Papio ursinus – Chacma Baboon


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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) (2007)	Not listed
CITES listing (1977)	Appendix II
Endemic	No

Chacma Baboons thrive in human-modified environments which often puts them in conflict with people.

Taxonomy

Papio ursinus (Kerr 1792)

ANIMALIA - CHORDATA - MAMMALIA - PRIMATES - CERCOPITHECIDAE - *Papio - ursinus*

Common names: Chacma Baboon (English), Bobbejaan (Afrikaans), Ifene, Indwangula, yaKapa (Ndebele), Tshwêne (Sepedi, Sesotho, Setswana), Imfene (Swati, Zulu), Mfenha (Tsonga), Pfene (Venda), Imfene (Xhosa)

Taxonomic status: Species

Taxonomic notes: Although up to eight Chacma forms have been suggested in the literature (Hill 1970), today only three are commonly accepted (Jolly 1993; Groves 2001). These are: *P. u. ursinus*, *P. u. griseipes,* and *P. u. ruacana. Papio u. ursinus*, the typical Chacma, is a large baboon with black nape fringes, dark brown fur, black fur on hands and feet and a relatively short tail. This variant occurs in the more southerly and westerly part of the Chacma range, including South Africa and some parts of Botswana. This group incorporates Hill's (1970) *ursinus*, *orientalis* and *occidentalis* subspecies. *Papio ursinus griseipes*, the Grey-Footed Baboon, is more fawn coloured and found in southwestern Zambia, Zimbabwe, in Mozambique south of the Zambezi, in parts of the Limpopo Province of South Africa, and in the Okavango Delta, Botswana (Jolly 1993). These are smaller than *P. u. ursinus* and have grey hands and feet, the same colour as their limbs, and a longer tail. This group incorporates Hill's *griesipes*, *ngamiensis*, *chobiensis* and *jubilaeus* subspecies. Today it is clear that *jubilaeus* is in fact a Yellow Baboon and not a Chacma at all. *Papio ursinus ruacana* is a small black-footed baboon that is darker than *P. u griseipes* and smaller than *P. u. ursinus*. They are found in Namibia and southwestern Angola (Groves 2001).

Mitochondrial genetic data confirms at least two distinct lineages within Chacma separating the species into northern (*griseipes*) and southern (*ursinus*) populations (Sithaldeen et al. 2009; Zinner et al. 2009). A third genetic clade may represent *orientalis* (Keller et al. 2010). As yet, no definitive data exist that distinguish a genetically distinct *ruacana* clade.

Assessment Rationale

This species is listed as Least Concern on account of its wide distribution and perceived abundance within the assessment region. However, as local subpopulations have been shown to be threatened with extinction and the population in KwaZulu-Natal Province (KZN) was estimated to be less than 10% of the expected population size, more population-level spatial and demographic data are needed before any level of confidence can be given to this assessment status. The most severe threat to this species is human–wildlife conflict, with baboon-specific electric fencing suggested as the primary intervention to mitigate this threat.

Regional population effects: Given that Chacma Baboons are listed as Least Concern, there is no scope for downlisting this species to a lower extinction risk category. However their adaptability and wide distribution afford them a substantial rescue effect.

Distribution

Chacma Baboons are widely distributed across southern Africa, ranging in South Africa, Swaziland, Lesotho, Mozambique, Botswana, Namibia, Zimbabwe, southern

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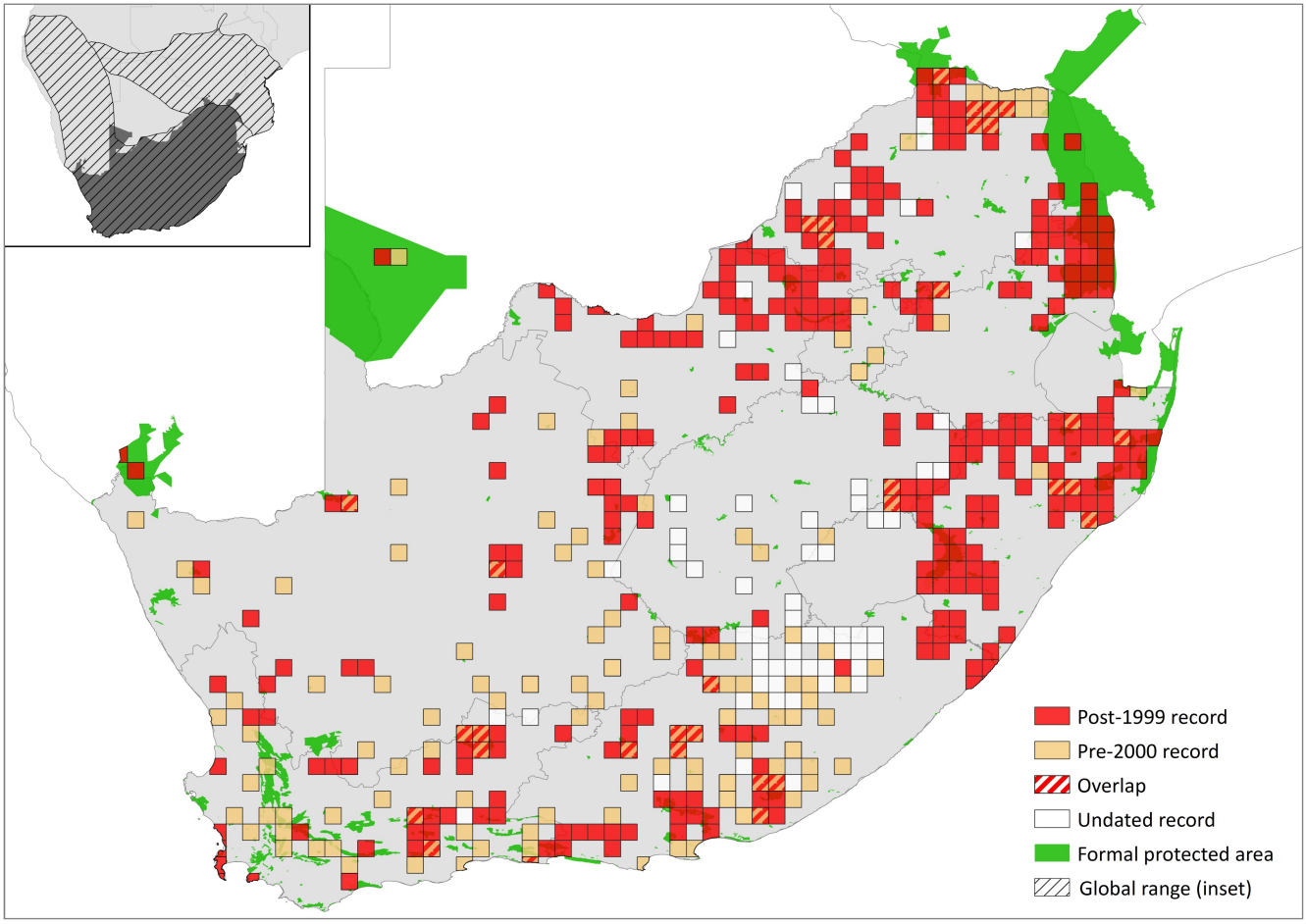

Figure 1. Distribution records for Chacma Baboon (*Papio ursinus*) within the assessment region

Table 1. Countries of occurrence within southern Africa

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

Zambia, and southern Angola. The combination of their dietary and behavioural flexibility (Bronikowski & Altmann 1996; Swedell 2011) allows these baboons to occupy a diverse range of habitats including deserts, savannahs, grasslands and forests (Altmann & Altmann 1970; Swedell 2011). Within their range, the only areas where Chacma Baboons are notably absent are in the dune fields of the Kalahari and Namib deserts.

Recent studies of specific subpopulations indicate that, despite their wide distribution, Chacma Baboons use the landscape selectively (Hoffman & O'Riain 2012a). Furthermore, high levels of habitat transformation in South Africa may have altered their distribution patterns (Stone et al. 2012).

Comparisons of current and historical distribution records do not indicate any major shift in Chacma Baboon distribution patterns. However, neither dataset is spatially comprehensive, nor are these records directly comparable given inconsistencies in data collection protocols.

Population

To date, there has been no attempt to calculate the overall population size of Chacma Baboons in the assessment region, and only a few studies conducted since 2004 have observed (Beamish 2010) or estimated the sizes of subpopulations. For example, Stone et al. (2012) estimated a meagre population of approximately 11,000 baboons in KZN with a density in occupied areas of *c.* 1.8 animals / km^2. Similarly, local subpopulations in KZN have been shown to be threatened with extinction (Uys 2011a, 2011b, 2012). These findings have been troubling. Stone et al. (2012) noted that the baboon population in KZN was less than 10% of the expected population size, highly fragmented and largely dependent on protected areas.

Extrapolation of information from the subpopulation to the population level – to deduce either population size or population trends – is both difficult and contentious. Estimations are hindered due to both the behavioural adaptability and large size differences of baboon troops (even those ranging within the same subpopulation), demographic structure (for example, ratio of mature individuals to immature individuals, Beamish 2010), and ranging patterns (Hoffman & O'Riain 2012b). In the absence of more comprehensive empirical information across the mammal assessment region, it is not possible to give an accurate measure of population size or to deduce an accurate population trend.

Current population trend: Unknown, but suspected to be stable.

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

Severely fragmented: No

Habitats and Ecology

Chacma Baboons occur across all biomes and bioregions in the assessment region, with the possible exception of the Namaqualand sandveld bioregion, and therefore are not restricted by habitats throughout most of their distribution. They occupy a diverse range of niches, occupying mesic and arid savannahs, low and high grasslands and coastal and montane forests (Altmann & Altmann 1970; Cowlishaw & Davies 1997; Barrett et al. 2002; Codron 2003; Henzi et al. 2003; Sithaldeen et al. 2009; Swedell 2011). Chacma Baboons can also thrive in human-modified environments (for example, urban and agricultural areas), particularly when these areas offer a concentration of high quality, and easily accessible, food sources that are situated in close proximity to water and sleeping sites (Hoffman & O'Riain 2012a, 2012b). This ability to adapt to human-modified habitats is a major driver of high levels of human-baboon conflict (Hoffman & O'Riain 2012c; Kaplan 2013).

Chacma Baboons do not appear to be restricted to particular soil types or mean annual precipitation levels provided they can access permanent water (Hamilton III 1986), for example, aquifers and seeps or windmill pumps drawing ground water to the surface. The highest mean annual rainfall found in inhabited areas is approximately 1,555 mm / year (Stone et al. 2013). Baboons are also capable of surviving at some of the highest altitudes (*c.* 3,280 m) in South Africa (Stone et al. 2013). However, they are unlikely to be able to survive winters at high altitude due to harsh environmental conditions that affect food sources and thermoregulatory constraints (Whiten et al. 1987).

Reflecting their wide ecological range, Chacma Baboons are omnivores with generalist diets, although they are selective in the parts of the plants they will consume (Norton et al. 1987; Byrne et al. 1993; Altmann 1998; Alberts et al. 2005). Their diets are dominated by fruits, leaves and subterranean items, while flowers and animal matter constitute a much smaller proportion of the diet.

On account of their behavioural adaptability and dietary breadth and flexibility, Chacma Baboons demonstrate marked ecological variation at the inter- and intra-subpopulation level. Troops may be comprised of as few as seven individuals (Beamish 2010) and as many as 115 individuals (Hoffman & O'Riain 2012b). Reported home range sizes vary from 1.5–37.7 km^2 (these extreme values come from a single subpopulation in the Cape Peninsula: Hoffman & O'Riain 2012b) and home range densities vary from 0.95 baboon / km^2 (Drakensberg mountains: Whiten et al. 1987) to 16.8 baboons / km^2 (Okavango Delta: Hamilton III et al. 1976). This variation is a function of both troop size and resource availability: larger troops tend to have larger home ranges and range at lower densities, while troops with access to high quality food resources tend to have smaller home ranges and range at higher densities (Hoffman & O'Riain 2012b).

Ecosystem and cultural services: Baboons are generalist omnivores, but their diet consists primarily of plant matter. Consequently it is possible that they play localised roles in seed dispersal for the plant species they consume. Indeed, it has been shown that baboons are important dispersers of seeds of certain species (for example, *Ziziphus mucronata*) in southern African savannah-type environments (Slater & Toit 2002). The role of baboons as seed dispersers in other habitats in the region is yet to be tested, but based on the above-mentioned findings, and those of studies conducted in other parts of Africa (Lieberman et al. 1979; Kunz & Linsenmair 2008), it stands to reason that they might play important roles in the dispersion and propagation of diverse plant species.

Use and Trade

Non-human primates, including *Papio*, have been widely used as models for human medical research (Bailey 2005). Historically, wild Chacma Baboons were sourced for medical research from within South Africa; however, this practice is now being discouraged, with captive-reared baboons being the preferred subjects for such research.

Across their global range, Chacma Baboons are also utilised for bushmeat and traditional medicine (for example, Minhós et al. 2013), although the extent and

Table 2. Use and trade summary for the Chacma Baboon (*Papio ursinus*)

Category	Applicable?	Rationale	Proportion of total harvest	Trend
Subsistence use	No	-	-	-
Commercial use	Yes	Traditional medicine, bushmeat, trophy hunting and medical research.	All	Stable to decreasing
Harvest from wild population	Yes	Baboons may be used for traditional medicine, bushmeat and trophy hunting.	Majority	Stable
Harvest from ranched population	No	-	-	-
Harvest from captive population	Medical research only but proportion of harvest not estimated.	Baboons offer a resilient and suitable human model for medical testing, but the use of wild-caught baboons has been declining.	Minority	Suspected decrease

Table 3. Possible net effects of wildlife ranching on the Chacma Baboon (*Papio ursinus*) and subsequent management recommendations

Net effect	Positive
Data quality	Anecdotal
Rationale	The general practice of wildlife ranching is predicted to have a positive effect on baboons given that levels of human–baboon conflict can be lower in wildlife ranching areas compared with commercial croplands and livestock farms. Baboons may also add an aesthetic value to wildlife ranches – hunters cited the presence of baboons as adding an authentic feel to their hunting experience, even though the baboons were not a target species – and negative impacts are negligible (O. Stone pers. obs.).
Management recommendation	Encourage inclusion of baboons in wildlife ranches, to improve the aesthetic value of hunting experiences.

trends of this use are neither well documented nor well understood. They have been found in bushmeat markets in Johannesburg (Whiting et al. 2011) and the Eastern Cape (Simelane & Kerley 1998), and are commonly traded at markets across KZN (Ngwenya 2001). Within the assessment region, we suspect neither the bushmeat nor traditional medicine trade make a significant negative impact on the population.

Finally, baboons are hunted both as trophies and for recreation, with minimal hunting restrictions. According to the CITES trade database, an average of 334 ± 67 baboons are hunted in the wild each year (2002–2012). Again, this is not suspected to impact the population negatively, although it may cause local subpopulation declines if not regulated.

Threats

The greatest threat to Chacma Baboons is conflict with humans for critical resources. Baboons (*Papio*) exhibit unrivalled levels of contact with humans when compared with other African primates (Swedell 2011) and are considered the most troublesome genus in Africa (Hill 2000).

Although their notoriety may be more related to human perceptions than empirical data (Warren et al. 2007), there is abundant evidence throughout Africa that baboons cause more crop damage than any other African primate (Naughton-Treves 1996; Hill 2000) as well as all other wildlife species (Naughton-Treves 1998; Biryahwaho 2002). They are reported as pests in Uganda (Hill 2000), Nigeria (Pepeh 1996), Cameroon (van Oosten 2004), Kenya (Strum 1994), Tanzania (Mascarenhas 1971), Malawi (Morris 2000) and South Africa (Kansky & Gaynor 2000; Brown et al. 2006).

Across their distribution, Chacma Baboons are killed, legally and illegally, as damage-causing animals and also killed by indiscriminate trapping and poisoning. Although reports of retaliatory killing of baboons are generally anecdotal, the few quantified examples that exist demonstrate that targeted removal of baboons can range from the level of the individual (Beamish & O'Riain 2014) to single or multiple troops numbering hundreds of animals (Katsvanga et al. 2006).

The high levels of human–baboon spatial overlap and the resultant conflict seen throughout Africa (Strum 1994; Hill 2000) is predicted to increase as human populations continue to expand and land development proliferates (Hoffman & O'Riain 2012c). Consequently, over time the benefits afforded to baboons by habitat alteration are likely to be exceeded by the deleterious consequences of chronic competition for space and food that manifests as

Table 4. Threats to the Chacma Baboon (*Papio ursinus*) 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	*5.1.3 Persecution/Control*: conflict with humans over resources with targeted removal of damage-causing animals by environmental managers and individual farmers.	Katsvanga 2006	Empirical	Regional	Suspected increase as a result of increasing habitat transformation for agriculture and urban land use.
		Uys 2011a, 2011b, 2012	Empirical	Local	
2	*5.1.1 Intentional Use*: illegal poaching for traditional medicine.	Simelane & Kerley 1998	Empirical	Regional	Unknown, but possibly increasing with rural settlement expansion.
		Ngwenya 2001	Empirical	Regional	
		Whiting et al. 2011	Empirical	Local	
3	*5.1.1 Intentional Use*: illegal poaching for bushmeat.	No scientific records of baboons being used for bushmeat in southern Africa (although records exist elsewhere, for example, West Africa; Minhós et al. 2013).	Anecdotal	-	Unknown, but possibly increasing with rural settlement expansion.
4	*5.1.1 Intentional Use*: potentially unsustainable trophy hunting (international).	-	Anecdotal	-	Stable (no data on local trends).

direct conflict with humans (Laurance et al. 2002; Beamish & O'Riain 2014). For example, Chacma Baboons in the Ugu region of KZN suffer direct competition for land (and its produce) that predominantly consists of sugar plantations. Local wildlife authority reports suggest that at least one of these subpopulations, which have been decreasing at a rate of approximately 10% per annum, will become extinct in the near future (Uys 2011a, 2011b, 2012).

Other threats include the use of Chacma Baboons for bushmeat and traditional medicine, although the extent and trends of these threats are neither well documented nor well understood. Finally, baboons are hunted both as trophies and for recreation, with minimal hunting restrictions.

Current habitat trend: Stable. Urbanisation and agriculture can force Chacma Baboons into increasingly marginalised, and often high-lying and rugged, natural habitat (Hoffman & O'Riain 2012a). Additionally, baboons are attracted to the high density and quality of food resources in agricultural areas. Together these "push and pull" factors may drive high levels of human–baboon conflict, which is evident throughout the subregion. Provincial reports show land alteration rates are increasing (Goodman 2010), leaving large areas of land uninhabitable for baboons (Stone et al. 2012).

Conservation

The greatest hindrance to Chacma Baboon conservation is conflict with humans, particularly in the agricultural sector. People experiencing this conflict have attempted to reduce it through various methods including: lethal removal, translocation, herding, a variety of deterrents, and food provisioning or diversionary feeding (outside of human areas; not to be confused with supplementary feeding). While few studies quantify the efficacy of these measures, the interventions most likely to succeed for high quality concentrated resources (for example, vineyards, citrus farms) are (in order of long-term effectiveness): baboon-specific electric fencing, dynamic noise (for example, bear bangers) and dynamic pain aversion (for example, paintball markers; Kaplan 2013) paired with the presence of field rangers (van Doorn 2009). It is critical to note that, when dealing with an animal as adaptable and intelligent as a baboon, any intervention will fail unless it is implemented conscientiously and adaptively. Where lethal control is practiced on either individual damage-causing animals or whole populations of damage-causing animals then best practice demands that the impacts of the removal on the sustainability of the population are assessed, and that the factors driving the conflict are addressed to reduce the need for long-term lethal control. Further, it is imperative that damage is correctly ascribed to particular individuals or troops if lethal control is to be effective and not impact on the population more broadly.

A rare but alternative intervention to lethal control of baboons is translocation. This is a costly method that requires extensive financial and professional resources, long-term post-translocation monitoring and available habitat in an area where conflict is predicted to be negligible and competition with conspecifics limited. An example of a successful translocation of a baboon troop is available for *Papio anubis*, a close relative of the Chacma Baboon (Strum 2005).


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Recommendations for land managers and practitioners:

- There are no national or provincial management plans for Chacma Baboons. Any management plans that exist are area specific (for example, Cape Peninsula).
- To conserve baboons across the assessment region efforts should be made to minimise the overlap of baboons and humans, so as to reduce human–wildlife conflict, the threat most pertinent to their conservation. Achieving this requires (a) restricting access to the resources (food, water and sleeping sites) that draw baboons into human-modified areas and (b) ensuring that sufficient natural habitat with suitable resources (food, water and sleeping sites) is left undeveloped for use by baboons (Hoffman 2011; Kaplan 2013).

Research priorities: Despite their widespread occurrence, current distribution data are not available across the geographic range of Chacma Baboons. Furthermore, as there is no national monitoring of population numbers and only one province (KZN) that conducts annual population counts, population data are typically only available at local scales. Also, threats to this species – which are potentially large – are poorly monitored and poorly documented. These factors make it difficult to accurately measure the extinction risk of this species.

Under the primary supervision of Prof. Justin O'Riain, the Baboon Research Unit at the University of Cape Town has conducted research on the demography, ecology and management of the Chacma Baboons of the Cape Peninsula. This research is nearing completion, having made a notable impact on baboon management locally, and having provided useful information for baboon management and conservation on a larger scale.

A second ongoing study under the supervision of Prof. O'Riain is focusing on the abiotic and biotic factors influencing damage to plantations in Mpumalanga. This study is comparing the levels of damage to trees both before and after a culling event aimed at reducing baboon densities within these plantations.

Finally, research predicting past distributions of the Chacma Baboon at a continental scale has been undertaken by Olivia Stone (University of New South Wales, Australia). In addition, in collaboration with Ezemvelo KZN Wildlife, a review of the population and distribution of baboons within KZN, has found the population to be greatly reduced.

Table 5. Conservation interventions for the Chacma Baboon (*Papio ursinus*) 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	*3.1 Species Management*: baboon-specific electric fencing to mitigate human–wildlife conflict.	Kaplan 2013	Empirical	Local	Success rate: 100%. Success is contingent on a good design (see Kaplan 2013). Failures are generally a result of design flaws or poor maintenance of the fence and surrounding vegetation.	Fence described in Kaplan (2013) is still in use: Baboon Technical Team (City of Cape Town, CapeNature and SANParks)
2	*3.1 Species Management*: bear bangers to mitigate human–wildlife conflict.	Kaplan 2013	Empirical	Local	Success rate: > 90%. Important to note that this study was done on a troop in a topographically conducive area (see Kaplan 2013) and thus success may differ in other areas or for other troops. Habituation to this deterrent is a possibility but this was not observed during the trial or in the two years following the trial.	Cape Peninsula, Western Cape; Baboon Technical Team (City of Cape Town, CapeNature and SANParks)
3	*3.1 Species Management*: field rangers (herders/ monitors) to mitigate human–wildlife conflict.	van Doorn 2009	Empirical	Local	Success rate is high but contingent on the availability of deterrent tools.	Cape Peninsula, Western Cape; Baboon Technical Team (City of Cape Town, CapeNature and SANParks)
4	*3.1 Species Management*: paintball markers to mitigate human–wildlife conflict.	-	Anecdotal	Local	Success is moderate and contingent on number and behavioural consistency of field rangers. Habituation to this intervention is rare, but it has occurred (P. Richardson pers. comm.).	Cape Peninsula; Baboon Technical Team (City of Cape Town, CapeNature and SANParks), and Overstrand, Western Cape; Overstrand municipality
5	*3.1 Species Management*: provisioning/ diversionary feeding to mitigate human–wildlife conflict.	Kaplan et al. 2011	Empirical	Local	Success is moderate but contingent on consistent waste management in areas surrounding the provisioning site. However, long-term application has negative implications for baboon management given the effects of provisioning on troop growth and dynamics.	None
6	*2.1 Site/Area Management*: waste management to mitigate human–wildlife conflict.	Kaplan 2013	Empirical	Local	Success can be high but generally compromised by lack of human compliance and behavioural consistency.	Cape Peninsula, Western Cape; City of Cape Town municipality
7	*3.1.3 Limiting Population Growth*: lethal removal to mitigate human–wildlife conflict.	Katsvanga et al. 2006	Empirical	Local	Success is temporary. Often the gaps resulting from the removal of individuals or troops are filled by baboons from neighbouring troops/areas.	None
8	*3.1 Species Management*: reflective light prisms to mitigate human–wildlife conflict.	Kaplan & O'Riain (2015)	Empirical	Local	Success rate: 0%. Habituation is inevitable, and there is no cost imposed on the baboon by this intervention.	None

More research is needed on:

- The distribution, numbers and population trends of Chacma Baboons throughout their range.
- The effects of human persecution and human-wildlife conflict on Chacma Baboon populations.
- The extent and impact of use of baboons in the traditional medicine markets (both local and international). With such information, we would be better informed about whether conservation actions are needed for Chacma Baboons.

Encouraged citizen actions: People can aid baboon conservation by the following strategies to minimise human–baboon conflict in their areas (Kaplan 2013):

- Restricting baboon access to human refuse in residential and recreational areas through the use of baboon-proof refuse bins.

- Restricting baboon access to human food sources (for example, removing/protecting vegetable gardens).
- Utilising the following deterrent techniques to exclude baboons from human-modified environments (for example, crop fields or residential areas):
  - Baboon-specific electric fencing.
  - Bear bangers or similar noise aversion techniques deployed adaptively.
  - Paintball markers (non-lethal) used adaptively.
- Educating residents and tourists about responsible behaviour inside, or adjacent to, baboon habitats.
- People can also collect distribution and demographic information about baboons to help improve our understanding of this species. This information can be submitted to virtual museum platforms (for example, iSpot and MammalMAP).

Data Sources and Quality

Table 6. Information and interpretation qualifiers for the Chacma Baboon (*Papio ursinus*) assessment

Data sources	Field study (literature, unpublished), indirect information (expert knowledge)
Data quality (max)	Estimated
Data quality (min)	Suspected
Uncertainty resolution	Best estimate
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.*