Fukomys damarensis – Damaraland Mole-rat

Hannah Thomas

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

This species is locally abundant in suitable habitat and there is little conflict with agriculture due to its arid distribution (Bennett 2013).

Taxonomy

Fukomys damarensis (Ogilby 1838)

ANIMALIA - CHORDATA - MAMMALIA - RODENTIA - BATHYERGIDAE - *Fukomys* - *damarensis*

Synonyms: *Cryptomys kubangensis* (Monard 1933)

Common names: Damaraland Mole-rat, Damaraland Blesmol (English), Damaralandse Vaalmol, Swart Blesmol (Afrikaans)

Taxonomic status: Species

Taxonomic notes: Although originally included in the genus *Cryptomys*, molecular phylogenies based on both mitochondrial and nuclear genes suggest that the species is evolutionarily divergent from other *Cryptomys* species (Faulkes et al. 2004). Thus the species has been assigned to the genus *Fukomys*.

Assessment Rationale

Listed as Least Concern, the Damaraland Mole-rat is present within a number of protected areas within the assessment region, including Tswalu Game Reserve, the Kgalagadi Transfrontier Park and Molopo Nature Reserve. There are no major threats to this species; consequently its population is unlikely to be declining. It is locally common and is frequently found at high population densities.

Regional population effects: This species is naturally fragmented, but no distinct barriers to dispersal have been identified, and thus a rescue effect is possible.

Distribution

Endemic to sub-Saharan Africa, this species is widespread across the central regions of southern Africa, occurring from central and northern Namibia, across western Zambia, and throughout the majority of Botswana (with the exception of the extreme east), into western Zimbabwe. The habitat of this species is contiguous, although naturally fragmented. The southern portion of its range extends into the Northern Cape and North West provinces of South Africa, where it occurs in the Kgalagadi Transfrontier Park, Tswalu Game Reserve, Hotazel, Blackrock and Winton (Figure 1). Its distribution is associated with red Kalahari arenosols but it also occurs in coarse sandy soils (Bennett 2013).

The species is said to be sympatric with the Common Mole-rat (*Cryptomys hottentotus*) where soil sandiness ensures local niche differentiation (Skinner & Chimimba 2005), which may be the case in the North West Province where such conditions exist (Power 2014). Power (2014) surmises that the Mafikeng Bushveld vegetation type is a zone of sympatry, and that the record 100 km west of Mafikeng marks their most eastern distribution in South Africa and thus their range boundary should be redrawn accordingly.

Population

The number of subpopulations of this species is currently unknown, but the Damaraland Mole-rat is considered locally abundant in suitable habitats. Population densities may reach more than 380 individuals / km^2 in grasslands, thornscrub and wheat fields (J.U.M. Jarvis & N.C. Bennett unpubl. data). However, abundance of subterranean mammals is difficult to estimate (Bennett 2013).

Although the population is not suspected to be declining, it should be established whether there is a continuing loss in the area of occupancy due to climate change, changes in land-use, and poor farming practices.

Current population trend: Stable

Continuing decline in mature individuals: No

Number of mature individuals in population: Unknown

Number of mature individuals in largest subpopulation: Unknown

Number of subpopulations: Unknown

Severely fragmented: No

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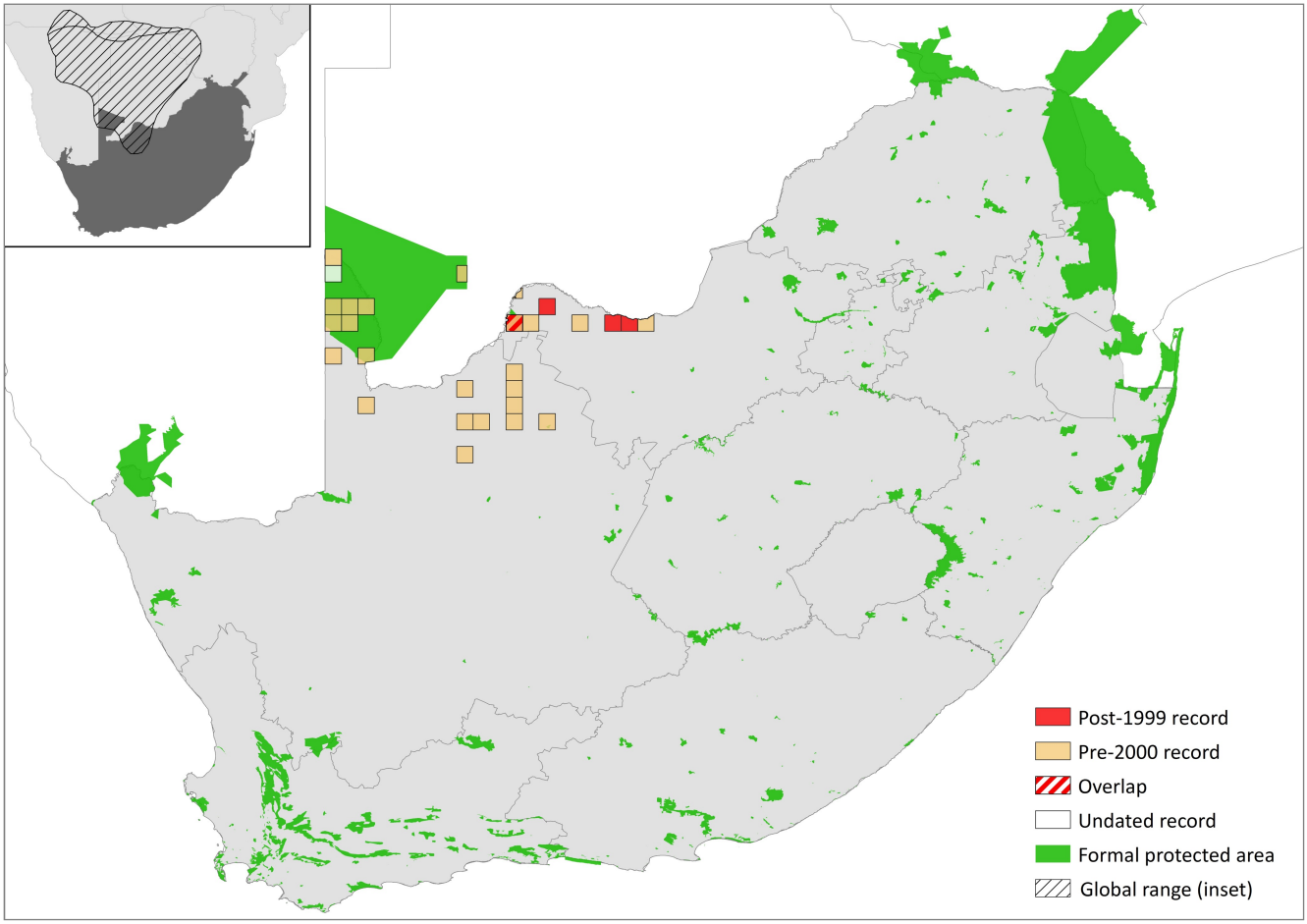

Figure 1. Distribution records for Damaraland Mole-rat (*Fukomys damarensis*) within the assessment region

Table 1. Countries of occurrence within southern Africa

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

Habitats and Ecology

This species occupies semi-arid regions consisting of red Kalahari sands and sandy soils, occupying habitats including grassland, savannah, thornscub and woodland (Bennett 2013). The annual rainfall in these areas is usually low to intermittent (200–400 mm). The Damaraland Mole-rat prefers coarse Kalahari sands, and loose unconsolidated alluvial sands. It is diurnal, subterranean, and lives in colonies averaging 16 individuals. It is one of a growing number of eusocial species of mole-rat emerging from recent research, and as many as 41 individuals have been identified in a single colony (Roper et al. 2001). Colonies consist of a single breeding female, one or more breeding males and their subsequent litters that do not leave the natal group (Bennett & Jarvis 1988; Jarvis & Bennett 1993). The non-reproductive members of the colony take up roles of caring for the young and burrow maintenance (Jarvis & Bennett 1993). A recent study reveals that the body shape of the reproductive female is significantly more elongate when compared to non-breeding (Young & Bennett 2010).

Similar to the other eusocial species of mole-rat, the Naked Mole-rat (*Heterocephalus glaber*) of East Africa, *F. damarensis*, is found in areas of low, irregular rainfall. Infrequent rainfall results in high energetic costs associated with foraging and burrowing (Lovegrove 1991; Jarvis et al. 1994). Cooperative reproduction, burrowing and foraging is suggested to be an adaptive technique associated with areas of unpredictable food availability and restricted opportunities for independent breeding and dispersal (Jarvis et al. 1994). Feeding mostly on geophytes (Bennett & Jarvis 1988), its principle food in the Kalahari is the Gemsbok Cucumber (*Acanthosicyos naudinianus*) (Jarvis et al. 1998). In arid areas, geophytes tend to be clumped or widely dispersed, and are therefore not always spatially predictable in their availability.

Up to four litters of an average of two young (up to a maximum of six) may be produced each year and, should the breeding female die, the colony will separate. On average, Damaraland Mole-rats live for three years; however, some have been recorded up to 11 years of age (Schmidt et al. 2013). Sex ratios of captured colonies range from 0.8 to 2.1 in favour of males. Mean body mass of individuals in the colony may vary, from 103–202 g in males, and 88–145 g in females, depending upon the ages of the adult non-reproductive animals in the colony (Jacobs et al. 1991).

Table 2. Threats to the Damaraland Mole-rat (*Fukomys damarensis*) 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	*11.1 Habitat Shifting & Alteration*: climate change affecting food resources and habitat suitability.	-	Anecdotal	-	Increasing

Ecosystem and cultural services: Generally mole-rats are good subterranean ecosystem engineers. Not only do they consume underground vegetation, but they also alter the soil both physically and chemically (Hagenah & Bennett 2013). Their extensive excavations and the associated impacts generate a dynamic mosaic of nutrients and soil conditions that promote species diversity and maintain disturbance-dependent components of plant communities (Reichman & Seabloom 2002).

Use and Trade

This species is not known to be traded or utilised in any form. Some individuals are taken from the wild for research purposes but this does not appear to have a negative impact upon the population. Individuals are also used for zoo exhibits to educate the public about their unique range of mating strategies.

Threats

There are no major threats to this species. As they occupy arid habitats, there is little conflict with agriculture (Bennett 2013). However, optimal conditions for foraging and burrowing are greatly restricted by the unpredictable and sporadic rainfall associated with the semi-arid habitats occupied by this species (Jarvis & Bennett 1991). Climate change in the Kalahari associated with lowered rainfall and an increase in ambient temperatures could affect the food resources (geophytes) of this species and in turn affect its population size and distribution. Additionally, dry soils become difficult to excavate, thus significantly enhancing the energetic costs associated with burrowing (Jarvis et al. 1998).

Current habitat trend: Stable

Conservation

The Damaraland Mole-rat is present within a number of protected areas throughout its range. These include the Kgalagadi Transfrontier Park, Tswalu Game Reserve and Molopo Nature Reserve, within the assessment region, as well as a number of protected areas in northern Botswana. Currently, no interventions are needed for this species within the assessment region. However, more research is needed on the possible effects of climate change on this species.

Recommendations for land managers and practitioners:

- The establishment of a breeding programme of captive Damaraland Mole-rats for laboratory research practices would reduce the removal of wild-caught colonies from their natural habitat.

Research priorities: Currently the Mammal Research Institute (University of Pretoria) is attempting to unravel the mechanism of sociality-induced infertility that is operational in this species.

- Research into the conservation of this species, and the effects of habitat loss and enhanced unpredictability of rainfall on population size, may be necessary in light of the current predicted effects of regional climate change.

Encouraged citizen actions:

- Report sightings on virtual museum platforms (for example, iSpot and MammalMAP). However, due to their subterranean lifestyle, citizen sightings may be rare.

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Data Sources and Quality

Table 3. Information and interpretation qualifiers for the Damaraland Mole-rat (*Fukomys damarensis*) assessment

Data sources	Museum records, field study (unpublished), indirect information (expert knowledge)
Data quality (max)	Inferred
Data quality (min)	Suspected
Uncertainty resolution	Expert consensus
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.*