Aethomys chrysophilus – Red Veld Rat


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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	Edge of range

The colloquial name of *Aethomys chrysophilus* refers to the colour of the body which has a reddish tinge, often accentuated towards the rump.

Taxonomy

Aethomys chrysophilus (de Winton, 1897)

ANIMALIA - CHORDATA - MAMMALIA - RODENTIA - MURIDAE - *Aethomys* - *chrysophilus*

Synonyms: *acticola, alticola, imago, singidae, voi* (Linzey et al. 2013)

Common names: Red Veld Rat (English)

Taxonomic status: Species

Taxonomic notes: Monadjem et al. (2015) support the recognition of *Aethomys ineptus* as a cryptic species distinct from *A. chrysophilus*, based on chromosomal, reproductive, biochemical (Visser & Robinson 1986, 1987), molecular (Russo et al. 2006) and biogeographical (Linzey et al. 2003) grounds. The two species are morphologically indistinguishable (Chimimba 1998; Linzey et al. 2003; Russo et al. 2006), but differ in chromosome number (Chimimba *et al*. 1999; Castiglia *et al*. 2003), with *A. ineptus* being 2n = 44 while *A. chrysophilus* is 2n = 50. There is no evidence of hybridization between *A. chrysophilus* and *A. ineptus* in areas of sympatry (Gordon & Watson 1986; Visser & Robinson 1986, 1987). *Aethomys chrysophilus* generally shows higher levels of genetic diversity at the intraspecific level than interspecifically with *A. ineptus* (Russo et al. 2006; J. Bryja unpubl. data). Additionally, monophyly amongst *A. chrysophilus* lineages, using geographically restricted samples, has not been supported to date, which suggests that additional cryptic taxa are contained within the currently described species. Future in-depth analysis of differentiation within *A. chrysophilus*, with better sampling over its entire range, will have important taxonomic implications for the species (J. Bryja unpubl. data).

Assessment Rationale

Red Veld Rats have a wide distribution within Africa, occurring at the southern limits of their range within the assessment region. They occur in Kruger National Park (north of the Olifants River) and Kgalagadi Transfrontier Park and can also occur in agricultural or disturbed habitats. No widespread decline is expected and thus the Least Concern listing is retained. However, as this species relies on ground cover, overgrazing and imprudent fire management could cause local declines and should be avoided. Further research is needed to more accurately delineate the relative distributions of this species and *A. ineptus.*

Regional population effects: Dispersal is possible along connected habitats of the northern border of South Africa (Limpopo, North West and Northern Cape provinces) from Namibia, Botswana, Zimbabwe and Mozambique.

Distribution

This species is widely distributed in the savannah habitats of southern and East Africa, being found from southern Kenya to northern South Africa, but may be replaced in South Africa by *A. ineptus* (Monadjem *et al*. 2015). Specifically, it occurs in Namibia, excluding the western desert regions, and is widely distributed throughout Zimbabwe (Skinner & Chimimba 2005). Although the species has also been positively identified in Francistown, Botswana (Russo et al. 2006), veld rats from Mozambique have not been positively identified but it seems likely that the distributional range of *A. chrysophilus* includes both northern Botswana and southern Mozambique (Linzey et al. 2003). The most important phylogeographic structure is the Kafue–Limpopo river system that divides all mitochondrial sequences into two main groups (J. Bryja unpubl. data). The southern lineage is then subdivided into several clades, one of them being *A. ineptus*, and it is possible that the Limpopo River played an important role in the split between *A. chrysophilus* and *A. ineptus* (J. Bryja unpubl. data).

Within the assessment region specifically, *A. chrysophilus* occurs in a relatively narrow band bordering Botswana, Zimbabwe, and Mozambique in Limpopo, North West and (possibly) Northern Cape provinces (Linzey & Chimimba 2008; Linzey et al. 2013). In the west, the range extends southward to 24°15'S (near Rooibokkraal in North West Province) and in the east to 24°00'S in the vicinity of the Olifants River in Kruger National Park (Linzey & Chimimba 2008), while its southern distributional range limit is

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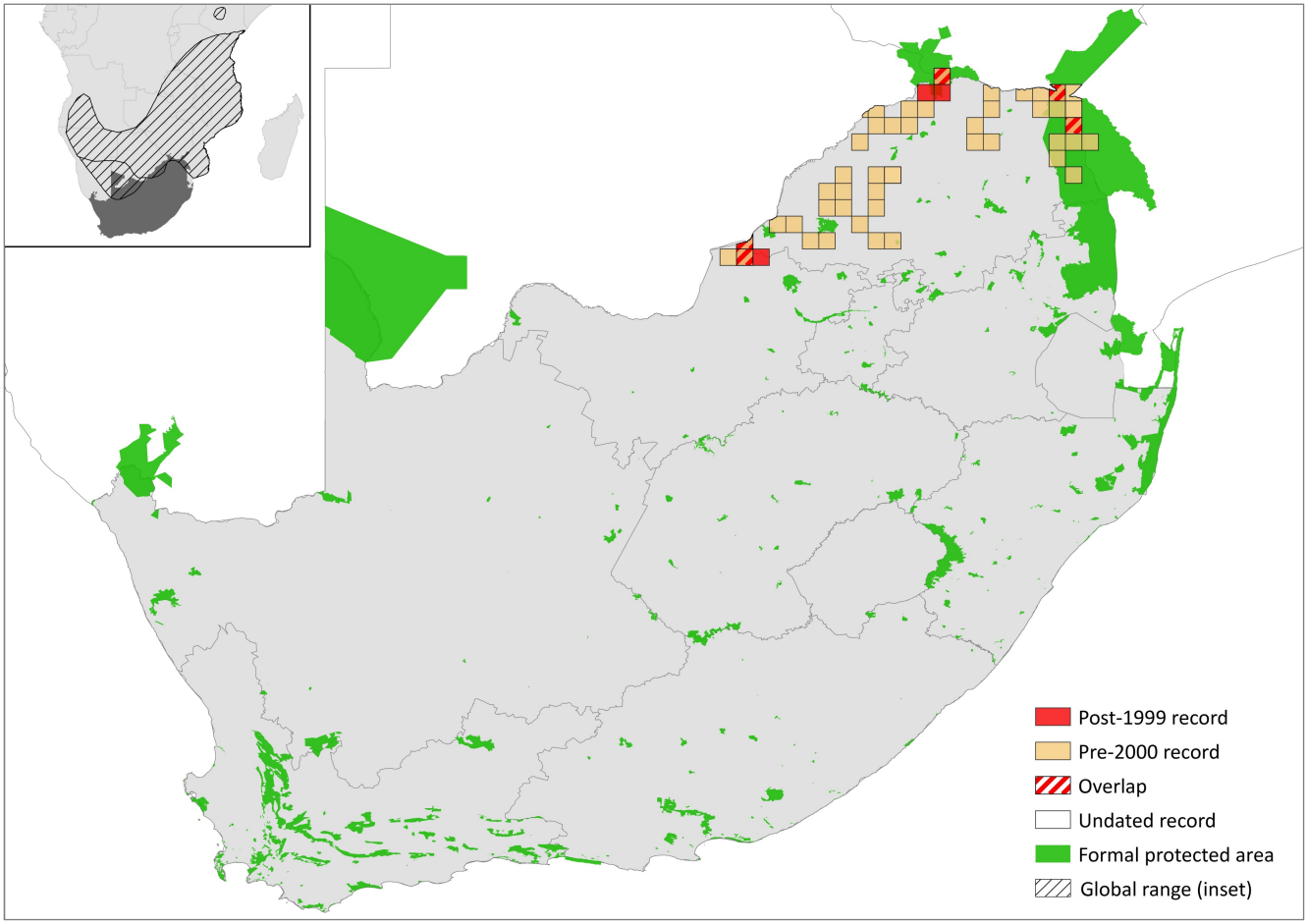

Figure 1. Distribution records for Red Veld Rat (*Aethomys chrysophilus*) within the assessment region

Table 1. Countries of occurrence within southern Africa

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

roughly correlated with the southern distribution of mopane (*Colophospermum mopane*) and baobab (*Adansonia digitata*) trees (Linzey & Chimimba 2008). It is also expected to occur in the northern bushveld in the lower Marico River valley of the North West Province (Power 2014), and was recorded in low numbers on the northern plains of the Kruger National Park (MacFadyen 2007).

Although this species and *A. ineptus* are mostly parapatric, with *A. chrysophilus* primarily being found at elevations < 1,000 m asl (Chimimba & Linzey 2008), their ranges are known to overlap west of Pretoria (Magaliesberg region of the North West Province) and west of the Soutpansberg in the Limpopo Province and are known with certainty to be syntopic at only one locality: Langjan Nature Reserve, Limpopo Province (Linzey *et al*. 2003).

Further vetting of museum records is necessary to delimit the distributions ranges of *A. chrysophilus* and *A. ineptus* more accurately.

Population

Studies indicate that the Red Veld Rat is generally a low-density (< 8 animals / ha) species (Linzey et al. 2013) that attains highest numbers in either the hot-wet or early cool-dry seasons, and is least abundant in the late hot-dry season, with densities varying from zero to 6.2 individuals / ha (Linzey & Kesner 1997a; Linzey & Chimimba 2008). The species typically comprises a secondary component of small mammal communities, often being the least abundant among commonly occurring species, comprising between 2% and 15% of the community abundance (Linzey & Kesner 1997b; Linzey & Chimimba 2008). Densities are also highest in areas with good ground cover of either vegetation or rocks.

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, savannah habitats largely intact and the species can occur in altered agricultural landscapes.

Table 2. Threats to the Red Veld Rat (*Aethomys chrysophilus*) 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	*2.3.2 Small-holder Grazing, Ranching or Farming*: current stress *1.2 Ecosystem Degradation*: ground cover loss through overgrazing.	Bowland & Perrin 1989	Empirical	Local	Possibly increasing with human settlement expansion and intensification of wildlife farming.
2	*7.1.1 Increase in Fire Frequency/Intensity*: current stress *2.1 Species Mortality*: fire management as a tool to promote grazing may lead to loss of ground cover.	Bowland & Perrin 1988	Empirical	Local	Unknown

Habitats and Ecology

Aethomys chrysophilus is a habitat generalist occupying a variety of savannah woodlands (Linzey et al. 2013), with the specific requirement being good ground cover in the form of rocky crevices, piles of boulders and debris, fallen trees or holes in termitaria, thorn fences around agricultural lands, thick scrub or clumps of grass and forbs (Skinner & Chimimba 2005; Linzey & Chimimba 2008; Linzey et al. 2013). These rats also may be recorded in the vicinity of homesteads and barns. They are found throughout savannah–woodland habitats that include varying combinations of grass–herbaceous ground cover, shrub understory, and miombo (*Brachystegia* spp.) or mopane woodlands (Davis 1962). This species dominated the more pristine habitats characterised by rock cover at Maguga Dam, Swaziland (Avenant & Kuyler 2002). However, it has also been recorded from *Aristida* grasslands (adjacent to dwellings, crop lands and roads), specifically Ngongoni Three-awn Grass (*Aristida junciformis*), an indicator of past disturbance, which demonstrates its ability to exist in disturbed areas (Fuller & Perrin 2001). It is absent from arid regions or high-elevation forested habitats. Frequently found in association with *Micaelamys namaquensis* but is more abundant when the latter is absent (Linzey et al. 2013)

It is nocturnal and digs burrows in soil in areas with a good grass cover, as well as constructing nests in rock niches, bases of trees and termite mounds (Linzey & Chimimba 2008). It is terrestrial but climbs trees occasionally (Linzey et al. 2013). It is omnivorous, but typically relies more on plant than animal foods.

Ecosystem and cultural services: They act as seed dispersers and are a good forage species for carnivores.

Use and Trade

This species may opportunistically be used as bushmeat (for example, in Zimbabwe; D. MacFadyen pers. obs. 2005), but this is not expected to impact the population.

Threats

There are no major threats to this species. However, because it requires substantial cover, overgrazing, overstocking and incorrect fire regimes may negatively affect local population densities (Bowland & Perrin 1988, 1989).

Current habitat trend: Stable**.** Habitat will not decline as savannah habitat is well-protected within the assessment region and it can exist in agricultural landscapes. However, overstocking of livestock farms and wildlife ranches will affect habitat quality.

Conservation

It occurs in a number of protected areas, including Kruger National Park and Venetia Limpopo Nature Reserve. No specific interventions are necessary at present. However, protection of patches of natural habitat through biodiversity stewardship programmes and reduction in stocking rates to retain ground cover will benefit this species.

Recommendations for land managers and practitioners:

- Landowners and communities should be incentivised to stock livestock or wildlife at ecological carrying capacity and to implement a natural fire regime.

Research priorities:

- Its precise distributional limits are unknown and further sampling and molecular analysis is required to distinguish between the ranges of the two *Aethomys* species. This includes vetting of existing museum records.
- Ecological and behavioural interactions between *A. ineptus* and *A. chrysophilus* should be researched.

Table 3. Conservation interventions for the Red Veld Rat (*Aethomys chrysophilus*) 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	*1.2 Resource & Habitat Protection*: stewardship agreements with private landowners to conserve wetlands and grasslands.	-	Anecdotal	-	-	Multiple organisations
2	*2.3 Habitat & Natural Process Restoration*: lower stocking rates to retain ground cover.	-	Anecdotal	-	-	-

Encouraged citizen actions:

- Practise indigenous gardening to sustain small mammal diversity, especially in rural areas.
- Encourage corridors of indigenous, rank vegetation to connect areas of suitable habitat.

Data Sources and Quality

Table 4. Information and interpretation qualifiers for the Red Veld Rat (*Aethomys chrysophilus*) assessment

Data sources	Field studies (literature), indirect information (literature)
Data quality (max)	Estimated
Data quality (min)	Inferred
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.*