Redunca fulvorufula fulvorufula – Southern Mountain Reedbuck


Erika Schulze

Regional Red List status (2016)	Endangered A2b*†
National Red List status (2004)	Least Concern
Reasons for change	Genuine: Population decline
Global Red List status (2008)	Least Concern
TOPS listing (NEMBA)	None
CITES listing	None
Endemic	Near

*Watch-list Data †Watch-list Threat

The reasons for the population decline over the past decade are not understood and research is urgently needed to test varying hypotheses to ensure that a conservation plan can be devised.

Taxonomy

Redunca fulvorufula fulvorufula (Afzelius 1815)

ANIMALIA - CHORDATA - MAMMALIA - CETARTIODACTYLA - BOVIDAE - *Redunca* - *fulvorufula* - *fulvorufula*

Common names: Mountain Reedbuck (English), Rooiribbok (Afrikaans), Letlabo (Sepedi), Letlabo, Lebele (Sesotho), Phele, Mohele, Mhele (Setswana), Incala (Swati), Nhlangu, Nhlangu ya Ntshava (Tsonga), Davhu (Venda), Inxala (Xhosa), Inxala, Ingxala, Inhlangu (Zulu)

Taxonomic status: Subspecies

Taxonomic notes: There are three recognised subspecies (Ansell 1972; IUCN SSC Antelope Specialist Group 2008; Avenant 2013): Western Mountain Reedbuck (*R. f. adamauae*), Chanler's Mountain Reedbuck (*R. f. chanleri*), and Southern Mountain Reedbuck (*R. f. fulvorufula*), which is the only subspecies to occur in the assessment region (Skinner & Chimimba 2005).

Assessment Rationale

The near–endemic Southern Mountain Reedbuck is widely but patchily distributed within the assessment region, restricted to rocky and grassy hillsides. Over three generations (1998–2013), there has been an estimated decline of 61% in 32 formally protected areas across its entire range (and thus broadly representative of trends for all subpopulations), where only 10 protected areas are stable or increasing. This equates to an estimated decline in abundance from 6,393 to 2,504 individuals in the sampled protected areas (representing *c*. 17% of the counted population on both formally protected and private lands). Analysing only the 19 protected areas with count data available for the full time period (thus omitting extrapolation of subpopulation size), the estimated population reduction is 73% (4,396 to 1,184 individuals). Of particular concern is the decline in the two Northern Cape protected areas where the estimated population size of 1,862 in 1998 declined to 179 in 2013. Thus, based on available data from formally protected areas, we list this subspecies as Endangered A2b due to an estimated population decline of 61–73% on all protected areas for which there are long-term count data available. While Mountain Reedbuck are difficult to survey accurately, we assume systemic error is constant in the counts and thus this represents a genuine decline. Although there are many subpopulations existing on private land, and long-term monitoring is needed to quantify subpopulation trends outside of protected areas, anecdotal reports suggest similar declines and we suspect threats are similar or more intense outside protected areas and thus privately protected subpopulations are probably not mitigating the losses on formally protected areas. Once such data are available, this subspecies should be reassessed as the trends may corroborate the current existing decline or conversely be mitigating losses in formally protected areas (and thus justify downlisting). From available data, the current (2013) minimum mature population size is estimated to be 10,214–13,669 individuals on both formally protected and private land. Thus, Mountain Reedbuck does not qualify for the C criterion.

It is uncertain why the population has declined so dramatically and research quantifying potential threats is desperately needed. Current hypotheses include increased predation rates, possibly from higher abundances of Black-backed Jackal (*Canis mesomelas*) and Caracal (*Caracal caracal*) possibly associated with lack of holistic land management, increased frequency of drought spells, break-outs from protected areas, and illegal hunting, directly or indirectly, for bushmeat or sport. It is crucial that conservationists gather enough information to develop a Biodiversity Management Plan and engage with private landowners to implement identified interventions.

Regional population effects: This subspecies has a disjunct distribution between the assessment region and the rest of its African range. It occurs marginally in

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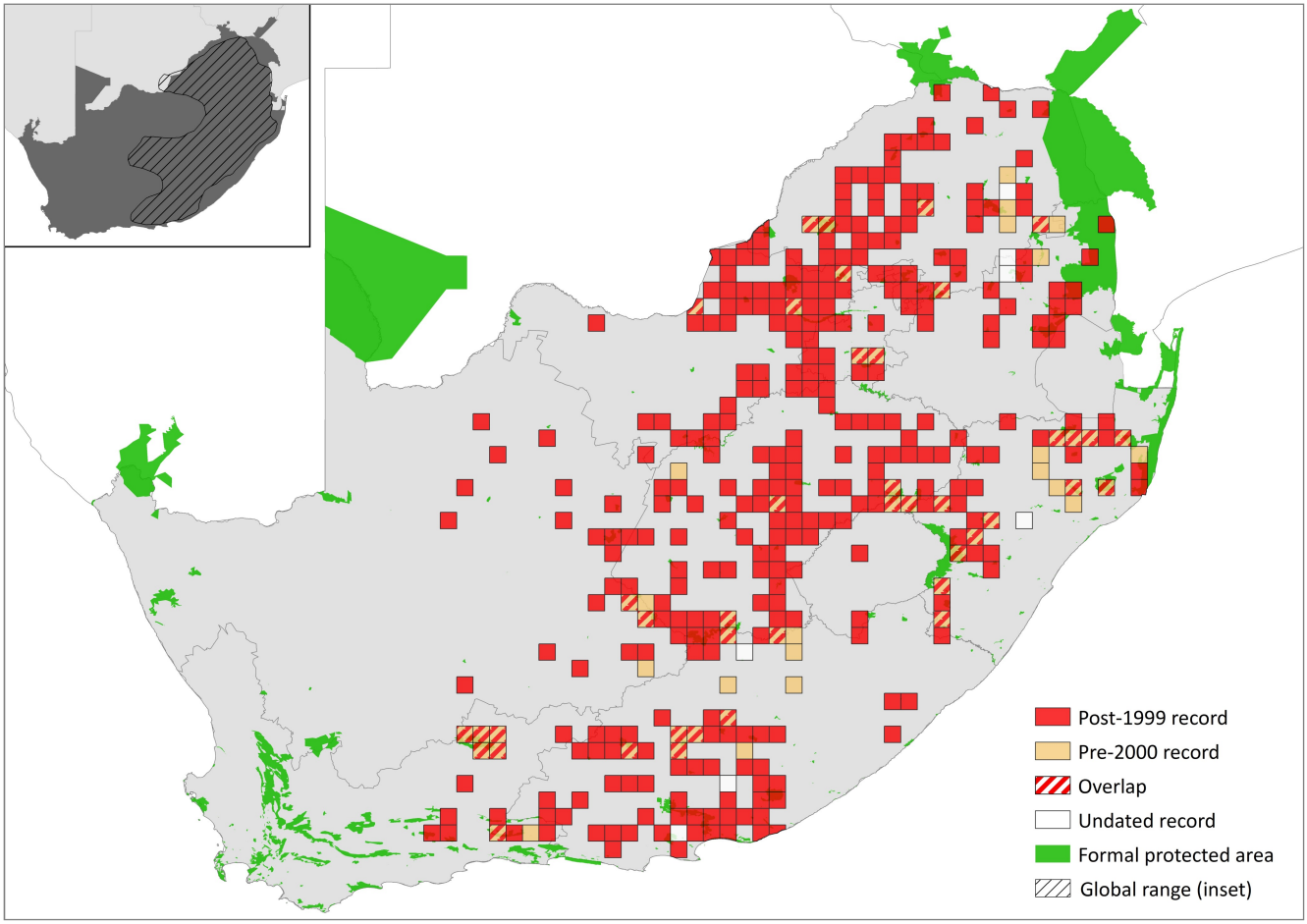

Figure 1. Distribution records for Southern Mountain Reedbuck (*Redunca fulvorufula fulvorufula*) within the assessment region

Table 1. Countries of occurrence within southern Africa

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

Botswana and Mozambique but no other neighbouring countries and thus no rescue effect is possible. The Botswana subpopulation may be isolated from South Africa, but separation between subpopulations has not been measured, and would likely be a function of the connectedness of rugged terrain and watersheds.

Distribution

The Mountain Reedbuck species occurs in three separate populations in East and southern Africa, and in a restricted area of eastern Nigeria and north-central Cameroon (East 1999; Avenant 2013). The Southern Mountain Reedbuck (*R. f. fulvorufula*) occurs extensively in South Africa, being present in all provinces, although only marginally in the Western Cape and the eastern Northern Cape provinces. They still occur throughout much of their former range, largely on private land but also in many formally protected areas throughout their range (Skinner & Chimimba 2005). They have also been extensively reintroduced in parts of its former range. They are rare in Lesotho, having been observed by Lynch (1994), Avenant (2004) and Avenant et al. (2014) only in a few scattered localities, but occur in the Drakensberg in KwaZulu-Natal Province up to 2,200 m asl (Rowe-Rowe 1994). They also occur in the hills of Swaziland (Monadjem 1998) and only narrowly in southeastern Botswana and the Lebombo Mountains of southwestern Mozambique (Skinner & Chimimba 2005), and thus the subspecies is near endemic to the assessment region. They have also been introduced into Namibia, as evidenced by their advertisement in Namibian hunting operations and permits having been issued to export the subspecies from South Africa to Namibia (E. Schulze pers. comm. 2016). Due to their specialised habitat requirements, they have a patchy and discontinuous distribution (Skinner & Chimimba 2005).

Population

Densities of Mountain Reedbuck within protected areas vary greatly according to factors such as the extent of suitable habitat and predator density. Estimated densities of the Southern Mountain Reedbuck in protected areas in South Africa vary from 10 individuals / 100 km² or less in areas such as Karoo, Addo Elephant (the Zuurberg section) and Marakele National Parks; 300–350 individuals / 100 km² in Golden Gate Highlands and Royal Natal National Parks; 750 individuals / 100 km² in Mountain Zebra National Park, to as high as 1,150 individuals / 100 km² in Sterkfontein Dam Nature Reserve (Taylor et al. 2007; IUCN SSC Antelope Specialist Group

Table 2. Summary of population size estimates for Southern Mountain Reedbuck (*Redunca fulvorufula fulvorufula*). "Private" refers to both private protected areas and wildlife ranches.

Province	Number of sites			Historical count (protected areas only)		Current count (2013)		
	Protected areas	Private properties	Total	N	Year of count	Protected areas	Private properties	Total
Northern Cape	2	18	20	1,862	1998	179	974	1,153
Eastern Cape	10	33	43	984	2003	776	3,224	4,000
Free State	10	165	175	1,169	2004	601	4,804	5,405
KwaZulu-Natal	4	7	11	240	1998	78	147	225
Limpopo	1	11	12	33	2000	70	269	339
Mpumalanga	8	3	11	826	2003	457	45	502
North West	4	117	121	328	2001	153	3,177	3,330
Western Cape	1	1	2	46	2002	21	46	67
Total	40	355	395	5,488		2,335	12,686	15,021

2008). Based on these densities, the total population was estimated to be 33,000 (East 1999; IUCN SSC Antelope Specialist Group 2008). However, the species is patchily distributed and can be uncommon in certain areas. For example, there only were a suspected 150 individuals in Kruger National Park in 2009 (Ferreira et al. 2013), but no long-term data are available to show a trend. Based on all available current data, we estimate the total population size to be at least 15,000 (Table 2), of which 10,214–13,669 individuals are mature, where the proportion of mature individuals is inferred to range from 68–91%. While Bothma (2010) describes herd structure as 32% adult rams, 36% adult ewes, 23% juvenile rams and 9% juvenile ewes, field experience suggests a much lower proportion of immature individuals, as juveniles are rarely seen. For example, herd composition data from Goedemoed, Free State Province, in 2004 and 2009 using both ground and aerial surveys indicate a mature population structure of 90.7–91.6%, consisting of 19.3–23.1% adult rams and 68.5–71.4% adult females (E. Schulze unpubl. data). The mature population size is an underestimate since we do not have comprehensive census data from private lands or formally protected areas. Similarly, it does not include the subpopulation on Maloti-Drakensberg Transfrontier Park for which there is no overall estimate but is suspected to be large (I. Rushworth unpubl. data).

What is certain is that the formally protected population is declining across many areas of the country and possibly declining outside protected areas too, such as in the Magaliesberg, North West Province (Power 2014). Generation length for this species is estimated at 4–8 years because most females breed for the first time in their second year and will reproduce every year as long as grazing conditions remain suitable. Although the average longevity is unknown in the wild, it can be assumed to be 8–10 years. Corroborating this, Pacifici et al. (2013) estimate generation length as 5.2 years, which equates to a 15.7 year three-generation period. Based on long-term subpopulation estimates from 32 protected areas across the breadth of its range (all provinces), the population is estimated to have declined by 61% (6,393 to 2,504 individuals) between 1998 and 2013 (three generations). This estimate is based on current (2013) data from all sampled protected areas and historical data between 1998 and 2003. A more conservative estimate (based only on 19 protected areas for which the data span the three-generation window) yields an estimated reduction of 73% (4,396 to 1,184 individuals), of which the declines in the Northern Cape (Doornkloof and Rolfontein Nature Reserves) are particularly worrying, having declined from 1,862 individuals to 179 individuals (Table 2). Similarly, although the decline over three generations in Pilanesberg National Park is 42% (145 to 84 individuals between 1998 and 2013), the decline since 1979 is estimated to be 91%, having declined from 1,150 individuals in 1979.

The Endangered threshold is robust to using a shorter generation length of 4 years (2001 to 2013), where the estimated population reduction for the same 32 protected areas is 52%. The listing is also robust when excluding the most severely declining subpopulation, Doornkloof Nature Reserve, which yields a 51% decline in 31 formally protected areas over three generations. Conversely, including only protected areas (14) where count methods have not changed over the three-generation window, or are more comprehensive counts, yields a more severe estimated decline of 75%. Overall, ten subpopulations are estimated to be stable or increasing, the largest of these being in Tsolwana and Commando Drift Nature Reserves, Eastern Cape Province. As the subpopulation estimates are restricted to protected areas with long-term and accurate count data, we believe this represents a genuine decline as the errors are likely to be systemic rather than random and thus the long-term trends are reliable while the absolute counts are questionable. However, further research and analysis is needed to more accurately determine the rate of decline on a national scale. For example, controlling for observer effort from field ranger patrols in Maloti-Drakensberg Transfrontier Park suggests a decline of 1.2% per annum between 1995 and 2014, which yields an estimated 18% subpopulation reduction in the area over three generations (I. Rushworth unpubl. data).

The losses on formally protected areas may be mitigated through potential subpopulation growth of this subspecies on private lands and game farms. However, no subpopulation trends are available for private lands and monitoring should be established in key areas to assess corroborating or contradicting trends. For example, anecdotal reports from the Northern Cape Province, suggest that the private lands surrounding Doornkloof Nature Reserve are experiencing similar significant declines where one property recorded a decline of 216 to

124 individuals from 2011 to 2016 using aerial surveys (C. Kraft unpubl. data).

Current population trend: Declining

Continuing decline in mature individuals: Possibly, due to illegal hunting and predation.

Number of mature individuals in population: At least 10,214–13,669

Number of mature individuals in largest subpopulation: 275–368 in Tsolwana Nature Reserve, Eastern Cape Province.

Number of subpopulations: Unknown

Severely fragmented: The level of fragmentation is unknown, but it is unlikely to be significant because Mountain Reedbuck occur extensively outside of protected areas and are therefore suspected to move fairly freely.

Habitats and Ecology

Mountain Reedbuck live on grass-covered ridges and hillsides in broken rocky country and high-altitude grasslands often with some tree or bush cover (Avenant 2013). This distinguishes their habitat use from the more lowland grassland species, the Southern Reedbuck (*R. arundinum*) (Skinner & Chimimba 2005). They also occur in drier hilly areas (such as the Nama Karoo), utilising steep slopes and the bases of hills for grazing. They are predominantly grazers and eat the greenest, softest parts of grasses such as Red Grass (*Themeda triandra*) and Thatch Grass (*Hyparrhenia* spp.) (Irby 1977). They tend to avoid very open areas with no cover. The availability of drinking water is crucial. As such, they are often associated with the lower slopes, making use of moister, cooler more southerly aspects than other antelopes (Rowe -Rowe 1983). They spend more time resting than Grey Rhebok (*Pelea capreolus*) and both species are active at night (Taylor et al. 2006). They live in small groups of 3–8 individuals and, in the Loskop Dam Nature Reserve, the mean area of a male territory was 0.28 km^2 and that of female herds was 0.57 km^2 (Irby 1977). At Sterkfontein Dam Nature Reserve, male territories averaged 0.15 km^2, while females often ranged over areas > 2 km^2 (Taylor et al. 2007). Within Northern Cape protected areas, group size is usually 1–5, but anecdotal reports from Doornkloof Nature Reserve suggest groups were often larger than eight individuals a decade ago (C. Kraft pers. comm. 2016).

Ecosystem and cultural services: As a medium-sized ungulate, they serve as important prey in hilly areas for Leopards (*Panthera pardus*) (Skinner & Chimimba 2005), Caracal (*Caracal caracal*) (Grobler 1981; Stuart & Hickman 1991; Pohl 2015) and Black-backed Jackal (*Canis mesomelas*) (Pohl 2015), such that well-managed subpopulations may buffer livestock that utilise hilly pastures.

Use and Trade

The Mountain Reedbuck is hunted for sport and food (IUCN SSC Antelope Specialist Group 2008). Trophy hunting is managed by provincial permit systems, with annual numbers hunted varying from ~ 400 to 1,000 animals across South Africa. Live animal translocations occur between provincial reserves and private game farms, but unpublished observations have found that many animals disappear from their new areas, suggesting that translocations may not be very successful. Subpopulations may recover slowly from disturbances such as translocation and hunting (E. Schulze pers. obs.), and should be investigated as a cause for decline.

Threats

While Friedmann and Daly (2004) listed no threats in the previous assessment, Avenant (2013) listed the main threats as the expansion of human settlements, which is likely to increase the rates of poaching, disturbance by cattle herders and their livestock, and hunting by dogs (see also Lynch 1994; Avenant et al. 2014). This certainly may be affecting the Southern Mountain Reedbuck, especially as human density increases along protected area edges (Wittemyer et al. 2008). For example, human settlement expansion along the Maloti-Drakensberg Transfrontier Park may be increasing poaching rates (I. Rushworth pers. comm. 2016), possibly leading to the observed declines.

Additionally, anecdotal reports from the Free State and Northern Cape provinces suggest that an emerging threat is increased predation levels from higher abundances of mesopredators, especially Black-backed Jackal (*Canis mesomelas*) (Pohl 2015; C. Kraft and N. Avenant pers. obs. 2015). For example, camera trap evidence has been obtained of Black-backed Jackals pursuing Mountain Reedbuck in the Botsalano Game Reserve, North West Province (J. Power pers. comm. 2016). However, on ranchlands where mesopredators are controlled, numbers are still declining (C. Kraft unpubl. data). Similarly, increasing Chacma Baboon (*Papio ursinus*) abundance

Table 3. Use and trade summary for the Southern Mountain Reedbuck (*Redunca fulvorufula fulvorufula*)

Category	Applicable?	Rationale	Proportion of total harvest	Trend
Subsistence use	Yes	Suspected bushmeat poaching.	Unknown	Unknown
Commercial use	Yes	Trophy hunting and live sales.	Unknown	Unknown
Harvest from wild population	Yes	Herds outside and on edge of protected areas vulnerable to poaching.	Unknown	Unknown
Harvest from ranched population	Yes	Many ranchlands stock Mountain Reedbuck for trophy hunting.	Unknown	Unknown
Harvest from captive population	No	No known captive breeding of the subspecies.	-	-

Table 4. Threats to the Southern Mountain Reedbuck (*Redunca fulvorufula fulvorufula*) 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	*8.2.2 Problematic Native Species/Diseases*: increased predator density. Current stress *2.1 Species Mortality*: increased predation rates.	-	Anecdotal	-	Possibly increasing with suspected increase in mesopredators density.
2	*1.1 Housing & Urban Areas*: loss of habitat from rural settlement expansion. Current stress *2.1 Species Mortality*: increased poaching rates.	GeoTerraImage 2015	Indirect (remote sensing)	National	Increasing: rural settlements expanded by 0.8–39% between 2000 and 2013.
3	*5.1.1 Hunting & Collecting Terrestrial Animals*: bushmeat and sport hunting (including snaring and hunting with dogs).	-	Anecdotal	-	Possibly increasing with rural settlement expansion.
4	*2.3.2 Small-holder Grazing, Ranching or Farming*: disturbance caused by cattle and/or livestock ranching.	-	Anecdotal	-	Possibly increasing with rural settlement expansion.
5	*11.2 Droughts*: increased frequency of droughts caused by climate change. Current stress *1.3 Indirect Ecosystem Effects*: habitat selection altered leading to increased predation levels.	Erasmus et al. 2002	Anecdotal	National	Aridity increasing along a west to east gradient.

may damage suitable habitat and lead to increased lamb predation, but this needs to be investigated. Reintroduction of larger predators into national parks may also be affecting numbers, as the reintroduction of Cheetah (*Acinonyx jubatus*) in Mountain Zebra National Park correlated with the decline in Mountain Reedbuck numbers (A. Gaylard pers. comm. 2016). Break-outs from protected areas have also been suggested as a reason for declining numbers. However, more research is required to understand the cause of the declines.

Droughts may also affect Southern Mountain Reedbuck as they move down from suitable habitat areas due to a lack of sufficient food resources and to obtain water resources, which makes them more vulnerable to predation as they are forced into the open habitat areas. In the Northern Cape, kills have been noted in areas where you would not expect the animals to be found (C. Kraft unpubl. data).

Current habitat trend: Suspected to be stable overall but declining in certain areas. For example, there have been some decreases in habitat quality to the escarpment in Mpumalanga Province and Lesotho. Nationally, rural settlements expanded by 0.8–39% between 2000 and 2013 (GeoTerraImage 2015), which is suspected to be increasing subsidiary threats. However, the private sector may be generally increasing habitat availability for this species or conserving land that would otherwise be overgrazed by livestock. Further research is needed to understand the net gain or loss in habitat and habitat quality and also assess the impact that climate change may have on the habitat in future (Erasmus et al. 2002).

Conservation

The primary intervention at this stage is research to investigate the causes of the decline and to then outline appropriate interventions. Adaptive management of formally protected areas is recommended to trial strategies that are effective in stabilising or increasing subpopulations. Private landowners should also be encouraged to continue to form conservancies to reduce the edge effects of small areas of natural habitat, such that vulnerability to poaching is lessened. There are currently no incentives for private landowners to provide stock to provincial nature reserves or to manage them holistically. More stakeholder engagement and research thus needs to be undertaken to understand how the private and public sector populations can interact for the conservation of the species. A more detailed analysis of trophy hunting and translocation impacts is necessary. With regards the latter, unpublished data suggest that the success rates of translocations between provincial nature reserves are not high. For example, most Mountain Reedbuck translocated into Sterkfontein Dam Nature Reserve during a single translocation event in 2001 disappeared and could not be accounted for (A. Taylor unpubl. data). Caution should be used, therefore, when using translocation as a conservation measure with this species, and further research is recommended.

Recommendations for land managers and practitioners:

- A Biodiversity Management Plan should be formulated by pooling knowledge from all stakeholders (conservationists, private landowners and local communities).
- Monitor and enforce penalties for illegal hunting.
- Patrols of private land for the purposes of apprehending would-be hunter trespassers, and snare removals must be regularly performed.
- More suitable survey methodologies should be considered to assist in getting more reliable population numbers. General multi-species aerial surveys tend to result in under-counts in many of the typical habitat types.

Research priorities:

- Investigating the reasons why the formally protected subpopulations have declined and quantifying the severity of various threats.
- Assessing subpopulation trends on private lands and establishing long-term monitoring sites.
- Identifying and testing suitable conservation

Table 5. Conservation interventions for the Southern Mountain Reedbuck (*Redunca fulvorufula fulvorufula*) 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	*5.4 Compliance & Enforcement*: increased prosecution of illegal hunting.	-	Anecdotal	-	-	-
2	*3.2 Species Recovery*: maintain predator density at ecologically suitable levels to reduce excessive predation rates.	-	Anecdotal	-	-	-
3	*2.1 Site/Area Management*: patrolling to detect illegal hunters and removing snares.	-	Anecdotal	-	-	Saving Magaliesberg Species, WESSA Northern Areas Region
4	*6.2 Linked Enterprises & Livelihood Alternatives*: substitute illegal sport hunting with dogs with other forms of recreation.	-	Anecdotal	-	-	-
5	*3.1.1 Harvest Management*: monitoring and regulation of hunting and translocation activities.	-	Anecdotal	-	-	Department of Environmental Affairs and provincial conservation agencies.
6	*1.2 Resource & Habitat Protection*: establish conservancies to protect key habitats.	-	Anecdotal	-	-	-

interventions, such as the outcomes of translocations.

- Identification of suitable habitat areas, particularly in areas where wildlife ranching is commonplace.

Encouraged citizen actions:

- Report sightings, especially outside protected areas, on virtual museum platforms (for example, iSpot and MammalMAP).
- Encourage wildlife ranchers to introduce them in suitable areas.
- Create conservancies to protect suitable habitats.

Data Sources and Quality

Table 6. Information and interpretation qualifiers for the Southern Mountain Reedbuck (*Redunca f. fulvorufula*) assessment

Data sources	Field study (unpublished)
Data quality (max)	Estimated
Data quality (min)	Estimated
Uncertainty resolution	Maximum/minimum values
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.*