Rhinolophus darlingi – Darling's Horseshoe Bat


Trevor Morgan

Regional Red List status (2016)	**Least Concern**
National Red List status (2004)	Near Threatened B2a
Reasons for change	Non-genuine: New information
Global Red List status (2016)	Least Concern
TOPS listing (NEMBA) (2007)	None
CITES listing	None
Endemic	No

Rhinolophus darlingi is now thought to be restricted to the mesic woodland regions of the northeastern parts of southern Africa (Jacobs et al. 2013).

Taxonomy

Rhinolophus darlingi K. Anderson 1905

ANIMALIA - CHORDATA - MAMMALIA - CHIROPTERA - RHINOLOPHIDAE - *Rhinolophus* - *darlingi*

Synonyms: *barbertonensis*

Common names: Darling's Horseshoe Bat (English), Darling se Saalneusvlermuis (Afrikaans)

Taxonomic status: Species

Taxonomic notes: Jacobs et al. (2013) present genetic evidence that *Rhinolophus darlingi* (*sensu lato*) is polyphyletic, comprising two cryptic species corresponding to the western populations that occur in arid habitats and the populations occurring in central and eastern southern Africa. Specifically, *R. damarensis* occurs in Angola, Namibia, and northwestern South Africa; while *R. darlingii* occurs in eastern South Africa, Mozambique, Swaziland, Zimbabwe, Botswana, Zambia and Malawi. The taxonomic status of the population in Nigeria is unclear (Cotterill & Happold 2013).

Assessment Rationale

This species is widely distributed in the Savannah Biome of the assessment region, occurs in multiple protected areas (including Great Limpopo Transfrontier Park), can roost in man-made structures and there are no major identified threats that could cause widespread population decline. Savannah habitats in the assessment region are well protected. Disturbance to roosting sites may cause local declines but there is no evidence for continuing decline. Thus we list as Least Concern.

Regional population effects: Habitat is connected across transfrontier parks and the species has low to intermediate wing loading (Norberg & Rayner 1987), so dispersal, and thus rescue effects, are presumed to be limited but possible.

Distribution

Distributed in southern Africa from northern KwaZulu-Natal through Swaziland, and northeastern South Africa to Zimbabwe, northern Botswana, the extreme southeast Zambia and southern Malawi (Monadjem et al. 2010). The species has probably been overlooked in central Mozambique.(Monadjem et al. 2010). Outside of southern Africa, it has been recorded from Benguela in Angola, Banagi in Tanzania, and possibly from Nigeria suggesting a wider distribution than is currently known (Skinner & Chimimba 2005; Monadjem et al. 2010). In the assessment region the species is known from the Limpopo, Mpumalanga, Gauteng, North West, and KwaZulu-Natal provinces of South Africa; as well as the lowveld and Lubombo regions of Swaziland. It is unclear if the species is present in Lesotho (Monadjem et al. 2010; ACR 2015). The current estimated extent of occurrence is 346,274 km^2.

Population

Locally common in the vicinity of day roosts in South Africa and Zimbabwe (Cotterill & Happold 2013). Darling's Horseshoe Bat is usually found in small numbers. For example, a group of *c*. 20 individuals is reported from KwaZulu-Natal (Taylor 1998); and groups of 2–15 were recorded by Rautenbach (1982). However, they can be represented by a maximum of about a hundred bats in a colony (Skinner & Chimimba 2005). Additionally, this species is well represented in museums, with 320 specimens examined in Monadjem et al. (2010). The total mature population is inferred to be a little less than 10,000 individuals in the assessment region.

Current population trend: Stable

Continuing decline in mature individuals: No

Number of mature individuals in population: *c*. 10,000

Recommended citation: Jacobs DS, Taylor PJ, Cohen L, MacEwan K, Richards LR, Schoeman C, Sethusa T, Monadjem A. 2016. A conservation assessment of *Rhinolophus darlingi*. 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.

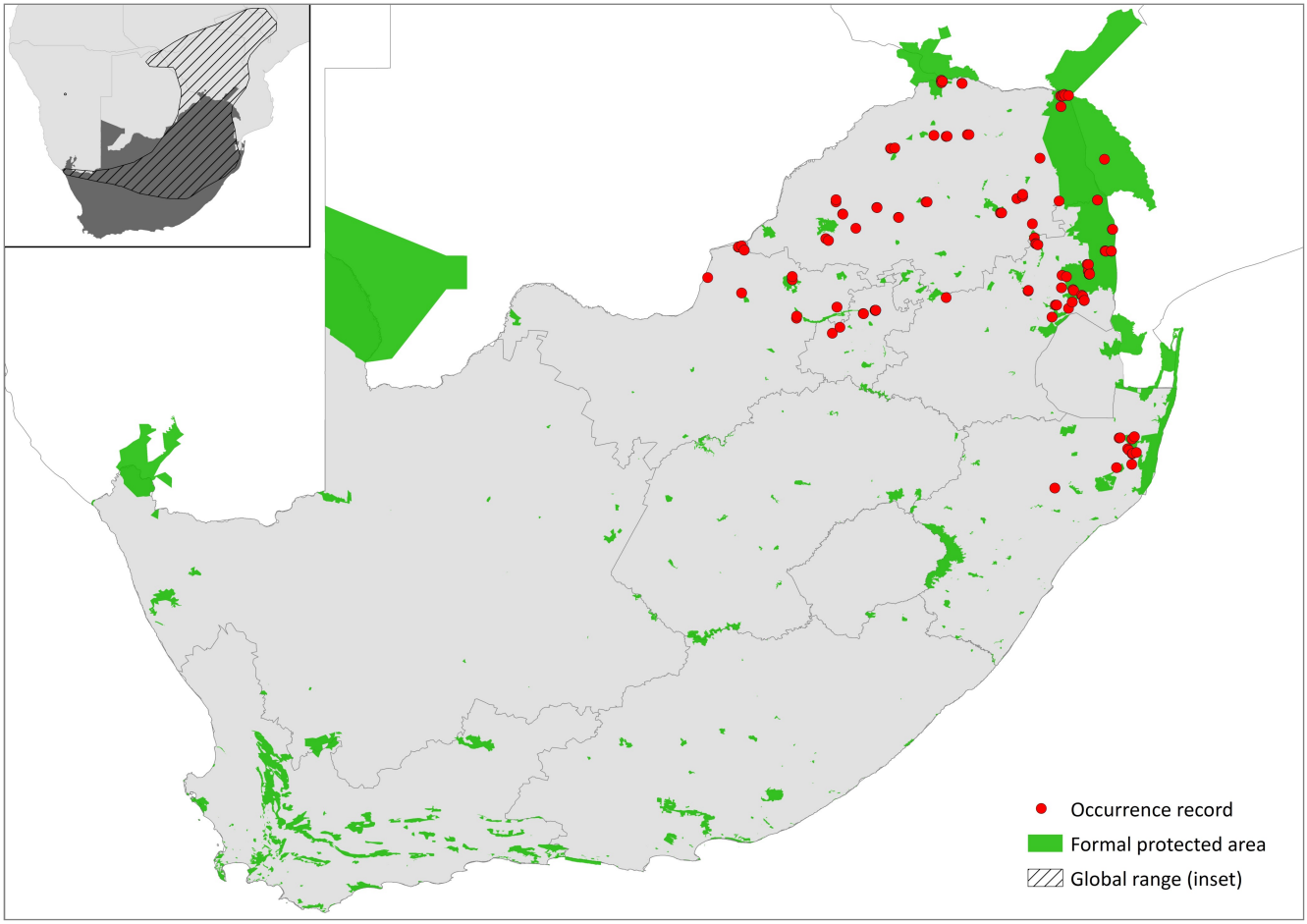

Figure 1. Distribution records for Darling's Horseshoe Bat (*Rhinolophus darlingi*) within the assessment region

Table 1. Countries of occurrence within southern Africa

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

Number of mature individuals in largest subpopulation: 100

Number of subpopulations: 40–80

Severely fragmented: No

Habitats and Ecology

Occurs in mesic woodland savannahs where suitable day-roosts are present (Cotterill & Happold 2013). In the southern part of its range, it is particularly associated with broken, rocky terrain where they roost in caves or in cavities in piles of boulders (Skinner & Chimimba 2005). It also roosts in mine adits, where it may form medium-sized colonies of *c*. 100 individuals, as well as culverts (Monadjem 1998), large hollow trees and disused buildings (Cotterill & Happold 2013). It hangs freely from ceilings (Rautenbach 1982). It is a clutter forager with Lepidoptera and Coleoptera comprising the bulk of its diet (Schoeman 2006).

Ecosystem and cultural services: As this species is insectivorous, it may contribute to controlling insect populations that damage crops (Boyles et al. 2011; Kunz et al. 2011). Ensuring a healthy population of insectivorous bats can thus decrease the need for pesticides.

Use and Trade

Not known to be traded or utilised in any form.

Threats

There appear to be no major threats to this species as a whole (ACR 2015). Roost disturbance may cause local declines but this remains to be documented. Indirect poisoning resulting from the use of insecticides, pesticides and similar chemicals may occur. In addition, use of such insecticides and pesticides may decrease the natural prey base.

Current habitat trend: Stable. Savannah habitats are well protected in the assessment region (Driver et al. 2012).

Conservation

This species is present in many protected areas, including Kruger National Park. No direct conservation interventions are currently needed for the species. However, it would benefit from holistic land management techniques that

Table 2. Threats to the Darling's Horseshoe Bat (*Rhinolophus darlingi*) 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	*6.1 Recreational Activities*: roost site disturbance from tourism activities and religious ceremonies. Current stress *2.2 Species Disturbance*.	-	Anecdotal	-	Stable
2	*9.3.3 Agricultural & Forestry Effluents*: indirect poisoning. Current stress *1.3 Indirect Ecosystem Effects*: loss of prey base.	-	Anecdotal	-	Stable

Table 3. Conservation interventions for the Darling's Horseshoe Bat (*Rhinolophus darlingi*) 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	*2.1 Site/Area Management*: protection of key roost sites required.	-	Anecdotal	-	-	-
2	*2.3 Habitat & Natural Process Restoration*: reduce pesticide use to restore natural prey base.	-	Anecdotal	-	-	-

reduce the need for pesticides, as well as identification and protection of key roost sites to limit disturbance.

Recommendations for land managers and practitioners:

- Identify and protect important roost sites for this species.
- Reduce pesticide use in agricultural landscapes.

Research priorities:

- Further taxonomic research is required to delimit distribution more accurately, especially for populations recorded outside of southern Africa.
- Systematic surveys to identify further colonies and assess population size and trend.

Encouraged citizen actions:

- Minimise disturbance to caves when visiting.
- As this species occurs in urban and rural areas, citizens can report sightings on virtual museum platforms (for example, iSpot and MammalMAP).

Data Sources and Quality

Table 4. Information and interpretation qualifiers for the Darling's Horseshoe Bat (*Rhinolophus darlingi*) assessment

Data sources	Field study (unpublished), indirect information (literature, expert knowledge), museum records
Data quality (max)	Inferred
Data quality (min)	Suspected
Uncertainty resolution	Expert consensus
Risk tolerance	Evidentiary

References

ACR. 2015. African Chiroptera Report 2015. Page i-xix + 7001 pp. AfricanBats, African Chiroptera Project, Pretoria, South Africa.

Boyles JG, Cryan PM, McCracken GF, Kunz TH. 2011. Economic importance of bats in agriculture. Science **332**:41–42.

Cotterill FPD, Happold M. 2013. *Rhinolophus darlingi* Darling's Horseshoe Bat. Pages 318–320 in Happold M, Happold DCD, editors. Mammals of Africa. Volume IV: Hedgehogs, Shrews and Bats. Bloomsbury Publishing, London, UK.

Driver A, Sink KJ, Nel JN, Holness S, van Niekerk L, Daniels F, Jonas Z, Majiedt PA, Harris L, Maze K. 2012. National Biodiversity Assessment 2011: An Assessment of South Africa's Biodiversity and Ecosystems. Synthesis Report. South African National Biodiversity Institute and Department of Environmental Affairs, Pretoria, South Africa.

Jacobs DS, Babiker H, Bastian A, Kearney T, van Eeden R, Bishop JM. 2013. Phenotypic convergence in genetically distinct lineages of a *Rhinolophus* species complex (Mammalia, Chiroptera). PLoS One **8**:e82614.

Kunz TH, Braun de Torrez E, Bauer D, Lobova T, Fleming TH. 2011. Ecosystem services provided by bats. Annals of the New York Academy of Sciences **1223**:1–38.

Monadjem A. 1998. The Mammals of Swaziland. Conservation Trust of Swaziland and Big Games Parks, Mbabane, Swaziland.

Monadjem A, Taylor PJ, Cotterill FPD, Schoeman MC. 2010. Bats of Southern and Central Africa: A Biogeographic and Taxonomic Synthesis. University of the Witwatersrand Press, Johannesburg, South Africa.

Norberg UM, Rayner JM. 1987. Ecological morphology and flight in bats (Mammalia; Chiroptera): wing adaptations, flight performance, foraging strategy and echolocation. Philosophical Transactions of the Royal Society B: Biological Sciences **316**: 335–427.

Rautenbach IL. 1982. Mammals of the Transvaal. No. 1, Ecoplan Monograph. Pretoria, South Africa.

Schoeman MC. 2006. The relative influence of competition and coevolution on the community structure of insectivorous bats in southern Africa. Ph.D. Thesis. University of Cape Town, Cape Town, South Africa.

Skinner JD, Chimimba CT. 2005. The Mammals of the Southern African Subregion. Third edition. Cambridge University Press, Cambridge, UK.

Assessors and Reviewers

David S. Jacobs[1], Peter J. Taylor[2], Lientjie Cohen[3], Kate MacEwan[4], Leigh R. Richards[5], Corrie Schoeman[6], Theresa Sethusa[7], Ara Monadjem[8]

[1]University of Cape Town, [2]University of Venda, [3]Mpumalanga Tourism and Parks Agency, [4]Inkululeko Wildlife Services, [5]Durban Natural Science Museum, [6]University of KwaZulu Natal, [7]South African National Biodiversity Institute, [8]University of Swaziland

Contributors

Matthew F. Child[1], Domitilla Raimondo[2]

[1]Endangered Wildlife Trust, [2]South African National Biodiversity Institute

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