# *Thallomys nigricauda* – Black-tailed Tree Rat


Bernard Dupont

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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) (2007) | None |
| CITES listing | None |
| Endemic | Edge of range |

*Watch-list Data

The Black-tailed Tree Rat is so named due to its distinctive black tail and arboreal lifestyle (Skinner & Chimimba 2005). It constructs large and conspicuous nests in hollow trunks and forks of trees (Nel 2013).

## Taxonomy

*Thallomys nigricauda* (Thomas 1882)

ANIMALIA - CHORDATA - MAMMALIA - RODENTIA - MURIDAE - *Thallomys* - *nigricauda*

**Common names:** Black-tailed Tree Rat (English), Swartstertboomrot, Swartstertrot (Afrikaans), Khuruvuru (Tsonga)

**Taxonomic status:** Species

**Taxonomic notes:** The type locality of this species is from the Hountop (Hudup or Hutop) River, west of Gibeon in Namibia (Skinner & Chimimba 2005). Although some suggest that this species should be treated as a species complex under *Thallomys paedulcus sensu lato*, Taylor et al. (1995) describe how two chromosomes of *T. paedulcus* and *T. nigricauda* are distinguishable on morphometric grounds. *Thallomys shortridgei* was previously included within *T. nigricauda*, but following Musser and Carleton (2005), *T. shortridgei* is currently recognised as a distinct species. The relationship between the species of this genus require resolution, and a molecular analysis of the genus is urgently required (Nel 2013; Monadjem et al. 2015).

## Assessment Rationale

The illegal harvesting of Acacia trees, especially *Vachellia* (previously *Acacia*) *erioloba* and *Senegalia* (previously *Acacia*) *mellifera*, across the range of this species is a major threat, as it reduces habitat quality through the destruction of nesting sites and food resources. Although widely distributed across the *Acacia* woodlands and shrublands of the northwestern parts of South Africa (including Northern Cape, North West and Limpopo provinces), this species was not recorded at all during a recent survey in North West Province, despite trapping effort of 380 trap nights and extensive spotlighting in the Molopo Bushveld vegetation type (R.J. Power unpubl. data) and the species was last recorded in Molopo in 2002. This suspected reduction in population over the last decade might qualify the species as Near Threatened A2c, but applying the regional criterion retains a Least Concern listing: the species is a good disperser and habitat is contiguous across both the Namibian and Botswana borders with presumed dispersal across countries. Additionally, it has a large potential area of occupancy (84,860 km$^2$) based on remaining natural woodland habitats within its range.

Although the species is benefitted by legislation in place to protect *Acacia* trees (harvesting requires a permit), ongoing illegal harvesting could be causing a continuing decline in habitat quality. For example, the Camel Thorn Tree (*V. erioloba*) is a protected species in terms of the National Forests Act (No. 84 of 1998) but it is not always enforceable. More research needs to be done to quantify the impact of this threat on population size and trend and provide evidence for effective conservation interventions. This species should be reassessed as more data become available.

**Regional population effects**: There is likely dispersal from Namibia and Botswana, and there is contiguous habitat across the borders to South Africa. Black-tailed Tree Rats are considered good dispersers as long as there is tree cover.

## Distribution

This largely southern African species has been recorded from western Angola in the north of its range, southwards through much of Namibia and Botswana to the northwestern parts of South Africa where it inhabits arid *Acacia* savannah (Figure 1). The precise delineation of this species' range remains controversial, as it is often mistaken for *T. paedulcus* (Skinner & Chimimba 2005). More specifically, the eastern limits of its distribution are unknown, and it could extent further east than is presented on Figure 1 (see Monadjem et al. 2015). Although Taylor et al. (1995) suggest that *T. nigricauda* and *T. paedulcus* have largely overlapping distributions extending throughout southern Africa (Skinner & Chimimba 2005), recent contrasting evidence suggests that it is more likely that much of their distributions do not overlap and *T. paedulcus* may be restricted to the eastern regions of southern Africa, and *T. nigricauda* to the

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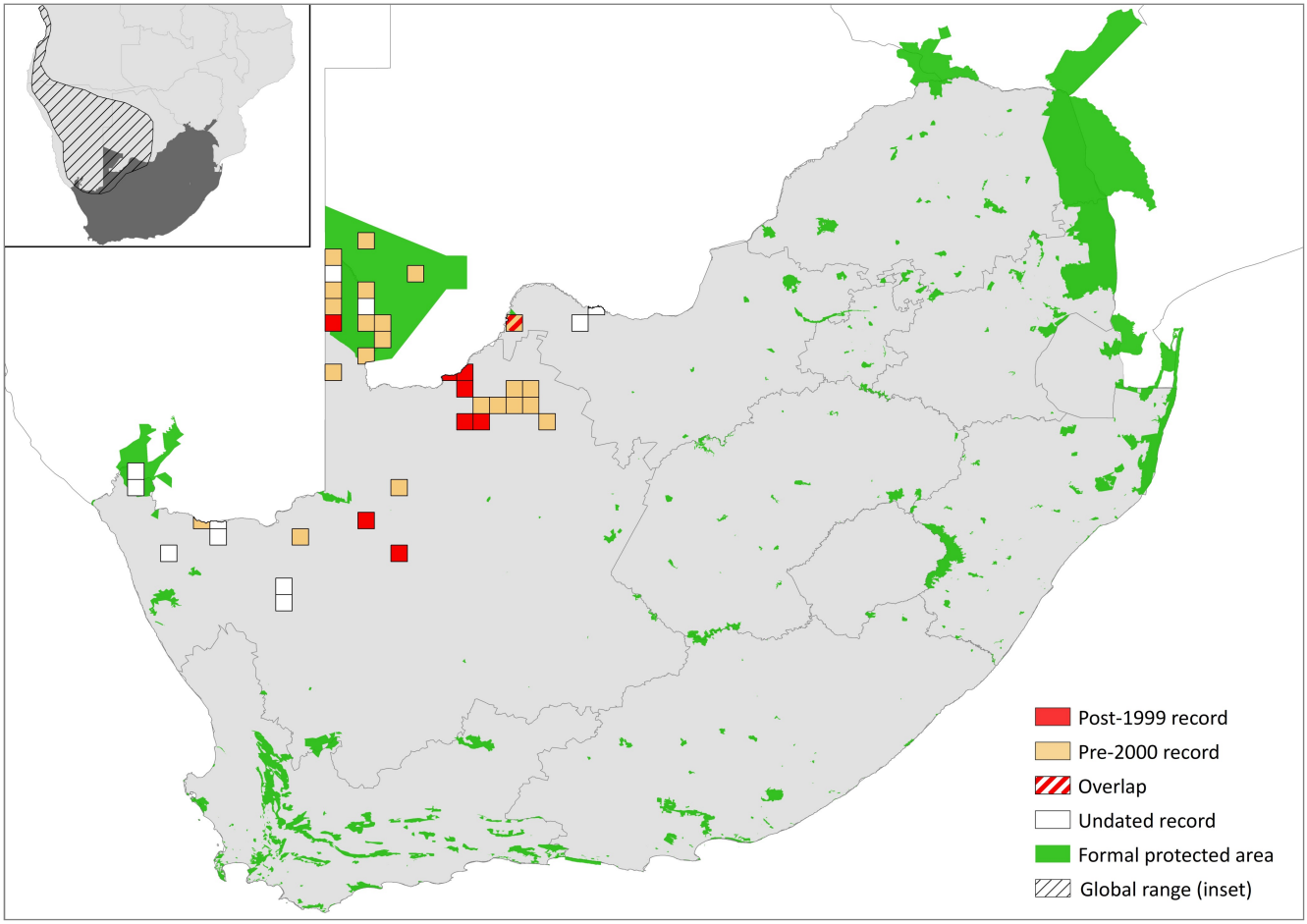


**Figure 1. Distribution records for Black-tailed Tree Rat (*Thallomys nigricauda*) within the assessment region**

**Table 1. Countries of occurrence within southern Africa**

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

western regions (see Monadjem et al. 2015). Further vetting of museum records is required to delimit the respective distributions of *T. nigricauda* and *T. paedulcus*. Similarly, the records on or south of the Gariep River must be vetted to ensure they do not refer to *T. shortridgei* (Monadjem et al. 2015). Currently, the degree of allopatry with *T. shortridgei* is unknown (Nel 2013).

A recent survey covering all vegetation types in the North West Province did not record this species, but did record *T. paedulcus* (Power 2013, 2014). It was last documented at Molopo Nature Reserve in 2000 (Eccard et al. 2006). Power (2014) speculated that an extensive fire in 1997, which burnt the whole northern half of the reserve, could have led to a local extinction, but this was disproved by evidence of a subpopulation present in 2002 (see Eccard et al. 2006; Meyer et al. 2008). Further field surveys are required from across its range to determine area of occupancy and other local extinctions.

# Population

The Black-tailed Tree Rat is locally common in stands of suitable trees (those containing cavities for nesting), but patchily distributed throughout its range. This species was not recorded at all during a recent survey of the North West Province despite the trapping effort of 380 trap nights and extensive spotlighting in the Molopo Bushveld vegetation type (Power 2014). Across two reserves, the Molopo Nature Reserve and Khamab Kalahari Reserve, a total of 1,226 km and 72 hours was totalled over 52 surveys, and no individuals were encountered (R.J. Power unpubl. data). The dearth in not finding this species should be a cause for concern (Power 2014). Population declines can also occur after bush fires when smoke filters through the cavities as the number of inhabited trees in burnt areas (even where trees are just singed) are lower than unburnt areas (Nel 2013). Captive individuals were found to have a longevity of about 4 years (Jones 1982). In the Thornveld Savannah of South Africa, Meyer et al. (2008) recorded sex ratios of 1:1, and density estimates of 0.5–1 individual / ha.

**Current population trend:** Unknown

**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 arboreal, nocturnal species is generally associated with arid savannahs, especially *Acacia* bushland habitats and Kalahari thornveld with *Acacia erioloba*, *A. luederitzii*, *Boscia albitrunca* and *Terminalia sericea* trees, with *A. mellifera* shrubs (Nel 2013). Occurs mostly in dense or open stands of trees but also in large isolated trees (Nel 2013). Typically, it requires tall trees, particularly Camel Thorn Trees (*A. erioloba*) (Dean et al. 1999), but has also been found nesting in Leadwood (*Combretum imberbe*), Mopane (*Colophospermum mopane*) and other species of large trees. On Molopo Nature Reserve, it was found to be dependent on any dead or alive mature trees with cavities for nesting, as long as they were in close proximity to its favoured food plant, *Acacia mellifera* (Eccard et al. 2006). This may limit the choice of suitable nest sites, since *A. mellifera* was less likely to grow within a vegetation patch containing large trees than in patches without large trees (Power 2014). Generally a nest is occupied by a pair and their young, but up to eight adults have been witnessed leaving a single nest (Smithers 1983). Thorns of *Acacia* trees may effectively protect tree rats from predators. For example, during a 143-day study in the Kalahari Thornveld, no predation of tree rats was observed (Meyer 2004). Additionally, Meyer et al. (2008) suggested that the dense shrub cover may protect this species from aerial predators during movement.

Predominantly vegetarian, they typically feed on the newly sprouting leaves of *Acacia* spp., as well as fine twigs and the outer green covering of seed pods (Coleman & Downs 2010). They prefer the arid savannahs of the western parts of South Africa (Skinner & Chimimba 2005). Although most rodents dwelling in xeric environments avoid the harsh environmental conditions by burrowing, this is one of a few species to have opted for an arboreal lifestyle (Coleman & Downs 2010). Nests are formed under loose bark or in the forks and hollows of trees using grass, sticks and leaves (Skinner & Chimimba 2005). They are able to survive independent of drinking water, meeting water requirements from their diet (Skinner & Chimimba 2005).

Black-tailed Tree Rats are seasonal breeders, and although no data are available for the assessment region, in the northern parts of southern Africa, young were born between August and April, and a mean litter size of 3.6 was observed (Skinner & Chimimba 2005).

**Ecosystem and cultural services:** Although this species may have a low predation rate in some parts of its range (Meyer 2004), it likely still utilised as a food source by many terrestrial or arboreal predators, such as small carnivores and snakes. On a small-scale, this species could aid in some degree of bush encroachment control, as it feeds on a major encroacher, the Black Thorn, *A. mellifera*.

# Use and Trade

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

# Threats

The Black-tailed Tree Rat requires vegetation structure with intact woodlands for food and nesting sites. Resultantly, it is vulnerable to the harvesting of mature trees, especially *V. erioloba* and *A. mellifera*, for firewood or charcoal production (Eccard et al. 2006). This is a noted problem in the North West Province (DACE 2008), though not severe in extent, and commercial harvesting of Camel Thorn in the Northern Cape is thought to be largely restricted to dead trees (von Staden & Raimondo 2015).

Woodland clearing of Camel Thorn and Black Thorn (often with the use of pesticides) to enhance grassland establishment and increase grazing suitability for livestock may also cause a decline in habitat availability for this species. This occurs mainly in areas threatened by bush encroachment, as a result of poor land management (von Staden & Raimondo 2015). Incorrect fire regimes are also a root problem as it promotes overgrazing that removes the fuel load, which leads to bush encroachment (Driver et al. 2012).

**Current habitat trend:** Declining

# Conservation

This species is present within some protected areas across the assessment region, for example Kgalagadi Transfrontier Park (de Graaff 1978) and Tswalu Kalahari Reserve. No direct interventions are necessary at present. However, conservationists should protect woodland patches and ensure connectivity through protected area expansion and biodiversity stewardship schemes. Additionally, harvesting of large trees should be regulated to make the practice sustainable. The protected status of *A. erioloba* in South Africa should be maintained, due to its ecological importance, cultural value and the threats associated with uncontrolled and illegal harvesting for commercial firewood (Seymour & Milton 2003). North West Province has enlisted the Black-tailed Tree Rat as Specially Protected in their current Biodiversity Act owing to the concern in the status of the species there.

**Table 2. Threats to the Black-tailed Tree Rat (*Thallomys nigricauda*) 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 | *5.3.3 Logging & Wood Harvesting*: harvesting of trees for firewood and charcoal production. | Anderson & Anderson 2001 | Indirect | Regional | Unknown |
| 2 | *2.3.2 Livestock Farming & Ranching*: woodland clearing for pasture. Current Stress *1.1 Ecosystem Conversion*. | von Staden & Raimondo 2015 | Indirect | Regional | Increasing |
| 3 | *2.1.3 Annual & Perennial Non-Timber Crops*: habitat loss from crop agriculture. Current stress *1.1 Ecosystem Conversion*. | Driver et al. 2012 | Indirect | National | Ongoing |

**Table 3. Conservation interventions for the Black-tailed Tree Rat (*Thallomys nigricauda*) 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 | *3.1.1 Harvest Management:* regulate fuelwood extraction of mature trees. | - | Anecdotal | - | - | - |
| 2 | *1.1 Site/Area Protection*: protected area expansion to conserve woodland. | - | Anecdotal | - | - | - |
| 3 | *5.3 Private Sector Standards & Codes*: stewardship schemes to conserve woodland. | - | Anecdotal | - | - | - |
| 4 | *5.4 Compliance & Enforcement*: stricter penalties and enforcement for illegal/uncontrolled tree harvesting. | - | Anecdotal | - | - | - |

**Recommendations for land managers and practitioners:**

- Subpopulations should be monitored to record any changes in abundance and distribution, and the monitoring of nest sites, and spotlight surveys, are suggested.
- Land managers should be encouraged to conserve woodlands and old trees.

**Research priorities:**

- Additional studies are needed into the taxonomic status of this species.
- Analysis of museum records to more accurately delimit distribution.

**Encouraged citizen actions:**

- Report sightings on virtual museum platforms (for example, iSpot and MammalMAP), especially outside protected areas. However, this species cannot be readily distinguished from *T. paedulcus* based on morphological characteristics.
- Landowners can preserve *Acacia* trees, both living and dead.

# Data Sources and Quality

**Table 4. Information and interpretation qualifiers for the Black-tailed Tree Rat (*Thallomys nigricauda*) assessment**

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|---|---|
| Data sources | Field study (unpublished), indirect information (literature), museum records |
| Data quality (max) | Inferred |
| Data quality (min) | Suspected |
| Uncertainty resolution | Expert consensus |
| 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.*