Rhinolophus cohenae – Cohen's Horseshoe Bat


K. de Wet

Regional Red List status (2016)	**Vulnerable C2a(ii)+D1**
National Red List status (2004)	Not Evaluated
Reasons for change	Genuine change: New species
Global Red List status	Not Evaluated
TOPS listing (NEMBA) (2007)	None
CITES listing	None
Endemic	Yes

Once considered synonymous with *Rhinolophus hildebrandtii*, research has revealed *Rhinolophus cohenae* to be a distinct species, with the type specimen hailing from Barberton, Mpumalanga Province (Taylor et al. 2012).

Taxonomy

Rhinolophus cohenae (Taylor, Stoffberg, Monadjem, Schoeman, Bayliss & Cotterill 2012)

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

Common names: Cohen's Horseshoe Bat (English)

Taxonomic status: Species

Taxonomic notes: In previous Red List assessments, this species was included within *Rhinolophus hildebrandtii*. Taxonomic changes, based on molecular systematics and differences in morphology, echolocation call frequencies and biogeography, have taken place within the *R. hildebrandtii* complex. *Rhinolophus hildebrandtii* was revised in 2012 and *R. cohenae* recognised as one of the four newly described species from this species complex (Taylor et al. 2012).

Assessment Rationale

A recently described species endemic to South Africa and known from the Mpumalanga Escarpment, and from a few records in the southeast of Limpopo Province with an estimated extent of occurrence of 15,640 km^2. There are inferred to be fewer than 1,000 mature individuals (and certainly fewer than 10,000) in the population. Colonies are usually small, numbering only a few individuals. The greatest number of mature individuals counted at a single site was ± 40. All recorded colonies are suspected to comprise the same subpopulation. An ongoing decline is inferred to be taking place as a result of loss of habitat due to poor land-use management practices, mining activities, agricultural intensification as well as infestation by alien invasive plant species. Further field surveys and vetting of museum records are needed to more accurately delimit the distribution range of the species. Currently, we list as Vulnerable C2a(ii) and D1.

Distribution

This newly described species has been recorded so far only from the two northernmost provinces of South Africa. Known from the Mpumalanga escarpment from Mariepskop, Abel Erasmus Pass to Barberton with the southernmost known locality between Badplaas and Machadodorp, its distribution falls within an elevational range of 457 m to 1698 m asl. As such, the main centre of its geographical range currently lies in the Mpumalanga Province with distribution just crossing into the Limpopo Province. The type locality for this species is from the Barberton Mountainlands Nature Reserve in Barberton, Mpumalanga Province at an elevation of 690 m asl (Taylor et al. 2012). This species appears to inhabit the Grassland and Savannah Biomes and further surveys and specimen reappraisal of existing museum material, previously referred to as *R. hildebrandtii* (ACR 2013), will probably reveal a wider distribution range.

Population

In total, 240 individuals have been counted in surveys, but this is an underestimate. The total population is thus inferred to be fewer than 1,000 mature individuals and thus certainly fewer than10,000 mature individuals, as this species is encountered in small groups of which around 40 individuals was the highest number counted at a single site. All recorded colonies are suspected to be part of one subpopulation.

Current population trend: Suspected to be declining.

Continuing decline in mature individuals: Suspected

Number of mature individuals in population: < 1,000

Number of mature individuals in largest subpopulation: < 40

Number of subpopulations: Possibly one.

Severely fragmented: No

Recommended citation: Cohen L, Taylor P, Jacobs D, Kearney T, MacEwan K, Monadjem A, Richards LR, Schoeman C, Sethusa T. 2016. A conservation assessment of *Rhinolophus cohenae*. 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.

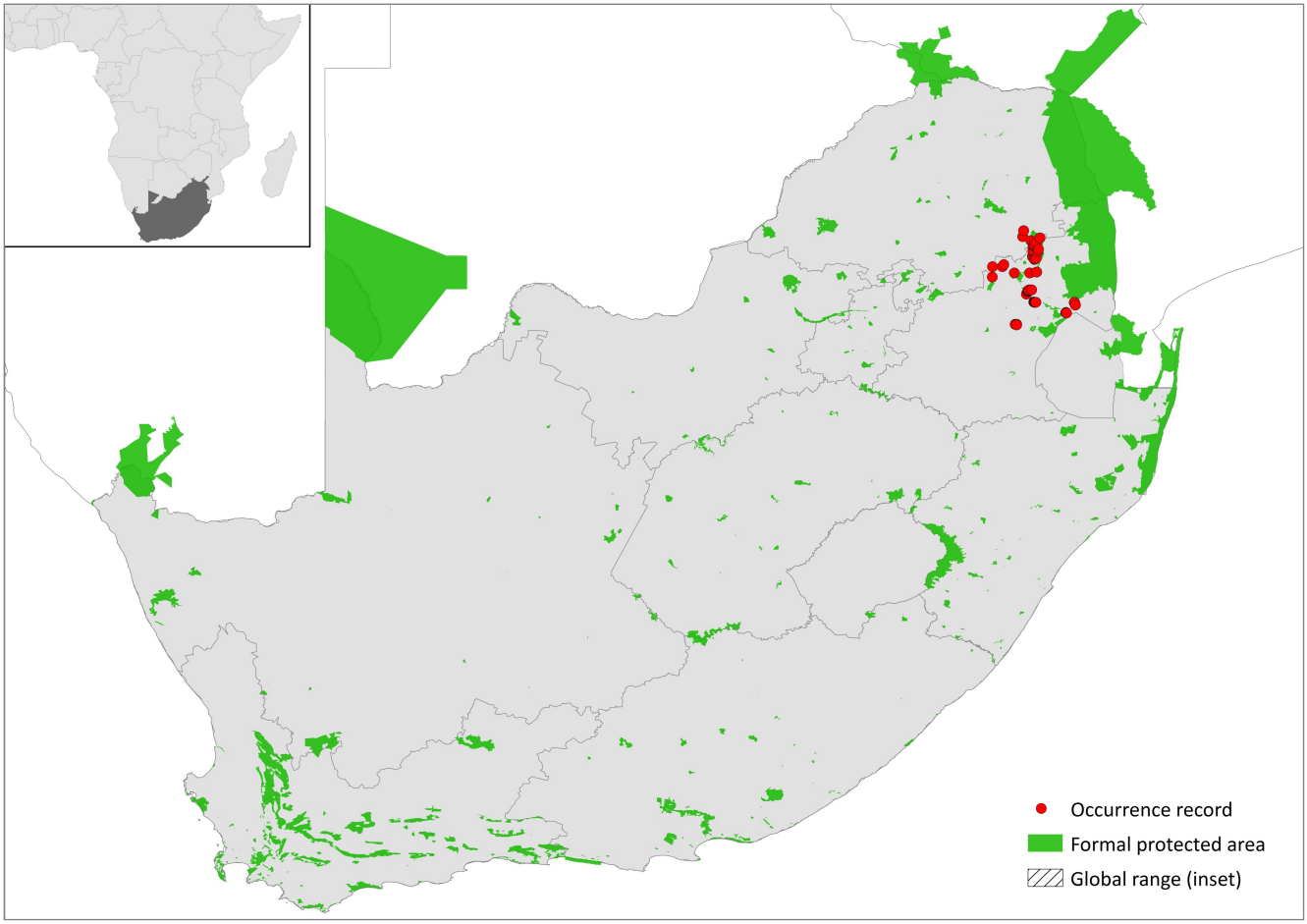

Figure 1. Distribution records for Cohen's Horseshoe Bat (*Rhinolophus cohenae*) within the assessment region

Table 1. Countries of occurrence within southern Africa

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

Habitats and Ecology

This species mainly occurs in the Mesic Highveld Grassland Bioregion but also occurs in the Lowveld Bioregion and the Central Bushveld Bioregion. Key roosting sites include subterranean habitats like caves and old mine adits. It has been recorded day-roosting in rock crevices and fissures, and is occasionally observed in old buildings. Thus its occurrence is, in most cases, subject to suitable sheltered and/or subterranean habitats. Regions with rock habitats that have cavities are of utmost importance for the survival of this species. Artificially created habitat, such as abandoned mine or prospecting shafts/tunnels, within various vegetation types, also serve as important/essential habitat sanctuaries. *Rhinolophus cohenae* requires suitable natural habitat outside roost sites for foraging. Individuals are normally encountered in very small groups; *c*. 40 individuals was the highest number counted at one locality consisting of a maze of old mine tunnels.

Ecosystem and cultural services: Insectivorous bats are important regulators of insect populations (Boyles et al. 2011; Kunz et al. 2011). Bats feed particularly on arthropods that damage crops, and thus agricultural areas with bats require less pesticides (Kunz et al. 2011).

Use and Trade

Not known to be utilised or traded in any form.

Threats

The Mpumalanga Tourism and Parks Agency (MTPA) mapped all development applications received at a cadastral scale over a 14-year period (2000–2014), which showed that greatest pressure for land-use change has come from prospecting applications (54% of the land surface area) and mining (25% of land surface area) (Lötter et al. 2014). A major threat within this species' range is mining (legal, illegal and recommissioning of old mines). Future developments at the above rates or even higher are likely to cause further detriment towards natural ecosystems and processes and, in particular, disturb or destroy foraging grounds and roosting and maternity sites, or alter key micro-climates needed by the species. Additionally, loss of natural habitat around roost sites through poor land-use management practices, (such as inappropriate burning regimes, overgrazing and alteration of vegetation structure negatively affect foraging areas and prey base), land development activities including

Table 2. Threats to the Cohen's Horseshoe Bat (*Rhinolophus cohenae*) 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 suitable foraging areas through agricultural intensification.	Driver et al. 2012	Indirect	National	Ongoing
2	*2.3.4. Livestock Farming & Ranching*: foraging habitat loss and degradation from livestock farming. Current stress *1.2 Ecosystem Degradation*: habitat degradation through overgrazing.	Driver et al. 2012	Indirect	National	Ongoing
3	*3.2. Mining & Quarrying*: loss of roost sites and disturbance to existing roosts.	Lötter et al. 2014	Indirect	Regional	Increasing (based on permit applications).
4	*5.3.3. Logging & Wood Harvesting*: alteration of vegetation structure and loss of foraging areas through fuelwood extraction.	-	Anecdotal	-	Inferred to be increasing from rural settlement expansion.
5	*6.3. Human Intrusions & Disturbance*: disturbance to roost sites through subsurface activities.	-	Anecdotal	-	Inferred to be increasing from rural settlement expansion.
6	*7.1.1. Increase in Fire Frequency/Intensity*: increased frequency of fires altering vegetation structure and reducing prey base.	-	Anecdotal	-	Possibly increasing with small-scale ranching expansion.
7	*8.1.1. Invasive Non-Native/Alien Species/Diseases*: alien plant infestation reducing habitat quality and decreasing prey base.	-	Anecdotal	-	Increasing
8	*9.2.2. Seepage from Mining*: loss of prey base due to mine seepage.	Lötter et al. 2014	Indirect	Regional	Increasing (based on permit applications).

agricultural intensification (Driver et al. 2012), and alien invasive plant infestations are causing a decline in available habitat for foraging.

Climate change may also influence micro-climate distribution. This species is very dependent on suitable subterranean environments for roosting and maternity requirements and associated natural habitats for foraging. These sites are limited throughout its distribution range and beyond. The effects of climate change can severely impact on the survival of this species if the above is not provided for and not adequate for habitation anymore.

Current habitat trend: Declining in extent and quality. In Mpumalanga Province, only 51% of the grasslands are still in a natural condition and not previously ploughed. Old lands, or previously ploughed areas now left fallow, make up 9% of the grassland biome in Mpumalanga, and these areas should be prioritised for further development. Only 5.3% of the grassland biome is protected (Lötter et al. 2014; Lötter 2015). Additionally, urban and rural settlements have expanded by 10.5% and 7.2% respectively in Mpumalanga Province (GeoTerraImage 2015), which is inferred to correlate with increased degradation of natural habitat and disturbance to roost sites.

Conservation

The species occurs in Mariepskop Primary Conservation Area and Barberton Mountainlands Nature Reserve. No specific conservation actions are directed towards this species at the moment. The MTPA has developed the Mpumalanga Biodiversity Sector Plan (MBSP), which indicates areas of high conservation value and is based on a systematic conservation plan that considers the distribution of all species and their habitat, sets quantitative targets for these and tries to find the most sufficient selection of areas to meet these targets. A few of the *R. cohenae* localities fall within the boundaries of protected areas (Mariepskop Primary Conservation Area and Barberton Mountainlands Nature Reserve) but most are situated on private land. The MBSP has categorised areas in terms of their biodiversity value and *R. cohenae* localities that fall within Protected, Critical Biodiversity and Ecological Support areas will potentially receive the best protection measures from a land development perspective where certain activities will not be allowed or will be restricted. With regards to all other areas, the MBSP land-use guidelines should also be followed and Environmental Impact Assessment legislative tools applied.

Several legislative and policy changes are necessary:

- An integrated land-use management strategy that can be applied on local, provincial, national and international scales.
- Expand national protected area network through provincial stewardship programmes.
- Declare subterranean environments and associated habitats as Threatened Ecosystems.
- Develop legislation where these Threatened Ecosystems (for example, dolomitic regions) are formally protected by law. This will act as an umbrella to protect other species too.
- On a provincial scale, the provincial conservation acts should be updated to address disturbance as a threat.

Create awareness and promote conservation of resources, natural habitat and the ecological role and ecosystem services delivered by this group of animals.

Recommendations for land managers and practitioners: Landowners should implement best land-use management practices to maintain sustainability and limit disturbance at roosting sites. To achieve this, ecological advisory services and training are needed.

Table 3. Conservation interventions for the Cohen's Horseshoe Bat (*Rhinolophus cohenae*) 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*: implement best land-use management practices and limit disturbance to roosting sites.	-	Anecdotal	-	-	-
2	*2.2. Invasive/Problematic Species Control*: clear alien vegetation to increase foraging areas.	-	Anecdotal	-	-	-
3	*2.3. Habitat & Natural Process Restoration*: reduce grazing pressure and sustain vegetation structure.	-	Anecdotal	-	-	-
4	*4.3. Awareness & Communications*: increase knowledge of ecosystem services and distribute best practice guidelines.	-	Anecdotal	-	-	Mpumalanga Tourism & Parks Authority (MTPA)
5	*4.2 Training*: provide formal land-management training to land-owners.	-	Anecdotal	-	-	-
6	*5.4.2. Compliance & Enforcement*: enforce penalties for illegal activities that impact ecosystems.	-	Anecdotal	-	-	National and Provincial Department of Environmental Affairs
7	*5.4.3. Compliance & Enforcement*: enforce penalties for transgressing provincial ordinances.	-	Anecdotal	-	-	MTPA

Research priorities:

- Field surveys and niche modelling to more accurately delimit distribution range, and to identify key roost sites for protection.
- Further vetting of *R. hildebrandtii* specimens to more accurately delimit distribution range.
- Investigating patterns of movement to establish level of demographic and genetic exchange between colonies and quantifying the effects on transformation/fragmentation on such processes.

Encouraged citizen actions:

- Limit disturbance to roost sites.
- Avoid or limit the use of pesticides/insecticides for agricultural and household purposes as this can potentially negatively affect the prey base and lead to poisoning of individuals of this species and bats in general.
- Deposit any dead specimens at your local conservation agency for identification.

References

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Data Sources and Quality

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

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

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