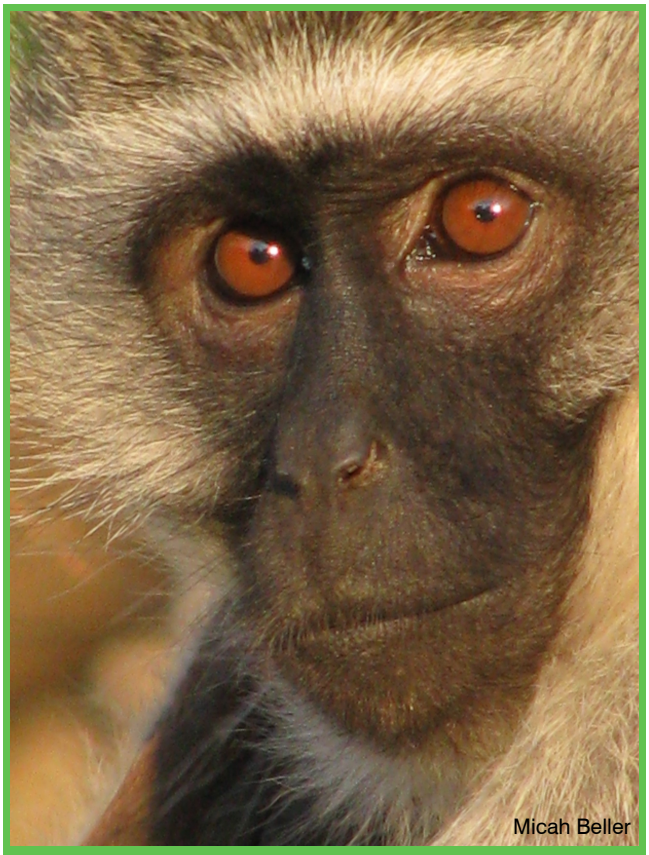
Chlorocebus pygerythrus – Vervet Monkey



Micah Beller

Regional Red List status (2016)	**Least Concern**
National Red List status (2004)	Least Concern
Reasons for change	No change
Global Red List status (2008)	Least Concern
TOPS listing (NEMBA)	None
CITES listing	Appendix II
Endemic	No

The name is borrowed from the French vernacular name of the species, *vervet* (Skinner & Chimimba 2005).

Taxonomy

Chlorocebus pygerythrus (Cuvier 1821)

ANIMALIA - CHORDATA - MAMMALIA - PRIMATES - CERCOPITHECIDAE - *Chlorocebus* - *pygerythrus*

Synonyms: *Cercopithecus pygerythrus* (Cuvier 1821)

Common names: Vervet Monkey (English), Blouaap (Afrikaans), Kgabo (Sepedi, Sesotho, Tswana), Khabo (Sesotho), Ngobiyane, Ingobiyane, Inkawu (Swati), Hacha, Nkawu, Ritoho, Ritohwe (Tsonga), Kgatla (Tswana), Thoho, Thobo (Venda), Inkawu (Xhosa, Zulu)

Taxonomic status: Species

Taxonomic notes: Grubb et al. (2003) regarded this as a subspecies of *C. aethiops*, but it is here treated as a distinct species. Groves (2001; 2005) included this species in *Chlorocebus*, and lists the following subspecies: *C. p. nifvoiridis* [sic] probably *rufoviridis*; *C. p. nesiotes*, *C. p. hilgerti*, *C. p. excubitor*; and *C. p. pygerythrus*. However, only the latter subspecies exists in the assessment region. Other subspecies variously listed in Meester et al. (1986) and Skinner and Smithers (1990) are not included. The relationships of the monkeys within the vervet/grivet group and to other guenons are conflicting. Even though Grubb et al. (2003) retained vervets within the genus *Cercopithecus* (following the advice of the African Primate Working Group), Groves (1989, 2001, 2005) has placed them in the genus *Chlorocebus*. This designation has been followed by most others. Within the group *Chlorocebus*, there is disagreement as to whether the different geographic morphs are subspecies or species. Both Groves (2001) and Skinner and Chimimba (2005) regard them as separate species. Grubb (2006) regards *Chlorocebus* as a geospecies. Using 19.7 million single nucleotide variations (SNV), Warren et al. (2015) found that the differences between animals in different locations are more similar to subspecies differences in other widespread semi-terrestrial primates. Recent work on mtDNA variation finds that although there are differences between local populations, these differences do not rise to the level of subspecific distinctions within the assessment region (Turner et al. 2016).

Assessment Rationale

Listed as Least Concern because this is a very widespread, adaptable and abundant species with no major threats. The species has a degree of habitat tolerance, as evidenced by its wide distribution and adaptation to urban environments. It occurs in both high rainfall habitats such as the coastal dune forests of KwaZulu-Natal and lower rainfall areas such as the riverine woodland areas in the Northern Cape, as well as in agricultural landscapes. Range expansions within the assessment region have been recorded and the conversion to wildlife ranching may be reclaiming habitat for this species. The species is used locally for traditional medicine and bushmeat, but this is not expected to cause widespread population decline.

Regional population effects: This species' range is continuous throughout East Africa and there is suspected to be dispersal along the northern border of South Africa between Botswana, Zimbabwe and Mozambique through the Mapungubwe and Greater Limpopo Transfrontier areas and northeast KwaZulu-Natal. There may also be dispersal across the Namibian and South African borders, although this is yet to be demonstrated by genetic evidence.

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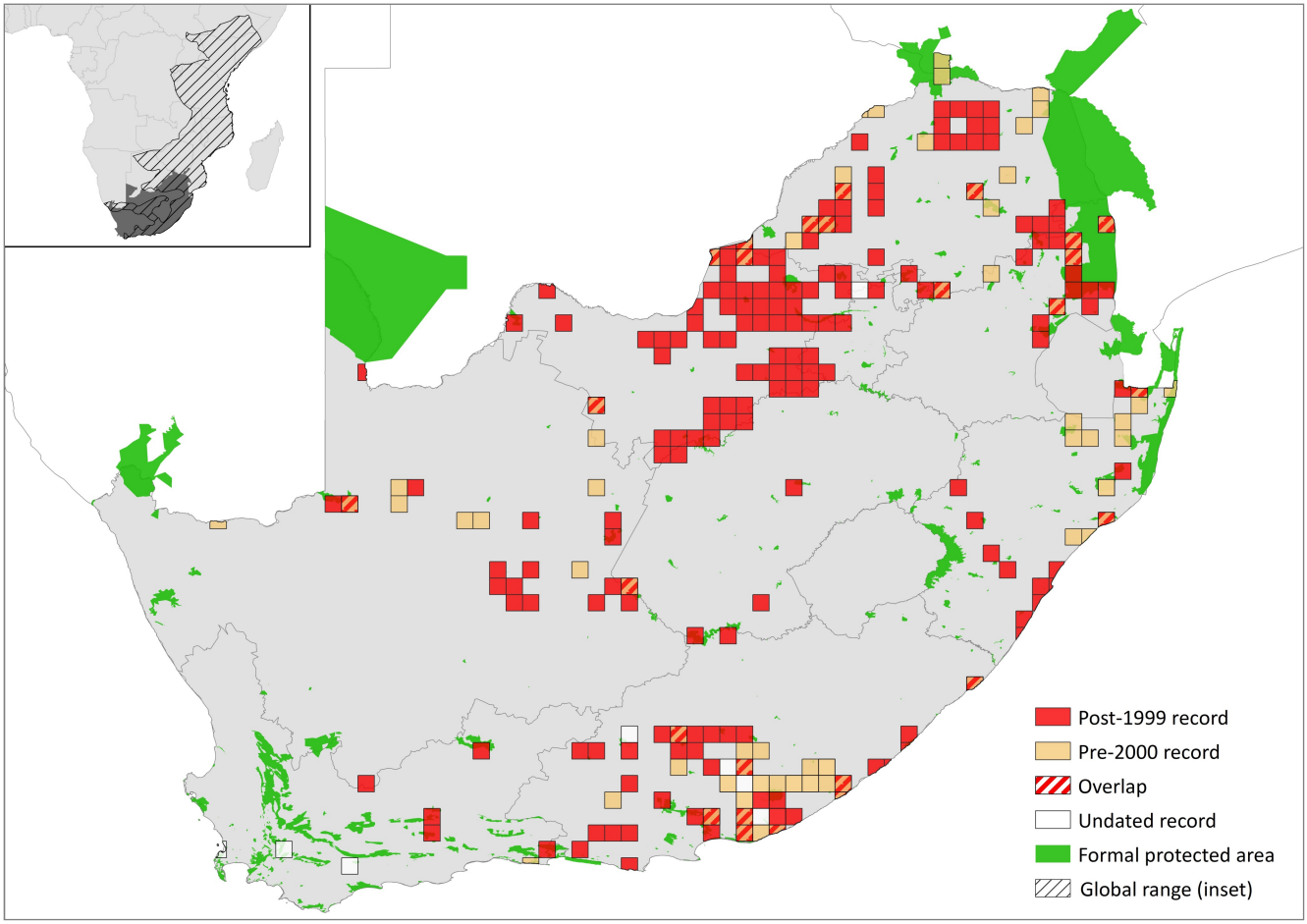

Figure 1. Distribution records for Vervet Monkey (*Chlorocebus pygerythrus*) within the assessment region

Table 1. Countries of occurrence within southern Africa

Country	Presence	Origin
Botswana	Extant	Native
Lesotho	Extant	Native
Mozambique	Extant	Native
Namibia	Extant	Native
South Africa	Extant	Native
Swaziland	Extant	Native
Zimbabwe	Extant	Native

Distribution

Vervet Monkeys are widespread; occurring from the Ethiopian Rift Valley, highlands east of the Rift, and southern Somalia, through the eastern lowlands of Ethiopia, Kenya, Tanzania, Uganda, Zambia (east of the Luangwa Valley), Malawi, Mozambique, Zimbabwe, Botswana and all nine provinces in South Africa (Kingdon et al. 2008). Within the assessment region, they occur as far west as the George and Knysna districts of the Western Cape and they are widely distributed in a variety of habitats including the urban environment (Skinner & Chimimba 2005; Whittaker 2013). The species is also found to occur in Swaziland (Skinner & Chimimba 2005) and Lesotho (Seier 2003).

There are no obvious areas where Vervets have been extirpated. They prefer drier habitats to other species in the genus and are most abundant in savannah riparian vegetation, where they can occur in otherwise inhospitable terrain along rivers, if the riverine woodland is intact to provide fruit-bearing trees and cover (Skinner & Chimimba 2005); which explains their occurrence in the interior of the Northern Cape. They are generally absent from deserts (except riverine vegetation of river systems in deserts e.g. Orange River) and deep forest, preferring savannah, riverine woodland and coastal scrub forest areas (Stuart & Stuart 2001; Skinner & Chimimba 2005; Isbell & Jaffe 2013). They are very common along the Vaal River, and even occur on the whole length of the Molopo River. Within the North West Province, the population has expanded since the 1970s (Power 2014).

Population

The Vervet Monkey is widespread and often abundant. However, it is very patchily distributed over its extensive geographic range, linked to the availability of appropriate sleeping trees and drinking water (Wrangham 1981; McDougall et al. 2010; T.M. Butynski & Y. de Jong pers. comm.). It is regarded as a pest species in cultivated and urban areas in parts of its range (Estes 1991; Grobler et al. 2006; Healy & Nijman 2014).

The species is common throughout most provinces in South Africa. Agriculture provides primates with additional food sources, and crops are intensively raided during scarcity of natural food resources (Lee & Priston 2005). This higher food availability may encourage range expansion, even on the Highveld where agricultural activities may benefit their persistence. They live in multi-male, multi-female groups of up to 70 individuals (Branch

Table 2. Use and trade summary for the Vervet Monkey (*Chlorocebus pygerythrus*)

Category	Applicable?	Rationale	Proportion of total harvest	Trend
Subsistence use	Yes	Bushmeat/traditional medicine.	Unknown	Unknown
Commercial use	Yes	Biomedical research and pet trade.	Negligible	Unknown
Harvest from wild population	Yes	Bushmeat hunting, traditional medicine and pet trade.	All	Unknown
Harvest from ranched population	No	-	-	Unknown
Harvest from captive population	Yes	Biomedical research.	Negligible	Unknown

et al. 2007) with many unrelated males in a group. Normal troop sizes range from 15 to 20 individuals (Branch et al. 2007).

Current population trend: Unknown, although this is under debate.

Continuing decline in mature individuals: No

Number of mature individuals in largest subpopulation: Unknown

Number of subpopulations: Possibly more than 1,000 (no published source for this information).

Severely fragmented: No

Habitats and Ecology

This species is present in a wide variety of savannah, open woodland, and forest-grassland mosaics, where it is dependent on water availability (it must drink daily) and trees for food and cover. It occurs in both high rainfall habitats such as the coastal dune forests of KwaZulu-Natal and lower rainfall areas such as the riverine woodland areas in the Northern Cape (Skinner & Chimimba 2005; Isbell & Jaffe 2013). It is an extremely adaptable and versatile species, able to persist in secondary and/or highly fragmented vegetation, including cultivated areas, and sometimes found living in both rural and urban environments.

Vervet Monkeys are extremely social, living in troops within which adult males form a clear dominance hierarchy. They are largely vegetarian (wild fruits, flowers, leaves and seeds) but are also known to feed on invertebrates, birds' eggs, birds, lizards, rodents and other vertebrate prey. In agricultural areas, they can become pests by eating beans, peas, young tobacco plants, vegetables, fruit and various grains (Skinner & Chimimba 2005).

Ecosystem and cultural services: Vervet Monkeys are good vectors of seed dispersal. Seeds are ingested as food and pass through the monkey's digestive system intact and are excreted some distance away from where they were originally consumed. Foord et al. (1994) found that they aid succession in rehabilitating dune forests by dispersing seeds from unmined to previously mined areas.

Use and Trade

This species is used in traditional medicine where the organs and skin are harvested (Whiting et al. 2011). The meat is also used as bushmeat (Lindsey et al. 2013; Paige et al. 2014). Vervet Monkeys are also taken from the wild to be kept as pets. For example, data from the Vervet Monkey Foundation in Limpopo Province, reveals that 44% of intakes comprises ex-pets (Healy & Nijman 2014). Captive animals are still used in medical research. Harvesting is not suspected to have any negative impact on the population overall.

Wildlife ranching and the private sector have generally had a positive effect on this species as it conserved more suitable habitat and helped to connect subpopulations through game farming areas, for example in the Waterberg. In addition, some large groups have been released on land that has transitioned to wildlife ranching but the overall success and impacts of this are unknown (Wimberger et al. 2010; Guy & Curnoe 2013). A number of properties may combine game ranching with agriculture on parts of their property – where this occurs there is inevitably conflict between people and Vervet Monkeys.

Threats

There are no major threats, although Vervet Monkeys were classed as vermin in parts of their range and they are actively persecuted (shot and hunted) by landowners in areas where they raid crops or interact with humans. For example, they are often intensively persecuted in parts of the North West and KwaZulu-Natal provinces. Large-scale roads with high traffic loads in urbanised areas are also known to cause multiple deaths. For example, most of the injured monkeys taken in by the Vervet Monkey

Table 3. Possible net effects of wildlife ranching on the Vervet Monkey (*Chlorocebus pygerythrus*) and subsequent management recommendations

Net effect	Positive
Data quality	Anecdotal
Rationale	Wildlife ranching may be creating additional habitat for the species.
Management recommendation	Reintroduction onto private land or wildlife ranches should follow the IUCN Reintroduction guidelines. Currently the success of reintroductions is unknown.

Table 4. Threats to the Vervet Monkey (*Chlorocebus pygerythrus*) ranked in order of severity with corresponding evidence (based on IUCN threat categories, with regional context)

Rank	Threat description	Evidence in the scientific literature	Data quality	Scale of study	Current trend
1	*5.1.3 Hunting & Collecting Terrestrial Animals*: direct persecution for crop raiding.	Wimberger et al. 2010	Attitudinal (landowner reports)	Local	Unknown
		Healy & Nijman 2014	Empirical	Local	
		Power 2014	Attitudinal (landowner reports)	Regional	
2	*5.1.1 Hunting & Collecting Terrestrial Animals*: bushmeat and traditional medicine use; capture for pet trade.	Whiting et al. 2011	Empirical	Local	Possibly increasing with settlement expansion.
		Healy & Nijman 2014	Empirical	Local	
		Paige et al. 2014	Empirical	Local	
3	*4.1 Roads & Railroads*: mortalities from vehicle collisions on roads.	Healy & Nijman 2014	Empirical	Local	Unknown, but possibly increasing.

Foundation in Limpopo Province suffered injuries caused by car strikes (Healy & Nijman 2014). They are also often reported as a problem in the many large provincial towns, and they are frequently removed (Power 2014). Vervet Monkeys are found to be a source of bushmeat in some areas. For example, Paige et al. (2014) found that Vervet Monkeys were the most frequently butchered primate for bushmeat in the study area in Uganda. They are also used as traditional medicine within the assessment region. For example, Vervet Monkeys were traded by half of the traders in the market investigated by Whiting et al. (2011).

Current habitat trend: An adaptable and versatile species with documented range expansions (Power 2014). Agricultural activities may benefit their persistence.

Conservation

The Vervet Monkey is listed on Appendix II of CITES and on Class B of the African Convention on the Conservation of Nature and Natural Resources. It is present in most protected areas within its range within the assessment region. No specific conservation interventions are necessary at present.

It is not necessary to develop captive breeding programmes. Many wildlife care programmes, such as the Centre for Rehabilitation of Wildlife (CROW), The Vervet Monkey Foundation, Riverside Rehabilitation and Education Centre and Bambelela have large holdings of Vervet Monkeys that have been shot, injured or orphaned in the urban, suburban environment. Reintroducing these monkeys to the wild is a significant challenge since there are few suitable localities able or willing to take them. There are also ethical issues about releasing monkeys into areas with existing populations, and releases into areas without existing populations may have problems of poor habitat suitability or high threats/mortality. Release of rehabilitated individuals into suitable areas should follow guidelines suggested by Guy and Curnoe (2013) which begins with the IUCN SSC guidelines and specifically targets them for primates. Various factors, such as habitat status, native population distribution and demographic status, genetic status of the native animals and the release stock, should be considered before reintroductions are initiated (Baker 2002). For example, while some reintroductions have been successful in KwaZulu-Natal Province, as released animals exhibited wild behaviours and established home ranges, success could be enhanced by ensuring troop composition mimics wild troops and excludes ex-pet individuals (Guy et al. 2012). Smaller reintroduced troops have also been shown to be more successful than larger troops, with only 6 of 35

Table 5. Conservation interventions for the Vervet Monkey (*Chlorocebus pygerythrus*) ranked in order of effectiveness with corresponding evidence (based on IUCN action categories, with regional context)

Rank	Intervention description	Evidence in the scientific literature	Data quality	Scale of evidence	Demonstrated impact	Current conservation projects
1	*1.1 Site/Area Protection*: form conservation areas, protected environments and nature reserves as defined by the Protected Areas Act (No. 57 of 2003) to increase the number of sites for reintroduction.	-	Anecdotal	-	-	-
2	*2.3 Habitat & Natural Process Restoration*: in situ conservation of natural areas and indigenous gardens already occupied by Vervet Monkeys.	-	Anecdotal	-	-	-
3	*3.3.1 Species Reintroduction*: reintroduce troops into areas where they have become locally extinct.	Wimberger et al. 2010	Empirical	Local	Overall successful but could be improved.	-
		Guy et al. 2012	Empirical	Local		

individuals (17%) confirmed alive in a large troop compared with 12 of 24 (50%) in a small troop reintroduced in KwaZulu-Natal Province (Wimberger et al. 2010). Landowners are encouraged to form conservancies to increase the number of suitable sites for reintroduction.

Recommendations for land managers and practitioners:

- Wild population management: They are regarded as problem animals and management of wild populations is necessary to reduce their risk of becoming a problem. In a number of cases managing the human population (in terms of waste management for example) could reduce the need to manage the wildlife.
- Improve reintroduction techniques by radio-collaring released individuals (Guy et al. 2012).
- Form conservancies to increase the number of suitable sites for reintroduction.

Research priorities:

- Taxonomic work is required to assess the validity of proposed subspecies.
- Human-primate interface and ethnoprimatology.
- Actual population size estimates are needed (total and regional), which can be used in conjunction with the distribution map to identify potential release sites for rehabilitated and/or damage-causing animals.
- Home range use and dietary studies within urban environments.
- Further studies into potential negative impact on indigenous birdlife.

Existing conservation and research projects include:

- Primate & Predator Project: Dr Russell Hill Durham University, UK.
- Inkawu Vervet Project
- Loskop Dam Nature Reserve: Applied Behavioural Ecology and Ecosystems Research Unit (ABEERU), University of South Africa.
- International Consortium for Vervet Monkey Research, Genetics and Life History of Vervet Monkeys, Professor Trudy Turner, UWM, Dr. Christopher Schmitt, Boston University, Dr. Nelson Freimer and Dr. Anna Jasinska, UCLA.
- Spatial ecology of Vervet Monkeys in urban areas of KwaZulu-Natal, Professor Colleen Downs, Dr Riddhika Kalle and Ph.D. student Lindsay Patterson, UKZN.

Data Sources and Quality

Table 6. Information and interpretation qualifiers for the Vervet Monkey (*Chlorocebus pygerythrus*) assessment

Data sources	Field study (literature, unpublished)
Data quality (max)	Estimated
Data quality (min)	Inferred
Uncertainty resolution	Best estimate
Risk tolerance	Evidentiary

Encouraged citizen actions:

- Members of the public are encouraged to report sightings of free-roaming individuals outside private lands or protected areas on virtual museum platforms (for example, iSpot and MammalMAP) to enhance the distribution map.
- Landowners should create conservancies to increase the number of sites suitable for reintroduction.

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Details of the methods used to make this assessment can be found in *Mammal Red List 2016: Introduction and Methodology.*