Georychus capensis – Cape Mole-rat


Heike Lutermann

Regional Red List status (2016)	**Least Concern**
KZN subpopulation	**Data Deficient***
Mpumalanga subpopulation	**Data Deficient***
National Red List status (2004)	Least Concern
KZN subpopulation	Endangered D
Mpumalanga subpopulation	Not Evaluated
Reasons for change	No change
KZN subpopulation	New information
Mpumalanga subpopulation	New information
Global Red List status (2016)	Least Concern
KZN subpopulation	Not Evaluated
Mpumalanga subpopulation	Not Evaluated
TOPS listing (NEMBA) (2007)	None
CITES listing	None
Endemic	Yes

*Watch-list Data

The Cape Mole-rat uses seismic communication to attract a mate. Males drum at a different frequency to females (Bennett & Jarvis 1988; Narins et al. 1992).

Taxonomy

Georychus capensis (Pallas 1778)

ANIMALIA - CHORDATA - MAMMALIA - RODENTIA - BATHYERGIDAE - *Georychus* - *capensis*

Synonyms: *Mus buffoni* (Cuvier 1834), *Georychus capensis canescens* (Thomas & Schwann 1906), *Fossor leucops* (Lichtenstein 1844), *Georychus yatesi* (Roberts 1913)

Common names: Cape Mole-rat, Cape Blesmol (English), Kaapse Blesmol (Afrikaans)

Taxonomic status: Species and subpopulations

Taxonomic notes: The subpopulations from KwaZulu-Natal (Honeycutt et al. 1987; Nevo et al. 1987; J.H. Visser unpubl. data) and Mpumalanga (C.G. Faulkes & N.C. Bennett unpubl. data; J.H. Visser unpubl. data) are genetically distinct from each other, and ongoing molecular research is uncovering at least two lineages in the Western Cape (J.H. Visser unpubl. data). The KwaZulu-Natal (Honeycutt et al. 1987; Nevo et al. 1987; J.H. Visser unpubl. data) and Mpumalanga (J.H. Visser unpubl. data) populations are considered worthy of species status, and other lineages may constitute species too. However, further research and taxonomic resolution for all subpopulations is needed.

Assessment Rationale

As a relatively common species, the Cape Mole-rat is currently listed as Least Concern. It is widely distributed across the southwestern regions of South Africa and along the southern coastline into the Eastern Cape Province, and can occupy human-modified landscapes although it requires certain ecological variables to be met. Additionally, separate, disjunct subpopulations occurring in isolated localities in KwaZulu-Natal and Mpumalanga provinces have been identified, but are rarely recorded. There are no current data on population size or trend, and it is uncertain whether habitat loss and degradation is a threat to the species. Climate change may threaten the fragmented subpopulations by reducing suitable habitat in the future. Further research on the taxonomic and conservation status of these subpopulations is underway, and the status of the subpopulations should be reassessed once species status is clear.

Distribution

Limited to the mesic regions of South Africa, mostly with annual rainfall levels above 500 mm (except in Nieuwoudtville, Citrusdal, Moorreesburg and Worcester), the Cape Mole-rat has a discontinuous distribution across the southwestern regions of South Africa. Its range extends northwards from the Cape Peninsula (Western Cape Province) to Citrusdal and Nieuwoudtville in the Northern Cape Province, and eastwards beyond Port Elizabeth to Bathurst (Bennett 2013) (Figure 1). Fossil evidence suggests that it once had a much wider distribution (Hendey 1969; Klein 1974; Avery 1998), which contracted during the Quaternary (Klein 1974; Avery 1991). Populations in Mpumalanga and KwaZulu-Natal provinces might therefore be geographical relicts (Avery 1991).

There are several additional isolated subpopulations, in southern KwaZulu-Natal along the border of Lesotho (specifically Nottingham Road and Impendle) and across central Mpumalanga (specifically Belfast, Ermelo and Wakkerstroom) (Figure 1). The Tafelkop locality (Wakkerstroom) is a known subpopulation, but field surveys are required to locate new subpopulations in the

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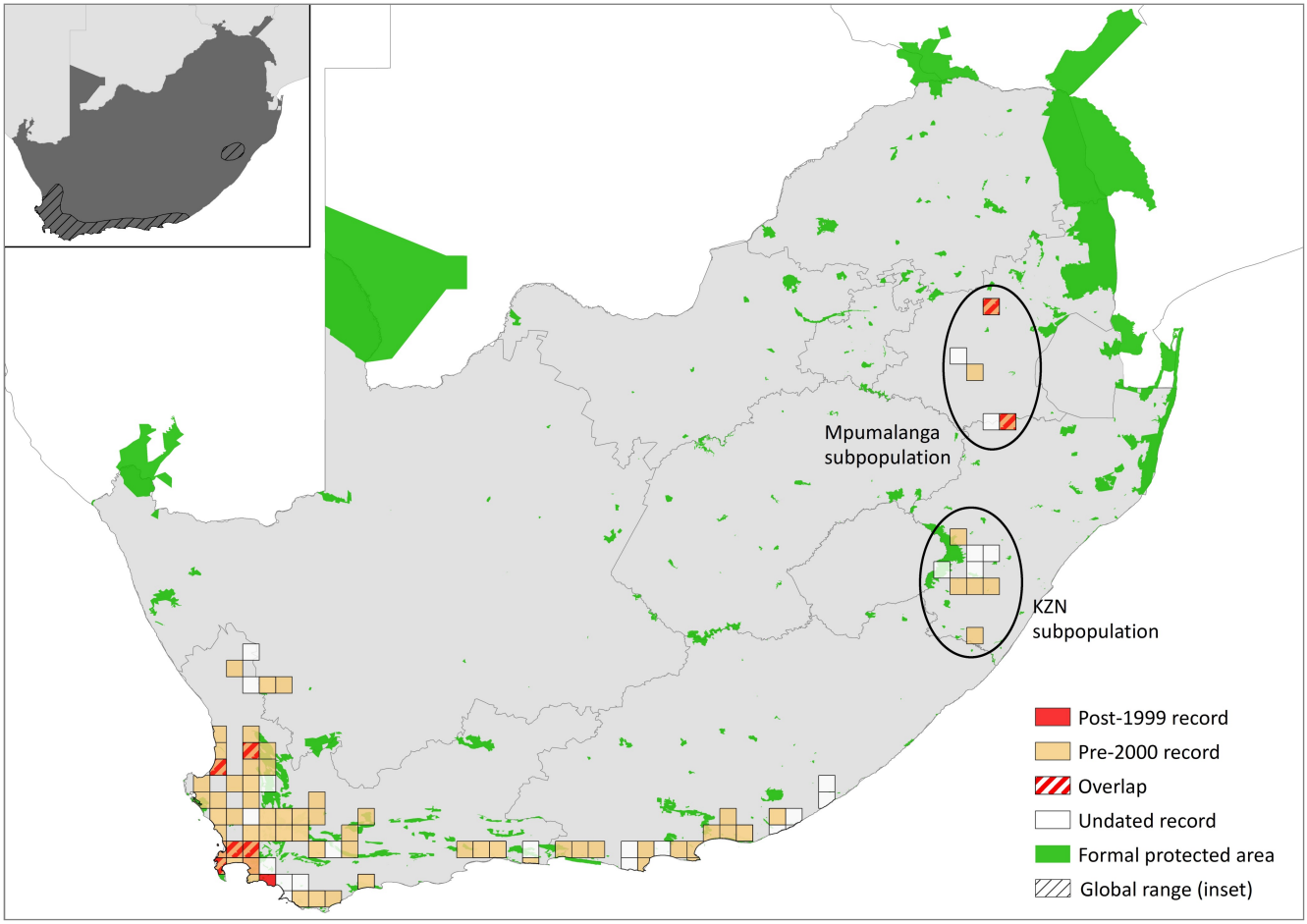

Figure 1. Distribution records for Cape Mole-rat (*Georychus capensis*) within the assessment region

Table 1. Countries of occurrence within southern Africa

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

Wakkerstroom area (L. Cohen pers. comm. 2016). The presence of the subpopulation in Belfast was confirmed in 2015.

The species has not been recorded from Lesotho (Lynch 1994). Previous research suggests that this species once ranged along South Africa's east coast (Avery 1991; Taylor 1998). Estimated extent of occurrence is 6,989 km^2 and 5,725 km^2 for the KZN and Mpumalanga subpopulations respectively.

Population

The Cape Mole-rat is considered to be a common, localised species, with population densities occasionally exceeding 30 individuals / km^2 in the Cape Town region (N.C. Bennett unpubl. data). Naturally fragmented subpopulations have been identified in montane habitats of KwaZulu-Natal and Mpumalanga. Areas outside the known localities remain poorly sampled and thus it is possible that intermediate subpopulations exist which have not been discovered.

Current population trend: Stable (*G. capensis*); unknown (*G. capensis* – KZN and Mpumalanga subpopulations).

Continuing decline in mature individuals: Unknown

Number of mature individuals in population: Unknown

Number of mature individuals in largest subpopulation: Unknown

Number of subpopulations: Unknown

Severely fragmented: No (*G. capensis*). Yes (*G. capensis* KZN and Mpumalanga subpopulations). These populations may have been left behind with past climate change as they are often associated with fynbos and/or grassland components.

Habitats and Ecology

The Cape Mole-rat prefers deep, sandy soils, particularly coastal dunes and sandy alluvial deposits along rivers and montane areas of the Western Cape, Eastern Cape (Skinner & Chimimba 2005) and Mpumalanga (Visser et al. *in press*) provinces. Generally, *G. capensis* is located in mesic areas receiving over 500 mm of rainfall per year. This species is commonly recorded in human-modified environments, such as golf courses, gardens and even at the main campus of the University of Cape Town. However, it is thought to be a habitat specialist that requires areas with vleis or in close proximity to rivers (Visser et al. *in press*). Similarly, its breeding pattern is

Photo 1. Cape Mole-rat in Belfast, Mpumalanga subpopulation (Source: Narda Vermaak)

linked to seasonal rainfall, possibly resulting in distinct breeding seasons for different subpopulations (Visser et al. *in press*). In the Western Cape Province, this species is found sympatrically with the Common Mole-rat, *Cryptomys hottentotus.* The subpopulation in Mpumalanga has been recorded in montane grassland areas consisting of red clay and black turf soils (Bronner 1990), and loose or sandy soils around pans (Roberts 1951). The subpopulation in KwaZulu-Natal Province occurs within mesic grasslands on sandy or clay soils, particularly in the midlands (for example, Impendle and Nottingham Road). Overall, the most commonly preferred soil types are derived from sandstone, limestone, shale and quartzite which comprise the sandy loam, clay and alluvium soils that are inhabited (Visser et al. *in press*). Predominantly solitary, the Cape Mole-rat produces two litters of between four and ten young each year (Bennett & Jarvis, 1988), with a generation length of four years (N.C. Bennett unpubl. data). They are solitary and burrow about 200 mm below the surface (Skinner & Chimimba 2005), and may store food, such as geophytes, in underground chambers (du Toit et al. 1985). They mainly eat plant storage organs. The seismic signal consists of a series of long bursts of very rapid drums (Bennett & Jarvis 1988).

Ecosystem and cultural services: As excellent soil engineers, the burrowing activities of subterranean Mole-rats can lead to modification of soil properties, thus enhancing the species richness of vegetation communities (Hagenah & Bennett 2013). Specifically, in the Western Cape, soils of Cape Mole-rat mounds were found to have higher nitrogen and magnesium levels, when compared to soils unaffected by Mole-rats (Hagenah & Bennett 2013). An increase in species richness, as a result subterranean Mole-rats in the Cape Floristic Region, may be particularly important considering the high conservation value of this area. Additionally, they create refuges for other species to use when escaping fire, and limit surface runoff of water by lowering the compactness of soil, thus increasing drainage and moisture-holding capacity (Hagenah & Bennett 2013).

Use and Trade

This species is not traded or utilised in any way, aside from limited numbers of individuals collected for laboratory research, but this has no impact on the population. *G. capensis* is not used to supplement protein intake by humans.

Threats

No major threats to this species have been identified in the Western Cape. The threats associated with loss in habitat quantity and quality due to the development of timber plantations and afforestation in the midlands and montane grasslands of KwaZulu-Natal and Mpumalanga have been stabilised (no further plantations planned), and are no longer regarded as major dangers to this species. However, afforestation makes the soils on which this species depends less suitable (Armstrong et al. 1998), and has thus effectively reduced area of occupancy. The

Table 2. Threats to the Cape Mole-rat (*Georychus capensis*) 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	*3.2 Mining & Quarrying*: habitat loss from mining expansion.	Neke & du Plessis 2004; MTPA 2014; Jewitt et al. 2015	Indirect (remote sensing and mining applications)	Regional	Increasing
2	*2.1.3 Annual & Perennial Non-timber Crops*: habitat loss from agricultural expansion. Current stress *1.3 Indirect Ecosystem Effects*: fragmentation of remaining habitat.	Neke & du Plessis 2004; MTPA 2014; Jewitt et al. 2015	Indirect (remote sensing)	Regional	Stable
3	*7.1.3 Fire & Fire Suppression*: habitat quality reduction from inappropriate burning regimes, affecting food availability.	-	Anecdotal	-	Unknown
4	*2.2.2 Wood & Pulp Plantations*: habitat loss from timber plantations. Current stresses *1.2 Ecosystem Degradation* and *1.3 Indirect Ecosystem Effects*: fragmentation and reduction of habitat quality in remaining patches.	Neke & du Plessis 2004; Armstrong et al. 1998; MTPA 2014; Jewitt et al. 2015	Indirect (remote sensing)/review	Regional	Stable
5	*11.1 Habitat Shifting & Alteration*: climate change impacting habitat suitability.	Midgley et al. 2002; Hulme et al. 2001	Simulation	National	Increasing

isolated subpopulations in Mpumalanga may face increasing threats of habitat loss and degradation as a result of mining, agriculture, and human settlements, where 77% of the grassland patches are < 10 km^2 in size (Neke & du Plessis 2004). The KwaZulu-Natal subpopulation is very rarely seen in gardens, which suggests it will not adapt to human-modified landscapes. This species faces an additional threat of predation by dogs in urban and some rural areas, as well as persecution by farmers and home owners who view this species as a pest, particularly within small scale vegetable gardens. Overall, ongoing habitat loss and fragmentation from agricultural, human settlement and industrial expansion, combined with alien vegetation infestation and incorrect fire regimes, may be causing a decline in the two subpopulations.

Current habitat trend: Stable (*G. capensis*); unknown (*G. capensis* – KwaZulu-Natal and Mpumalanga subpopulations). Overall, there was a 20.4% loss of natural habitat from 1994 to 2011, with an average loss of 1.2% per annum, due primarily to agriculture (5.2% increase; 4,962 km^2), but also plantations, built environments and settlements, mines and dams (Jewitt et al. 2015). There has been no analysis of rate of loss within Mpumalanga Province but the Mpumalanga Tourism and Parks Agency (MTPA) mapped all development applications received at a cadastral scale over a 14-year period (2000–2014), which showed that greatest pressure for land-use change has come from prospecting applications (54% of the land surface area) and mining (25% of land surface area), with the balance of applications related to built infrastructure (9%), residential development (4%) and cultivation (0.7%) (Lötter et al. 2014). Future developments at the above rates or even higher are likely to cause further detriment towards natural ecosystems and processes that this species is associated with. Finally, climate change could directly affect the food resources and impact distribution in the areas bordering semi-arid areas (Hulme et al. 2001; Midgley et al. 2002).

However, it should be noted that anthropogenic disturbances do not necessarily cause population declines or a loss of habitat, as grazing and the planting of lawns creates suitable habitat and they are found in such landscapes across the distribution. Apparent range contractions in certain (broad) areas of KwaZulu-Natal and Mpumalanga may constitute natural fragmentation as a result of the life-history of the animal being sessile and subterranean, along with its specialised habitat type, and may have occurred historically before human influence.

Conservation

The Cape Mole-rat occurs in several key protected areas within the assessment region, such as Table Mountain National Park, Cederberg Wilderness Area and Langebaan Nature Reserve in the Western Cape. Additionally, the Wakkerstroom subpopulation in Mpumalanga occurs on the farm Tafelkop 126 HT, which has been recently declared a nature reserve and is known as the Tafelkop Nature Reserve (L. Cohen pers. comm. 2016). The Mpumalanga Biodiversity Sector Plan (MBSP) has been developed by the Mpumalanga Tourism and Parks Agency (MTPA) and is based on a systematic conservation plan, which considers the distribution of all species and their habitats. According to the MBSP, large parts of the farm where the known Belfast subpopulation occurs are situated in an irreplaceable and optimal Critical Biodiversity Area that has high value of conservation status. The KwaZulu-Natal subpopulation, however, only occurs in the Drakensberg foothills and not the protected areas, and should thus be prioritised for protected area expansion.

The following interventions are encouraged:

1. Work in local communities to prevent poisoning and persecution.
2. Educate and train farmers to mitigate poor grazing and burning regimes. For example, in Mpumalanga Province, structured veld management training programmes are provided for formally proclaimed areas which form part of protected area expansion/ stewardship initiatives.
3. Expand protected areas to preserve the remaining habitat for the KZN and Mpumalanga subpopulations.

Finally, further studies into the taxonomic status and distributions of the KwaZulu-Natal and Mpumalanga subpopulations are needed. If the subpopulations in Mpumalanga and KwaZulu-Natal are conclusively found to

Table 3. Conservation interventions for the Cape Mole-rat (*Georychus capensis*) 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*: implement protected area expansion strategies that conserve habitats for both the Mpumalanga and KwaZulu-Natal subpopulations.	-	Anecdotal	-	-	Mpumalanga Tourism and Parks Agency and Ezemvelo KZN Wildlife
2	*4.3 Awareness & Communications*: work in local communities to prevent poisoning and persecution through education campaigns.	-	Anecdotal	-	-	-
3	*4.2 Training*: training programmes aimed at farmers to mitigate poor grazing and burning regimes.	-	Anecdotal	-	-	Provincial Dept. of Agriculture, Forestry and Fisheries: general advisory and extension services to landowners and communities.

be of different taxonomic status (as is suspected) then they should be reassessed. These two subpopulations are characterised by a small geographic area and low densities of occurrence (except in Wakkerstroom).

Recommendations for land managers and practitioners:

- Systematic surveys and ongoing monitoring to document subpopulation localities and densities.
- Reduce overgrazing and implement correct fire regime.

Research priorities:

- Further studies into the taxonomic status of the KZN and Mpumalanga subpopulations are needed.
- Studies assessing the population size, trend and distribution, particularly of KZN and Mpumalanga subpopulations.

Encouraged citizen actions:

- Report sightings to conservation officials and researchers and on virtual museum platforms (for example, iSpot and MammalMAP), especially outside protected areas.
- Deposit any dead specimens at your local conservation office for identification.

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Data Sources and Quality

Table 4. Information and interpretation qualifiers for the Cape Mole-rat (*Georychus capensis*) assessment

Data sources	Museum records, field study (unpublished), indirect information (literature, unpublished)
Data quality (max)	Inferred
Data quality (min)	Suspected
Uncertainty resolution	Best estimate
Risk tolerance	Evidentiary

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

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