Felis silvestris – African Wildcat


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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 (2015)	Least Concern
TOPS listing (NEMBA)	None
CITES listing	Appendix II
Endemic	No

*Watch-list Threat †Conservation Dependent

This species is threatened by hybridisation with domestic cats, the frequency of which increases with human population pressure. The genetically purest African Wildcats are found in the Kgalagadi Transfrontier Park (Le Roux et al. 2015).

Taxonomy

Felis silvestris (Schreber 1777)

ANIMALIA - CHORDATA - MAMMALIA - CARNIVORA - FELIDAE - *Felis* - *silvestris*

Common names: African Wildcat (English), Groukat, Vaalboskat (Afrikaans), !Garo (Nama), Igola, Ipaka ye-Afrika (Ndebele), Phaga (Sepedi), Qwabi, Setsetse, Tsetse (Sesotho), Imbodla, Ligoya, Imphaka, Ingewa (Swati), Goya, Mphaha (Tsonga), Phagê, Tibê (Tswana), Phaha, Gowa (Venda), Ingada, Ichathaza, Imbodla (Xhosa), Impaka, Imbodla (Zulu)

Taxonomic status: Species

Taxonomic notes: There is currently no clear agreement on how to relate geographically linked variation in morphology and genetics to the taxonomy and systematics of the widely distributed Wildcat (*Felis silvestris*) (Kitchener & Rees 2009). The latest phylogeographical analyses (Driscoll et al. 2007, 2009; Macdonald et al. 2010) suggest that the Wildcat consists of five subspecific groups and three traditional subspecies (Nowell & Jackson 1996; Stuart et al. 2013): including the recent recognition of the Southern African Wildcat (*F. s. cafra* Desmarest, 1822).

Based on genetic, morphological and archaeological evidence, the familiar housecat was believed to be domesticated from the Near Eastern Wildcat (*F. s. lybica*), probably 9,000–10,000 years ago in the Fertile Crescent region (Vigne et al. 2004; Driscoll et al. 2007), coinciding with the first agricultural settlements (Driscoll et al. 2007; Macdonald et al. 2010). Although the domestic cat derived relatively recently from the Wildcat, in terms of biological processes and phylogeny, it can be taxonomically classified either as a subspecies (*F. s. catus*) of *F. silvestris* or as a separate species (*F. catus*) (Macdonald et al. 2010). Recent evidence supports the classification of domestic cats as genetically distinct from Wildcats (Driscoll et al. 2007).

For the purposes of this assessment, although we recognise the potential validity of the Southern African Wildcat (*F. s. cafra*), we defer to the species level until further research can accurately delineate subspecific geographical boundaries.

Assessment Rationale

The African Wildcat is listed as Least Concern because it is the most common and widely distributed wild felid within the assessment region. However, extensive hybridisation and introgression with domestic cats across its global distribution range has been recorded. Recent studies suggest lower levels of introgression than expected in South Africa (Wiseman et al. 2000; Le Roux et al. 2015). As incidences of hybridisation correlate with human population pressure, high rates of rural and urban expansion (8% and 15% respectively for both Northern Cape and Limpopo provinces), especially around protected area edges, may increasingly threaten this species. Further research on the levels of hybridisation and declines of genetically pure subpopulations may thus lead to a reassessment of the African Wildcat as a threatened species, under criterion A4e. Key interventions include the establishment and enforcement of large protected areas to reduce the edge effects of the wild–domestic animal interface (for example the Kgalagadi Transfrontier Park), and spaying and neutering domestic cats, especially in rural areas and close to protected areas.

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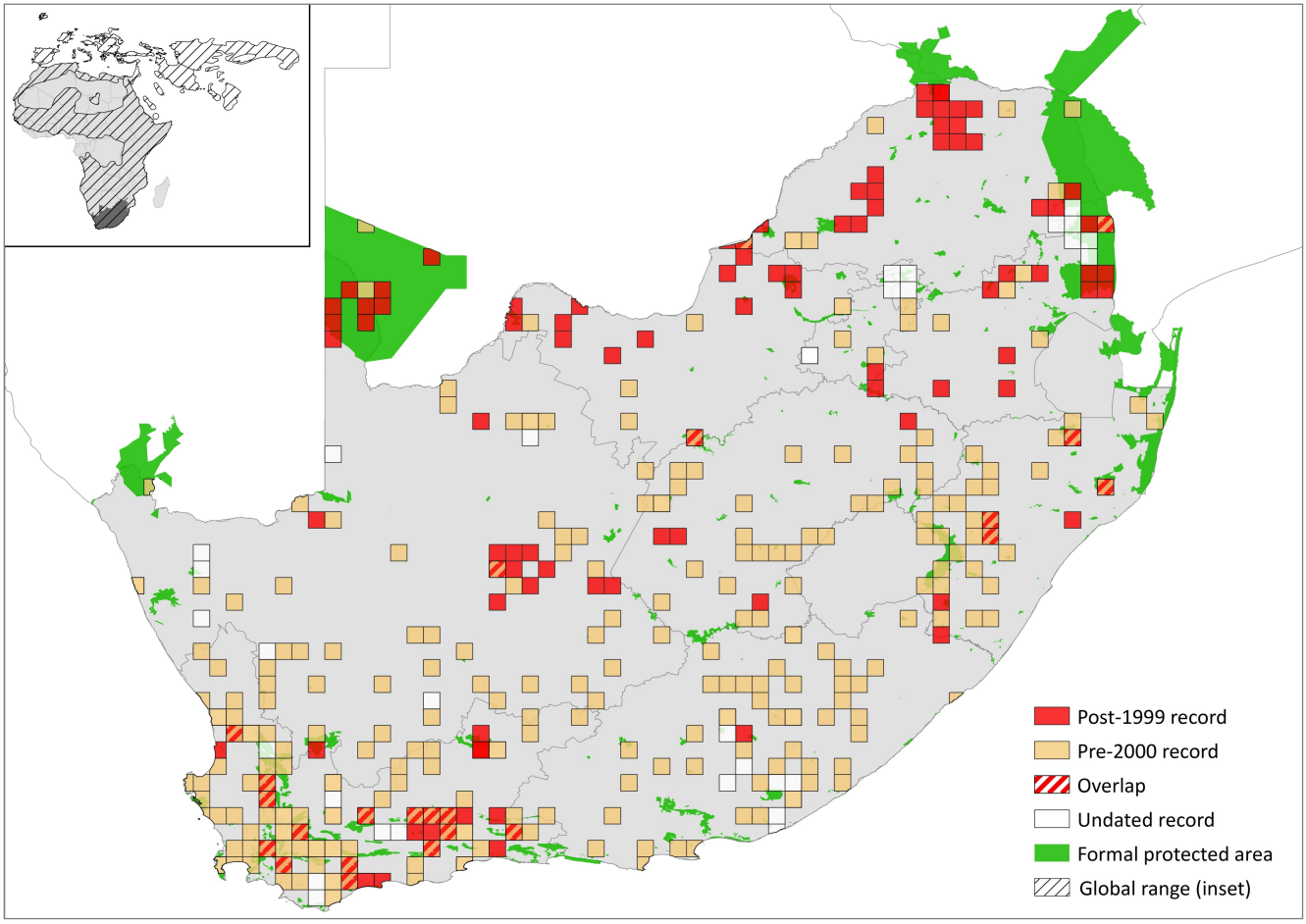

Figure 1. Distribution records for African Wildcat (*Felis silvestris*) within the assessment region

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

Regional population effects: Wildcats have a continuous distribution across the African continent and movements between regions and countries are likely to occur.

Distribution

The Wildcat has a large geographic distribution and is found throughout most of Africa, Europe, and southwest and central Asia into India, China, and Mongolia. Two of the five recognised Wildcat subspecies (Driscoll et al. 2007; Macdonald et al. 2010), *F. s. lybica* and *F. s. cafra*, are considered African and have the following distributions: the Near Eastern Wildcat (*F. s. lybica*) occurs across northern Africa and extends around the periphery of the Arabian Peninsula to the Caspian Sea (Driscoll et al. 2007). Further south, it is replaced by the Southern African Wildcat subspecies, *F. s. cafra* (Driscoll et al. 2007). At present the available genetic data are insufficient to determine the border of transition between the two subspecies; however morphological evidence suggests that it is somewhere in the southeastern region of Tanzania and Mozambique (Yamaguchi et al. 2004a, 2004b; Kitchener & Rees 2009).

Southern African Wildcats occur in all South African provinces, as well as in neighbouring Lesotho and Swaziland (Figure 1, Table 1). Population numbers are unknown but it is assumed that this subspecies is fairly common in most protected areas. Their extremely wide distribution range is due to their broad ecological tolerance. They occur at altitudes ranging from sea level to 2,400 m a.s.l. (Skinner & Chimimba 2005). There is concern over a possible recent range contraction or local extinction in areas of the North West Province in South Africa, as the species seems to have disappeared from the south-eastern grasslands, having been recorded only in the northern Kalahari and bushveld habitats (Power 2014).

Population

The world's domestic cat population is estimated to be around 600 million individuals (Baker et al. 2010), making the domesticated form of *F. silvestris* one of the world's most numerous animals. Domestic cats can hybridise freely with Wildcats, for example in Europe (Pierpaoli et al. 2003; Driscoll et al. 2007), southern Africa (Yamaguchi et al. 2004b; Stuart et al. 2013), and North Africa (Stuart et al. 2013). However the extent of hybridisation may be lower than previously reported and may vary locally (Le Roux et al. 2015). It is believed that today very few genetically distinct Wildcat populations still exist (Nowell & Jackson 1996; Herbst 2009).

It is difficult to distinguish morphologically/visually between genetically pure Wildcats and domestic cats and therefore difficult to assess the status of Wildcats in their natural environment (Nowell & Jackson 1996). The morphological criteria listed for Wildcats by Skinner and Chimimba (2005) should help to assist in the visual identification of Wildcats. To date, three studies have determined the genetic structure of Wildcat populations in southern Africa (Wiseman et al. 2000; Herbst 2009; Le Roux et al. 2015). Subsequently several recent papers have developed improved genetic markers for discrimination between Wildcats and domestic cats (Driscoll et al. 2011; Nussberger et al. 2013, 2014a; Devillard et al. 2014) that would assist in future assessments.

Current population trend: Stable, but possibly declining based on ongoing human settlement expansion and subsequent risk of hybridisation with domestic cats.

Continuing decline in mature individuals: Unknown, but the number of mature individuals will decline if hybridisation increases.

Number of mature individuals in population: Unknown

Number of mature individuals in largest subpopulation: Unknown, but likely to be Kgalagadi Transfrontier Park.

Number of subpopulations: Unknown

Severely fragmented: No. They have a broad habitat tolerance and can exist in agricultural and rural landscapes.

Habitats and Ecology

African Wildcats are found in a wide variety of habitats, from deserts and scrub grassland to dry and mixed forest, being only absent from rainforest and true deserts. Throughout their range they require some cover and protection such as rocky hillsides, bushes, dwarf shrubs, reed beds and tall grasses (Nowell & Jackson 1996; Skinner & Chimimba 2005). Where adequate cover is unavailable, they use holes created by species such as Aardvark (*Orycteropus afer*) or under the roots of trees or holes in termitaria. They have also been recorded from agricultural landscapes where they use tall crops such as maize as shelter (Skinner & Chimimba 2005). Their presence in rural landscapes is also confirmed by the presence of House Rats (*Rattus rattus*) in their diets (Skinner & Chimimba 2005).

Home range sizes show large variability and this could be due to seasonal changes in densities and distribution of prey species. Annual home range estimates for African Wildcats in the southern Kalahari were 3.5 ± 1.0 km^2 for females and 7.7 ± 3.5 km^2 for males and fall within the ranges of other Wildcat studies (Herbst 2009). Phelan and Sliwa (2006) reported a home range of 52.7 km^2 for a radio-tracked female in the Sharjah desert (United Arab Emirates), but this may be more the exception than the rule.

Rodents, other small mammals, and birds constitute the staple food of Wildcats across their distribution range; however, diet composition may vary considerably according to seasonal prey availability. Wildcats may also feed on smaller prey and invertebrates or even scavenge when food availability is low (Herbst & Mills 2010). They are almost entirely nocturnal; however they do show crepuscular activity depending on food availability and temperature (Herbst 2009). African Wildcats are solitary and communicate by actively scent marking their territories.

Ecosystem and cultural services: Together with sympatric small to medium carnivore species, it is suspected that Wildcats play a role in controlling population numbers of rodent and other small mammal species.

Use and Trade

African Wildcats may be hunted for their fur; for example, communities in the Kalahari, Khomani San and Mier, wear different pieces of fur as traditional garments (M. Herbst pers. obs. 2003–2006). Some commercial hunting operations also list African Wildcats as trophy species (M. Herbst pers. obs. 2009–2016). However, impact is unknown and expected to be limited and in specific regions only. The impacts of uncontrolled breeding of pure Wildcats and selling of individuals as pets are unknown. The expansion of wildlife ranches, game farms and large, isolated protected areas will become increasingly important as habitats for pure African Wildcats and efforts need to be made to prevent introduction of domestic cats into these areas, as well as where possible maintain exclusion zones around the peripheries of protected areas (Table 3; Le Roux et al. 2015).

Threats

The most severe threat to African Wildcats throughout their range is hybridisation with domestic or feral cats. Hybridisation is widespread (Driscoll et al. 2007), notably in Europe (Pierpaoli et al. 2003; Hertwig et al. 2009; Say et al. 2012; Mattucci et al. 2013; Nussberger et al. 2014b), and it is unknown how many genetically pure populations of Wildcats remain. Recent analyses of Southern African Wildcat populations in South Africa found surprisingly low

Table 2. Use and trade summary for the African Wildcat (*Felis silvestris*)

Category	Applicable?	Rationale	Proportion of total harvest	Trend
Subsistence use	Yes	Subsistence hunting for fur.	Limited	Unknown, probably stable.
Commercial use	Yes	Selling of individuals as pets (or breeding stock).	Unknown	Unknown
Harvest from wild population	No	-	-	-
Harvest from ranched population	No	-	-	-
Harvest from captive population	Yes	Production of offspring to be sold as pets (or breeding stock).	Minority	Unknown

Table 3. Possible net effects of wildlife ranching on the African Wildcat (*Felis silvestris*) and subsequent management recommendations

Net effect	Positive
Data quality	Inferred
Rationale	African Wildcats are expected to perform well on wildlife ranches, game farms and large, isolated areas.
Management recommendation	Prevent introduction of domestic cats or spay/neuter them. Maintain exclusion zones around protected areas. Sustain a natural prey base of small mammals.

levels of hybridisation between wildcats and domestic cats but did find evidence that levels of hybridisation were significantly higher outside of protected areas than inside (Le Roux et al. 2015).

Minor additional threats include possible competition for space between feral cats and Wildcats; and the potential for disease transmission between the two taxa (Daniels et al. 1999). Other threats include human-caused mortality, especially road kills (W. Collinson unpubl. data). Wildcats are also killed as pests, either directly or through bycatch as part of other predator control programmes, although this does not seem to have resulted in population declines (Stuart et al. 2013).

Current habitat trend: African Wildcats occupy a wide range of open arid and semi-arid habitats, and therefore are not restricted by habitats throughout most of their distribution. Furthermore, they can in principle do well in anthropogenically disturbed landscapes due to increased rodent densities (Skinner & Chimimba 2005), although these are the areas where hybridisation with domestic cats are more likely to occur (Le Roux et al. 2015). High rates of urban and rural expansion in all provinces between 2000 and 2013, ranging from 5–10% and 0.8–39% respectively (GeoTerraImage 2015), may be increasingly threatening this species as it increases contact between Wildcats and domestic cats. The high rate of settlement expansion in both the Northern Cape and Limpopo provinces (15% and 9% urban and rural expansion in both), along protected area edges (Wittemyer et al. 2008) are a concern. Both the largest protected areas, Kgalagadi and Greater Limpopo transfrontier parks, exist in these provinces respectively. There is already evidence that the Kruger National Park subpopulation has higher levels of hybridisation than the Kgalagadi Transfrontier Park due to greater human settlement density (Le Roux et al. 2015). Additionally, Power (2014) reports that the species may be locally extinct in the south-eastern grasslands of the North West Province due to the extent of transformation in that region (NW READ 2014).

Conservation

Although domestic cats and African Wildcats are genetically distinct, they can still interbreed, and therefore there is a need to control feral cats in and around rural and protected areas (Wiseman et al. 2000). It is important to identify genetically pure subpopulations (e.g. Kgalagadi Transfrontier Park; Le Roux et al. 2015) and focus conservation efforts to prevent hybridisation. Such efforts are complicated by the difficulty in distinguishing Wildcats from domestic/feral cats, especially where hybridisation has already taken place (Macdonald et al. 2010; Devillard et al. 2014). New methods have recently been developed in order to improve detection of hybridisation (see Driscoll et al. 2011; Nussberger et al. 2013, 2014a; Devillard et al. 2014; Le Roux et al. 2015).

Creating large, connected protected areas that contain core areas away from human settlements has demonstrated success. Levels of hybridisation were significantly lower for individuals inside or within 5 km of a protected area, and showed higher genetic purity, than individuals outside protected areas (Le Roux et al. 2015). We recommend buffer zones around protected areas where increased awareness and responsible pet

Table 4. Threats to the African Wildcat (*Felis silvestris*) 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*: increasing population of feral/domestic cats. Species stress: *2.3.1 Hybridisation*: hybridisation with domestic/feral cats.	Yamaguchi et al. 2004	Empirical	National	Increasing due to expansion of urban and rural settlements.
		Power 2014	Empirical	Regional	
		Le Roux et al. 2015	Empirical	National	
2	*5.1 Hunting & Collecting Terrestrial Animals*: persecution (hunting, trapping, and poisoning) either directly or as bycatch.	Stuart et al. 2013	Anecdotal	-	Unknown, but probably stable.
3	*8.2.2 Problematic Native Species/Diseases*: disease transmission from increasing domestic/feral cat population.	-	Suspected	-	Likely increasing due to expansion of urban and rural settlements.
4	*4.1 Roads & Railroads*: road collisions.	W. Collinson unpubl. data	Empirical	National	Increasing with road construction and habitat fragmentation.
5	*5.1.1 Hunting & Collecting Terrestrial Animals*: hunting for fur and cultural purposes, collecting animals for the pet trade, and may also include low incidences of trophy hunting.	M. Herbst pers. obs 2003–2006	Anecdotal	Local	Stable, due to cultural use being localised.
		M. Herbst pers. obs 2009–2016	Anecdotal	Local	Pet trade and hunting trends are unknown.

Table 5. Conservation interventions for the African Wildcat (*Felis silvestris*) ranked in order of effectiveness with corresponding evidence (based on IUCN action categories, with regional context)

Rank	Intervention description	Evidence in the scientific	Data quality	Scale of evidence	Demonstrated impact	Current conservation
1	*1.1 Site/Area Protection*: establish and connect large protected areas or transfrontier spaces to minimise edge of wild–domestic animal interface.	Le Roux et al. 2015	Empirical	National	Kgalagadi Transfrontier Park has the purest Wildcat subpopulation.	SANParks protected area expansion strategy; Peace Parks Foundation
2	*2.1 Site/Area Management*: promote domestic/feral cat exclusion zones around protected areas through removal and/or sterilisation.	-	Anecdotal	-	-	-
3	*2.2 Invasive/Problematic Species Control*: neuter or spay domestic/feral cats on game farms, ranches, conservancies, rural and peri-urban areas.	-	Anecdotal	-	-	-
4	*4.3 Awareness & Communications*: establish a national campaign to educate public about responsible domestic cat ownership, especially in rural areas.	-	Anecdotal	-	-	-

ownership are promoted. The conservation of African Wildcats is dependent on protected area expansion strategies, consolidation and conservancy design.

Recommendations for land managers and practitioners: It is recommended to spay or neuter domestic/feral cats, especially in areas where Wildcats are likely to occur and around the borders of large protected areas/national parks. The keeping of domestic cats in state and privately owned protected areas should be prohibited.

Research priorities: Further research on the extent of hybridisation between domestic/feral cat and African Wildcat populations is needed. Current data indicate that levels of hybridisation in the larger protected areas in the southern African region (e.g. Kgalagadi Transfrontier Park) are low. However the data are inadequate to fully ascertain the status of subpopulations outside protected areas. There is a need to:

- Continue research studies using recently developed genetic markers to determine the genetic purity of subpopulations of the Southern African Wildcat.
- Determine the transition zone between the distribution ranges of the Near Eastern Wildcat and Southern African Wildcat and assess the subspecies level to inform future conservation efforts and plans.
- Research and monitor the effectiveness of the interventions described in Table 5.

Encouraged citizen actions:

- Report sightings on virtual museum/social media platforms (for example, iSpot and MammalMAP), especially outside protected areas.
- All pet owners (urban or rural), should be advised to spay or neuter their domestic cats to limit unregulated population growth of feral cats.

Data Sources and Quality

Table 6. Information and interpretation qualifiers for the African Wildcat (*Felis silvestris*) assessment

Data sources	Field study (literature, unpublished), indirect information (unpublished)
Data quality (max)	Inferred
Data quality (min)	Suspected
Uncertainty resolution	Author consensus
Risk tolerance	Evidentiary

References

Baker PJ, Soulsbury CD, Iossa G, Harris, S. 2010. Domestic cat (*Felis catus*) and domestic dog (*Canis familiaris*). Pages 157–171 in Gehrt SD, Riley SPD, Cypher BL, editors. Urban Carnivores: Ecology, Conflict, and Conservation. The Johns Hopkins University Press, Baltimore, Maryland, USA.

Daniels MJ, Golder MC, Jarrett O, Macdonald DW. 1999. Feline viruses in Wildcats from Scotland. Journal of Wildlife Diseases **35**:121–124.

Devillard S, Jombart T, Léger F, Pontier D, Say L, Ruette S. 2014. How reliable are morphological and anatomical characters to distinguish European wildcats, domestic cats and their hybrids in France? Journal of Zoological Systematics and Evolutionary Research **52**:154–162.

Driscoll CA, Menotti-Raymond M, Roca AL, Hupe K, Johnson WE, Geffen E, Harley EH, Delibes M, Pontier D, Kitchener AC, Yamaguchi N, O'Brien SJ, Macdonald DW. 2007. The Near Eastern origin of cat domestication. Science **317**:519–523.

Driscoll CA, Macdonald DW, O'Brien SJ. 2009. From wild animals to domestic pets, an evolutionary view of domestication. Proceedings of the National Academy of Sciences **106**:9971–9978.

Driscoll C, Yamaguchi N, O'Brien SJ, Macdonald DW. 2011. A suite of genetic markers useful in assessing wildcat (*Felis silvestris* ssp.)–domestic cat (*Felis silvestris catus*) admixture. Journal of Heredity **102**:S87–S90.

GeoTerraImage. 2015. Quantifying settlement and built-up land use change in South Africa.

Herbst M. 2009. Behavioural ecology and population genetics of the African wild cat, *Felis silvestris* Forster 1980, in the southern

Kalahari. Ph.D. Thesis. University of Pretoria, Pretoria, South Africa.

Herbst M, Mills MG. 2010. The feeding habits of the Southern African wildcat, a facultative trophic specialist, in the southern Kalahari (Kgalagadi Transfrontier Park, South Africa/Botswana). Journal of Zoology **280**:403–413.

Hertwig ST, Schweizer M, Stepanow S, Jungnickel A, Böhle U-R, Fischer MS. 2009. Regionally high rates of hybridization and introgression in German wildcat populations (*Felis silvestris*, Carnivora, Felidae). Journal of Zoological Systematics and Evolutionary Research **47**:283–297.

Kitchener AC, Rees EE. 2009. Modelling the dynamic biogeography of the wildcat: implications for taxonomy and conservation. Journal of Zoology **279**:144–155.

Kitchener AC, Yamaguchi N, Ward JM, Macdonald DW. 2005. A diagnosis for the Scottish wildcat (*Felis silvestris*): a tool for conservation action for a critically-endangered felid. Animal Conservation **8**:223–237.

Le Roux JJ, Foxcroft LC, Herbst M, MacFadyen S. 2015. Genetic analysis shows low levels of hybridization between African wildcats (*Felis silvestris lybica*) and domestic cats (*F. s. catus*) in South Africa. Ecology and Evolution **5**:288–299.

Macdonald DW, Yamaguchi N, Kitchener AC, Daniels M, Kilshaw K, Driscoll C. 2010. Reversing cryptic extinction: the history, present and future of the Scottish Wildcat. Pages 471–492 in Macdonald DW, Loveridge AC, editors. Felid Biology and Conservation. Oxford University Press, Oxford, UK.

Mattucci F et al. 2013. Genetic structure of wildcat (*Felis silvestris*) populations in Italy. Ecology and Evolution **3**:2443–2458.

Nowell K, Jackson P. 1996. Wild Cats. Status Survey and Conservation Action Plan. IUCN SSC Cat Specialist Group, Gland, Switzerland and Cambridge, UK.

Nussberger B, Greminger MP, Grossen C, Keller LF, Wandeler P. 2013. Development of SNP markers identifying European wildcats, domestic cats, and their admixed progeny. Molecular Ecology Resources **13**:447–460.

Nussberger B, Wandeler P, Camenisch G. 2014a. A SNP chip to detect introgression in wildcats allows accurate genotyping of single hairs. European Journal of Wildlife Research **60**:405–410.

Nussberger B, Wandeler P, Weber D, Keller LF. 2014b. Monitoring introgression in European wildcats in the Swiss Jura. Conservation Genetics **15**:1219–1230.

NW READ. 2014. North West Environment Outlook Report 2013. North West Provincial Government, Mahikeng, South Africa.

Phelan P, Sliwa A. 2006. Range size and den use of Gordon's wildcats in the Emirate of Sharjah, United Arab Emirates. Cat News **44**:16–17.

Pierpaoli M, Biro ZS, Herrmann M, Hupe K, Fernandes M, Ragni B, Szemethy L, Randi E. 2003. Genetic distinction of wildcat (*Felis silvestris*) populations in Europe, and hybridization with domestic cats in Hungary. Molecular Ecology **12**:2585–2598.

Power RJ. 2014. The Distribution and Status of Mammals in the North West Province. Department of Economic Development, Environment, Conservation & Tourism, North West Provincial Government, Mahikeng.

Say L, Devillard S, Léger F, Pontier D, Ruette S. 2012. Distribution and spatial genetic structure of European wildcat in France. Animal Conservation **15**:18–27.

Skinner JD, Chimimba CT. 2005. The Mammals of the Southern African Subregion. Third edition. Cambridge University Press, Cambridge, UK.

Stuart C, Stuart T, De Smet KJ. 2013. *Felis silvestris* Wildcat. Pages 206–210 in Kingdon J, Hoffmann M, editors. The Mammals of Africa. Volume 5: Carnivores, Pangolins, Equids and Rhinoceroses. Bloomsbury Publishing, London, UK.

Vigne J-D, Guilaine J, Debue K, Haye L, Gérard P. 2004. Early taming of the cat in Cyprus. Science **304**:259–259.

Wiseman R, O'Ryan C, Harley EH. 2000. Microsatellite analysis reveals that domestic cat (*Felis catus*) and southern African wild cat (*F. lybica*) are genetically distinct. Animal Conservation **3**: 221–228.

Wittemyer G, Elsen P, Bean WT, Burton ACO, Brashares JS. 2008. Accelerated human population growth at protected area edges. Science **321**:123–126.

Yamaguchi N, Driscoll CA, Kitchener AC, Ward JM, Macdonald DW. 2004a. Craniological differentiation between European wildcats (*Felis silvestris silvestris*), African wildcats (*F. s. lybica*) and Asian wildcats (*F. s. ornata*): implications for their evolution and conservation. Biological Journal of the Linnean Society **83**: 47–63.

Yamaguchi N, Kitchener AC, Driscoll CA, Ward JM, Macdonald DW. 2004b. Craniological differentiation amongst wild-living cats in Britain and southern Africa: natural variation or the effects of hybridisation? Animal Conservation **7**:339–351.

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