

Section C: Faunal Assessment



NATURAL SCIENTIFIC SERVICES

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SECTION C: FAUNAL ASSESSMENT

1. Introduction

Detailed in this report **Section C** is the Baseline Faunal Assessment, which involved desktop and field-based investigations of mammals, birds, reptiles, frogs, butterflies, scorpions and odonatan (dragonflies and damselflies).

2. Methodology

2.1. Desktop Research

Lists of potentially occurring fauna were compiled for:

- Mammals, including bats, using the published species distribution maps in Friedmann & Daly (2004) and Stuart & Stuart (2007), and Monadjem *et al.* (2010), respectively, and online species distribution data from MammalMAP (2016).
- Birds, using the online species distribution maps from the first and second Southern African Bird Atlas Projects (SABAP 1 & 2, 2013), and the latest online list of bird species for the region, which included relatively recent SABAP 2 records for pentads 2800_2635, 2800_2640, 2805_2640, 2810_2640, 2810_2645 and 2815_2645, and older SABAP 1 records for QDSs 2826BA, BB and BD. Bird species were classified according to a modified version of Newman's (2002) 12 bird categories, which are described in **Table 3-3**.
- Reptiles, using the published species distribution maps in Bates *et al.* (2014), and online species distribution data from ReptileMAP (2016).
- Frogs, using the published species distribution maps in Minter *et al.* (2004) and online species distribution data from FrogMAP (2016).
- Butterflies, using the published species distribution maps in Mecenero *et al.* (2013), and online species distribution data from LepiMAP (2016).
- Scorpions, using the published species distribution maps in Leeming (2003), and online species distribution data from ScorpionMAP (2016) – although currently ScorpionMAP has no records of scorpions from the region.
- Odonata, using the published distribution maps in Samways (2008), and online species distribution data from OdonataMAP (2016) – although currently OdonataMAP has no records of odonata from the region.

The lists were refined based on our field observations, where the Likelihood of Occurrence (LoO) of each species was rated using the following scale:

- 1 Present: the species, or signs of its presence, was observed.
- 2 High: the species is highly likely to occur, based on available distribution data, and observed habitats.



- 3 Moderate: the species may occur, based on available distribution data, and observed habitats and disturbances.
- 4 Low: the species is unlikely to occur, based on available distribution data, lack of suitable habitat and/or disturbances.
- 5 Managed: the observed species occurs as a managed population.

2.2. Field Work

Field work was performed during 14-16 December 2015, 25-29 January 2016 and 24-26 February 2016, and involved (day and night-time) visual observations, sweep-netting, grab-sampling, “mat-trapping,” camera-trapping and live-trapping of fauna, as well as driven acoustic surveys (transects) to detect bats.

2.2.1. Visual observations, sweep-netting & grab-sampling

Faunal observations were made while driving, walking, and inspecting different habitats in and around the three mine complexes. Taxa were identified based on observations of dead or live specimens, spoor, droppings, burrows and other evidence. Rocks and logs were turned to find reptiles, scorpions, frogs and invertebrates. Sweep nets were used to catch butterflies and odonata. At night a spotlight and torches were used to search for nocturnal vertebrates, and a UV torch was used to detect scorpions.

2.2.2. Mat-trapping

Within each complex, 5-7 (50cm x 50cm) artificial grass mats (**Figure 2-1**) were spaced ca. 3m apart in a roughly linear series on the ground amidst grassy vegetation. The mats were used to provide artificial shelter that might attract small, terrestrial fauna including snakes, frogs and macro-invertebrates. The mats were dropped during the December 2015 eco-scan, checked during the January 2016 site visit, and checked again and collected during the February 2016 site visit.

2.2.3. Camera-trapping

Motion-sensitive cameras (**Figure 2-1**) were installed at 21 locations (seven locations per site visit) where vertebrate activity seemed likely and the risk of theft seemed low (**Figure 2-2 - Figure 2-4**). Most of the cameras were baited with Friskies cat food to purposefully attract carnivorous mammals.

2.2.4. Live-trapping

During the December 2015 eco-scan, faunal traps were placed at three locations and operated over two nights and three days. The trapping locations included: hydromorphic grassland in the Beatrix 1, 2 and 3 shaft complex; a small (artificial) rocky outcrop in the Beatrix 4 shaft complex; and a cluster of *Acacia* trees (savanna) in the Wolvepan / Rietpan evaporation complex. During the detailed January 2016 survey, a greater variety of traps was placed at four locations and operated over four nights and five days. The trapping locations included: *Acacia* savanna in the Beatrix 1, 2 and 3 shaft complex; hydromorphic

grassland in the Beatrix 4 shaft complex; and *Acacia* savanna at two separate locations in the Wolvepan / Rietpan evaporation complex (**Figure 2-2**).

During the eco-scan a series of 6-10 Sherman (i.e. small mammal metal) traps was placed at each trapping location. During the detailed survey a series comprising eight pairs of Sherman traps and one pair of multi-entry small mammal metal traps (**Figure 2-1**), was placed at each trapping location. During both surveys each trap was baited with a mixture of peanut butter, rolled oats, sunflower oil and seeds, and supplied with cotton wool and a wooden cover board to provide warmth and shade for trapped animals. The traps were checked daily and re-baited when necessary.



Figure 2-1 Faunal trap types

In addition to the small mammal traps, during the detailed survey at each trapping location a plastic drift fence array with pitfall and funnel traps (**Figure 2-1**) was installed to live-trap small terrestrial vertebrates (especially reptiles and amphibians) and invertebrates (Campbell & Christman, 1982). A schematic layout of an array is presented in **Figure 2-5**. Each trapping array consisted of three arms of plastic drift fencing (30cm high and 8m long). Pitfall traps (5 litre buckets sunken to ground level) were placed at the centre of the array and at the end of each drift fence. Each pitfall trap was provisioned with a stone, wet cotton wool and a raised, wooden cover board to provide shelter, moisture and shade for trapped animals. A plastic, mesh funnel trap was placed on either side of each drift fence and covered with a wooden board for shade (**Figure 2-1**). The array traps were also checked daily.

FAUNAL TRAPPING LOCALITIES & BAT TRANSECT ROUTE

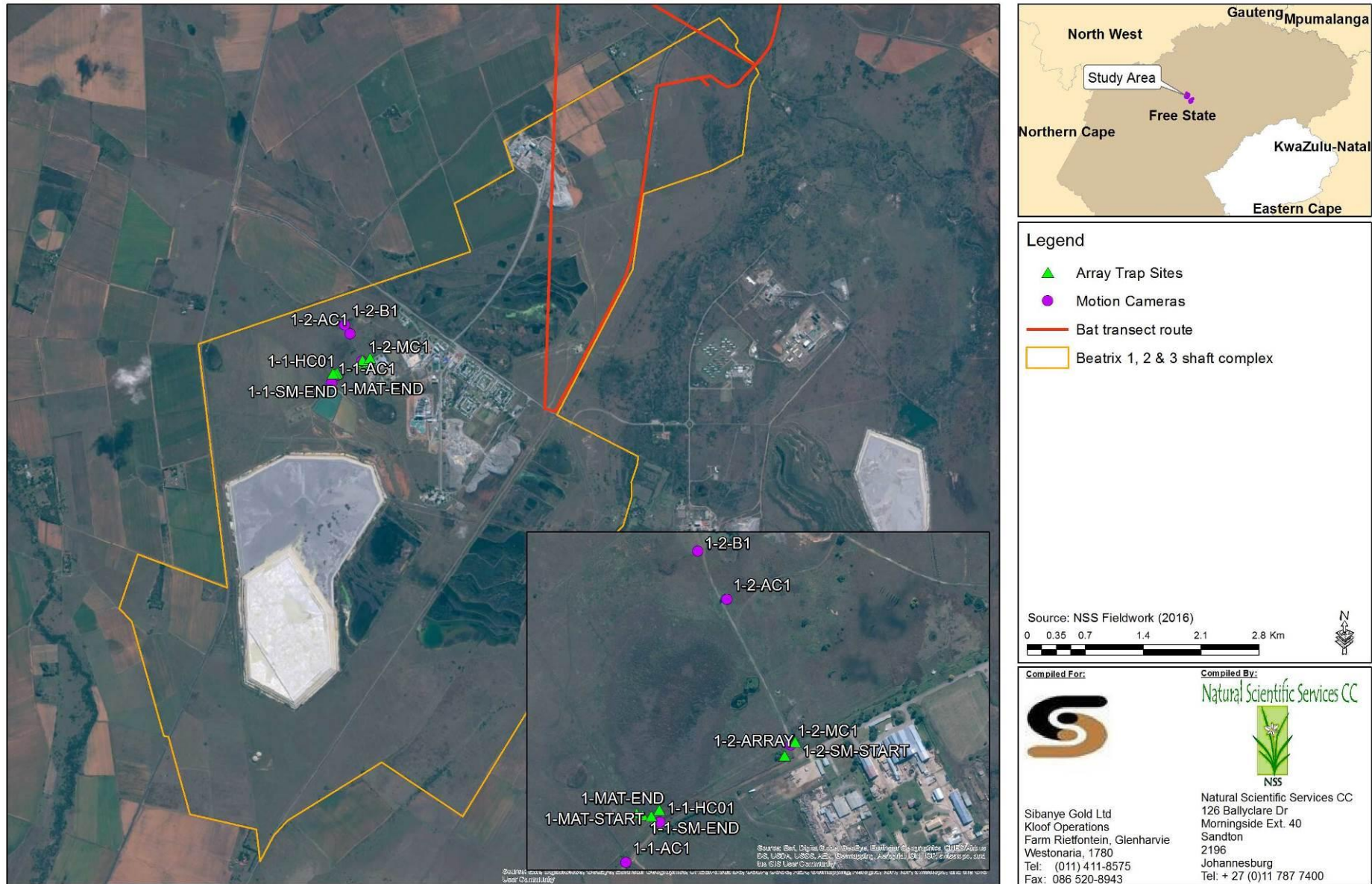


Figure 2-2 Faunal trapping localities and bat transect route in the Beatrix 1, 2 and 3 shaft complex

FAUNAL TRAPPING LOCALITIES & BAT TRANSECT ROUTE

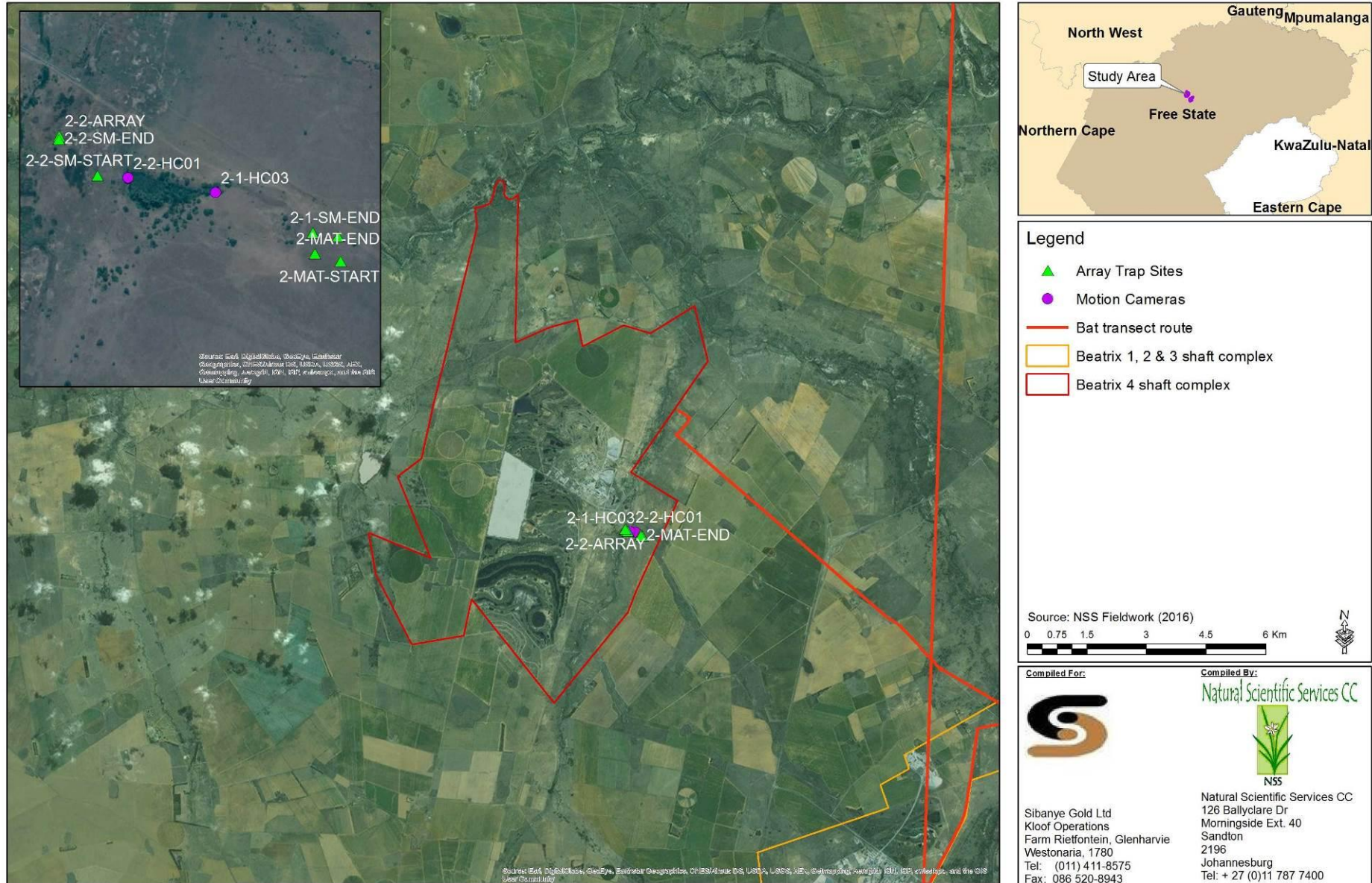


Figure 2-3 Faunal trapping localities and bat transect route in the Beatrix 4 shaft complex



FAUNAL TRAPPING LOCALITIES & BAT TRANSECT ROUTE

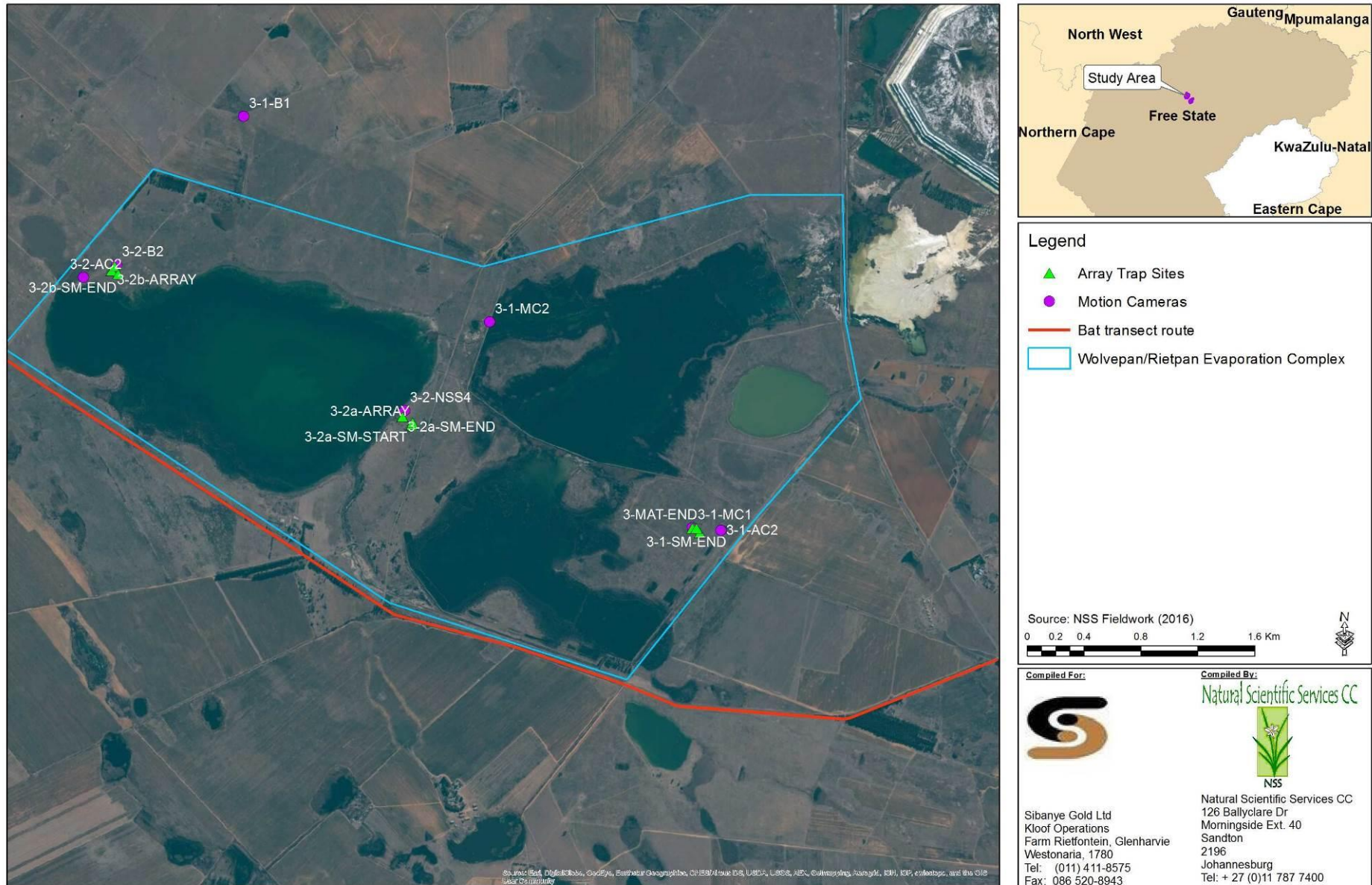


Figure 2-4 Faunal trapping localities and bat transect route in the Wolvepan / Rietpan evaporation complex



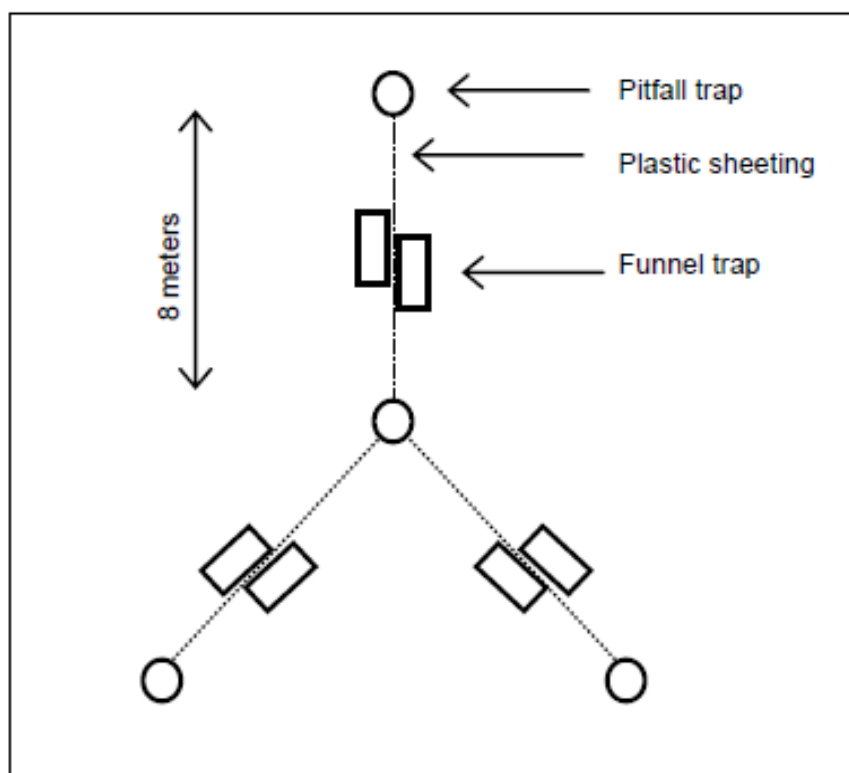


Figure 2-5 Schematic layout of an array trap including drift fences, pitfall and funnel traps

2.2.5. Acoustic surveys for bats

On 15 December 2015, 28 January 2016 and 25 February 2016 an ultra-sonic Echo Meter 3 (EM3) detector (Wildlife Acoustics, Inc., USA) was used to record bat calls at night while driving selected “transect” routes in the Beatrix region (**Figure 2-2**). Wildlife Acoustics Compressed (.wac) files of bat calls recorded by the EM3 detector were converted to wave (.wav) and zero crossing (.zc) files using the Kaleidoscope programme (Wildlife Acoustics Inc., USA). The converted call data were subsequently viewed in the Analook and BatSound Pro (Pettersson Elektronik, Sweden) programmes to identify bat taxa from detailed examination of the peak frequency, duration and band width of calls.

2.3. Conservation Status of Species

In the appended faunal lists:

- The global Red List status of species is provided, as determined by the IUCN.
- The status of species under the National Environmental Management: Biodiversity Act (NEM:BA 2004) is given, as indicated for mammals, birds, reptiles and scorpions in the 2015 list of Threatened or Protected Species (ToPS), and as indicated for frogs and butterflies in the 2007 ToPS list.

The regional or national Red Data status is provided for:

Mammals as stated in Friedmann & Daly (2004).

Birds as stated in Taylor *et al.* (2015).

Reptiles as stated in Bates *et al.* (2014).

Frogs as stated in Minter *et al.* (2004) or Measey (2011).

Butterflies as stated in Mecenero *et al.* (2013).

Dragonflies and damselflies (i.e. odonata) as stated in Samways (2006)

An atlas and Red Data book for South African scorpion species has not yet been published. Due to spatio-temporal variation in human disturbances, the conservation status of some species differs between the IUCN, the relevant national Red Data assessment publication, and the NEM:BA. *Unless otherwise stated, the most threatened status of a species is provided in text, whether this is at a global or other spatial scale.*

2.4. Limitations

- Not all potentially occurring species were likely to be detected, as this would require intensive long-term survey work.
- Conditions during the December 2015 eco-scan were exceptionally dry, which compromised vertebrate and invertebrate activity.
- Some species, which are uncommon, small, migratory, secretive or otherwise difficult to detect may not have been detected even though they are present.

3. Results

Provided in **Appendices 5.1-5.7** is the scientific and common name, and the global and regional / national Red Data status and, where relevant, the NEM:BA status (on the 2015 or otherwise the 2007 ToPS List) of each observed or potentially occurring indigenous mammal, bird, reptile, frog, butterfly, scorpion and odonata species for the three Beatrix complex areas combined, and treated separately. Observed alien species are mentioned in text, but have not been included in tables or the appended species lists. Shown in **Figure 3-5** are the locations of observed Conservation Important (CI) faunal species. These, and CI faunal species with a high LoO on the mine premises, are discussed in text.

3.1. Mammals

Of 63 indigenous South African mammal species that are expected to occur wild in the Beatrix region (**Appendix 5.1**), at least 22 (35%) were detected during our site visits (**Table 3-1; Figure 3-1**). In addition to these, managed populations of Springbuck and Gemsbok, and Blesbuck, Red Hartebeest and Plains/ Burchell's Zebra, which must be "managed in an ecologically sustainable manner" under NEM:BA, were detected in or adjacent to the Beatrix complexes. Bat calls could not be identified with 100% certainty, but if correct, would represent range extensions for the Yellow-bellied House Bat, Rusty Pipistrelle, and in particular, Ruppell's Pipistrelle (for which there are extremely few records from South Africa; Monadjem *et al.* 2010). Provided in **Appendix 5.1** are BatSound Pro screen clips of calls from different bat species, which were recorded in or near Beatrix. Away from human settlements, domestic cats were seen in proximity to the Mine offices. Domestic dogs and large cattle herds were seen in association with herders. Donkeys and horses were also encountered in the region.



Kudu
(*Tragelaphus strepsiceros*)



Black-backed Jackal
(*Canis mesomelas*)



Slender Mongoose
(*Galerella sanguinea*)



Domestic Cat
(*Felis catus*)



Blesbok
(*Damaliscus pygargus phillipsi*)



Multi-mammate Mouse
(*Mastomys coucha*)



Common Duiker
(*Sylvicapra grimmia*)



CapeGround Squirrel
(*Xerus inauris*)



Hare
(*Lepus sp.*)



Vervet Monkey
(*Cercopithecus pygerythrus*)



Cape Clawless Otter
(*Aonyx capensis*) scat



Warthog
(*Phacochoerus africanus*)



Porcupine
(*Hystrix africaeaustralis*)



Red Veld Rat
(*Aethomys chrysophilus*)



Yellow Mongoose
(*Cynictis penicillata*)



Domestic Dog
(*Canis lupus*)

Figure 3-1 Evidence of mammals in or near Beatrix

Mammal species that were not detected, but which are considered highly likely to occur, include mainly nocturnal carnivore species such as Aardwolf, African Weasel, Caracal, Striped Polecat, and the Protected Bat-eared and Cape foxes, and insectivores such as the small and secretive Near Threatened (NT) Southern African Hedgehog, and the Data Deficient (DD) Lesser Dwarf Shrew and Reddish-grey Musk Shrew, and rodents. Mammal species that were rated with a moderate LoO include e.g. the Vulnerable (VU) Black-footed Cat, African Wild Cat, NT Brown Hyaena and Chacma Baboon, which may be threatened by people, pets and lack of suitable habitat, as well as the cave-dependent (NT) Geoffroy's and (NT) Darling's horseshoe bats, the sensitive, river-dependent NT Spotted-necked Otter, and insectivore and rodent species with marginal published distributions.

Mammal species that were detected in all three Beatrix complexes, which appear to be especially common in the region include e.g. Cape Ground Squirrel, Yellow Mongoose, Slender Mongoose, Porcupine, hares, Common Duiker, Steenbok and Black-backed Jackal. Cape Clawless Otter, Water Mongoose and Kudu were detected along well-vegetated streams in the shaft 1, 2, 3 and/or 4 complex areas. Rupliculous species such as the Rock Hyrax, Smith's Red Rock Rabbit and Rock Elephant-shrew are unlikely to occur in Beatrix due to a lack of rocky outcrops within the three complex areas.

None of the detected mammal species are currently regarded as Conservation Important (CI) except for the Aardvark, which is listed as a Protected Species under NEM:BA. Aardvark burrows were most prevalent (in grassland) in the Wolwepan / Rietpan evaporation complex; although a number of burrows were also found (in grassland) in the Beatrix 1, 2 and 3 shaft complex. In addition, calls were recorded which possibly belong to the NT Natal Long-fingered Bat, and it is considered highly likely that the NT Southern African Hedgehog and Protected Cape Fox occur (**Table 3-2**). Multiple CI mammal species with a moderate LoO would potentially be detected with further sampling.

Table 3-1 Mammal diversity

ORDER	COMMON NAMES	No. OF SPECIES POTENTIALLY PRESENT	No. OF SPECIES DETECTED	PERCENTAGE OF SPECIES DETECTED
CARNIVORA	Carnivores	18	6	33%
CHIROPTERA	Bats	9	1(+5?)	11%
EULIPOTYPHILA	Hedgehog & shrews	5	0	0%
HYRACOIDEA	Hyraxes	1	0	0%
LAGOMORPHA	Hares & rabbits	3	1(+1?)	33%
MACROSCELIDEA	Elephant-shrews	1	0	0%
PERISSODACTYLA	Zebras & rhinoceroses	0	1	n.a.
PRIMATES	Primates	2	1	50%
RODENTIA	Rodents	19	8	42%
RUMINANTIA	Giraffe, buffalo & antelopes	3	7	233%
SUIFORMES	Pigs	1	1	100%
TUBULIDENTATA	Aardvark	1	1	100%
TOTAL		63	27	43%

Table 3-2 Conservation Important mammal species

SCIENTIFIC NAME	COMMON NAME	STATUS			LoO	
		GLOBAL IUCN	S.A. RED DATA	S.A. NEM:BA	REGION	BEATRIX
<i>Mystromys albicaudatus</i>	White-tailed Rat	EN (D)	EN	-	3	4
<i>Felis nigripes</i>	Black-footed Cat	VU (D)	LC	PS	3	3
<i>Hyaena brunnea</i>	Brown Hyaena	NT (D)	NT	PS	3	3
<i>Lutra maculicollis</i>	Spotted-necked Otter	LC (D)	NT	-	3	3
<i>Atelerix frontalis</i>	Southern African Hedgehog	LC (S)	NT	-	2	2
<i>Miniopterus natalensis</i>	Natal Long-fingered Bat	LC (U)	NT	-	3	?
<i>Rhinolophus clivosus</i>	Geoffroy's Horseshoe Bat	LC (U)	NT	-	3	3
<i>Rhinolophus darlingi</i>	Darling's Horseshoe Bat	LC (U)	NT	-	3	3
<i>Orycteropus afer</i>	Aardvark	LC (U)	LC	PS	2	1
<i>Otocyon megalotis</i>	Bat-eared Fox	LC (U)	LC	PS	2	2
<i>Vulpes chama</i>	Cape Fox	LC (S)	LC	PS	2	2
<i>Poecilogale albinucha</i>	African Weasel	LC (U)	DD	-	2	2
<i>Crocidura cyanea</i>	Reddish-grey Musk Shrew	LC (S)	DD	-	2	2
<i>Crocidura fuscomurina</i>	Tiny Musk Shrew	LC (U)	DD	-	3	3
<i>Crocidura mariquensis</i>	Swamp Musk Shrew	LC (U)	DD	-	3	3
<i>Suncus varilla</i>	Lesser Dwarf Shrew	LC (U)	DD	-	2	2

3.2. Birds

The complete list of potentially occurring and observed bird species is provided in **Appendix 5.2**, and examples of bird observations in Beatrix are shown in **Figure 3-2**. Bird species were classified according to a modified version of Newman's (2002) 12 bird categories as described in **Table 3-3**. Provided in **Figure 3-3** is a comparison of the total numbers of bird species with different feeding habits, which were observed during our site visits, and which have been recorded by observers during the Second South African Bird Atlas Project (SABAP 2) within one or more of the six pentad grid cells 2800_2635, 2800_2640, 2805_2640, 2810_2640, 2810_2645 and 2815_2645 wherein Beatrix is situated (**Figure 3-4**).

Of approximately 233 South African indigenous bird species that have been recorded in the region by SABAP 2 observers, at least 129 species (55%) were detected in or near the Beatrix complexes during our combined December 2015, January 2016 and February 2016 site visits (**Figure 3-2**). Bird taxa that have been recorded in the region, but which were not recorded during our site visits include e.g. storks, snipes, pelicans, cranes, honeyguides, thrushes, flycatchers, sunbirds, waxbills and buntings. Bird species that were detected during our site visits, which have not yet been recorded in the region by SABAP observers include the Brubru, Wing-snapping Cisticola, Tawny-flanked Prinia and Southern Boubou – for which there is currently only one other record from the central Free State (SABAP 2, 2016).



Southern Pale Chanting Goshawk (*Melierax canorus*)



Greater Flamingos (*Phoenicopterus ruber*)



Lesser Kestrel (*Falco naumanni*)



Greater Striped Swallow (*Hirundo cucullata*)



Cape Longclaw (*Macronyx capensis*)



White-browed Sparrow-weaver (*Plocepasser mahali*) nest



Northern Black Korhaan (*Afrotis afroides*)



Black-shouldered Kite (*Elanus caeruleus*)



Whiskered Terns (*Chlidonias hybrida*)



Spotted Eagle-owl (*Bubo africanus*) roadkill



Helmeted Guineafowl (*Numida meleagris*) nest



Owl feather



Pin-tailed Whydah (*Vidua macroura*)



South African Cliff Swallow (*Hirundo spilodera*) nests



Cattle Egrets (*Bubulcus ibis*)



Common Mynas (*Acridotheres tristis*)

Figure 3-2 Evidence of birds in or near Beatrix

Table 3-3 Newman’s (2002) modified bird categories

BIRD CATEGORY	DESCRIPTION
1. Ocean birds	Albatrosses, gannets/boobies, gulls, penguins, petrels, prions, shearwaters, skimmer, skuas, sub-Antarctic birds, terns, & tropic-/frigatebirds.
2. Inland water birds	Pelicans, cormorants, herons, egrets, storks, hamerkop, flamingos, spoonbill, ibises & finfoot.
3. Ducks & wading birds	Ducks, geese, grebes, coot, gallinules, crakes, flufftails, snipes, plovers, lapwings, waders, jacanas, oystercatchers, curlews, avocet & stilts.
4. Large terrestrial birds	Thicknees, pratincoles, coursers, korhaans, bustards, cranes, quail, francolins, spurfowl, buttonquail, guineafowl, ostrich & secretarybird.
5. Raptors	Vultures, kites, eagles, buzzards, sparrowhawks, hawks, harriers, falcons & kestrels.
6. Owls & nightjars	Owls & nightjars.
7. Sandgrouse, doves, etc	Sandgrouse, doves, pigeons, parrots, lovebirds, trogon, turacos & go-away birds (louries), cuckoos & coucals.
8. Aerial feeders, etc	Swallows, martins, swifts, mousebirds, bee-eaters, kingfishers, rollers, hoopoes, hornbills, barbets, woodpeckers, wryneck & honeyguides.
9. Cryptic & elusive insect-eaters	Larks, finchlarks, pipits, wagtails, drongos, black flycatcher, cuckooshrikes, crows, orioles, bulbuls, tits, babblers, thrushes, chats & robins.
10. Regular insect-eaters	Warblers, apalises, titbabblers, eremomelas, carmoropteras, grassbird, cisticolas, prinias, flycatchers, batises, shrikes, boubous, tchagras, helmetshrikes & starlings.
11. Oxpeckers & nectar feeders	Sunbirds, oxpeckers, white-eyes & queleas.
12. Seed-eaters	Sparrows, weavers, widow birds, bishops, finches, firefinches, waxbills, manikins, whydahs, canaries, siskins & buntings.

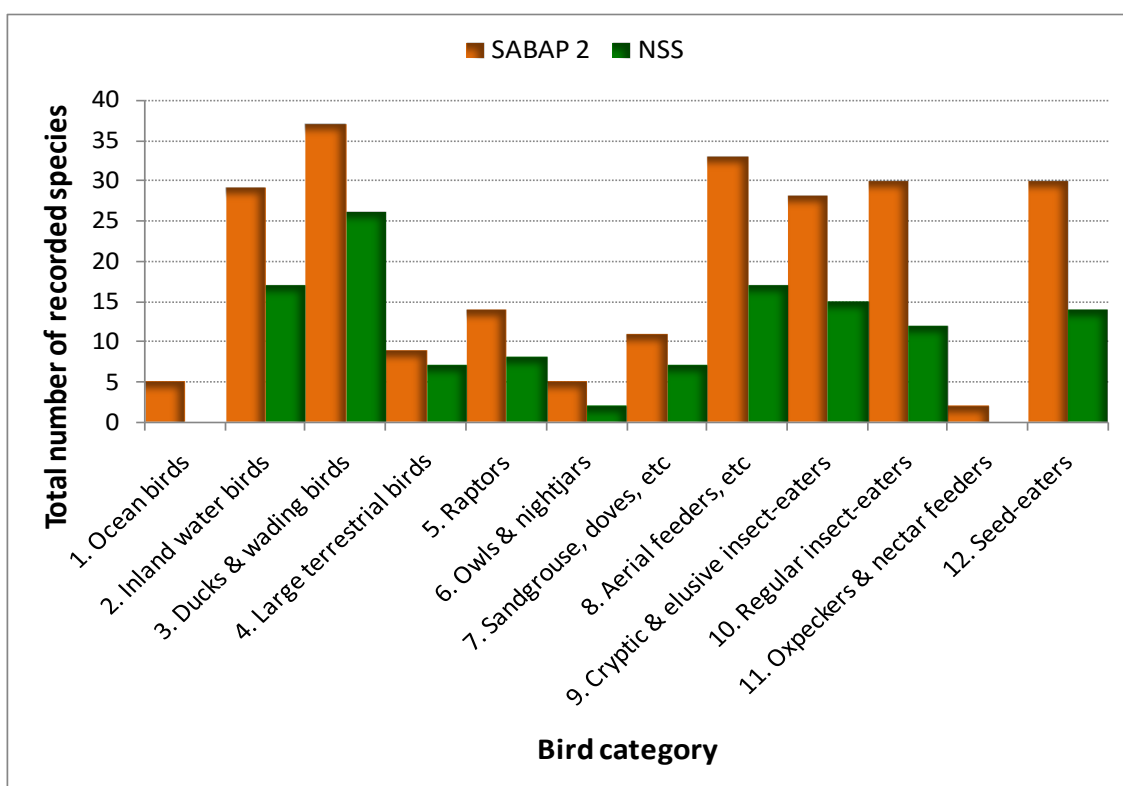


Figure 3-3 Total numbers of bird species with different feeding habits (modified from Newman, 2002), which were observed in or near Beatrix by NSS, and in the greater region by observers during the SABAP 2.



BIRD RECORDS & PENTADS

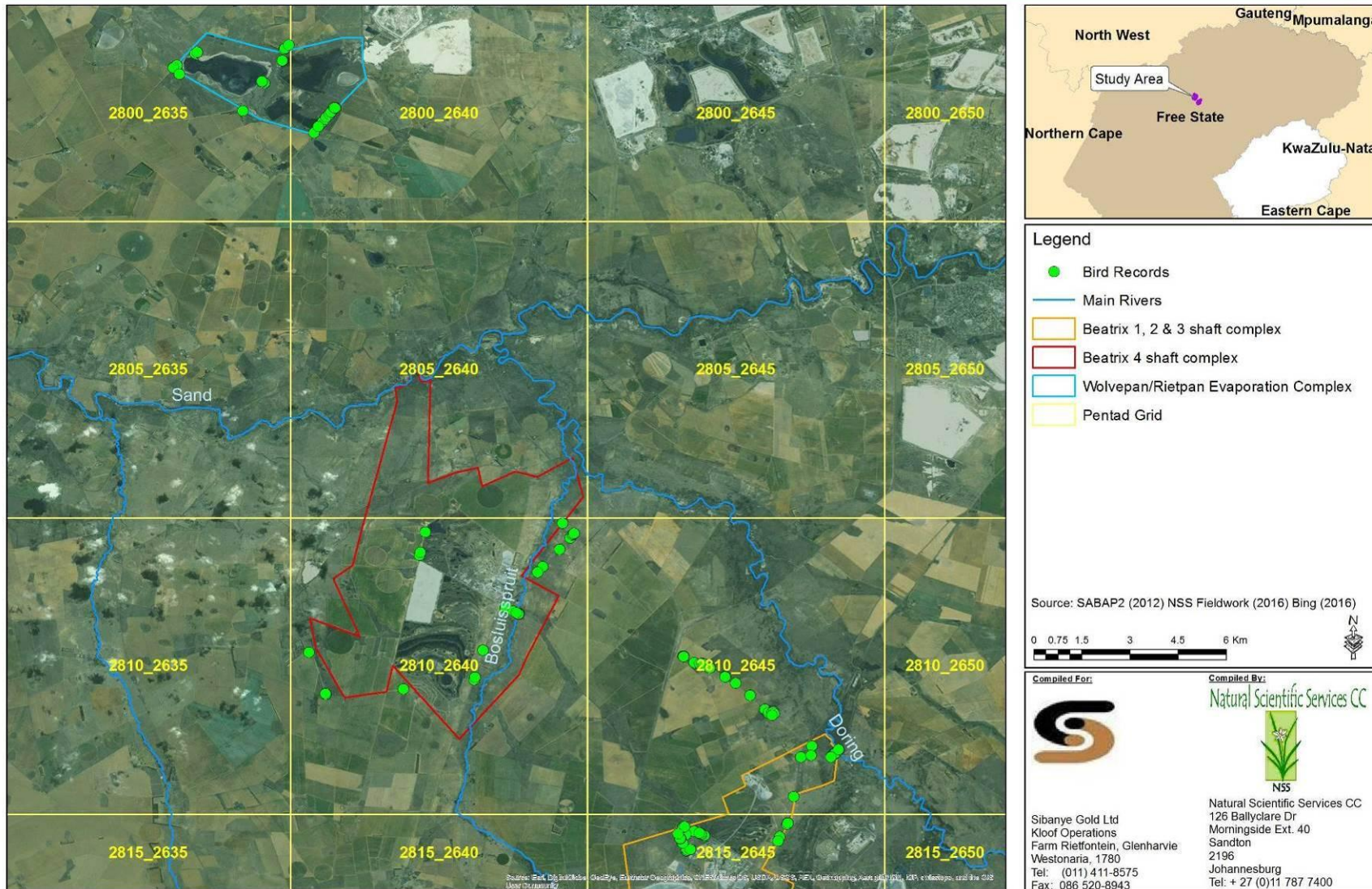


Figure 3-4 Quarter degree and pentad grid cells wherein Beatrix is situated

Regionally-occurring water birds such as pelicans, storks, and certain duck species (in categories 1, 2 and 3) and kingfisher species (category 8) might occur infrequently in Beatrix due to a lack of sufficient prey (e.g. fish) and/or appropriate habitat (e.g. undisturbed streams). However, our observations of Fish Eagle and Goliath Heron in the Wolvepan / Rietpan complex, and of Malachite Kingfisher in the Beatrix 1, 2 and 3 shaft complex, potentially suggest otherwise.

All regionally-occurring large terrestrial (category 4) bird species were detected by NSS in Beatrix except for the VU Blue Crane and NT Blue Korhaan. Blue Korhaans have been recorded from five of the six regional pentads, whilst Blue Cranes have only been recorded in the pentads wherein the Beatrix 1, 2 and 3 shaft complex is situated (SABAP 2, 2016). It is therefore possible that these threatened bird species could visit patches of less disturbed grassland within the mine complexes.

Regionally-occurring raptor (category 5) species that were not detected during our site visits are all likely to occur with the exception perhaps of Rock Kestrel and Osprey. However, whilst Rock Kestrels tend to favour rocky areas, the species can breed in buildings and appropriate the nests of other bird species (Sinclair & Ryan 2010). The presence of Ospreys in Beatrix depends largely on the availability of fish since the diet of this species reportedly comprises 99% fish (Evans 1982).

All regionally-occurring owl species are expected to occur in Beatrix including the VU African Grass-owl, which has been recorded in pentad 2810_2645 wherein the Beatrix 1, 2 and 3 shaft complex is situated. Suitable habitat for Africa Grass-owls in the form of dense patches of *Imperata* grass, was observed along the Bosluisspruit approximately 600m south-east of the main entrance gate to the Beatrix 4 shaft complex (**Figure 3-5**). Tunnels (similar to those created by grass-owls) were also observed in the *Imperata*, and a white owl feather was observed nearby (**Figure 3-2**).

Regionally-occurring cuckoo and honeyguide (category 7 and 8) species have also only been recorded during the SABAP 2 in pentad 2810_2645 wherein the Beatrix 1, 2 and 3 shaft complex is situated. It is likely, however, that these birds might occur throughout the region where there is suitable habitat for them, in the form of *Acacia* savannah and even alien tree stands and gardens.

Most if not all of the regionally-occurring insect-eating (category 9 and 10), nectar-feeding (category 11) and seed-eating (category 12) bird species are expected to occur at least occasionally in Beatrix – especially pentad 2810_2645, wherein the Beatrix 1, 2 and 3 shaft complex is situated. Here, many of the regionally-occurring “bushveld” bird species appear to be localized where riparian woodland / *Acacia* savannah adjoins the Doringspruit. Certainly more of these bird species would be detected with more time spent birding in this area.

CI bird species which potentially occur in or near Beatrix are listed in **Table 3-4**, and the locations of those species that were detected during our site visits are shown in **Figure 3-5**.

A single nationally EN African Marsh-harrier was observed foraging over the Bosluisspruit almost directly opposite the entrance to the Beatrix 4 shaft complex. African Marsh-harrier has only been recorded during the SABAP 2 in pentad 2815_2645 wherein the Beatrix 1, 2 and 3 shaft complex is situated. These observations suggest that the African Marsh-harrier occurs at least sporadically within the region.

During the December 2015 site visit a single globally VU Secretarybird was observed flying over the Wolvepan / Rietpan evaporation complex. During the SABAP 2 this species has only been recorded in pentad 2815_2645, wherein the Beatrix 1, 2 and 3 shaft complex is situated. These observations suggest that the Secretarybird occurs at least occasionally within the region. The VU Lanner Falcon was detected in the Beatrix 1, 2 and 3 shaft complex. Unlike the regionally common Lesser Kestrel, it appears that the Lanner Falcon may be localized to pentad 2810_2645 (SABAP 2, 2016).

Small flocks of the globally NT Lesser Flamingo and larger flocks of the nationally NT Greater Flamingos were observed at various wading localities in the Wolvepan / Rietpan evaporation complex, as indicated in **Figure 3-5**. Both species, especially the Greater Flamingo, appear to be common within the six regional pentads (SABAP 2, 2016).

Finally, although the species was not seen on site, it is worth mentioning that a small group of the globally NT Maccoa Duck was seen swimming on Flamingo Lake to the west of the R30 near Welkom. Given that this species has been recorded by SABAP 2 observers in five of the six pentads wherein Beatrix is situated, it is likely to occur on the mine premises.

Additional CI bird species, which were not detected during our site visits, but which have been recorded in the Beatrix region by SABAP 2 observers include the EN Yellow-billed Stork, the VU Black Stork, Caspian Tern, and Great White and Pink-backed pelicans, and the NT Chestnut-banded Plover, Black-winged Pratincole, and Melodious Lark. Based on observed habitat conditions in Beatrix, all these species could potentially occur on site. SABAP 2 records for the six regional pentads suggest, however, that White-backed Pelican and Black Stork are the least widespread and/or common.

During December 2015 especially, a significant number (>20) Lesser Kestrels were seen foraging over grassland in the southern section of the Beatrix 1, 2 and 3 shaft complex, and near the north-eastern corner of the Beatrix 4 shaft complex. The species has indeed been recorded in all six regional pentads, suggesting that there may be a (summer) resident and widespread colony / colonies in the region. Although the Lesser Kestrel was previously listed as Vulnerable, it no longer has a global or national threatened or protected status (Taylor *et al.* 2015).

Table 3-4 Conservation Important bird species

SCIENTIFIC NAME	COMMON NAME	GLOBAL IUCN	STATUS			LoO	
			S.A. RED DATA	S.A. NEM:BA	REGION	BEATRIX	
<i>Circus ranivorus</i>	African Marsh-harrier	LC (D)	EN	-	1	1	
<i>Mycteria ibis</i>	Yellow-billed Stork	LC (D)	EN	-	1	3	
<i>Sagittarius serpentarius</i>	Secretarybird	VU (D)	VU	-	1	1	
<i>Anthropoides paradiseus</i>	Blue Crane	VU (S)	NT	PS	1	2	
<i>Ciconia nigra</i>	Black Stork	LC (U)	VU	-	1	3	
<i>Falco biarmicus</i>	Lanner Falcon	LC (I)	VU	-	1	1	
<i>Pelecanus onocrotalus</i>	Great White Pelican	LC (U)	VU	-	1	3	
<i>Pelecanus rufescens</i>	Pink-backed Pelican	LC (S)	VU	-	1	3	
<i>Sterna caspia</i>	Caspian Tern	LC (I)	VU	-	1	2	
<i>Tyto capensis</i>	African Grass-owl	LC (D)	VU	-	1	2	
<i>Charadrius pallidus</i>	Chestnut-banded Plover	NT (S)	NT	-	1	2	
<i>Glareola nordmanni</i>	Black-winged Pratincole	NT (D)	NT (NB)	-	1	2	
<i>Oxyura maccoa</i>	Maccoa Duck	NT (D)	NT	-	1	2	
<i>Phoenicopterus minor</i>	Lesser Flamingo	NT (D)	NT	-	1	1	
<i>Eupodotis caerulescens</i>	Blue Korhaan	NT (S)	LC	-	1	2	
<i>Mirafra cheniana</i>	Melodious Lark	NT (D)	LC	-	1	2	
<i>Phoenicopterus ruber</i>	Greater Flamingo	LC (I)	NT	-	1	1	

Although an impact assessment was not required for this report, it must be mentioned that during the February 2016 visit to Beatrix, a large number of dead and dying Egyptian Geese and ducks were found on the shoreline of the evaporation pond (at co-ordinates 28° 2' 37.38"S and 26°39' 52.89"E) in the Wolwepan / Rietpan complex. It is not known why the birds were dying, but the reported use of agrochemicals to poison Egyptian Geese and other "pest" bird species in the region, is a possible explanation. According to BirdLife South Africa (2016), in the region surrounding the Willem Pretorius Game Reserve and IBA, "Poison (usually Temmick) is thrown out by farmers in... newly planted wheat fields, for Egyptian Goose, Spur-winged Goose, Helmeted Guineafowl... and other 'pest' species. Poisoned birds that return and die inside the reserve may then cause secondary poisoning and mortality for predators and scavengers that eat the carcasses. The secondary poisoning of African Fish Eagle... has been reported. Since the poisoning is hard to trace and prove, it is also hard to prosecute perpetrators."

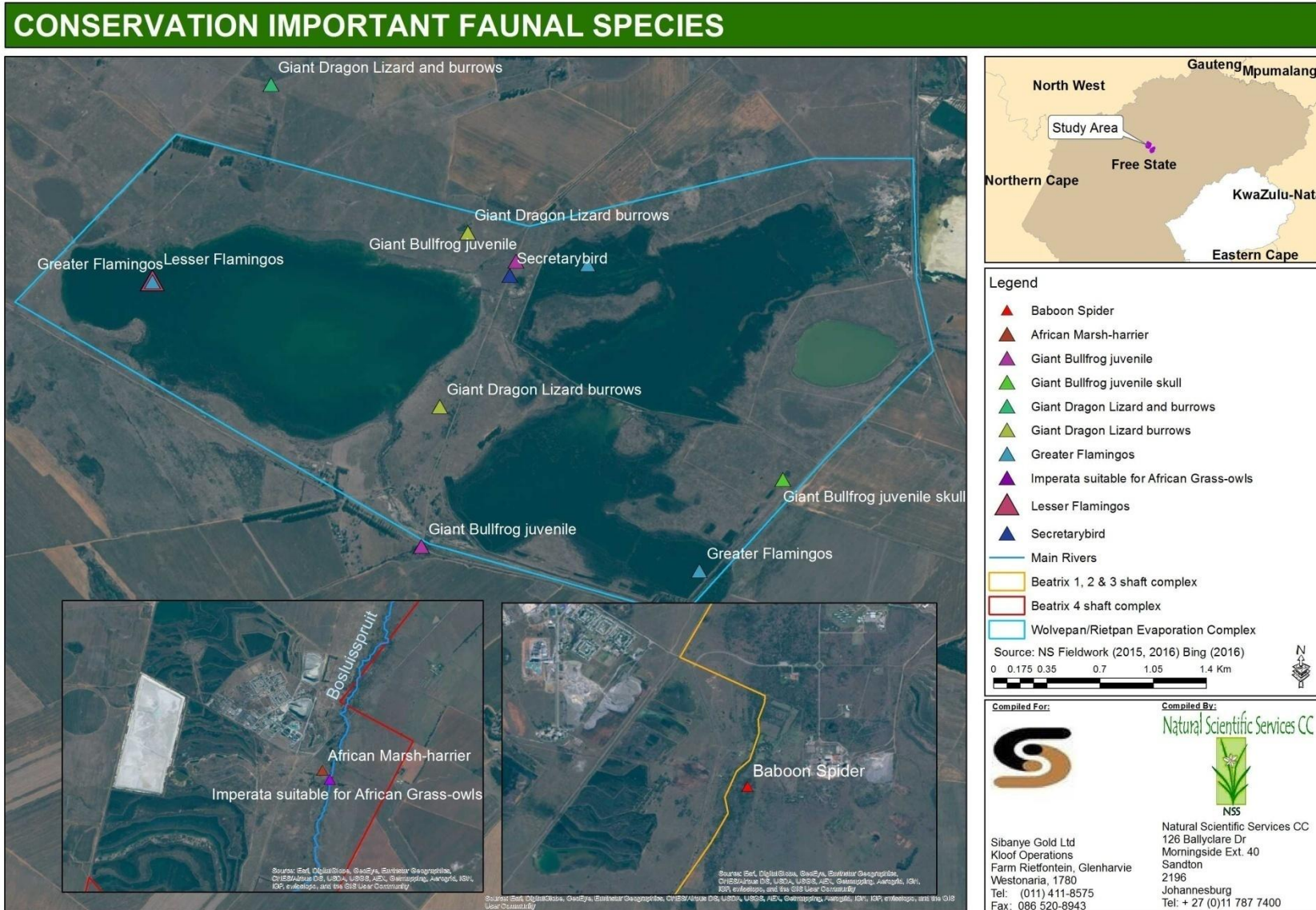


Figure 3-5 Locations of detected Conservation Important faunal species

3.3. Reptiles

Of at least 38 indigenous reptile species that are expected to occur in the Beatrix region (**Appendix 5.3**), eight species (21%) were detected during our site visits (**Table 3-5**), which included Marsh Terrapin, Common Dwarf Gecko, Red-lipped Snake, Puff Adder, Cape Cobra, Rinkhals, Nile Monitor and most notably the VU Giant Dragon Lizard (**Figure 3-6**). In addition, according to local farmers, Mole Snakes are also common in the region.

Table 3-5 Reptile diversity

FAMILY	COMMON NAMES	No. OF SPECIES POTENTIALLY PRESENT	No. OF SPECIES DETECTED	PERCENTAGE OF SPECIES DETECTED
PELOMEDUSIDAE	Terrapins	1	1	100%
TESTUDINIDAE	Tortoises	2	0	0%
GEKKONIDAE	Geckos	3	1	33%
AMPHISBAENIDAE	Worm lizards	1	0	0%
LACERTIDAE	Typical lizards	3	0	0%
CORDYLIDAE	Girdled lizards & relatives	1	1	100%
GERRHOSAURIDAE	Plated lizards & relatives	1	0	0%
SCINCIDAE	Skinks	5	0	0%
VARANIDAE	Monitors	2	1	50%
CHAMAELEONIDAE	Chameleons	1	0	0%
AGAMIDAE	Agamas	2	0	0%
TYPHLOPIDAE	Blind snakes	1	0	0%
LEPTOTYPHLOPIDAE	Thread snakes	1	0	0%
VIPERIDAE	Adders	1	1	100%
LAMPROPHIDAE	Advanced snakes	9	0	0%
ELAPIDAE	Cobras & relatives	2	2	100%
COLUBRIDAE	Typical snakes	2	1	50%
TOTAL		38	8	21%

Reptile taxa that were not detected, but which are highly likely to occur include several snake, skink and other lizard species, the Eastern Ground and Southern Rock agamas, and the Cape Gecko (**Appendix 5.3**). Reptiles are generally very elusive, and the exceptionally dry conditions during the December 2015 site visit, and the lack of rocky habitat in the region made it challenging to sample this vertebrate group. Live-trapping after heavy rain for long periods and additional locations would no doubt increase the probability of detecting more species. Apart from the Vulnerable Giant Dragon Lizard, no other observed or potentially occurring reptile species currently has a threatened or protected status.

Collectively 10 or more Giant Dragon Lizard burrows were found in at least three separate locations in or adjacent to the Wolvepan / Rietpan evaporation complex, at least one of which was occupied by a Giant Dragon Lizard. Pieces of a dead Giant Dragon Lizard were also found outside a burrow. The cause of this lizard's death was not clear. A survey to determine the extent and size of the Giant Dragon Lizard population(s) would certainly be warranted should the mine or its lessees plan to alter the area in any significant way.



Giant Dragon Lizard
(*Smaug giganteus*)



Red-lipped Snake
(*Crotaphopeltis hotamboeia*)



Cape Cobra
(*Naja nivea*)



Puff Adder
(*Bitis arietans arietans*)



Marsh Terrapin
(*Pelumodusa subrufa*)



Common Dwarf Gecko
(*Lygodactylus capensis capensis*)



Sloughed Rinkhals
(*Hemachatus haemachatus*) scales



Nile Monitor
(*Varanus niloticus*)



Limb of a dead Giant Dragon
Lizard(*Smaug giganteus*)

Figure 3-6 Evidence of reptiles in or near Beatrix

“In August 2013, Harmony signed a memorandum of agreement with and made a donation to the Endangered Wildlife Trust aimed at conservation of the vulnerable Sungazer [now called the Giant Dragon] Lizard (*Smaug giganteus*), which is... found close to Harmony’s operations near Welkom. The Endangered Wildlife Trust’s conservation efforts focus on the lizard’s habitat and biology and it is in the process of trying to have this lizard proclaimed as South Africa’s national lizard. The Endangered Wildlife Trust’s Conservation Stewardship Programme, a key tool in habitat protection, seeks to formally proclaim suitable habitats and relevant levels of commitment from stakeholders ranging from biodiversity agreements to the proclamation of official nature reserves. Harmony seeks to identify areas in which it can assist with the Stewardship Programme on some of its properties” (Harmony 2014).

3.4. Frogs

Sixteen indigenous frog species potentially occur in the Beatrix region (**Appendix 5.4**), of which six (38%) were detected during our site visits (**Table 3-6; Figure 3-7**). Apart from the Common Platanna (African Clawed Frog), which can inhabit a broad spectrum of aquatic habitats, most of the remaining species preferably utilize temporary or seasonal wetlands for breeding. Boettger's Caco and Bubbling Kassina appeared to be widespread in the region. Evidence of the NT Giant Bullfrog was found at three separate locations in the Wolvepan / Rietpan evaporation complex. The evidence included the skull of a young bullfrog near a small, seasonal pan, a live young bullfrog near a different small, seasonal pan, and a live young bullfrog in a water-logged road side ditch. Evidently, at least two pans in the complex support Giant Bullfrog breeding. No other CI frog species is expected to occur in the region.

Table 3-6 Frog diversity

FAMILY	COMMON NAMES	No. OF SPECIES POTENTIALLY PRESENT	No. OF SPECIES DETECTED	PERCENTAGE OF SPECIES DETECTED
BUFONIDAE	True toads	5	1	20%
HYPEROLIIDAE	Reed frogs & relatives	2	1	50%
PHRYNOBATRACHIDAE	Puddle frogs	1	0	0%
PIPIDAE	Platannas	1	1	100%
PYXICEPHALIDAE	River frogs & relatives	7	3	43%
TOTAL		16	6	38%



Bubbling Kassinas
(*Kassina senegalensis*)



Boettger's Caco
(*Cacosternum boettgeri*)



Young Giant Bullfrog
(*Pyxicephalus adspersus*)



Giant Bullfrog
(*Pyxicephalus adspersus*) skull



Western Olive Toad
(*Amietophrynus poweri*)



Tremolo / Tandy's Sand Frog
(*Tomopterna cryptotis / tandyi*)

Figure 3-7 Evidence of frogs in or near Beatrix

3.5. Butterflies

An estimated 79 indigenous butterfly species potentially occur in the Beatrix region (**Appendix 5.5**), of which seven (9%) were detected on site, mainly in grassland areas (**Table 3-7; Figure 3-8**). Certainly more than seven butterfly species occur on the mine premises, and would likely be recorded if baited trapping and active searching were performed for longer periods during different times of the year. None of the observed or potentially occurring butterfly species have a known threatened or protected status, and most are widespread or locally common.

Table 3-7 Butterfly diversity

FAMILY	COMMON NAMES	No. OF SPECIES POTENTIALLY PRESENT	No. OF SPECIES DETECTED	PERCENTAGE OF SPECIES DETECTED
HESPERIDAE	Skippers & relatives	12	0	0%
LYCAENIDAE	Blues, Coppers, Opals & relatives	35	4	11%
NYMPHALIDAE	Acraeas, Browns, Charaxes & relatives	20	1	5%
PAPILIONIDAE	Swallowtails & relatives	1	0	0%
PIERIDAE	Whites, Yellows & relatives	11	2	18%
TOTAL		79	7	9%



Velvet-spotted Babul Blue
(*Azanus ubaldus*)



Tailed Meadow Blue
(*Cupidopsis jobates jobates*)



Hintza Pierrot
(*Zintha hintza hintza*)



Basotho Skolly
(*Thestor basutus capeneri*)

Figure 3-8 Evidence of butterflies in or near Beatrix

3.6. Scorpions & Other Arachnids

Between one and four scorpion species are potentially native to the Beatrix region (**Table 3-8**). Of these, the most likely to occur is *Uroplectes triangulifer*, which was indeed found under rocky surface debris in grassland approximately 1km south-east of the Beatrix 4 shaft entrance gate (**Figure 3-9**). The three remaining species have a moderate LoO given their marginal published distribution ranges, and habitat requirements (Leeming 2003). Of the four listed scorpion species, none currently have a threatened or protected status (**Appendix 5.5**). Evidence of other large arachnids in Beatrix included various live solifuges (sun spiders), a baboon spider in its burrow, and a trap door spider burrow (**Figure 3-9**). No 2015 ToPS-listed spider species is known to occur in the Beatrix region.

Table 3-8 Scorpion diversity

FAMILY	COMMON NAMES	No. OF SPECIES POTENTIALLY PRESENT	No. OF SPECIES DETECTED	PERCENTAGE OF SPECIES DETECTED
BUTHIDAE	Thick-tailed scorpions & relatives	3	1	33%
SCORPIONIDAE	Burrowing scorpions & relatives	1	0	0%
TOTAL		4	1	25%

*Uroplectes triangulifer*

Baboon spider burrow



Solifuge / Sun spider



Trap door spider trap door

Figure 3-9 Evidence of large arachnids in Beatrix

3.7. Odonata

At least 20 indigenous odonata species potentially occur in the Beatrix region, of which nine species (45%) were observed during our field surveys (**Table 3-9**). These included the Slate Sprite, Vaal Sprite, Marsh Bluetail, Swamp Bluet, Julia Skimmer, Long Skimmer, Broad Scarlet, Kirby's Dropwing, and the Pantala (**Figure 3-10**). These all represent common, widespread species with a Biotic Index score of 0 or 1, with the exception of the Vaal Sprite, which is endemic to the central Highveld, and which has a Biotic Index score of 5 (Samways 2008).

Samway's (2008) Biotic Index for odontata is "based on three criteria: geographical distribution, conservation status and sensitivity to change in habitat. It ranges from a minimum of 0 to a maximum of 9. A very common, widespread species which is highly tolerant of human disturbance scores 0. In contrast, a range-restricted, threatened and sensitive endemic species scores 9."

Our observation of the Vaal Sprite, along with odonata species with a Biotic Index score of mainly 0 or 1, suggests that many, *but not all*, aquatic and wetland habitats in the region are disturbed. Of the 20 listed regional odonata species (**Appendix 5.7**), 14 (70%) have a Biotic Index score of 0 or 1. Three (15%) of the listed species have a score of 2. One species (the Yellow-faced Sprite) has a score of 3; and one species (the Sapphire Bluet) has a score of 4. The Vaal Sprite has the highest score of 5. None of the observed or potentially occurring odonatan species has a known threatened or protected status.



Broad Scarlet
(*Crocothemis erythraea*) male



Marsh Bluetail
(*Ischnura senegalensis*) male



Vaal Sprite
(*Pseudagrion vaalense*) female



Swamp Bluet
(*Africallagma glaucum*) male



Slate Sprite
(*Pseudagrion salisburyense*) female



Long Skimmer
(*Orthetrum trinacria*) female



Kirby's Dropwing
(*Trithemis kirbyi*) male



Pantala
(*Pantala flavescens*) pair



Long Skimmer
(*Orthetrum trinacria*) male

Figure 3-10 Evidence of odonata in or near Beatrix

Table 3-9 Odonata diversity

FAMILY	COMMON NAMES	No. OF SPECIES POTENTIALLY PRESENT	No. OF SPECIES DETECTED	PERCENTAGE OF SPECIES DETECTED
LESTIDAE	Spreadwings	1	0	0%
PROTONEURIDAE	Threadtails	1	0	0%
COENAGRIONIDAE	Citrils, Sprites & relatives	5	3	60%
AESHNIDAE	Hawkers, Emperors & relatives	2	0	0%
CORDULIIDAE	Presbas & Cruisers	1	0	0%
LIBELLULIDAE	Skimmers, Dropwings & relatives	7	3	43%
TOTAL		17	6	35%

4. Summary & Conclusion

The faunal assessment involved desktop- and field-based investigations of mammals, birds, reptiles, frogs, butterflies, scorpions and odonata (dragonflies and damselflies). Field surveys involved visual observation, sweep-netting, grab-sampling, “mat-trapping” and camera- and live-trapping of fauna, and driven acoustic surveys to detect bats. At least 55% of potentially occurring bird species, approximately 45% of potentially occurring mammal and odonata species, 38% of potentially occurring frog species, and more than 20% of potentially occurring reptile and scorpion species was recorded in or adjacent to the three Beatrix complex areas. At least 22 CI terrestrial vertebrate species have a high Likelihood of Occurrence (LoO) within the mine premises, several of which were detected during our site visits. These included the Endangered African Marsh-harrier, the Vulnerable Giant Dragon Lizard, Secretarybird, and Lanner Falcon, and the Near Threatened (NT) Greater and Lesser flamingos and Giant Bullfrog, and the Protected Aardvark. Calls were also recorded, which resemble those of the cave-roosting NT Natal Long-fingered Bat. Grassland and/or wetland habitats are especially important for virtually all the detected and potentially occurring CI faunal species. A survey to determine the extent and size of the Giant Dragon Lizard population(s) in Beatrix would certainly be warranted should the mine or its lessees plan to alter the area in any significant way. Provided in report **Section E** are descriptions of the relative sensitivity or conservation importance of different areas in Beatrix for fauna and other biodiversity, including recommended buffers for observed CI animal species habitats.

5. Appendices

5.1. List of mammal species for the Beatrix region

ORDER & SCIENTIFIC NAME	COMMON NAME	CONSERVATION STATUS			HABITAT										
		GLOBAL IUCN	S.A. RED DATA	S.A. NEM:BA	REGIONAL LoO	BEATRIX	1, 2 & 3 SHAFT	4 SHAFT	WOLVE/RIETPAN	VICINITY	SAVANNA	GRASSLAND	WETLAND	ALIEN	BUILT
CARNIVORA	Carnivores														
<i>Aonyx capensis</i>	Cape Clawless Otter	LC (S)	LC	-	2	1	1	1					x		
<i>Atilax paludinosus</i>	Water Mongoose	LC (D)	LC	-	2	1		1					x		
<i>Canis mesomelas</i>	Black-backed Jackal	LC (S)	LC	-	2	1	1		1		x	x	x		
<i>Caracal caracal</i>	Caracal	LC (U)	LC	-	2	2									
<i>Cynictis penicillata</i>	Yellow Mongoose	LC (S)	LC	-	2	1	1	1	1	1	x	x	x	x	
<i>Felis nigripes</i>	Black-footed Cat	VU (D)	LC	PS	3	3									
<i>Felis silvestris</i>	African Wild Cat	LC (D)	LC	-	2	3									
<i>Galerella pulverulenta</i>	Small Grey Mongoose	LC (S)	LC	-	3	3									
<i>Galerella sanguinea</i>	Slender Mongoose	LC (S)	LC	-	2	1	1	1	1		x	x		x	
<i>Genetta genetta</i>	Small-spotted Genet	LC (S)	LC	-	2	1	1				x				
<i>Hyaena brunnea</i>	Brown Hyaena	NT (D)	NT	PS	3	3									
<i>Ictonyx striatus</i>	Striped Polecat	LC (S)	LC	-	2	2									
<i>Lutra maculicollis</i>	Spotted-necked Otter	LC (D)	NT	-	3	3									
<i>Otocyon megalotis</i>	Bat-eared Fox	LC (U)	LC	PS	2	2									
<i>Poecilogale albinucha</i>	African Weasel	LC (U)	DD	-	2	2									
<i>Proteles cristatus</i>	Aardwolf	LC (S)	LC	-	2	2									
<i>Suricata suricatta</i>	Suricate	LC (U)	LC	-	2	2									
<i>Vulpes chama</i>	Cape Fox	LC (S)	LC	PS	2	2									

ORDER & SCIENTIFIC NAME	COMMON NAME	CONSERVATION STATUS					HABITAT							
		GLOBAL IUCN	S.A. RED DATA	S.A. NEM:BA	REGIONAL LoO	BEATRIX	1, 2 & 3 SHAFT	4 SHAFT	WOLVE/RIETPAN	VICINITY	SAVANNA	GRASSLAND	WETLAND	ALIEN
CHIROPTERA	Bats													
<i>Eptesicus hottentotus</i>	Long-tailed Serotine	LC (U)	LC	-	2	?								
<i>Miniopterus natalensis</i>	Natal Long-fingered Bat	LC (U)	NT	-	3	?								
<i>Neoromicia capensis</i>	Cape Serotine	LC (S)	LC	-	2	?								
<i>Nycteris thebaica</i>	Egyptian Slit-faced Bat	LC (U)	LC	-	2	2								
<i>Pipistrellus rueppellii</i>	Ruppell's Pipistrelle	LC (U)	LC	-	4	?								
<i>Pipistrellus rusticus</i>	Rusty Pipistrelle	LC (U)	LC	-	3	?								
<i>Rhinolophus clivosus</i>	Geoffroy's Horseshoe Bat	LC (U)	NT	-	3	3								
<i>Rhinolophus darlingi</i>	Darling's Horseshoe Bat	LC (U)	NT	-	3	3								
<i>Scotophilus dinganii</i>	Yellow-bellied House Bat	LC (U)	LC	-	3	?								
<i>Scotophilus viridis</i>	Green House Bat	LC (U)	-	-	4	?								
<i>Tadarida aegyptiaca</i>	Egyptian Free-tailed Bat	LC (U)	LC	-	2	1								
EULIPOTYPHILA	Hedgehog & shrews													
<i>Atelerix frontalis</i>	Southern African Hedgehog	LC (S)	NT	-	2	2								
<i>Crocidura cyanea</i>	Reddish-grey Musk Shrew	LC (S)	DD	-	2	2								
<i>Crocidura fuscomurina</i>	Tiny Musk Shrew	LC (U)	DD	-	3	3								
<i>Crocidura mariquensis</i>	Swamp Musk Shrew	LC (U)	DD	-	3	3								
<i>Suncus varilla</i>	Lesser Dwarf Shrew	LC (U)	DD	-	2	2								
HYRACOIDEA	Hyraxes													
<i>Procavia capensis</i>	Rock Hyrax	LC (U)	LC	-	3	4								
LAGOMORPHA	Hares & rabbits													
<i>Lepus capensis</i>	Cape Hare	LC (D)	LC	-	2	1	1	1	1		x			



ORDER & SCIENTIFIC NAME	COMMON NAME	CONSERVATION STATUS					HABITAT								
		GLOBAL IUCN	S.A. RED DATA	S.A. NEM:BA	REGIONAL LoO	BEATRIX	1, 2 & 3 SHAFT	4 SHAFT	WOLVE/RIETPAN	VICINITY	SAVANNA	GRASSLAND	WETLAND	ALIEN	BUILT
<i>Lepus saxatilis</i>	Scrub Hare	LC (D)	LC	-	2										
<i>Pronolagus rupestris</i>	Smith's Red Rock Rabbit	LC (U)	LC	-	3	4									
MACROSCELIDEA	Elephant-shrews														
<i>Elephantulus myurus</i>	Rock Elephant-shrew	LC (S)	LC	-	3	4									
PERISSODACTYLA	Zebras & rhinoceroses														
<i>Equus quagga</i>	Plains Zebra	LC (S)	LC	PS*		5			1		x				
PRIMATES	Primates														
<i>Cercopithecus pygerythrus</i>	Vervet Monkey	LC (S)	LC	-	2	1	1	1		x				x	
<i>Papio ursinus</i>	Chacma Baboon	LC (S)	LC	-	2	3									
RODENTIA	Rodents														
<i>Aethomys chrysophilus</i>	Red Veld Rat	LC (U)	LC	-	2	1		1		x					
<i>Aethomys namaquensis</i>	Namaqua Rock Mouse	LC (S)	LC	-	2	3									
<i>Cryptomys hottentotus</i>	Common Mole-rat	LC (S)	LC	-	2	1	1	1			x				
<i>Dendromus melanotis</i>	Grey Climbing Mouse	LC (S)	LC	-	3	3									
<i>Desmodillus auricularis</i>	Short-tailed Gerbil	LC (S)	LC	-	3	3									
<i>Gerbillurus paebe</i>	Hairy-footed Gerbil	LC (S)	LC	-	3	1		1		x					
<i>Glyphurus murinus</i>	Woodland Dormouse	LC (S)	LC	-	3	3									
<i>Hystrix africaeaustralis</i>	Porcupine	LC (S)	LC	-	2	1	1	1	1	x	x	x	x		
<i>Malacothrix typica</i>	Large-eared Mouse	LC (S)	LC	-	2	2									
<i>Mastomys coucha</i>	Multimammate Mouse	LC (S)	LC	-	2	1		1							
<i>Mystromys albicaudatus</i>	White-tailed Rat	EN (D)	EN	-	3	4									
<i>Otomys angoniensis</i>	Angoni Vlei Rat	LC (S)	LC	-	3	3									
<i>Otomys irroratus</i>	Vlei Rat	LC (S)	LC	-	2	2									

ORDER & SCIENTIFIC NAME	COMMON NAME	CONSERVATION STATUS					HABITAT								
		GLOBAL IUCN	S.A. RED DATA	S.A. NEM:BA	REGIONAL LoO	BEATRIX	1, 2 & 3 SHAFT	4 SHAFT	WOLVE/RIETPAN	VICINITY	SAVANNA	GRASSLAND	WETLAND	ALIEN	BUILT
<i>Pedetes capensis</i>	Springhare	LC (U)	LC	-	2	2									
<i>Rhodomys pumilio</i>	Striped Mouse	LC (S)	LC	-	2	1	1	1			x	x	x		
<i>Saccostomus campestris</i>	Pouched Mouse	LC (S)	LC	-	2	2									
<i>Steatomys krebsii</i>	Krebs's Fat Mouse	LC (S)	LC	-	3	3									
<i>Tatera brantsii</i>	Highveld Gerbil	LC (U)	LC	-	2	1		1	1		x				
<i>Xerus inauris</i>	Cape Ground Squirrel	LC (S)	LC	-	2	1	1	1	1	1	x	x		x	
RUMINANTIA	Giraffe, buffalo & antelopes														
<i>Alcelaphus buselaphus</i>	Red Hartebeest	LC (D)	LC	PS*		5				1		x			
<i>Antidorcas marsupialis</i>	Springbok	LC (I)	LC	-		5	5			1		x			
<i>Damaliscus pygargus phillipsi</i>	Blesbok	LC (S)*	LC	PS*		5	5			1		x			
<i>Oryx gazella</i>	Gemsbok	LC (S)	LC	-		5				1		x			
<i>Raphicerus campestris</i>	Steenbok	LC (S)	LC	-	2	1	1	1	1	1	x	x	x	x	
<i>Sylvicapra grimmia</i>	Common Duiker	LC (S)	LC	-	2	1	1	1	1		x	x	x	x	
<i>Tragelaphus strepsiceros</i>	Kudu	LC (S)	LC	-	2	1	1				x		x		
SUIFORMES	Pigs														
<i>Phacochoerus africanus</i>	Warthog	LC (S)	LC	-	2	1		1	1		x	x		x	
TUBULIDENTATA	Aardvark														
<i>Orycteropus afer</i>	Aardvark	LC (U)	LC	PS	2	1	1		1			x			

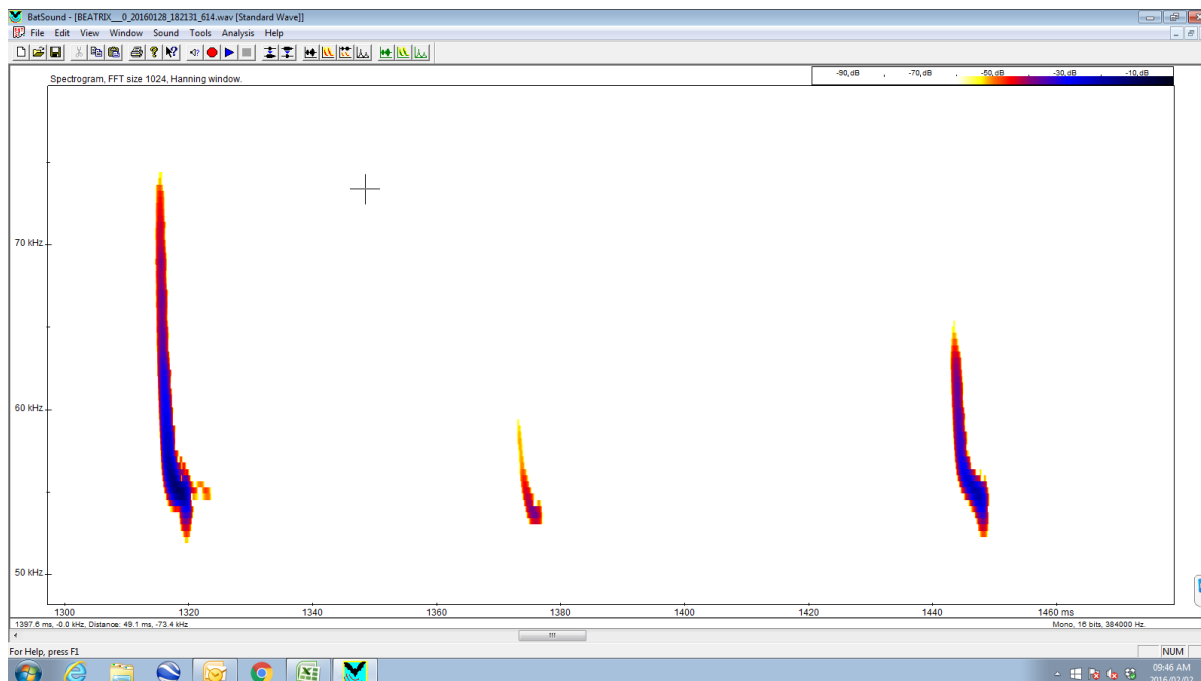
Status: D = Declining; DD = Data Deficient; EN = Endangered; I = Increasing; LC = Least Concern; NT = Near Threatened; PS = Protected Species; PS* = Species must be managed in an ecologically sustainable manner; S = Stable; U = Unknown population trend; VU = Vulnerable

Likelihood of Occurrence (LoO): 1 = Present; 2 = High; 3 = Moderate; 4 = Low; 5 = Present as a managed population; ? = Call identification not certain

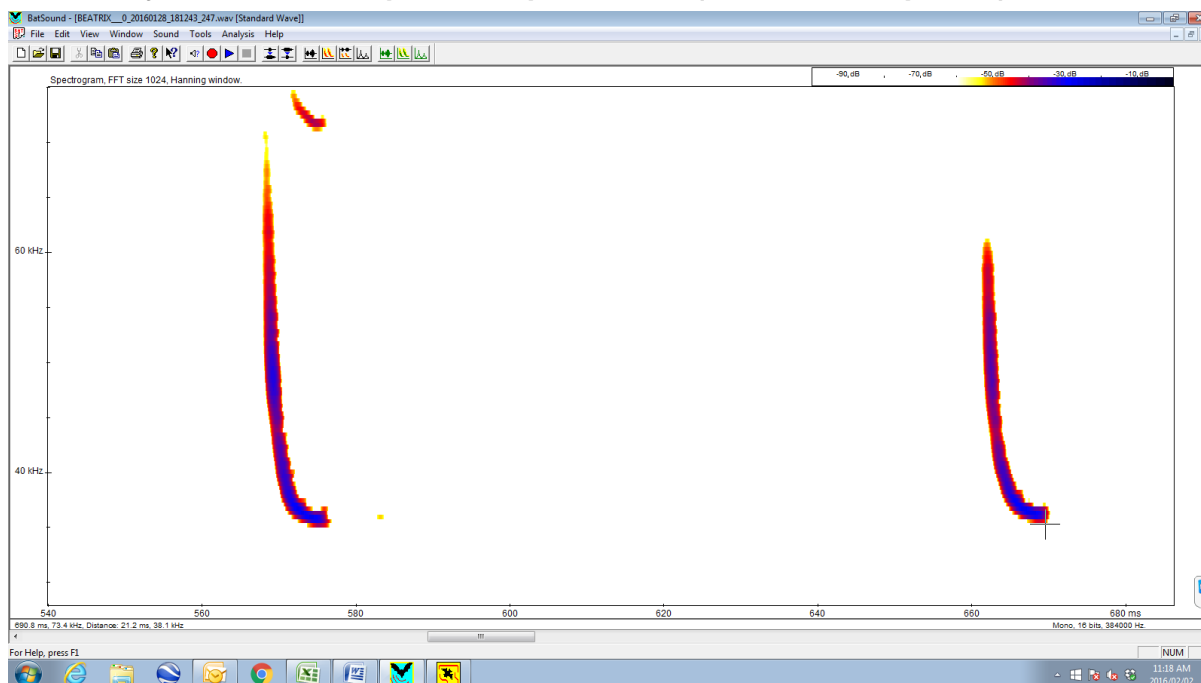
Sources: Friedmann & Daly (2004); Stuart & Stuart (2007); Monadjem *et al.* (2010); IUCN (2013); ToPS List (2015); MammalMAP (2016)

5.1. BatSoundPro screen grabs

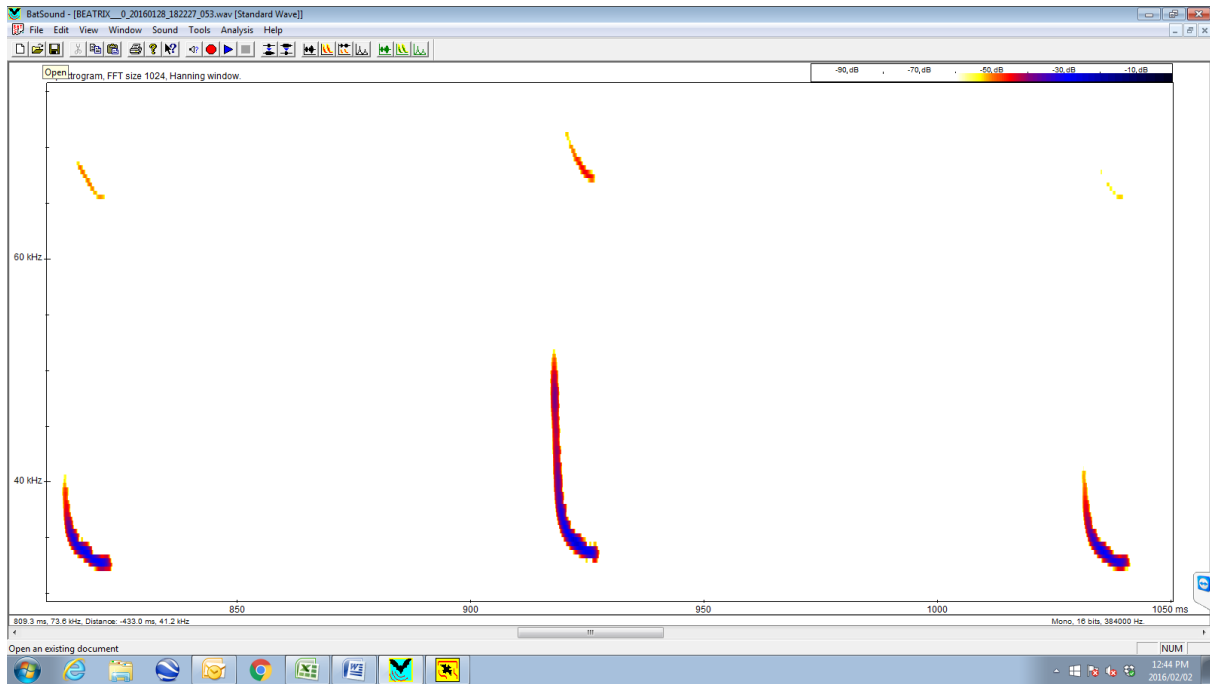
Calls resembling those of the NT Rusty Pipistrelle (*Pipistrellus rusticus*)



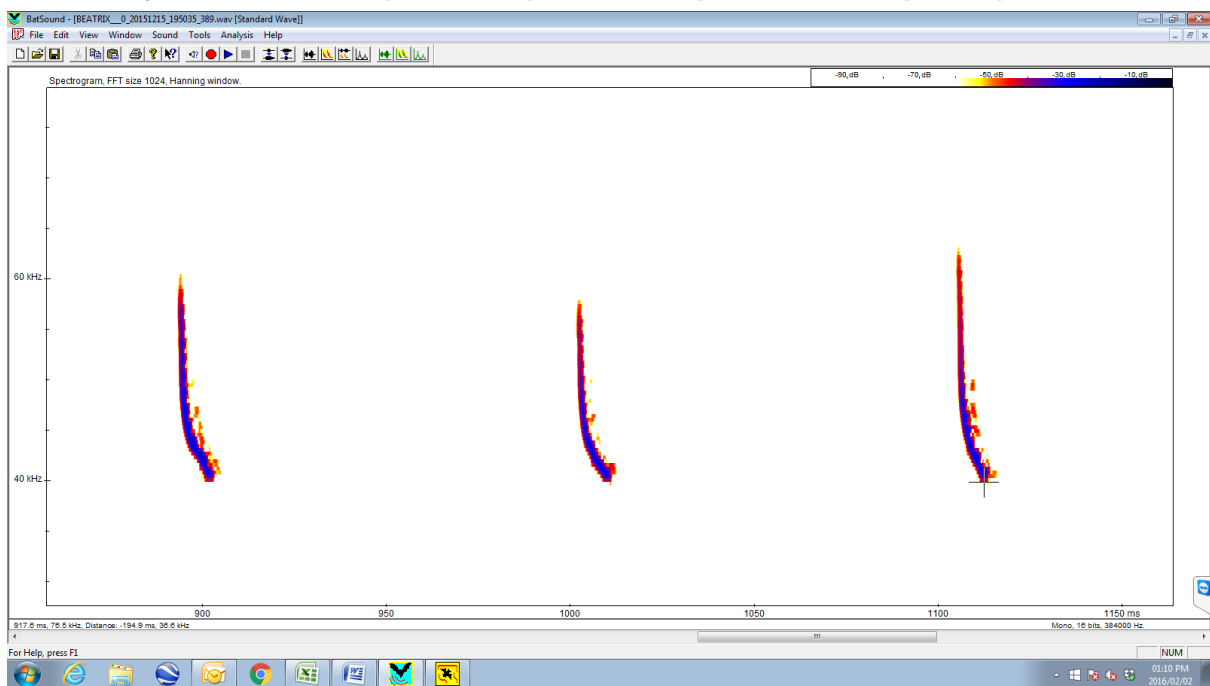
Calls resembling those of Ruppell's Pipestrelle (*Pipistrellus rueppellii*), but which are more likely calls of the ubiquitous Cape Serotine (*Neoromicia capensis*)



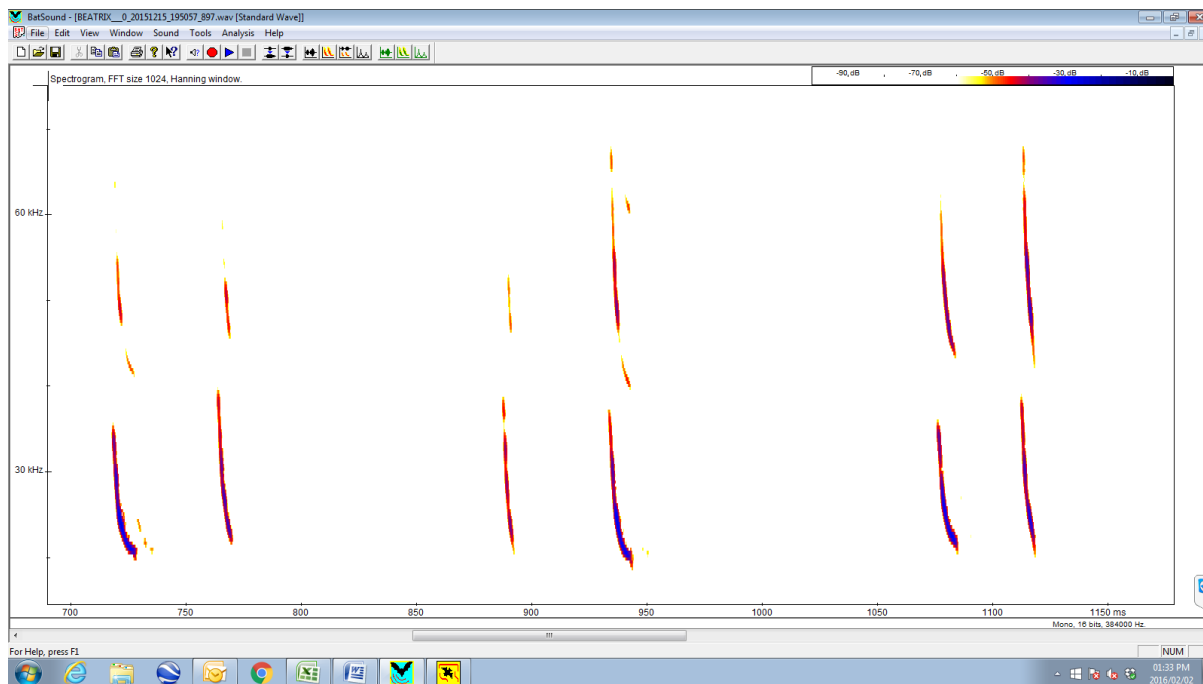
Calls resembling those of the Long-tailed Serotine (*Eptesicus hottentotus*) or Yellow-bellied House Bat (*Scotophilus dinganii*)



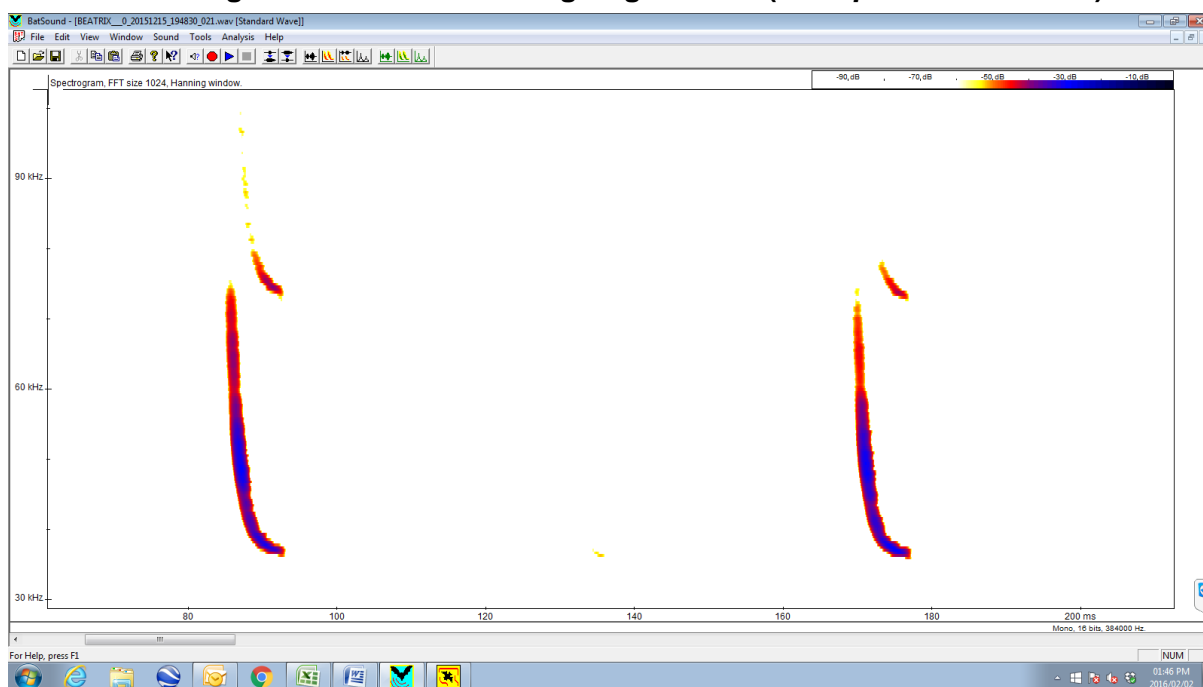
Calls resembling those of the Green House Bat (*Scotophilus viridis*), but which are more likely calls of the ubiquitous Cape Serotine (*Neoromicia capensis*)



Calls of the ubiquitous Egyptian Free-tailed Bat (*Tadarida aegyptiaca*)



Calls resembling those of the Natal Long-fingered Bat (*Miniopterus natalensis*)



5.2. List of bird species for the Beatrix region

CATEGORY & SCIENTIFIC NAME	COMMON NAME	CONSERVATION STATUS			SABAP 2						NSS									
		GLOBAL IUCN	S.A. RED DATA	S.A. NEM:BA	ALL PENTADS	PENTAD					BEATRIX	WOLFE-/RIETPAN	4 SHAFT	1, 2 & 3 SHAFT	VICINITY	SAVANNA	GRASSLAND	HABITAT		
						2800_2635	2800_2640	2805_2640	2810_2640	2810_2645								2815_2645	WETLAND	ALIEN
1. Ocean birds																				
<i>Larus fuscus</i>	Lesser Black-backed Gull	LC (I)	LC (Vag)	-	1	1	1	1	1											
<i>Pelecanus onocrotalus</i>	Great White Pelican	LC (U)	VU	-	1														1	
<i>Pelecanus rufescens</i>	Pink-backed Pelican	LC (S)	VU	-	1	1	1	1	1											
<i>Sterna caspia</i>	Caspian Tern	LC (I)	NT	-	1	1	1	1	1											
2. Inland water birds																				
<i>Anhinga rufa</i>	African Darter	LC (D)	LC	-	1	1	1	1	1	1				1					x	
<i>Ardea cinerea</i>	Grey Heron	LC (U)	LC	-	1	1	1	1	1	1										
<i>Ardea goliath</i>	Goliath Heron	LC (S)	LC	-	1	1	1	1	1	1	1								x	
<i>Ardea melanocephala</i>	Black-headed Heron	LC (I)	LC	-	1	1	1	1	1	1	1			1					x	
<i>Ardea purpurea</i>	Purple Heron	LC (D)	LC	-	1	1	1	1	1	1										
<i>Ardeola ralloides</i>	Squacco Heron	LC (D)	LC	-	1	1	1	1	1	1	1			1					x	
<i>Bostrychia hagedash</i>	Hadeda Ibis	LC (I)	LC	-	1	1	1	1	1	1	1			1					x	
<i>Bubulcus ibis</i>	Cattle Egret	LC (I)	LC	-	1	1	1	1	1	1	1			1	x	x			x	
<i>Butorides striata</i>	Green-backed Heron	LC (D)	LC	-	1					1										
<i>Chlidonias hybrida</i>	Whiskered Tern	LC (S)	LC	-	1	1	1	1	1	1	1			1					x	
<i>Chlidonias leucopterus</i>	White-winged Tern	LC (S)	LC (NB)	-	1	1	1	1	1	1	1									
<i>Ciconia abdimii</i>	Abdim's Stork	LC (D)	LC (NB)	-	1	1	1	1	1											
<i>Ciconia ciconia</i>	White Stork	LC (I)	LC (NB)	-	1	1	1	1	1											
<i>Ciconia nigra</i>	Black Stork	LC (U)	NT	-	1					1										
<i>Egretta ardesiaca</i>	Black Heron	LC (S)	LC	-	1	1	1	1	1	1	1			1					x	
<i>Egretta garzetta</i>	Little Egret	LC (I)	LC	-	1	1	1	1	1	1	1									
<i>Glareola nordmanni</i>	Black-winged Pratincole	NT (D)	NT (NB)	-	1	1	1	1	1											
<i>Ixobrychus minutus</i>	Little Bittern	LC (D)	LC	-	1					1										
<i>Larus cirrocephalus</i>	Grey-headed Gull	LC (S)	LC	-	1	1	1	1	1	1	1								1	
<i>Mycteria ibis</i>	Yellow-billed Stork	LC (D)	NT	-	1	1	1	1	1	1	1									
<i>Nycticorax nycticorax</i>	Black-crowned Night-heron	LC (D)	LC	-	1	1	1	1	1	1	1									
<i>Phalacrocorax africanus</i>	Reed Cormorant	LC (D)	LC	-	1	1	1	1	1	1	1			1					x	
<i>Phalacrocorax carbo</i>	White-breasted Cormorant	LC (I)	LC	-	1	1	1	1	1	1	1								x	
<i>Phoenicopterus minor</i>	Lesser Flamingo	NT (D)	NT	-	1	1	1	1	1	1	1			1					x	
<i>Phoenicopterus ruber</i>	Greater Flamingo	LC (I)	NT	-	1	1	1	1	1	1	1			1					x	
<i>Platalea alba</i>	African Spoonbill	LC (S)	LC	-	1	1	1	1	1	1	1			1					x	
<i>Plegadis falcinellus</i>	Glossy Ibis	LC (D)	LC	-	1	1	1	1	1	1	1								x	
<i>Scopus umbretta</i>	Hamerkop	LC (S)	LC	-	1	1	1	1	1	1	1								x	
<i>Threskiornis aethiopicus</i>	African Sacred Ibis	LC (D)	LC	-	1	1	1	1	1	1	1			1					x	
3. Ducks & wading birds																				
<i>Actitis hypoleucos</i>	Common Sandpiper	LC (D)	LC (NB)	-	1	1	1	1	1	1	1			1					x	
<i>Actophilornis africanus</i>	African Jacana	LC (S)	LC	-	1	1	1	1	1	1	1									
<i>Alopochen aegyptiacus</i>	Egyptian Goose	LC (D)	LC	-	1	1	1	1	1	1	1			1					x	
<i>Anas capensis</i>	Cape Teal	LC (I)	LC	-	1	1	1	1	1	1	1								x	
<i>Anas erythrorhyncha</i>	Red-billed Teal	LC (D)	LC	-	1	1	1	1	1	1	1								x	
<i>Anas hottentota</i>	Hottentot Teal	LC (D)	LC	-	1	1	1	1	1	1	1								x	
<i>Anas smithii</i>	Cape Shoveler	LC (I)	LC	-	1	1	1	1	1	1	1								x	
<i>Anas sparsa</i>	African Black Duck	LC (D)	LC	-	1	1	1	1	1	1	1									



CATEGORY & SCIENTIFIC NAME	COMMON NAME	CONSERVATION STATUS			SABAP 2						NSS									
		GLOBAL IUCN	S.A. RED DATA	S.A. NEM:BA	ALL PENTADS	PENTAD					BEATRIX	WOLVE-/RIETPAN	4 SHAFT	1, 2 & 3 SHAFT	VICINITY	SAVANNA	HABITAT			
						2800_2635	2800_2640	2805_2640	2810_2640	2810_2645							2815_2645	GRASSLAND	WETLAND	ALIEN
<i>Anas undulata</i>	Yellow-billed Duck	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1	1				X	
<i>Calidris ferruginea</i>	Curlew Sandpiper	LC (I)	LC (NB)	-	1	1	1	1	1	1	1	1	1	1	1				X	
<i>Calidris minuta</i>	Little Stint	LC (D)	LC (NB)	-	1	1	1	1	1	1	1	1	1	1	1				X	
<i>Charadrius hiaticula</i>	Common Ringed Plover	LC (D)	LC (NB)	-	1	1	1	1	1	1	1	1	1	1	1				X	
<i>Charadrius pallidus</i>	Chestnut-banded Plover	NT (S)	NT	-	1	1	1	1	1	1	1	1	1	1	1					
<i>Charadrius pecuarius</i>	Kittlitz's Plover	LC (U)	LC	-	1	1	1	1	1	1	1	1	1	1	1					
<i>Charadrius tricollaris</i>	Three-banded Plover	LC (U)	LC	-	1	1	1	1	1	1	1	1	1	1	1				X	
<i>Dendrocygna bicolor</i>	Fulvous Duck	LC (D)	LC	-	1	1	1	1	1	1	1	1	1	1	1					
<i>Dendrocygna viduata</i>	White-faced Whistling Duck	LC (I)	LC	-	1	1	1	1	1	1	1	1	1	1	1				X	
<i>Fulica cristata</i>	Red-knobbed Coot	LC (D)	LC	-	1	1	1	1	1	1	1	1	1	1	1				X	
<i>Gallinago nigripennis</i>	African Snipe	LC (U)	LC	-	1	1	1	1	1	1	1	1	1	1	1					
<i>Gallinula chloropus</i>	Common Moorhen	LC (U)	LC	-	1	1	1	1	1	1	1	1	1	1	1				X	
<i>Himantopus himantopus</i>	Black-winged Stilt	LC (I)	LC	-	1	1	1	1	1	1	1	1	1	1	1				X	
<i>Netta erythrophthalma</i>	Southern Pochard	LC (D)	LC	-	1	1	1	1	1	1	1	1	1	1	1				X	
<i>Oxyura maccoa</i>	Maccoa Duck	NT (D)	LC	-	1	1	1	1	1	1	1	1	1	1	1				X	
<i>Philomachus pugnax</i>	Ruff	LC (D)	LC (NB)	-	1	1	1	1	1	1	1	1	1	1	1					
<i>Plectropterus gambensis</i>	Spur-winged Goose	LC (I)	LC	-	1	1	1	1	1	1	1	1	1	1	1				X	
<i>Podiceps cristatus</i>	Great Crested Grebe	LC (U)	LC	-	1	1	1	1	1	1	1	1	1	1	1				X	
<i>Podiceps nigricollis</i>	Black-necked Grebe	LC (U)	LC	-	1	1	1	1	1	1	1	1	1	1	1				X	
<i>Porphyrio madagascariensis</i>	African Purple Swamphen	LC (U)	LC	-	1	1	1	1	1	1	1	1	1	1	1				X	
<i>Recurvirostra avosetta</i>	Pied Avocet	LC (U)	LC	-	1	1	1	1	1	1	1	1	1	1	1				X	
<i>Tachybaptus ruficollis</i>	Little Grebe	LC (D)	LC	-	1	1	1	1	1	1	1	1	1	1	1				X	
<i>Tadorna cana</i>	South African Shelduck	LC (I)	LC	-	1	1	1	1	1	1	1	1	1	1	1				X	
<i>Thalassornis leuconotus</i>	White-backed Duck	LC (D)	LC	-	1	1	1	1	1	1	1	1	1	1	1					
<i>Tringa glareola</i>	Wood Sandpiper	LC (S)	LC (NB)	-	1	1	1	1	1	1	1	1	1	1	1					
<i>Tringa nebularia</i>	Common Greenshank	LC (S)	LC (NB)	-	1	1	1	1	1	1	1	1	1	1	1					
<i>Tringa stagnatilis</i>	Marsh Sandpiper	LC (D)	LC (NB)	-	1	1	1	1	1	1	1	1	1	1	1					
<i>Vanellus armatus</i>	Blacksmith Lapwing	LC (I)	LC	-	1	1	1	1	1	1	1	1	1	1	1				X	
<i>Vanellus coronatus</i>	Crowned Lapwing	LC (I)	LC	-	1	1	1	1	1	1	1	1	1	1	1			X		
4. Large terrestrial birds																				
<i>Afrotis afraoides</i>	Northern Black Korhaan	-	LC	-	1	1	1	1	1	1	1	1	1	1	1			X		
<i>Anthropoides paradiseus</i>	Blue Crane	VU (S)	NT	PS	1	1	1	1	1	1	1	1	1	1	1					
<i>Burhinus capensis</i>	Spotted Thick-knee	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1	1		X			
<i>Eupodotis caerulescens</i>	Blue Korhaan	NT (S)	NT (N-End)	-	1	1	1	1	1	1	1	1	1	1	1					
<i>Numida meleagris</i>	Helmeted Guinea fowl	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1	1		X	X	X	X
<i>Pternistis swainsonii</i>	Swainson's Spurfowl	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1	1		X			
<i>Rhinoptilus africanus</i>	Double-banded Courser	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1	1					
<i>Sagittarius serpentarius</i>	Secretarybird	VU (D)	VU	-	1	1	1	1	1	1	1	1	1	1	1			X		
<i>Struthio camelus</i>	Common Ostrich	LC (D)	LC	-	1	1	1	1	1	1	1	1	1	1	1		X	X		
5. Raptors																				
<i>Buteo rufofuscus</i>	Jackal Buzzard	LC (S)	LC (N-End)	-	1	1	1	1	1	1	1	1	1	1	1					
<i>Buteo vulpinus</i>	Steppe Buzzard	LC (I)	LC (NB)	-	1	1	1	1	1	1	1	1	1	1	1		X		X	
<i>Circus aeruginosus</i>	Western Marsh-harrier	LC (I)	LC	-	1	1	1	1	1	1	1	1	1	1	1					
<i>Circus ranivorus</i>	African Marsh-harrier	LC (D)	EN	-	1	1	1	1	1	1	1	1	1	1	1				X	
<i>Elanus caeruleus</i>	Black-shouldered Kite	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1	1			X		X
<i>Falco biarmicus</i>	Lanner Falcon	LC (I)	VU	-	1	1	1	1	1	1	1	1	1	1	1					



CATEGORY & SCIENTIFIC NAME	COMMON NAME	CONSERVATION STATUS			SABAP 2						NSS										
		GLOBAL IUCN	S.A. RED DATA	S.A. NEM:BA	ALL PENTADS	PENTAD					BEATRIX	WOLVE-/RIETPAN	4 SHAFT	1, 2 & 3 SHAFT	HABITAT						
						2800_2635	2800_2640	2805_2640	2810_2640	2810_2645					2815_2645	VICINITY	SAVANNA	GRASSLAND	WETLAND	ALIEN	BUILT
<i>Falco naumanni</i>	Lesser Kestrel	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1	1	1	x				
<i>Falco rupicoloides</i>	Greater Kestrel	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1	1						
<i>Falco rupicolus</i>	Rock Kestrel	-	LC	-	1	1	1	1	1	1	1	1	1	1	1						
<i>Haliaeetus vocifer</i>	African Fish-eagle	LC (S)	LC	-	1							1	1	1	1				x		
	Southern Pale Chanting Goshawk	LC (S)	LC	-	1							1	1	1	1					x	
<i>Melierax canorus</i>	Goshawk	LC (S)	LC	-	1							1	1	1	1						x
<i>Milvus aegyptius</i>	Yellow-billed Kite	-	LC	-	1							1	1	1	1						
<i>Milvus migrans</i>	Black Kite	LC (U)	LC (NB)	-	1							1	1	1	1						
<i>Pandion haliaetus</i>	Osprey	LC (I)	LC (NB)	-	1																1
6. Owls & nightjars																					
<i>Asio capensis</i>	Marsh Owl	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1	1			x			
<i>Bubo africanus</i>	Spotted Eagle-owl	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1	1			x			
<i>Caprimulgus rufigena</i>	Rufous-cheeked Nightjar	LC (S)	LC (B)	-	1																1
<i>Tyto alba</i>	Barn Owl	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1	1						
<i>Tyto capensis</i>	African Grass-owl	LC (D)	VU	-	1																1
7. Sandgrouse, doves etc																					
<i>Centropus superciliosus</i>	White-browed Coucal	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1	1						
<i>Chrysococcyx caprius</i>	Diederik Cuckoo	LC (S)	LC (B)	-	1	1	1	1	1	1	1	1	1	1	1		x				x
<i>Chrysococcyx klaas</i>	Klaas's Cuckoo	LC (S)	LC	-	1																
<i>Clamator glandarius</i>	Great Spotted Cuckoo	LC (S)	LC (B)	-	1																1
<i>Clamator jacobinus</i>	Jacobin Cuckoo	LC (S)	LC (B)	-	1																1
<i>Columba guinea</i>	Speckled Pigeon	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1	1					x	x
<i>Cuculus solitarius</i>	Red-chested Cuckoo	LC (S)	LC (B)	-	1																1
<i>Oena capensis</i>	Namaqua Dove	LC (I)	LC	-	1	1	1	1	1	1	1	1	1	1	1		x				
<i>Streptopelia capicola</i>	Cape Turtle Dove	LC (I)	LC	-	1	1	1	1	1	1	1	1	1	1	1		x	x	x	x	x
<i>Streptopelia semitorquata</i>	Red-eyed Dove	LC (I)	LC	-	1	1	1	1	1	1	1	1	1	1	1		x				
<i>Streptopelia senegalensis</i>	Laughing Dove	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1	1		x	x	x	x	x
8. Aerial feeders, etc																					
<i>Alcedo cristata</i>	Malachite Kingfisher	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1	1						
<i>Apus affinis</i>	Little Swift	LC (I)	LC	-	1	1	1	1	1	1	1	1	1	1	1			x			x
<i>Apus caffer</i>	White-rumped Swift	LC (I)	LC (B)	-	1	1	1	1	1	1	1	1	1	1	1			x	x	x	x
<i>Apus horus</i>	Horus Swift	LC (I)	LC	-	1	1	1	1	1	1	1	1	1	1	1						
<i>Ceryle rudis</i>	Pied Kingfisher	LC (U)	LC	-	1	1	1	1	1	1	1	1	1	1	1						
<i>Colius colius</i>	White-backed Mousebird	LC (I)	LC	-	1	1	1	1	1	1	1	1	1	1	1						x
<i>Colius striatus</i>	Speckled Mousebird	LC (I)	LC	-	1																x
<i>Cypsiurus parvus</i>	Palm Swift	LC (I)	LC	-	1	1	1	1	1	1	1	1	1	1	1			x			
<i>Delichon urbicum</i>	Common House-martin	LC (D)	LC	-	1	1	1	1	1	1	1	1	1	1	1						
<i>Dendropicos fuscescens</i>	Cardinal Woodpecker	LC (S)	LC	-	1																1
<i>Halcyon albiventris</i>	Brown-hooded Kingfisher	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1	1						
<i>Hirundo albigularis</i>	White-throated Swallow	LC (I)	LC	-	1	1	1	1	1	1	1	1	1	1	1			x			
<i>Hirundo cucullata</i>	Greater Striped Swallow	LC (I)	LC	-	1	1	1	1	1	1	1	1	1	1	1		x	x	x	x	x
<i>Hirundo fuligula</i>	Rock Martin	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1	1						
<i>Hirundo rustica</i>	Barn Swallow	LC (D)	LC (NB)	-	1	1	1	1	1	1	1	1	1	1	1		x	x	x	x	x
<i>Hirundo semirufa</i>	Red-breasted Swallow	LC (I)	LC	-	1	1	1	1	1	1	1	1	1	1	1						
<i>Hirundo spilodera</i>	South African Cliff Swallow	LC (I)	LC (B, N- End)	-	1	1	1	1	1	1	1	1	1	1	1			x	x		x
<i>Indicator indicator</i>	Greater Honeyguide	LC (I)	LC	-	1																



CATEGORY & SCIENTIFIC NAME	COMMON NAME	CONSERVATION STATUS			SABAP 2						NSS									
		GLOBAL IUCN	S.A. RED DATA	S.A. NEM:BA	ALL PENTADS	PENTAD					BEATRIX	WOLFE-/RIETPAN	4 SHAFT	1, 2 & 3 SHAFT	VICINITY	SAVANNA	HABITAT			
						2800_2635	2800_2640	2805_2640	2810_2640	2810_2645							2815_2645	GRASSLAND	WETLAND	ALIEN
<i>Indicator minor</i>	Lesser Honeyguide	LC (S)	LC	-	1					1										
<i>Jynx ruficollis</i>	Red-throated Wryneck	LC (I)	LC	-	1					1			1			x				
<i>Merops apiaster</i>	European Bee-eater	LC (D)	LC (B/NB)	-	1	1	1	1	1	1	1	1			x				x	
<i>Merops bullockoides</i>	White-fronted Bee-eater	LC (I)	LC	-	1	1	1	1	1	1	1									
<i>Merops hirundineus</i>	Swallow-tailed Bee-eater	LC (S)	LC	-	1															1
<i>Phoeniculus purpureus</i>	Green Wood-hoopoe	LC (D)	LC	-	1					1										
<i>Rhinopomastus cyanomelas</i>	Common Scimitarbill	LC (D)	LC	-	1	1	1	1	1	1	1									
<i>Riparia cincta</i>	Banded Martin	LC (I)	LC	-	1					1							x			
<i>Riparia paludicola</i>	Brown-throated Martin	LC (D)	LC	-	1	1	1	1	1	1	1	1			1				x	
<i>Riparia riparia</i>	Sand Martin	LC (D)	LC (NB)	-	1	1	1	1	1	1	1									
<i>Tachymarptis melba</i>	Alpine Swift	LC (S)	LC (B)	-	1					1										
<i>Trachyphonus vaillantii</i>	Crested Barbet	LC (D)	LC	-	1	1	1	1	1	1	1				1	x				
<i>Tricholaema leucomelas</i>	Acacia Pied Barbet	LC (I)	LC	-	1	1	1	1	1	1	1				1	x				
<i>Upupa africana</i>	African Hoopoe	-	LC	-	1	1	1	1	1	1	1				1	x				
<i>Urocolius indicus</i>	Red-faced Mousebird	LC (U)	LC	-	1	1	1	1	1	1	1				1	x				
9. Cryptic & elusive insect-eaters																				
<i>Acrocephalus arundinaceus</i>	Great Reed-warbler	LC (D)	LC (NB)	-	1					1	1									
<i>Acrocephalus baeticatus</i>	African Reed-warbler	-	LC (B)	-	1		1	1	1	1	1	1	1						x	
<i>Acrocephalus gracilirostris</i>	Lesser Swamp-warbler	LC (S)	LC	-	1	1	1	1	1	1	1	1	1						x	
<i>Anthus cinnamomeus</i>	African Pipit	LC (S)	LC	-	1	1	1	1	1	1	1	1	1							
<i>Anthus leucophrys</i>	Plain-backed Pipit	LC (S)	LC	-	1					1	1									
<i>Anthus vaalensis</i>	Buffy Pipit	LC (I)	LC	-	1	1	1	1	1											
<i>Calandrella cinerea</i>	Red-capped Lark	LC (I)	LC	-	1	1	1	1	1	1	1								x	
<i>Chersomanes albofasciata</i>	Spike-heeled Lark	LC (D)	LC	-	1	1	1	1	1	1	1	1	1						x	
<i>Cisticola aridulus</i>	Desert Cisticola	LC (I)	LC	-	1	1	1	1	1						1				x	
<i>Cisticola ayresii</i>	Wing-snapping Cisticola	LC (D)	LC	-	1														x	
<i>Cisticola chiniana</i>	Rattling Cisticola	LC (S)	LC	-	1					1										
<i>Cisticola fulvicapilla</i>	Neddicky	LC (S)	LC	-	1	1	1	1	1	1	1	1	1			x				
<i>Cisticola juncidis</i>	Zitting Cisticola	LC (I)	LC	-	1	1	1	1	1	1	1	1	1						x	
<i>Cisticola textrix</i>	Cloud Cisticola	LC (D)	LC (N-End)	-	1	1	1	1	1						1				x	
<i>Cisticola tinniens</i>	Levaillant's Cisticola	LC (S)	LC	-	1	1	1	1	1	1	1	1	1						x	
<i>Eremomela icteropygialis</i>	Yellow-bellied Eremomela	LC (S)	LC	-	1	1	1	1	1											
<i>Eremopterix leucotis</i>	Chestnut-backed Sparrowlark	LC (S)	LC	-	1					1										
<i>Eremopterix verticalis</i>	Grey-backed Sparrowlark	LC (S)	LC	-	1					1	1									
<i>Macronyx capensis</i>	Cape Longclaw	LC (S)	LC	-	1	1	1	1	1	1	1	1	1						x	
<i>Mirafra africana</i>	Rufous-naped Lark	LC (D)	LC	-	1	1	1	1	1	1	1	1	1						x	
<i>Mirafra apiata</i>	Cape Clapper Lark	LC (D)	LC (N-End)	-	1	1	1	1	1	1	1									
<i>Mirafra cheniana</i>	Melodious Lark	NT (D)	NT (End)	-	1	1	1	1	1	1	1									
<i>Mirafra fasciolata</i>	Eastern Clapper Lark	-	LC	-	1	1	1	1	1	1	1									
<i>Motacilla capensis</i>	Cape Wagtail	LC (S)	LC	-	1	1	1	1	1	1	1	1	1						x	
<i>Phylloscopus trochilus</i>	Willow Warbler	LC (D)	LC (NB)	-	1	1	1	1	1											
<i>Prinia flavicans</i>	Black-chested Prinia	LC (S)	LC	-	1	1	1	1	1	1	1	1	1			x				
<i>Prinia subflava</i>	Tawny-flanked Prinia	LC (S)	LC	-	1															x
<i>Pycnonotus nigricans</i>	African Red-eyed Bulbul	LC (I)	LC	-	1	1	1	1	1	1	1	1	1			x				
<i>Spizocorys conirostris</i>	Pink-billed Lark	LC (D)	LC	-	1															
<i>Sylvietta rufescens</i>	Long-billed Crombec	LC (S)	LC	-	1					1	1									



CATEGORY & SCIENTIFIC NAME	COMMON NAME	CONSERVATION STATUS			SABAP 2							NSS								
		GLOBAL IUCN	S.A. RED DATA	S.A. NEM:BA	ALL PENTADS	PENTAD					BEATRIX	WOLVE-/RIETPAN	4 SHAFT	1, 2 & 3 SHAFT	VICINITY	SAVANNA	HABITAT			
						2800_2635	2800_2640	2805_2640	2810_2640	2810_2645							2815_2645	GRASSLAND	WETLAND	ALIEN
10. Regular insect-eaters																				
<i>Batis pririt</i>	Pririt Batis	LC (S)	LC	-	1	1	1	1	1	1	1	1								
<i>Cercomela familiaris</i>	Familiar Chat	LC (S)	LC	-	1	1	1	1	1	1	1	1							x	
<i>Cercomela sinuata</i>	Sickle-winged Chat	LC (S)	LC (N-End)	-	1															
<i>Cercotrichas paena</i>	Kalahari Scrub Robin	LC (S)	LC	-	1	1	1	1	1	1	1	1	1						x	
<i>Corvus albus</i>	Pied Crow	LC (S)	LC	-	1															
<i>Cossypha caffra</i>	Cape Robin-chat	LC (S)	LC	-	1	1	1	1	1	1	1	1	1						x	
<i>Creatophora cinerea</i>	Wattled Starling	LC (S)	LC	-	1	1	1	1	1	1	1	1	1						x	
<i>Dicrurus adsimilis</i>	Fork-tailed Drongo	LC (S)	LC	-	1	1	1	1	1	1	1	1	1							
<i>Erythropygia coryphaeus</i>	Karoo Scrub-robin	LC (S)	LC	-	1															
<i>Lamprotornis nitens</i>	Cape Glossy Starling	LC (S)	LC	-	1	1	1	1	1	1	1	1	1							
<i>Laniarius atrococcineus</i>	Crimson-breasted Shrike	LC (I)	LC	-	1	1	1	1	1	1	1	1	1							
<i>Laniarius ferrugineus</i>	Southern Boubou	LC (S)	LC	-	1														x	
<i>Lanius collaris</i>	Southern Fiscal	LC (I)	LC	-	1	1	1	1	1	1	1	1	1	1					x	
<i>Lanius minor</i>	Lesser Grey Shrike	LC (D)	LC (NB)	-	1															
<i>Myrmecocichla formicivora</i>	Ant-eating Chat	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1					x	
<i>Nilaus afer</i>	Brubru	LC (S)	LC	-	1														x	
<i>Oenanthe monticola</i>	Mountain Wheatear	LC (S)	LC	-	1		1	1	1	1	1	1	1							
<i>Oenanthe pileata</i>	Capped Wheatear	LC (S)	LC (B)	-	1		1	1	1	1	1	1	1							
<i>Onychognathus morio</i>	Red-winged Starling	LC (I)	LC	-	1															
<i>Parisoma subcaeruleum</i>	Chestnut-vented Tit-babbler	-	LC	-	1	1	1	1	1	1	1	1	1						x	
<i>Parus cinerascens</i>	Ashy Tit	LC (S)	LC	-	1															
<i>Psophocichla litsipsirupa</i>	Groundscraper Thrush	LC (U)	LC	-	1															
<i>Saxicola torquatus</i>	African Stonechat	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1					x	
<i>Sigelus silens</i>	Fiscal Flycatcher	LC (S)	LC (N-End)	-	1	1	1	1	1	1	1	1	1	1					x	
<i>Spreo bicolor</i>	Pied Starling	LC (S)	LC (N-End)	-	1	1	1	1	1	1	1	1	1	1	1				x	
<i>Stenostira scita</i>	Fairy Flycatcher	LC (S)	LC (N-End)	-	1	1	1	1	1	1	1	1	1	1					x	
<i>Tchagra australis</i>	Brown-crowned Tchagra	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1						
<i>Telophorus zeylonus</i>	Bokmakierie	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1					x	
<i>Terpsiphone viridis</i>	African Paradise-flycatcher	LC (S)	LC	-	1															
<i>Thamnolaea cinnamomeiventris</i>	Mocking Cliff-chat	LC (S)	LC	-	1															
<i>Turdus olivaceus</i>	Olive Thrush	LC (U)	LC	-	1	1	1	1	1	1	1	1	1	1						
<i>Turdus smithi</i>	Karoo Thrush	-	LC (N-End)	-	1	1	1	1	1	1	1	1	1	1						
11. Oxpeckers & nectar feeders																				
<i>Nectarinia famosa</i>	Malachite Sunbird	LC (S)	LC	-	1															
<i>Zosterops pallidus</i>	Orange River White-eye	LC (U)	LC	-	1		1	1	1	1	1	1	1							
12. Seed-eaters																				
<i>Amadina erythrocephala</i>	Red-headed Finch	LC (S)	LC	-	1	1	1	1	1	1	1	1	1							
<i>Amandava subflava</i>	Orange-breasted Waxbill	LC (S)	LC	-	1		1	1	1	1	1	1	1							
<i>Crithagra atrogularis</i>	Black-throated Canary	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1					x	
<i>Crithagra flaviventris</i>	Yellow Canary	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1					x	
<i>Emberiza capensis</i>	Cape Bunting	LC (S)	LC	-	1															
<i>Emberiza flaviventris</i>	Golden-breasted Bunting	LC (S)	LC	-	1	1	1	1	1	1	1	1	1							
<i>Emberiza tahapisi</i>	Cinnamon-breasted Bunting	LC (S)	LC	-	1															
<i>Estrilda astrild</i>	Common Waxbill	LC (S)	LC	-	1		1	1	1	1	1	1	1							
<i>Estrilda erythronotos</i>	Black-faced Waxbill	LC (S)	LC	-	1	1	1	1	1	1	1	1	1							



CATEGORY & SCIENTIFIC NAME	COMMON NAME	CONSERVATION STATUS			SABAP 2						NSS										
		GLOBAL IUCN	S.A. RED DATA	S.A. NEM:BA	PENTAD						BEATRIX	WOLFE-/RIETPAN	4 SHAFT	1, 2 & 3 SHAFT	HABITAT						
					ALL PENTADS	2800_2635	2800_2640	2805_2640	2810_2640	2810_2645					2815_2645	VICINITY	SAVANNA	GRASSLAND	WETLAND	ALIEN	BUILT
<i>Euplectes afer</i>	Yellow-crowned Bishop	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1	1	1			X		
<i>Euplectes orix</i>	Southern Red Bishop	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1	1	1	X	X	X	X	
<i>Euplectes progne</i>	Long-tailed Widowbird	LC (S)	LC	-	1		1	1	1	1	1	1	1	1	1	1		X	X	X	
<i>Granatina granatina</i>	Violet-eared Waxbill	LC (S)	LC	-	1					1											
<i>Lagonosticta senegala</i>	Red-billed Firefinch	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1	1		X				
<i>Ortygospiza atricollis</i>	African Quail Finch	LC (S)	LC	-	1					1	1	1	1	1	1			X			
<i>Passer diffusus</i>	Southern Greyheaded Sparrow	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1	1	1	X				
	Northern Grey-headed Sparrow																				
<i>Passer griseus</i>	Sparrow	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1	1	1					
<i>Passer melanurus</i>	Cape Sparrow	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1	1	1	X				
<i>Plocepasser mahali</i>	White-browed Sparrow-weaver	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1	1	1	X			X	X
<i>Ploceus capensis</i>	Cape Weaver	LC (S)	LC (N-End)	-	1					1											
<i>Ploceus velatus</i>	Southern Masked Weaver	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1	1	1	X		X	X	
<i>Pytilia melba</i>	Green-winged Pytilia	LC (S)	LC	-	1					1	1	1	1	1	1	1					
<i>Quelea quelea</i>	Red-billed Quelea	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1	1	1	X	X	X		
<i>Serinus canicollis</i>	Cape Canary	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1	1	1					
<i>Sporopipes squamifrons</i>	Scaly-feathered Finch	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1	1	1					
<i>Uraeginthus angolensis</i>	Blue Waxbill	LC (S)	LC	-	1		1	1	1	1	1	1	1	1	1	1					
<i>Vidua chalybeata</i>	Village Indigobird	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1	1	1	X				
<i>Vidua macroura</i>	Pin-tailed Whydah	LC (S)	LC	-	1		1	1	1	1	1	1	1	1	1	1	X	X	X		
<i>Vidua paradisaea</i>	Long-tailed Paradise-whydah	LC (S)	LC	-	1	1	1	1	1	1	1	1	1	1	1	1					
<i>Vidua regia</i>	Shaft-tailed Whydah	LC (S)	LC	-	1					1											

Status: B = Breeding; D = Declining; EN = Endangered; End = Endemic; I = Increasing; LC = Least Concern; NB = Non-breeding; N-End = Near-Endemic; NT = Near Threatened; PS = Protected Species; S = Stable; U = Unknown population trend; VU = Vulnerable

Likelihood of Occurrence (LoO): 1 = Present; 2 = High; 3 = Moderate; 4 = Low

Sources: Barnes (2000);Newman (2002); ToPS List (2007); IUCN (2013); SABAP 2 (2016)



5.3. List of reptile species for the Beatrix region

FAMILY & SCIENTIFIC NAME	COMMON NAME	CONSERVATION STATUS										HABITAT			
		GLOBAL IUCN	S.A. RED DATA	S.A. NEM:BA	REGIONAL Loo	BEATRIX	1, 2 & 3 SHAFT	4 SHAFT	WOLVE/RIETPAN	VICINITY	SAVANNA	GRASSLAND	WETLAND	ALIEN	BUILT
AGAMIDAE	Agamas														
<i>Agama aculeata distanti</i>	Eastern Ground Agama	-	1LC	-	2	2									
<i>Agama atra</i>	Southern Rock Agama	-	1LC	-	2	2									
AMPHISBAENIDAE	Worm lizards														
<i>Monopeltis capensis</i>	Cape Worm Lizard	-	1LC	-	2	3									
CHAMAELEONIDAE	Chamaeleons														
<i>Bradypodion ventrale</i>	Eastern Cape Dwarf Chameleon	LC (U)	1LC	-	3 (i)	4									
COLUBRIDAE	Typical snakes														
<i>Crotaphopeltis hotamboeia</i>	Red-lipped Snake	-	2LC	-	2	1		1			x				
<i>Dasypeltis scabra</i>	Rhombic Egg-eater	LC (U)	2LC	-	2	2									
CORDYLIDAE	Girdled lizards & relatives														
<i>Smaug giganteus</i>	Giant Dragon Lizard	VU	1VU	VU	2	1		1	1		x				
ELAPIDAE	Cobras & relatives														
<i>Hemachatus haemachatus</i>	Rinkhals	LC (S)	1LC	-	2	1	1					x			
<i>Naja nivea</i>	Cape Cobra	-	2LC	-	2	1	1						x		
GEKKONIDAE	Geckos														
<i>Lygodactylus capensis capensis</i>	Common Dwarf Gecko	-	1LC	-	4	1	1			x					x
<i>Pachydactylus capensis</i>	Cape Gecko	-	2LC	-	2	2									
<i>Pachydactylus mariquensis</i>	Common Banded Gecko	-	1LC	-	3	3									
<i>Gerrhosaurus flavigularis</i>	Yellow-throated Plated Lizard	-	2LC	-	2	2									
LACERTIDAE	Typical lizards														
<i>Nucras holubi</i>	Holub's Sandveld Lizard	-	2LC	-	2	2									
<i>Nucras intertexta</i>	Spotted Sandveld Lizard	-	2LC	-	2	2									
<i>Pedioplanis lineocellata lineocellata</i>	Spotted Sand Lizard	-	2LC	-	3	3									
LAMPROPHIIDAE	Advanced snakes														

FAMILY & SCIENTIFIC NAME	COMMON NAME	CONSERVATION STATUS							HABITAT					
		GLOBAL IUCN	S.A. RED DATA	S.A. NEM:BA	REGIONAL LOO	BEATRIX	1, 2 & 3 SHAFT	4 SHAFT	WOLVE/RIETPAN	VICINITY	SAVANNA	GRASSLAND	WETLAND	ALIEN
<i>Aparallactus capensis</i>	Black-headed Centipede-eater	LC (S)	2LC	-	2	2								
<i>Lamprophis aurora</i>	Aurora Snake	LC (D)	1LC	-	2	2								
<i>Lycodonomorphus rufulus</i>	Brown Water Snake	-	1LC	-	3	3								
<i>Lycophidion capense capense</i>	Cape Wolf Snake	-	2LC	-	2	2								
<i>Prosymna sundevallii</i>	Sundevall's Shovel-snout	-	1LC	-	3	3								
<i>Psammophis crucifer</i>	Cross-marked Grass Snake	-	1LC	-	2	2								
<i>Psammophis trinasalis</i>	Fork-marked Sand Snake	-	2LC	-	2	2								
<i>Psammophylax rhombeatus rhombeatus</i>	Spotted Grass Snake	-	2LC	-	2	2								
<i>Pseudaspis cana</i>	Mole Snake	-	2LC	-	2	2								
LEPTOTYPHLOPIDAE	Thread snakes													
<i>Leptotyphlops scutifrons</i>	Peters' Thread Snake	-	1LC	-	3	3								
PELOMEDUSIDAE	Terrapins													
<i>Pelomedusa subrufa</i>	Marsh Terrapin	-	2LC	-	2	1		1				x		
SCINCIDAE	Skinks													
<i>Acontias gracilicauda</i>	Thin-tailed Legless Skink	LC (U)	1LC	-	2	2								
<i>Afroablepharus wahlbergii</i>	Wahlberg's Snake-eyed Skink	-	2LC	-	2	2								
<i>Trachylepis capensis</i>	Cape Skink	-	2LC	-	2	2								
<i>Trachylepis punctatissima</i>	Speckled Rock Skink	LC (S)	2LC	-	2	2								
<i>Trachylepis varia</i>	Variable Skink	-	2LC	-	2	2								
TESTUDINIDAE	Tortoises													
<i>Homopus femoralis</i>	Greater Dwarf Tortoise	-	1LC	-	3	3								
<i>Stigmochelys pardalis</i>	Leopard Tortoise	-	1LC	-	3	3								
TYPHLOPIDAE	Blind snakes													
<i>Rhinotyphlops lalandei</i>	Delalande's Beaked Blind Snake	-	2LC	-	2	2								
VARANIDAE	Monitors													



FAMILY & SCIENTIFIC NAME	COMMON NAME	CONSERVATION STATUS										HABITAT			
		GLOBAL IUCN	S.A. RED DATA	S.A. NEM:BA	REGIONAL LoO	BEATRIX	1, 2 & 3 SHAFT	4 SHAFT	WOLVE/RIETPAN	VICINITY	SAVANNA	GRASSLAND	WETLAND	ALIEN	BUILT
<i>Varanus albigularis albigularis</i>	Southern Rock Monitor	-	2LC	-	3	3									
<i>Varanus niloticus</i>	Nile Monitor	-	2LC	-	3	1	1						x		
VIPERIDAE	Adders														
<i>Bitis arietans arietans</i>	Puff Adder	-	2LC	-	2	1		1					x		

Status: 1 = Global; 2 = Regional; D = Declining; LC = Least Concern; S = Stable; U = Unknown population trend
Likelihood of Occurrence (LoO): 1 = Present; 2 = High; 3 = Moderate; 4 = Low
Sources: Branch (1990); IUCN (2013); Bates *et al.* (2014); ToPS List (2015); ReptileMAP (2016)



5.4. List of frog species for the Beatrix region

FAMILY & SCIENTIFIC NAME	COMMON NAME	CONSERVATION STATUS										HABITAT		
		GLOBAL IUCN	S.A. RED DATA	S.A. NEM:BA	REGIONAL LoO	BEATRIX	1, 2 & 3 SHAFT	4 SHAFT	WOLVE/RIETPAN	VICINITY	SAVANNA	GRASSLAND	WETLAND	ALIEN
BUFONIDAE	True toads													
<i>Amietophrynus gutturalis</i>	Guttural Toad	LC (I)	LC	-	2	2								
<i>Amietophrynus poweri</i>	Western Olive Toad	LC (U)	LC	-	2	1				x		x		
<i>Amietophrynus rangeri</i>	Raucous Toad	LC (D)	LC	-	2	2								
<i>Poyntonophrynus vertebralis</i>	Southern Pygmy Toad	LC (U)	LC	-	3	3								
<i>Schismaderma carens</i>	Red Toad	LC (U)	LC	-	3	3								
HYPEROLIIDAE	Reed frogs & relatives													
<i>Kassina senegalensis</i>	Bubbling Kassina	LC (U)	LC	-	2	1		1				x		
<i>Semnodactylus wealii</i>	Rattling Frog	LC (U)	LC	-	3	3								
PHRYNOBATRACHIDAE	Puddle frogs & relatives													
<i>Phrynobatrachus natalensis</i>	Snoring Puddle Frog	LC (S)	LC	-	3	4								
PIPIDAE	Platannas / Clawed frogs													
<i>Xenopus laevis</i>	Common Platanna	LC (I)	LC	-	2	1	1							x
PYXICEPHALIDAE	River, stream & other frogs													
<i>Amietia angolensis</i>	Common River Frog	LC (S)	LC	-	2	3								
<i>Amietia fuscigula</i>	Cape River Frog	LC (S)	LC	-	2	3								
<i>Cacosternum boettgeri</i>	Boettger's Caco	LC (U)	LC	-	2	1	1	1	1			x		
<i>Pyxicephalus adspersus</i>	Giant Bullfrog	LC (D)	NT	PS	2	1			1	1		x		x
<i>Tomopterna cryptotis</i>	Tremolo Sand Frog	LC (S)	LC	-	2	1			1	1		x	x	x
<i>Tomopterna natalensis</i>	Natal Sand Frog	LC (U)	LC	-	2	3								
<i>Tomopterna tandyi</i>	Tandy's Sand Frog	LC (U)	LC	-	2	2								

Status: D = Declining; I = Increasing; LC = Least Concern; NT = Near Threatened; PS = Protected Species; S = Stable; U = Unknown population trend;

Likelihood of Occurrence (LoO): 1 = Present; 2 = High; 3 = Moderate; 4 = Low

Sources: Minter *et al.* (2004); ToPS List (2007); Du Preez & Carruthers (2009); Measey (2011); IUCN (2013); FrogMAP (2016)

5.5. List of butterfly species for the Beatrix region

SCIENTIFIC NAME	COMMON NAME	CONSERVATION STATUS					HABITAT								
		GLOBAL IUCN	S.A. RED DATA	S.A. NEM:BA	REGIONAL Loo	BEATRIX	1, 2 & 3 SHAFT	4 SHAFT	WOLVE/RIETPAN	VICINITY	SAVANNA	GRASSLAND	WETLAND	ALIEN	BUILT
HESPERIIDAE	Skippers & relatives														
<i>Borbo gemella</i>	Twin Swift	-	1LC	-	2										
<i>Coeliades forestan forestan</i>	Striped Policeman	-	1LC	-	2										
	Common Hottentot														
<i>Gegenes niso niso</i>	Skipper	-	1LC	-	3										
<i>Gegenes pumilio gambica</i>	Dark Hottentot	-	1LC	-	3										
<i>Kedestes lepenula</i>	Chequered Ranger	-	1LC	-	3										
<i>Spialia agylla agylla</i>	Grassveld Sandman	-	1LC	-	3										
<i>Spialia asterodia</i>	Star Sandman	-	1LC	-	2										
<i>Spialia diomus ferax</i>	Common Sandman	-	1LC	-	2										
<i>Spialia dromus</i>	Forest Sandman	-	1LC	-	3										
<i>Spialia mafa mafa</i>	Mafa Sandman	-	1LC	-	2										
<i>Spialia nanus</i>	Dwarf Sandman	-	1LC	-	3										
<i>Spialia spio</i>	Mountain Sandman	-	1LC	-	2										
LYCAENIDAE	Blues, Coppers, Opals & relatives														
<i>Aloeides aranda</i>	Aranda Copper	-	1LC	-	3										
<i>Aloeides damarensis damarensis</i>	Damara Copper	-	1LC	-	2										
<i>Aloeides dentatis maseruna</i>	Roodepoort Copper	-	1LC	-	3										
<i>Aloeides henningi</i>	Henning's Copper	-	1LC	-	2										
<i>Aloeides pierus</i>	Dull Copper	-	1LC	-	2										
<i>Aloeides trimeni southeyae</i>	Trimeni's Copper	-		-	2										
<i>Anthene livida livida</i>	Pale Hairtail	-	1LC	-	2										
<i>Azanus jesous</i>	Topaz Babul Blue	-	1LC	-	2										
<i>Azanus moriqua</i>	Thorn-tree Babul Blue	-	1LC	-	2										
	Velvet-spotted Babul														
<i>Azanus ubaldus</i>	Blue	-	1LC	-	2	1	1				x	x			
<i>Cacyreus fracta fracta</i>	Water Bronze	-	1LC	-	2										

SCIENTIFIC NAME	COMMON NAME	CONSERVATION STATUS					HABITAT							
		GLOBAL IUCN	S.A. RED DATA	S.A. NEM:BA	REGIONAL Loo	BEATRIX	1, 2 & 3 SHAFT	4 SHAFT	WOLVE/RIETPAN	VICINITY	SAVANNA	GRASSLAND	WETLAND	ALIEN
<i>Cacyreus marshalli</i>	Common Geranium Bronze	-	1LC	-	2									
<i>Chilades trochylus</i>	Grass Jewel	-	1LC	-	2									
<i>Cigaritis ella</i>	Ella's Bar	-	1LC	-	3									
<i>Cigaritis natalensis</i>	Natal Bar	-	1LC	-	3									
<i>Crudaria leroma</i>	Silver Spotted Grey	-	1LC	-	2									
<i>Cupidopsis jobates jobates</i>	Tailed Meadow Blue	-	1LC	-	2	1				x	x			
<i>Eicochrysops messapus mahallakoaena</i>	Cupreous Blue	-	1LC	-	2									
<i>Lampides boeticus</i>	Pea Blue	-	1LC	-	2									
<i>Lepidochrysops ketsi ketsi</i>	Ketsi Blue	-	1LC	-	3									
<i>Lepidochrysops letsea</i>	Free State Blue	-	1LC	-	2									
<i>Lepidochrysops ortygia</i>	Koppie Blue	-	1LC	-	3									
<i>Lepidochrysops patricia</i>	Patricia Blue	-	1LC	-	2									
<i>Lepidochrysops plebeia plebeia</i>	Twin-spot Blue	-	1LC	-	2									
<i>Leptomyrina henningi henningi</i>	Henning's Black-eye	-	1LC	-	2									
<i>Leptotes pirithous pirithous</i>	Common Zebra Blue	-	1LC	-	2									
<i>Lycaena clarki</i>	Eastern Sorrel Copper	-	1LC	-	2									
<i>Oraidium barberae</i>	Dwarf Blue	-	1LC	-	2									
	Bowker's Marbled													
<i>Stugeta bowkeri henningi</i>	Sapphire	-	1LC	-	3									
<i>Tarucus sybaris linearis</i>	Dotted Blue	-	1LC	-	2									
<i>Thestor basutus basutus</i>	Basotho Skolly	-	1LC	-	2	1				x	x			
<i>Thestor protumnus aridus</i>	Boland Skolly	-	1LC	-	2									
<i>Zintha hintza hintza</i>	Hintza Pierrot	-	1LC	-	2	1				x	x			
<i>Zizeeria knysna knysna</i>	Sooty Blue	-	1LC	-	2									
<i>Zizula hylax</i>	Gaika Blue	-	1LC	-	2									
NYMPHALIDAE	Acraeas, Browns, Charaxes & relatives													
<i>Acraea lygus</i>	Lygus Acraea	-	1LC	-	2									

SCIENTIFIC NAME	COMMON NAME	CONSERVATION STATUS					HABITAT								
		GLOBAL IUCN	S.A. RED DATA	S.A. NEM:BA	REGIONAL Loo	BEATRIX	1, 2 & 3 SHAFT	4 SHAFT	WOLVE/RIETPAN	VICINITY	SAVANNA	GRASSLAND	WETLAND	ALIEN	BUILT
<i>Acraea natalica</i>	Natal Acraea	-	1LC	-	3										
	Wandering Donkey														
<i>Acraea neobule neobule</i>	Acraea	-	1LC	-	2										
<i>Acraea stenobea</i>	Suffused Acraea	-	1LC	-	2										
<i>Aeropetes tulbaghia</i>	Table Mountain Beauty	-	1LC	-	3										
<i>Byblia ilithyia</i>	Spotted Joker	-	1LC	-	2										
<i>Catacroptera cloanthe cloanthe</i>	Pirate	-	1LC	-	3										
<i>Charaxes jasius saturnus</i>	Foxy Charaxes	-	1LC	-	3										
<i>Danaus chrysippus orientis</i>	African Monarch	-	1LC	-	2	1	1	1	1	1	x	x		x	
<i>Hypolimnas misippus</i>	Common Diadem	-	1LC	-	2										
<i>Junonia hierta cebrene</i>	Yellow Pansy	-	1LC	-	2										
<i>Junonia oenone oenone</i>	Blue Pansy	-	1LC	-	2										
<i>Junonia orithya madagascariensis</i>	Eyed Pansy	-	1LC	-	2										
<i>Melanitis leda</i>	Twilight Brown	-	1LC	-	2										
<i>Phalanta phalantha aethiopica</i>	African Leopard	-	1LC	-	2										
<i>Physcaeneura panda</i>	Dark-webbed Ringlet	-	1LC	-	3										
<i>Precis archesia archesia</i>	Garden Commodore	-	1LC	-	3										
<i>Telchinia rahira rahira</i>	Marsh Acraea	-	1LC	-	2										
<i>Telchinia serena</i>	Dancing Acraea	-	1LC	-	2										
<i>Vanessa cardui</i>	Painted Lady	-	1LC	-	2										
PAPILIONIDAE	Swallowtails & relatives														
<i>Papilio demodocus demodocus</i>	Citrus Swallowtail	-	1LC	-	2										
	Whites, Yellows & relatives														
PIERIDAE															
<i>Belenois aurota</i>	Brown-veined White	-	1LC	-	2										
<i>Belenois creona severina</i>	African Common White	-	1LC	-	3										
<i>Catopsilia florella</i>	African Migrant	-	1LC	-	2	1	1	1			x	x			
<i>Colias electo electo</i>	African Clouded Yellow	-	1LC	-	2										
<i>Colotis evenina evenina</i>	Orange Tip	-	1LC	-	2										

SCIENTIFIC NAME	COMMON NAME	CONSERVATION STATUS					HABITAT							
		GLOBAL IUCN	S.A. RED DATA	S.A. NEM:BA	REGIONAL LoO	BEATRIX	1, 2 & 3 SHAFT	4 SHAFT	WOLVE/RIETPAN	VICINITY	SAVANNA	GRASSLAND	WETLAND	ALIEN
<i>Eurema brigitta brigitta</i>	Broad-bordered Grass Yellow	-	1LC	-	2	1	1				x			
<i>Mylothris agathina agathina</i>	Common Dotted Border	-	1LC	-	2									
<i>Pinacopteryx eriphia eriphia</i>	Zebra White	-	1LC	-	2									
<i>Pontia helice helice</i>	Common Meadow White	-	1LC	-	2									
<i>Teracolus agoye agoye</i>	Speckled Sulphur Tip	-	1LC	-	2									
<i>Teracolus subfasciatus</i>	Lemon Traveller	-	1LC	-	2									

Status: 1 = Global; 2 = Regional; LC = Least Concern

Likelihood of Occurrence (LoO): 1 = Present; 2 = High; 3 = Moderate; 4 = Low

Sources: Woodhall (2005); ToPS List (2007); Mecenero *et al.* (2013); IUCN (2015); LepiMAP (2016)



5.6. List of scorpion species for the Beatrix region

FAMILY & SCIENTIFIC NAME	COMMON NAME	CONSERVATION STATUS		HABITAT										
		GLOBAL IUCN	S.A. NEM:BA	REGIONAL LoO	BEATRIX	1, 2 & 3 SHAFT	4 SHAFT	WOLVE/RIETPAN	VICINITY	SAVANNA	GRASSLAND	WETLAND	ALIEN	BUILT
BOTHURIDAE	Namibian scorpions													
BUTHIDAE	Thick-tailed scorpions & relatives													
<i>Parabuthus mossambicensis</i>	Mozambique Thick-tailed Scorpion	-	-	3	3									
<i>Uroplectes carinatus</i>	Carinated Bark Scorpion	-	-	3	3									
<i>Uroplectes triangulifer</i>	Highveld Lesser Thick-tailed Scorpion	-	-	2	1		x				x			
ISCHNURIDAE	Rock scorpions & relatives													
SCORPIONIDAE	Burrowing scorpions & relatives													
<i>Opisththalmus carinatus</i>	Robust Burrowing Scorpion	-	-	3	4									

Status: PS = Protected Species

Likelihood of Occurrence (LoO): 1 = Present; 2 = High; 3 = Moderate; 4 = Low

Sources: Leeming (2003); IUCN (2014); ToPS List (2015)

5.7. List of odonata species for the Beatrix region

FAMILY & SCIENTIFIC NAME	COMMON NAME	BIOTIC INDEX	GLOBAL IUCN	S.A. RED DATA	S.A. NEM:BA	CONSERVATION STATUS											
						REGIONAL LOO	BEATRIX	1, 2 & 3 SHAFT	4 SHAFT	WOLWE/RIETPAN	VICINITY SAVANNA	GRASSLAND	WETLAND	ALIEN	BUILT		
LESTIDAE	Spreadwings																
<i>Lestes plagiatus</i>	Highland Spreadwing	2	LC (U)	-	-	3	2										
PROTONEURIDAE	Threadtails																
<i>Elattonaura glauca</i>	Common Threadtail	1	LC (U)	-	-	2	2										
COENAGRIONIDAE	Citrils, Sprites & relatives																
<i>Pseudagrion citricola</i>	Yellow-faced Sprite	3	LC (S)	-	-	3	3										
<i>Pseudagrion salisburyense</i>	Slate Sprite	1	LC (U)	-	-	2	1	1					x				x
<i>Pseudagrion vaalense</i>	Vaal Sprite	5	LC (U)	-	-	3	1	1						x			x
<i>Ischnura senegalensis</i>	Marsh Bluetail	0	LC (S)	-	-	2	1	1									x
<i>Africallagma glaucum</i>	Swamp Bluet	1	LC (U)	-	-	2	1	1									x
<i>Africallagma sapphirinum</i>	Sapphire Bluet	4	LC (I)	-	-	3	4										
AESHNIDAE	Hawkers, Emperors & relatives																
<i>Anax imperator</i>	Blue Emperor	1	LC (S)	-	-	2	2										
<i>Anax speratus</i>	Orange Emperor	2	LC (U)	-	-	3	3										
CORDULIIDAE	Presbas & Cruisers																
<i>Phyllomacromia picta</i>	Darting Cruiser	2	LC (U)	-	-	2	3										
LIBELLULIDAE	Skimmers, Dropwings & relatives																
<i>Orthetrum julia falsum</i>	Julia Skimmer	1	LC (U)	-	-	3	1	1						x			x
<i>Orthetrum trinacria</i>	Long Skimmer	1	LC (U)	-	-	2	1	1						x	x		x
<i>Crocothemis erythraea</i>	Broad Scarlet	0	LC (I)	-	-	2	1	1	1					x	x		x
<i>Sympetrum fonscolombii</i>	Nomad	0	LC (S)	-	-	2	2										
<i>Trithemis arteriosa</i>	Red-veined Dropwing	0	LC (S)	-	-	3	2										
<i>Trithemis dorsalis</i>	Round-hook Dropwing	0	LC (U)	-	-	2	3										
<i>Trithemis kirbyi</i>	Kirby's Dropwing	0	LC (I)	-	-	3	1	1									x
<i>Trithemis stictica</i>	Jaunty Dropwing	1	LC (U)	-	-	2	2										
<i>Pantala flavescens</i>	Pantala	0	LC (S)	-	-	3	1										x

Status: I = Increasing Population Trend; LC = Least Concern; S = Stable population trend; U = Unknown population trend

Likelihood of Occurrence (LoO): 1 = Present; 2 = High; 3 = Moderate; 4 = Low

Sources: Samways (2006); Samways (2008); IUCN (2014); ToPS List (2015)