Loxodonta africana – African Elephant


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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)	Vulnerable A2a
TOPS listing (NEMBA) (2007)	Protected
CITES listing: South Africa (2007)	Appendix II with annotations
CITES listing: Swaziland (2007)	Appendix I
Endemic	No

*Watch-list Threat †Conservation Dependent

Since 2007, the illegal ivory trade has more than doubled. Although more prevalent in East and Central Africa currently, this represents an emerging threat to the population in the assessment region.

Taxonomy

Loxodonta africana (Blumenbach 1797)

ANIMALIA - CHORDATA - MAMMALIA - PROBOSCIDEA - ELEPHANTIDAE - *Loxodonta* - *africana*

Synonyms: *Elephas africana* (Blumenbach 1797)

Common names: African Elephant (English), Afrika Olifant (Afrikaans), !Khanni (Damara, Nama), Impofu (Ndebele), Mhofu (Shona, Tsonga), Tlou (Setswana, Sotho), Phofu (Tshivenda), iNdlovu (Zulu)

Taxonomic status: Species

Taxonomic notes: Preliminary genetic evidence suggests that there may be at least two species of African Elephant, namely the Savannah Elephant (*Loxodonta africana*) and the Forest Elephant (*Loxodonta cyclotis*) (Roca et al. 2001, 2005). A third species, the West African Elephant, has also been postulated. The IUCN SSC African Elephant Specialist Group currently accepts the single species proposal and has indicated that more extensive research is required before any decision is made to support any proposed re-classification of the African Elephant. Additionally, there is concern that premature allocation of more than one species may leave hybrid individuals in an uncertain conservation status (IUCN SSC African Elephant Specialist Group 2003). As only the Savannah Elephant occurs in southern Africa, the change in taxonomy will not affect any of the southern African populations.

Assessment Rationale

The total wild population within the assessment region is estimated at approximately 26,896 individuals of which 22,222 and 4,674 occur on state and private land respectively. Kruger National Park (KNP) (17,086 animals) and the agglomeration of private reserves adjoining KNP (3,930 animals) in South Africa contains the largest African Elephant subpopulation in the assessment region with an estimated 21,016 animals, of which 7,986 are inferred to be mature. Since 2006, elephant numbers have increased by approximately 41% within the assessment region. Furthermore, considerable effort has gone into translocating elephants to new properties over the past 30 years, thus expanding the current range (both extent of occurrence and area of occupancy). There are currently no major threats facing the wild elephant population in the assessment region. However, illegal ivory poaching, which is currently low to negligible, is anticipated to become a threat in the future. The Red List status of the African Elephant within the assessment region is thus maintained at Least Concern as elephant subpopulations regionally as well as locally are either stable or increasing and the minimum number of mature individuals is >8,000. However, as a precaution, and due to the concern of increased ivory poaching within southern Africa, it is recommended that annual reviews of the African Elephant's conservation status within the assessment region be done to keep track of trends relating to sharp increases in illegal killings both outside and within the region. Additionally, as existing elephant habitat is severely fragmented (see below) and the long-term resilience of the population depends on managing translocations between protected areas and developing migratory corridors across transfrontier conservation spaces, this species remains conservation dependent.

Regional population effects: Within the assessment region, the majority of the properties holding elephant are fully fenced and thus do not allow for range expansion or dispersal. There are currently no migratory populations in South Africa though two of the largest subpopulations, namely the Greater Limpopo Transfrontier Conservation Area (GLTFCA) – which includes KNP – and the Greater Mapungubwe Transfrontier Conservation Area (GMTFCA) – which includes Mapungubwe National Park – do undertake cross-border movements. The GLTFCA subpopulation moves between KNP, the adjoining private reserves to the west, Mozambique to the east and Gonarezhou to the north of KNP in Zimbabwe. The Tuli elephants (GMTFCA) move between Botswana, Mapungubwe National Park in South Africa and southern

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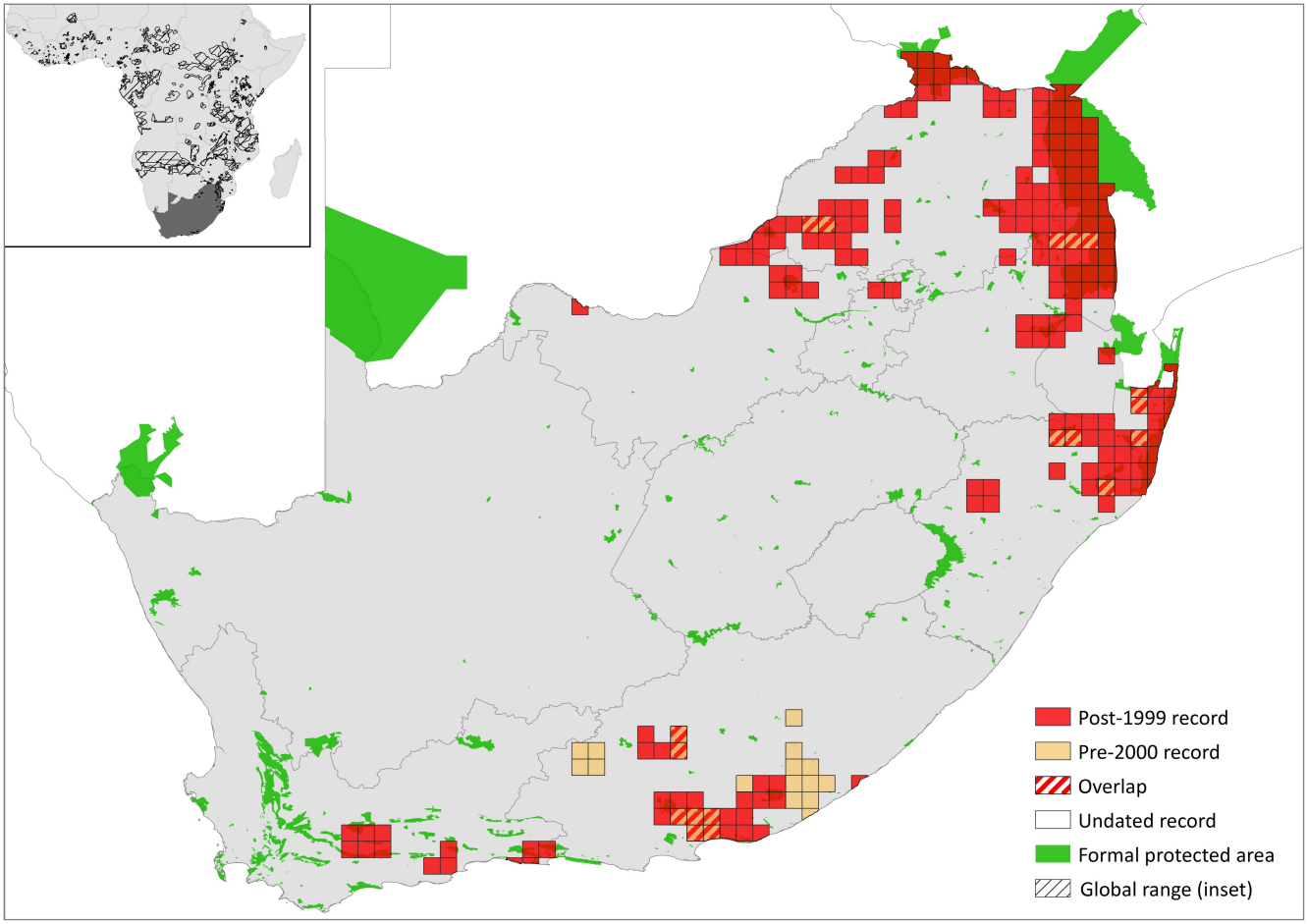

Figure 1. Distribution records for African Elephant (*Loxodonta africana*) within the assessment region

Table 1. Countries of occurrence within southern Africa

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

sections of Zimbabwe. Studies on the cross-border movement patterns have, however, not been running long enough to establish whether dispersal or range expansion is taking place. Tracking records from Elephants Alive show definite movement between Pafuri in the KNP and Gonarezhou in Zimbabwe as well as between KNP and Mozambique within the GLTFCA (Cook et al. 2015). Although it may still be too early to categorise any particular subset of the population as a source or sink population, it appears as if Limpopo National Park in Mozambique is being re-colonised from the Kruger population.

Distribution

African Elephants currently occur in 37 countries in sub-Saharan Africa. They have become Regionally Extinct in five countries since 1913, namely Burundi (1970s), The Gambia (1913), Mauritania (1980s), Swaziland (1920), and Sierra Leone (2009), while their current status in Senegal, Somalia and Sudan is uncertain (UNEP, CITES, IUCN, TRAFFIC 2013). Although large tracts of contiguous elephant range remain in parts of central, eastern and southern Africa, elephant distribution is becoming increasingly fragmented across the continent.

Elephants likely occurred at some or other time in the past over most of South Africa, including even the arid north-western parts (Boshoff et al. 2015). However, almost all of South Africa's elephants had been hunted by the 1890s, with only three, or possibly four, relict subpopulations remaining within the country (Carruthers et al. 2008). Since then, elephants in South Africa have undergone a period of sustained growth due to the proclamation and fencing of national parks and reserves. Between 1979 and 2001, over 800 elephants were translocated to approximately 58 reserves in South Africa (Garaï et al. 2004). These newly introduced elephant subpopulations have been characterized by high growth rates (Carruthers et al. 2008; van Aarde et al. 2008). At present, elephants occur in all the provinces but the Northern Cape and the Free State, and within approximately 79 reserves of which 21 are state owned or managed, and 59 private properties (ESAG 2015). No elephants occur within Lesotho. Elephants in Swaziland were reintroduced to the country in the 1980s and 1990s. Elephants now occur in two parks, namely Hlane National Park and Mkhaya Nature Reserve (ESAG 2015). In recent years, elephants have sporadically ventured into Malolotja National Park from Songimvelo Nature Reserve in South Africa.

Prior to the 1980s, the area available to elephants decreased, but within the last 20–30 years elephant range within South Africa has been increasing, through reserve expansion and the introduction of elephants onto private properties (Slotow et al. 2005; Selier 2007; Druce et al. 2008). Even though there has been a significant expansion of the elephant range within the assessment region, the population is fragmented and most subpopulations are small and fully fenced.

Habitat available to elephants is estimated to have increased from approximately 30,455 km^2 in 2007 to approximately 33,840 km^2 in 2013 (ESAG 2015). This is only an estimate as limited data are available on the area sizes of private properties.

Population

On the African continent, estimates of the total African Elephant population range between 436,305 and 650,000 individuals (CITES, IUCN and TRAFFIC 2013). Recently, the southern African range states have become the last stronghold of the African Elephant, holding close to 55% of the known elephants on the continent, approximately 270,299–364,925 elephants (African Elephant Database). East Africa holds approximately 28% and Central Africa 17%. In West Africa, less than 2% of the continent's known elephants are spread out over the remaining 13 elephant range States. In the late 1970s, southern Africa's elephant populations were recovering from historical lows due to overhunting in the early 20th century. That recovery has continued, and elephant numbers in this region are now considerably higher than they were in the late 1970s, and indeed higher than in any other African region. Within southern Africa, Botswana holds by far the largest population in the sub-region and on the continent, while Namibia, South Africa, Zambia and Zimbabwe also hold large elephant populations. While numbers appear to be increasing in Namibia and South Africa, there appear to be some initial declines in some of the subpopulations in Zimbabwe and Zambia, and subpopulations in Mozambique are presently being severely poached and are showing steep declines (CITES, IUCN and TRAFFIC 2013; Booth 2014).


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South Africa holds approximately 6.3% of the total African Elephant population (UNEP, CITES, IUCN, TRAFFIC 2013) and has the third largest elephant population in southern Africa. The elephant population is fragmented and subpopulation sizes vary from very small (one individual) to very large (such as the KNP; Scholes & Mennell 2008). Fences restrict movements of all but a few elephant subpopulations in the assessment region (van Aarde et al. 2008). Subpopulations not fully fenced include iSimangaliso Wetland Park, Ithala Game Reserve, the GMTFCA, and KNP, of which the latter is linked to the GLTFCA. The largest subpopulation currently is that of KNP (17,086 animals) (S. Ferreira pers. comm. 2016) and the adjoining agglomeration of reserves to the west of the KNP (3,930 animals) with a total population estimate of 21,016 elephants. Currently, more than 72% of the properties in South Africa have fewer than 75 elephants (ESAG 2015), and most of these subpopulations occurring on small and medium-sized fenced properties are highly managed to prevent habitat degradation (Slotow et al.

Table 2. Summary of population size estimates for African Elephant (*Loxodonta Africana*) in South Africa

Province	Inside natural distribution range	Formally protected		Private		Total	
		No of sites (2014)	Subpopulation total (2013–2015)	No of sites (2014)	Subpopulation total (2013–2015)	No of sites (2014)	Subpopulation total (2013–2015)
Eastern Cape	Yes	2	663	9	221	11	884
KwaZulu-Natal	Yes	5	1,299	15	574	20	1,873
Gauteng	Yes	0	0	1	13	1	13
Limpopo	Yes	5	18,371	25	2,558	30	20,929
Mpumalanga	Yes	3	610	5	1,263	8	1,873
North West	Yes	2	1,246	2	16	4	1,262
Northern Cape	Yes	0	0	0	0	0	0
Western Cape	Yes	1	1	2	29	3	30
Free State	No	0	0	0	0	0	0
Total		18	22,190	59	4,674	77	26,864

2005). Subpopulations with more than 150 elephants account for approximately 5% of the total South African population (ESAG 2015). Thus, even precluding intensively managed subpopulations on small reserves, leaves 21,016 individuals within the greater KNP system, of which 7,986 are estimated to be mature based on a 38% mature herd structure (Owen-Smith 1988). Metapopulation management is not implemented among small and medium-sized reserves, but is important for retaining the genetic diversity within the national population.

The estimated annual population growth rate, particularly for small subpopulations in South Africa, exceeds the maximum theoretical growth rate of 7% (Calef 1988; van Aarde et al. 2008). Annual growth rates for South African subpopulations range from -0.6 to 25.5% per year, where, of the 29 estimates of annual population growth rates in South Africa, only two were negative and 16 were higher than 7% per annum (van Aarde et al. 2008). Synchronised breeding and skewed age structures can cause high, short-term spurts in annual population growth rates which are unlikely to persist in the longer term (van Aarde et al. 2008). Elephant numbers in South Africa increased by approximately 26.8% between 2002 (14,071 elephants) and 2006 (17,847 elephants). Since 2006 there has been an approximate increase of 41% in South Africa's elephant population. The average annual growth rate for the South African elephant population is estimated at 6.9% for the period 2001 to 2013 (ESAG 2015) despite the KNP annual growth rate having dropped to 3.5% between 2006 and 2012. At the time when culling stopped in the mid-1990s, the annual growth rate for KNP was estimated at 6.1% (Ferreira et al. 2012). Elephant subpopulations on private land have been increasing at 7.2% per annum (ESAG 2015). As most private properties have, or are in the process of, implementing immuno-contraception and other measures to reduce reproduction (for example, vasectomy), this trend is likely to stabilise in future. The elephant subpopulation of GMTFCA is increasing at < 2% per annum (Selier et al. 2014). The only subpopulation where there appears to be a continued decline in numbers is the relict population in the Knysna forests (Carruthers et al. 2008). This subpopulation is not considered to be viable.

The total elephant population of Swaziland is small, with only two subpopulations totalling approximately 32 elephants. All subpopulations are fully fenced and managed. Elephants within Malolotja National Park are most likely individuals crossing over from Songimvelo Nature Reserve in South Africa.

Current population trend: Increasing. The average annual growth rate for the South African elephant population is estimated at 6.9% for the period 2001 to 2013.

Continuing decline in mature individuals: No

Number of mature individuals in population: Due to the large variation in subpopulation sizes and social structures, and lack of information on specific subpopulation structures, it is difficult to determine the number of mature individuals for the total population in the assessment region. However, based just on the broader KNP ecosystem, we estimate the minimum number of mature individuals as 7,986 (see below).

Number of mature individuals in largest subpopulation: The Greater KNP subpopulation: 7,986, considering approximately 38% of a growing population is mature individuals (> 15 years of age) (Owen-Smith 1988).

Number of subpopulations: 79: 18 formally protected, 59 privately protected, and two communal owned reserved managed by provincial authorities.

Severely fragmented: Yes. Most subpopulations exist in small, fenced areas, which necessitates translocation and management.

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Habitats and Ecology

Elephants are megaherbivores (Owen-Smith 1988). They are generalists that can use a variety of food resources (van Aarde et al. 2008). Within South Africa, elephants occur in most habitat types, such as the bushveld regions of the Lowveld and Zululand (KwaZulu-Natal), as well as Eastern Cape thicket habitats extending into the southern Cape forests. Major river systems have been shown to be important for elephant distribution (Gaylard et al. 2003; Smit et al. 2007; Smit & Ferreira 2010), and thus there is some dependence on these linear habitats. Much research has documented their preference for riverine habitats (Viljoen 1987; Smit et al. 2007; Ihwagi et al. 2010) and they concentrate in areas where surface water is available (Chamaillé-Jammes et al. 2007; De Knegt et al. 2011). Tampering with the distribution of water through the construction of dams and waterholes will therefore alter the ranging behaviour of elephants (Grainger et al. 2005).

Elephants have been translocated across several provinces within South Africa, and now occur in habitat types that may not have formed part of their natural distribution range in the past (Ebedes et al. 1995; Scholes & Mennell 2008). At present, elephants occur in nearly all habitat types within South Africa, but historically were not found year round in certain habitats, such as the Karoo. Elephants may cause habitat degradation in areas where they occur in high densities or where they did not naturally occur (Kerley et al. 2008). Due to the combined effect of fire, increased elephant densities and climate change, vegetation changes such as bush encroachment and tall tree loss is being observed in some areas.

Within South Africa there has been an increase in the number of private game reserves, as well as land expansion programmes by provincial and national conservation bodies. High numbers of restricting fences and intense resource management (for example, artificial water points), have prevented elephants from dispersing across most South African properties and all Swaziland sites (Scholes & Mennell 2008; Vanak et al. 2010). This in turn has had effects on natural population control mechanisms. Additionally, elephants in South Africa have relatively small home ranges compared to those of elephants throughout the rest of the region (Table 3). In dry areas such as the far western parts of South Africa, where rainfall is relatively low, elephants tend to have larger home ranges than in wetter areas to the east (van Aarde et al. 2008). In KNP, a seven-year movement study including 36 adult elephant cows revealed that elephant clans (cow/calf groups) occupy home ranges to which they are faithful and they do not undertake seasonal "migrations" (Whyte 2001). Elephants tend to concentrate around permanent rivers or other permanent water sources during the dry season, and disperse once the rains commence and surface water becomes available elsewhere. However, such dispersal appears to remain mostly within their home ranges. Adult bulls are generally fairly sedentary within bull areas, but they do disperse quite widely during musth periods. In some areas, elephants have been able to expand their home ranges as fences have been removed (Druce et al. 2008). The establishment of TFCAs has meant that some elephants may now move across international boundaries (Cook et al. 2015; Selier et al. 2014), but these should still be considered to be normal within home range movements and not migrations.

Elephants are capable of occupying diverse habitats because they are physiologically adapted to do so and because their close-knit social structures create platforms for continued learning and adaptation. They are capable of engaging in effective tool-use (Hart et al. 2001) and have passed the mirror self-recognition test as have apes and dolphins (Plotnik et al. 2006). Elephants' brains have a relatively large hippocampus compared to primates which may explain their long social and chemical memories (Hakeem et al. 2005). Consequently they can keep track spatially of where other individuals are relative to themselves (Bates et al. 2008), and it has even been shown that elephants can classify subgroups of humans that pose different degrees of danger (Bates et al. 2007). Elephants are known to exhibit concern for deceased individuals or to offer assistance to conspecifics in distress (Douglas-Hamilton et al. 2006). Research has shown that they show higher levels of interest in elephant skulls and

Table 3. Home range sizes (minimum convex polygons) of elephant bulls and cows collared within the Associated Private Nature Reserves (Henley 2014) in comparison with the literature (*van Aarde et al. 2008)

Group type	South Africa*		Associated Private Nature Reserves		Other regions*	
	n	Home range size in km^2 (range)	n	Home range size in km^2 (range)	n	Home range size in km^2 (range)
Cows	51	595 (21–2,766)	8	1,863 (619–3,203)	73	1,678 (4–10,738)
Bulls	43	153 (32–1,707)	23	3,818 (1,092–11,172)	23	2,095 (3–12,800)

Table 4. Use and trade summary for the African Elephant (*Loxodonta africana*)

Category	Applicable?	Rationale	Proportion of total harvest	Trend
Subsistence use	No	-	-	-
Commercial use	Yes	Both consumptive utilisation in the form of trophy hunting (< 1%) and non-consumptive tourism in the form of photographic tourism on provincial and private reserves are high. Photographic and "safari" tourism is higher than trophy hunting in both quantity and revenue.	100%	Stable
Harvest from wild population	Yes	Both consumptive utilisation in the form of trophy hunting (< 1%) and non-consumptive tourism in the form of photographic tourism on provincial and private reserves are high.	100%	Stable
Harvest from ranched population	No	-	-	-
Harvest from captive population	Yes	Very low number of elephants in captivity (approx. 126) and primarily for ecotourism purposes. Also virtually no removals from wild to captive (only 5 live elephants were exported from captive facilities after 2008).	Very low	Decreasing

Table 5. Possible net effects of wildlife ranching on the African Elephant (*Loxodonta africana*) and subsequent management recommendations

Net effect	Positive
Data quality	Observed
Rationale	Wildlife ranching and the private sector in general had a positive effect on this species. The species has been widely reintroduced onto private properties within its natural distribution range but also in some cases introduced outside of its natural distribution range. Each private property manages their elephants as they need to according to the size of the property, density of game and elephants, objectives and habitat. Many private reserves have tourism as the main objective and therefore will manage for optimal elephant viewing. Nearly all elephants within the assessment region, with the exception of KNP, Mapungubwe National Park, Addo Elephant Park and Tembe Elephant Park, are translocated elephants. The founding populations originated in most cases from KNP during the late 1980s and 1990s; in some later translocations, the elephants were moved between some of the reserves. All elephants are free-roaming. Captive elephants are not included in this assessment and are not considered part of the overall population. In accordance with the National Norms and Standards for the Management of Elephants in South Africa (Government Gazette No. 30833, 29 February 2008), all properties with elephants are required to submit an elephant management plan to the relevant Provincial Management Authority.
Management recommendation	Keep elephant density low in small reserves to maintain habitat quality. Include elephant and habitat monitoring in elephant management plans.

ivory than in other natural objects (McComb et al. 2006). We now know that the oldest individuals in a group have enhanced social discrimination and consequently function as important repositories of social knowledge (McComb et al. 2001). Gradually it has become permissible to talk about elephant cognition and the empathy of elephants (Byrne et al. 2008).

Ecosystem and cultural services: Elephants are a keystone species which means that their interactions with other species generate effects that are large relative to their abundance (Carignan & Villard 2002). The African Elephant, specifically, is an ecosystem architect and gardener without parallel. The breaking of trees creates microhabitats for seedlings and small vertebrates and invertebrates. Their dung is a food source for dung beetles and a variety of birds and a dispersal mechanism for many tree species. Even species such as the Ground Hornbill (*Bucorvus leadbeateri*) and the Pearl-spotted Owlet (*Glaucidium perlatum*) rely on elephants to create nesting sites in hollows of old dead trees. In the winter months, elephants dig holes in the dry riverbeds to access water, which is then available to all other water-dependent species. Their big feet create pathways through the thickets for other smaller species to follow and even for humans when hiking through the African bush. Through their feeding habits they make browse available for other browsers, maintain structure in savannahs by reducing the tree to grass ratio and create nutrient rich microclimates underneath dead trees. Overall their effect is to increase biodiversity, from mites to mammals.

The elephant is also an umbrella species in that it requires large areas of suitable habitat to maintain viable populations and its requirements for persistence are believed to encapsulate those of an array of associated species (Carignan & Villard 2002). Elephants have vast home ranges and require large intact areas to maintain their populations. By creating areas in which we protect elephants, we ultimately protect many other species that share their habitat with elephants.

And lastly the elephant is a flagship species. These are species that can easily attract public support for conservation and we can piggy back many of our conservation efforts on the back of elephant conservation,

especially for those species less likely to attract the public's eye (Carignan & Villard 2002). Elephants share many attributes with humans such as their consciousness, their extraordinary communication, good memory, similar lifespan, strong sense of family, their ability to plan into the future and their awareness of death. They raise emotions and topics surrounding bioethics and animal rights to a greater degree than most other creatures (Scholes & Mennell 2008).

Literature on elephants has not only focussed on their ecological importance but has placed elephants within various human and cultural views. Hence our attitude towards elephants has ranged from hostile to sympathetic and from economic to ethical over the past 150 years (Carruthers 2010). The importance of ivory has made elephants part of our history for centuries. The Tso Chwan of 548 BC had already remarked that elephants have tusks which lead to the destruction of their bodies as their tusks are seen as gifts. Ancient Egyptians were thought to use ivory as early as 6000 BC. In our present time, elephants are still being slaughtered for their ivory, which has particular cultural value either as objects of prestige in the form of carved statues, family seals or religious artefacts. Live elephants have played pivotal roles as work horses in the timber industry and as modes of transport, as instruments of warfare, as guardians of temples, as objects of sport during trophy hunting or simply as sources of protein when hunted for consumption. With such a diverse array of cultural services, they can be regarded as cultural emissaries of mankind.

Use and Trade

In South Africa, elephants are utilised for trophy hunting, photographic tourism and recreation (for example, captive individuals) in accordance with the sustainable use policy environment prescribed by the National Environmental Management: Biodiversity Act 10 of 2004 (NEMBA). Trade can be described as commercial at local, regional, national and international scales. Photographic tourism remains the predominant form of utilisation within the assessment region (Table 4; Table 5). Trophy hunting is limited, and it is unlikely to have a deleterious effect on the population as a whole. Regulatory mechanisms are however required to prevent the over utilisation of large-tusked individuals (Selier et al. 2014).

Increasing trends in offtake due to trophy hunting (for international and limited national markets) have been observed in certain reserves/regions within South Africa. Local trade involves mainly exchanges between properties through translocations, but is limited. The Swaziland elephant population is included in Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), while the South African population has been listed on Appendix II since 2000. A trade ban on the international trade in ivory was implemented in 1989. However, South Africa and three other southern African countries were allowed a once-off sale of stock piled ivory in 2007 (van Aarde & Ferreira 2009). There was a significant increase in the legal and illegal international trade in carvings and elephant feet from 2002–2011, but in no other elephant products (CITES trade database, UNEP World Conservation Monitoring Centre, Cambridge, UK). There are approximately 126 elephants in captivity (Wentzel & Hay 2015; Table 4).

Threats

Poaching and the illegal ivory trade are currently the major global threats to elephants. The loss and fragmentation of habitat caused by ongoing human population expansion and rapid land conversion is a current and ongoing threat to elephants within Africa. A specific manifestation of this trend is the reported increase in human-elephant conflict, which further aggravates the threat to elephant populations. According to the CITES, IUCN SSC African Specialist Group, TRAFFIC International (2013) report, the poaching rate of 7.4% in 2012 remains at an unsustainably high level as it exceeds natural population growth rates of usually no more than 5%. Central Africa consistently shows the highest overall poaching levels, in contrast with southern Africa which shows the lowest overall levels (CITES et al. 2013). Across Central Africa and in parts of East Africa a greater than 60% decline in elephant numbers in the past 10 years has been suggested (Maisels et al. 2013).

There are currently no major threats facing wild elephant subpopulations in the assessment region. However, illegal

Table 6. Threats to the African Elephant (*Loxodonta africana*) 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	*5.1.1 Hunting & Collecting Terrestrial Animals*: increased poaching of Elephant for the illegal ivory trade.	UNEP, CITES, IUCN, TRAFFIC 2013	Empirical	Global	Increasing, based on general rise in poaching across Africa. In KNP alone, 19 Elephants were poached in 2015.
2	*5.1.1 Hunting & Collecting Terrestrial Animals*: over utilisation of large tusked individuals leading to a decline in these animals.	Selier et al. 2014	Empirical	Local	Increasing
3	*1.1 Housing & Urban Areas*: settlement expansion has led to small, isolated subpopulations. Current stresses *1.2 Ecosystem Degradation* and *1.3 Indirect Ecosystem Effects*: degradation and fragmentation of remaining ecosystems may undermine the long term resilience of the population.	-	Anecdotal	-	Stable

poaching, which is currently low to negligible, is anticipated to become a threat in the near future. The following bulleted statistics, collated from various sources, highlight the potential poaching threat to elephant populations within South Africa by first outlining continental trends and then narrowing the potential threat down to the assessment region in particular (Table 6):

- There has been a 45% decline in elephant range over 28 years, with at least 70% of their remaining range falling outside of protected areas (Blanc et al. 2007). Illegal killing levels have become unsustainable since 2010, peaking in 2011 with over 100,000 lost between 2010 and 2012 (Wittemyer et al. 2014).
- These mortality rates exceed the maximum annual reproductive rate of 7% and with continuation of these trends we are experiencing a continent-wide decline in elephant numbers of approximately 3% (Wittemyer et al. 2014).
- Elephants in southern Africa now make up more than 50% of the continental total compared to only 21% of the total elephant population more than 20 years ago (Douglas-Hamilton 2009).
- Poaching incidents have consequently progressed with time from West to Central to East Africa with southern African states experiencing more recent incidents. Poachers are expected to intensify their activities in areas that will afford them the best catch-per-unit effort. The KNP elephant population, although the largest in South Africa, is at risk due to the ongoing poaching of both species of rhinoceros (*Ceratotherium simum simum* and *Diceros bicornis*) within this region, the lack of adequate law enforcement on the Mozambique side, coupled with the substantial area over which poachers can gain access to resources within the KNP.
- At present, illegal offtake of elephants is still considered low in South Africa, with only three incidents of poaching reported for 2013 and two in 2014. However, in 2015 a sudden increase in poaching was observed with 19 elephants poached in KNP alone in September and October 2015 (S. Ferreira pers. comm. 2015). It is thus anticipated that poaching may become a threat to elephants in South Africa in the future.
- These threats are severe on the continental scale and, since South Africa is a stronghold for elephant conservation, this national status can act as an indicator of increasing severity across the continent. Hence this assessment should be re-evaluated regularly.

Another threat may be unregulated trophy hunting. Even though trophy hunting of elephants is limited, and it is unlikely to have a deleterious effect on the population as a whole, large-tusked individuals are in high demand for trophy hunts and these animals are becoming increasingly scarce as a consequence. Regulatory mechanisms are thus required to prevent the over utilisation of large-tusked individuals (Selier et al. 2014).

Table 7. Conservation interventions for the African Elephant (*Loxodonta africana*) 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	*1.1 Site/Area Protection*: create transfrontier conservation areas and corridors to allow for elephant movements and better connectivity in the landscape.	Druce et al. 2008	Empirical	Local	Natural recolonization was documented following fence removal. Elephants move more quickly through corridors.	Peace Parks Foundation, Space for Elephants, Central Limpopo Valley Elephant Research Project
		Douglas-Hamilton et al. 2005	Empirical	Regional		
		Jachowski et al. 2013	Empirical	Local		
		van de Perre et al. 2014	Attitudinal	Local		
		van Aarde & Jackson 2007	Review	National		
		Selier et al. 2015	Empirical	Regional		
2	*3.1.1 Harvest Management* and *3.1.2 Trade Management*: create strict protocols in reserves where elephants are trophy hunted to ensure sustainable quotas and protect large-tusked individuals from being over-exploited.	Selier et al. 2014	Empirical	Local	Smaller trophy hunting quota suggested but not yet implemented.	Central Limpopo River Valley Elephant Research Project
3	*5.2 Policies & Regulations*: revision of National Norms and Standards for the Management of Elephants in South Africa to be more in line with the latest scientific thinking and better address current management challenges, including the creation of a meta-population plan to coordinate the management and movement of elephants on a national level.	Selier et al. in press	Empirical	National	Suggestions made but not yet implemented.	ESAG, DEA proposed revision 2018-2019

Minor threats to elephants within South Africa, especially those on small reserves being intensively managed, include:

- The impact of fencing and natural resource manipulation, such as the provisioning of perennial artificial water supplies, on the movement patterns and intensity of habitat use by elephants, which could lead to habitat degradation.
- The potential long-term effects of contraception and other restricting measures on elephant social structure and behaviour within small reserves.
- A decline in genetic diversity due to the lack of a national metapopulation management plan within the network of small reserves.

While contraception can control population growth, one of the tools to reduce population sizes, namely translocation, is currently limited due to a lack of suitable new areas or reserves to which elephants can be introduced. The manipulation of natural resources, such as the provision of artificial water supplies all year round, together with fencing, are concerns in larger subpopulations as these affect the movements of elephants and the intensity of resource use by elephants, potentially leading to habitat degradation. Habitat degradation in small fenced reserves, in conjunction with severe droughts, may affect these small fenced populations if elephants cannot be relocated in time. Within South Africa, only two elephant subpopulations can move naturally as fences restrict movements elsewhere. Metapopulation management is not implemented among small reserves, but is important for retaining genetic diversity within the national population. Small family units translocated to various properties throughout the country with no metapopulation management plan in place could lead to inbreeding depression and a loss in genetic diversity (van Aarde et al. 2008).

Current habitat trend: Habitat available to elephants has increased through the rise of transfrontier conservation areas and small private protected areas. However, elephants have a preference for riverine habitats where 84% of South Africa's main river ecosystems are threatened and 54% are Critically Endangered (Nel et al. 2007). Furthermore, while 16 of the 112 main river ecosystems are relatively well represented within protected areas, only 50% of rivers within protected areas are intact (Nel et al. 2007). Protecting riverine corridors is thus an imperative for conservation planning.

Conservation

Since 2008, elephants in South Africa have been managed in accordance with the National Norms and Standards for the Management of Elephants in South Africa (Government Gazette No. 30833, 29 February 2008). The species is listed as protected in terms of section 56 of NEMBA, and various provincial ordinances and Acts provide further legislative protection. Permits are therefore required to undertake a variety of activities in relation to elephants (for example, hunting and other forms of direct use). Since the implementation of the National Norms and Standards for the Management of Elephants in South Africa, no wild elephants have been exported to captive facilities abroad. However, the same does not apply to Swaziland, whom recently exported wild elephants to zoos in the USA.

The following agreements are in place within the assessment region:

- CITES: South Africa's elephant population was downlisted to Appendix II in 2000, which means that, according to Article IV, elephants and derivatives can be exported if the CITES Scientific Authority of South Africa deems it non-detrimental to the long term survival of the species. At present, ivory is listed as Appendix I and can only be exported as part of a hunting trophy but cannot be traded.
- SADC Protocol on Wildlife Conservation and Law Enforcement (1999). This protocol seeks to establish a framework for the conservation and sustainable use of wildlife resources in the SADC region.
- Southern Africa Regional Elephant Conservation and Management Strategy and the Addis Ababa Principles and Guidelines for the Sustainable Use of Biodiversity. The purpose of the strategy is to facilitate coordination, collaboration and communication in the management of elephant populations across the region so as to conserve elephants and expand their range within historical range, forming as contiguous a population as possible across southern Africa, and, in so doing, realising their full potential as a component of wildlife-based land use for the benefit of the region and its people.
- CITES Elephant Action Plan, 15th meeting of CoP Doha, Qatar 13–25 March 2010.

The following legislation is in place within South Africa:

- Elephants are listed as protected in terms of section 56 of NEMBA, due to the international trade in the species and its high conservation value. All activities relating to the direct use of elephants (for example, translocation, hunting, selling, etc.) cannot be undertaken without a permit issued by the relevant Provincial Management Authority.
- The National Norms and Standards for the Management of Elephants: to ensure that elephants are managed in a way that safeguards their long-term survival within the ecosystems in which they occur or may occur in the future, to promote broader biodiversity and socio-economic goals that are socially, economically and ecologically sustainable, and to enable the achievement of specific management objectives of protected areas.
- Local management plans to effectively manage elephants.

The following actions or interventions are needed (Table 7):

- Establishment and effective management of transfrontier conservation areas, to allow for the freer movement of elephants (Druce et al. 2008). This includes the implementation of transboundary elephant management plans and the management of transboundary populations on a population level.
- The establishment and effective management of corridors between large game reserves within the assessment region (*sensu* Douglas-Hamilton et al. 2005; van Aarde & Jackson 2007; Jachowski et al. 2013; Perre et al. 2014; Selier et al. 2015). This includes developing wildlife corridors between private reserves and/or provincial or national parks to allow for movements.

- Revise the National Norms and Standards for the Management of Elephants in South Africa to be more in line with the latest scientific thinking and better address current management challenges (Selier et al. *in press*).
- Apply strict protocols and regulatory mechanisms in reserves where elephants are trophy hunted to not only ensure sustainable quotas but specifically to protect large-tusked individuals from being over-exploited.
- Legislative action, such as employing sanctions against countries that have proved to have no control over fuelling the illegal trade in wildlife products (for example, Mozambique and China).
- Stricter legislative measures to prevent illegal ivory from being smuggled through and out of South Africa.

Recommendations for land managers and practitioners:

- Effective community consultation and participation is necessary in corridors and reserves to decrease poaching rates and to uplift local economies.
- More effective implementation of the National Norms and Standards for the Management of Elephants in South Africa, including the implementation of management plans on both state owned and private land.
- Implementing immuno-contraception and other measures to reduce reproduction (for example, vasectomy), to stabilise small- and medium-sized subpopulations on fenced reserves and limit possible detrimental effects on habitat.
- The species would not benefit from captive breeding programmes. Instead, promote corridors and linkages to increase areas available for elephant movement.
- Develop a metapopulation management plan for small reserves to ensure the long-term resilience of the population. This includes developing a habitat sensitivity map of ecosystems/habitats in which the reintroduction of elephants would be detrimental.

Research priorities:

- The long-term effects of contraception on elephant social structure and behaviour.
- Collating poaching incidents throughout neighbouring countries (illegal shooting and poisoning in Mozambique and Zimbabwe specifically) to follow trends and ensure that such incidences can be curbed by stricter legislation or preventative measures such as fencing sections for stricter control of human exploitation.
- Similarly, investigating the effects of rhinoceros poaching and the associated increased human presence due to poachers and security measures, on the behaviour and stress levels of elephants in areas within South Africa where the species coexist, could help to plan reintroductions and translocations.
- Understanding the importance of 'Damage Causing Animals' or 'Escaped or Roaming Animals' as corridor establishers, dispersers and/or economic burdens or gains in areas where they are found.
- Continue research on the effects of closures of water points on both vegetation and the dynamics of the affected elephant subpopulations.

Encouraged citizen actions:

- Citizens can report any suspect activities in our protected areas as well as report all mortalities.
- Landowners should create conservancies and corridors for this species and engage local communities to create sustainable, wildlife-based rural economies.
- Report sightings of free-roaming herds outside protected areas on virtual museum databases (for example, iSpot and MammalMAP), especially sightings of large-tusked individuals.
- Provide detailed documentation and meticulous record keeping where Damage Causing Animal incidences occur on private land.
- Report sightings of large tree-nesting birds within reserves for monitoring the effects of elephants.

Data Sources and Quality

Table 8. Information and interpretation qualifiers for the African Elephant (*Loxodonta africana*) assessment

Data sources	Census (literature and unpublished), field study (literature and unpublished)
Data quality (max)	Observed
Data quality (min)	Estimated
Uncertainty resolution	Total count/confidence intervals
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.*