Graphiurus rupicola – Stone Dormouse

Photograph wanted

Regional Red List status (2016)	Near Threatened B1ab(iii)*
National Red List status (2004)	Not Evaluated
Reasons for change	No change
Global Red List status (2016)	Least Concern
TOPS listing (NEMBA) (2007)	None
CITES listing	None
Endemic	No

*Watch-list Data

The recently reinstated species, *Graphiurus rupicola*, is so named due to its selection of rocky habitat.

Taxonomy

Graphiurus rupicola (Thomas & Hinton 1925)

ANIMALIA - CHORDATA - MAMMALIA - RODENTIA - GLIRIDAE - *Graphiurus* - *rupicola*

Synonyms: *australis*, *kaokoensis*, *montosus* (Holden 2013)

Common names: Stone Dormouse, Rupicolous African Dormouse (English)

Taxonomic status: Species

Taxonomic notes: Although originally listed as a species by Roberts (1951), this taxon was later reclassified as a subspecies of *G. platyops* by Genest-Villard (1978). However, more recently, this group was reassessed and is currently recognised as a valid species once again (Holden 2005, 2013).

Due to its flattened skull and rupiculous habits (features shared with the allopatric *G. platyops*), this species is unlikely to be confused with any other *Graphiurus* within its range, except *G. angolensis* which is smaller, does not have a flattened skull and occurs in woodlands (Monadjem et al. 2015). Similarly, *Graphiurus microtis* is significantly smaller and does not have a flattened skull (Monadjem et al. 2015).

Assessment Rationale

The Stone Dormouse is listed as Near Threatened B1ab(iii) due to its restricted range within the assessment region (estimated 13,723 km^2 extent of occurrence using available museum records). Although the species occurs in inaccessible habitat, climate change and development in the region, particularly diamond mining and water pipelines, may be causing habitat loss or a decline in habitat quality. Similarly, the geographic range of this species may be naturally fragmented, and these interconnecting locations are further threatened by development. Additionally, no rescue effect is possible as the Orange River is a barrier to immigration from Namibia. Thus, this is a precautionary listing for this species and we strongly recommend field surveys to accurately determine occupied localities and subpopulation trends for this species. New data will require reassessment as the species is most likely Least Concern.

Regional population effects: Isolated and disjunct subpopulations in South Africa and Namibia. No rescue effect is possible because the Orange River is a major barrier to dispersal.

Distribution

This species occurs in a narrow belt predominantly along the escarpment of Namibia and marginally into northwestern South Africa (Monadjem et al. 2015). While the northernmost limit was previously thought to be Kamanjab and Mount Brukaros in Namibia, specimens from Mt. Soque, Angola, are considered to represent this species (Holden 2013). It thus occurs on central mountains and plateaux from Mt. Soque, Angola, south to Port Nolloth, Kleinzee, Alexander Bay and Eenriet in Namaqualand, South Africa (Holden 2005). The population is fragmented and subpopulations between South Africa and Namibia are separated by the Orange River. The estimated extent of occurrence within South Africa is 13,723 km^2. There is assumed to be no overlap with the closely related *G. platyops*. Additional field research is needed to establish the specific extent of its distribution.

Population

Little information on population size or trends is available. This species was once thought plentiful within the rocky habitats around Karibib, Namibia (Shortridge 1934). Roberts (1951) considered it to be rare, which is supported by the relatively few specimens (*c*. 20) available in museum collections (Holden 2013). Information relating to its population within its marginal distribution along the northwest coast of the assessment region is extremely limited. Similar to other species of this group, the Stone Dormouse is considered difficult to trap and is rarely collected. Its habitat is, however, thought to be fairly continuous.

Current population trend: Unknown

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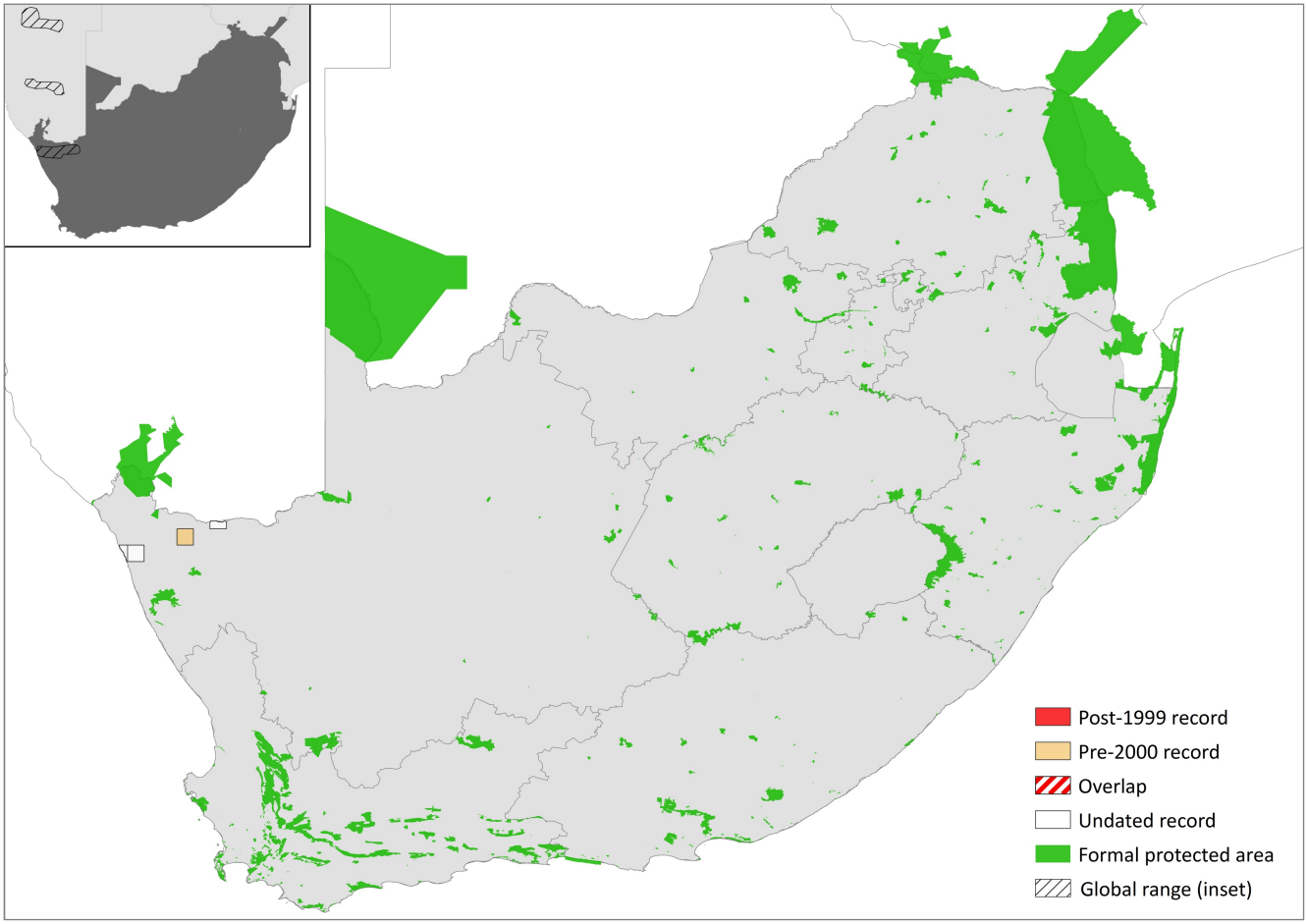

Figure 1. Distribution records for Stone Dormouse (*Graphiurus rupicola*) within the assessment region

Table 1. Countries of occurrence within southern Africa

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

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

Habitats and Ecology

This species is predominantly limited to rocky areas along escarpments from altitudes of 400 m to at least 1,586 m (Holden 2013), but is known to utilise open areas to disperse to new suitable rocky habitats. It probably nests exclusively in rock crevices (Holden 2013). Shortridge (1934) described the Stone Dormouse as a nocturnal species, confined to mountainous and treeless habitats. Most specimens have been caught in bushy Karoo-Namib shrubland or Karoo transition vegetation zones (Holden 2013). Its flattened cranium allows it to move through narrow rock crevices (Holden 2013). There is limited research pertaining to its diet, reproduction and behaviour.

Ecosystem and cultural services: This species is not known to provide any ecosystem services, but this may simply reflect the paucity of information available.

Use and Trade

This species is not known to be traded or utilised in any form. Its limited distributional range and low population numbers would make it unsuitable for the pet trade.

Threats

Although no major threats are suspected to cause substantial population decline, as their rocky habitats are largely unsuitable for agriculture, diamond mining and the resulting environmental transformation along the West Coast of South Africa could result in significant habitat degradation. Small-scale mining companies in the area often do not engage in environmental rehabilitation practices, thus further aggravating the problem.

Expanding anthropogenic development, including the construction of a large-scale water pipeline, threatens to affect the movements of this species, as well as the suitability of habitat across its range. Finally, climate change is predicted to have a severe impact on the arid and semi-arid regions of southern Africa through

Table 2. Threats to the Stone Dormouse (*Graphiurus rupicola*) 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	*11.2 Droughts*: climate change altering habitat suitability. Current stress *1.2 Habitat Degradation*.	Boko et al. 2007	Indirect	Regional	Increasing
		Foden et al. 2007	Indirect	Regional	
2	*1.2 Commercial & Industrial Areas*: habitat loss and disturbance from infrastructural disturbance. Current stress *1.3 Habitat Fragmentation*.	-	Anecdotal	-	Increasing
3	*3.2 Mining & Quarrying*: diamond mining leading to habitat transformation. Current stress *1.1 Ecosystem Conversion*.	-	Anecdotal	-	Stable

increased frequency and duration of drought (Boko et al. 2007), possibly leading to exacerbated habitat degradation and range contraction or shifts (*sensu* Foden et al. 2007).

Current habitat trend: Stable, but possibly declining habitat quality.

Conservation

The Stone Dormouse occurs within the protected areas of Namaqua National Park and Kleinzee Conservation Area, although its current occupancy in protected areas remains to be verified. This species would be expected to benefit from the effective rehabilitation of mining areas, as well as the implementation and regulation of environmental policies relating to the mining industry. Additional research into the distribution, abundance, general ecology and threats relating to this cryptic species is urgently necessary before species-specific conservation initiatives can be designed.

Recommendations for land managers and practitioners:

- Rehabilitation of areas of suitable habitat (such as rocky areas), as well as corridors between suitable habitats that this species may utilise for dispersal.

Research priorities:

- Field surveys to determine the distributional range of this species.
- Genetic studies to determine range boundaries or overlaps and possibly hybridization with *G. platyops.*
- Quantifying the severity of threats facing this species.
- Continued research into the general ecology, habitat preferences and population dynamics of this species.

Encouraged citizen actions:

- Report sightings on virtual museum platforms (for example, iSpot and MammalMAP), especially outside protected areas.
- Stronger laws and public pressure to enforce rehabilitation of areas mined and those to be mined.
- Development or protection of corridors of suitable habitat to allow for dispersal and gene flow between populations.

References

Boko M, Niang I, Nyong A, Vogel C, Githeko A, Medany M, Osman-Elasha B, Tabo R, Yanda P. 2007. Africa. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Pages 433–467. Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, UK.

Foden W, Midgley GF, Hughes G, Bond WJ, Thuiller W, Hoffman MT, Kaleme P, Underhill LG, Rebelo A, Hannah L. 2007. A changing climate is eroding the geographical range of the Namib Desert tree Aloe through population declines and dispersal lags. Diversity and Distributions **13**:645–653.

Genest-Villard H. 1978. Révision systématique du genre *Graphiurus* (Rongeurs, Gliridae). Mammalia **42**:391–426.

Holden ME. 2005. Family Gliridae. Pages 819–841 in Wilson DE, Reeder DM, editors. Mammal Species of the World. Johns Hopkins University Press, Baltimore, Maryland, USA.

Table 3. Conservation interventions for the Stone Dormouse (*Graphiurus rupicola*) 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 connect rocky habitats and allow climate change adaptation.	-	Anecdotal	-	-	-
2	*5.1.3 Legislation*: stronger laws around rehabilitation of diamond mining on the West Coast.	-	Anecdotal	-	-	-
3	*5.2 Policies & Regulations*: mining licence regulations.	-	Anecdotal	-	-	-

Data Sources and Quality

Table 4. Information and interpretation qualifiers for the Stone Dormouse (*Graphiurus rupicola*) assessment

Data sources	Museum records, indirect information (expert knowledge)
Data quality (max)	Suspected
Data quality (min)	Suspected
Uncertainty resolution	Expert consensus
Risk tolerance	Precautionary

Holden ME. 2013. *Graphiurus rupicola* Rupicolous African Dormouse. Pages 131–132 in Happold DCD, editor. Mammals of Africa. Volume III: Rodents, Hares and Rabbits. Bloomsbury Publishing, London, UK.

Monadjem A, Taylor PJ, Denys C, Cotterill FPD. 2015. Rodents of Sub-Saharan Africa: A Biogeographic and Taxonomic Synthesis. De Gruyter, Berlin, Germany.

Roberts A. 1951. The Mammals of South Africa. The Trustees of the Mammals of South Africa, Central News Agency, Johannesburg, South Africa.

Shortridge GC. 1934. The Mammals of South West Africa. Volumes I & II. Heinemann, London, UK.

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