Mus indutus – Desert Pygmy Mouse

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 Desert Pygmy Mouse is so named due to its extensive range through the semi-arid terrain of South Africa and Botswana.

Taxonomy

Mus indutus (Thomas 1910)

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

Common names: Desert Pygmy Mouse (English), Woestyndwergmuis (Afrikaans)

Taxonomic status: Species

Taxonomic notes: Recent phylogenetic analyses support the classification of *Mus indutus* as a discrete monophyletic species of the subgenus *Nannomys* (Lamb et al. 2014). Four subspecies of *Mus indutus* were previously described by Meester et al. (1986), these included *M. i. indutus*, with a range extending across the Northern Cape into Botswana and western Zimbabwe; *M. i. valschensis* (Roberts 1926) from the Free State; *M. i. pretoriae* (Roberts 1926), which is distributed across the Limpopo, Mpumalanga, Gauteng and North West provinces; and finally *M. i. sybilla* (Thomas 1918) from Damaraland in Namibia north into Angola. However, more recently, *sybilla* has been reclassified as the distinct species *Mus sybilla* (Crawford-Cabral 1998; Lamb et al. 2014).

Assessment Rationale

Listed as Least Concern because it ranges extensively within the assessment region and at times has been recorded as extremely abundant due to occasional population explosions. The rate of habitat loss in the North West Province, which constitutes a large portion of the species' extent of occurrence, was 12% between 1994 and 2010. However, because this species is able to exist in agricultural habitats and wildlife ranching is expanding in the North West Province, we retain the Least Concern listing. Due to confusion with *M. minutoides* in the past, the distribution of this species has not been resolved. Further vetting of museum records and field surveys to determine occupancy are required in order to resolve the uncertainty around this species.

Regional population effects: There is presumably dispersal across contiguous habitat from Botswana and Namibia into Kgalagadi Transfrontier Park and surrounding areas.

Distribution

The geographic extent of this species' range is largely uncertain, owing to the confusion with *M. minutoides* (Lamb et al. 2014). However, based on molecular grounds, it has been confirmed from three widely separated localities across South Africa and Botswana, suggesting that it has a wide distribution across the arid and semi-arid regions of southern Africa (Lamb et al. 2014). Although its range was previously suggested to extend into northeastern Namibia, southwestern Zambia, western Zimbabwe and southern Angola, no records of this species were confirmed from these regions by Lamb et al. (2014). It is possible that the previous records from southwestern Angola and Namibia belong exclusively to the species *M. sybilla* (previously recognised as a subspecies of *M. indutus*; Meester et al. 1986).

Within the assessment region (Figure 1), its range is believed to include the Northern Cape, North West, Gauteng and Free State provinces of South Africa. Within the North West Province, this tiny mouse species was found on a few occasions throughout the province, and was more often recorded than the nationally more common Pygmy Mouse, *M. minutoides* (Power 2014). Additionally, specimens from Tussen die Riviere in the Free State have recently been assigned to *M. indutus* using molecular markers and thus the range of the species should be extended south to 30°29' S (Veyrunes et al. 2004) (Figure 1), which is reflected in Monadjem et al. (2015). Finally, the presence of this species has also been confirmed in the Sandveld Nature Reserve (near Bloemhof Dam in the Free State) on the basis of their karyotype (2n = 36) (F. Veyrunes & J. Britton-Davidian unpubl. data). Further vetting of museum records is required to delimit its distribution comprehensively.

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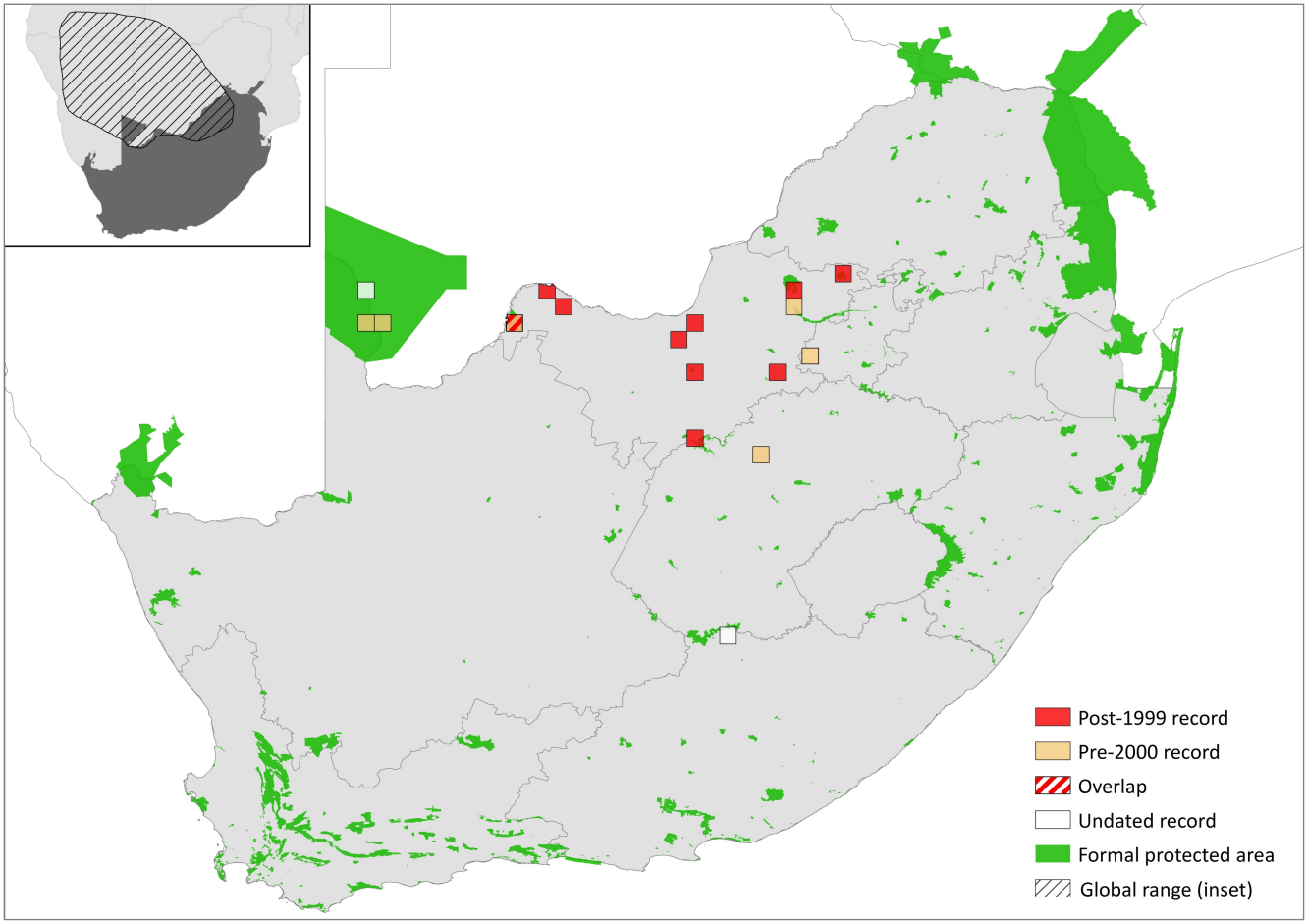

Figure 1. Distribution records for Desert Pygmy Mouse (*Mus indutus*) within the assessment region

Table 1. Countries of occurrence within southern Africa

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

Population

Although the population status of this species is uncertain, they are considered to be one of the most abundant species in the Kalahari. Additionally, this species may experience periods of population explosion when conditions are favourable and food availability increases. Their population numbers rise rapidly, followed by a population crash to very low levels (Smithers 1971). Within the assessment region, very few are trapped, possibly because of their small body size. However, they occur in disturbed habitats and we suspect there are over 10,000 mature individuals. This species occurs sympatrically and has regularly been confused with *M. minutoides* (Chevret et al. 2014), thus caution should be taken when conducting population surveys of this species.

Current population trend: Stable

Continuing decline in mature individuals: Unknown

Number of mature individuals in population: It is suspected that there may be more than 10,000 mature individuals within South Africa.

Number of mature individuals in largest subpopulation: Unknown

Number of subpopulations: Unknown

Severely fragmented: No, can occur in agricultural habitats.

Habitats and Ecology

The Desert Pygmy Mouse has an extensive habitat tolerance throughout semi-arid savannahs (Lamb et al. 2014), although it typically avoids open microhabitats. They have been recorded from the arid scrub savannah of the Kalahari to the wetter regions of the Okavango Delta (Skinner & Chimimba 2005). In general, their range includes areas with an average annual precipitation of 200–700 mm.

This nocturnal species spends the daylight hours under cover, within crevices beneath debris, logs, bark and stones, and occasionally will dig small burrows into sandy soils, or utilise holes dug by other species (Skinner & Chimimba 2005). A colony of 35 individuals was documented during a period of favourable environmental conditions in the Kalahari Transfrontier Park, Northern Cape (Skinner & Chimimba 2005). They are not seasonal breeders, and give birth in round grass nests within shallow burrows (Smithers 1971).

This omnivorous species primarily feeds on grass seeds, seeds of *Vachellia* (previously *Acacia* spp.), dry pods, and

Table 2. Threats to the Desert Pygmy Mouse (*Mus indutus*) 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	*3.2 Mining & Quarrying*: habitat loss from mining expansion.	Desmet & Schaller 2015	Indirect (remote sensing)	Regional	Increasing
2	*11.1 Habitat Shifting & Alteration* and *11.2 Droughts*: climate change altering habitat suitability. Current stress *1.2 Ecosystem Degradation*.	-	Anecdotal	-	Increasing
3	*2.3 Livestock Farming & Ranching*: overgrazing by livestock. Current stress *1.2 Ecosystem Degradation*.	Hoffmann & Zeller 2005	Indirect	Regional	The decline in grass cover, arthropod abundance, and plant species diversity causes a loss of food resources for small mammals, a disruption in habitat structure and shelter, and an increase in predation.

the dry exterior layer of fruit from trees such as *Ziziphus mucronata* (Buffalo Thorn). They will also consume termites and small beetles, and have been documented exhibiting cannibalistic behaviour (Skinner & Chimimba 2005).

Ecosystem and cultural services: This species represents a valuable prey species for a number of predators, such as Suricates (*Suricata suricatta*) and Barn Owls (*Tyto alba*), and may also contribute to seed dispersal in the semi-arid and arid regions of southern Africa.

Use and Trade

This species does not appear to be utilised or traded in any form.

Threats

No major threats have been recognised for this species. However, Driver et al. (2012) document considerable loss of natural habitat in North West Province due to agricultural expansion, mining, and human settlement expansion. This species can exist in disturbed habitats and, given the proliferation of wildlife ranching within the province (Power 2014), should continue to be stable. While they are able to survive in degraded areas, hugely overgrazed areas and areas transformed into habitats with little or no biomass for forage and shelter would negatively impact this species (Hoffmann & Zeller 2005). Additionally, climate change is predicted to affect resource availability and distribution of arid and semi-arid regions.

Current habitat trend: Declining. In North West Province, which comprises the bulk of its range, habitat loss between 1994 and 2010 amounted to 12% (NW READ 2014; Desmet & Schaller 2015).

Conservation

The Desert Pygmy Mouse occurs in many protected areas within the assessment region and no specific conservation interventions are necessary at present. However, further research is required to delineate the population dynamics, current and potential threats, as well as the general ecology and life history traits of this species. Should this species become a nuisance, due to population explosions, Barn Owls are a valuable means of biocontrol for nocturnal rodent species.

Recommendations for land managers and practitioners:

- Landowners and managers should breed Barn Owls to mitigate the species as an agricultural and human health threat.

Research priorities:

- Accurate distribution mapping and the identification of population size and trend estimates is necessary. This includes vetting museum records.
- Investigations into this species' ability to survive in agricultural areas and on wildlife ranches.
- Population trends in disturbed areas.

Encouraged citizen actions:

- Accurate sighting reports of this species on virtual museum platforms is unlikely, considering the morphological similarities between this species and *M. minutoides*.
- Citizens can plant indigenous gardens, like Brenthurst Gardens in Johannesburg, and create corridors of natural vegetation between properties.
- Save electricity and fuel to mitigate CO_2 emissions and hence the rate of climate change.

Data Sources and Quality

Table 3. Information and interpretation qualifiers for the Desert Pygmy Mouse (*Mus indutus*) 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

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.*