Crocidura flavescens – Greater Red Musk Shrew


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Regional Red List status (2016)	**Least Concern**
National Red List status (2004)	Data Deficient
Reasons for change	Non-genuine change: New information
Global Red List status (2016)	Least Concern
TOPS listing (NEMBA)	None
CITES listing	None
Endemic	Near

Greater Red Musk Shrews tend to be rather aggressive (unlike *Myosorex* spp.) and may inflict a painful bite (Monadjem 1998).

Taxonomy

Crocidura flavescens (Geoffroy 1827)

ANIMALIA - CHORDATA - MAMMALIA - EULIPOTYPHLA - SORICIDAE - *Crocidura* - *flavescens*

Common names: Greater Red Musk Shrew, Greater Musk Shrew (English), Groter Skeerbek (Afrikaans)

Taxonomic status: Species

Taxonomic notes: None

Assessment Rationale

This species is near endemic with a wide distribution within the assessment region and occurs in multiple biomes and habitat types, including transformed landscapes. Although it is suspected that moist grasslands will contract due to ongoing climate change, compounded by settlement expansion and overgrazing, this species is commensal with humans and is adaptable, being able to live in disturbed areas and gardens. There are thus no major threats that are predicted to cause rapid decline and this species is evaluated as Least Concern. Key interventions include protected area expansion of moist grassland habitats, as well as incentivising landowners to sustain natural vegetation around wetlands and keep livestock or wildlife at ecological carrying capacity.

Regional population effects: No rescue effects are possible as the majority of the population occurs within the assessment region

Distribution

This species occurs mainly in the higher rainfall regions of the assessment region in South Africa, Swaziland and Lesotho (Figure 1). They exist on the coast as well as at altitudes of 2,300 m asl in the Drakensberg Mountains, KwaZulu-Natal Province (Rowe-Rowe & Meester 1982) and at 1,800 m asl in the Amathole Mountains, Eastern Cape Province (R. Baxter unpubl. data). It is reported to occur in the southern parts of Inhambane Province in Mozambique and from Port Nolloth, in the Northern Cape Province south along the West Coast (Skinner & Chimimba 2005). However, there are no records available to us to corroborate this. For example, only *Crocidura cyanea* was found in the Springbok area in the 1990s and records from this region need further vetting (Avery & Avery 2011). The most northerly record in the Western Cape Province is from the Eland's Bay area (Figure 1). While there are no records for Mozambique, it is possible that the species occurs in southern Mozambique but further field surveys are needed to confirm this. Its confirmed absence in Mozambique would make this species endemic to the assessment region. Based on museum records, it occurs predominantly along the coast and interior of Western Cape, Eastern Cape, and KwaZulu-Natal provinces and inland in Lesotho, Swaziland and Mpumalanga. In Swaziland, it occurs in the highveld region and marginally in the middleveld region (Monadjem 1998). Although there is single record from North West Province, based on a putative specimen collected by Newbery (1996), it is presumably a misidentification (Power 2014).

Population

This species is relatively common in the coastal part of its range, although it was relatively infrequently caught in Dukuduku Forest, northern KwaZulu-Natal Province (Perrin & Bodbijl 2001), with lower numbers being found at high altitudes. It can be very common in gardens and houses. The population may be declining overall due to the loss of moist grasslands.

Current population trend: Declining. Inferred from wetland habitat loss and degradation across its range.

Continuing decline in mature individuals: Unknown

Number of mature individuals in population: Unknown

Number of mature individuals in largest subpopulation: Unknown

Number of subpopulations: Unknown

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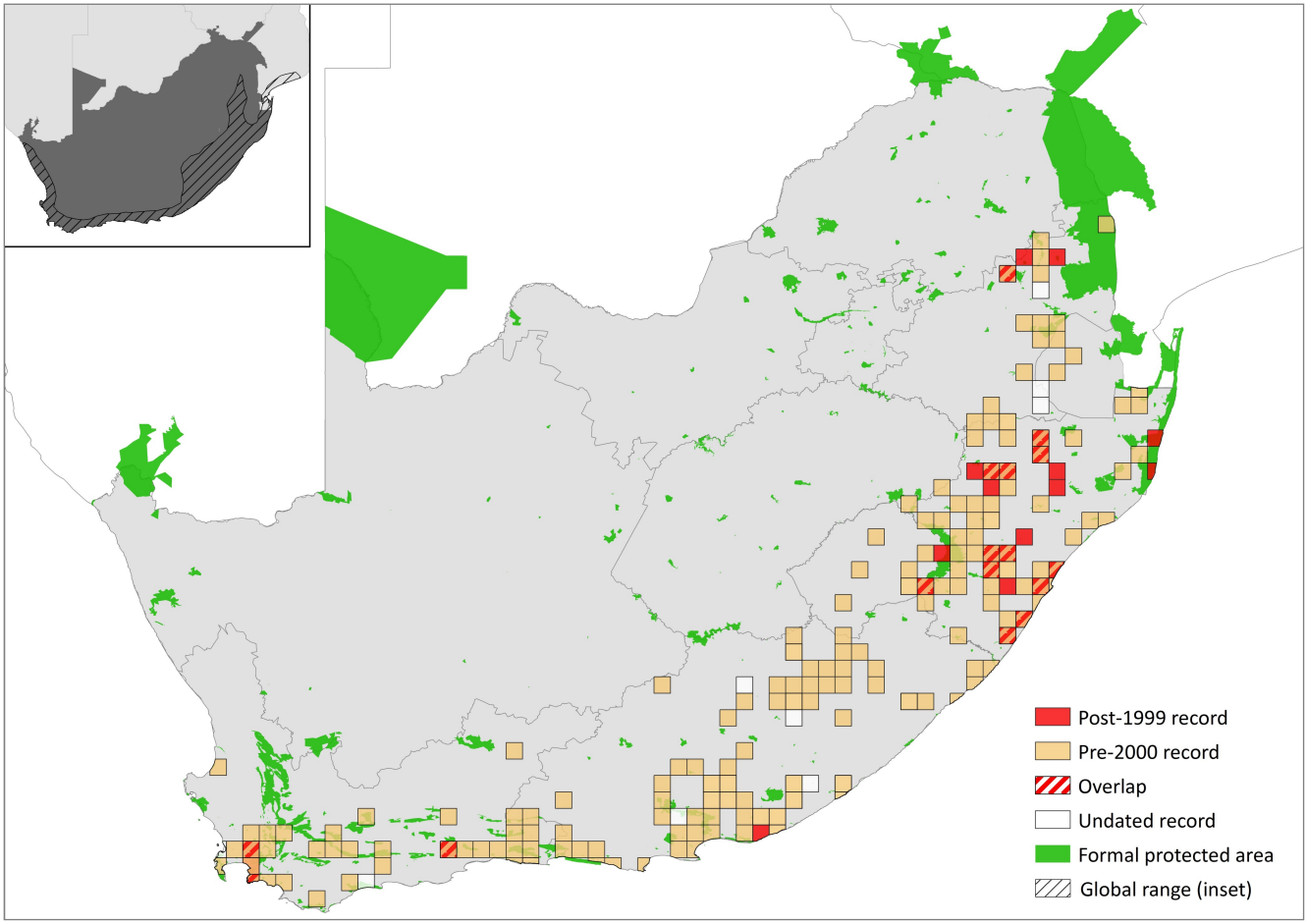

Figure 1. Distribution records for Greater Red Musk Shrew (*Crocidura flavescens*) within the assessment region

Table 1. Countries of occurrence within southern Africa

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

Severely fragmented: No. Can occur in multiple habitats, including gardens and transformed landscapes.

Habitats and Ecology

This species occurs mainly in moist grassland (montane, temperate and subtropical) but has a wide habitat tolerance and is found in fynbos, Afromontane and coastal forest, woodland and savannah, disturbed areas, gardens, and built-up areas (Meester 1963; Taylor 1998). It is commensal with humans and adapted to living in transformed habitats, such as gardens. At Dukuduku Forest, KwaZulu-Natal Province, they were found in grassland and shrubland but absent from woody areas (Perrin & Bodbijl 2001). In Swaziland, it predominantly inhabits moist, rank grasslands but may also occur in riverine thickets (Monadjem 1997). While they prefer moist habitats, they have also been collected from sparse, recently burnt grasslands (Taylor 1998). The major determinants of its habitat appear to be proximity to water and adequate ground cover.

This is the largest shrew species in the assessment region, measuring 160 mm from tip to tail and weighing 30 g (Skinner & Chimimba 2005). It is solitary and tends to be aggressive (unlike *Myosorex* spp.) and has been observed to kill and eat a House Mouse *Mus musculus* (Goulden & Meester 1978; Baxter & Meester 1982). Thus, while mainly insectivorous, it sometimes predates on vertebrates. It is predominantly nocturnal and crepuscular (Baxter et al. 1979), and undergoes spontaneous torpor to avoid expending energy on maintaining a constant body temperature through the coldest period of the night (Baxter 1996).

Ecosystem and cultural services: An important prey species for owls (for example, Avery et al. 2005).

Use and Trade

There is no known subsistence or commercial use of this species.

Threats

There are no severe threats currently known to affect this species. However, the main threat to shrews in general is the loss or degradation of moist, productive areas such as wetlands and rank grasslands within suitable habitat. The two main drivers behind this are abstraction of surface water and draining of wetlands through industrial and

Table 2. Threats to the Greater Red Musk Shrew (*Crocidura flavescens*) 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	*2.3.2 Small-holder Grazing, Ranching or Farming*: wetland and grassland degradation through overgrazing (removal of ground cover).	Bowland & Perrin 1989	Empirical	Local	Possibly increasing with human settlement expansion and intensification of wildlife farming.
		Driver et al. 2012	Indirect	National	45% of remaining wetland area exists in a heavily modified condition.
2	*7.2 Dams & Water Management/Use*: wetland loss through drainage/water abstraction during agricultural, industrial and urban expansion.	Driver et al. 2012	Indirect (land cover change from remote sensing)	National	Increasing with settlement expansion and 65% of wetland ecosystem types threatened already.
3	*7.1.2 Suppression in Fire Frequency/Intensity*: human expansion around forests has decreased natural fire frequency. Current stress *1.2 Ecosystem Degradation*: altered fire regime leading to bush encroachment (including alien vegetation invasion) and thus loss of moist grasslands.	-	Anecdotal	-	-
4	*11.1 Habitat Shifting & Alteration*: loss of moist grasslands.	Taylor et al. 2016	Projected	National	Contraction of grassland and fynbos habitats by 2050.

residential expansion, and overgrazing of moist grasslands, which leads to the loss of ground cover (de-structures habitat) and decreases small mammal diversity and abundance (Bowland & Perrin 1989, 1993). Overgrazing is particularly threatening for this species, as it relies on medium to tall vegetation cover. Suppression of natural ecosystem processes, such as fire, can also lead to habitat degradation through bush encroachment or loss of plant diversity through infestation of vegetation by alien invasives, and is suspected to be increasing with human settlement expansion. There are also clear overlaps and synergistic effects between these threats.

We infer a continuing population decline based on loss of natural habitat.

Current habitat trend: Widely distributed and common in gardens. However, it may be part of a suite of species that will display a general decline with grassland and fynbos contraction due to climate change (Taylor et al. 2016).

Conservation

This species occurs in a number of protected areas. The main intervention for this species is the protection and

Table 3. Conservation interventions for the Greater Red Musk Shrew (*Crocidura flavescens*) 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	*1.2 Resource & Habitat Protection*: stewardship agreements with private landowners to conserve wetlands and grasslands.	-	Anecdotal	-	-	Multiple organisations
2	*2.2 Invasive/Problematic Species Control*: maintain stocking rates of livestock and wildlife at ecological carrying capacity.	Bowland & Perrin 1989	Empirical	Local	Small mammal diversity and abundance significantly higher after decrease in grazing pressure.	-
3	*2.1 Site/Area Management*: maintain/ restore natural vegetation around wetlands.	-	Anecdotal	-	-	-
4	*2.2 Invasive/Problematic Species Control*: clear alien vegetation from watersheds and wetlands to restore habitat quality.	-	Anecdotal	-	-	Working for Water, Department of Environmental Affairs
5	*4.3 Awareness & Communications*: educating landowners in the importance of wetlands and grasslands.	-	Anecdotal	-	-	-

restoration of suitable habitat, such as moist grassland and fynbos patches. Biodiversity stewardship schemes should be promoted to conserve such patches. Protecting these habitats may create dispersal corridors between patches that will enable adaptation to climate change. At the local scale, landowners and managers should be educated, encouraged and incentivised to conserve the habitats on which shrews and small mammals depend. Retaining ground cover is the most important management tool to increase small mammal diversity and abundance. This can be achieved through lowering grazing pressure (Bowland & Perrin 1989), or by maintaining buffer strips of natural vegetation around wetlands (Driver et al. 2012). Small mammal diversity and abundance is also higher in more complex or heterogeneous landscapes, where periodic burning is an important tool to achieve this (Bowland & Perrin 1993). Removing alien vegetation from watersheds, watercourses and wetlands is also an important intervention to improve flow and water quality, and thus habitat quality, for shrews. Education and awareness campaigns should be employed to teach landowners and local communities about the importance of conserving wetlands and moist grasslands.

Recommendations for land managers and practitioners:

- Landowners and communities should be incentivised to stock livestock or wildlife at ecological carrying capacity and to maintain a buffer of natural vegetation around wetlands.
- Enforce regulations on developments that potentially impact on the habitat integrity of grasslands and wetlands.

Research priorities:

- Additional field surveys are needed to clarify and confirm the habitat selection and distribution of this species.
- The effects of climate change on its distribution and abundance should be specifically modelled.

Encouraged citizen actions:

- Citizens are requested to submit any shrews killed by cats or drowned in pools to a museum or a provincial conservation authority for identification, thereby enhancing our knowledge of shrew distribution (carcasses can be placed in a ziplock bag and frozen with the locality recorded).
- Practice indigenous gardening to sustain small mammals.

Data Sources and Quality

Table 4. Information and interpretation qualifiers for the Greater Red Musk Shrew (*Crocidura flavescens*) assessment

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

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