Rhinolophus simulator – Bushveld Horseshoe Bat


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Regional Red List status (2016)	**Least Concern**
National Red List status (2004)	Least Concern
Reasons for change	None
Global Red List status (2016)	Least Concern
TOPS listing (NEMBA) (2007)	None
CITES listing	None
Endemic	No

Bushveld Horseshoe Bats alter their roosting positions according to the relative humidity and temperature within the cave, preferring humidities of 83–100% and temperatures of 19–23°C (Skinner & Chimimba 2005).

Taxonomy

Rhinolophus simulator K. Andersen 1904

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

Synonyms: *Rhinolophus bembanicus* Senna 1914 (probable synonym; see Monadjem et al. 2010)

Common names: Bushveld Horseshoe Bat (English), Bosveldsaalneusvlermuis (Afrikaans)

Taxonomic status: Species

Taxonomic notes: Although no subspecies were recognised by Meester et al. (1986), more recently two subspecies are tentatively recognised: *Rhinolophus simulator simulator* from eastern Africa, extending from Ethiopia to KwaZulu-Natal, South Africa; and *R. s. alticolus* from Guinea, Liberia, Nigeria and Cameroon (Cotterill & Happold 2013). Future research may confirm that *R. s. alticolus* is a distinct species (Cotterill & Happold 2013).

Assessment Rationale

Listed as Least Concern in view of its wide distribution (in the assessment region, extent of occurrence is estimated as 349,369 km^2), its presumed large population, ability to utilise modified habitats for roosting, and, although declining in some parts of its range, the overall population within the assessment region is not suspected to be declining fast enough to qualify for listing in a threatened category. Savannah habitats within the assessment region are generally well protected.

Regional population effects: The range of this species extends to the moist savannah and bushveld regions of Zimbabwe and Mozambique. However, while dispersal rates are unknown, dispersal capacity is assumed to be low due to its low wing-loading (Cotterill & Happold 2013), and thus rescue effects are uncertain.

Distribution

This species has a broad distribution across sub-Saharan Africa. In West Africa, there are records from the Wonegizi Mountains and Mount Nimba (Guinea and Liberia), from central Nigeria and Cameroon, which refer to the subspecies *R. s. alticolus* (Denys et al. 2013). There are many more records in East Africa, where this species ranges from Ethiopia and southern Sudan, southwards through Uganda, Kenya and Tanzania to Zambia, Malawi, Zimbabwe, Mozambique, southern Botswana to the eastern regions of South Africa, including Swaziland (ACR 2015). It has possibly been overlooked in southern Mozambique and eastern Botswana (Monadjem et al. 2010). In the assessment region, the Bushveld Horseshoe Bat occurs in the Limpopo, Mpumalanga, Gauteng, North West and KwaZulu-Natal provinces of South Africa as well as Swaziland (Monadjem et al. 2010). The extent of occurrence in the assessment region is 349,369 km^2.

Population

This species is thought to be common, with 300 specimens examined in Monadjem et al. (2010). Colonies of up to 300 individuals have been recorded in caves and mine adits (Rautenbach 1982), but Bushveld Horseshoe Bats also roost singly or in smaller groups within rocky outcrops, caverns and culverts under the road (Monadjem et al. 2010). There are limited population estimates available for this species, but they are considered locally common in Zimbabwe (Cotterill & Happold 2013).

Current population trend: Stable

Continuing decline in mature individuals: Unknown

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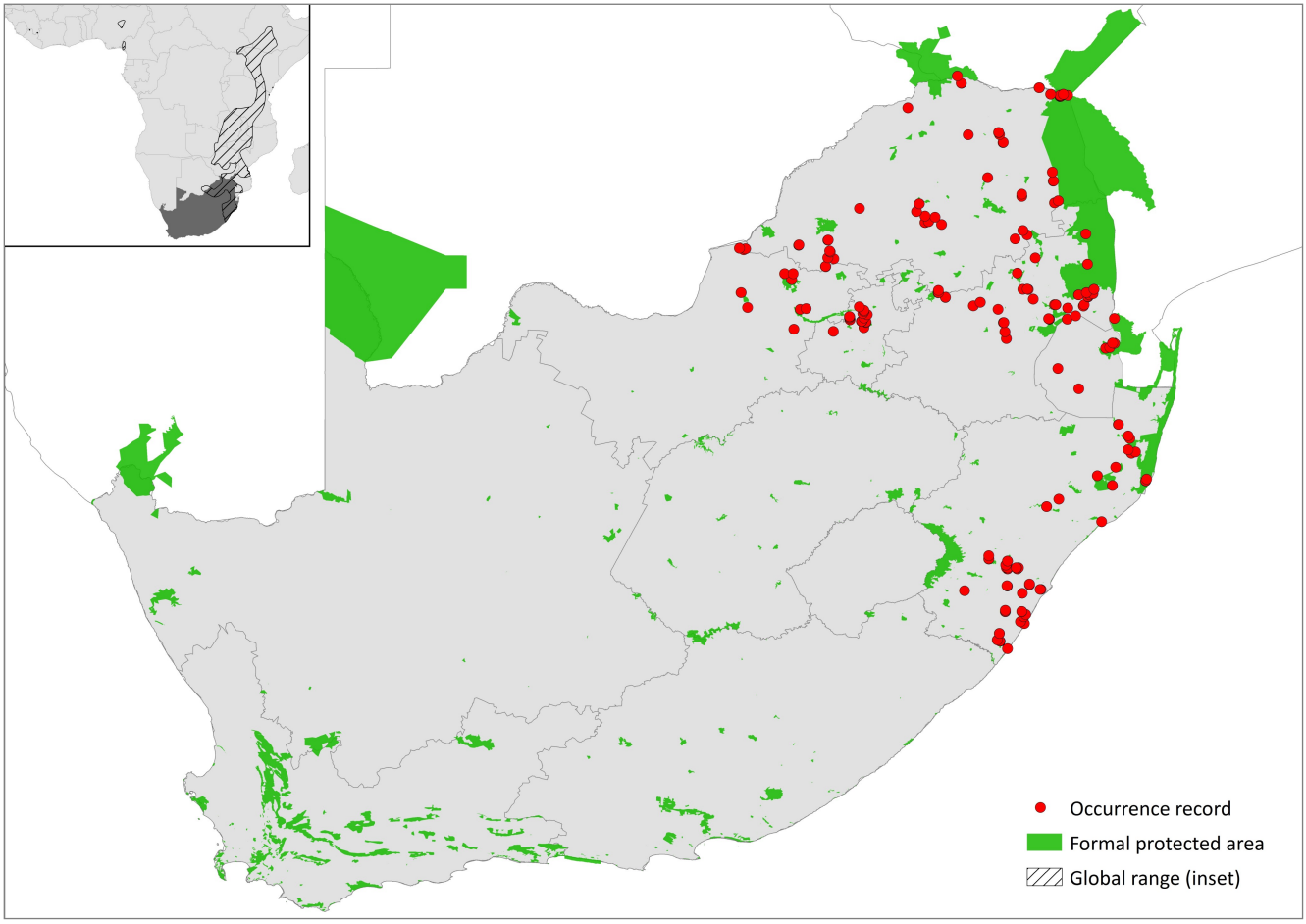

Figure 1. Distribution records for Bushveld Horseshoe Bat (*Rhinolophus simulator*) within the assessment region

Table 1. Countries of occurrence within southern Africa

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

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 typically occurs in caves within areas of moist savannah, but has also been documented in bushveld regions adjacent to rivers and savannah woodland (for example, *Brachystegia* woodland in Zimbabwe) (Skinner & Smithers 1990), montane habitats and coastal mosaics (Cotterill & Happold 2013). It is most commonly associated with riparian forest and along wooded drainage lines (Monadjem et al. 2010). The availability of diurnal roosting sites, such as caves and mine adits, is an essential component of its habitat requirements (Taylor 1998). In KwaZulu-Natal it is often associated with Valley Bushveld regions, which occur along the lower reaches of east-flowing rivers (Taylor 1998). It is absent from deserts and rare in semi-arid savannahs (Cotterill & Happold 2013).

The Bushveld Horseshoe Bat is an insectivorous clutter forager (Skinner & Chimimba 2005; Monadjem et al. 2010), feeding on a range of soft-bodied insects (Rautenbach 1997); it is known to hunt insect prey amongst dense vegetation and even on the ground (Rautenbach 1997). It feeds most commonly on Lepidoptera, but to a lesser extent, is also known to take Hemiptera, Isoptera, Orthoptera and Coleoptera (Whitaker & Black 1976; Findley & Black 1983; Schoeman 2006). This is a slow, but acrobatic, flier (Rautenbach 1997) with low aspect ratio, very low wing-loading and rounded wing tips (Cotterill & Happold 2013). In spring, females have been observed migrating to maternity roosts to give birth, before returning to the colony with their young (Wingate 1983). In KwaZulu-Natal, pregnant females were observed in September and October (Skinner & Chimimba 2005). A single, naked young is born in summer, usually in late November or early December (Rautenbach 1997). Young are weaned after a period of four to six weeks (Rautenbach 1997).

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

Table 2. Threats to the Bushveld Horseshoe Bat (*Rhinolophus simulator*) 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	*2.1.1 Annual & Perennial Non-timber Crops*: loss of natural habitats and insect prey-base.	Jewitt et al. 2015	Indirect (land cover change from remote sensing)	Regional	Ongoing
2	*3.2 Mining & Quarrying*: loss of natural habitat due to mining operations.	-	Anecdotal	-	Increasing, based on prospecting applications.
3	*6.1 Recreational Activities*: roost disturbance during traditional ceremonies and tourism.	-	Anecdotal	-	Ongoing

Table 3. Conservation interventions for the Bushveld Horseshoe Bat (*Rhinolophus simulator*) 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*: expansion of protected areas to conserve natural habitat.	-	Anecdotal	-	-	-
2	*2.1 Site/Area Management*: protection of key roost sites.	-	Anecdotal	-	-	-

Use and Trade

There is no evidence to suggest that the species is traded or utilised in any form.

Threats

Although there are no major threats to this species, it is locally threatened by habitat loss resulting from mining and agriculture. Extensive transformation of natural habitat, particularly in KwaZulu-Natal (Jewitt et al. 2015), is likely to be causing declines where the insect prey base is depleted as a result of loss of native vegetation or the use of pesticides. Additionally, as a cave-roosting species, it may be threatened by human disturbance at roost sites as a result of traditional ceremonies and tourism activities, which frequently take place in caves.

Current habitat trend: Stable with local declines in area and quality, particularly from agricultural expansion and mining operations (Jewitt et al. 2015). Overall, savannah habitats in the assessment region are well protected (Driver et al. 2012).

Conservation

This species is well protected and present in a number of protected areas, including Kruger National Park, iSimangaliso Wetland Park, Madikwe Nature Reserve, Pilanesberg Game Reserve, Oribi Gorge Nature Reserve and Songimvelo Nature Reserve. No species-specific conservation initiatives are necessary at present. However, this species is likely to benefit from protected area expansion, as well as the protection of key roost sites.

Recommendations for land managers and practitioners:

- Reduce pesticide use in agricultural landscapes.

Data Sources and Quality

Table 4. Information and interpretation qualifiers for the Bushveld Horseshoe Bat (*Rhinolophus simulator*) assessment

Data sources	Field study (unpublished), indirect information (literature), museum records
Data quality (max)	Estimated
Data quality (min)	Inferred
Uncertainty resolution	Best estimate
Risk tolerance	Evidentiary

Research priorities:

- Taxonomic revision of the species and tentative subspecies to determine whether *R. s. alticolus* is a distinct species.
- Population size and trends.
- Systematic monitoring to identify key roost sites.

Encouraged citizen actions:

- Limit disturbance to roost sites.
- Citizens can assist in the conservation of the species by reporting sightings on virtual museum platforms (for example, iSpot and MammalMAP), and therefore contribute to an understanding of the species distribution. However, this species is easily confused with *R. darlingi*, and can only be reliably separated by the position and presence of the minute first upper premolar (Monadjem et al. 2010).

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