Xerus inauris – Cape Ground Squirrel

Emmanuel Do Linh San

Regional Red List status (2016)	**Least Concern**
National Red List status (2004)	Least Concern
Reasons for change	No change
Global Red List status (2008)	Least Concern
TOPS listing (NEMBA)	None
CITES listing	None
Endemic	No

They use their tail as a parasol during feeding on hot days (Bennett et al. 1984). The name *inauris* refers to their very small ear pinnae.

Taxonomy

Xerus inauris (Zimmermann 1780)

ANIMALIA - CHORDATA - MAMMALIA - RODENTIA - SCIURIDAE - *Xerus* - *inauris*

Common names: Cape Ground Squirrel, Ground Squirrel, South African Ground Squirrel (English), Waaierstertgrondeekhoring (Afrikaans), Sehlora (Sepedi), Lesamane (Sesotho), Sekata-mosima, Sekate (Setswana), Sinkwe (siSwati), Unomatse (isiXhosa), Maxindlani (Xitsonga), Ingwejeje yaseKapa, Intshidane yaseKapa (isiZulu)

Taxonomic status: Species

Taxonomic notes: Three genetic clades, corresponding to geographical restriction, have been identified (Herron et al. 2005), but the genetic differences are not sufficient to warrant the recognition of further taxa (Monadjem et al. 2015). No subspecies are recognised (Skinner & Chimimba 2005). Although doubts have been raised regarding the specific distinctness of *X. inauris* and *X. princeps*, molecular research supports each as a monophyletic lineage (Herron et al. 2005).

Assessment Rationale

This species has a wide distribution across the assessment region, occurs in many protected areas – including Kgalagadi Transfrontier Park – and there are no major threats that could cause range-wide population declines. Habitat available for Ground Squirrels is stable if not expanding, as they can exist on overgrazed lands, and thus the expansion of livestock and wildlife ranching may benefit this species. Furthermore, it is a resilient species, adapting its social organisation, space use and breeding to climactic fluctuations, and thus will likely be able to adapt to climate change. No specific interventions are necessary at present.

The Damara Ground Squirrel (*Xerus princeps*) is Not Evaluated in this revision as, although it may marginally exist in South Africa (for example, at Augrabies National Park; J. Waterman pers. obs.), it is an extreme edge of range species and there is no evidence of a breeding population. It is therefore considered vagrant. However, it may become more prevalent within South Africa (inhabiting mountains, cliffs and gorges) as climate change increases arid conditions, and may thus require a reassessment in future.

Regional population effects: The species' range is continuous throughout the arid areas of southern Africa and thus dispersal is possible across Namibia and Botswana. Populations in Namibia and Botswana are not expected to decline.

Distribution

This species is restricted to southern Africa, south of the Cunene and Zambezi Rivers (Griffin & Coetzee 2008). It is distributed widely in Namibia, except where replaced by *X. princeps* in the north-west (Skinner & Chimimba 2005), and is absent from coastal regions. It is confined to the semi-desert Kalahari in Botswana. In South Africa, it occurs mainly in the arid interior, being widely distributed in the arid parts of North West (Power 2014), Free State, the Northern Cape (northern and north-eastern parts of the province) provinces, and southwards to the Graaff Reinet District in the Eastern Cape, which marks the most southerly limit of its distribution (Skinner & Chimimba 2005). There are isolated subpopulations in northern Limpopo Province (I. Gaigher & W. Collinson pers. obs. 2015; Figure 1). It also occurs in western Lesotho (Lynch 1994). The greater part of its range is within the Nama-Karoo and Succulent Karoo biomes in areas with a mean annual rainfall of 100–500 mm (Skinner & Chimimba 2005). The species' range is continuous throughout the arid areas of southern Africa, except in areas of the western Namib (Skurski & Waterman 2005), which is reflected by mitochondrial DNA work that suggests all subpopulations are genetically connected and represent only a single species (Herron et al. 2005).

Population

This is a common species wherever it occurs. In Namibia, it exists at densities of *c.* 400 individuals / km^2 and, in S.A. Lombard Nature reserve, North West Province, the density is higher (J. Waterman unpubl. data). The population is considered stable based on no net decline in habitat.

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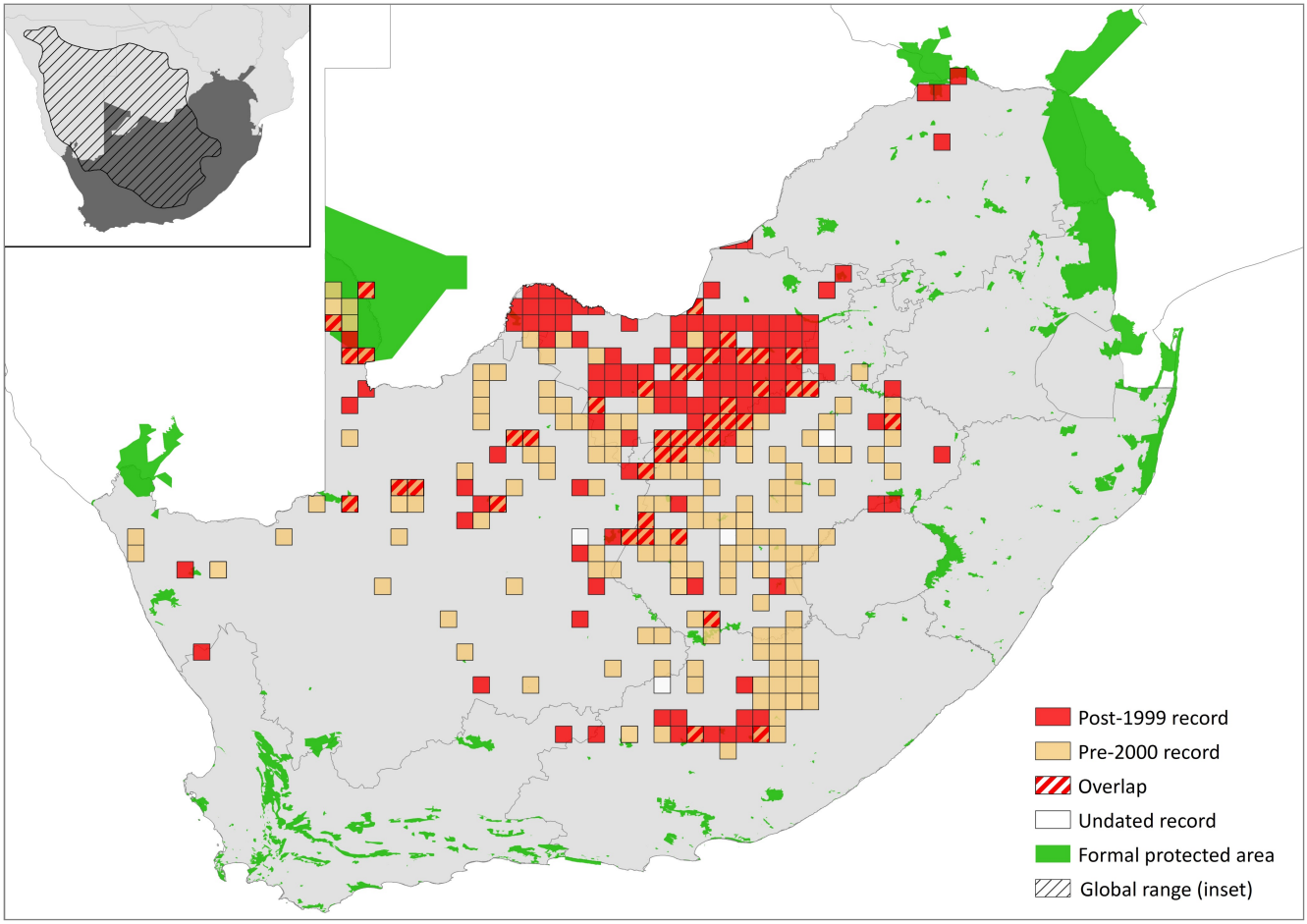

Figure 1. Distribution records for Cape Ground Squirrel (*Xerus inauris*) within the assessment region

Table 1. Countries of occurrence within southern Africa

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

Local declines may be expected in areas where Black-backed Jackal (*Canis mesomelas*) numbers are high due to the removal of apex predators. For example, at three sites in the Northern Cape, there was a negative relationship between Ground Squirrel and Black-backed Jackal abundance (Bagniewska & Kamler 2014).

Current population trend: Stable, inferred from stable habitat and high densities.

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. Their habitat is connected and they can utilise agricultural landscapes.

Habitats and Ecology

They have a preference for open terrain with little bush cover and a substrate suitable for burrowing, occurring on open calcareous ground on the fringes of dry pans, watercourses and floodplains, on open overgrazed ground, and in open grassland or karroid areas, providing the substrate is suitable (Skinner & Chimimba 2005). They avoid extremely loose sandy areas for making their burrows but are found burrowing near the dunes of the Kalahari Desert in stable zones. They are locally common along the edges of salt pans or at old kraal sites and overgrazed patches, and there are isolated colonies occurring in the northern bushveld regions (Power 2014).

Photo 1. A Cape Ground Squirrel using its parasol-like tail

They are diurnal, and highly social, with males forming all-male groups that are essentially independent of female groups except during breeding. There are social hierarchies in both groups but these are more developed in the female groups (Wilson 1996). Individual vigilance during foraging decreases with group size (Edwards & Waterman 2011). Breeding can occur year-round, and females are capable of having up to three litters of one to two young annually, where orphans are often adopted by related females in the same group (J. Waterman unpubl. data). Although it has been postulated that their parasol-like tails are used to decrease body temperature whilst foraging during the day, new data suggest that the tail simply provides comfort during the heat of the day and that they retreat into burrows to dissipate a heat load and remain active diurnally (Fick et al. 2009). Unlike the Damara Ground Squirrel (*Xerus princeps*), this species has no arboreal tendencies and is purely ground-living (Skinner & Chimimba 2005). They are predominantly herbivorous (leaves, grass stems, seeds, bulbs, roots and plant stems), being able to digest cellulose, but do eat insects (Skinner & Chimimba 2005).

The 'landscape of fear' for this species has been quantified in Augrabies Falls National Park, Northern Cape Province (van der Merwe & Brown 2008): among three colonies, only 3–22% of the space resulted in low foraging costs while 31–92% of the sampled areas represented very high foraging costs. Overall, they are a resilient and dynamic species, being able to adapt their home range size and reproductive output in response to drought conditions (Waterman & Fenton 2000), and thus will likely be able to adapt to climate change in the future.

Ecosystem and cultural services: Many other species (for example, Suricates *Suricata suricata* and Yellow Mongooses *Cynictis penicillata*) use the burrows of Cape Ground Squirrels for refuge, suggesting they are ecological engineers (Waterman & Roth 2007). Furthermore, in central South Africa and the Namib desert grasslands, controlled, replicated studies revealed increased diversity and abundance of small mammals and invertebrates in burrow areas and a higher abundance of plants (Ewacha et al. 2016). Thus, the burrowing and foraging behaviour of this species creates habitat for plant and animal communities. However, Power (2014) found no evidence of enhanced small mammal diversity in relation to Ground Squirrel burrow clusters in three landscapes.

Use and Trade

There is no evidence for significant utilisation of this species.

Threats

There are no major identified threats that could cause population declines. It is considered to be an agricultural pest in some parts of its range (Griffin & Coetzee 2008), but has not been reported as such within the assessment region (Power 2014). There are localised complaints about damage to gravel and farm roads as a result of burrow formations (B. Wilson unpubl. data). They tend to prefer *Schmidtia kalaharensis* (J. Waterman unpubl. data), a grass that is characteristic of degraded lands, such as where there is overgrazing. Thus, livestock and wildlife ranching, contrary to what was reported in the previous assessment (Friedmann & Daly 2004), are not threats but are probably beneficial to this species.

Current habitat trend: Stable. Occurs on modified and agricultural lands (including road verges) and is commensal with humans. It does not occur in long grass so overgrazed areas are suitable. It can thus occur on overstocked ranchlands, and will possibly benefit with the expansion of wildlife ranching across South Africa. Furthermore, as this species is adapted to arid conditions, drier conditions are not expected to constrain its distribution (Herron et al. 2005).

Conservation

The species is common in many protected areas across the assessment region, including Kgalagadi Transfrontier Park. Additionally, the expansion of wildlife ranches across the arid parts of its range may be expanding habitat for this species as it occurs in areas that have been overgrazed or where there are high densities of grazers (J. Waterman unpubl. data). No specific conservation interventions are necessary at present.

Recommendations for land managers and practitioners: None

Research priorities: An ongoing research project (since 2002) is being conducted in S. A. Lombard Nature Reserve, North West Province, by Prof. Jane Waterman. Research areas include parasitology (Hillegass et al. 2008, 2010), and its energetic costs (Scantlebury et al. 2007); physiology (Scantlebury et al. 2012), including the effects of hormone physiology and resource availability on reproduction (Jackson et al. 2007; Pettitt et al. 2008; Pettitt & Waterman 2011); gender-bias in immunology (Manjerovic & Waterman 2012); effectiveness of chemical immobilization and anaesthesia (Joubert et al. 2011); and behavioural ecology, including interactions with predators and group dynamics (Belton et al. 2007; Unck et al. 2009).

Research priorities regarding the conservation assessment are as follows:

- The abundance and distribution of the species given various grazing intensities of both livestock and wildlife ranching.
- The efficacy of this species as an ecological engineer in enhancing small mammal abundance, invertebrate abundance and plant diversity.

Encouraged citizen actions:

- Report sightings of this species, especially outside protected areas, on virtual museum platforms (for example, iSpot and MammalMAP).

Data Sources and Quality

Table 2. Information and interpretation qualifiers for the Cape Ground Squirrel (*Xerus inauris*) assessment

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