Petrodromus tetradactylus – Four-toed Sengi


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Regional Red List status (2016)	Near Threatened B2ab(ii,iii,v)*
National Red List status (2004)	Endangered D
Reasons for change	Non-genuine: New information
Global Red List status (2015)	Least Concern
TOPS listing (NEMBA)	None
CITES listing	None
Endemic	Edge of Range

*Watch-list Data

When alarmed they rapidly stamp their hind feet on the ground, which can be heard many metres away (Rathbun 2005).

Taxonomy

Petrodromus tetradactylus (Peters 1846)

ANIMALIA - CHORDATA - MAMMALIA - MACROSCELIDEA - MACROSCELIDIDAE - *Petrodromus* - *tetradactylus*

Common names: Four-toed Sengi, Four-toed Elephant-shrew (English), Bosklaasneus (Afrikaans)

Taxonomic status: Subspecies

Taxonomic notes: In the past the single family was included in the order Insectivora, but now the family is in the monophyletic order Macroscelidea and the newly created super-cohort Afrotheria. Currently, there are 19 living species recognized in four genera. The soft-furred sengis or elephant-shrews include three genera: *Petrodromus* is monospecific, *Macroscelides* has three species, and *Elephantulus* contains 11 species. The four species of giant sengis belong to the genus *Rhynchocyon*. The common name "sengi" is being used in place of elephant-shrew by many biologists to try and disassociate the Macroscelidea from the true shrews (family Soricidae) in the order Soricomorpha. See the IUCN SSC Afrotheria Specialist Group web site and www.sengis.org for additional information.

This genus specifically is in need of a taxonomic revision that would assess the currently recognized 10 subspecies. Subspecies are characterised mainly by pelage colour and bristles under the tail. Two subspecies occur within the assessment region, *P. t. schwanni* in north-eastern Limpopo and *P. t. warreni* in northern KwaZulu-Natal. The subspecies in KwaZulu-Natal (*P. t. warreni*) lacks tail bristles, as opposed to other forms (Rathbun 2013). For general biological information, please consult Perrin and Rathbun (2013), Rathbun (2013) and Rathbun (2005).

Assessment Rationale

This species is at the edge of its range within the assessment region where two disjunct subspecies occur: *P. t. schwanni* in north-eastern Limpopo and *P. t. warreni* in northern KwaZulu-Natal, both being restricted to intact riparian and coastal forest. The estimated area of occupancy for *P. t. schwanni* and *P. t. warreni*, based on remaining forest habitat, is 72 and 192 km^2 respectively. Although *P. t. warreni* at least may represent a South African endemic, further taxonomic resolution is required before we assess it separately. Overall, the species qualifies for Endangered B2ab(ii,iii,v) based on restricted area of occupancy (264 km^2 in South Africa) presumed small population size, and a continuing decline in woodland habitat as a result of human expansion over the past decade. In KwaZulu-Natal alone, there was a 7.6% loss of natural habitat from 2005 to 2011. As such, forest patches are likely to be severely fragmented, hindering dispersal of the species. Fragmentation further opens up forest patches for ongoing anthropogenic disturbances, such as incidental bushmeat hunting and removal of ground cover and thus represents a continuing decline in both mature individuals and habitat quality. However, the species occurs predominantly in large, well-managed protected areas, including the Great Limpopo Transfrontier Park (*P. t. schwanni*) and the Lubombo Transfrontier Conservation Area (*P. t. warreni*), so net population decline is unlikely. Additionally, rescue effects are possible (see below). Thus we downlist to Near Threatened B2ab(ii,iii,v). The key intervention for this species is further protected area expansion (especially transfrontier expansion) and connection of remaining forest patches.

Regional population effects: This species is the second-most widespread sengi in Africa, occurring from central and eastern Africa south to the north-eastern corner of South Africa. The assessment region thus represents the edge of its range. Although sengis are not long-distance dispersers, the presence of both subspecies in major transfrontier conservation areas, with presumably intact forest corridors, leads us to suspect rescue effects are possible. However, *P. t. schwanni* may represent a unique subspecies/species, in which case rescue effects are not possible. This should be investigated and may require reassessment.

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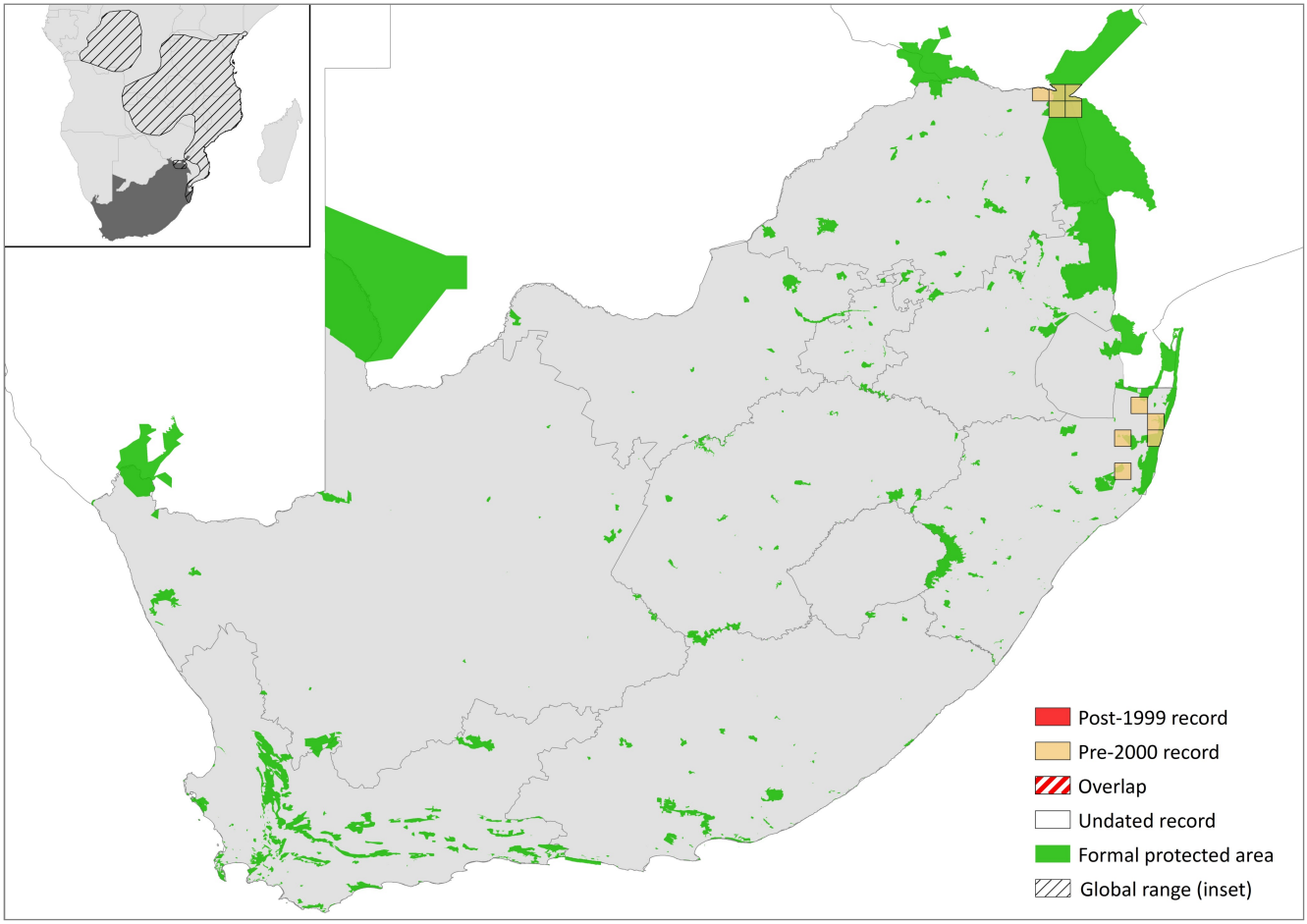

Figure 1. Distribution records for Four-toed Sengi (*Petrodromus tetradactylus*) within the assessment region

Table 1. Countries of occurrence within southern Africa

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

Distribution

This species is one of the most widespread sengis, occurring in forest, woodland, and thicket habitats in central and eastern Africa from DR Congo to northeastern South Africa. Their occurrence depends on the availability of suitable forest or woodland habitat with dense underbrush, which is discontinuous throughout their range (Skinner & Chimimba 2005). It is an edge-of-range species within the assessment region, occurring in woodland and forest habitats in Limpopo, KwaZulu-Natal and perhaps Swaziland. The subspecies *P. t. warreni* occurs in KwaZulu-Natal and may be a South African endemic form (Corbet & Hanks 1968), where their distribution is predominantly coastal (Rathbun 2005), whereas *P. t. schwanni* occurs in the riparian forests of the northern Limpopo and across the border to the north. Although it has not been recorded from Swaziland (Monadjem 1998), it may possibly occur there marginally in suitable forest habitats.

The estimated area of occupancy (AOO) globally is 2,485,700 km^2 based on censored minimum convex polygon with no consideration of fragmented habitat. The estimated global extent of occurrence is 5,700,000 km^2. Within the assessment region, the AOO is estimated to be 6,438 km^2 based on occupied grid cells. However, if we use forest and woodland areas as a proxy for occupied habitat (Mucina & Rutherford 2006), the estimated AOO for *P. t. schwanni* and *P. t. warreni*, based on remaining forest habitat, is 72 and 192 km^2 respectively; and thus 264 km^2 for the species overall.

Population

Although widespread, the species is often only locally common because it is restricted to closed-canopy forest, woodlands, and thickets. Little information is available on densities. In *Afzelia* habitat within Arabuko-Sokoke Forest (Kenya), the estimated density was 1.2 animals / ha (FitzGibbon 1995). Using this density for the estimate AOO within the assessment region yields 31,680 individuals. However, there is no evidence that it is abundant. For example, as there was no overlap between the home ranges of adjoining pairs in Tembe Elephant Park, KwaZulu-Natal, low population density was assumed (Oxenham & Perrin 2009). Further studies should be conducted to determine density estimates for both subspecies within the assessment region.

It often foot-drums and thus attracts the attention of people in suitable habitat, but sightings are almost always

Table 2. Use and trade summary for the Four-toed Sengi (*Petrodromus tetradactylus*)

Category	Applicable?	Rationale	Proportion of total harvest	Trend
Subsistence use	Yes	May be opportunistically used in bushmeat	All	Unknown. Perhaps increasing with rural settlement expansion.
Commercial use	No	-	-	-
Harvest from wild population	Yes	-	-	
Harvest from ranched population	No	-	-	-
Harvest from captive population	No	-	-	-

of individuals. It builds and maintains characteristic and distinct paths through the leaf litter that are often composed of a straight series of clean oval patches, which can be used as an indicator of presence.

Current population trend: Unknown

Continuing decline in mature individuals: Suspected from incidental bushmeat hunting.

Number of mature individuals in population: < 31,680

Number of mature individuals in largest subpopulation: Unknown

Number of subpopulations: Unknown

Severely fragmented: Possibly, due to fragmentation of forest habitats.

Habitats and Ecology

Forest, dense woodlands, and thickets (Jennings & Rathbun 2001), where animals probably form monogamous pairs (FitzGibbon 1995; Oxenham & Perrin 2009). They prefer habitats usually with surface leaf litter, which makes it easy to identify their characteristic paths that are usually composed of a straight line of oval bare patches in the leaf litter. They are able to live in fallow agricultural areas that have suitable cover and leaf litter, invertebrates for food, and that are adjacent to undisturbed habitats. They are omnivorous, but prey mainly on invertebrates. This is the largest species of sengi in the subregion (Rathbun 2005). They are active during day and night and shelter in holes, termite mounds, under fallen logs, hollow logs, patches of dense underbrush or under roots of trees but do not build or use nests (Jennings & Rathbun 2001). When alarmed they rapidly stamp their hind feet on the substrate, which can be heard many metres away, and may utter a loud shrill squeak when in distress (Rathbun 2005). The common name emanates from the fact that, unlike all other members of the family, they have only four toes on their hind feet.

Ecosystem and cultural services: None recorded.

Use and Trade

FitzGibbon et al. (1995) documented subsistence hunting in coastal Kenya, which is assumed to continue to the present, but it is not known whether this species is hunted in South Africa. Given the increase in the human population along protected area edges in general (Wittemyer et al. 2008), one could assume that hunting pressure has increased, and may especially be prevalent in KwaZulu-Natal where many rural communities surround forest patches. However, bushmeat hunting of this species may be lower than expected from relative density based on model outputs (Rowcliffe et al. 2003).


Andrew Molinaro

Table 3. Threats to the Four-toed Sengi (*Petrodromus tetradactylus*) 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	*1.1 Housing & Urban Areas*: forest habitat loss and fragmentation from woodland clearing due to expanding human settlements.	Jewitt et al. 2015	Indirect	Regional	Continuing
		GeoTerraImage 2015	Indirect	National	Continuing
2	*5.1.1 Intentional Use*: opportunistic bushmeat hunting, especially around forest or protected area edges adjacent to rural communities.	FitzGibbon et al. 1995	Empirical	Regional	Possibly increasing with expansion of rural settlements and loss of woodland cover.

Table 4. Conservation interventions for the Four-toed Sengi (*Petrodromus tetradactylus*) 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*: protected area expansion to mitigate woodland habitat loss and connect forest patches.	-	Anecdotal	-	-	-

Threats

There are no major identified threats range-wide, although habitat loss through woodland clearing and subsistence snaring may have impacts on local subpopulations in the assessment region. If we assume that both woodland clearing and subsistence hunting increase with rural population density and settlement expansion, it is suspected there is an ongoing loss of habitat and mature individuals, especially the forests of KwaZulu-Natal (see below).

Current habitat trend: Declining. Habitat loss is ongoing through woodland clearing, especially around protected area fringes (Wittemyer et al. 2008). There was a 7.6% loss of natural habitat from 2005 to 2011, with an average loss of 1.2% per annum in KwaZulu-Natal (Jewitt et al. 2015). Additionally, there has been an 8% and 1% increase in rural settlements in Limpopo and KwaZulu-Natal, respectively, between 2000 and 2013 (GeoTerraImage 2015).

Conservation

The species occurs in several protected areas (confirmed in northern Kruger National Park and protected areas in KwaZulu-Natal) within the assessment region, including Great Limpopo Transfrontier Park (*P. t. schwanni*) and the Lubombo Transfrontier Conservation Area (*P. t. warreni*). For example, they occur in Tembe Elephant Park (Oxenham & Perrin 2009), Isimangaliso Wetland Park and Bonamanzi Game Reserve. A comprehensive list of protected areas should be tallied. This species would benefit from protected area expansion to conserve woodland habitat and connect subpopulations existing in forest fragments. For example, a transfrontier conservation area in Maputaland that connects with the existing Lubombo Transfrontier Conservation Area has recently been proposed and would add 480 km^2 of linking corridors between forest habitats and potentially generate US$18.8 million from game ranching (Smith et al. 2008). Such a protected area network would undoubtedly benefit this species.

Data Sources and Quality

Table 5. Information and interpretation qualifiers for the Four-toed Sengi (*Petrodromus tetradactylus*) assessment

Data sources	Museum records, indirect information (literature, expert knowledge)
Data quality (max)	Inferred
Data quality (min)	Suspected
Uncertainty resolution	Best estimate
Risk tolerance	Evidentiary

Recommendations for land managers and practitioners: Land owners and communities should reduce stocking rates to conserve undergrowth.

Research priorities:

- Field surveys to confirm occupancy rate across the assessment region. Continue to accumulate information on occurrence points (see www.sengis.org). Collect evidence to indicate population trends and status of habitats.
- Genetic and phenotypic analyses to determine whether, if any, species-complexes are present across its distribution south of the Sahara.
- Studies to determine the extent and impact of snaring in South Africa.

Encouraged citizen actions:

- Landowners can create conservancies to protect woodland habitat.

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