Sauromys petrophilus – Roberts' Flat-headed Bat


Trevor Morgan

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

The defining feature of this species is the flattened skull (unlike in other Molossid species), which is an adaptation for roosting in very narrow rock crevices (Skinner & Chimimba 2005).

Taxonomy

Sauromys petrophilus (Roberts 1917)

ANIMALIA - CHORDATA - MAMMALIA - CHIROPTERA - MOLOSSIDAE - *Sauromys* - *petrophilus*

Synonyms: *Platymops petrophilus* (Roberts 1917), *Mormopterus petrophilus* (Roberts 1917), *Sauromys petrophilis* Roberts 1946 ssp. *erogensis*, *Sauromys petrophilis* Roberts 1946 ssp. *fitzsomonsi*, *Sauromys petrophilis* Roberts 1917 ssp. *haagneri*, *Sauromys petrophilis* Shortridge & Carter 1938 ssp. *umbratus*

Common names: Roberts' Flat-headed Bat, Roberts's Flat-headed Bat, Flat-headed Free-tailed Bat, Rock-loving Flat-headed Bat, Rock-dwelling Flat-headed Bat, Flatheaded Free-tailed Bat (English), Platkop-losstertvlermuis (Afrikaans)

Taxonomic status: Species

Taxonomic notes: Initially, this species was described as *Platymops petrophilus* (Skinner & Chimimba 2005; Cotterill 2013). The family Molossidae was revised by Peterson (1965), and the genus *Platymops* was geographically restricted to the East African region, while those species from southern Africa were included under the genus *Sauromys* (Skinner & Chimimba 2005; Monadjem et al. 2010). Although *Platymops* and *Sauromys* were previously listed as subgenera under the genus *Mormopterus* (Freeman 1981; Koopman 1993), following Meester et al. (1986), Jacobs & Fenton (2001), Bronner et al (2003), Skinner & Chimimba (2005) and Monadjem et al. (2010), we consider *Sauromys* a distinct genus. ACR (2015) lists four subspecies, including *S. p. erongensis* (Roberts 1946) from Namibia, *S. p. umbratus* (Shortridge & Carter 1938) from the Western Cape, *S. p. haagneri* (Roberts 1917) from Namibia and the Northern Cape, and *S. p. petrophilus* (Roberts 1917) from the Limpopo Province, Botswana, Zimbabwe and Mozambique. However, there is doubt as to their validity (Cotterill 2013). The distribution of this species is fragmented and may have led to genetic isolation of principal populations where the western population is separated from the eastern one by 800 km and future studies may well show these to be genetically distinct (Monadjem et al. 2010).

Assessment Rationale

Roberts' Flat-headed Bat is listed as Least Concern in view of its wide distribution (extent of occurrence in the assessment region is 634,414 km^2), presumed large population, its presence in many protected areas, and because no severe threats have been recorded to affect this species within the assessment region. It occurs in inaccessible habitats unlikely to be transformed. While there are some threats to the species, none are presumed to cause future declines which could severely affect the population. However, climate change may represent an emerging threat to this species as it may be especially vulnerable to dehydration during periods of extreme heat. Future work should focus on estimating population size and trend as well as resolving its taxonomy.

Regional population effects: Although the distribution of this species is somewhat patchy through southern Africa, dispersal is possible considering its high wing-loading (Jacobs & Fenton 2001) and its occurrence in transfrontier parks, such as Ai-Ais Richtersveld Transfrontier Park and the Greater Mapungubwe Transfrontier Conservation Area.

Distribution

The species is widely but patchily distributed throughout southern Africa ranging along the west coast from southern Angola through Namibia, south into South Africa. In South Africa, its distribution extends southwards into the Western Cape Province, as well as eastwards along the northern border of South Africa, extending marginally into southern Botswana (Cotterill 2013) and into Zimbabwe and western Mozambique (Monadjem et al. 2010). It is inexplicably absent from northwest Zimbabwe where habitat is thought to be suitable (Monadjem et al. 2010). It is abundant in the drier western regions of Namibia and South Africa (Skinner & Chimimba 2005), and is generally found between 100 m and 2,000 m asl. In South Africa its range is discontinuous, with records from Limpopo, Mpumalanga, the Pretoria area of Gauteng, Western Cape (Clanwilliam and Ceres) and the Northern Cape (e.g. Goodhouse and Augrabies Falls) provinces (Figure 1; Monadjem et al. 2010). This species is also

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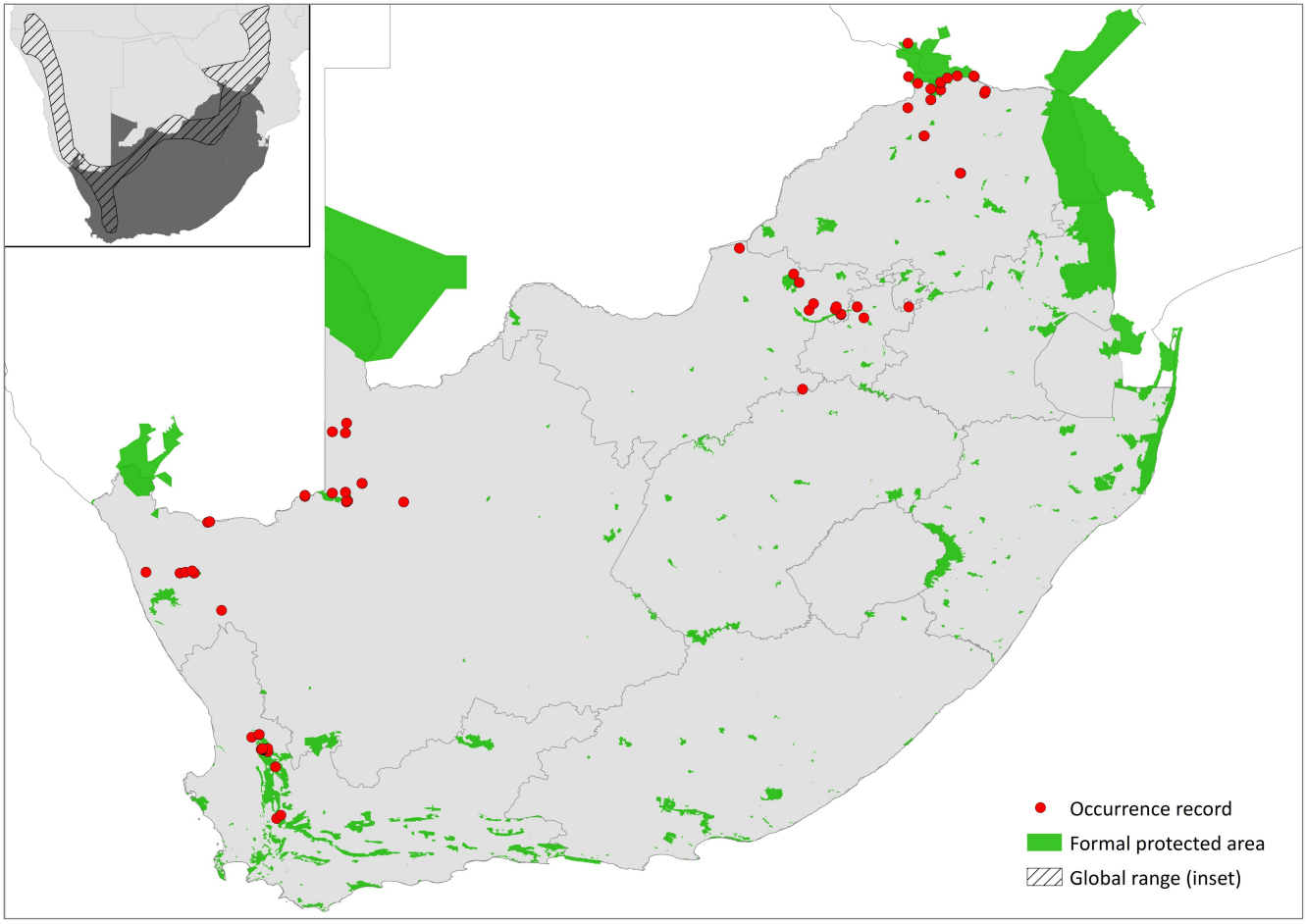

Figure 1. Distribution records for Roberts' Flat-headed Bat (*Sauromys petrophilus*) within the assessment region

Table 1. Countries of occurrence within southern Africa

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

present within the Greater Mapungubwe Transfrontier Conservation Area, as well as the Ai-Ais Richtersveld Transfrontier Park (Skinner & Chimimba 2005; Monadjem et al. 2010). The type specimen is from the former Transvaal, now North West Province, South Africa (Monadjem et al. 2010). The distribution of this species is fragmented owing to the patchy nature of its habitat (Monadjem et al. 2010). The estimated extent of occurrence in the assessment region is 634,414 km^2.

Population

Roberts' Flat-headed Bat is locally common in some areas, particularly the arid, western regions of southern Africa (Jacobs & Fenton 2001; Monadjem et al. 2010; ACR 2015), or where roosting sites are abundant, such as the Limpopo Valley and the Cederberg, but rare elsewhere (Cotterill 2013). Generally, this species occurs in colonies consisting of tens of individuals rather than hundreds (Rautenbach 1982; ACR 2015).

Current population trend: Stable

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

Occurs in both wet and dry woodlands (including miombo and mopane), shrublands and Acacia-wooded grasslands always in areas with rocky outcrops and hills, especially of Karoo sandstones and granitic intrusions (Cotterill 2013). This species is closely associated with rocky habitats, usually in dry woodland, mountain fynbos or arid scrub (Monadjem et al. 2010). In the assessment region, the species is recorded from the Mopane Bioregion, Central Bushveld, Lowveld, Gariep Desert, Bushmanland, Northwest Fynbos, Namaqualand Hardeveld, Namaqualand Sandveld. In the Western Cape, it utilises open areas surrounding artificial wetlands (Sirami et al. 2013). Generally restricted to rocky areas, the essential habitat requirements of this species include the presence of narrow rock crevices and fissures for daytime roosting, as well as the availability of an adequate insect food supply (Skinner & Chimimba 2005).

Table 2. Threats to the Roberts' Flat-headed Bat (*Sauromys petrophilus*) 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	*11.3 Temperature Extremes*: climate change and severe weather leading to fatal dehydration.	Toussaint & McKechnie 2012	Indirect	Local	*S. petrophilus* showed rapid increases in evaporative water loss at high ambient temperatures, thus is vulnerable to fatal dehydration during heat waves.
2	*3.3 Renewable Energy*: habitat loss and mortality by barotrauma or direct collision with turbine blades at wind turbines.	MacEwan 2011	Anecdotal	Regional	Increasing with the expansion of wind energy plants.

It roosts in crevices, narrow cracks, exfoliated rock, sandstones and granite (Jacobs & Fenton 2001; Monadjem et al. 2010). Its extremely flattened skull is an adaptation to roosting in the narrowest of rock crevices (Jacobs & Fenton 2002). Roosts are made up of small numbers; most records average a roost size of four (Skinner & Chimimba 2005). The species is known as an open-air forager with a diet consisting mainly of Diptera, Hemiptera and Coleoptera (Monadjem et al. 2010). The reproductive ecology of this species is largely unknown. However, in Zimbabwe, a pregnant and lactating female was recorded in mid-November (Monadjem et al. 2010).

Ecosystem and cultural services: As this species is insectivorous, it may contribute to 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

There is no evidence to suggest that this species is traded or harvested within the assessment region.

Threats

There appear to be no current major threats to this species. However, in certain parts of its range, habitat alteration, due to deforestation, has been identified as a potential threat to this species (ACR 2015). Additionally, climate change has been recognised as a potential threat to most bat species (Sherwin et al. 2013), and *S. petrophilus* specifically, was found to exhibit rapid spikes in Evaporative Water Loss during conditions of high ambient temperature (Toussaint & McKechnie 2012). Thus, this species may be especially vulnerable to fatal dehydration during periods of extreme heat (Toussaint & McKechnie 2012; ACR 2015).

Due to the fact that this species is an open-air forager, fatalities at wind farm sites (especially along the western coast of the Western and Northern Cape) pose a future threat. Such renewable energy sites could potentially become a greater threat to insectivorous bats within the assessment region (Baerwald et al. 2008). When bats fly near to turbine blades, they either collide directly with the blade or they experience barotrauma, which is the internal bleeding caused by rapid changes in air pressure near the blades (Baerwald et al. 2008; MacEwan 2016).

Current habitat trend: Stable. However, increasing development of renewable energy sites could reduce the amount of available habitat in the Northern and Western Cape. Climate change may cause habitat degradation.

Conservation

Roberts' Flat-headed Bat is present within several protected areas of Namibia and Angola. Additionally, in South Africa, this species has been reported from the Greater Mapungubwe Transfrontier Conservationo Area, the Ai-Ais Richtersveld Transfrontier Park, the Algeria forestry station (ACR 2015), Blouberg Nature Reserve, Baobab Tree Reserve and Augrabies Falls National Park. Although no direct conservation measures are currently necessary for this species, wind farms and extreme temperatures pose future threats, and thus monitoring the impacts on subpopulations will be required.

Recommendations for land managers and practitioners:

- Reduce pesticide use in agricultural landscapes.

Research priorities:

- Systematic monitoring to determine population size and trends.
- Molecular research to resolve its taxonomy.
- Quantification of future potential threats.

Encouraged citizen actions:

- Citizens can assist the conservation of the species by reporting sightings on virtual museum platforms

Table 3. Conservation interventions for the Roberts' Flat-headed Bat (*Sauromys petrophilus*) 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, and population monitoring.	-	Anecdotal	-	-	-

(for example, iSpot and MammalMAP), and therefore contribute to an understanding of the species distribution. This species can be fairly easily distinguished from other free-tailed bat species by its small size and lack of flap of skin between its ears (Monadjem et al. 2010).

Data Sources and Quality

Table 4. Information and interpretation qualifiers for the Roberts' Flat-headed Bat (*Sauromys petrophilus*) 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

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