Miniopterus natalensis – Natal Long-fingered Bat

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Regional Red List status (2016)	**Least Concern***
National Red List status (2004)	Near Threatened B2ab(ii,iii,iv,v)
Reasons for change	Non-genuine: New information
Global Red List status (2016)	Least Concern
TOPS listing (NEMBA) (2007)	None
CITES listing	None
Endemic	No

*Watch-list Threat

Although this species is widespread within the assessment region, it faces an emerging threat from wind farm development across large parts of its range, where direct mortality and disruption of migration routes may cause local declines.

Taxonomy

Miniopterus natalensis (A. Smith 1834)

ANIMALIA - CHORDATA - MAMMALIA - CHIROPTERA - MINIOPTERIDAE - *Miniopterus* - *natalensis*

Synonyms: *Miniopterus natalensis* ssp. *arenarius* (Heller 1912); *Miniopterus schreibersii* ssp. *natalensis* (Smith 1833); *Miniopterus breyeri* (Jameson 1909); *Miniopterus dasythrix* (Temminck 1840); *Miniopterus scotinus* (Sundevall 1846)

Common names: Natal Long-fingered Bat, Natal Clinging Bat (English)

Taxonomic status: Species complex

Taxonomic notes: The currently recognized *Miniopterus natalensis* is probably a complex of at least three morphologically similar species. For example, it was previously included as a subspecies of *M. schreibersii*, from which it is genetically distinct (Miller-Butterworth et al. 2005). The latter species is now restricted to North Africa and Europe (Appleton et al. 2004), with *M. natalensis* occurring in sub-Saharan Africa. Similarly, the West African *villiersi* (V. Aellen, 1956) (Rosevear 1965), recognised as a subspecies of *M. natalensis*, may be a distinct species (Fahr et al. 2006). Ongoing molecular research may reveal cryptic species within the assessment region.

Assessment Rationale

Listed as Least Concern in view of its wide distribution and large population. Although this species may be experiencing localised declines due to disturbance of roost sites, loss of foraging habitat due to conversion of natural areas for agriculture, and mortalities from collisions with wind turbines, it remains sufficiently widespread to not qualify under a category of threat. However, wind farms are permanent structures and there is an overlap between the species' known and modelled distribution and that of existing and planned wind farms, which may ultimately disrupt migration routes and thus pose a major threat. Thus, systematic monitoring of subpopulation sizes and trends is needed and the status of this species must be reviewed annually.

Regional population effects: This species occurs as one continuous population within the assessment region and into neighbouring countries. It is assumed to have adequate dispersal capacity given its intermediate wing-loading (Norberg & Rayner 1987), and thus rescue effects are likely.

Distribution

This widely distributed species has largely been recorded from southern and East Africa, with some records from Central Africa and from the Arabian Peninsula. In Africa, it ranges south from Angola and southern Democratic Republic of the Congo, into Namibia, Botswana, South Africa, Lesotho, Mozambique, Malawi, Zimbabwe and Zambia, and from here north into Tanzania, Kenya, possibly Uganda, possibly southern Sudan and possibly Ethiopia (ACR 2015). It occurs widely within southern Africa, but with more records in the southern and eastern parts than in the arid west (Monadjem et al. 2010). It has been recorded from the southern tip of South Africa east and northwards through much of the country and neighbouring Lesotho and Swaziland, occurring in all nine South African provinces. It also occurs widely in Namibia and southern and western Angola, but appears absent from much of the Kalahari (Monadjem et al. 2010). The type specimen is from Durban, South Africa (BM 1848.6.12.19) (Monadjem et al. 2010). Because of frequent misidentification between this species and *Miniopterus schreibersii*, there is a need to carefully review the distribution of *Miniopterus natalensis* (ACR 2015). The extent of occurrence (EOO) is calculated as 1,387,139 km^2.

Recommended citation: MacEwan K, Richards LR, Cohen L, Jacobs D, Monadjem A, Schoeman C, Sethusa T, Taylor PJ. 2016. A conservation assessment of *Miniopterus natalensis*. In Child MF, Roxburgh L, Do Linh San E, Raimondo D, Davies-Mostert HT, editors. The Red List of Mammals of South Africa, Swaziland and Lesotho. South African National Biodiversity Institute and Endangered Wildlife Trust, South Africa.

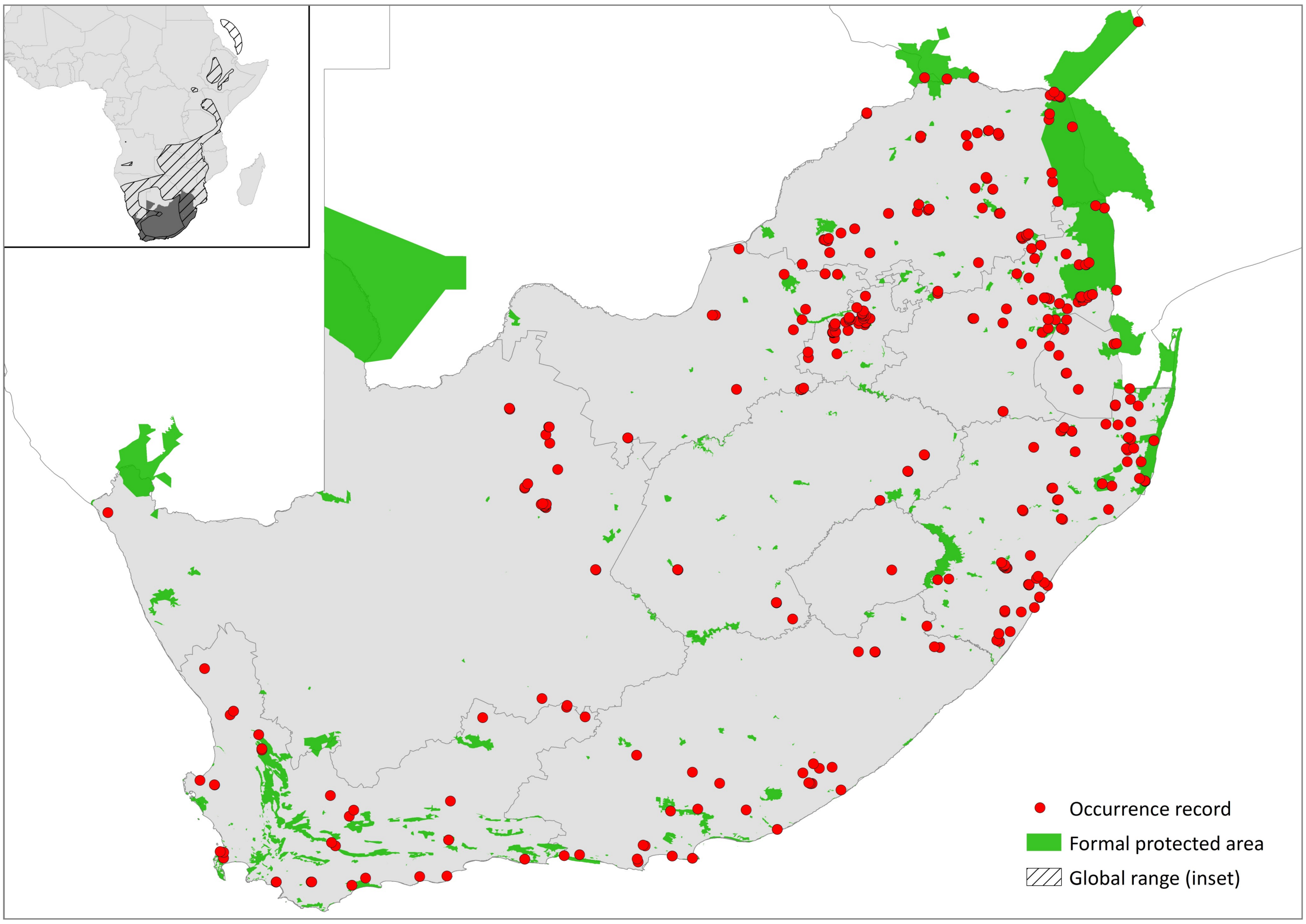

Figure 1. Distribution records for Natal Long-fingered Bat (*Miniopterus natalensis*) within the assessment region

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

Population

A common and widespread species. It roosts in small colonies but can also be found in colonies of more than 2,500 animals, with some colonies exceeding 200,000 in certain seasons, such as the De Hoop Guano Cave in the Western Cape (Monadjem et al. 2010). In the highveld caves, its numbers vary from a few individuals up to *c*. 4,000 (van der Merwe 1973). This species is very well represented in museums, with over 800 specimens examined in Monadjem et al. (2010).

Current population trend: Stable, but possibly experiencing localised declines.

Continuing decline in mature individuals: No

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

It is predominantly a temperate or subtropical species with the core of its distribution in the savannahs and grasslands of southern Africa (Monadjem et al. 2010), and has been recorded from semi-desert, dry and moist savannah, and Mediterranean-type shrubby vegetation. It is associated with trees and orchards surrounding artificial wetlands (Sirami et al. 2013). It is generally a cave roosting species also found in similar habitats such as disused mines. The availability of suitable roosting sites may be more critical in determining its presence in an area than the surrounding vegetation (Monadjem et al. 2010). Smaller groups will also utilise crevice-type habitats. It utilises separate caves as winter hibernacula and summer maternity roosts (van der Merwe 1975), with hibernacula generally being cooler and at higher altitudes, which may be an important consideration for wind farm planning. Females typically migrate seasonally between these caves, which may be separated by up to 260 km (Miller-Butterworth et al. 2003). Females congregate at maternity roosts where each one gives birth to a single young (Monadjem et al. 2010). This species holds the longevity record for a southern Africa bat of 13 years (van der Merwe 1989).

It is a clutter-edge forager, feeding on a variety of aerial prey including Diptera, Hemiptera, Coleoptera, Lepidoptera and Isoptera (Jacobs 1999; Schoeman & Jacobs 2003; Miller-Butterworth et al. 2005).

Photo 1. *Miniopterus natalensis* displaying the long "fingers" typical of the genus (K. MacEwan & T. Morgan)

Ecosystem and cultural services: As this species is insectivorous, it plays an important role in controlling insect populations (Boyles et al. 2011; Kunz et al. 2011). Bats often prey on the insect species that destroy crops (Boyles et al. 2011; Kunz et al. 2011). Ensuring a healthy population of insectivorous bats can thus result in a decrease in the use of pesticides.

Use and Trade

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

Threats

Within the assessment region, large areas are being developed for wind energy. Wind turbines pose a major threat to this species since the life span of wind turbines is an estimated 20 years (Mortensen 2013), and there is an overlap between the species' known and modelled distribution and that of existing and planned wind farms, with fatalities of this species having been recorded at wind energy facilities in the Eastern Cape (MacEwan 2016). Its high wing loading and aspect ratio (Norberg & Rayner 1987; Jacobs 1999; Schoeman & Jacobs 2003, 2008;

Table 2. Threats to the Natal Long-fingered Bat (*Miniopterus natalensis*) 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	*2.1.3 Agro-industry Farming*: loss of natural habitats. Current stress *1.3 Indirect Ecosystem Effects*: loss of insect prey base.	Driver et al. 2012 Jewitt et al. 2015	Indirect (land cover change from remote sensing)	National Regional	Ongoing
2	*3.3 Renewable Energy*: mortality from collision with wind turbine blades.	MacEwan 2016	Empirical	Regional	Increasing
3	*6.1 Human Intrusions & Disturbance*: recreational activities and traditional ceremonies disturb roost sites.	-	Anecdotal	-	Ongoing
4	*9.3.3 Agricultural & Forestry Effluents*: incidental poisoning. Current stress *1.3 Indirect Ecosystem Effects*: loss of insect prey base.	Driver et al. 2012 Jewitt et al. 2015	Indirect (land cover change from remote sensing)	National Regional	Ongoing

Photo 2. A *Miniopterus natalensis* specimen collected from the base of a wind turbine. This species ranks amongst the highest in South Africa of confirmed fatalities from wind farm developments. (Kate MacEwan)

Miller-Butterworth et al. 2005) suggests that this bat is a fast flyer in relatively open spaces and, because it is migratory (van der Merwe 1975), means it is prone to flying in the rotor sweep zone of wind turbines both while foraging and commuting during migration. Not all collection localities are monitored, therefore the impact of this threat to the different subpopulations cannot yet be quantified, but only inferred to be significant based on fatalities recorded from the monitored sites. The tendency of this species to roost in a few localised sites places it at risk of future population declines. Furthermore, genetic research indicates a high degree of philopatry in this species (Miller-Butterworth 2003), which means that should a colony be lost or destroyed, it may not be repopulated from other areas, potentially leading to local extinction.

Additionally, in parts of its range, it is locally threatened by habitat loss resulting from conversion of land to agricultural use, incidental poisoning with insecticides (and associated loss of prey base), and the disturbance of roosting and maternity caves by tourist activities and religious ceremonies (ACR 2015). However, as this species is widespread and common within the assessment region and throughout much of Africa, the threats listed above are not likely to be having a significant impact on the overall population.

Current habitat trend: Stable but declining locally in quality, particularly from agricultural expansion (Driver et al. 2012; Jewitt et al. 2015).

Conservation

The species occurs in more than 15 protected areas within the assessment region and many roosts are well protected. There is a need to identify and protect additional important roost sites (especially maternity caves) and to gain a better understanding of their migratory routes. The impact of wind farming should also be monitored to determine resultant population decline. No direct conservation interventions are necessary at present. However, to mitigate mortalities from turbine collisions on wind farms, interventions such as using ultrasound to deter bats and curtailing turbines at low wind speeds could be employed (Baerwald et al. 2009; Berthinussen et al. 2010; Arnett et al. 2011).

Recommendations for land managers and practitioners:

- Data sharing by wind farm managers into a national database to be able to calculate cumulative impacts and thereafter implement collaborative mitigation and management efforts is needed.

Research priorities:

- Monitoring mortalities linked with wind farm operations and assessing impact on populations.
- Research in identifying key migratory routes.
- Investigations into effective mitigation methods to reduce bat mortality around wind farms.
- Molecular research to resolve the species complex.
- Better determine the range of this species when compared to that of *Miniopterus schreibersii* (ACR 2015).

Encouraged citizen actions:

- Limit disturbance to roost sites.
- Deposit any dead specimens at local museums or Bat Interest Groups.

Table 3. Conservation interventions for the Natal Long-fingered Bat (*Miniopterus natalensis*) 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*: identify key roost sites for protection.	-	Anecdotal	-	-	Identifying sites for protection, Bat Interest Groups
2	*2.1 Site/Area Management*: manage wind turbines to reduce bat mortality.	Baerwald et al. 2009 Berthinussen et al. 2010 Arnett et al. 2011	Review	International Review International	Bat mortalities lowered using ultrasonic deterrents and turbine curtailment during low wind speed.	-
3	*4.3 Awareness & Communications*: public education campaigns to mitigate disturbance to key roost sites.	-	Anecdotal	-	-	Bat Interest Groups

Data Sources and Quality

Table 4. Information and interpretation qualifiers for the Natal Long-fingered Bat (*Miniopterus natalensis*) assessment

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