncus infinitesimus</i>	Lesser dwarf shrew
<i>Chlorotalpa sclateri</i>	Slater's golden mole
<i>Eidolon helvum</i>	Straw-coloured fruit bat
<i>Nycteris hispida</i>	Hairy slit faced bat
<i>Rhinolophus darling</i>	Darling's horseshoe bat
<i>Rhinolophus lasii</i>	Swinny's horseshoes bat
<i>Myotis welwitschi</i>	Welwitsch's hairy bat
<i>Myotis tricolor</i>	Anchieta's pipistrelle
<i>Chalinolobus variegatus</i>	Butterfly bat
<i>Laephotis wintoni</i>	Winton's long-eared bat
<i>Aptesicus rendalli</i>	Rendall's serotine bat
<i>Eptesicus hottentotus</i>	Long-tailed serotine bat
<i>Eptesicus zuluensis</i>	Somali serotine bat
<i>Nycticeicus schlieffenii</i>	Schlieffen's bat
<i>Kerivoula argentata</i>	Damara woolly bat
<i>Kerivoula lanosa</i>	Lesser woolly bat
<i>Ceropithecus mitis</i>	Samango monkey
<i>Vulpes chama</i>	Cape fox
<i>Civettictis civetta</i>	Civet
<i>Paracynictis selousi</i>	Selousis mongoose
<i>Helogae parvula</i>	Dwarf mongoose
<i>Hyaena brunnea</i>	Brown hyena
<i>Acinonyx jubatus</i>	Cheetah
<i>Panther pardus</i>	Leopard
<i>Panthera leo</i>	Lion
<i>Felis nigripes</i>	Small spotted cat
<i>Oxodonta Africana</i>	Elephant
<i>Ceratotherium simum</i>	White rhinoceros
<i>Dendrohyrax arboreus</i>	Tree dassie



<i>Giraffe camelopardalis</i>	Giraffe
<i>Connochaetus gnou</i>	Black wildebeest
<i>Alcelaphis buselaphus</i>	Red hartebeest
<i>Damaliscus lunatus</i>	Tsessebe
<i>Philantomba monticola</i>	Blue duiker
<i>Cephalophus natalensis</i>	Red duiker
<i>Oreotragus oreotragus</i>	Klipspringer
<i>Syncerus caffer</i>	Buffalo
<i>Kobus ellipsiprymnus</i>	Waterbuck
<i>Hippopotamus amphibious</i>	Hippopotamus
<i>Parazerus pallitus</i>	Red squirrel
<i>Pedetes capensis</i>	Springhare
<i>Georychuss capensis</i>	Cape mole rat
<i>Otomys lamitus</i>	Laminated vlei rat
<i>Otomys sloggetti</i>	Sloggetti's rat
<i>Tatera leucogaster</i>	Bushveld gerbil
<i>Mystromys albicaudatus</i>	White tailed mouse
<i>Steatomys pratensis</i>	Fat mouse
<i>Steatomys krebsii</i>	Krebs's fat mouse
<i>Dasymys incomtus</i>	Water rat
<i>Grammomys cometes</i>	Mozambique woodland mouse
<i>Pronolagus rupestris</i>	Smith's rock hare
<i>Petrodromus tetradactylus</i>	Four-toed elephant shrew
<b><u>BIRDS</u></b>	
<i>Ardeidae: not in the Bittern Fourth Schedule</i>	All herons, egrets and bitterns (except <i>Botaurus stellaris</i> listed in the Fourth Schedule)
<i>Scopus umbretta</i>	Hamerkop
<i>Threskiornithidea:</i>	
All species not in the Fourth Schedule	All ibises and spoonbills (except Bald Ibis <i>Geronticus calvus</i> listed in the Fourth Schedule)
<i>Phoenicopteridae: all species</i>	All Flamingos
<i>Nettapus auritus</i>	Pygmy Goose
Accipitridae: all species not in the Fourth Schedule	All diurnal birds of prey (except all vultures listed in the Fourth Schedule)
<i>Pandion haliaetus</i>	osprey



<i>Turnix hottentotta</i>	<i>Blackrumped Buttonquail</i>
<i>Sarothrura</i> : all species not in the Fourth Schedule	All flufftails (except Whitewinged Flufftail <i>Sarothrura ayresi</i> listed in the Fourth Schedule
<i>Podica senegalensis</i>	African Finfoot
<i>Otididae</i> : all species not in the Fourth Schedule	All bustards and korhaans (except Stanley's Bustard <i>Neotis denhami</i> listed in the Fourth Schedule
<i>Jacanidae</i> : all species	All jacanas
<i>Glareola pratinola</i>	Red-winged Pratincole
<i>Hydroprohne caspia</i>	Caspian Tern
<i>Poicephalus cryptoxanthus</i>	Brown headed Parrot
<i>Musophagidae</i> : all species	All louries
<i>Tytonidae and Strigidae</i> : all species	All owls
<i>Caprimulgus natalensis</i>	Natal Nightjar
<i>Halcyon senegaloides</i>	Mangrove Kingfisher
<i>Smithornis capensis</i>	African Broadbill
<i>Zoothera gurneyi</i>	Orange Thrush
<i>Batis fratrum</i>	Woodwards Batis
<i>Anthus brachyurus</i>	Shorttailed Pipit
<i>Hemimacronyx chloris</i>	Yellowbreasted Pipit
<i>Macronyx ameliae</i>	Pinkthroated Longclaw
<i>Nectarinia neergaardi</i>	Neegaar's Sunbird
<i>Mandingoa nitidula</i>	Green Twinspot
<i>Hypargos mararitatus</i>	Pinkthroated Twinspot

## **REPTILES**

<i>Kinixys spekei</i>	Savanna hinged tortoise
<i>Kinixys natalensis</i>	Natal hinged tortoise
<i>Chelonia mydas</i>	Green turtle
<i>Eretmochelys imbricata</i>	Hawksbill turtle
<i>Caretta caretta</i>	Loggerhead turtle
<i>Leptotyphlops sylvicolus</i>	Forest thread snake
<i>Lycodonomorphus laevisissimus natalensis</i>	Natal dusky-bellied water snake
<i>Lycodonomorphus whytei</i>	Whyte's water snake
<i>Lamprophis fuscus</i>	Yellow-bellied house snake
<i>Lycophidion variegatum</i>	Variegated wolf snake



<i>Lycophidion pygmaeum</i>	Pygmy wolf snake
<i>Natriciteres variegata</i>	Forest marsh snake
<i>Prosymna janii</i>	Mozambique shovelnout
<i>Amblyodipsas concolor</i>	Natal purple-glossed snake
<i>Amblyodipsas microphthalma</i>	White-lipped snake
<i>Homoroselaps dorsalis</i>	Striped harlequin snake
<i>Xenocalamus transvaalensis</i>	Transvaal quill-snouted snake
<i>Meizodon semiornatus</i>	Semiornate snake
<i>Philothamnus angolensis</i>	Angola green snake
<i>Dasypeltis medici</i>	East African egg-eater
<i>Montaspis gilvamaculata</i>	Cream-spotted mountain snake
<i>Scelotes inornatus</i>	Smith's burrowing skink
<i>Scelotes bourquini</i>	Bourquin's burrowing skink
<i>Scelotes fitzimonsi</i>	Fitzimon's burrowing skink
<i>Mabuya homalocephala smithii</i>	Smith's red-sided skink
<i>Pedioplanis lineocellata lineocellata</i>	Ocellated sand lizard
<i>Tropidosaura cottrelli</i>	Cottrell's mountain lizard
<i>Tropidosaura Montana natalensis</i>	Natal mountain lizard
<i>Cordylus warreni warren</i>	Warren's girdled lizard
<i>Cordylus warren barbertonensis</i>	Barberton girdled lizard
<i>Crocodylus niloticus</i>	Nile crocodile

### **AMPHIBIANS**

<i>Bufo fenoulheti fenoulheti</i>	Northern pygmy toad
<i>Bufo gariensis nubicolus</i>	Karoo toad
<i>Bufo pardalis</i>	Leopard toad
<i>Bufo pusillus</i>	Little toad
<i>Hemisis guttatus</i>	Spotted shovel-nosed frog
<i>Hyperolius marmoratus verrucosus</i>	Warty painted reed frog
<i>Afrivalus spinifrons</i>	Natal leaf-folding frog
<i>Strongylopus hymenopus</i>	Berg stream frog
<i>Leptopelis mossambicus</i>	Brown-backed tree frog
<i>Breviceps maculatus</i>	Spotted rain frog
<i>Breviceps verrucosus typanifer</i>	Plaintive rain frog
<i>Arthroleptella hewitti</i>	Natal chirping frog
<i>Cacosternum striatum</i>	Lined caco



<i>Cacosternum nanum parvum</i>	Little bronze caco
<i>Natalobatrachus bonebergi</i>	Kloof frog
<i>Phrynobatrachus acridoides</i>	East African puddle frog
<i>Hildebrandtia ornate ornate</i>	Ornate frog
<i>Pyxicephalus adspersus</i>	Giant bullfrog
<i>Rana dracomontana</i>	Drakenberg river frog
<i>Rana vertebralis</i>	Aquatic river frog
<i>Tomopterna marmorata</i>	Russet-backed sand frog

### **FRESH WATER FISH**

<i>Opsaridium peringueyi</i>	Barred minnow
<i>Silhouettea sibayi</i>	Barebreast goby
<i>Oreochromis placidus</i>	Black tilapia
<i>Ctenopoma intermedium</i>	Blackspot climbing perch
<i>Eleotris melanosoma</i>	Broadhead sleeper
<i>Croilia mossambica</i>	Burrowing goby
<i>Redigobius dewaali</i>	Checked goby
<i>Myxus capensis</i>	Freshwater mullet
<i>Hypseleotris dayi</i>	Golden sleeper
<i>Serranochromis meridianus</i>	Lowveld largemouth
<i>Chiloglanis emarginatus</i>	Pongolo suckermouth
<i>Clarias theodora</i>	Snake catfish
<i>Nothobranchius orthonotus</i>	Spotted killfish
<i>Brycinus lateralis</i>	Striped robber

### **BUTTERFLIES**

<i>Dingana alaedeus</i>	Wakkerstroom widow
<i>Dingana dingana</i>	Dingaan's widow
<i>Acraea rabbaiae</i>	Clear-wing acraea
<i>Acraea satis</i>	East Coast acraea
<i>Euryphura achlys</i>	Mottled green nymph
<i>Durbania amakosa flavida</i>	Amakosa rocksitter
<i>Aslauga australis</i>	Southern purple
<i>Lolaua diametra natalica</i>	Natal Yellow-banded sapphire
<i>Hypolycaena lochmophila</i>	Coastal hairstreak
<i>Capys penningtoni</i>	Pennington's protea-butterfly



<i>Aloeides merces</i>	Wakkerstroom copper
<i>Chrysoritis oreas</i>	Drakensberg daisy copper
<i>Chrysoritis phosphor borealis</i>	Scarce scarlet
<i>Anthene minima</i>	Little hairtail
<i>Lepidochrysops pephredo</i>	Estcourt blue
<i>Papilio euphranor</i>	Forest swallowtail
<i>Spialia confusa confua</i>	Confusing sandman
<i>Abantis bicolor</i>	Bicoloured skipper
<i>Metisella meninx</i>	Marsh sylph
<i>Metisella syrinx</i>	Bamboo sylph
<i>Borbo ferruginea dondo</i>	Ferrous skipper
<i>Fresna nyassae</i>	Variegated acraea hopper

**DRAGONFLIES**

<i>Chlorolestes draconicus</i>	Drakensberg sylph
<i>Pseudagrion newtoni</i>	Newton's sprite
<i>Enallagma rotundipenne</i>	Scarce blue
<i>Enallagma sinuatum</i>	Mysterious blue
<i>Agriocnemis falcifera falcifera</i>	Sickle wisp
<i>Agriocnemis gratiosa</i>	Zanzibar wisp
<i>Agriocnemis pinheyi</i>	Pinhey's wisp
<i>Agriocnemis ruberrima ruberrima</i>	Red wisp
<i>Onychogomphus supinus</i>	Scarce hooktail
<i>Gynacantha zuluensis</i>	Zulu darner
<i>Hemicordulia asiatica</i>	Asian hemicordulia
<i>Orthetrum robustum</i>	Robust orthetrum
<i>Diplacodes deminuta</i>	Tiny percher
<i>Trithemis pluvialis</i>	River dropwing
<i>Zyxomma atlanticum</i>	Cryptic zyxomma
<i>Parazyxomma flavicans</i>	Scarce zyxomma
<i>Aethriamanta rezia</i>	Rezia

**FRUIT CHAFERS**

<i>Pachnoda discolor</i>
<i>Uloptera planate</i>
<i>Cytothyrea rubriceps ichthyurus</i>



*Trichocephala brincki*  
*Caelorrhina relucens*  
*Lonchothyrea mozambica*  
*Heteroclita raeuperi*  
*Anoplocheilus globosus*  
*Phoxomeloides laticincta*  
*Taurhina splendens*  
*Anisorrhina serripes*  
*Raceloma jansoni*  
*Raceloma natalensis*  
*Diplognatha striata*  
*Rhinocoeta cornuta*  
*Xeloma aspersa*  
*Xeloma leprosa*  
*Cosmiophaenia rubescens*  
*Rhabdotis semipunctata*  
*Rhabdotis sobrina*  
*Polystalactica furfurosa*  
*Discopeltis bellula*  
*Discopeltis tricolor tricolor*  
*Pseudoclinteria cincticollis*

### **MOLLUSCS**

*Chlamydephorus burnupi*  
*Chlamydephorus dimidius*



## APPENDIX B

## South African Bird Atlas Project 2 list for quadrant 2730AD

Common name	Afrikaans name	Scientific name	Status
Common Fiscal	Fiskaallaksman	<i>Lanius collaris</i>	
Cape Turtle-Dove	Gewone Tortelduif	<i>Streptopelia capicola</i>	
Hadeda Ibis	Hadeda	<i>Bostrychia hagedash</i>	
Dark-capped Bulbul	Swartoogtiptol	<i>Pycnonotus tricolor</i>	
African Stonechat	Gewone Bontrokkie	<i>Saxicola torquatus</i>	
Greater Striped Swallow	Grootstreepswael	<i>Hirundo cucullata</i>	
Long-tailed Widowbird	Langstertflap	<i>Euplectes progne</i>	
African Pipit	Gewone Koester	<i>Anthus cinnamomeus</i>	
Cape Canary	Kaapse Kanarie	<i>Serinus canicollis</i>	
Cape Longclaw	Oranjekeelkalkoentjie	<i>Macronyx capensis</i>	
Anteater Chat	Swartpiek	<i>Myrmecocichla formicivora</i>	
Jackal Buzzard	Rooiborsjakkalsvoel	<i>Buteo rufufuscus</i>	
Cape Robin-Chat	Gewone Janfrederik	<i>Cossypha caffra</i>	
Levaillant's Cisticola	Vleitinkinkie	<i>Cisticola tinniens</i>	
Bokmakierie Bokmakierie	Bokmakierie	<i>Telophorus zeylonus</i>	
Cape White-eye	Kaapse Glasogie	<i>Zosterops virens</i>	
Banded Martin	Gebande Oewerswael	<i>Riparia cincta</i>	
Barn Swallow	Europese Swael	<i>Hirundo rustica</i>	
Cape Crow	Swartkraai	<i>Corvus capensis</i>	
Red-winged Starling	Rooivlerkspreu	<i>Onychognathus morio</i>	
Pied Starling	Witgatspreu	<i>Spreo bicolor</i>	
Bar-throated Apalis	Bandkeelkleinjantjie	<i>Apalis thoracica</i>	
Zitting Cisticola	Landeryklopklopie	<i>Cisticola juncidis</i>	
Southern Boubou	Suidelike Waterfiskaal	<i>Laniarius ferrugineus</i>	
Southern Red Bishop	Rooivink	<i>Euplectes orix</i>	
Buff-streaked Chat	Bergklipwagter	<i>Oenanthe bifasciata</i>	
White-throated Swallow	Witkeelswael	<i>Hirundo albigularis</i>	
Southern Grey-headed Sparrow	Gryskopmossie	<i>Passer diffusus</i>	
Helmeted Guineafowl	Gewone Tarentaal	<i>Numida meleagris</i>	
Cape Grassbird	Grasvoel	<i>Sphenoeacus afer</i>	
Malachite Sunbird	Jangroentjie	<i>Nectarinia famosa</i>	
Black-headed Heron	Swartkopreier	<i>Ardea melanocephala</i>	
Wing-snapping Cisticola	Kleinste Klopklopie	<i>Cisticola ayresii</i>	
Red-eyed Dove	Grootringduif	<i>Streptopelia semitorquata</i>	
Cape Batis	Kaapse Bosbontrokkie	<i>Batis capensis</i>	
Cape Wagtail	Gewone Kwikkie	<i>Motacilla capensis</i>	
Red-chested Cuckoo	Piet-my-vrou	<i>Cuculus solitarius</i>	
Southern Bald Ibis	Kalkoenibis	<i>Geronticus calvus</i>	VU
Pin-tailed Whydah	Koningrooibekkie	<i>Vidua macroura</i>	
Egyptian Goose	Kolgans	<i>Alopochen aegyptiacus</i>	
White-rumped Swift	Witkruiswindswael	<i>Apus caffer</i>	
African Paradise-Flycatcher	Paradysvlievanger	<i>Terpsiphone viridis</i>	
Wailing Cisticola	Huiltinkinkie	<i>Cisticola lais</i>	
Cape Weaver	Kaapse Wewer	<i>Ploceus capensis</i>	
Southern Masked-Weaver	Swartkeelgeelvink	<i>Ploceus velatus</i>	
Drakensberg Prinia	Drakensberglangstertjie	<i>Prinia hypoxantha</i>	
Fork-tailed Drongo	Mikstertbyvanger	<i>Dicrurus adsimilis</i>	
Black-headed Oriole	Swartkopwielewaal	<i>Oriolus larvatus</i>	
Speckled Mousebird	Gevlekte Muisvoel	<i>Colius striatus</i>	
Common Waxbill	Rooibeksysie	<i>Estrilda astrild</i>	
Red-knobbed Coot	Bleshoender	<i>Fulica cristata</i>	
Olive Bush-Shrike	Olyfboslaksman	<i>Telophorus olivaceus</i>	





Common name	Afrikaans name	Scientific name	Status
Barratt's Warbler	Ruigtesanger	<i>Bradypterus barratti</i>	
Rufous-naped Lark	Rooineklewerik	<i>Mirafra africana</i>	
Spur-winged Goose	Wildemakou	<i>Plectropterus gambensis</i>	
Black-collared Barbet	Rooikophoutkapper	<i>Lybius torquatus</i>	
Fan-tailed Widowbird	Kortsterflap	<i>Euplectes axillaris</i>	
Bush Blackcap	Rooibektiptol	<i>Lioptilus nigricapillus</i>	NT
Sombre Greenbul	Gewone Willie	<i>Andropadus importunus</i>	
White Stork	Witooievaar	<i>Ciconia ciconia</i>	
Amur Falcon	Oostelike Rooipootvalk	<i>Falco amurensis</i>	
Black Cuckoo	Swartkoekoek	<i>Cuculus clamosus</i>	
Long-billed Pipit	Nicholsonse Koester	<i>Anthus similis</i>	
Lazy Cisticola	Luitinkinkie	<i>Cisticola aberrans</i>	
African Wattled Lapwing	Lelkiewiet	<i>Vanellus senegallus</i>	
Speckled Pigeon	Kransduif	<i>Columba guinea</i>	
Forest Canary	Gestreepte Kanarie	<i>Crithagra scotops</i>	
Cattle Egret	Veereier	<i>Bubulcus ibis</i>	
Yellow-billed Duck	Geelbekeend	<i>Anas undulata</i>	
Red-winged Francolin	Rooivlerkpatrys	<i>Scleroptila levaillantii</i>	
African Firefinch	Kaapse Vuurvinkie	<i>Lagonosticta rubricata</i>	
Common Quail	Afrikaanse Kwartel	<i>Coturnix coturnix</i>	
Black Saw-wing	Swartsaagvlerkswael	<i>Psalidoprocne holomelaena</i>	
Red-capped Lark	Rooikoplewerik	<i>Calandrella cinerea</i>	
Black-shouldered Kite	Blouvalk	<i>Elanus caeruleus</i>	
Diderick Cuckoo	Diederikkie	<i>Chrysococcyx caprius</i>	
Greater Double-collared Sunbird	Groot-rooibandsuikerbekkie	<i>Cinnyris afer</i>	
Red-collared Widowbird	Rooikeelflap	<i>Euplectes ardens</i>	
Cloud Cisticola	Gevlekte Klopkloppie	<i>Cisticola textrix</i>	
Dark-capped Yellow Warbler	Geelsanger	<i>Chloropeta natalensis</i>	
Yellow-fronted Canary	Geelooqkanarie	<i>Crithagra mozambicus</i>	
Steppe Buzzard	Bruinjakkalsvoel	<i>Buteo vulpinus</i>	
Pale-crowned Cisticola	Bleekkopklopkloppie	<i>Cisticola cinnamomeus</i>	
Little Swift	Kleinwindswael	<i>Apus affinis</i>	
Secretarybird Secretarybird	Sekretarisvoel	<i>Sagittarius serpentarius</i>	NT
Crowned Lapwing	Kroonkiewiet	<i>Vanellus coronatus</i>	
African Sacred Ibis	Skoorsteenveer	<i>Threskiornis aethiopicus</i>	
Red-throated Wryneck	Draaihals	<i>Jynx ruficollis</i>	
Cape Rock-Thrush	Kaapse Kliplyster	<i>Monticola rupestris</i>	
Little Grebe	Kleindobbertjie	<i>Tachybaptus ruficollis</i>	
African Quailfinch	Gewone Kwartelvinkie	<i>Ortygospiza atricollis</i>	
Tawny-flanked Prinia	Bruinsylangstertjie	<i>Prinia subflava</i>	
Yellow-crowned Bishop	Goudgeelvink	<i>Euplectes afer</i>	
Reed Cormorant	Rietduiker	<i>Phalacrocorax africanus</i>	
Amethyst Sunbird	Swartsuikerbekkie	<i>Chalcomitra amethystina</i>	
Chorister Robin-Chat	Lawaaimakerjanfrederik	<i>Cossypha dichroa</i>	
Blue Crane	Bloukraanvoel	<i>Anthropoides paradiseus</i>	VU
Cape Sparrow	Gewone Mossie	<i>Passer melanurus</i>	
Laughing Dove	Rooiborsduifie	<i>Streptopelia senegalensis</i>	
White-bellied Korhaan	Witpenskorhaan	<i>Eupodotis senegalensis</i>	VU
Swainson's Spurfowl	Bosveldfisant	<i>Pternistis swainsonii</i>	
Red-billed Quelea	Rooibekkewelea	<i>Quelea quelea</i>	
Blacksmith Lapwing	Bontkiewiet	<i>Vanellus armatus</i>	
Karoo Thrush	Geelbeklyster	<i>Turdus smithi</i>	
Klaas's Cuckoo	Meitjie	<i>Chrysococcyx klaas</i>	
Plain-backed Pipit	Donkerkoester	<i>Anthus leucophrys</i>	
Olive Thrush	Olyflyster	<i>Turdus olivaceus</i>	
Yellow Bishop	Kaapse Flap	<i>Euplectes capensis</i>	
White-breasted Cormorant	Witborsduiker	<i>Phalacrocorax carbo</i>	
Yellow-breasted Pipit	Geelborskoester	<i>Anthus chloris</i>	VU



Common name	Afrikaans name	Scientific name	Status
Common Moorhen	Grootwaterhoender	<i>Gallinula chloropus</i>	
Eastern Long-billed Lark	Grasveldlangbeklewerik	<i>Certhilauda semitorquata</i>	
Grey Crowned Crane	Mahem	<i>Balearica regulorum</i>	VU
Crested Barbet	Kuifkophoutkapper	<i>Trachyphonus vaillantii</i>	
Lesser Striped Swallow	Kleinstreepswael	<i>Hirundo abyssinica</i>	
Yellow-throated Woodland-Warbler	Geelkeelsanger	<i>Phylloscopus ruficapilla</i>	
Horus Swift	Horuswindswael	<i>Apus horus</i>	
Black-throated Canary	Bergkanarie	<i>Crithagra atrogularis</i>	
African Black Duck	Swarteend	<i>Anas sparsa</i>	
South African Cliff-Swallow	Familieswael	<i>Hirundo spilodera</i>	
African Marsh-Harrier	Afrikaanse Vleivalk	<i>Circus ranivorus</i>	VU
Hamerkop Hamerkop	Hamerkop	<i>Scopus umbretta</i>	
Streaky-headed Seedeater	Streepkopkanarie	<i>Crithagra gularis</i>	
Neddicky Neddicky	Neddikkie	<i>Cisticola fulvicapilla</i>	
Village Weaver	Bontrugwewer	<i>Ploceus cucullatus</i>	
Rock Martin	Kransswael	<i>Hirundo fuligula</i>	
Alpine Swift	Witpenswindswael	<i>Tachymarptis melba</i>	
White-starred Robin	Witkoljanfrederik	<i>Pogonocichla stellata</i>	
Lemon Dove	Kaneelduifie	<i>Aplopelia larvata</i>	
Brown-throated Martin	Afrikaanse Oewerswael	<i>Riparia paludicola</i>	
Willow Warbler	Hofsanger	<i>Phylloscopus trochilus</i>	
Golden-breasted Bunting	Rooirugstreepkoppie	<i>Emberiza flaviventris</i>	
Olive Woodpecker	Gryskopspeg	<i>Dendropicos griseocephalus</i>	
Blue Waxbill	Gewone Blousysie	<i>Uraeginthus angolensis</i>	
Groundscraper Thrush	Gevlekte Lyster	<i>Psophocichla litsipsirupa</i>	
Little Rush-Warbler	Kaapse Vleisanger	<i>Bradypterus baboecala</i>	
Black-winged Lapwing	Grootswartvlerkkiewiet	<i>Vanellus melanopterus</i>	NT
Croaking Cisticola	Groottinkinkie	<i>Cisticola natalensis</i>	
Rock Kestrel	Kransvalk	<i>Falco rupicolus</i>	
Red-faced Mousebird	Rooiwangmuisvoel	<i>Urocolius indicus</i>	
Yellow-billed Kite	Geelbekwou	<i>Milvus aegyptius</i>	
Black Cuckooshrike	Swartkatakoeroe	<i>Campephaga flava</i>	
Black Crake	Swartriethaan	<i>Amaurornis flavirostris</i>	
Pied Kingfisher	Bontvisvanger	<i>Ceryle rudis</i>	
Mountain Wheatear	Bergwagter	<i>Oenanthe monticola</i>	
Striped Pipit	Gestreepte Koester	<i>Anthus lineiventris</i>	
African Purple Swamphen	Grootkoningriethaan	<i>Porphyrio madagascariensis</i>	
Half-collared Kingfisher	Blouvisvanger	<i>Alcedo semitorquata</i>	NT
African Spoonbill	Lepelaar	<i>Platalea alba</i>	
African Snipe	Afrikaanse Snip	<i>Gallinago nigripennis</i>	
African Dusky Flycatcher	Donkervlievanger	<i>Muscicapa adusta</i>	
Verreaux's Eagle	Witkruisarend	<i>Aquila verreauxii</i>	
Common Swift	Europese Windswael	<i>Apus apus</i>	
African Hoopoe	Hoepoep	<i>Upupa africana</i>	
Familiar Chat	Gewone Spekvreter	<i>Cercomela familiaris</i>	
Fiscal Flycatcher	Fiskaalvlievanger	<i>Sigelus silens</i>	
Wahlberg's Eagle	Bruinarend	<i>Aquila wahlbergi</i>	
African Black Swift	Swartwindswael	<i>Apus barbatus</i>	
Grey Heron	Bloureier	<i>Ardea cinerea</i>	
African Olive-Pigeon	Geelbekbosduif	<i>Columba arquatrix</i>	
South African Shelduck	Kopereend	<i>Tadorna cana</i>	
House Sparrow	Huismossie	<i>Passer domesticus</i>	
Brown-backed Honeybird	Skerpbekheuningvoel	<i>Prodotiscus regulus</i>	
Swee Waxbill	Suidelike Swie	<i>Coccyzygia melanotis</i>	
Terrestrial Brownbul	Boskrapper	<i>Phyllastrephus terrestris</i>	
Black-backed Puffback	Sneebal	<i>Dryoscopus cubla</i>	
Denham's Bustard	Veldpou	<i>Neotis denhami</i>	VU
Ground Woodpecker	Grondspeg	<i>Geocolaptes olivaceus</i>	



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<b>Common name</b>	<b>Afrikaans name</b>	<b>Scientific name</b>	<b>Status</b>
Black Stork	Grootswartooievaar	<i>Ciconia nigra</i>	NT
Black-crowned Tchagra	Swartkroontjagra	<i>Tchagra senegalus</i>	
Cape Bunting	Rooivlerkstreepkoppie	<i>Emberiza capensis</i>	
Golden-tailed Woodpecker	Goudstertspeg	<i>Campethera abingoni</i>	
Orange-breasted Waxbill	Rooiassie	<i>Amandava subflava</i>	
African Palm-Swift	Palmwindswael	<i>Cypsiurus parvus</i>	
Kurrichane Thrush	Rooibeklyster	<i>Turdus libonyanus</i>	

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