Mus minutoides – Pygmy Mouse


Tim Jackson

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) (2007)	None
CITES listing	None
Endemic	No

The species is remarkable for its atypical sex chromosome composition. A high proportion of Pygmy Mice females are sex reversed (Veyrunes et al. 2010) – that is, some females from geographically widespread localities in southern and eastern Africa possess a Y chromosome (as do the males). This makes them one of the rarest species chromosomally (the condition has only been reported in some lemming and South American field mouse species).

Taxonomy

Mus minutoides Smith 1834

ANIMALIA - CHORDATA - MAMMALIA - RODENTIA - MURIDAE - *Mus* - *minutoides*

Synonyms: *Mus kasaicus* (Cabrera 1924)

Common names: Pygmy Mouse, Tiny Pygmy Mouse (English), Dwergmuis (Afrikaans)

Taxonomic status: Species complex

Taxonomic notes: The taxonomic status of this species is uncertain (see Monadjem 2013). Although previously considered a species complex with *Mus musculoides*, molecular markers and chromosomal data unambiguously discriminate *M. musculoides* from *Mus minutoides* (Veyrunes et al. 2004, 2005). However, they are closely related phylogenetically, i.e., sister species. Phylogeographical surveys using mitochondrial sequences (Cytb) have uncovered four distinctive clades throughout sub-Saharan Africa (but possibly more, see Bryja et al. 2014): West Africa, western Central Africa, East Africa and southern Africa. The latter two clades occur within the assessment region where they can be further subdivided into chromosomal groups. Pygmy Mice from the East African clade have a diploid number of $33 < 2n < 35$, while the southern African clade harbours two subclades: one with $2n = 34$ and the other $2n = 18$. The $2n = 18$ subclade is endemic to South Africa (Veyrunes et al. 2004, 2005, 2010, 2014; Kouassi et al. 2008; Mboumba et al. 2011; McDonough et al. 2013; Chevret et al. 2014; Lamb et al. 2014).

Assessment Rationale

Listed as Least Concern in view of its wide distribution within the assessment region, including many protected areas, as well as being able to survive in modified and agricultural landscapes. Additionally, this species is connected to its extensive range throughout West, East and southern Africa, and there are no major threats within the assessment region that could cause population decline. Further research is necessary to define its geographical distribution more accurately and to resolve the potential species complex.

Regional population effects: Based on recent molecular studies, the species range is believed to be continuous throughout eastern Africa (Eastern Clade) and the western and central regions of southern Africa (Southern Clade) (Chevret et al. 2014) (see **Distribution**). There is possible migration between South Africa's northern border regions, especially through the Great Limpopo Transfrontier Conservation Area (GLTFCA), and northern KwaZulu-Natal.

Distribution

This species is widely distributed across sub-Saharan Africa where it occurs in a wide variety of savannah and grassland habitats (Monadjem et al. 2015). Based on molecular and chromosomal data (see Monadjem et al. 2015), its distribution is more extensive than previously thought; for example, it is now thought to occur in the arid regions of southern Africa in sympatry with *M. indutus* (Monadjem et al. 2015). Until recently, *M. minutoides* was restricted to southern Africa, the northern limits of its range remaining unknown. Through molecular phylogeny and cytogenetic data, its northern distribution limits have been extended to Kenya–Tanzania in East Africa, and Guinea in West Africa, in sympatry with *M. musculoides* (Veyrunes et al. 2004, 2005; Monadjem et al. 2015).

Within the assessment region, the species occurs in the Cape Macchia Zone, the savannah grassland and woodland areas to the east and northeast, Highveld grassland, and in areas with a mean annual rainfall from about 100 mm in the southwest to 1,000 mm in the Drakensberg (Skinner & Chimimba 2005), also occurring at higher altitudes in Swaziland (Monadjem 2013). It

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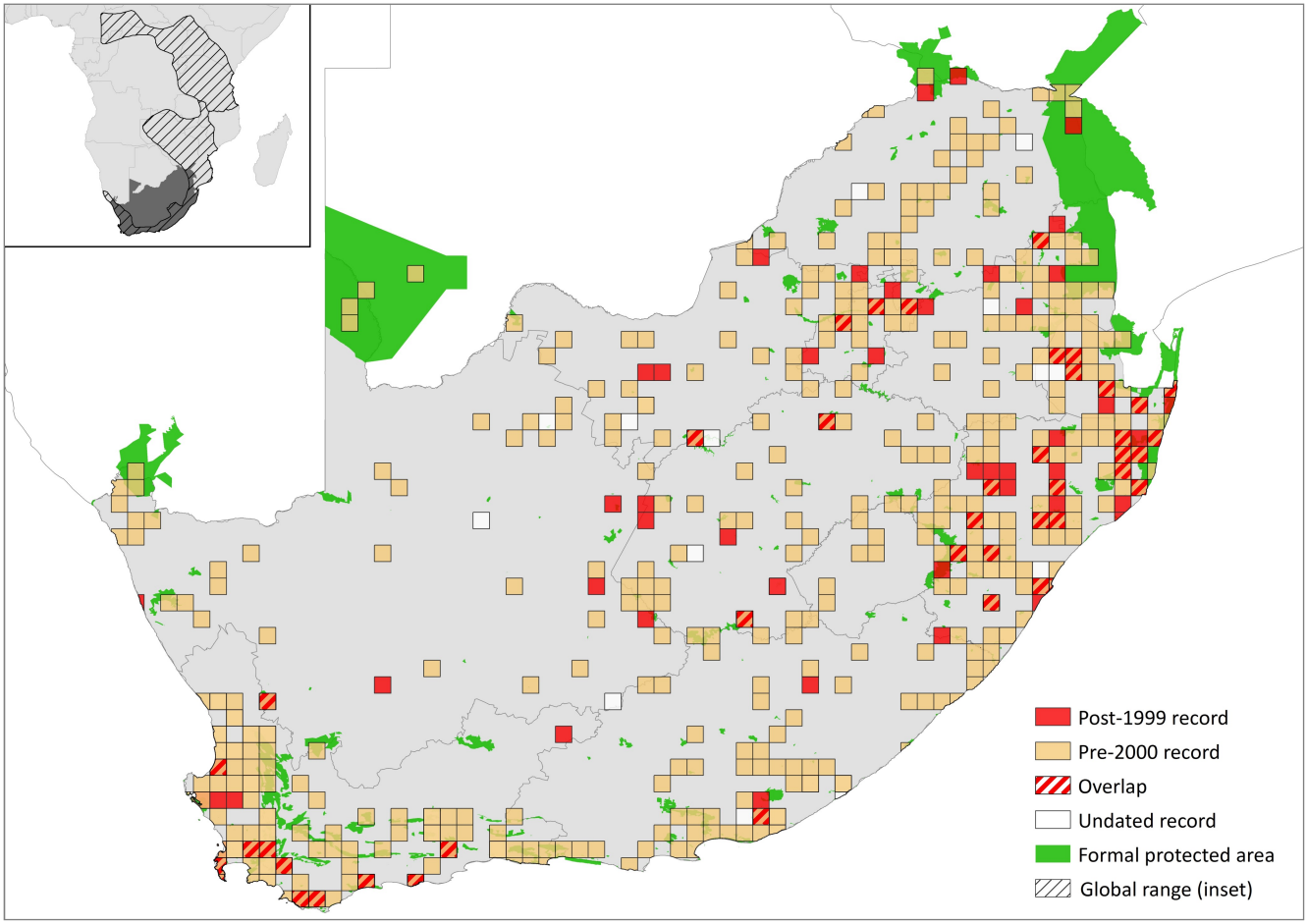

Figure 1. Distribution records for Pygmy Mouse (*Mus minutoides*) within the assessment region

Table 1. Countries of occurrence within southern Africa

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

marginally occurs in the North West Province, and is generally distributed further east of the province (Power 2014). However, it is speculated that misidentifications of this species and *Mus* spp. juveniles may have taken place, and thus any younger than sub-adult specimens must be examined via the available keys (e.g. de Graaff 1981; Meester et al. 1986), as the past museum records of this species may now be *M. indutus*. Further research is thus necessary to delimit its distribution more accurately.

Population

Generally, this species is considered abundant to very abundant. Recorded population densities reach 28 individuals / ha and, during favourable environmental conditions, even higher densities are probable (Monadjem 2013). Population sizes are highly variable with peaks and subsequent crashes occurring. Although its abundance fluctuates widely, it is more numerous in dry winter months (Monadjem & Perrin 2003). Although previous literature may refer to this species as uncommon, this is expected to be a result of low capture rates, as it can be difficult to trap. In Phinda Private Game Reserve, KwaZulu-Natal, Pygmy Mice occurred in the greatest number of sampled vegetation types, where abundance was significantly different amongst seasons but not amongst vegetation types (Rautenbach et al. 2014).

Current population trend: Stable, although fluctuates widely across seasons.

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 is a generalist species, well distributed across the southern and eastern parts of South Africa, where it prefers grassland, but also occurs in lightly wooded areas and on the fringes of semi-forested areas. It occurs across a number of habitat types, including savannah, fynbos, grassland, rocky habitats, as well as vlei and riverine regions (Monadjem 2013). Pygmy Mice have also been recorded in grasslands that have been recently burnt and disturbed (for example, Umvoti Vlei Conservancy, KwaZulu-Natal; Fuller & Perrin 2001), in areas affected by

Table 2. Threats to the Pygmy Mouse (*Mus minutoides*) 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	*8.3 Introduced Genetic Material*: possible threat of genetic pollution of resident populations related to the pet trade of this species.	-	Anecdotal	-	-

agriculture, livestock production and forestry. It also occurs in suburban areas, although it is not usually found inside buildings (Skinner & Chimimba 2005). In Rolfontein Nature Reserve, Northern Cape Province, it was found in short vegetation and hard calcareous soil, and near human settlements (Jooste & Palmer 1982). In Swaziland, this species was recorded in rocky, riparian floodplain forest and low rocky thicket in the Maguga Dam area (Avenant & Kuyler 2002). In the arid regions of southern Africa, this species occurs in sympatry with *M. indutus* (Monadjem et al. 2015).

It is nocturnal and terrestrial, and is not a communal species, thus burrows are used only by a pair or a family group. In soft ground it constructs shallow burrows, but much more commonly uses existing shelter under fallen logs, piles of debris, boulders or holes in termite mounds. The species appears to forage singly at night and may not be tied closely to a single shelter. An effective way of catching Pygmy Mice is to lay a tarpaulin or sheets of corrugated iron on the ground which it will use as a temporary diurnal shelter (Skinner & Chimimba 2005). Its main diet is grass seeds, insects and termites (Monadjem 2013); Wilson (1975) recorded the seeds of couch grass *Cynodon dactylon* in stomach contents.

The colloquial name is appropriate as *Mus minutoides* is among the smallest of the murids. The adults of this species have a total length of about 97 mm, with tails of 41 mm and a mass of 5.5 g (Skinner & Chimimba 2005). The upper parts of the body are brownish-buff and this brownish colour is imparted to the pelage by the presence of black-tipped hairs that become fewer on the flanks, which are orange-buffy in colour. The border between the colour of the flanks and the white of the underparts is sharply defined. The tail is brown above and buffy below, the ears brownish, the hands and feet buffy-white.

Ecosystem and cultural services: This species represents a valuable prey species for a number of small predators, and may also contribute to seed dispersal throughout the assessment region.

Use and Trade

This species is not thought to be traded or utilised in any form. However, closely related species are involved in international pet trade, and this species may be marketed as African Pygmy Mice.

Threats

Although no specific threats have been identified, there is some concern surrounding the pet trade. If this species is involved in the pet trade and it is of a different geographical population, genetic pollution of resident populations could take place from escapees or deliberate releases.

Current habitat trend: Stable

Conservation

This species is widespread across the assessment region and occurs within a number of protected areas, including the Kruger National Park. No conservation interventions are currently necessary.

Recommendations for land managers and practitioners:

- No management recommendations have been identified.

Research priorities:

- Taxonomic resolution is necessary.

Encouraged citizen actions:

- Report sightings on virtual museum platforms (for example, iSpot and MammalMAP), especially outside protected areas. However, due to their morphological similarities, misidentification of this species with *M. indutus* is common.
- Citizens can plant indigenous gardens and create corridors of natural vegetation between properties.
- Reduce the use of pesticides.

Data Sources and Quality

Table 3. Information and interpretation qualifiers for the Pygmy Mouse (*Mus minutoides*) assessment

Data sources	Field studies (unpublished, literature), indirect information (literature), museum records
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.*