# *Parotomys littledalei* – Littledale's Whistling Rat

Tim Jackson

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|---|---|
| **Regional Red List status (2016)** | Near Threatened B2b(iii,iv)+c(iii)*† |
| National Red List status (2004) | Near Threatened B2a+c(ii) |
| 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 †Watch-list Threat

The increasing frequency and duration of drought conditions associated with climate change may threaten this species by affecting key forage resources.

## Assessment Rationale

Listed, under a precautionary risk tolerance, as Near Threatened B2b(iii,iv)+c(iii) as it is suspected to be more threatened by droughts than the closely related Brants's Whistling Rat (*P. brantsii*) and became locally extinct in Goegap Nature Reserve after a severe drought in 2003 (retuning only in low numbers in 2014). Thus, this species might be especially vulnerable to an increase in intensity and duration of droughts as a consequence of climate change. Additionally, habitat degradation from overgrazing of rangelands may threaten this species as it is more reliant on plant cover than *P. brantsii*. However, it also has a wide distribution within the assessments region and occurs in several protected areas (including Richtersveld and Augrabies National Parks). Ongoing protected area expansion in the area should sustain strong subpopulations across the range. We recommend more research and long-term monitoring of subpopulation trends, geographic distribution, effects of climate change and threat level. Vulnerability to increased drought periods are of special research emphasis. This species probably qualifies for Least Concern, but further subpopulation trends and area of occupancy estimates are needed to demonstrate this. It should be reassessed following new data.

**Regional population effects**: Possible through dispersal from Namibia across contiguous and largely unfragmented habitat, although the Orange River represents a barrier to dispersal from Namibia. Dispersal ability might be low, as indicated by the long absence from Goegap Nature Reserve after the 2003 drought. Dispersal might depend on connected areas of shrub growth.

## Taxonomy

*Parotomys littledalei* Thomas 1918

ANIMALIA - CHORDATA - MAMMALIA - RODENTIA - MURIDAE - *Parotomys* - *littledalei*

**Synonyms:** *molopensis, namibensis* (Jackson 2013)

**Common names:** Littledal's Whistling Rat (English)

**Taxonomic status:** Species

**Taxonomic notes:** Molecular data suggest that *Parotomys* should be synonymised with *Otomys* (Taylor et al. 2011, 2014), but the genera are recognised as distinct pending a final phylogenetic analysis of species relationships within the Otomyinae (Monadjem et al. 2015). This species is similar to *P. brantsii* but distinguishable, both through dental morphology (un-grooved upper incisors) and whistle frequency and length (Le Roux et al. 2002; Monadjem et al. 2015).

## Distribution

This species has a narrow distribution in the driest parts of southern Africa, from the western regions of South Africa north into Namibia and mostly along a narrow strip of desert (Monadjem et al. 2015). It occurs in the South-West Africa Biotic Zone (Namib Desert and Karoo regions) (Jackson 2013), and is absent from the central Namib Desert. It has not been recorded from Angola. Museum records need vetting to improve the accuracy of its distribution map. It is suspected to have an area of occupancy of < 2,000 km2 due to its patchy distribution and vulnerability to local extinctions. However, this should be more accurately quantified in future assessments.

## Population

Relatively common in suitable habitats (although caught seldomly in small mammal traps) and is rarely seen but frequently heard (Jackson 2013). It undergoes population irruptions in response to environmental conditions and has a patchy distribution, linked to the distribution of deep sandy soils. Thus, detecting a population trend is difficult and long-term, systematic monitoring is necessary. The presence of *P. littledalei* in an area is usually indicated by

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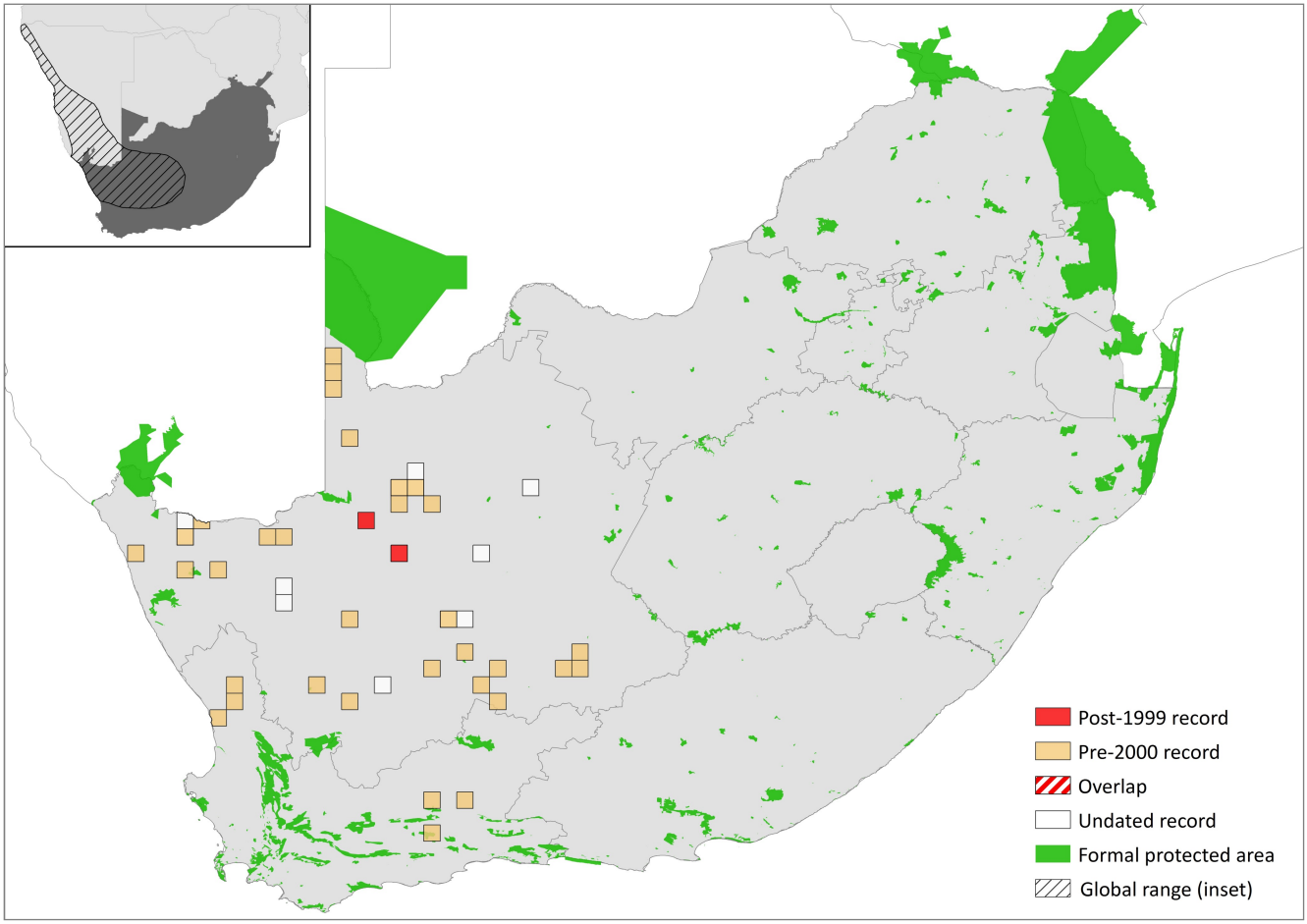


**Figure 1. Distribution records for Littledale's Whistling Rat (*Parotomys littledalei*) within the assessment region**

**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 | - |

a complex warren system under bushes (Coetzee & Jackson 1999; Jackson 2000). Population data from Goegap Nature Reserve, Northern Cape Province, indicate that it is more prone to local extinction than *P. brantsii*, where a density of 15 individuals / ha was recorded in 2001 and subsequently was not recorded until 2014 at a density of 1 individual / ha (C. Schradin unpubl. data). At the same site, *P. brantsii* exhibited densities of 2–10 individuals / ha remaining stable and consistent between 2001 and 2014 (C. Schradin unpubl. data).

**Current population trend:** Stable

**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 diurnal species occurs in shrubland and is more dependent on ground cover than *P. brantsii* (Jackson 2000). They avoid open habitats. It is not known if the species can persist in disturbed or modified habitats, but it does occur in rangelands. It has a patchy habitat distribution, reflecting forage availability and the need for deep soils. It occurs specifically in coastal hummocks, sand dunes and gravel plains of the Namib Desert, as well as dry riverine systems, extending inland from the coastal plains of Namibia (Coetzee & Jackson 1999; Jackson 2013).

Littledale's Whistling Rat is herbivorous only, feeding on fresh plant material, including annuals, succulent perennials, non-succulent perennials, and grasses (Jackson 2013). It depends on plant leaves and succulents as food and cannot switch to seeds or other resources. As such, it depends on the presence of green foliage and became locally extinct in Goegap Nature Reserve in 2003 due to a prolonged drought that removed all green plant material (C. Schradin unpubl. data).

Burrows are constructed below bushes, and linked together through surface pathways that also link to foraging areas, and contain several nest chambers filled with shredded vegetation (Jackson 2013). Its large kidneys (1.4% of body mass compared to 0.6% of *P. brantsii*) enable the most concentrated production of urine of any southern African otomyine species (Jackson et al. 2004). This helps to avoid water loss. It emits a high-

**Table 2. Threats to the Littledale's Whistling Rat (*Parotomys littledalei*) 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*: population decline from loss of foraging resources. Current stress *1.2 Ecosystem Degradation*. | du Plessis et al. 1989 | Indirect | Local | Increasing |
| 2 | *2.3.2 Livestock Farming & Ranching*. Current stress *1.2 Ecosystem Degradation*: from overgrazing. | Jackson 2000 | Indirect | Local | Possibly decreasing |
| | | Masubelele et al. 2014 | Indirect | Regional | |

pitched alarm whistle when disturbed by predators (Le Roux et al. 2002; Jackson 2013). Under artificial conditions, *P. littledalei* females prefer to inbreed, leading to a male bias in litter composition (Pillay 2002). Whether such inbreeding is adaptive for living in small isolated populations must be tested.

**Ecosystem and cultural services:** Desmet and Cowling (1999) suggested that the nutrient-rich soil patches around *P. brantsii* burrows may facilitate the re-vegetation of mine dumps, which might similarly apply to *P. littledalei*. This should be interpreted with some caution as the rats require forage and would only recolonise areas where there is at least some plant cover.

# Use and Trade

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

# Threats

This is a species that should be flagged as being potentially threatened due to projected aridification as a result of climate change (Boko et al. 2007). Increased frequency and duration of drought conditions may affect the forage resources on which it depends. This response to global change may be exacerbated by the sensitivity of this rodent to high ambient temperatures (du Plessis et al. 1989), which may limit foraging behaviour under hotter conditions. For example, it became locally extinct in Goegap Nature Reserve after a severe drought in 2003 and returned in low numbers in 2014 (C. Schradin unpubl. data).

Similarly, overgrazing in some areas reduces habitat quality. This species may be more threatened by overgrazing than *P. brantsii* because it is more restricted to areas of adequate cover (Jackson 2000). Whereas grazing should be encouraged to decrease bush encroachment (see **Habitats and Ecology**), overgrazing should be avoided, especially in the more open vegetation types. As such, the proliferation of wildlife ranching should be monitored for its potential negative impacts as overgrazing may impact key vegetation types that this species requires. However, more research is needed to understand the net effects of local overgrazing on this species. For example, a recent study found that, contrary to prediction, grass cover has increased and dwarf shrub cover has decreased in the Nama and Succulent Karoo, which is attributed to a general decrease in stocking rate in the area (Masubelele et al. 2014).

**Current habitat trend:** Stable. Although the extent of habitat is not expected to decline, there may have been a decrease in habitat quality due to overgrazing – especially of the key resource areas listed above. Human settlements are not expected to encroach on its habitat. The effects of climate change on this species should be monitored.

# Conservation

It occurs commonly but patchily in protected areas across the range; for example Richtersveld and Augrabies National Parks and Goegap Nature Reserve. Systematic monitoring is required to assess population trends and dynamics. The species would benefit from continued protected area expansion to enable it to track shifting habitats caused by climate change. For example, WWF South Africa is purchasing Knersvlakte to increase the size of a reserve and, in 2014, the Goegap Nature Reserve was increased in size, from 150 km$^2$ to around 250 km$^2$, by including several neighbouring farms. Removing ground cover and green plant material through overgrazing will negatively affect this species and thus rangelands should be managed holistically by lowering stocking rates and conserving buffer zones.

**Recommendations for land managers and practitioners:**

- Land managers should decrease stocking rates to conserve key resource areas.

**Table 3. Conservation interventions for the Littledale's Whistling Rat (*Parotomys littledalei*) 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 mitigate effects of climate change. | - | Anecdotal | - | - | Department of Environment and Nature Conservation protected area expansion strategy. |
| 2 | *2.3 Habitat & Natural Process Restoration*: employ ecological stocking rates to prevent overgrazing. | - | Anecdotal | - | - | - |

- Long-term, systematic monitoring is needed to establish subpopulation trends and threat levels.

**Research priorities:**

- Effects of overgrazing and climate change on key resource area quality and distribution and its impact on subpopulation trends.
- Effect of extended drought periods of population extinction over a larger geographic scale.
- Long distance dispersal ability (to re-colonise habitat where the species became locally extinct), which includes assessing the extent of fragmentation of subpopulations.

**Encouraged citizen actions:**

- Inform local farmers and guest farms about the concerns regarding the vulnerability of this species to droughts to get information on subpopulation trends.
- Report sightings on virtual museum platforms (for example, iSpot and MammalMAP).

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# Data Sources and Quality

**Table 4. Information and interpretation qualifiers for the Littledale's Whistling Rat (*Parotomys littledalei*) assessment**

| | |
|---|---|
| Data sources | Field study (unpublished), indirect information (literature), museum records |
| Data quality (max) | Inferred |
| Data quality (min) | Suspected |
| Uncertainty resolution | Author consensus |
| Risk tolerance | Precautionary |

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