# *Crocidura fuscomurina* – Tiny Musk Shrew

Photograph wanted

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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 | Edge of range |

This is the smallest *Crocidura* species occurring within southern Africa, adults measuring a paltry 100 mm, of which 40% is tail (Skinner & Chimimba 2005).

## Taxonomy

*Crocidura fuscomurina* (Heuglin 1865)

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

**Common names:** Tiny Musk Shrew, Bicolored Musk Shrew (English), Dwergskeerbek, Dwergskeerbekmuis (Afrikaans)

**Taxonomic status:** Species complex

**Taxonomic notes:** Meester et al. (1986) listed two subspecies: *C. f. bicolor* (Bocage 1889), occurring in the northern Free State, KwaZulu-Natal, North West, Limpopo, Mpumalanga, and Gauteng provinces, as well as Zimbabwe, Mozambique and north-eastern Botswana; and *C. f. woosnami* (Dollman 1915) from the southern Free State, northern and central Botswana and northern Namibia. The species known as *C. bicolor* was shown to be a synonym of *C. fuscomurina* (Hutterer 1983). The taxonomic status of the lowveld subpopulations in Limpopo and Mpumalanga provinces needs research as they might comprise a different species (R. Hutterer unpubl. data).

## Assessment Rationale

This small species is widely, but patchily distributed, across the assessment region, existing at the edge of its Africa range. It exists in many protected areas, including Kruger National Park, and across multiple habitat types, including agricultural landscapes (as long as not overgrazed), and can be locally abundant in suitable habitats. As with all shrew species, it may suffer local declines from ongoing wetland and grassland loss caused by land-use and climate change. However, it is also a savannah species, and thus, in savannah regions, it is less likely to experience major habitat loss in the future. Thus, we list as Least Concern as there is no reason to suspect a decline at this stage. However, this is a poorly known species and we recommend further research and field studies, including the ongoing vetting of museum records, to more accurately delineate its distribution and habitat requirements. Similarly to other shrew species, the following interventions will benefit this species: 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 significant rescue effects are possible as, although habitats are presumably connected across regions in some areas, this species is too small to disperse over long distances.

## Distribution

The Tiny Musk Shrew is widely distributed in sub-Saharan Africa, ranging from Senegal, through West Africa and Central Africa to southern Sudan and Ethiopia in the east, and into southern Africa, as far south as north-eastern South Africa. Within the assessment region, scattered records indicate they exist patchily in all provinces besides the Western and Eastern Cape (Figure 1). In Swaziland, it is sparsely recorded from the lowveld and middleveld regions (Monadjem 1998). Although they have not been recorded from Lesotho, (Lynch 1994) they may occur in the low-lying areas, considering they have a wider distribution in the Free State Province than once thought (Avery et al. 2003). In North West Province, it has been recently confirmed from Bospoort dam area, and many outstanding specimens are suspected to be this species, thus it may be a more widespread species than currently recorded in the province (Power 2014). A possible range contraction or local extinction may have occurred in the Tussen-die-Riviere Nature Reserve area in Free State Province where Lynch (1983) recorded this species close to the reserve, as it has not been recorded in more recent years (Watson 2006).

## Population

This species is not readily trapped, especially in Sherman traps (pitfall traps are better), because it is so small. They can be one of the dominant sandveld small mammal species. For example, when using pitfall trapping, they

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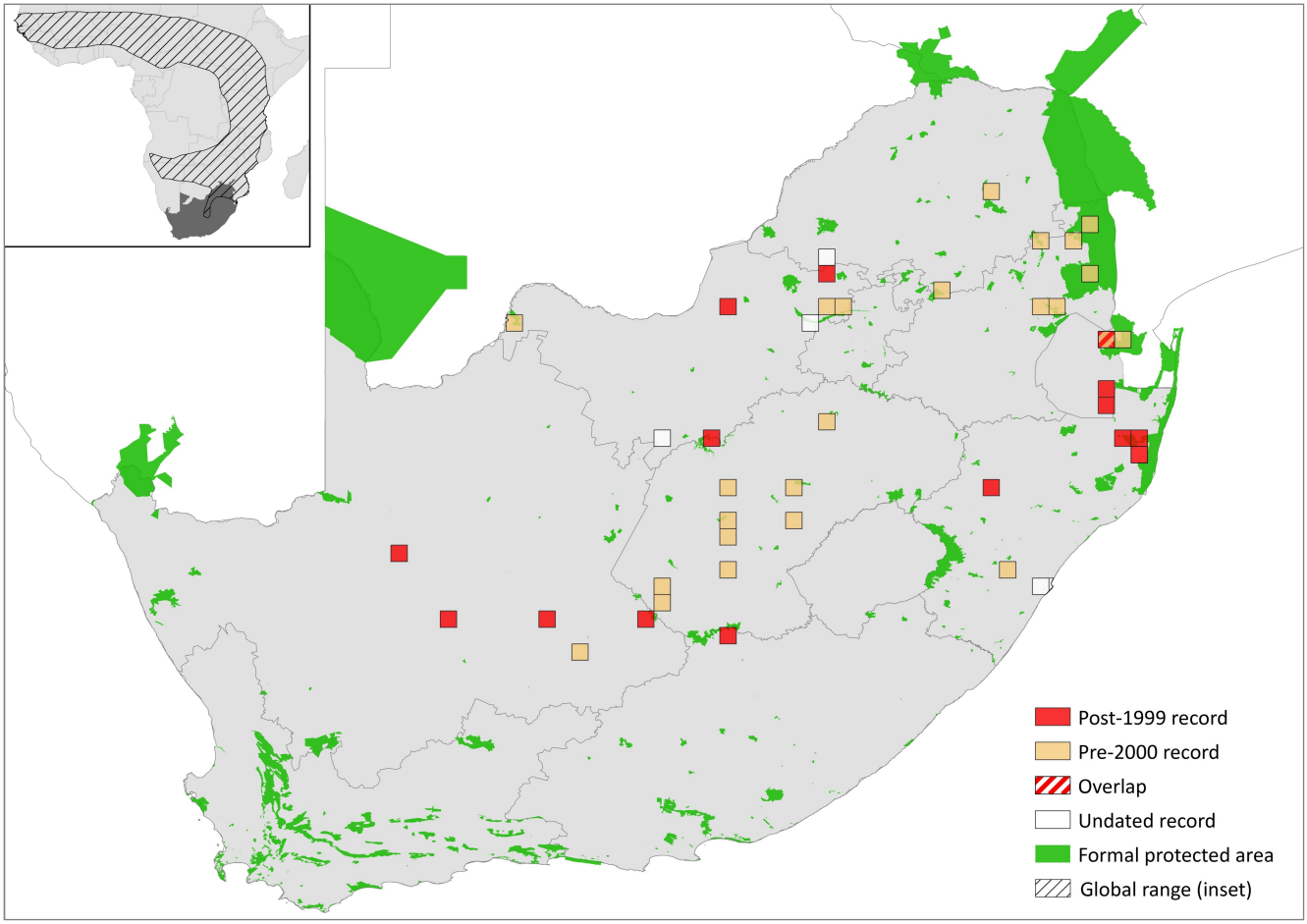


**Figure 1. Distribution records for Tiny Musk Shrew (*Crocidura fuscomurina*) within the assessment region**

**Table 1. Countries of occurrence within southern Africa**

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

have been found to be locally common in Mkhuze Game Reserve, KwaZulu-Natal Province, where *C. hirta* and *C. fuscomurina* accounted for 73% of all shrew captures (Delcros et al. 2015). Similarly, it had the greatest abundance and occurred in the most number of vegetation types of all shrews sampled at Phinda Private Game Reserve, KwaZulu-Natal Province, where abundance was not significantly different amongst seasons or vegetation types (Rautenbach et al. 2014). If we assume this relative abundance occurs in other protected areas across its range, we can extrapolate a high abundance within the assessment region.

**Current population trend:** Stable. Occurs in a wide variety of habitats and in both urban and agricultural habitats, so no reason to suspect population decline based on habitat loss.

**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. Occurs in a wide variety of habitats and in both urban and agricultural habitats.

# Habitats and Ecology

This species is generally associated with savannahs (Skinner & Chimimba 2005), including the dry Kalahari savannah and grasslands of the west and the moist woodlands and bush savannah of the east. They generally occur in thick grass, such as Couch Grass (*Cynodon dactylon*) along the water's edge, but also occur on dry, sandy soil near water and has been recorded from rubbish heaps and wood piles (Skinner & Chimimba 2005). In both Phinda and Mkhuze Game Reserves, it occurred in most sites sampled, including *Acacia* woodland, *Combretum molle* woodland, riverine woodlands, Lebombo thicket, floodplain grassland and Sand forest, indicating a wide habitat tolerance (Rautenbach et al. 2014; Delcros et al. 2015). In Swaziland, specimens have been collected from lowveld *Acacia* woodland and from a home in an industrial area (Monadjem 1998, 1999). They can also survive in agricultural landscapes, as long as they are not overgrazed (P. Taylor pers. comm.).

Like other *Crocidura* species, they appear to be active both nocturnally and diurnally and show preference for dense vegetation – especially during the day to escape

**Table 2. Threats to the Tiny Musk Shrew (*Crocidura fuscomurina*) 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 | - | - |

the heat and predators. They also prefer moist soils (Dickman 1995), presumably because of the higher prey content and because burrow construction is easier. It is insectivorous and takes prey from the soil surface or among leaf litter and other debris.

**Ecosystem and cultural services:** An important prey species, having been found in owl remains (for example, Avery et al. 2003).

# Use and Trade

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

# Threats

The main threat to shrews 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 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; Monadjem 1999). For example, they can exist in agricultural landscapes as long as the areas are not overgrazed. Suppression of natural ecosystem processes, such as fire, can also lead to habitat degradation through bush encroachment or loss of plant diversity through alien invasives, and is suspected to be increasing with human settlement expansion. There are also clear overlaps and synergistic effects between these threats.

**Current habitat trend:** As this is predominantly a savannah species, it does not suffer as much from habitat loss as grassland or forest specialist species, as savannah remains relatively intact within the assessment region (Driver et al. 2012). Furthermore, as it can be commensal with humans, urban and rural expansion has fewer negative effects. Similarly, climate change is not predicted to become a major threat for this species as savannahs are projected to expand (for example, Kgope et al. 2010). Thus, the habitat for this species is stable. However, it may suffer local declines from ongoing wetland and grassland loss caused by land-use changes and degradation through overexploitation.

# Conservation

This species is found in many protected areas across its range, including Kruger National Park. Although no interventions are currently necessary, protecting and restoring suitable habitat, such as moist grassland patches, will benefit this species. Biodiversity stewardship schemes should be promoted to conserve such patches. Importantly, 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 a buffer strip 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.

**Table 3. Conservation interventions for the Tiny Musk Shrew (*Crocidura fuscomurina*) 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 | - | - | - |

**Research priorities:** This is a poorly known species and we recommend further research and field studies.

- Additional field surveys are needed to clarify and confirm the distribution of this species.
- Museum specimens must be vetted to refine the distribution map.
- Molecular research is needed to revise the taxonomic status of putative subspecies.

**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 Tiny Musk Shrew (*Crocidura fuscomurina*) assessment**

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|---|---|
| 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 | Precautionary |

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