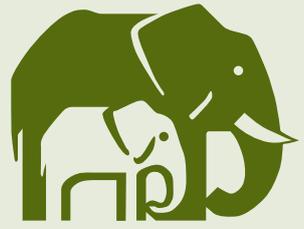


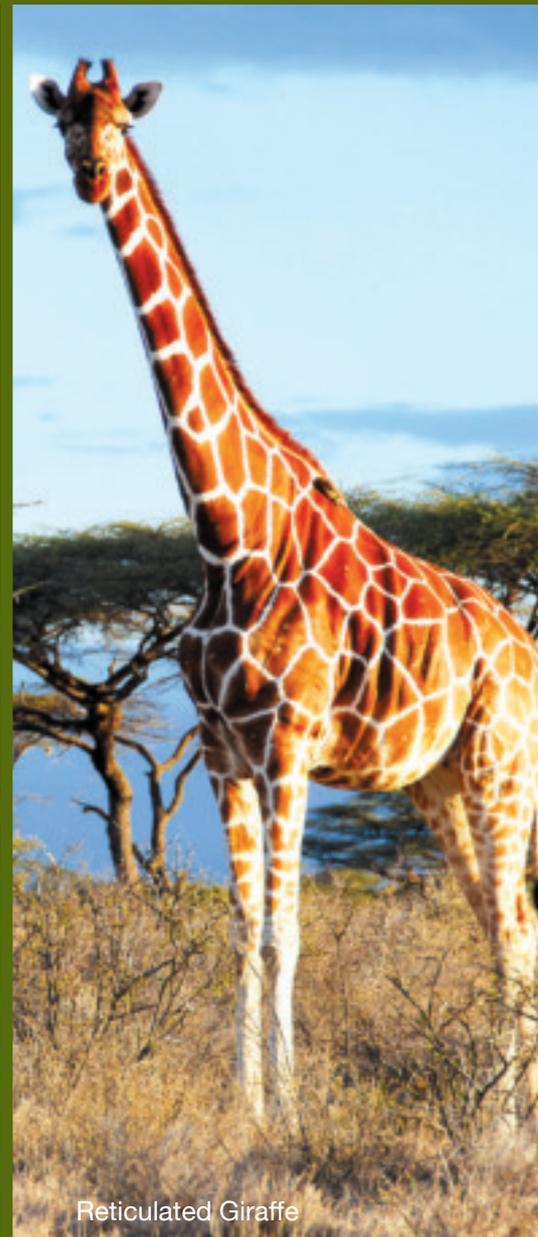
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Maasai Giraffe

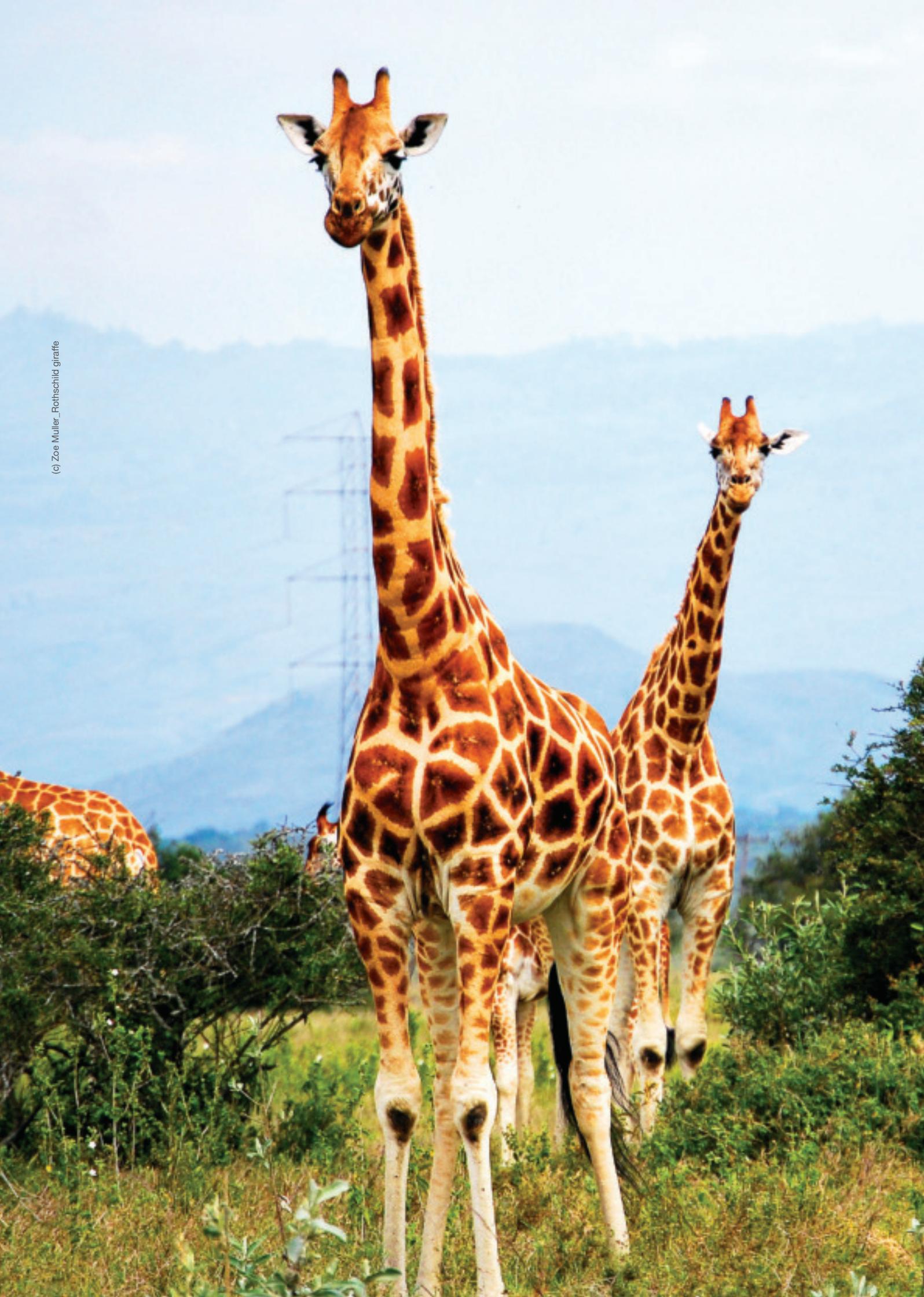


Rothschild Giraffe



Reticulated Giraffe

**National Recovery and Action Plan for
Giraffe (*Giraffa camelopardalis*) in
Kenya (2018-2022)**



NATIONAL RECOVERY AND ACTION PLAN FOR GIRAFFE (*Giraffa camelopardalis*) IN **KENYA (2018-2022)**



AFRICAN
CONSERVATION
CENTRE



Mradi wa twiga aina somali

**Reticulated
Giraffe Project**



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Finally, we are grateful again to the African Wildlife Foundation for providing financial support towards a 2 day workshop in Naivasha for the finalisation of this National Recovery and Action Plan, the Directorate of Resource Surveys and Remote Sensing for providing key giraffe population data and the efforts of all participants in this workshop.

All stakeholders share a passion for working at the grassroots level of conservation and wildlife management, and support the need for continuing efforts to ensure sustainable conservation of giraffe in Kenya.

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Abbreviations

ACC	African Conservation Centre
AFEW	African Fund for Endangered Wildlife (Kenya)
AWF	African Wildlife Foundation
BR&M	Biodiversity Research and Monitoring
CITES	Convention on International Trade in Endangered Species
CSR	Corporate Social Responsibility
CWS	Community Wildlife Service
DG	Director General
DD	Deputy Director
DDS	Deputy Director Security
DRSRS	Directorate of Resource Surveys and Remote Sensing
EA	Environmental Audit
EIA	Environmental Impact Assessment
GCF	Giraffe Conservation Foundation
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for Conservation of Nature
KALRO	Kenya Agricultural and Livestock Research Organisation
KLCT	Kenya Land Conservation Trust
KFS	Kenya Forest Service
KICD	Kenya Institute of Curriculum Development
KPLC	Kenya Power
KWS	Kenya Wildlife Service
LAPSSET	Lamu Port, South Sudan, Ethiopia Transport Corridor
NEMA	National Environment Management Authority
NGOs	Non-Governmental Organisations
NNP	Nairobi National Park
NRT	Northern Rangelands Trust
NWC	Nakuru Wildlife Conservancy
OGW	Order of Grand Warrior
SRS	Senior Research Scientist
SSC	Species Survival Commission (IUCN)
UNFCCC	United Nations Framework Convention on Climate Change
WCK	Wildlife Clubs of Kenya

Glossary

Extralimital population: population introduced outside species natural range.

Extralimital introduction: process of introducing wildlife population outside their natural range

Invasive Species: Plant or animal that is not native to a specific location (an introduced species) and has a tendency to spread causing damage to the environment, human economy and/or human health.

IUCN red list categories: Extinct, Critically Endangered, Endangered, Vulnerable, Near Threatened, and Least Concern are categories of the IUCN 'Red List' of threatened species and has become an important tool defining conservation status and subsequent action at international, national, and thematic levels. The existing definitions are based upon a series of criteria.

Extinct: A taxon is considered 'Extinct' when exhaustive surveys in known and/or expected habitat throughout its historic range have failed to record an individual.

Extinct in the Wild: A taxon is 'Extinct in the Wild' when it is known only to survive in cultivation, in captivity or as a naturalized population (or populations) well outside the past range.

Critically Endangered: A taxon is 'Critically Endangered' when the best available evidence indicates that it faces extremely high risk of extinction in the wild.

Endangered: A taxon is 'Endangered' when the best available evidence indicates that it faces a very high risk of extinction in the wild.

Vulnerable: A taxon is 'Vulnerable' when the best available evidence indicates that it faces a high risk of extinction in the wild.

Near Threatened: A taxon is 'Near Threatened' when it does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.

Least Concern: A taxon is considered 'Least Concern' when it is widespread and abundant in its known range.

Translocation: Capture, transport and release of individuals from one area to another, either to improve chances of survival, establish new populations, to augment established populations and/or to introduce new genetic lines into a population.

Anthropogenic: Changes in nature caused by humans.

Wildlife drive: process of 'chasing' wildlife from one area to another using helicopters or vehicles.

Captive: facilities that provide shelter and care to wildlife. The facilities could be a sanctuary, an orphanage or a rescue centre, the animals are fully dependant on human care

Semi-captive: facilities that provide shelter and care to wildlife. In these facilities the animals are not fully dependant on human care.

Enclosed: natural areas that offer refuge to wildlife, the animals can be independent of human care but are not able to move from one area to another. These facilities are mostly fenced.

Foreword by Chairman of KWS Board of Trustees

Kenya is endowed with high biodiversity richness which includes endemic and threatened wildlife species.

Wildlife species in Kenya are found in national parks and national reserves with a considerable percentage existing outside protected areas in private conservancies, ranches, community conservancies and sanctuaries. Since the 1970's, large wild herbivore species like giraffe have faced significant threats from land use conversions, poaching, extraction of resources and habitat fragmentation. Erection of artificial barriers urban development, tourism and infrastructure development inside and outside protected areas have increasingly continued to restrict the giraffe range and affected their forage base. This National Giraffe Recovery and Action Plan is aimed at guiding implementation of activities by various stakeholders that will address the identified conservation challenges and therefore lead to sustainable conservation and management of giraffe within their natural ranges in Kenya.

KWS recognizes and appreciates the input and efforts of stakeholders in the conservation and management of giraffe in Kenya. Successful implementation of this action plan will ensure that the species' populations and habitats are conserved and managed. Recognizing that conservation of wildlife is a shared responsibility, the Kenya Wildlife Service will encourage and strengthen, participation and collaboration of all stakeholders including Government, Non-Governmental Organizations, land owners, local communities, researchers and donors.

KWS is committed to the realization of this National Recovery and Action Plan, and calls upon all partners to support the implementation of the activities outlined in this National Recovery and Action Plan.



DR. JOHN WAITHAKA

Preface by Ag. Director General of KWS

Giraffe face serious threats across their range due to human encroachment into their habitats, poaching and competition for resources like water with livestock. Negative anthropogenic effects on giraffe habitats have been experienced in all giraffe ranges in Kenya. This National Recovery and Action Plan for Giraffe in Kenya is aimed at addressing these challenges for sustainable conservation and management of the three giraffe subspecies in Kenya. It emphasizes the need to develop and implement appropriate strategies to tackle the impacts of the threats on giraffe and their habitats.

The Recovery and Action Plan calls upon conservation agencies and other stakeholders to implement national and trans-boundary conservation initiatives between Kenya and Tanzania governments in the Tsavo West National Park-Mkomazi Game Reserve, Amboseli-Mt. Kilimanjaro National Parks and the Serengeti-Maasai Mara National Reserves. It identifies integrated land use plan to be critical in minimizing the negative impacts on giraffe habitats. Lastly, the Recovery and Action Plan further emphasizes the need to conduct research on giraffe ecology and population dynamics within its ranges in Kenya, as well as ecological needs of giraffe within the migration corridors and dispersal areas for sustainable conservation and management of the species.

The preparation of this National Recovery and Action Plan was truly a team effort. KWS is grateful to the entire team which provided tremendous support, active participation and contribution throughout the process of development.

Implementation of activities in this National Recovery and Action Plan will require resources. Hence, we call upon all stakeholders to support its implementation.



JULIUS KIMANI

Executive Summary

There are three currently recognized subspecies of giraffe found in Kenya: the Maasai giraffe (*Giraffa camelopardalis tippelskirchi*), Rothschild's giraffe (*G. c. rothschildi*) and reticulated giraffe (*G. c. reticulata*).

This first-ever National Recovery and Action Plan for this species aims at focusing attention on individual subspecies of giraffe. Previously, much of the species-level focus in Kenya was on black rhino (*Diceros bicornis*) and African elephant (*Loxodonta africana*), neglecting other key species of concern. To bridge this gap, the Kenya Wildlife Service created the Department of Species Conservation and Management which aims at giving the necessary attention to all threatened species within the country.

One of the driving factors of Kenya's Vision 2030 is tourism and given that wildlife is a key component in the tourism industry in Kenya, all wildlife must be accorded a high priority and be conserved to the very best of our abilities. Giraffe have so far been overlooked in comparison to other large mammals in terms of conservation efforts. Yet, they are a symbol of African wildlife, a popular animal to be seen in Kenya and do in fact represent a crucial calling card for tourists and the tourism industry as a whole. Therefore, knowledge gained from the 2010 National Giraffe Stakeholders workshop and this National Recovery and Action Plan will be used to drum up support from political leaders and communities alike to support this critical conservation initiative.

The 2010 National Giraffe Stakeholders workshop in Nairobi and the 2018 stakeholder Review Workshop in Naivasha 2018 furthered our knowledge of baseline information on giraffe population estimates, distribution and threats in Kenya. This baseline information helps to determine how to plan for their future, and where to counter threats and conservation challenges facing the three giraffe subspecies in Kenya. With a 67% giraffe population decrease since the 1970's, addressing this decline in Kenya is of high priority. This National Recovery and Action Plan also aims to address the issue of working with local communities for them to appreciate and identify how best they can benefit from giraffe conservation efforts. Thus, there is a need to initiate projects both at community and government levels that have a direct link to giraffe conservation.

This National Recovery and Action Plan for Giraffe in Kenya has also come up with a clear implementation structure to facilitate information flow. This will be critical in addressing all the threats leading to population decline as the stakeholder's roles are clearly assigned and measurable.

Chapter I: Introduction

1.1 Background

East Africa is a hotspot for mammalian evolution and diversity (Cerling, 1992; Kingdon, 2003) but the region has also some of the fastest growing human populations and economies on the continent (Tshirley *et al.*, 2015). Countries in the region drafted long-term economic growth plans that incorporate the preservation and conservation of wildlife for future generations. Kenya established Vision 2030, which recognizes tourism, and by extension wildlife, as a key pillar for national development. To ensure that wildlife and their habitats are adequately protected for future generations, stakeholders have also drafted and implemented Species Recovery and Action Plans (conservation and management strategies) to mitigate threats they face and ensure their survival.

In collaboration with various stakeholders, the Kenya Wildlife Service (KWS) has developed conservation and management strategies for elephant, cheetah (*Acinonyx jubatus*) and wild dogs (*Lycaon pictus*), lion (*Panthera leo*) and spotted hyena (*Crocuta crocuta*), black rhino, Grevy's zebra (*Equus grevyi*), among others. Species-specific action plans have proved successful in addressing the deficiencies, knowledge gaps, and mitigating threats to populations either at the national, regional, or range-wide level (Golladay *et al.*, 2016; Ortega-Argueta *et al.*, 2017).

In an effort to promote giraffe conservation in Kenya, KWS held a National Stakeholders Workshop in 2010 in Nairobi, with the support of various conservation partners. The workshop produced the initial draft, which was reviewed by the National Kenya Giraffe Task Force comprised of wildlife conservation and policy experts. In 2018, an additional workshop was held in Naivasha to update the National Recovery and Action Plan for Giraffe in Kenya to incorporate new data and policies that have been put in place to protect giraffe at the species level. This National Recovery and Action Plan represents the collaborative efforts between government institutions, non-government organisations (NGOs), research and academic institutions, and community and private conservancies to ensure that conservation efforts are guided and streamlined adequately to protect the three subspecies of giraffe in Kenya.

During the formulation of this Recovery and Action Plan, participants worked on the following three questions that aided in the conservation planning process:

1. Where are we now? (Assessment of status)
2. Where do we want to go? (Definition of goals)
3. How can we get there? (Way forward on actions)

There is need to identify problems and enabling conditions in giraffe conservation, thus, this process involved formulating a long-term vision, a goal that represents the ideal situation for giraffe, and objectives, targets and activities.

1.1. Framework for Species Conservation within Kenya

The main objective of this National Recovery and Action Plan was to develop a national framework for the conservation of giraffe in Kenya through a participatory process involving all partners based on an assessment of threats and enabling conditions in the country. There were two rationales for species-specific conservation planning in Kenya: (1) addressing challenges facing threatened species, which are numerous and complex; and (2) coordinating actions to ensure the future survival of threatened species. Thus, the Department of Species Conservation and Management was established by KWS to promote threatened species conservation planning and conservation initiatives.

Conservation planning is a process that involves formation of species-specific conservation Task Forces (expert groups composed of Government, conservation biologists, NGO's and special interest groups). Their main objective is to steer the process of formulating species-specific Recovery plans/conservation and management strategies, identify stakeholders, and hold participatory planning meetings and workshops and mobilise resources for implementing conservation actions.

This National Recovery and Action Plan will help in addressing giraffe conservation in Kenya. The actions will be reviewed annually to assess status, gaps and plan next steps. Challenges of developing and implementing the conservation plan include:

- i. The process is time consuming.
- ii. Consensus building – differing opinions.
- iii. Expensive – task force meetings, retreats and workshops.
- iv. Conflicts between species specific strategies.
- v. Implementation is a full-time job (or greater) and requires a lot of financial resources.
- vi. Team work is essential.

1.2. Giraffe conservation status and distribution in Africa

1.2.1. Giraffe – scientific classification

Kingdom	– Animalia
Phylum	– Chordata
Class	– Mammalia
Order	– Artiodactyla
Sub-order	– Ruminantia
Family	– Giraffidae
Genus	– <i>Giraffa</i>

- Species – *Camelopardalis*
- Subspecies – *G. c. angolensis* (Angolan giraffe); *G. c. antiquorum* (Kordofan giraffe); *G. c. camelopardalis* (Nubian giraffe); *G. c. giraffa* (South African giraffe); *G. c. peralta* (West African giraffe); *G. c. reticulata* (reticulated giraffe); *G. c. rothschildi* (Rothschild's giraffe); *G. c. thornicrofti* (Thornicroft's giraffe); *G. c. tippelskirchi* (Maasai giraffe).

Historically, giraffe ranged widely across much of the African continent, but they are now largely found in national parks and reserves, conservancies and private ranches, and surrounding community and conservancy land. Currently, the International Union for the Conservation of Nature (IUCN) recognizes only one species and nine subspecies of giraffe but there is considerable uncertainty surrounding the geographic and taxonomic limits of giraffe subspecies. Recent phylogenetic studies have proposed varying taxonomic classifications of giraffe species and subspecies (Brown *et al.*, 2007; Hassanin *et al.*, 2007; Fennessy *et al.*, 2013; Bock *et al.*, 2014; Fennessy *et al.*, 2016). The IUCN SSC Giraffe & Okapi Specialist Group has proposed to review all available data and literature to update the taxonomy of giraffe as current classification is adapted from Lydekker (1904), whose interpretation of the geographical range of giraffe was based on limited knowledge of their actual range.

Giraffe range throughout the northern and southern savannah regions of sub-saharan Africa, from the open woodland, avoiding dense forest and desert environments (Skinner & Smithers, 1990; Estes, 1998; East, 1999). A distinctive broad strip of moist miombo woodland separates the current southern and northern range of giraffe in Africa.

Results from analysis of mitochondrial DNA sequences and nuclear microsatellite loci suggest that a major adaptive radiation of giraffe occurred in East Africa during the mid to late Pleistocene era, that is, between 1.62 and 0.16 million years ago (Brown *et al.* 2007). This adaptive radiation is reflected in the species' current distribution despite the ranges of all populations becoming greatly reduced and increasingly fragmented (Kingdon, 2003; GCF, 2017). Giraffe's restricted range is often limited in areas of expanding human populations.

Currently, giraffe are distributed in, and arc from West Africa through Central Africa into Eastern Africa and south across Southern Africa (Kingdon, 2003; GCF, 2017). Specifically, giraffe are currently found in 22 countries: Angola, Botswana, Cameroon, Central African Republic, Chad, Democratic Republic of Congo, Ethiopia, Kenya, Mozambique, Namibia, Niger, Somalia, South Africa, South Sudan, Tanzania, Uganda, Zambia, and Zimbabwe (Fig. 1). Extralimital populations are found in Malawi, Rwanda, Senegal and Swaziland (GCF, 2017).

Over the last three decades, increased giraffe translocations have resulted in giraffe range expansions in some areas, including re-introductions to former ranges and introduction outside the subspecies historical range in some countries. While changes in population structure and distribution are easy to understand through studies, factors influencing its dynamics are not clearly known. The majority of population dynamics studies focus on current ranges of the species and their relation to conservation and management (Berry, 1978; Ciofolo, 1995; Flanagan *et al.* 2016; McQualter *et al.* 2016). Numerous short-term studies of giraffe population dynamics have been undertaken throughout their current range (Innis, 1958; Foster, 1966; Dagg & Foster, 1972; Berry 1973; Leuthold, 1979; Pellew, 1984; Van der Jeugd & Prins, 2000; Fennessy, 2004).

Giraffe numbers across the continent are thought to have declined by ~40% in the last thirty years from a historic estimate of ~155,000 to ~99,000 individuals (Muller *et al.*, 2016). This resulted in giraffe as a species being up listed to 'Vulnerable' on the IUCN Red List in December 2016 (Muller *et al.*, 2016). Currently, only the Rothschild's and West African giraffe have been assessed by the IUCN Red List, where they were listed as 'Endangered' in 2010 and 2008 respectively (Fennessy & Brenneman, 2010). As a result of recent genetic studies (Fennessy *et al.*, 2016) on the taxonomic status of giraffe, IUCN is currently conducting detailed assessments of all subspecies of giraffe, to be finalised in 2018/19.

Historical knowledge of a species population dynamics provides a valuable background for its management. Limited data on giraffe ecology and population dynamics has restricted appropriate conservation and management efforts for the giraffe and their subspecies across the African continent. Limited research and associated difficulties in monitoring of giraffe hinder our understanding of their population structures and life history (Fennessy, 2009; GCF, 2017). Although understanding a species population structure is beneficial, a broad knowledge of the historical and current factors, coupled with intrinsic and extrinsic factors and use of emerging technologies, can provide information for appropriate conservation of the species (Fennessy, 2009).

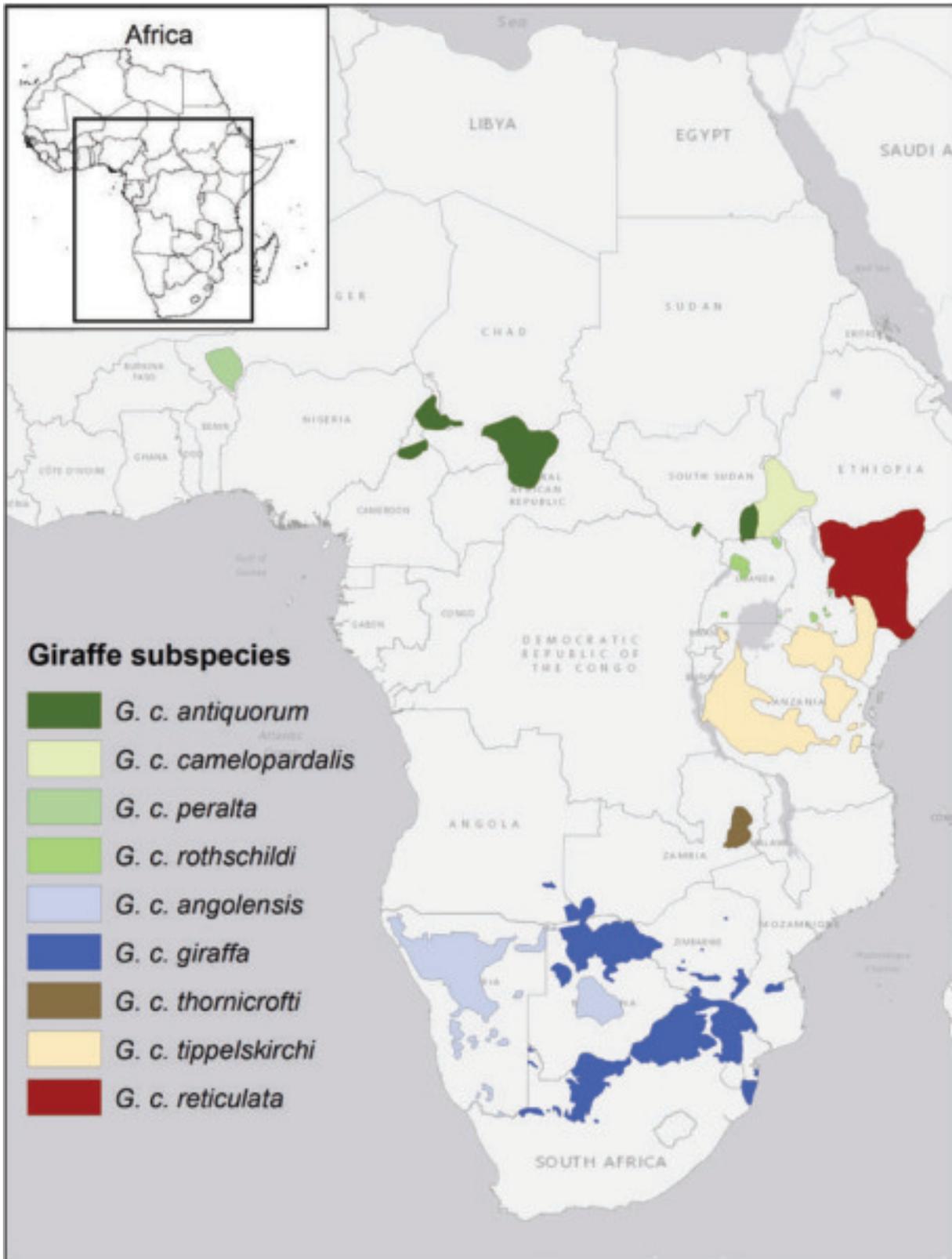


Fig. 1: Distribution of giraffe subspecies in Africa. Source (GCF, 2017)

1.2.2. Biology of giraffe

The name giraffe is derived from the Arabic word '*zarafa*' which translates to 'one who walks swiftly' (Shorrocks 2016). The giraffe is the tallest land mammal with a very long neck, long legs, patchy coat pattern, short 'horns' (ossicones), short stiff mane and long tuft of hair on the tail. While giraffe have the longest neck, they have the same number (seven) of cervical vertebrae as other mammals but elongated. On average, males can grow to a height of 5.5m (18ft) and females to 4.5m (15ft), whereas they can weigh 1,200kg and 830kg, respectively (GCF, 2017). Giraffe have a long prehensile tongue that they use in combination with the upper lip to feed; giraffe are selective browsers. They feed on tree leaves, shoots, pods, and fruits. In rare instances, they feed on grass.

Giraffe can run 50km/h for sustained periods and can kick in all directions for defence against predation. Giraffe, especially males, form loose social bonds; they adjust their social systems, ranging from solitary to large mixed herds. This is known as fission-fusion where individuals or smaller groups readily join or split from the herd, but this differs from one population to another (Shorrocks, 2016; GCF, 2017). Giraffe reach maturity at three to four years old, often later for males, and are estimated to live up to ~25 years in the wild, although likely longer as long-term studies are non-existent.

1.2.3. Conservation status of giraffe

Giraffe are currently not listed under the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) species as there is not sufficient evidence of international trade and its derivatives. This notion may need to be evaluated as giraffe now face serious threats as a result of poaching for meat, skin and tail and likely trade of body parts, however, much of this appears to be for local consumption and there are no indications of international trade.

In October 2017 giraffe were listed on Appendix II of the Convention of Migratory Species (CMS) (CMS COP12, 2017). While protected across most of its range, protection under CMS hopes to facilitate increased collaboration across conservation range States and improve awareness and management of their plight internationally.



Chapter 2: Distribution and Present Status of Giraffe in Kenya

Introduction

There are three subspecies of giraffe found in Kenya: Maasai giraffe, also known as the Kilimanjaro giraffe; the reticulated giraffe, also known as the Somali giraffe; and, the Rothschild's giraffe, also known as Uganda or Baringo giraffe (Fig. 2).

The latest detailed genetic studies suggest that both the Maasai and reticulated giraffe should be elevated to species, rather than subspecies, and the Rothschild's giraffe subsumed into Nubian giraffe as it is genetically identical (Fennessy *et al.*, 2016). However, the IUCN SSC Giraffe and Okapi Specialist Group (GOSG) currently recognize a single species of giraffe (i.e., *Giraffa camelopardalis*; Muller *et al.*, 2016). The group also recognizes three subspecies of giraffe (*G. c. rothschildi*, *G. c. reticulata* and *G. c. tippelskirchi*) in Kenya (Muller *et al.*, 2016). Further, Muller *et al.* (2016) points out that until an extensive reassessment of the taxonomic status of giraffe is completed, it is premature to alter the taxonomic status quo. Therefore, to avoid the ambiguity of describing giraffe according to inconclusive taxonomy the IUCN recognizes giraffe as a single species (Muller *et al.*, 2016). This national recovery and action plan for giraffe recognizes the giraffe as one species with three subspecies in Kenya.

2.1. Maasai giraffe

The Maasai (or Masai) giraffe, inhabits the southern areas of Kenya, ranges throughout Tanzania and a recent extralimital introduction into Rwanda. In Kenya, the subspecies occupies the savannah ecosystems of Tsavo and Amboseli National Parks, Naivasha, Magadi area and Maasai Mara National Reserve, as well as many community areas surrounding these. The savannah ecosystem strides across the Kenya/Tanzania border thus forming transboundary giraffe ranges of the Tsavo National Parks in Kenya and Mkomazi in Tanzania, Amboseli National Park in Kenya and Kilimanjaro/Longido in Tanzania, Namanga/Magadi and the Maasai Mara/Serengeti ecosystems.

2.2. Reticulated giraffe

Reticulated giraffe historically ranged across southern Ethiopia, northern Kenya, east of the Rift, adjacent southern Somalia and south to north of the Tana River, Kenya (East, 1998). The available data on reticulated giraffe number are few but it is estimated that ~15,000 individuals remain, the majority occurring in Kenya. This number represents a fraction (~40%) of the 36,000 estimated to have existed in the mid-1980s (East, 1999), suggesting that the subspecies has recently suffered a major and rapid decline, and giving rise to concern about its long-term persistence.



Fig. 2: Giraffe subspecies distribution in Kenya (Source: KWS/National Giraffe Task Force/DRSRS)

2.3. Rothschild's giraffe

The Rothschild's giraffe historically ranged over Western Kenya, however all known wild populations have been extirpated mainly by agricultural development. Today, they survive in four populations in Uganda, possibly in South Sudan, and in introduced areas in Kenya. Habitat fragmentation, habitat loss and conversion, and illegal hunting have confined Rothschild's giraffe range over the years.

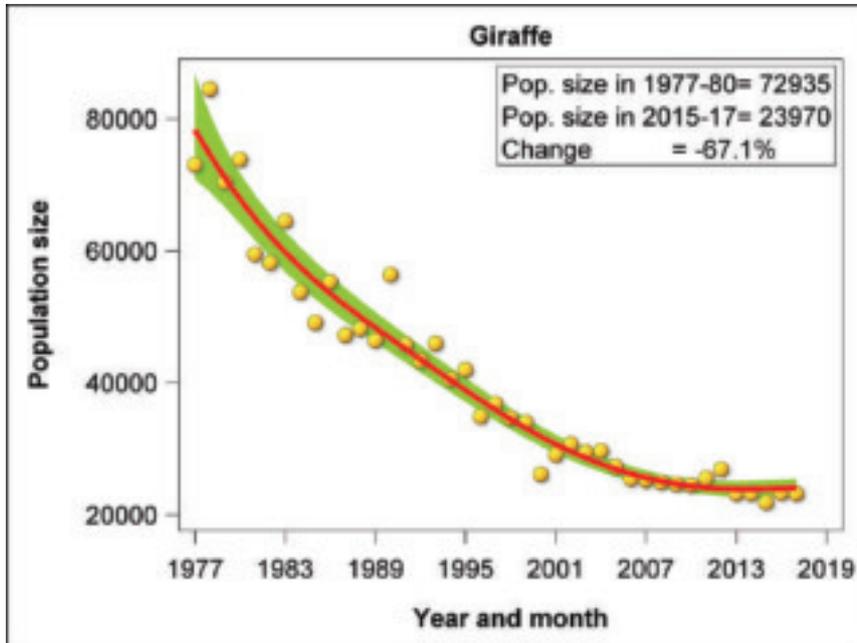
In Kenya, populations of Rothschild's giraffe were introduced into numerous private and public areas, including Giraffe Manor, Kigio Wildlife Conservancy, Lake Nakuru National Park, Mwea National Reserve, Ruma National Park and Soysambu Conservancy. Additionally, Rothschild's giraffe were re-introduced to Ruko Community Wildlife Conservancy on Lake Baringo to re-establish its presence in its historical range. All Kenyan populations were derived from a single, endemic population dispersed when the defunct Soi army base, located in western Kenya north of Lake Victoria, and east of Mt. Elgon near Eldoret town, was opened for resettlement in the late 1970s. The largest population of Rothschild's giraffe in Kenya is found in Ruma National Park, followed by Soysambu Wildlife Conservancy and Lake Nakuru National Park, respectively (Table 1) (GCF, 2017).

2.4. Conservation status of giraffe in Kenya

All three giraffe subspecies in Kenya are accorded full protection under the Wildlife Conservation and Management Act, 2013, where they are listed as 'Endangered'. Giraffe have for a long time been considered one of Kenya's most charismatic, ecologically and economically important species of the mega-fauna. Over the last three decades, the giraffe population in Kenya has declined by ~40% (Fig. 3): in 1998, the total giraffe population was estimated to be ~45,000, declining to a current estimate of 28,850 individuals.

Gaps do exist on detailed giraffe numbers and distribution in Kenya, and whilst some areas host potentially large giraffe populations, definite numbers and range are unavailable. Moving forward, surveys/censuses should be carried out in such areas where information on giraffe populations is lacking and to assist mapping range boundaries and distribution of giraffe subspecies in the country.

Fig. 1: Giraffe population trend in Kenya (1977-2018). Source: Ogutu et. al. (2016)*



* Graph adapted from Ogutu et. al. 2016 which showed changes in national population size from 1977-1980 to 2011-2013; updated to show changes in population size from 1977-1980 to 2015-2017.

Table 1. Maasai and Rothschild's giraffe population estimates and distribution in Kenya

ECOSYSTEM	NUMBER	SOURCE	YEAR
MAASAI GIRAFFE			
Tsavo	4,068	KWS	2017
Amboseli	3,470	KWS	2013
Namanga and Magadi	1,577	KWS	2013
Maasai Mara	2,607	KWS	2017
Nairobi National Park	112	KWS	2017
Maanzoni-Malinda and Mwalimu Ranches	47	KWS	2016
Athi-Kapiti and Machakos Ranches	303	KWS	2005
Naivasha-Nakuru	529	NWC	2017
Shimba Hills	4	KWS	2017
TOTAL	12,717		

ROTHSCHILD'S GIRAFFE			
Ruma National Park	275	GCF	2018
Ruko Community Conservancy	8	KWS/NRT	2017
Soysambu Wildlife Conservancy	159	Soysambu	2018
Kigio Wildlife Conservancy	34	Kigio	2017
Lake Nakuru National Park	74	KWS	2017
Mwea National Reserve	51	GCF	2018
Mt. Elgon National Park	2	KWS	2017
Rimoi National Reserve	6	KWS	2017
TOTAL	609		

Table 2. Reticulated giraffe population estimates and distribution in Kenya

Area	Number	Source	Year
Mandera	130	Ogutu <i>et. al.</i> 2016 ¹	2011
Marsabit	342	KWS aerial count	2017
Wajir	3,797	Ogutu <i>et. al.</i> 2016 ¹	2011
Laikipia - Samburu (includes Isiolo)	4,019	KWS aerial count	2017
Meru	876	KWS aerial count	2017
Nyeri (Aberdare Country Club)	30	KWS	2017
Garissa (South)	4,356	Ogutu <i>et. al.</i> 2016 ¹	2016
Lamu	1,974	GEC aerial count ^{2,3}	2015
Total (approximate)	15,524		

DRSRS: Department of Resource Surveys and Remote Sensing

GEC: Great Elephant Census

KWS: Kenya Wildlife Service

NRT: Northern Rangelands Trust

¹ Estimates for Mandera (130) Wajir (3,797) and Garissa (6,988; DRSRS 2011) are included even though the fractions of the areas sampled (and the numbers counted) were small: 6.15% (8), 5.03% (191) and 5.28% (369) respectively, so as to be conservative, and use actual data rather than expert opinion.

² This figure excludes blocks counted by KWS/NRT in 2011 (162, 163, 167, 170, 171)

³ It is possible that this figure includes a small number of Masai giraffe south-west of the Tana River (blocks 153, 157).

Table 3. Giraffe populations in captive/ semi captive facilities in Kenya

ECOSYSTEM	NUMBER	SOURCE	YEAR
ROTHSCHILD'S GIRAFFE			
Haller Park	8	KWS	2017
Giraffe Center	12	KWS	2017
Delta Crescent	1	KWS	2015
Tindress Wildlife Sanctuary	4	KWS	2017
Sergoi Farm (formerly Kruger farm)	14	KWS	2018
Bora Bora	5	KWS	2018

2.5. Survey methods used to estimate giraffe numbers in Kenya

No specific national giraffe census has been conducted, rather giraffe surveys have been undertaken during various large mammal censuses. Methods used to conduct census vary from region to region and include: total aerial count, sample aerial count, ground survey methods, distance sampling, photographic mark recapture, and other ground-based estimates, e.g. road counts.

Total aerial counts: Used mostly in large areas such as Tsavo-Mkomazi, Amboseli-West Kilimanjaro, Laikipia-Samburu and Maasai Mara. The survey is carried out using aircrafts with a crew consisting of a pilot, Front Seat Observer and Rear Seat Observer (s), who also record the data. The method is based on total aerial count method of wildlife survey as described by Norton–Griffiths (1978) and Douglas-Hamilton (1996) with modifications described by Okello *et al.* (2015). The survey area is delineated into regular blocks and each block is systematically searched using air-crafts fitted with observer-calibrated streamers to guide observers on where to limit their observations. The aircraft flies either North South or East West direction along transects of 1-2 km width depending on visibility and terrain. In mountainous areas, irregular transects are undertaken. During the census the aircraft crew systematically searches for and makes observations while recording wildlife species and their numbers, livestock numbers, water sources/point and human activities along flight transects. For each observation a waypoint is marked using a hand held Global Positioning System (GPS) and the observation recorded on a data sheet. Large herds of more than 10 individuals are photographed and tallied later to verify counted individuals.

Sample aerial count: More recent survey method used in large ecosystems such as Tsavo-Mkomazi and Laikipia-Samburu. It is based on the standard methodology for strip-transect sampling (Norton-Griffiths, 1978), which has been well established for aerial surveys of large African herbivores (Craig & Gibson 2002; Chase & Griffin 2009, Dunham 2010,). Large mammal surveys using this methodology carried out in Kenya normally follow the procedures and methodology used by Dunham (2010) and Chase (2011) for conducting, analyzing and presenting wildlife aerial survey data and encouraged by the PAASE Standard Operating Procedures (2014).

Total ground count: This activity has traditionally taken place in Nairobi, Nakuru-Naivasha-Hell's Gate and to some extent Kajiado and Amboseli areas, because of their open habitat nature. Counting blocks have been delineated into discrete counting blocks, usually bordered by well-defined features such as roads, rivers, escarpment edges, mountains or the park/reserve boundary to enable a near effective coverage and sighting of available wildlife from vehicle or foot teams. The blocks are normally kept as permanent as possible for continuous comparison.

Photographic mark recapture: long term method used in some areas for monitoring giraffe populations. The method is based on individual identification of giraffe by use of their unique coat pattern. A photo of each individual giraffe's left and/or right side is taken and the coat pattern is used for identification. The pictures are stored in a database for long term population monitoring, records of any new individuals, births and deaths are also kept.



Chapter 3: Threats to Giraffe In Kenya

3.1 Introduction

Giraffe ecology and population dynamics can be influenced by both extrinsic and intrinsic factors. Extrinsic factors include precipitation, human disturbance, habitat disturbance and competition, while intrinsic are such factors like allele effects, stress, intra-specific competition and other density dependent processes (Obari, 2009). Population dynamics in giraffe can also be influenced by poaching, habitat fragmentation, predation, forage and shift in fecundity (Dagg & Foster, 1972).

This section provides an overview of the threats faced by giraffe in Kenya as a rationale for aiding strategic planning and implementation. The threats identified are listed as area specific although many are similar across some areas and some populations. Currently, the main threats facing giraffe in Kenya are identified as:

Extrinsic threats including:

- 1) Poaching/illegal hunting – snaring, meat (subsistence and trade), hides, bracelets, ‘heroism’, resource conflicts with humans
- 2) Habitat loss - due to encroachment, modification, destruction, degradation, invasive species, habitat fragmentation and constriction, Loss of dispersal areas - land-use changes and Insular effects like fencing.
- 3) Climate change – El Nino & La Nina phenomena (floods, prolonged cyclic droughts, reduced forage, water scarcity, stress)
- 4) Infrastructural developments - Accidents through road and railway kills.
- 5) Inter specific competition - with other species of wildlife and/or livestock

Intrinsic threats including:

- 1) Inbreeding (as a result of population isolation, insularization and loss of migration corridors) thus leading to genetic invariability and loss of genetic vigour in populations.
- 2) Dietary complications – toxins and tannin effects
- 3) Inter-specific competition leading to reduced carrying capacity and reduced food for nutrition
- 4) Disease – anthrax, rinderpest, foot ulcers, Giraffe Skin Disease etc

Habitat loss and fragmentation

The gradual reduction of accessible grazing land for pastoralists and land-use change from pastoral to sedentary lifestyle in core wildlife landscapes presents a major challenge for sustainable ecosystem management in Kenya (Kimiti *et al.*, 2016). Population growth and increased pressure on conservation areas fuels human-wildlife conflict whereby both human and animal lives are lost in addition to crop damage. Additionally, development of tarmacked roads through giraffe habitat have resulted in an increase in the number of wildlife killed by vehicles. The proposed solution of using fences to cordon off roads and demarcate human settlement areas also poses a lethal threat to giraffe populations, notably in southern Kenya. Giraffe are known to entangle themselves when attempting to jump over fences to access resources in search of forage and mates, depending on availability and climatic conditions. It is important to document these instances to help make informed conservation and management policies.

Poaching

While giraffe are often snared, in some cases they are not the intended target species. Snares are often set in and around protected areas by poachers intending to trap smaller game for subsistence. Snare injuries often lead to giraffe mortalities due to difficulty in mobility or permanent injuries in cases where affected animals are maimed – and as such more prone to predation. To date, only one study in Murchison Falls NP, Uganda has attempted to quantify the proportion of the giraffe populations with snare injuries, observing that giraffe with snare injuries had a poorer body condition (Brown & Fennessy, 2014). More generally, snaring incidences of giraffe have been recorded across populations in Kenya. The transboundary region of northern Tanzania and southern Kenya appears to be a hotspot area for giraffe poaching, despite being one of the last strongholds for Masai giraffe. Thus, there's a crucial need to understand and document the socio-economic and cultural importance of giraffe in the region, as well as monitor poaching incidences and increase anti-poaching efforts.

Climate change

Climate change directly affects ecosystems through seasonal increases in air temperatures and changes in precipitation, thus, causing severe droughts and fires (IPCC, 2007). With climate change, there will likely be shifts in biodiversity ranges and the distribution of many species may change. Such changes affect the availability, accessibility and quality of resources upon which people and wildlife rely on. These have implications on protection and management of wildlife, habitats, protected areas and forests (Gandiwa & Zisdza, 2010). Climate change has rendered wildlife more vulnerable to ecological disasters. For example, the ability to adapt to climate variability and change is influenced by local characteristics like topography, existing biodiversity and presence of invasive species, successional changes in ecosystem state and landscape fragmentation. Understanding the range of natural variability and ecosystem response plays a key role for the future management of ecosystems (Gandiwa & Zisdza, 2010). Other serious impacts of climate change on ecosystems include change in nutrient concentration in plants and river systems, surface water availability, river flow regimes and differences in phenology of plants. There will also be increased incidents of human/wildlife conflicts as were in the cases of Amboseli and Tsavo National Parks during the 2009/2010 severe drought (KWS-Amboseli Ecosystem Integrated Management Plan, 2010-2015). Climate change will also bring about change in wildlife behaviour, that is, non-migratory animal species may be forced to develop migratory tendencies in search of food and water with great difficulty of adapting to the new lifestyles. Climate change may also bring about increased incidents of pests and wildlife disease outbreaks. There will be disruption of both plant and animal species life cycles whereby interdependent species may lose synchronization of their activities (UNFCCC, 1992).

Diseases

Giraffe are not only at risk due to anthropogenic sources, but are vulnerable to disease outbreaks. Giraffe populations have previously been significantly affected by outbreaks of rinderpest (McNeil Jr., 2011), anthrax (Kaitho *et al.*, 2013), papillomavirus infection (Karstad & Kaminjolo, 1978; Van Dyk *et al.*, 2011) and lumpy skin disease (Woods, 1988; Hunter & Wallace, 2001). However, the epidemiology and pathology of these diseases are well understood given that they occur in a variety of mammalian taxa. In the past 20 years, new diseases have emerged in giraffe populations and have gained limited conservation and epidemiological attention. Giraffe Skin Disease (GSD) and Giraffe Ear Disease (GED) have been recorded in various giraffe populations across East Africa, though GSD was first observed in Uganda in 1995 (Kalema, 1996) and in Tanzania in 2000 (Epaphras *et al.*, 2012). The generic names describing the infections indicate how little researchers know about them (Karimuribo *et al.*, 2011). More importantly, the effect of these diseases on giraffe populations remains unknown.

Table 4: Threats facing giraffe in Kenya

Ecosystem	Area	Threats
MAASAI GIRAFFE		
Tsavu	Tsavu West, Tsavu East and Chyulu Hills National Parks, South Kitui National Reserve, Galana and Taita Ranches	<ul style="list-style-type: none"> • Poaching • Interspecies competition with elephant • Possible hybridisation with reticulated giraffe • Climate change: Water shortage and prolonged dry periods, invasive plant species • Road kills: Nairobi-Mombasa highway and railway • Habitat fragmentation and loss: charcoal burning • Mining • Moats • Wild fires
Amboseli	Amboseli National Park, OI Gulului/Lolorashi Group Ranch, Mbirikani Group Ranch, Kuku Group Ranch, Selengei Group Ranch, OI Gulului Trust Land, Kimana Group Ranch, Rombo Group Ranch, Mashuru, Namanga/Magadi	<ul style="list-style-type: none"> • Poaching • Rail kill - Magadi railway line • Fence lines (barbed wire) • Electrocutation by power lines • Loss of corridors and dispersal areas • Interspecies competition with elephant • Limited water access • Road kills • Habitat fragmentation and loss • Land use change • Drought

Ecosystem	Area	Threats
Greater Mara ecosystem	Mara National Reserve, Mara Conservancy, Siana, Koiyaki, Olare Orok Lemek, Ol Pieyei, Loita hills plains and forest, Suswa, Nguruman, Maji Moto, Ol Choro Orua	<ul style="list-style-type: none"> Habitat fragmentation and loss: Charcoal burning, fencing, etc Poaching Electrocution by power lines Land use change: wheat farming Overgrazing by livestock leading to suppression of plant community succession Road kills: Maai-Mahiu to Narok Moats
Nairobi/Athi	Athi Kapiti, Nairobi National Park, Athi-Kitengela & Kaputei Plains, Machakos Ranches	<ul style="list-style-type: none"> Habitat fragmentation and loss: urban and infrastructure development and charcoal burning, invasive species Poaching Climate change: Water shortage Road kills: Emali - Loitokitok road Land use change
Naivasha	Crater Lake, Mundui ranch, Olerai, Oserian Wildlife Conservancy, Hell's Gate National Park, Kedong Ranch, Crescent island, Bushy Island/Yacht club /Higgins/Dolier, Marula, Rocco farm	<ul style="list-style-type: none"> Poaching: snaring, bush meat Land use change Electrocution by powerlines Infrastructure development along Naivasha - Nakuru highway Climate change - water shortage Encroachment into protected areas Pollution Possibility of reduced forage - due to over-browsing and debarking of <i>Acacia xanthophoelea</i> trees) Habitat loss and fragmentation - due to charcoal burning, invasive species Wildlife displacement - geothermal expansion Inbreeding depression
Shimba Hills		<ul style="list-style-type: none"> Lack of forage Invasive and exotic species Inter-species competition with elephants Possible inbreeding (isolated population)
ROTHSCHILD'S GIRAFFE		
Ruma National Park		<ul style="list-style-type: none"> Poaching: snares Fire Limited space – local overpopulation Disease
Soysambu Wildlife Conservancy		<ul style="list-style-type: none"> Carrying capacity - overabundance Electrocution by power lines Potential inbreeding Invasive species: <i>Lantana camara</i>, Leleshwa (<i>Tarchonanthus camphoratus</i>) Disease Possibility of reduced forage due to debarking of <i>A. xanthophoelea</i> Poaching: snares

Ecosystem	Area	Threats
Kigio Wildlife Conservancy		<ul style="list-style-type: none"> • Limited space – local overpopulation • Potential inbreeding • Invasive species - Leleshwa and <i>L. camara</i> • Disease • Poaching: snares
Lake Nakuru National Park		<ul style="list-style-type: none"> • Invasive species • Interspecies competition • Pollution • Over-browsing: possibility of reduced forage due to debarking of <i>A. xanthophoelea</i> • Fire • Disease • Climate change: lake water level increase
Mwea National Park		<ul style="list-style-type: none"> • Poaching: snares, bows and arrows • Habitat loss: invasive species (<i>L. camara</i>)
RETICULATED GIRAFFE		
North eastern area	Meru/Mandera/Garissa/Ijara/Wajir and Samburu/Laikipia/Isiolo	<ul style="list-style-type: none"> • Poaching for commercial and subsistence use: Firearms, snares, spears, • Invasive species - <i>Prosopis juliflora</i> • Charcoal burning • Drought: reduced forage and water shortage • Limited conservation efforts • Fences • Interspecific competition with camels and livestock • Disease • Bush Fires • Solid waste pollution (mainly plastic waste) • Unsustainable harvesting of gum from <i>Acacia senegal</i> • Military activities • Road kills: Isiolo - Marsabit highway, and the proposed railway line, LAPSET • Electrocutation by power lines • Corridor blockage: Isiolo to Samburu • Habitat degradation



Chapter 4: National Recovery and Action Plan for Giraffe in Kenya

4.3 Vision and Goal

4.3.1 Vision

To have viable, free-ranging populations of all three giraffe subspecies, recognizing their ecological role, Kenya's unique heritage and legacy as the world centre of giraffe diversity, and ensuring benefits to Kenyans.

4.3.2 Goal

To mitigate the threats and reverse the declining trends in giraffe numbers while ensuring benefits accrue to local communities

Strategic objectives

1. Enhance protection of giraffe to ensure recovery and maintenance of free ranging populations;
2. Arrest and reverse the current decline in giraffe habitats through appropriate conservation and management;
3. Ensure effective management of enclosed populations to secure their long-term conservation;
4. Ensure coordinated research on and monitoring of giraffe populations;
5. Enhance community involvement in giraffe conservation to facilitate information exchange, education and public awareness; and
6. Ensure infrastructural developments in giraffe ranges are compatible with their conservation.

4.4 Strategic Objectives

Strategic Objective 1: Enhance Protection of Giraffe to Ensure Recovery and Maintenance of Free Ranging Populations

TARGET	ACTIVITY	INDICATOR	TIMELINE	ACTORS
1.1 Reduce the proportion of giraffe illegally killed by 50% within 5 years	1.1.1 Establish the current levels of poaching on giraffe	Assessment report	Year 1	KWS/ Stakeholders
	1.1.2 Sensitize and train prosecutors, investigators and sensitise the judiciary through seminars and workshops to ensure efficient prosecution of cases	Number of seminars and workshops	Bi-annual	KWS, NGO's
		Number of sentences delivered; Increase in successful prosecution of cases related to giraffe	Continuous	KWS, NGO's
	1.1.3 Sensitize law enforcement agencies on the need to safeguard giraffe and associated policies/legislation e.g. Kenya Police Reserve, KFS, NEMA, National Police Service, NIS, community scouts and KDF	Number of sensitization meetings/workshops held	Annual	KWS, NGOs
	1.1.4 Enhance law enforcement of bush meat through forensic work	Bush meat market and traders identified; Bush meat hotspots mapped	Bi-annual	KWS, NGO's
	1.1.5 Train community, county and private conservancy scouts/rangers on law enforcement skills	Number of trainings and scouts/rangers trained	Continuous for 5 years	KWS, community conservancies and NGOs
	1.1.6 Lobby the Central and County Governments to reduce illegal arms possession in giraffe range areas through support of local peace building initiatives and voluntary disarmament	Number of meetings held with the government; Number of amnesty periods given; Number of arms surrendered/ seized	5 years	Central and County administration; KWS, NGOs, Local communities, conservancies
	1.1.7 Increase numbers of community wildlife scouts/rangers	Additional number of community scouts/rangers recruited, trained, equipped, deployed	Annual	County government, private and community conservancies
	1.1.8 Increase community awareness on giraffe conservation through public barazas, learning institutions targeting high risk giraffe areas	Number of barazas, publicity and media programmes held and aired; Number of learning institutions sensitized.	Continuous for 5 years	KWS, county governments, conservancies, communities
	1.1.9 Promote giraffe as a flagship species in protected areas, community and private conservancies	Number of conservancies that have adopted giraffe as a flagship species	Annually	KWS, communities, conservancies
1.1.10 Promote transboundary conservation initiatives in the giraffe range areas of Tsavo/Mkomazi; Amboseli/ Mt. Kilimanjaro; Maasai Mara/ Serengeti	Number of meetings held	Quarterly	KWS, NGOs, Tanzanian conservation authorities	
	Transboundary and conservation framework developed	2 years		
	Number of joint patrols carried out	Monthly		

1.2 Strengthen legislation to support giraffe conservation	1.2.1	Review Schedule 6 of WCMA 2013 to include all three subspecies	All 3 subspecies included in Schedule 6	Year 1	KWS
	1.2.2	Implementation of the Wildlife Conservation and Management Act 2013 which gives the provision of enhanced penalties	Relevant sections of the Act implemented; Number and type of penalties given	2 years	KWS, central government, NGOs
	1.2.3	Lobby county governments to make relevant regulations on giraffe protection	Number of counties with giraffe protection regulations in place	5 years	County governments, KWS, NGOs
1.3 Develop mechanisms for discouraging bush meat consumption by rural and urban communities	1.3.1	Conduct publicity campaigns through written and electronic media to sensitize retailers and consumers on the conservation implications and human health risks of retailing and consuming bush meat	More than 60% of populations within giraffe ranges and markets where giraffe meat is sold sensitized	3 years	KWS, Conservancies, communities
			Number of pre- and post-sensitization surveys conducted to determine the effectiveness of campaigns	3 years	KWS, conservancies, Conservation organizations

Strategic Objective 2: To Arrest and Reverse the Current Decline in Giraffe Habitat Through Appropriate Conservation and Management

TARGET	ACTIVITY	INDICATOR	TIMELINE	ACTORS
2.1 Develop a distribution map for giraffe in Kenya	2.1.1 Collect and collate all available data on giraffe distribution and habitat	Centralized up to date database	6 months	KWS, DRSRS, NGOs, conservancies, communities, research Institutions
	2.1.2 Identify knowledge gaps on giraffe presence and Map current and potential giraffe conservation areas	Distribution and habitat map of giraffe in Kenya developed	6 months	KWS
	2.1.3 Map threat hotspots	Threat map produced and shared with relevant stakeholders	1 year	KWS, AWF, GCF
2.2 Secure new giraffe conservation areas	2.2.1 Implement the recommendations of wildlife migratory corridors dispersal areas report	Corridors, migratory and dispersal areas secured	3 years	KWS, NGOs, conservancies, communities, county governments, Task Force
	2.2.2 Identify and secure giraffe habitats for conservation management	Number of areas and amount of land secured	3 years	KWS, NGOs, conservancies, communities, county governments
	2.2.3 Negotiate for conservation compatible land use in identified key giraffe areas	Number spatial plans developed and implemented; Number of easements, agreements in place	3 years	KWS, County governments, NGOs
	2.2.3 Encourage and facilitate the development of new conservancies targeting giraffe conservation	Number of new conservancies established in key giraffe areas; Translocate/ drive giraffe to new conservancies	3 years	KWS, NEMA, County governments, KWCA, NGOs
2.3 Reduce habitat destruction by promoting alternative livelihoods in giraffe areas	2.3.1 Determine extent of habitat destruction through charcoal burning, fire wood harvesting etc	Number of conservation and community areas covered; Report on extent of habitat destruction through deforestation produced	2 years	KWS, development NGOs, private and community conservancies
	2.3.2 Encourage, promote and facilitate eco-tourism development in giraffe areas	Number of eco-tourism facilities established in giraffe range areas	5 years	KWS, community conservancies, Ministry of Tourism, NGOs
	2.3.3 Identify and pilot alternative environmentally sustainable livelihoods to supplement household incomes such as non-timber forest products and non-nature based enterprises	Number of enterprises piloted; Scaling up of pilot enterprises	3 years	KWS, NGOs
	2.3.4 Promote sustainable livestock husbandry practices	Number of livestock husbandry practices adopted; Number of grazing plans developed and implemented	5 years	KWS, county government, NGOs

2.4 Control invasive species threatening key giraffe habitat	2.4.1	Identify distribution and type of invasive species impacting giraffe and their habitat	Map and list of invasive species impacting giraffe	5 years	KWS, research institutions, KALRO, Invasive Species Task Force, conservancies
	2.4.2	To identify the best technique for controlling invasive species	Analysis report on control techniques of invasive species	5 years	KWS, conservancies and research institutions
	2.4.3	Control of invasive species impacting giraffe and their habitat using appropriate protocols for target species	Number of areas with invasive species control programmes established; Success of control programmes	5 years	KWS, Research institutions, KALRO, Invasive Species Task Force, conservancies
	2.4.4	Rehabilitation of areas degraded by invasive species	Reduction in area covered by invasive species	5 years	KWS, Research institutions, KALRO, Invasive Species Task Force, conservancies

Strategic Objective 3: To Ensure Effective Management of Enclosed Populations to Secure Their Long-Term Conservation

TARGET	ACTIVITY	INDICATOR	TIMELINE	ACTORS
3.1 To ensure effective management of confined populations to secure their long-term conservation	3.1.1 Reducing the incidence of diseases in enclosed giraffe populations	Number of reports	5 years	KWS
	3.1.2 Monitoring, surveillance and report on giraffe health conditions on regular basis	Number of reports, research documents and reports on disease occurrences	5 years	KWS, conservancies, research institutions
	3.1.3 To observe principles of preventive medicine; (provision of food, water, cover (shelter), space, stress and mates).	Body condition score developed; Birth and mortality rates monitored and reported	5 years	KWS, conservancies, research institutions
3.2 To minimize the chances of inbreeding	3.2.1 Determine the genetic diversity of small/confined populations of giraffe	Number of genetic diversity analysis	5 years	KWS, conservancies, research institutions
	3.2.2 Keep proper records of the history of existing populations	Established protocol, number of records established	1 year	KWS, giraffe stakeholders
	3.2.3 Enrich smaller populations via translocations	Number of translocations conducted and number of individuals successfully moved	5 years	KWS, giraffe stakeholders
3.3 To determine appropriate carrying capacity for confined populations	3.3.1 Determine the ecological carrying capacities for areas with enclosed populations	Number of areas assessed	5 years	KWS, conservancies, NGOs, research institutions
	3.3.2 Determine the ecological impacts of exceeding carrying capacity in relation to forage availability and dietary deficiencies	Number of studies on carrying capacity ecological impacts	5 years	KWS, conservancies, research institutions
	3.3.3 Undertake studies to determine reasons for debarking of trees by Rothschild's and Maasai giraffe	Number of reports and publications produced	5 years	KWS, conservancies, research institutions
	3.3.4 Determine the minimum viable area for giraffe conservation to be sustainable in different habitats	Number of study reports highlighting viability of giraffe in different habitats	5 years	KWS, conservancies, research institutions, NGOs
	3.3.5 Develop a protocol for determining ecological suitability and carrying capacity in giraffe areas	Protocol developed	1 year	KWS, giraffe stakeholders

3.5 To reduce incidences and impacts of fire	3.5.1	Train personnel in fire-fighting	Training report on fire-fighting produced; Number of personnel trained in fire-fighting	1 year	KWS, conservancies
	3.5.2	Purchase of fire-fighting equipment	Number and list of equipment procured	1 year	KWS, conservancies
	3.5.3	Declaration and identification of fire seasons and disaster preparedness	Analysis undertaken of fire season and disaster preparedness, and report developed	1 year	KWS, conservancies
	3.5.4	Adoption and domestication of emerging satellite technologies on wild fire management	Number of conservation managers and areas adopting technologies on wild fire management	5 years	KWS, conservancies
	3.5.5	To establish and maintain fire breaks in giraffe habitats	Number and length of fire breaks established	5 years	KWS, conservancies
	3.5.6	Prescribed burning as a management tool	Fire management plan developed; Extent of area sustainably burnt for conservation management	1 year	KWS, conservancies

Strategic Objective 4: Ensure Coordinated Research and Monitoring of Giraffe Populations

TARGET	ACTIVITY	INDICATOR	TIMELINE	ACTORS
4.1 Create effective structures for coordinating research, monitoring, conservation and management	4.1.1 To identify knowledge gaps on giraffe ecology and biology	Literature review report (list of areas of interest), number of publications	1 year	KWS, conservancies, research institutions
	4.1.2 Coordinate national giraffe census	Census reports	3 years	KWS, DRSRS, NGOs, conservancies, research institutions
	4.1.3 Train community scouts on collecting data on giraffe monitoring	Number of community scouts equipped and trained for collecting data on giraffe populations and their monitoring; Number of reports generated by community scouts	3 years	KWS, DRSRS, NGOs, conservancies, research institutions
	4.1.2 Establish an inventory database of giraffe populations in Kenya	Functional database established and maintained; Protocol for database use developed and distributed; Number of collaborating institutions adopting central database/website	1 year	KWS, conservancies, research institutions
4.2 To better understand giraffe ecology in Kenya by using scientific data and evidence-based information	4.2.1 Adopt technology to determine priority areas for giraffe conservation	Priority areas for giraffe conservation identified; Number and type of technologies adopted; Number of studies on spatial ecology of giraffe	2 years	KWS, giraffe stakeholders
	4.2.2 Examine genetic diversity of giraffe	Number of areas sampled; Number of samples collected and analysed; Report on giraffe genetic diversity	2 years	KWS, NGO's
	4.2.3 Monitor giraffe health/disease status	List of disease vectors per site established; Report on vector dynamics developed; Number of diseases detected and interventions carried out	3 years	KWS, NGOs, research institutions
	4.2.4 Assess, and as appropriate, develop site-specific translocation plans following IUCN guidelines for identified giraffe conservation areas	Habitat suitability studies completed and reported; Sensitisation programme conducted among local communities affected including community attitudes survey; Source animals identified (sex, age, number, genetic relatedness); Disease Risk Analysis carried out	5 years	KWS, giraffe stakeholders
	4.2.5 Translocate animals to approved sites	Number of animals translocated; Released animals breeding	As needed	KWS, giraffe stakeholders
	4.2.6 Develop and implement post-release and post-collaring monitoring schedules	Monitoring reports produced semi-annually	Semi-annually	KWS, giraffe stakeholders

Strategic Objective 5: Enhance Community Involvement in Giraffe Conservation to Facilitate Information Exchange, Education and Public Awareness

TARGET	ACTIVITY	INDICATOR	TIMELINE	ACTORS
5.1 Mobilize the community to establish conservancies in critical giraffe range areas	5.1.1 Identify and document areas that are suitable for giraffe conservancy establishment	Assessment report and map produced	1 year	KWS, County Councils/Government, local community leaders, NGOs
	5.1.2 Support establishment of at least two conservancies using giraffe as the flagship species	Number of stakeholder meetings; Number of conservancies established	5 years	KWS, NGOs
	5.1.3 Mobilise community scouts for training on giraffe conservation	Number of community scouts trained	3 years	KWS, County Council/Government, NGOs
5.2 Ensure enabling legislation to support community wildlife conservation	5.2.1 Lobby for enactment of the conservancy and sanctuary regulations	Number of sessions held with legislators and/or councils	1 year	KWS, County Council/Government, NGOs
	5.2.2 Facilitate community owned eco-tourism enterprises in giraffe areas	Number of ecotourism enterprise projects initiated	5 years	KWS, County Council/Government, NGOs
5.3 Promote alternative livelihoods in giraffe areas to reduce reliance on giraffe products and habitat destruction	5.3.1 Identify and pilot alternatives to charcoal and fuel wood in giraffe areas e.g. energy saving cooking stoves/jikos	Number of alternatives energy sources to charcoal and firewood identified and piloted	2 years	KWS, KFS, NEMA, and relevant government agencies, NGOs
	5.3.2 Identify and initiate environmentally sustainable livelihoods to supplement household incomes such as non-timber forest products and nature based enterprises	Number of alternative livelihood projects initiated	5 years	KWS, County Council/Government, NGOs
5.4 Develop mechanisms for discouraging bush meat consumption by rural and urban communities	5.4.1 Conduct community barazas on importance of giraffe conservation	Number of barazas held per year	5 years	KWS, County Council/Government, NGOs
	5.4.2 Initiate Corporate Social Responsibility (CSR) projects in giraffe range areas	No. of CSR projects undertaken	5 years	KWS, relevant government agencies and NGOs

5.5	Increase public awareness on a national scale about giraffe conservation status	5.5.1	Develop and implement outreach campaigns to sensitize the public on giraffe conservation	Number of brochures, newsletters and posters produced and disseminated; Number of communities reached.	3 years	KWS, conservancies, relevant government agencies and NGOs
		5.5.2	Conduct a media campaign highlighting the plight of giraffe in Kenya	Number of campaigns in print and electronic media per year.	5 years	KWS, relevant government agencies, NGOs, wildlife forums and media houses
		5.5.3	Conduct school outreach programmes	Number of outreach activities conducted; Number of groups reached; Map of areas covered	5 years	KWS, WCK, wildlife forums and stakeholders
		5.5.4	Develop youth activities and involvement in giraffe conservation	Number of youth activities developed and conducted.	5 years	KWS, NGO's and Ministry of youth affairs
		5.5.5	Sponsor drama festivals i.e. poems, drama, songs, using art to disseminate conservation information	Number of events sponsored	2 years	KWS, giraffe stakeholders
		5.5.6	Participate during World Giraffe Day	June 21st is observed as World Giraffe Day.	Annually	KWS, giraffe stakeholders
		5.5.7	Undertake community barazas especially with the youth	Number of barazas	2 years	KWS, Conservation NGOs, relevant government agencies

Strategic Objective 6: Ensure Infrastructural Developments in Giraffe Ranges are Compatible with Their Conservation

TARGET	ACTIVITY	INDICATOR	TIMELINE	ACTORS
6.1 Develop and share with relevant authorities the guidelines on infrastructural development within giraffe range areas	6.1.1 Hold stakeholder workshops and seminars to develop guidelines	Guidelines developed; Number of documents circulated to relevant stakeholders.	2 years	KWS, NGOs
6.2 Minimise the proportion of infrastructural related giraffe mortality by 70%	6.2.1 Conduct a national environmental audit of existing development infrastructures (pylons, roads, moats) within the giraffe ranges	Audit report developed establishing baseline; Mitigation measures implemented.	5 years -continuous	KWS, NEMA, NGOs
	6.2.2 Liaise with KPLC, KETRACO on power installations and ensure all EIA recommendations are adhered to	Number of EIAs and EA compliant to the guidelines with respect to giraffe requirements.	5 years -continuous	KWS, NGOs, relevant government agencies
	6.2.3 Liaise with Ministry of Roads and Transport, NEMA, and KPLC on installation of signage, bumps, underpasses, overpasses on roads and railway lines in giraffe range areas	Number of compliant agencies; Number of signage installed and speed bumps erected; Underpasses, overpasses installed	1 year-continuous	KWS, NGOs, relevant government agencies

Chapter 5: Implementation of the National Recovery and Action Plan for Giraffe in Kenya

5.1 Endorsement

Once the National Recovery and Action Plan for Giraffe in Kenya is completed and endorsed, it will be launched officially with the relevant stakeholders invited to secure the necessary support required for its implementation.

5.2 Implementation, Responsibilities and Control

A National Management Committee will be established whose main purpose is to oversee the implementation of the National Recovery and Action Plan. The National Management Committee will be composed of: DG-KWS (Chairman), DD-BR&M (Secretary) and DD-CWS, DDS, and other members will be co-opted.

After adoption of this National Recovery and Action Plan, the National Task force (Appendix 2) will be reconstituted to be the Technical Committee whose main purpose is to act as an advisory body composed of giraffe experts, veterinarians, community representatives, conservancy and ranch owners, NGO representatives and AD-Species. The Technical Committee will be chaired by the AD-Species and will meet at least twice (bi-annually) per year.

At a local level, Range Committees will be established to articulate the needs of each giraffe subspecies. The Range Committee will also be tasked with the responsibility of coordinating the implementation of the National Recovery and Action Plan and each committee has/will develop a subspecies Action Plan. Regional (geographic) Sub-Committees will be grouped together and the formulation of Range Committees will be included in the National Recovery and Action Plan. The Range Committees will be composed of the Area AD's (Chair), Area SRS - Secretary, community representatives, NGO representatives, research institutions, other relevant stakeholders.

KWS Species Office will be in-charge of overseeing the implementation of the action plan, coordinating the range committees and the technical committee and centralize information from all over the country.

KWS will be the overall implementing authority.

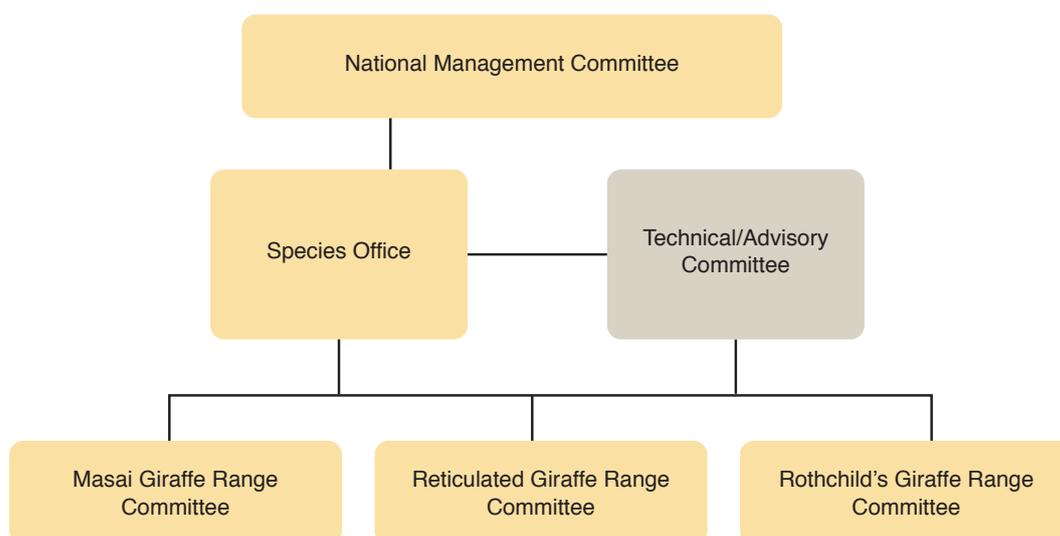


Fig. 4: Implementation structure of the National Recovery and Action Plan for Giraffe in Kenya



Appendices

Appendix I: Giraffe Factsheet

PARAMETER	INFORMATION
Height (average adult)	♂ 5.3m (17ft. 4 in) ♀ 4.3m (14ft. 2 in)
Weight (average adult)	♂ 1,200kg ♀ 830kg
Largest	♂ recorded at 6m (19+ ft)
Heaviest	♂ recorded at 1,900kg
Foot size	30 cm diameter
	Hoof: ♂ 20cm (8in); ♀ 18cm (7in) (average).
Defence	Forelegs and hind legs can deliver a lethal kick. They can kick in all directions
Speed	50 kph for sustained periods; calves less than 3m high can outrun adults.
Means of feeding	Browsing, with a prehensile tongue (50 cm long) and upper lip.
Diet	Tree leaves, fruits, pods and shoots
Senses	Colour vision, acute sense of smell, good hearing
Sleep	4.5 hours, mainly at night; either standing or lying down.
Longevity	+/- 25 years (average)
Social behaviour	Ranges from solitary (often older males) to large, loose and mixed herds. Known as fission-fusion society, whereby individuals or smaller groups readily merge with or split from the herd; differs from one population to another.
Sex ratio	Very close to 1:1 (average)
Age at sexual maturity	♀ 3–4 years; in oestrus 1 day every 2 weeks. ♂ Restricted by competition from larger bulls.
Breeding lifetime	Throughout life; ♀ recorded mating within weeks of giving birth.
Gestation	+/- 15 months (453–464 days)
Offspring	Single calf, rarely twins; known to stay with mother until 22 months old, but often independent much sooner, depending on the gender.

Source: Giraffe Conservation Foundation (2017)

Appendix 2: Historical Distribution of Giraffe in Kenya 1970's - 2000's (Source: DRSRS)

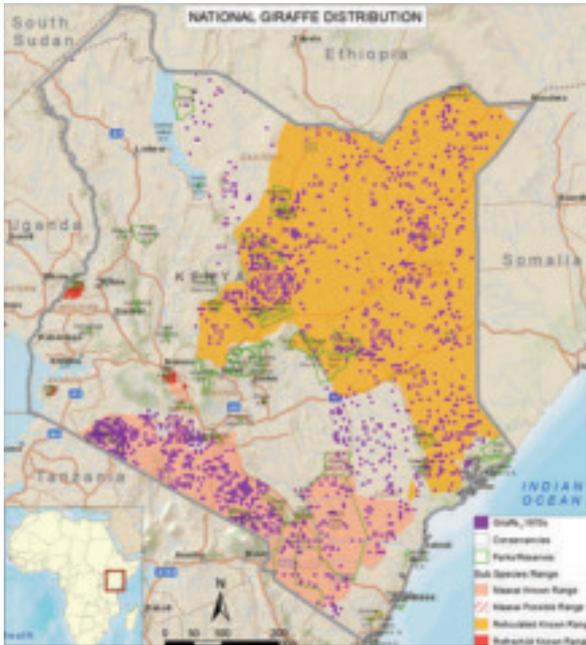


Figure 5. 1970's Giraffe distribution

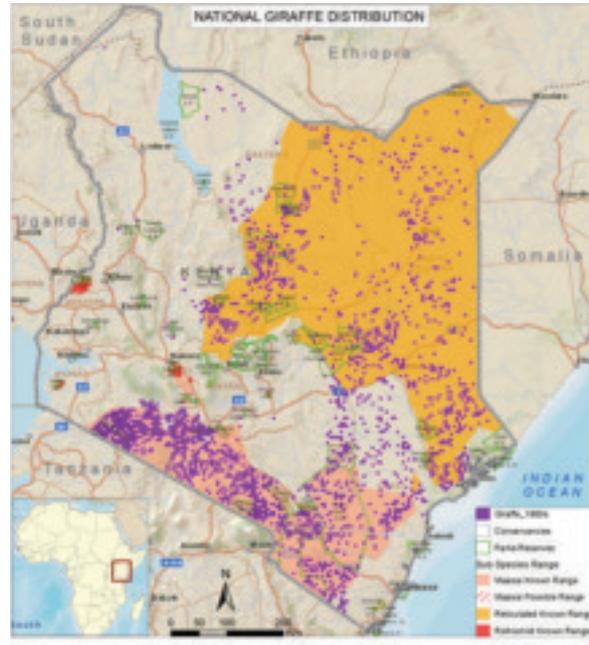


Figure 6. 1980's Giraffe distribution

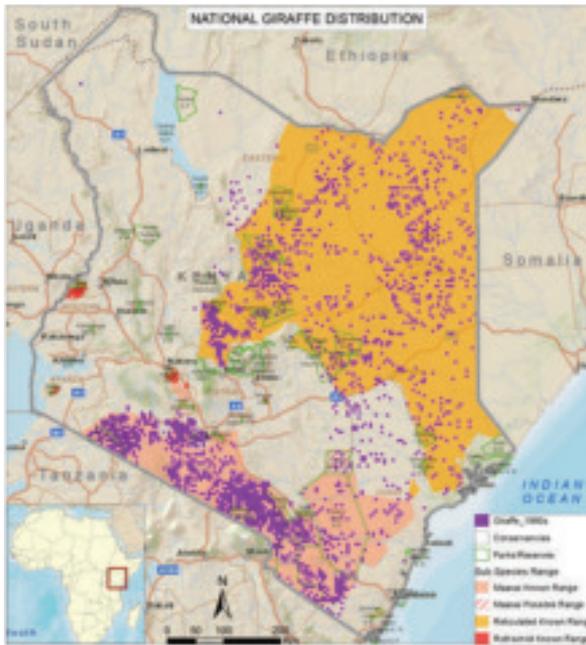


Figure 7. 1990's Giraffe distribution

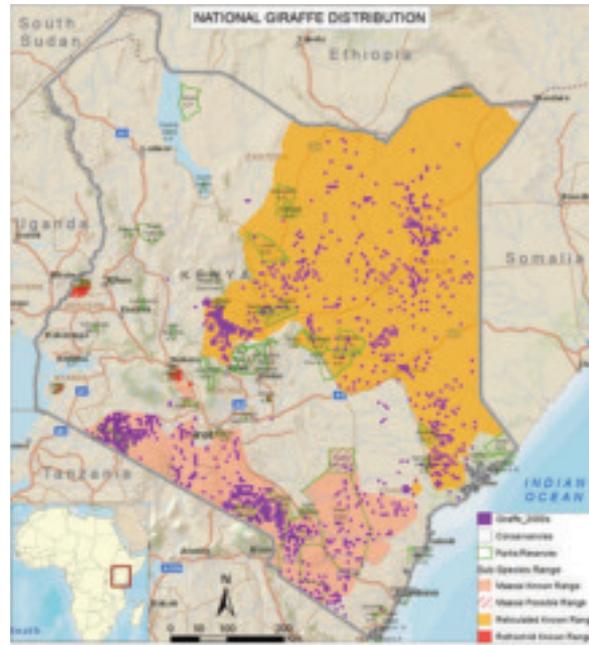


Figure 8. 2000's Giraffe Distribution

Appendix 3: National Giraffe Conservation Task Force Members

1. Dr. Charles Musyoki, OGW – KWS
2. Dr. Thadeus Obari – KWS / IUCN SSC Giraffe and Okapi Specialist Group
3. Dr. Juliet King – Northern Rangelands Trust
4. Dr. Julian Fennessy – Giraffe Conservation Foundation / IUCN SSC Giraffe and Okapi Specialist Group
5. Dr. Philip Muruthi – African Wildlife Foundation / IUCN SSC Giraffe and Okapi Specialist Group
6. John Doherty – Queen’s University Belfast / IUCN SSC Giraffe and Okapi Specialist Group
7. Zoe Muller – University of Bristol, United Kingdom / IUCN SSC Giraffe and Okapi Specialist Group
8. Christine Odhiambo – Giraffe Center / African Fund for Endangered Wildlife
9. Dr. Ali Hussein – Garissa Giraffe Sanctuary
10. Dr. Rick Brenneman – Giraffe Conservation Foundation / IUCN SSC Giraffe and Okapi Specialist Group

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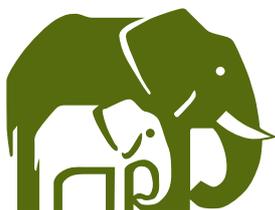




(c) Julian Femnessy_Reticulated Giraffe

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