Country Profile

Republic of Zambia

Giraffe Conservation Status Report

February 2022

General statistics

Size of country: 752,614 km²

Size of protected areas / percentage protected area coverage: 286,161 km²/~38%

Species and subspecies

In 2016 the International Union for the Conservation of Nature (IUCN) completed the first detailed assessment of the conservation status of giraffe, revealing that their numbers are in peril. This was further emphasised when the majority of the IUCN recognised subspecies were assessed in 2018 – some as *Critically Endangered*. While this update further confirms the real threat to one of Africa's most charismatic megafauna, it also highlights a rather confusing aspect of giraffe conservation: how many species/subspecies of giraffe are there? The IUCN currently recognises one species (*Giraffa camelopardalis*) and nine subspecies of giraffe (Muller *et al*. 2018) historically based on outdated assessments of their morphological features and geographic ranges. The subspecies are thus divided: Angolan giraffe *(G. c. angolensis),* Kordofan giraffe *(G. c. antiquorum),* Masai giraffe (*G. c. tippelskirchi*), Nubian giraffe *(G. c. camelopardalis),* reticulated giraffe *(G. c. reticulata),* Rothschild's giraffe *(G. c. rothschildi),* South African giraffe (*G. c. giraffa),* Thornicroft's giraffe (*G. c. thornicrofti*) and West African giraffe *(G. c. peralta).*

However, over the past decade GCF together with their partner Senckenberg Biodiversity and Climate Research Centre (BiK-F) have performed the first-ever comprehensive DNA sampling and analysis (genomic, nuclear and mitochondrial) from all major natural populations of giraffe throughout their range in Africa. As a result, an update to the traditional taxonomy now exists. This study revealed that there are four distinct species of giraffe and likely five subspecies (Fennessy *et al.* 2016; Winter *et al.* 2018; Coimbra *et al.* 2021). The four species are Masai giraffe (*G. tippelskirchi*), northern giraffe (*G. camelopardalis*), reticulated giraffe (*G. reticulata*) and southern giraffe (*G. giraffa*). Nubian giraffe (*G. c. camelopardalis*), Kordofan giraffe (*G. c. antiquorum*), West African giraffe (*G. c. peralta*) are the three subspecies of the northern giraffe, while Angolan giraffe (*G. g. angolensis*) and South African giraffe (*G. g. giraffa*) fall under the southern giraffe. Rothschild's giraffe is genetically identical to the Nubian giraffe, and thus subsumed into it. Similarly, the Luangwa giraffe (*G. t. thornicrofti*) is genetically similar to the Masai giraffe (*G. t. tippelskirchi*), however, now proposed as separate subspecies (Winter *et al.* 2018; Coimbra *et al.* 2021). Based on this research, GCF in all publications refers to the updated giraffe taxonomy of four species.

The following species and subspecies of giraffe are found in Zambia:

Species:	Masai giraffe (*Giraffa tippelskirchi*)
	Southern giraffe (*Giraffa giraffa*)
Subspecies:	Luangwa giraffe *(Giraffa camelopardalis thornicrofti)*
	Angolan giraffe *(Giraffa giraffa angolensis)*
	South African giraffe (*Giraffa giraffa giraffa*)

Conservation Status

IUCN Red List (IUCN 2018):

Giraffa camelopardalis (as a species) – Vulnerable (Muller *et al.* 2018)

Giraffa tippelskirchi – Endangered (Bolger *et al.* 2019) – as a subspecies

Giraffa camelopardalis thornicrofti – Vulnerable (Bercovitch *et al*. 2018) – as a subspecies

Giraffa giraffa (as a species) – Not Assessed

Giraffa giraffa giraffa – Not Assessed

Giraffa giraffa angolensis – Least Concern (Marias *et al*. 2018) – as a subspecies

In the Republic of Zambia:

The Department of National Parks and Wildlife (DNPW) under the Ministry of Tourism, formerly the Zambia Wildlife Authority (ZAWA), is mandated under the Zambia Wildlife Act No. 14 of 2015 to manage and conserve Zambia's wildlife and under this act, the hunting of giraffe in Zambia is illegal (FAO 2021; ZAWA 2015).

Zambia has the second largest proportion of land under protected status in Southern Africa with 286,161 km^2 designated as protected areas (UNEP-WCMC & IUCN 2019). This accounts for a total of 635 protected areas, which include national parks (NP), game management areas (GMA), and forest/wildlife reserves (IUCN ESARO 2020). In addition, Zambia is part of six transboundary conservation areas (TFCA): the Kavango-Zambezi TFCA (potentially the world's largest conservation area, spanning five southern African countries), Liuwa Plain-Mussuma TFCA, Lower Zambezi-Mana Pools TFCA, Malawi-Zambia TFCA, Mosi-oa-Tunya/Victoria Falls Transboundary World Heritage site and the Zimbabwe-Mozambique-Zambia TCFA (IUCN ESARO 2020).

While the sustainable use of wildlife and its habitats is promoted in NPs through eco-tourism, both settlements and hunting are strictly prohibited in NPs (Mwanza 2006). However, GMAs in Zambia were established by government for sustainable use of wildlife and to control the hunting of game and protected animals through a licensing and monitoring system (ZAWA 2015).

While not included in protected areas, private game farms (accounting for ~6,000 km^2) provide another avenue for wildlife conservation (Lindsey *et al*. 2013). During the time from 1997 to 2012, while most wildlife populations were declining in NPs and GMAs, wildlife populations were increasing on private wildlife estates (Lindsey *et al*. 2013). In addition, many game farms provided stock to replenish wildlife in protected areas, such as Lusaka, Mosi-oa-Tunya, and Sioma Ngwezi NPs (Lindsey *et al*. 2013).

Issues/threats

Biodiversity in Zambia in general is increasingly coming under pressure from both human and natural factors, including resource conflicts, human settlement encroachment, habitat degradation, climate change, illegal hunting (poaching), pollution, overexploitation of resources, deforestation, introduction of alien species into the ecosystem, and a lack of environmental education (IUCN ESARO 2020). Zambia is the second largest producer of copper in Africa, and the majority of its economy relies on mining export (Hobson *et al*. 2020). However, Zambia remains one of the poorest countries in the world (AWF 2020).

The Luangwa giraffe survives as an entirely isolated population in a small area of north-eastern Zambia in the South Luangwa Valley (Fennessy *et al.* 2013; Fennessy 2008a). Their geographic isolation is most commonly attributed to the Rift Valley Escarpment which prevents movement and subsequent genetic flow with other giraffe in neighbouring areas (Stutzman & Flesch 2010). Their isolation potentially renders them susceptible to a genetic bottleneck among other problems inherent in small populations (disease, predation, natural catastrophes, habitat degradation/loss, etc.) that make them vulnerable to extinction (Bercovitch *et al.* 2014; Stutzman & Flesch 2010).

The Luangwa Valley GMAs are in a spiral of degradation economically, sociologically and ecologically, and the natural habitats available to support wildlife in GMAs are shrinking due to increased settlements, cultivation, traditional land claims and un-coordinated planning by government departments (Simasiku *et al.* 2008). The Luangwa giraffe have lived in protected habitats since 1938 (Bercovitch *et al.* 2014), but most of the GMAs in the Luangwa Valley lack enforceable land use plans to the extent that settlements are largely uncoordinated and not in tandem with wildlife management (Simukonda 2012). Over the past decade, law enforcement has generally failed to control the harmful impact of anthropological threats and very little funding goes to resource protection (Simasiku *et al.* 2008). Diseases, such as anthrax and rinderpest, have had a history of devastating wildlife populations in South Luangwa NP. In 1987, an anthrax outbreak swept the Luangwa Valley, killing over 4,000 hippopotami (7% mortality rate) as well a number of Luangwa giraffe (Siamudaala 2003). Although the exact cause of the anthrax epidemic is unknown, low rainfall, high temperatures and poor drainage probably contributed to the outbreak (Siamudaala 2003). Anthrax spores remain dormant in the soil for extended periods of time, re-emerging when conditions are favourable, posing a continued threat to all wildlife in the region. Rinderpest was a deadly viral infection affecting all ungulate species with up to 100% mortality in susceptible herds and is the only animal disease to have successfully been completely eradicated, with the last documented case occurring in 2003 (Ochmann & Behrens 2018). In addition, climate change could increase the prospects of drought and fire in the Luangwa Valley, endangering not only the Luangwa giraffe, but all fauna and flora. Natural predation by lions is also of concern for this small, isolated population. Lion hunting is legal (with a permit) in the GMAs adjacent to South Luangwa NP could result in movement of more lions into the park to avoid hunters (Bercovitch *et al.* 2014; M. Becker pers. comm.).

Although only a single confirmed case of poaching of giraffe has been recorded within the last few years, the use of illegal wire snares has been documented and pose a threat to giraffe despite giraffe not being the main target (Bercovitch *et al.* 2014; M. Becker pers. comm.). Recently, up to five giraffe snaring incidents per year have been reported (R. McRobb pers. comm.). While low, poaching remains a potential threat to giraffe populations across Zambia.

The continued expansion of mining operations in Zambia (copper, coal, nickel, uranium, and gemstones) could pose a threat to the Luangwa giraffe (Okeowo 2013). Mineral extraction and resource exploitation could hinder the free-flow of the Luangwa River and, although South Luangwa NP is not directly affected by the mining industry, the Luangwa River runs through the park and wildlife could be impacted should the river become a key water source for mining or become polluted by mining extracts (Bercovitch *et al.* 2014).

Historically undetermined, the giraffe in Sioma Ngwezi NP in south-west Zambia were recently reported as South African (*G. g. giraffa*) giraffe (Winter et al. 2018). Once an area teeming with wildlife, these were decimated during the conflicts which have characterised the history of the region (Peace Parks Foundation 2013). The 25-year long Angolan Civil War and illegal hunting devastated wildlife populations in neighbouring Sioma Ngwezi NP (Chase & Griffin 2009; APF 2003; East 1999). The park's proximity to the Luiana Partial Reserve across the border in south-east Angola, the base of military operations for UNITA, exposed the wildlife of the park to extensive illegal hunting (Chase & Griffin 2009). Refugees also depended heavily on bush meat to survive and illegal hunting is difficult to control in these areas (WCS 2014; Chase & Griffin 2009).

According to a 2003 report by the African Parks Network (APN), the destruction of wildlife in Sioma Ngwezi NP was far greater than originally realised (APN 2003). Wedged between the Luiana Partial Reserve in Angola and the Bwabwata NP in Namibia, the area plays an essential ecological role for wildlife movement along the Kwando and Zambezi Rivers despite it not extending all the way to the Zambezi River. The park and the surrounding area within the West Zambezi GMA have been earmarked for intensive wildlife recovery. Numerous wildlife species with distribution ranges limited to the area west of the Zambezi formerly occurred in the park and the wildlife recovery will include the restocking of these species – including giraffe (Peace Parks Foundation 2013; ZAWA per. comm.). However, the translocation of animals from elsewhere in Zambia has not been possible due to the limited supplies of game together with long distances and poor roads – and concerns have been raised over the genetic integrity of the animals being (re-)introduced (APN 2003).

Sioma Ngwezi NP is also highly susceptible to bush fires during the late dry season when neighbouring farmers burn their fields, thereby affecting the distribution and abundance of wildlife outside and inside the park (Chase & Griffin 2009). While previously the economic potential within the park was restricted due to limited to no tourism infrastructure (Chase & Griffin 2009), plans are currently in place to develop the park under the support of the KAZA TFCA initiative (Peace Parks Foundation, 2013). Additionally, the settlements of thousands of people along the Cuando River have cut off this vital water source from the park interior (APN 2003).

As part of their grant to KAZA TFCA, the German Kreditanstalt für Wiederaufbau (KfW) allocated €3.3 million to Sioma Ngwezi NP. Initial efforts were concentrated on field patrols, the mitigation of human-wildlife conflict, participation in the Community Centred Conservation and Development (CCCD) programme, compilation of work plans and finalisation of the Ngonye Falls development plan (Peace Parks Foundation 2013).

With the resolution of civil unrest/conflict in recent years, the main threats to giraffe across Zambia are poaching and habitat loss/fragmentation due to increasing human population and associated infrastructure development. In an effort to combat these threats, organisations like the Peace Parks Foundation (PPF) are working to preserve key wildlife habitats and establish/maintain viable wildlife corridors through developing transfrontier conservation areas (TFCA) in collaboration with each country's government and wildlife authority (Peace Parks Foundation 2021a). In Zambia, PPF is currently managing three TFCAs, which are the Nyika-North Luangwa and Kasungu-Lukusuzi TFCAs across Zambia into Malawi, the Kavango Zambezi TFCA spreading across the south-west corner of Zambia into Angola, Botswana, Namibia, and Zimbabwe (Peace Parks Foundation 2021b,c). PPF aims to manage these conservation areas through a holistic, multipronged approach including anti-poaching and law enforcement support, re-wilding efforts, and community engagement (Peace Parks Foundation 2021b,c).

Estimate population abundance and trends

Although some authorities have suggested that the subspecies *G. c. thornicrofti* should be elevated into their own species, *G. thornicrofti* (Groves & Grubb 2011), current information regarding their genetic profile indicate that the Luangwa giraffe is genetically similar to the Masai giraffe, *G. tippelskirchi*, despite it being geographically and ecologically unique (Winter *et al.* 2018; Fennessy *et al.* 2016; Fennessy *et al.* 2013). However, additional research is necessary to determine if Luangwa giraffe should become a distinct subspecies of the Masai giraffe (Winter *et al.* 2018). Recent genetic analysis of both the Mosi-oa-Tunya and Sioma Ngwezi NPs giraffe populations has shown that they are both South African giraffe (*G. g. giraffa*) populations.

Historic

At the end of the 19th century, giraffe in Zambia were limited to two isolated regions: one in Barotseland, and the other in the Luangwa Valley (ZLS 1965). Previously it was thought doubtful whether giraffe historically existed in any other parts of the country (ZLS 1965; Ansell 1952), however, evidence indicates that giraffe were present (migratory) in Kafue NP from a letter sent by Mr J Loewen to Mr P. de. V. Moss in 1974, who reported seeing three giraffe within the park. However, much debate still surrounds the anecdotal records of giraffe in this region (Lines *et al.* 2018). More investigation is required in order to confirm the historical presence of giraffe within the Kafue NP and neighbouring areas. The stronghold of Luangwa giraffe appears to have always been on the east bank of the Luangwa River in the Petauke District, and in the narrow corridor between the Luangwa River and the Mwembezi Hills (Fennessy 2008a; R. Shenton pers. comm.).

In the early 1900s, Luangwa giraffe were speculatively estimated to number only 30-70 individuals, mostly ranging on the east bank of the Luangwa River in small herds, but these counts came from the impressions of the early British administrators (Berry 1973). By the 1920s an estimate of over 500 giraffe was reported, but is probably inaccurate (Berry 1973). Their range increase north of the Mwembezi Hills is a relatively recent occurrence with giraffe not known to inhabit the area before the 1930s (Fennessy 2008a). Pitman (1934) believed that there were about 300 or 400 individuals in the area, an increase on the probable 70 individuals previously recorded (ZLS 1965). In 1958, the population was estimated to number 300 individuals (Fennessy 2008a). Anecdotal reports suggest that giraffe were likely present in lower Luangwa Valley for longer than previously thought, and as far south as 15km from the confluence of the Nyamadzi and Luangwa Rivers (R. Shenton pers. comm.).

In the 1960s, Luangwa giraffe were reported to range primarily along the eastern side of the Luangwa River (Berry 1978; Sidney 1965; Darling 1960), but some individuals did cross the river to the western banks (Berry 1973; Sidney 1965; Darling 1960). The majority occurred in the Petauke area, although others ranged eastwards into the Fort Jameson District (Sidney 1965). According to Fennessy (2008a), giraffe became well established as far upstream as the Lupande confluence during the 1950s and 1960s at which time the population was estimated to number about 200-250 giraffe (Darling 1960). Their limited range restricted their numbers, but they were seldom, if at all, hunted (Sidney 1965).

In 1964, giraffe were reported in the Nsefu Game Reserve, coming either from below the Lupande confluence or the west bank of the Luangwa River (Fennessy 2008a). In 1965, giraffe were observed on the Rukuzye River, north of the Nsefu Game Reserve as well as on the east bank at the Chibembe pontoon (Fennessy 2008a). Giraffe were further reported at the Katete stream between the Lukusuzi and Rukuzye Rivers in 1967 (Fennessy 2008a). This was the farthest north the subspecies had been recorded on the east bank. In 1967, giraffe were reported near Zokwe on the Luangwa River and near Kalamulilo Hot Springs (Fennessy 2008a). In 1968, the species were observed north of the Mangwalala Safari Camp on the east bank of the Luangwa River; near the Chifuna Villages; and near the confluence of the Kanyu Stream with the Luangwa River (Fennessy 2008a). In 1968, giraffe were recorded at Minuwa Lagoon near the Kanyu/Luangwa Rivers confluence and on the east bank of the Luangwa River opposite the Luwi River (Fennessy 2008a).

By the end of the 1960s, more accurate records of Luangwa giraffe population size were obtained. Their range expanded in both northerly and southerly directions (Berry 1973), and by the end of the 1960s, the maximum population size was approximately 300 individuals (Berry 1973; Dagg & Foster 1982). According to Fennessy (2008a), the Luangwa giraffe population was estimated to number 300 individuals in 1974 and 270-300 in 1980.

Luangwa giraffe were estimated to number 450 in the early 1980s (East 1999). East (1999) reported the bulk of the population to occur in South Luangwa NP and the Lupande GMA. In 1994, aerial sample counts of South Luangwa NP estimated the Luangwa giraffe population at 275 individuals, while ground surveys of the

Lupande GMA estimated a giraffe population of 780 individuals (East 1999). A total of 90 giraffe were further estimated to occur in other GMAs in the Luangwa Valley, while 16 giraffe reportedly occurred on private game ranches (East 1999). The subspecies was only found as vagrant in North Luangwa NP (East 1999).

A total of 350 individuals were estimated to occur in South Luangwa NP and the Lupande GMA in 1996; 398 in 1998; and 202 in 1999 (Fennessy 2008a). An aerial census of South Luangwa NP and the Lupanda GMA was undertaken in 2002 in order to establish the status of elephant and other large herbivores resident in the area (Dunham & Simwanza 2002). An estimate of 236 giraffe were recorded for the area, of which 187 occurred in South Luangwa NP and 48 in the Lupande GMA (Dunham & Simwanza 2002).

An aerial survey of selected large wild herbivores in the Luangwa Valley hunting blocks was conducted in 2004 (Simwanza 2004). Giraffe were observed in only one hunting block, namely Nyampala hunting block, and the population was estimated at 41 individuals (Simwanza 2004).

In 2006, 191 giraffe were estimated to occur in South Luangwa NP and Lupande GMA (Fennessy 2008a). The total estimate of Luangwa giraffe in 2008 was 700-880 individuals (Fennessy 2008a). Giraffe observations continue to be reported further north on the eastern bank of the Luangwa River up to Zokwe (Fennessy 2008a). While these are most likely vagrants, it appears that the population continues to disperse north, whilst its strong hold is in the south. This is most likely attributed to human population growth and pressures (Fennessy 2008a).

In 2009, giraffe were opportunistically photographed when encountered in the Luangwa Valley (Halloran *et al.* 2014). Individuals were identified using Wild-ID software for photographic capture/recapture analysis, resulting in an estimate of 423 giraffe (Halloran *et al.* 2014).

An aerial survey of the Middle Luangwa Valley Ecosystem in 2011 estimated the giraffe population at 407 individuals (Simukonda 2012). Giraffe were sighted in four areas: South Luangwa NP, and the Munyamadzi, Lupande and Sandwe GMAs (Simukonda 2012). An estimate of 168 giraffe was recorded in Lupande, 83 in South Luangwa NP, 57 in Munyamadzi and 82 in Sandwe. The highest population of giraffe was observed in the Lupande GMA though most of these were observed close to South Luangwa NP (Simukonda 2012). In 2012, 423 giraffe were estimated in the Luangwa Valley (M. Becker pers. comm.).

Luangwa giraffe have been present on private game ranches in the Lower Luangwa Valley south of the currently published southern extent, including Nyakolwe, Nyamvu, Nkalamu, Munyamadzi and Kazumba Game Ranches for the past 20 years based on sightings by resident managers and anti-poaching scouts as well as visiting tourists to the area (N. Carruthers per. comm.). Unfortunately, historical numbers are unknown.

The South African giraffe population in Barotseland (western Zambezi) roamed the western parts of the region, between the Zambezi and Mashi Rivers in the 1960s (Dagg 1962). Referred to as Barotse giraffe (*G. c. infumata*[1]), at the time, these animals occurred on the Siluana Plain and on the borders of the Mashi River in west Barotseland (Sidney 1965). In 1952, the Carp Expedition estimated that there were between 150 and 200 individuals in the region (Sidney 1965). In 1965, the estimated number of giraffe in Barotseland remained the same at 150-200 individuals (Sidney 1965). According to East (1999) only a small number of these giraffe (clumped in with the 'Southern giraffe' at the time) survived in south-western Zambia by the late 1990s, all inhabiting Sioma Ngwezi NP.

[1]*G. c. infumata* was considered to be a synonym of *G. c. angolensis* (Dagg 1971). Although East (1999) referred to *G. c. giraffe, G. c. angolensis, G. c. infumata, G. c. capensis and G. c. wardi (the latter two synonymous with G. g. giraffa,* collectively as southern giraffe. South African giraffe (*G. g. giraffa*) were recently reported to be in Sioma Ngwesi NP.

In 2004 and 2005, aerial surveys of Sioma Ngwezi NP estimated 211 giraffe in the area (Chase & Griffin 2009). In 2008, an aerial survey of Mosi-oa-Tunya National Park, Kazungula and the Sioma Complex (which comprises Sioma Ngwezi NP and West Zambezi GMA) was conducted. During this survey, 161 giraffe were estimated in the Lower West Zambezi and 420 in Sioma Ngwezi NP, while 11 giraffe were observed in Mosi-oa-Tunya NP, giving a total of 581 giraffe for the region (Simukonda 2009). Uncertainty remains with regards to the origin of the giraffe population in Mosi-oa-Tunya although what seems certain is they are a (re-)introduced population (M. Nyirenda pers. comm., F. Willems pers. comm.). Anecdotal sources from the former ZAWA suggest that they could have come from Sioma Ngwesi NP, while others indicate they may be from north-eastern Zimbabwe (M. Nyirenda pers. comm.). However, both are now proven to be South African giraffe (Winter *et al.*, 2018; Fennessy *et al.,* 2016).

Current

In 2013, two systematic surveys of giraffe were undertaken in the South Luangwa NP (Bercovitch *et al.* 2014). Giraffe were encountered during both surveys in discrete areas rather than sighted all along the survey area (Bercovitch *et al.* 2014). The lowest estimate was 121 individuals and the highest estimate was 735 individuals, with the average value across all of the studies suggesting a population size of approximately 556 individuals in the Luangwa Valley (Bercovitch *et al.* 2014). A photographic "capture/recapture" survey of the Luangwa giraffe initiated in 2009 by Zambian Carnivore Programme has been gathering photographs of giraffe in the Luangwa Valley and using Wild-ID software to identify individuals has generated a recent estimated population of 600 individuals (Bercovitch *et al.* 2018; Halloran *et al.* 2014). More recent estimates based on ongoing assessments of individual ID photographs estimate a minimum of 650 Luangwa giraffe (M. Becker pers. comm.) in the Middle Luangwa Valley.

Giraffe have in recent years has expanded north into the Luambe National Park. There was no giraffe in the Luambe area from the 1990s until 2014 when two bulls were observed (M. Riffel pers. comm.). Since then numbers are steadily increasing, with an estimated current population of 40 individuals (M. Riffel pers. comm.).

In the southern Luangwa Valley, giraffe are present in the West Petauke GMA, however no accurate estimate of numbers exists. However, herds between 3-10 individuals are seen regularly near the Luangwa River. This population likely extends down the Luangwa River as far south as just above the Ndevu Gorge and within 10-15 km of the Luangwa River within the GMA (N. Carruthers pers. comm.). On the Open Private Game Ranches of Lower Luangwa (the eastern bank opposite West Petauke GMA), giraffe are regularly seen near the river up to 10 km away from it towards the base of the hills in the Miombo-Mopane interface (N. Carruthers pers. comm.). Herds of up to 10 or more individuals have been recorded on camera traps (N. Carruthers pers. comm.). Their southern range is the southern boundary of Kazumba Game Ranch. Whilst accurate numbers do not exist, a cumulative lower estimate for the whole Lower Luangwa area (i.e. West Petauke GMA and open private game ranches) would be 50 individuals (N. Carruthers pers. comm.).

An aerial survey of elephant and other wildlife in Sioma Ngwezi NP was conducted in 2013 (Chase *et al.* 2013). A total of 232 giraffe were estimated: 44 in Sioma Ngwezi NP West and 188 in Sioma Ngwezi NP East (Chase *et al.* 2013). The giraffe population in Sioma Ngwezi NP has remained stable, with an estimate of around 200 individuals noted in the park in 2020 (Pelc 2020).

The giraffe population in Mosi-oa-Tunya NP has grown slowly, increasing to 13 individuals by 2015 and now numbering a maximum of 30 individuals as of 2020 (J. Katampi pers. comm.).

In 2015 as part of a lager conservation effort to rewild Simalaha Community Conservancy, PPF reintroduced an extralimital population of eight Angolan giraffe from the Salambala Conservancy in the Zambezi Region of Namibia (Peace Parks Foundation 2015). This population has been doing well and has since increased to 35 individuals (G. Homer pers. comm.).

On private land, introductions of South African giraffe onto commercial game farms have occurred across the central regions of Zambia. There are ongoing discussions as to what constitutes 'wild' and whether or not to include individuals found on private game farms in wild population estimates. There are some game farmers / private reserves in Zambia that keep them, but only in very small numbers, typically 1-5 animals, thus are "ornamental" rather than commercial (F Willem pers. comm.). All giraffe on game farms in Zambia are descended from two consignments of animals imported in the late 1980s and 1990s from the Lowveld of Zimbabwe (I. Parsons pers. comm.). In addition, there is a population of giraffe in Livingstone Park, however, Parsons believes the individuals found here are possibly inbreeding. Data obtained from ZAWA game ranch returns and questionnaire surveys estimate giraffe numbers within the Protected Area Network at 757 individuals, while numbers on game ranches were estimated at 351 individuals (29.8%) (Lindsey *et al.* 2013). The known number of giraffe on private farms in recent years were as follows: three on Kwisoko Game Ranch, one on Lwimba Ranch, 10 on Kafue Lodge, six on Gamamwe Ranches, and 15 on Khal Amaz Game Farm (M. Mwanakatwe pers. comm., C. Clubb pers. comm., T. Blackenberg pers. comm., N. Kirkpatrick pers. comm., S. barnes pers. comm.). However, these numbers have not been updated since 2015 and the survey for these extralimital giraffe populations within Zambia is ongoing.

The Kasanka Trust, working across the southern Bangweulu basin, Chambeshi in the upper Congo system including Kasanka NP, Lavushi Manda NP and the Bangweulu wetlands, report no giraffe occurring in the region (F. Willems pers. comm.).

In summary, the Luangwa giraffe population in the Luangwa Valley appears to be relatively stable and genetically viable, with a population estimate of 700 individuals – although new data will be available mid-2022 (M. Becker pers. comm.). An estimated population of <260 South African giraffe resides in south western Zambia, approximately 200 South African giraffe in Sioma Ngwesi NP, 30 South African giraffe in Mosi-oa-Tunya NP, 35 Angolan giraffe as an extra limital population in Simalaha Community Conservancy, and <100 introduced individuals on private properties, with some hybridisation highly likely in these populations.

Future Conservation Management

The following are proposed conservation management options for giraffe in Zambia:

- Development of National Giraffe Strategy and Action Plan for Zambia;
- Identification of priority conservation efforts for giraffe conservation;
- Establishing a better understanding of Luangwa giraffe numbers and range throughout the Luangwa Valley;
- GPS satellite tagging of giraffe populations to help with monitoring and anti-poaching support as some of the populations are increasing and expanding; and
- Support to dedicated giraffe conservation, translocation, habitat protection, education and awareness initiatives (government, NGO and academic).

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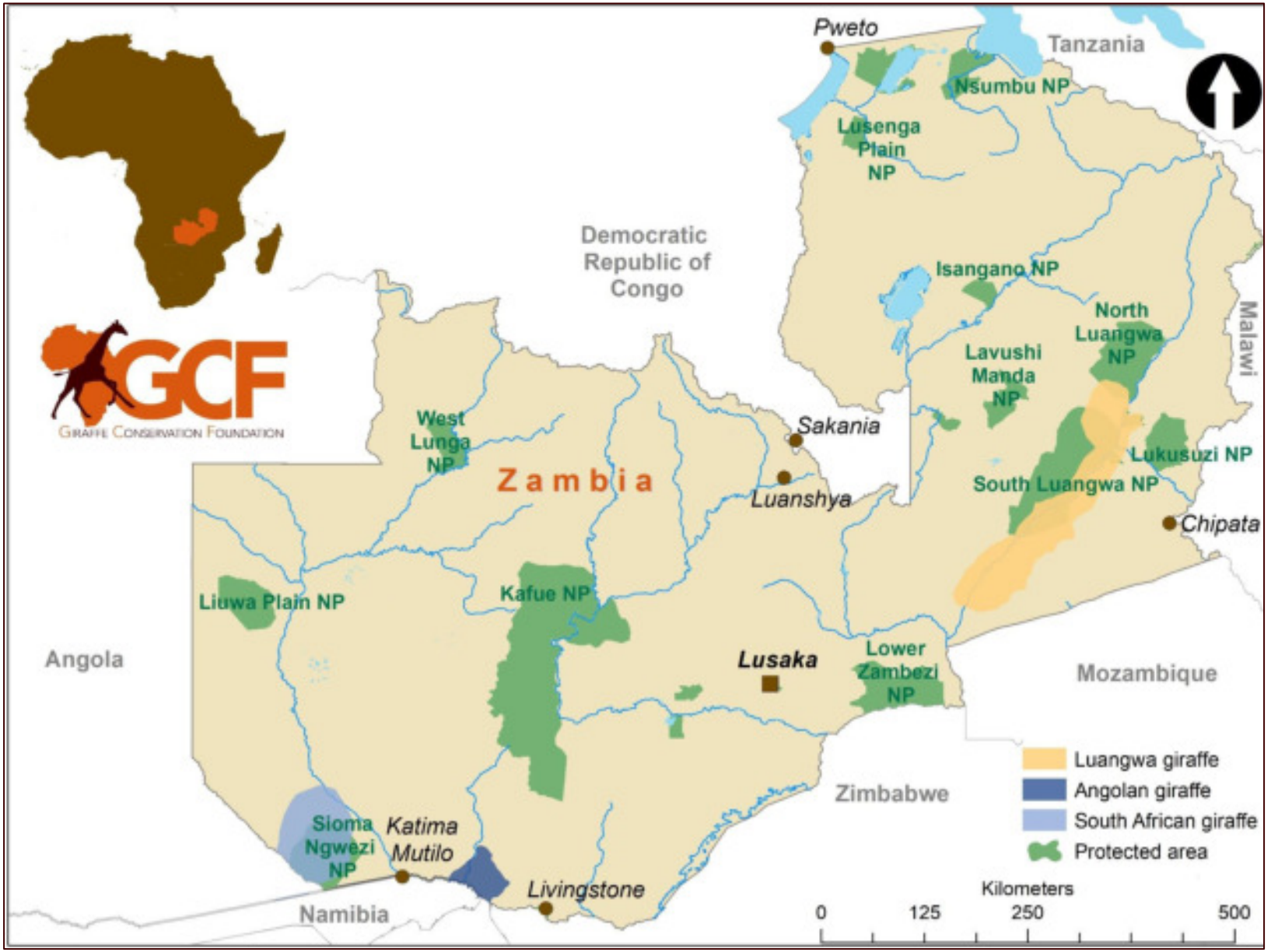
Map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Tanzania
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Democratic Republic of Congo
Isangano NP
North Luangwa NP
Lavushi Manda NP
Malawi
West Lunga NP
Sakania
Zambia
Luanshya
Lukusuzi NP
South Luangwa NP
Chipata
Liuwa Plain NP
Kafue NP
Angola
Lusaka
Lower Zambezi NP
Mozambique
Zimbabwe
Sioma Ngwezi NP
Katima Mulilo
Livingstone
Namibia
Luangwa giraffe
Angolan giraffe
South African giraffe
Protected area
Kilometers
0
125
250
500