

Non-detriment finding assessment for *Giraffa camelopardalis giraffa* (South African giraffe)

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Summary of findings

Giraffa Camelopardalis (giraffe) was included in Appendix II to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) at the Conference of the Parties in 2019. In terms of Article IV of the Convention, an export permit shall only be granted for an Appendix II species when a Scientific Authority of the State of export has advised that such export will not be detrimental to the survival of that species. However, South Africa has submitted a reservation with regards to the listing of giraffe on Appendix II, which means that at present the current listing and reporting requirements for giraffe are not applicable to South Africa. Regardless, a non-detriment finding (NDF) for *Giraffa Camelopardalis giraffa* (South African giraffe) was compiled through a review of the relevant literature and deliberations held at a Scientific Authority workshop convened by the South African National Biodiversity Institute on 29 June 2022 (workshop participants and references included at the end of this document), and amended through various further consultations. The information presented is current as of June 2022.

Giraffes are long-lived, with both sexes living between 20 and 25 years, and are considered to have a low reproductive rate. Female giraffes have a long gestation period of about 22 months. Giraffes start breeding at the age of five years and on average produce one calf every 12 to 24 months. The species is regarded as a habitat and dietary specialist due to its preference for selectively browsing trees of sufficient height as well as its unique morphological adaptations for foraging at higher strata than any other savanna herbivores. As a large mammal, giraffe is likely to be a good disperser, but under the current conditions i.e. habitat fragmentation through fencing as well as availability of suitable habitats within reserves, giraffe is considered a medium disperser. The species seems to be tolerant and resilient to human activity, but is conservation dependent across its range.

The South African giraffe can be hailed as a southern African conservation success story. Although the national population is fragmented, the subspecies is widespread in the country, occurring within all nine provinces. The South African population is estimated between 21,053 and 26,919 individuals of which approximately half of the population occurs on privately-owned land. The subspecies is thus considered a common species within South Africa. The population of *Giraffa camelopardalis giraffa* in South Africa is increasing. Data from 13 formally protected areas show an estimated population increase of 54% over three generations (1985–2015). Recent quantitative data of individual populations exist on a local level and there is a high confidence in the population trends. *G. c. giraffa* is regionally listed in the IUCN Red List category of Least Concern and there are no major threats facing the subspecies. Minor threats include habitat fragmentation and degradation. Another potential threat is hybridization between different subspecies, which may threaten the genetic integrity of the southern subspecies *G. c. giraffa*. There is no evidence of illegal killing of giraffe for the international trade. The illegal killing for domestic use is considered small to negligible.

Legal harvest of *G. c. giraffa* is predominantly for population management purposes and dually managed by both private landowners and government (provincial and national) within an adaptive framework, focused on the long term conservation and sustainable use of the subspecies. While there is no national management plan for the subspecies, the population of *G. c. giraffa* is well managed in South Africa. The policy/regulatory framework in place across all provinces for giraffe can be considered an approved and coordinated management plan. Across all provinces the subspecies is listed as Protected, which means that all provinces acknowledge the need that giraffe requires special measures. In addition, all policies / regulations are approved and subject to a public participation process. There are no national or provincial quotas for the off-take of giraffe in South Africa, but off-

takes are managed on a local scale by the provincial Management Authorities through a permit system on a case-by-case basis, based on direct population estimates. A quota is thus not considered a requirement for this species. Based on the above there is thus a high confidence in the harvest management and monitoring of giraffe in South Africa.

Majority of the legal harvest occur on private land, outside of protected areas and considered beneficial to the species. The increase in private ownership of giraffes across South Africa and the economic interest in conserving a thriving, healthy and viable population, and by default a suitable environment for giraffes, have stimulated an increase in giraffe numbers. At present, approximately half of the estimated giraffe population of 23,470 – 26,919 individuals occur within privately-owned properties. In addition, giraffe is widespread occurring on nearly all wildlife properties across its natural distribution range in South Africa.

Throughout the non-peer-reviewed literature, and primarily within the UK- and USA-based media sources, Dunn *et al.*, (2021) observed a common assertion that the international trade of giraffe trophies from Southern Africa had an additional negative impact on wild giraffe populations. This finding, however, was not corroborated by their the peer-reviewed literature or specialist survey responses, which instead highlighted a stark regional disparity in the trade and offtake of giraffe, with few indications of international trade occurring outside the legal and sustainable trophy hunting operation within Southern Africa.

Approximately 50% of the estimated giraffe population occur within state protected areas, and is therefore well protected. The Kruger National Park population was estimated between 7,598 – 11,972 individuals at the end of 2020. Harvesting is one of the mechanisms that provides incentives for the keeping and conservation of giraffe in South Africa. Both the management and specifically the harvest of the species is subject to strong regulation on a provincial level which is considered very effective. Thus at present no population or area in which giraffes occur is excluded from offtake potential.

The non-detriment finding undertaken for *Giraffa Camelopardalis giraffa* (South African giraffe) demonstrates that international trade poses a low risk to this species in South Africa (Fig. 2). The national giraffe population is increasing and there is no evidence of overuse anywhere in South Africa. The subspecies is well managed and the Scientific Authority does not have any current concerns relating to the harvest of the species.

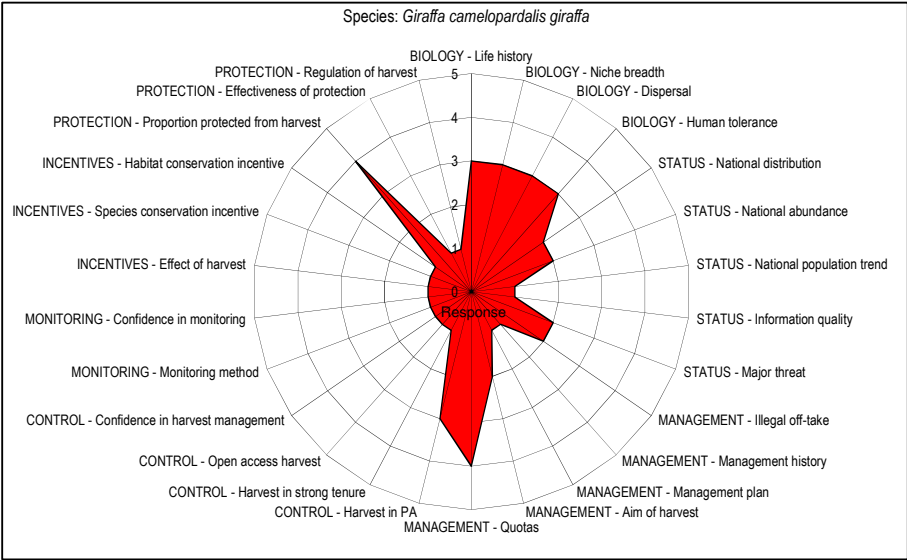


Figure 1: Radar chart summarizing the non-detriment finding assessment for *Giraffa camelopardalis giraffa* (South African giraffe) in South Africa in accordance with the CITES NDF checklist. Explanations of scores given are detailed in Table 1. Higher scores are indicative of higher risks to the species. The limited shaded area in the radar chart demonstrates an overall low risk to the species.

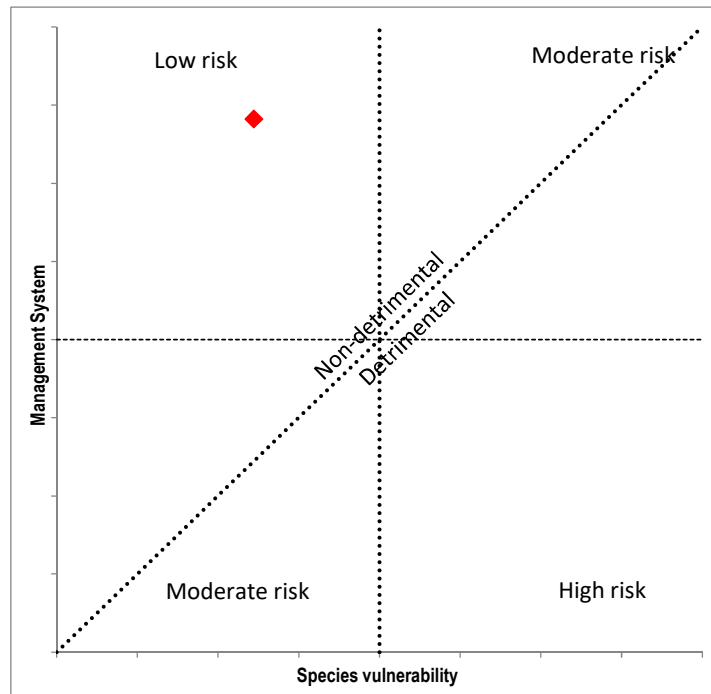


Figure 2: The risk of trading in *Giraffa camelopardalis giraffa* (South African giraffe) by South Africa, as represented by the relationship between species vulnerability (biology and status) and the strength of the management system to which the species is subjected (management, control, monitoring, incentives and protection). The figure demonstrates that the species is at a low risk and that trade is non-detrimental.

Table 1. Detailed non-detriment (NDF) assessment for *Giraffa camelopardalis giraffa* (South African giraffe) in South Africa, undertaken in accordance with the CITES NDF checklist. Scores assigned to each question are indicated (bold text and shaded blocks) along with detailed explanations/justifications where relevant. Higher scores are indicative of higher risks to the species.

Biological characteristics		
1. Life history: What is the species' life history?	High reproductive rate, long-lived	1
	High reproductive rate, short-lived	2
	Low reproductive rate, long-lived	3
	Low reproductive rate, short-lived	4
	Uncertain	5
The South African giraffe (<i>Giraffa camelopardalis giraffa</i>) is long-lived with both sexes living to approximately 20-25 years in the wild (Bond <i>et al.</i>, 2021a). Adult females form discrete, but spatially overlapping social communities (Bond, <i>et al.</i>, 2021a) with significant preferred as well as avoided associations amongst the females (Carter <i>et al.</i>, 2013). In the wild female giraffes are sexually mature at 4.5 years (Hall-Martin & Skinner 1978), while males mature, and mate when older (Skinner & Chimimba, 2005). The gestation period is between 14 months (Leuthold 1979), and c.15 months (Skinner & Chimimba, 2005; Bond <i>et al.</i>, 2021a), and one of few mammals to exceed a year when pregnant (Skinner & Chimimba, 2005). The inter-calving interval is 550-650 days (Skinner & Chimimba, 2005). For the most part a single young is born (Skinner & Chimimba, 2005).		
2. Ecological adaptability: To what extent is the species adaptable (habitat, diet, environmental tolerance etc.)?	Extreme generalist	1
	Generalist	2
	Specialist	3
	Extreme specialist	4
	Uncertain	5
Giraffe is a savanna woodland species that needs sufficient browse trees, particularly across all seasons. While they are water-dependent, they can survive in arid areas as long as there is enough high-water content browse (Skinner & Chimimba, 2005). Giraffes are exceptionally well-adapted to dry and arid habitats, with food availability during the dry season probably a fundamental regulator of giraffe distribution (Berry & Bercovitch, 2017). Within South Africa the subspecies' preferred natural habitat is predominantly the savannah/woodland areas of Limpopo Province, the lowveld areas of Mpumalanga Province, northern sections of North West Province, and the north-eastern region of the Northern Cape Province (Deacon & Tutchings, 2018). Giraffes in the Kalahari prefer tree densities of 744 to 1,084 plants / ha where they can select very specific woody species to browse (Deacon & Smit, 2017). Giraffes are browsers that selectively feed on the leaves of trees, in particular those of the <i>Combretum</i> and <i>Acacia</i> (viz <i>Vachellia</i>, <i>Senegalia</i>) species (Innis, 1958; Leuthold, 1979; Pellew, 1984; Skinner & Chimimba, 2005), and show distinct seasonal preferences for specific browse species (Sauer <i>et al.</i>, 1977). Adaptations to the neck vertebrae have enabled the species to gain access to tree foliage above the 2m strata (Pellew, 1984; Skinner & Chimimba, 2005), thus reducing competition from other browsers (Du Toit, 1988; Cameron <i>et al.</i>, 2007). The giraffe's head and mouth morphology is further adapted to selectively feed on leaves of thorny plants (Innis 1958; Skinner & Chimimba, 2005). Giraffes have found to adapt well to areas outside of their natural distribution range, provided there is enough browse (Theron, 2005; Parker & Bernard, 2005). Theron (2005) found that in the Free State browsing constituted 53% of the daily activities of the animals. Similar to the diet of giraffe within their natural distribution range, a deciduous species, the sweet thorn (<i>Vachellia karroo</i>), was the most important species in the diet of giraffes introduced into the Eastern Cape. Giraffe in the Eastern Cape Province, however, consumed more evergreen species than those within their native range, probably due to the relative lack of deciduous species. Seasonal variation in the consumption of preferred species in the diet was evident with members of the genus <i>Rhus</i> being more important in the winter months, which was attributed to the deciduous nature of the sweet thorn (Parker & Bernard, 2005). To fulfil their energetic needs, giraffe spend much of the day feeding and moving between foraging sites (du Toit & Yetman, 2005), especially when resources are scarce (Pellew, 1984b). Compared to other ruminants, giraffe allocate a disproportionate proportion of the day to feeding (average 13 hours/day) compared to ruminating (average 4.5 h/day; Mitchell <i>et al.</i>, 2015). To alleviate passage-rate constraints, walking-ruminating, a behaviour seen in no other browsers, forms 25% of total rumination time (du Toit & Yetman, 2005). The giraffe's requirement for trees of a sufficient height to browse would suggest that the species tends towards being a habitat specialist. They are furthermore considered a selective browser, which would make the species a dietary specialist too. This is further supported by the unique morphological adaptations for foraging at higher strata than any other savanna herbivores.		

3. Dispersal efficiency: How efficient is the species' dispersal mechanism at key life stages?	Very good	1
	Good	2
	Medium	3
	Poor	4
	Uncertain	5
Age and sex of individuals appear to underpin the formation of giraffe groups (Cameron & du Toit, 2005, Bercovitch & Berry, 2013a, 2015a, Muller <i>et al.</i>, 2018b), and giraffe exhibit characteristics of species with complex cooperative social systems (Clutton-Brock & Lukas, 2012, Lukas & Clutton-Brock, 2012a, b, Bond & Lee, 2020). This dynamic but ultimately structured social system characterised by multiple levels of organization, with the upper level comprising stable adult female communities that largely overlap in space (Bond, <i>et al.</i>, 2021a), potentially enable young giraffes to disperse exclusively socially. Bond <i>et al.</i>, (2021b) found that dispersal is sex-specific, with females being predominately philopatric. When dispersing, both sexes did so at a mean of 4 years of age. Most (69% of total) young males dispersed, with 84% of male dispersers associating with a different adult female social community than that of their mother, but one in four of these dispersers remained spatially near to their natal area. Only 26% of young females dispersed and half of these continued to associate with the adult female social community into which they were born, confirming the importance of maintaining ties among females from calf to adulthood (Bond <i>et al.</i>, 2021b). However, variation in factors, such as reserve size, habitat type and complexity, availability and density of conspecifics, hunting pressure, predator density, and human-related activity such as tourism or conservation, are also likely to influence giraffe sociality, although quantified data on their effects are limited (Muller & Harris, 2022). These factors are also likely to influence the dispersal ability of individuals within a population. As a large mammal, giraffe is likely to be a good disperser, but under the current conditions i.e. habitat fragmentation through fencing as well as availability of suitable habitats within reserves, giraffe is considered a medium disperser.		
4. Interaction with humans: Is the species tolerant to human activity other than harvest?	No interaction	1
	Pest / Commensal	2
	Tolerant	3
	Sensitive	4
	Uncertain	5
In South Africa, giraffes only occur naturally in large protected areas such as the Kruger National Park (KNP), and have been widely reintroduced to game farms and other protected areas (Skinner & Chimimba, 2005; Deacon & Parker, 2016). Being wholly conservation dependent would be a good proxy of how tolerant they are of humans. Bond <i>et al.</i>, (2020a) found that giraffe communities that are closer to traditional compounds of indigenous Masai people express weaker relationship strengths and the giraffes in these communities are more exclusive in their associations. In addition, Scheijen <i>et al.</i>, (2021) found that giraffes walked significantly further distances in the presence of humans, but the cumulative time that observers were present decreased the hourly distance walked with an observer present, suggesting that the giraffes were becoming habituated. The number of observers present significantly increased the percentage of time spent on observing an observer as well as the number of unhabituated individuals present in the herd. The percentage of time spent observing a human observer did not decrease with the increase of habituation. Concentrations of giraffes were found to increase with human presence, but decreased when individuals became habituated to human presence. These studies indicate that giraffes may be sensitive to human activities at a very local and individual scale. However, within the South African context, giraffe are mainly exposed to tourism activities such as game drives etc. within protected areas and game reserves where giraffes become adapted to vehicles, roads etc. and these activities do not seem to affect their reproductive rates. The species can thus be considered tolerant and resilient to human activities other than harvest.		
National status		
5. National distribution: How is the species distributed nationally?	Widespread, contiguous in country	1
	Widespread, fragmented in country	2
	Restricted and fragmented	3
	Localized	4
	Uncertain	5
The South African giraffe can be hailed as a southern African conservation success story. The subspecies is widespread across South Africa, occurring within all nine provinces (Fig. 3). The subspecies naturally occurs in the savannah/woodland areas of the northern parts of South Africa, from Kwazulu-Natal and Mpumalanga, westward through Limpopo, North West and in the west of the Northern Cape. However extra-limital populations have been introduced into the southern provinces, in particular the Free State, Eastern Cape and Western Cape (Deacon & Parker, 2016). Giraffe past occurrence has interestingly been disputed in Kwazulu-Natal (Goodman & Tomkinson, 1987), but palaeoecological evidence has been forthcoming to suggest they were indeed present in the distant past (Cramer & Mazel, 2007).		

The distribution of the South African giraffe in South Africa is fragmented as most subpopulations exist in fenced protected areas or private/community game farms and reserves. The species is however relatively widespread in the country (Fig. 3).

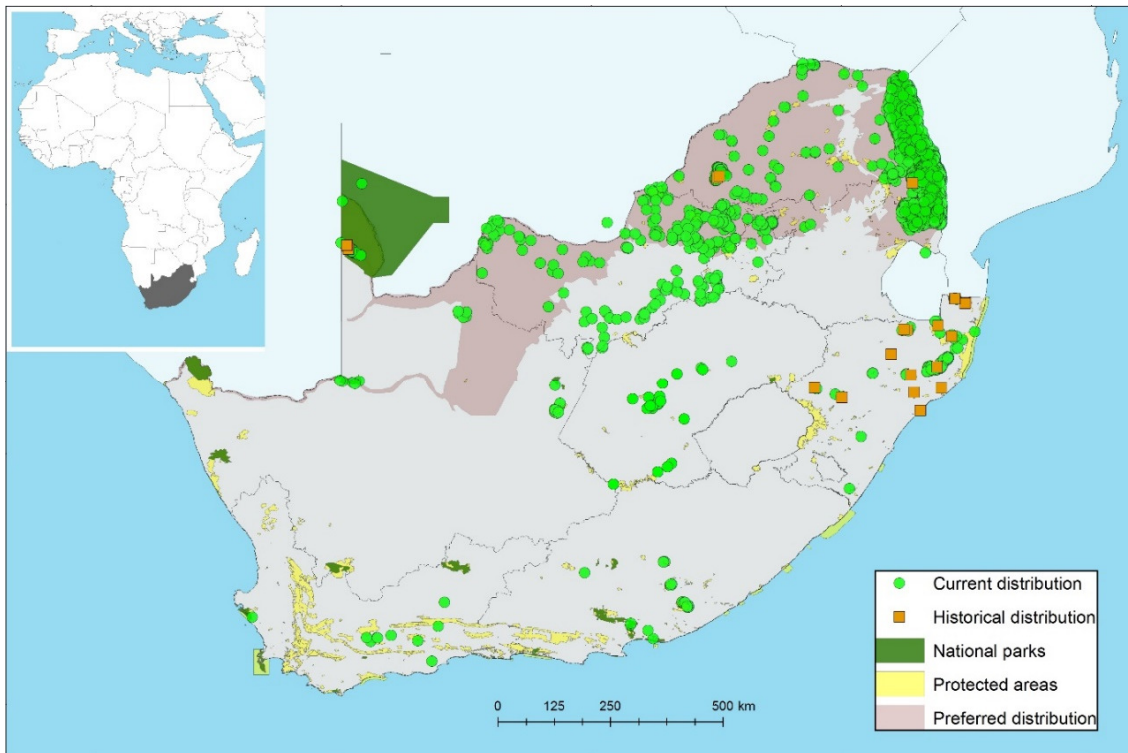


Figure 3: Current and historical records of the South African giraffe *Giraffa camelopardalis giraffa*. Current counts include private game farms, private nature reserves, Provincial Nature Reserves and National Parks, totalling 21,053 - 26,919 individuals (Deacon & Tutchings, 2018).

6. National abundance: What is the abundance nationally?	Very abundant	1
	Common	2
	Uncommon	3
	Rare	4
	Uncertain	5

The South African giraffe is considered a common species within South Africa, with an estimated population of between 21,053 and 26,919 individuals. Approximately half of the population occurs on privately-owned land (Deacon, & Tutchings, 2018). Since the 1960s, wildlife numbers on South African commercial farms have continued to rise, as has their economic value (Carruthers, 2008). In the early 1980s there were approximately 250 privately-owned giraffes in South Africa, but following their introduction into numerous private and provincial game reserves (reserves managed by government nature conservation authorities; Theron, 2005) it is now estimated there are giraffes on most of South Africa's estimated 12,000 game farms and ranches. Populations on these properties comprise between one and 250 individuals, with a mean of 30 individuals per property (M. Child, unpubl. data). In the North West Province, as of 2021, there was a minimum of 2,624 giraffes on game farms, with a mean population size per game farm being 9 ± 12 (range 1-150, $n = 291$), while in total there were 317 properties with giraffe present (some without numbers). As for the state-owned reserves in the North West, in 2020, there were 507 giraffes, across seven reserves. Population sizes in reserves averaged 72 ± 74 (range 5-202, $n = 7$). In Gauteng there are a minimum of 186 giraffe. There are currently 24 giraffes within provincial reserves in the province and 139 giraffes in private reserves where GDARD is a partner. On the 18 state-owned reserves within Limpopo Province keeping giraffe, there were a minimum of 883 giraffes collectively in 2020. The giraffe population within KNP is estimated between 7,598 – 11,972 individuals at the end of 2020 (Ferreira, *et al.*, 2021).

The population within state protected areas is estimated between 10,000 and 15,000, individuals of which between 7,962 and 12,366 occur within national parks and an additional estimated 3,000 on provincial reserves. As a result, the subspecies was listed as Least Concern in the IUCN regional (South Africa, Swaziland and Lesotho) Red List of Threatened Species (Deacon & Parker, 2016).

7. National population trend: What is the recent national population trend?	Increasing	1
	Stable	2
	Reduced, but stable	3
	Reduced and still decreasing	4
	Uncertain	5
The population of <i>Giraffa camelopardalis giraffa</i> in South Africa is increasing. Data from 13 formally protected areas show an estimated population increase of 54% over three generations (1985–2015) (Deacon & Parker, 2016). By 2013, the number of giraffes in the KNP had increased by approximately 150% from the 1979 estimate. An even greater increase occurred on many of the estimated 12,000 privately-owned game ranches, indicating that private ownership can help to conserve the subspecies. The giraffe populations in North-West Parks reserves have been steadily increasing since 2000. The increase in private ownership of giraffes across South Africa and the economic interest in conserving a thriving, healthy and viable population, and by default a suitable environment for giraffes, have stimulated an increase in giraffe numbers within South Africa (Deacon & Tutchings, 2018).		
8. Quality of information: What type of information is available to describe abundance and trend in the national population?	Quantitative data, recent	1
	Good local knowledge	2
	Quantitative data, outdated	3
	Anecdotal information	4
	None	5
The most recent conservation assessment of South African giraffe was conducted in 2015 as part of the national Red List assessment (Deacon & Parker, 2016). Game counts are conducted for large mammals annually or biannually in most national and provincial reserves. Private landowners in general also conduct regular counts of economically important mammal species. Being large, conspicuous animals (Skinner & Chimimba, 2005), giraffes render relatively precise count estimates when counted by air, with a low Coefficient of Variation (CV) (Reilly, 2002), so aerial count estimates are generally very accurate and precise. There is thus recent quantitative data of individual populations at the local level, but these data are not collated and centralised. However, these data are easily obtained and trend data is quantitative and there is a high confidence in the population trends.		
9. Major threats: What major threat is the species facing (underline following: overuse/ habitat loss and alteration / invasive species/ other: Hybridization) and how severe is it?	None	1
	Limited/Reversible	2
	Substantial	3
	Severe/Irreversible	4
	Uncertain	5
There are no immediate threats severe enough to cause a population decline in the population of <i>G. c. giraffa</i> within South Africa in the foreseeable future (Deacon & Parker, 2016; Deacon & Tutchings, 2018). Minor threats include habitat fragmentation and degradation. Another potential threat is hybridization between different subspecies, which may threaten the genetic integrity of the southern subspecies <i>G. c. giraffa</i> (Both the Kgalagadi Transfrontier Park and the Tuli Game Nature Reserve contain introduced <i>G. c. angolensis</i> and <i>G. c. giraffa</i> . Because the former subspecies is extralimital to the area, while the latter subspecies is endemic to the area, the combined population creates hazards for conservation management decisions (Deacon & Parker, 2016).		
Harvest management		
10. Illegal off-take or trade: How significant is the national problem of illegal or unmanaged off-take or trade?	None	1
	Small	2
	Medium	3
	Large	4
	Uncertain	5
There is no evidence of illegal killing of giraffe for the international trade. The illegal killing for domestic use is considered small to negligible.		
11. Management history: What is the history of harvest?	Managed harvest: ongoing with adaptive framework	1
	Managed harvest: ongoing but informal	2
	Managed harvest: new	3
	Unmanaged harvest: ongoing or new	4
	Uncertain	5

Giraffe are utilised for ecotourism and for hunting by both local and international hunters. The tails are used by traditional leaders and tribesmen as a status symbol (Deacon & Parker, 2016). Live animals are also traded privately and at government sanctioned game auctions across South Africa. Non-trophy products are generally sourced from the trophy hunting industry, or from natural deaths, or from animals culled or hunted for meat. Giraffe meat, sourced from the trophy hunting industry or from animals culled is not only locally used for subsistence bushmeat but also for commercial sale within Namibia, South Africa and Zimbabwe as biltong (dried meat) and game meat in certain tourist restaurants (Dunn *et al.*, 2021). Live giraffes are exported from South Africa for various purposes, including introduction into zoos and breeding programmes, as well as reintroductions into nearby range states where this necessitates. Between 2017 and 2021, approximately 32 live giraffes were exported internationally from Gauteng. Giraffe has been successfully translocated from Africa to Europe since 1826.

The giraffe is listed as Protected in provincial nature conservation Ordinances/Acts in all nine provinces. Permits are therefore required to undertake all restricted activities in relation to giraffe, e.g. hunting, transport and other forms of direct use (i.e. monitoring, collaring, blood tissue sampling etc.). The regulatory framework in place thus allows for sustainable off-takes. On a property level managers and/or landowners have an interest in ensuring the stability of their populations and manage their populations and off-takes accordingly. The harvest of giraffe is thus dually managed by both private landowners and government within an adaptive framework. In addition, all trophy hunts by international clients must be recorded in the Professional Hunter's Register. The professional hunter accompanying the international client is responsible for completing and submitting the register to the provincial conservation authority. The Department of Forestry, Fisheries and the Environment (DFFE) collate the provincial registers into a national register on an annual basis.

12. Management plan or equivalent: Is there a management plan related to the harvest of the species?	Approved and co-ordinated local and national management plans	1
	Approved national/state/provincial management plan(s)	2
	Approved local management plan	3
	No approved plan: informal unplanned management	4
	Uncertain	5

Though there is no national management plan for the subspecies, the population of *G. c. giraffa* is well managed in South Africa. National and provincial parks do not have a specific management strategy for giraffe, although management of the subspecies follows the general policy for the management of large mammals in protected areas, as per general ecological management plans. On the whole in South Africa, there is a combination of management with unapproved plans to local management plans that are not necessarily giraffe specific, but are comprehensive enough to cover nominal giraffe management.

In addition, the policy/regulatory framework in place across all provinces for giraffe can be considered an approved and coordinated management plan. The regulatory framework is aimed at the long term sustainable use of the species. Across all provinces the subspecies is listed as Protected, which means that all provinces acknowledge the need that giraffe requires special measures. In addition, all policies / regulations are approved and subject to a public participation process. There is also currently a national process underway to improve policy alignment between provincial ordinances/Acts.

13. Aim of harvest regime in management planning: What is harvest aiming to achieve?	Generate conservation benefit	1
	Population management/control	2
	Maximize economic yield	3
	Opportunistic, unselective harvest, or none	4
	Uncertain	5

Giraffe populations on almost all properties across their range are increasing. In the absence of large predators giraffe populations is likely to exceed their carrying capacity and negative impact on other biodiversity objectives. For this reason, in most of the smaller reserves within South Africa giraffe populations are actively managed through either hunting, culling or live sales.

Giraffe are utilised non-consumptively for ecotourism and consumptively for trophy hunting by both local and international hunters. The tails are used by traditional leaders and tribesmen as a status symbol (Deacon & Parker, 2016). Live animals are also traded privately and at government sanctioned game auctions across South Africa. Non-trophy products are generally sourced from the trophy hunting industry, or from natural deaths, or from animals culled or hunted for meat.

The USA and Europe are the major markets for hunting trophies. Between 2010 and 2020 approximately 2,809 giraffe were hunted within South Africa by international clients, mainly from the EU (29%) and USA (62%), averaging 255±95 animals per year (South African Professional Hunters Register, DFFE) (Table 2). In addition, it is estimated that an additional 300 giraffe are hunted by local hunters or culled each year. In total, this equates to between 2.0% and 3.0% of the total population and is

thus sustainable. Hunting mainly takes place on wildlife ranches and private game reserves and virtually every part of the animal is utilised to produce products for sale, which are marketed locally and internationally. Giraffe meat, sourced from the trophy hunting industry or from animals culled is not only locally used for subsistence bushmeat but also for commercial sale within Namibia, South Africa and Zimbabwe as biltong (dried meat) and game meat in certain tourist restaurants (Dunn *et al.*, 2021). The long bones and scapula are mainly used for carvings and paintings, while the metatarsals and metacarpals are used for the cutting of knife handles (pers. comm. Pieter Swart, South African Taxidermy & Tannery Association). Approximately eight pieces can be cut per bone to make knife handles (pers. comm. Pieter Swart, South African Taxidermy & Tannery Association).

An estimated five to 11 bones per giraffe can on average be used for carving and the manufacturing of other curios such as knife handles (pers. comm. Pieter Swart, South African Taxidermy & Tannery Association). As such, South Africa could potentially export between 25,000 and 68,860 bones (and/or bone curios) over a 10 year period, sourced from the estimated 563±63 giraffe hunted or culled per year. (And this is a conservative estimate.) It is thus highly likely that a large percentage, if not all, of the 27,656 (non-hunting trophy) giraffe specimens imported into the USA from South Africa between 2006 and 2015 (as reported in the listing proposal for giraffe (CoP18 Prop. 5); approximately 83% of the 33,321 giraffe specimens originate from South Africa) are by-products of a sustainable hunting industry in South Africa. South Africa can in fact sustainably supply the USA market and any other large international markets (such as the European Union) with giraffe specimens/curios.

Table 2: Number of giraffes trophy hunted by international clients in each of the nine provinces in South Africa between 2010 and 2019. (EC=Eastern Cape; FS=Free State; GP=Gauteng; KZN=KwaZulu-Natal; LP=Limpopo; MP=Mpumalanga; NC=Northern Cape; NW=North West; WC=Western Cape).

Provinces	Years										
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
EC	23	51	44	26	41	16	19	32	36	41	3
FS	4	6	6	12	8	15	4	4	2	10	2
GP	0	2	0	1	2	1	3	0	0	1	0
KZN	13	17	22	22	20	17	37	20	12	21	2
LP	43	126	155	166	180	175	201	205	239	212	6
MP	0	8	15	9	7	12	13	5	13	21	1
NC	21	16	15	20	17	20	19	14	20	9	5
NW	18	6	21	4	24	27	27	20	13	35	2
WC	0	0	0	0	1	2	0	1	2	0	0
Total	122	232	278	260	300	285	323	301	337	350	21

14. Quotas: Is the harvest based on a system of quotas?	Ongoing national quota: based on biologically derived local quotas	1
	Ongoing quotas: "cautious" national or local	2
	Untried quota: recent and based on biologically derived local quotas	3
	Market-driven quota(s), arbitrary quota(s), or no quotas	4
	Uncertain	5

The giraffe is listed as Protected in provincial nature conservation Ordinances/Acts in all nine provinces. Permits are therefore required to undertake a variety of activities in relation to giraffe, e.g. hunting and other forms of direct use. There are no national or provincial quotas for the off-take of giraffe in South Africa, but off-takes are managed on a local scale by the provincial Management Authorities through a permit system on a case-by-case basis, based on direct population estimates. A quota is thus not considered a requirement for this species as the species is well managed and populations increasing.

Control of harvest

15. Harvesting in Protected Areas: What percentage of the legal national harvest occurs in State-controlled Protected Areas?	High	1
	Medium	2
	Low	3
	None	4
	Uncertain	5

Harvesting of giraffe from protected areas is mainly in the form of live capture and removal. For example SANParks have removed live giraffe from Kruger for reintroduction to Limpopo and Zinave National Parks, in Mozambique.

	High	1
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16. Harvesting in areas with strong resource tenure or ownership: What percentage of the legal national harvest occurs outside Protected Areas, in areas with strong local control over resource use?	Medium	2
	Low	3
	None	4
	Uncertain	5
Majority of the legal national harvest occurs outside of protected areas on private land.		
17. Harvesting in areas with open access: What percentage of the legal national harvest occurs in areas where there is no strong local control, giving <i>de facto</i> or actual open access?	None	1
	Low	2
	Medium	3
	High	4
	Uncertain	5
There are no giraffe occurring in open access areas.		
18. Confidence in harvest management: Do budgetary and other factors allow effective implementation of management plan(s) and harvest controls?	High confidence	1
	Medium confidence	2
	Low confidence	3
	No confidence	4
	Uncertain	5
In all provinces budgetary and human resource capacity required for the development and implementation of species management plans are limited, however in the context of giraffe management and conservation in South Africa there is a high confidence in the harvest management.		
Monitoring of harvest		
19. Methods used to monitor the harvest: What is the principal method used to monitor the effects of the harvest?	Direct population estimates	1
	Quantitative indices	2
	Qualitative indices	3
	National monitoring of exports	4
	No monitoring or uncertain	5
Being large, conspicuous animals (Skinner & Chimimba, 2005), giraffes render relatively precise count estimates when counted by air, with a low Coefficient of Variation (CV) (Reilly, 2002), so aerial count estimates are generally very accurate and precise. There is thus recent quantitative data of individual populations at the local level and data are easily obtained. Trend data is quantitative and there is a high confidence in the population trends of the national population.		
In addition, the policy and regulatory mechanisms require direct population estimates for any restricted activity. Through the permitting system, monitoring data on the annual off-takes of species per property are generated. Thus off-takes are managed on a local scale by the provincial Management Authorities through a permit system on a case-by-case basis, based on direct population estimates. In addition, all trophy hunts by international clients must be recorded in the Professional Hunter's Register. The professional hunter accompanying the client (a legal requirement) is responsible for completing and submitting the register to the provincial conservation authority. The DFFE collate the provincial registers into a national register on an annual basis allowing fine scale analyses of trends in trophy hunting off-takes and possible impacts on species subject to trophy hunting, such as giraffe.		
20. Confidence in harvest monitoring: Do budgetary and other factors allow effective harvest monitoring?	High confidence	1
	Medium confidence	2
	Low confidence	3
	No confidence	4
	Uncertain	5
There is a high confidence in the monitoring of off-takes of giraffe.		
Incentives and benefits from harvesting		
21. Utilization compared to other threats: What is the effect of the harvest when taken together with the major	Beneficial	1
	Neutral	2
	Harmful	3

threat that has been identified for this species?	Highly negative	4
	Uncertain	5
A healthy wildlife economy, which is underpinned by sustainable use, incentivizes communities and private landowners to conserve the species. It is likely that hunting has contributed to the overall increase in giraffe numbers across the country by providing important incentives to private landowners to stock giraffe on their game farms and private nature reserves (Furstenburg, 2013; Deacon & Parker, 2016) which allows for more habitat for the giraffe, mitigating one of the threats facing the subspecies. While across Africa, the majority of giraffe species and subspecies are in decline (Bercovitch <i>et al.</i>, 2017), the South African population of the South African giraffe continue to increase (Deacon & Parker, 2016; Deacon & Tutchings, 2018), highlighting the benefit of private ownership and sustainable use to the species. Throughout the non-peer-reviewed literature, and primarily within the UK- and USA-based media sources, Dunn <i>et al.</i>, (2021) observed a common assertion that the international trade of giraffe trophies from Southern Africa had an additional negative impact on wild giraffe populations (Biesecker, 2019; Cheever, 2017; HSI, 2018). This finding, however, was not corroborated by their the peer-reviewed literature or specialist survey responses, which instead highlighted a stark regional disparity in the trade and offtake of giraffe, with few indications of international trade occurring outside the legal and sustainable trophy hunting operation within Southern Africa (Dunn <i>et al.</i>, 2021).		
22. Incentives for species conservation: At the national level, how much conservation benefit to this species accrues from harvesting?	High	1
	Medium	2
	Low	3
	None	4
	Uncertain	5
The increase in private ownership of giraffes across South Africa and the economic interest in conserving a thriving, healthy and viable population, and by default a suitable environment for giraffes, have stimulated an increase in giraffe numbers (Deacon & Tutchings, 2018). At present, approximately half of the estimated giraffe population of 23,470 – 26,919 individuals occur within privately-owned properties (Deacon & Tutchings, 2018). In addition, giraffe is widespread occurring on nearly all wildlife properties across its natural distribution range in South Africa. However, continued monitoring and surveillance of protocols and adherence to best practice are essential to retain a healthy subspecies population, especially as habitat loss and fragmentation, along with landscape changes, continue to reduce the number of suitable environments across the rest of the continent (Reid <i>et al.</i>, 2004).		
23. Incentives for habitat conservation: At the national level, how much habitat conservation benefit is derived from harvesting?	High	1
	Medium	2
	Low	3
	None	4
	Uncertain	5
The increase in private ownership of giraffes across South Africa and the economic interest in conserving a thriving, healthy and viable population, and by default a suitable environment for giraffes, have stimulated an increase in giraffe numbers (Deacon & Tutchings, 2018). While the introduction of giraffe outside of its natural distribution range may have some detrimental impacts on habitat, the conservation benefits accrued still outweighs the negative impacts which seem to be negligible and manageable and can be mitigated. Due to its high value both as a species popular with photographic tourists and hunters, giraffe can be used as a flagship species driving habitat conservation for the subspecies but also habitat conservation of other lesser valued species.		
Protection from harvest		
24. Proportion strictly protected: What percentage of the species' natural range or population is legally excluded from harvest?	>15%	1
	5-15%	2
	<5%	3
	None	4
	Uncertain	5
Approximately half of the estimated giraffe population of 23,470 – 26,919 individuals occur within state protected areas (Deacon & Tutchings, 2018), and is therefore well protected. Harvesting is one of the mechanisms that provides incentives for the keeping and conservation of giraffe in South Africa. Both the management and specifically the harvest of the species is subject to strong regulation on a provincial level. Thus at present no population or area in which giraffes occur is excluded from offtake potential.		

25. Effectiveness of strict protection measures: Do budgetary and other factors give confidence in the effectiveness of measures taken to afford strict protection?	High confidence	1
	Medium confidence	2
	Low confidence	3
	No confidence	4
	Uncertain	5
The national and provincial permitting systems are effective. There is a high confidence in the effectiveness of the protection measures taken as the illegal offtake of giraffe from within protected areas are negligible.		
26. Regulation of harvest effort: How effective are any restrictions on harvesting (such as age or size, season or equipment) for preventing overuse?	Very effective	1
	Effective	2
	Ineffective	3
	None	4
	Uncertain	5
At present all offtakes in terms of giraffe are regulated through a system of permits. Regulatory mechanisms in place are very effective as there are currently no evidence of overuse or harvest in giraffe.		

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