Chrysospalax villosus – Rough-haired Golden Mole

Regional Red List status (2016)	**Vulnerable B2ab(ii,iii,iv)***
National Red List status (2004)	Critically Endangered C2a(i)+D
Reasons for change	Non-genuine change: New information
Global Red List status (2015)	Vulnerable B2ab(ii,iii,iv)
TOPS listing (NEMBA)	None
CITES listing	None
Endemic	Yes

*Watch-list Data

Like the closely related Giant Golden Mole (*Chrysospalax trevelyani*), this species often forages above ground, especially after rains. Despite being blind, individuals are able to escape to the nearest burrow with uncanny speed and precision when danger is detected.

Taxonomy

Chrysospalax villosus (A. Smith 1833)

ANIMALIA - CHORDATA - MAMMALIA - AFROSORICIDA - CHRYSOCHLORIDAE - *Chrysospalax* - *villosus*

Common names: Rough-haired Golden Mole (English), Grasveldgouemol, Grofhaarkruipmol (Afrikaans)

Taxonomic status: Species

Taxonomic notes: Meester (1974) listed six subspecies distinguished mainly by subtle differences in pelage colour: *villosus*, *transvaalensis, leschae, dobsoni, rufopallidus* and *rufus*. The validity of these subspecies is uncertain (Bronner 2013).

Assessment Rationale

While the extent of occurrence of this species appears large (> 20,000 km^2), it has very specific habitat requirements and has been recorded from only 11 locations. Based on recent field surveys it no longer occurs at three of these, as its preferred natural grassland habitats have vanished under urban sprawl (especially in Gauteng around Pretoria, and KwaZulu-Natal around Pietermaritzburg). Known locations are scattered far apart suggesting possible fragmentation into numerous subpopulations with little gene flow. Even at sites where this species occurs it is uncommon, suggesting that population densities are low. Its total area of occupancy is estimated at 128 km^2. Many of the sites at which this species was collected historically have been transformed by agricultural practices and other anthropogenic activities. The widespread practice of ranchers allowing livestock to graze in wetlands and grasslands near waterbodies during the dry winter months leads to trampling of vegetation and a loss of cover, which undoubtedly impacts this species negatively as these are its preferred habitats and it is known to spend at least some time foraging above ground. Likewise, overgrazing and the frequent (often annual) burning of pasturelands in areas where this species occurs surely reduce resources (cover and invertebrates) that local populations rely on. In Mpumalanga the Highveld grasslands favoured by this species have been severely impacted by open-cast coal mining to fuel the South African power station hub; this, together with associated industrial activities, rapid spread of local towns, and increasing human population pressures are likely threats at many locations. Other threats include the widespread use of pesticides during agro-industrial farming and the loss of habitat to agro-industrial plantations (diminishing but historically acute).

Due to uncertain levels of fragmentation, the status of this species potentially ranges between Vulnerable and Endangered. An AOO of 128 km^2 meets the requirement for endangered status, but only one of the three necessary criteria is clearly met (B2bii, iii). Criteria B2a can only be met if severe fragmentation occurs (number of locations is > 5), and this is not known. Taking a slightly evidentiary approach, this species is listed as Vulnerable under criteria B2a + B2b(ii,iii) (given its restricted area of occupancy, probable decline in number of locations and area/extent/quality of suitable habitat with only six locations where its presence is still certain, and the persistent, varied threats to the population across its entire range). Should the number of known locations decline further or if evidence arises of severe fragmentation, it will clearly qualify for Endangered status. Further field surveys are thus urgently required.

Distribution

This species has a disjunct distribution in South Africa, being recorded historically only from scattered localities in Eastern Cape, KwaZulu-Natal, Gauteng and Mpumalanga; and recently in Gauteng (Gauteng Department of Agricultural and Rural Development, unpubl. data) and Mpumalanga (L. Cohen, Mpumalanga Parks and Tourism Agency unpubl. data) (Figure 1). The species is possibly now locally extinct at some localities, such as Tsolo,

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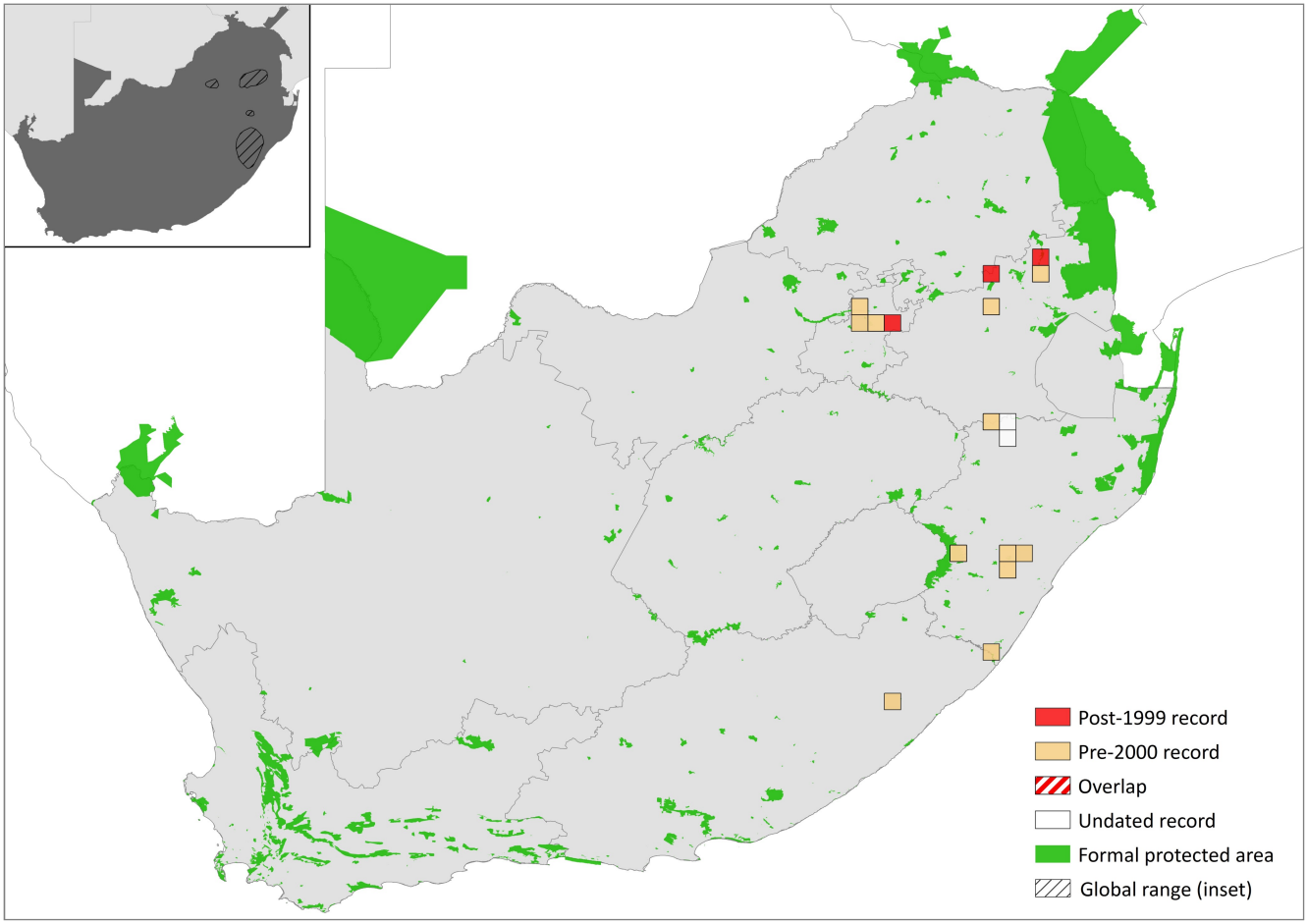

Figure 1. Distribution records for Rough-haired Golden Mole (*Chrysospalax villosus*) within the assessment region

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	-

Eastern Cape (type locality, never subsequently found there), and urban areas around Pretoria (Pretoria West, Lynwood Glen) and Scottsville (Pietermaritzburg) where intensive urbanization has destroyed all natural habitat.

Population

This species is extremely rare and secretive. Only three specimens have been collected since 1980 (Bronner 2013). They are difficult to detect owing to their preference for areas with sandy soils and dense vegetation cover.

Current population trend: Unknown, but probably declining.

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, but continuing decline in number of subpopulations is inferred based on ongoing habitat loss in grasslands.

Severely fragmented: Unknown but suspected based on existing information where more than half of the individuals (or, more than half of the occupied habitat area) are in isolated patches.

Habitats and Ecology

The Rough-haired Golden Mole occurs in sandy soils in grasslands, meadows and along edges of marshes in Savannah and Grassland biomes of South Africa. Some specimens have been recorded from gardens and parklands, and also in dense stands of Kikuyu Grass (*Pennisetum clandestinum*) and marginally on golf courses adjoining natural grasslands. Unlike other golden mole species, *C. villosus* presumably does not make subsurface runs, but rather excavates burrows and lives in chambers, emerging most commonly after rainfall events (Roberts 1951; G.N. Bronner unpubl. data). They feed on insects and earthworms.

Use and Trade

This species is not known to be traded or utilised in any form.

Threats

The major threats to this species are habitat alteration and degradation. Alteration occurs as a result of mining and

Table 2. Threats to the Rough-haired Golden Mole (*Chrysospalax villosus*) 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	*1.1 Housing & Urban Areas*: habitat loss from settlement expansion and development.	GeoTerraImage 2015	Indirect (land cover change from remote sensing)	Regional	Increasing
2	*1.2 Commercial & Industrial Areas*: habitat loss from power infrastructure and development.	Lötter et al. 2014	Indirect (prospecting applications)	Regional	Increasing
3	*2.1.3 Agro-industry Farming*: habitat loss and degradation from agricultural expansion.	Driver et al. 2012 Jewitt et al.2015	Indirect (land cover change from remote sensing)	National Regional	Increasing
4	*2.3.3 Agro-industry Grazing, Ranching or Farming*: habitat loss and degradation from livestock ranching expansion. Current stress *1.2 Ecosystem Degradation*: habitat degradation from overgrazing.	Driver et al. 2012 Jewitt et al.2015	Indirect (land cover change from remote sensing)	National Regional	Increasing
5	*3.2 Mining & Quarrying*: habitat loss from mining expansion.	Lötter et al. 2014	Indirect (mining applications)	Regional	Increasing
6	*7.1.1 Increase in Fire Frequency/Intensity*: ecologically inappropriate fire regime by farmers. Current stresses *1.2 Ecosystem Degradation* and *2.1 Species Mortality*: increased predation and resource loss.	-	Anecdotal	-	Stable

power generation, ecologically poor agricultural practices and urbanisation. Habitat degradation is associated with mining for shallow coal deposits to fuel numerous power stations that occur in the high-altitude grassland habitats in the northern parts of this species' range. Rehabilitation attempts at these sites appear to have been largely ineffective. These power stations form the backbone of South Africa's electricity network, and disturbance is likely to increase as human populations grow and the demand for power increases. The widespread practice of allowing cattle to graze in marshes and dense grasslands near water during dry winter months leads to trampling and a loss of cover, and this undoubtedly impacts severely on this species. Likewise, ranchers often burn such areas to provide fresh graze at the end of the dry winter, which adversely affects this species through predation and resource loss, given their tendency to forage above-ground under dense vegetative cover. Some areas in which they formerly occurred (for example, Tshwane West) have been completely transformed by urbanisation and industrialisation. Currently, there are only a handful of sites (three in the KwaZulu-Natal midlands, three in Mpumalanga) where there are conclusive signs of their presence, but given its cryptic nature and lack of sustained surveying effort; this species may prove to be more resilient and widespread than current data indicate.

Current habitat trend: Declining in area and quality. Widespread transformation and loss of Highveld grassland habitats favoured by this species continue to occur. In Mpumalanga, 40% of the grassland vegetation types are listed as threatened and only 51% of the grasslands are still natural and previously not ploughed (Lötter et al. 2014). The Mpumalanga Tourism and Parks Agency (MTPA) mapped all development applications received at a cadastral scale over a 14-year period (2000–2014) and showed that greatest pressure for land-use change has come from prospecting applications (54.2% of the land surface area of Mpumalanga) and mining (24.5% of land surface area). The province can anticipate much greater expansion in the mining sector than ever before (Lötter et al. 2014). In KwaZulu-Natal, between 2005 and 2011 there was a loss of 7.6% of the natural habitat of the province with an average loss of 1.2% per year since 1994, where the drivers of this loss were agriculture,

Table 3. Conservation interventions for the Rough-haired Golden Mole (*Chrysospalax villosus*) 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*: protected area expansion to preserve and connect grasslands.	-	Anecdotal	-	-	-
2	*1.2 Resource & Habitat Protection*: biodiversity stewardship schemes to conserve critical habitat areas, targeting old fields.	-	Anecdotal	-	-	-
3	*2.3 Habitat & Natural Process Restoration*: maintain ecological stocking levels and correct fire regimes to sustain resources for this species.	-	Anecdotal	-	-	-

plantations, built environments and settlements, mines and dams (Jewitt et al. 2015). Additionally, in Gauteng, there has been a 13% loss of natural habitat between 1995 and 2009 (Driver et al. 2012). Finally, rural settlement expansion has increased by 38%, 7% and 1% in Gauteng, Mpumalanga and KwaZulu-Natal, respectively (GeoTerraImage 2015).

Conservation

It possibly occurs in the Blyde River Canyon Nature Reserve and Verloren-Vallei Nature Reserve (Mpumalanga), and Mgeni Vlei Nature Reserve (KwaZulu-Natal). Critical research is needed to assess the status of these populations and the threats they face, at all known localities. In particular, the conservation areas in the Drakensberg foothills and Mpumalanga are in need of urgent surveying.

A possible intervention for this species is to prioritise the old lands or previously ploughed areas now left fallow (which make up 8.9% of the Grassland Biome in Mpumalanga; Lötter et al. 2014) for future development, instead of pristine grasslands. Additionally, it is expected that this species would benefit from protected area expansion and biodiversity stewardship schemes in these grasslands habitats.

Recommendations for land managers and practitioners:

- Field surveys to assess the status of existing subpopulations at all known localities and to discover additional subpopulations.
- Land managers should be incentivised to de-stock ranchlands to conserve grassland habitats, especially vlei areas, and to follow ecologically-sensitive veld burning practices (using a mosaic spatial scheme so that refugia remain, from which re-colonisation of burned areas can take place).

Research priorities:

- Urgent research and surveys to determine subpopulation sizes, trends and distributions.
- The identification of key protection sites, and connectivity possibilities.
- Research into the severity of threats at known localities.
- Effectiveness of conservation interventions, particularly de-stocking ranchlands to improve subpopulation status.
- Surveying to identify the species' distributional extent.
- Research on life history traits and ecological tolerances.

Encouraged citizen actions:

- Report sightings on virtual museum platforms (for example, iSpot and MammalMAP), especially outside protected areas.
- Deposit any dead specimens found in a state or provincial museum, together with information on the date and site where found.
- Create indigenous vegetation gardens.

Data Sources and Quality

Table 4. Information and interpretation qualifiers for the Rough-haired Golden Mole (*Chrysospalax villosus*) 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

References

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