

Graphiurus murinus – Woodland Dormouse



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

*Watch-list Data

The Woodland Dormouse uses daily torpor spontaneously to save energy when faced with unfavourable conditions like scarcity of food and low temperatures. Excluding the bats, it is currently the smallest known non-volant African mainland hibernator (Mzilikazi et al. 2012).

Taxonomy

Graphiurus murinus (Desmarest 1822)

ANIMALIA - CHORDATA - MAMMALIA - RODENTIA - GLIRIDAE - *Graphiurus - murinus*

Synonyms: *alticola*, *cineraceus*, *cinerascens*, *collaris*, *erythrobronchus*, *griseus*, *isolatus*, *johnstoni*, *lalandianus*, *raptor*, *saturates*, *selindensis*, *soleatus*, *vulcanicus*, *zuluensis*. See full list in Holden (2013).

Common names: Woodland Dormouse, Forest African Dormouse (English), Boswaaierstermuis (Afrikaans), Mokomane, Nthuê, Nthufê, Nthuhê, Motsêkêtsêkê, Tsikôtsikô (Tswana)

Taxonomic status: Species complex

Taxonomic notes: Taylor et al. (1994) reported that specimens from Mkhuze in KwaZulu-Natal, Simunye in Swaziland and Waterpoort in Limpopo differed morphologically (reduced upper molar, inflated bullae) from other specimens of *Graphiurus murinus* and from the Stone Dormouse (*G. platyops*). Similarly, recent evidence reported differences in the morphology of two populations

of *G. murinus* in the Eastern Cape (Kryštufek et al. 2004). Although karyotypes were the same for both populations, they differed from previously recorded karyotypes for this genus in Africa (Kryštufek et al. 2004). Additionally, a high degree of chromosomal diversity has been recorded in this species (Dippenaar et al. 1983; Holden 1993). Taxonomic research and DNA analysis is therefore necessary to carry out a systematic revision of this species complex (Skinner & Chimimba 2005; Holden 2013).

Assessment Rationale

The Woodland Dormouse is listed as Least Concern in view of its wide distribution within the assessment region and presumed large population. It is present in many protected areas, and can co-occur with human habitation. Although the species is thought to occur in naturally low numbers, it is not suspected to be declining as there are no major threats. As this rodent is arboreal, it is difficult to trap on the ground, and thus may be more abundant than expected. For future surveys, it is recommended that traps are set in trees. This species may have to be reassessed as the species complex is disentangled through ongoing molecular work.

Regional population effects: Unless conditions are favourable, this species may occur in low numbers across the central, eastern and northern parts of the assessment area. Where it occurs in Mozambique, Zimbabwe, Botswana and Namibia, immigration is expected where continuous woodland is found or where patchy woodlands are connected by riverine forests or similar wooded corridors.

Distribution

The Woodland Dormouse has a scattered distribution that stretches from Ethiopia to South Africa (reaching as far west as the Western Cape) and Lesotho. Within the assessment region, it ranges across Limpopo, North West, Gauteng, Mpumalanga, KwaZulu-Natal, and Eastern Cape provinces and marginally into the Western and Northern Cape. It also occurs in Swaziland (Monadjem 1998) and Lesotho (Lynch 1994).

Within the North West Province, only one individual was captured recently (post-2000), which was taken in *Terminalia sericea* woodland near Mositha in the Mafikeng Bushveld vegetation type (Power 2014). However, numerous dead specimens were found throughout the province as Woodland Dormice often nest in electrical switchboxes and sometimes die when in torpor.

Population

This species is thought to generally occur at low densities, although these can vary drastically where the species experiences “boom and bust” cycles, possibly in response to variations in rainfall and food availability. In the Great Fish River Nature Reserve (GFRNR), Eastern

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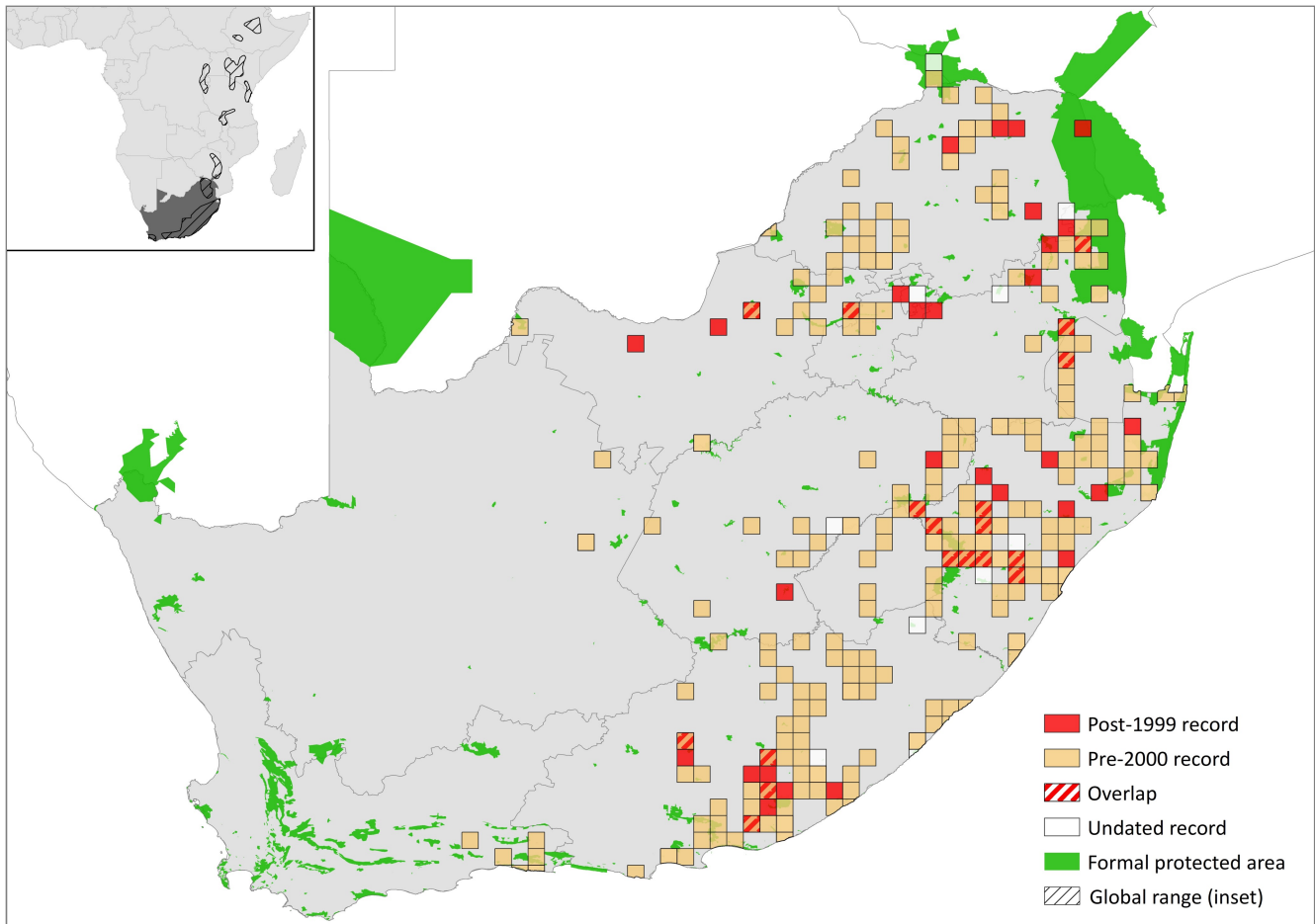


Figure 1. Distribution records for Woodland Dormouse (*Graphiurus murinus*) within the assessment region

Table 1. Countries of occurrence within southern Africa

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

Cape, densities have been estimated to vary between 2 and 16 individuals / ha depending on the season and year (Madikiza 2010; Z.J.K. Madikiza pers. obs. 2006–2012) in riverine *Combretum* forests, where it can be the dominant small mammal. It is, however, unclear whether the presence of wooden nest boxes at the study site might have improved nesting conditions and offspring survival (Madikiza et al. 2010a), hence leading to overall higher densities than usual. Woodland Dormice exhibit low densities in Telperion Nature Reserve (Mpumalanga) in areas where large rocks are present, but have been recorded from various accommodation units at the study site (MacFadyen 2014).

Although it has been noted that this species is seldom caught in traps and is more commonly recorded from houses, it is likely because in most studies traps were set on the ground and not on logs or in trees. In GFRNR, Madikiza et al. (2010b) did not make a single capture on

the ground, either inside or outside the riverine forest, during a 13-month period. In contrast, trapping success in trees averaged 13.3 captures per 100 trap nights, with a minimum average of 5.1 captures in winter and a maximum average of 19.0 captures in summer. In a subsequent study in the same area, Lamani (2014) only recorded 10% of captures on the ground over the four seasons of the year.

Current population trend: Unknown, but probably stable due to lack of major threats to the species.

Continuing decline in mature individuals: Unknown, but probably not.

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 species inhabits woodland, savannah, grassland and rocky areas (Skinner & Chimimba 2005). In parts of its range it is found in either Afromontane forest or riverine forest dominated by *Combretum* (Qwede 2003; Kryštufek et al. 2004; Madikiza 2010; Photo 1). In Rolfontein Nature Reserve, Northern Cape Province, two specimens were caught in the *Acacia karroo* community (Jooste & Palmer 1982), as it is dependent on large trees for nesting. It can persist in secondary habitats, and in some regions occurs in various types of buildings. For example, it is recorded

regularly in buildings at Tswalu Kalahari Reserve (D. MacFadyen pers. obs. 2007) and can reach pest proportions in dwellings in the Soutpansberg. This species has also been recorded using piles of debris deposited by high floods near seasonal rivers (Skinner & Chimimba 2005). The diet has only been studied in GFRNR based on remains found in nest boxes. There, arthropods – mainly beetles and millipedes – were dominant (99% occurrence) in all seasons, followed by molluscs (16%) and the fruits of the Cross-berry (*Grewia robusta*) and the Buffalo Thorn (*Ziziphus mucronata*) (14%).

The species is nocturnal and arboreal, and to a lesser extent terrestrial (Lamani 2014; Lombard 2014). At night it forages singly in trees or on rocks – depending on habitat – in search of insects and other food items. In GFRNR, Lamani (2014) found that, in riverine forests, Woodland Dormice select areas with dense canopy cover and a high percentage of arboreal connectivity when active at night, possibly to reduce predation risk and facilitate movements. This species tends to be crepuscular on overcast days on the Highveld (D. MacFadyen pers. obs. 2009) and has been observed during the afternoon at Telperion Nature Reserve (D. MacFadyen pers. obs. 2009). It is inactive at low temperatures in the winter months on the Highveld (MacFadyen 2014). Woodland Dormice are competent thermoregulators (Ellison & Skinner 1991; Webb & Skinner 1996; Whittington-Jones & Brown 1999). In the Eastern Cape, they have been found torpid at different periods of the year (Madikiza 2010), even entering a state of hibernation during the colder months (Mzilikazi et al. 2012). The longest torpor bout that dormice can undergo without arousal is about 8 days, and torpid dormice can drop their body temperature to a minimum of 1.5°C (Mzilikazi et al. 2012).

During the day Woodland Dormice sleep inside branches and trunks (Lamani 2011; Photo 1), and locally in rock crevices. Dead logs and underground sites (burrows) are rarely used (Lamani 2011). In GFRNR, Cape Bushwillows (*Combretum caffrum*) are the predominant trees used for the resting sites, probably due to their abundance in the forest, and their propensity to rot from the inside and provide natural cavities. Woodland Dormice use several resting sites throughout the year, but site fidelity on consecutive days is very high during winter (Lamani 2011; Z.J.K Madikiza & E. Do Linh San unpubl. data). Specific resting sites (both natural and nest boxes) are used by several different dormice, and simultaneous sharing is frequent (Photo 2), taking place between all combinations of male, female and juvenile dormice, with different patterns observed depending on the season of the year (Madikiza et al. 2010a; Madikiza 2010, 2017).

Woodland dormice are seasonal breeders, starting from October up to February (Qwede 2003; Madikiza 2010), and females can produce up to two litters 6–8 weeks apart (Madikiza 2010). At least in some areas, reproduction seems to be associated with high availability and abundance of insects, fruits and high rainfall (De Graaff 1981). After a gestation of about 24 days (Kingdon 1974), females in natural populations give birth to 3–6 young (Lynch 1989). Using extensive trapping and nest box monitoring data, Madikiza et al. (2011) found high intra- and intersexual home range overlaps, with the home ranges of males twice as large as those of females. This, coupled with asynchronous sexual receptivity in females and a complex network and dynamics of sleeping associations (Madikiza 2010, 2017) suggests that



Photo 1. Woodland Dormouse (*Graphiurus murinus*) peeking out from a cavity in a Cape Bushwillow (*Combretum caffrum*) (Emmanuel Do Linh San)



Photo 2. Woodland Dormice (*Graphiurus murinus*) huddling in a nest box during winter (Emmanuel Do Linh San)

Woodland Dormice have a promiscuous mating system. In addition, some females may engage in communal breeding (Madikiza 2010, 2017).

Ecosystem and cultural services: The Woodland Dormouse is one of the core small mammals in the forest ecosystem, as observed notably in some study sites in the Eastern Cape. It is therefore likely to play a significant ecological role, for example in seed dispersal and/or as a food source for small carnivores (Matolengwe 2010) and aerial predators.

Use and Trade

The Woodland Dormouse seems to be growing in popularity in the pet trade in Europe and USA (see e.g. <https://www.thespruce.com/african-dormice-as-pets-1236775>). We suspect that a large majority of pet Woodland Dormice originate from captive breeding programmes rather than from the wild. There are also anecdotal records of schoolboys keeping them as pets in Zimbabwe (Skinner & Chimimba 2005).

Threats

There are no major threats to this species. However, habitat loss and fragmentation from mining and agriculture is likely to cause local subpopulation declines. This species is unlikely to persist in agricultural monocultures with few or no trees. In transformed areas, it is only likely to remain within the rocky, inaccessible

Table 2. Threats to the Woodland Dormouse (*Graphiurus murinus*) 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	2.1.2 Annual & Perennial Non-Timber Crops: habitat loss and fragmentation from agricultural expansion.	-	Anecdotal	-	-
2	3.2 Mining & Quarrying: habitat loss and fragmentation.	-	Anecdotal	-	-

Table 3. Conservation interventions for the Woodland Dormouse (*Graphiurus murinus*) 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 include woodland ecosystems.	-	Anecdotal	-	-	-
2	2.1 Site/Area Management: ensure corridors of woodland between agricultural monocultures.	-	Anecdotal	-	-	-

habitats, which are unsuitable for agriculture. However, it is adaptable and is known to make use of secondary habitats, including roofs of buildings or thatched huts, switch boxes, water pumps and transformers. Resultantly, it can become a nuisance by causing electrical short circuits (Skinner & Chimimba 2005).

Current habitat trend: Stable

Conservation

Within the assessment region, the Woodland Dormouse is present within many protected areas across its range, including the Kruger National Park (Limpopo and Mpumalanga), Telperion Nature Reserve (Mpumalanga), Ezemvelo Nature Reserve (Gauteng), Tswalu Kalahari Reserve (Northern Cape), Silaka, Hluleka, Dwesa, Mpofu, Fort Fordyce and the Great Fish River nature reserves (Eastern Cape). It is also present in the forests of the Amathole Mountains. Although no specific conservation interventions are necessary, protected area expansion to ensure corridors of suitable woodland for movement would benefit this species.

Recommendations for land managers and practitioners:

- Protect woodland areas.
- Influence agricultural policy to ensure connected patches of woodland are retained.

Research priorities:

- Taxonomic revision is required to disentangle this species complex.
- The boundaries between *G. murinus* and *G. microtis* should be clearly defined.
- A better knowledge of the geographic distribution of this and other dormice species is needed. As trap placement is critical, with traps generally having to be set in trees in order to successfully catch this species, it means that Woodland Dormice could well be present in areas where they have not previously been detected.

A team of researchers at the University of the Witwatersrand and at the University of Fort Hare has been

running a long-term project on the biology, ecology and behaviour of the Woodland Dormouse. Contact details of the research coordinator: Dr Kim Madikiza, School of Animal, Plant & Environmental Sciences, Faculty of Science, University of the Witwatersrand, WITS 2050. Email: kim.madikiza@wits.ac.za.

Encouraged citizen actions:

- Report sightings on virtual museum platforms (for example, iSpot and MammalMAP), especially outside protected areas.
- Plant suitable indigenous trees in gardens and ensure corridors of natural vegetation remain to allow local movements.

Data Sources and Quality

Table 4. Information and interpretation qualifiers for the Woodland Dormouse (*Graphiurus murinus*) assessment

Data sources	Field study (literature, unpublished), indirect information (literature, expert knowledge), 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*.