



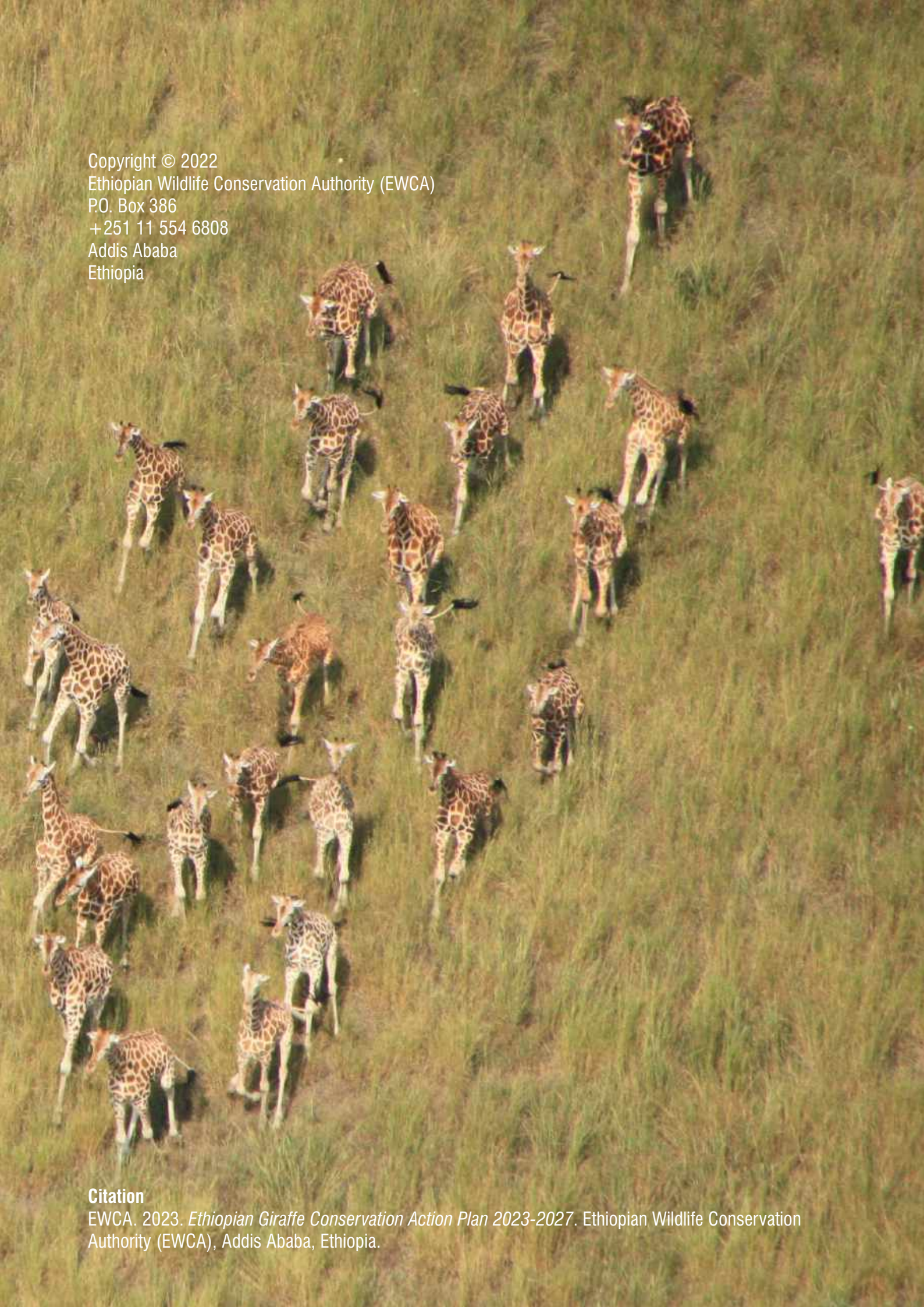
# Ethiopian Giraffe Conservation Action Plan

2023-2027



Addis Ababa  
Ethiopia



A high-angle photograph of a large herd of giraffes running across a vast, green grassy plain. The giraffes are scattered throughout the frame, moving in various directions. Their distinctive spotted patterns are clearly visible against the green grass. The lighting is bright, suggesting a sunny day.

Copyright © 2022  
Ethiopian Wildlife Conservation Authority (EWCA)  
P.O. Box 386  
+251 11 554 6808  
Addis Ababa  
Ethiopia

**Citation**

EWCA. 2023. *Ethiopian Giraffe Conservation Action Plan 2023-2027*. Ethiopian Wildlife Conservation Authority (EWCA), Addis Ababa, Ethiopia.



# Table of Contents


|  |     |
|--|-----|
| Executive Summary  | i   |
| Acknowledgements   | ii  |
| Acronyms and Abbreviations   | iii |
| Glossary   | iv  |
| Preface  | v   |
| Foreword   | vi  |
| 1. Introduction  | 1   |
| 1.1 Background   | 1   |
| 1.2 Giraffe Conservation Status and Distribution in Africa   | 1   |
| 1.2.1 Taxonomy and Scientific Classification   | 1   |
| 1.2.2 Geographical Distribution and Trends in Africa   | 2   |
| 1.2.3 Behaviour and Biology  | 4   |
| 1.3 Status and Distribution of Giraffe in Ethiopia   | 5   |
| 1.3.1 Taxonomic Status of Giraffe in Ethiopia  | 5   |
| 1.3.2 Distribution of Giraffe in Ethiopia  | 5   |
| 1.3.2.1 Gambella National Park   | 7   |
| 1.3.1.2 Omo National Park  | 7   |
| 1.3.1.3 Tama Wildlife Reserve  | 10  |
| 1.3.1.4 Mago National Park   | 10  |
| 1.3.1.5 Geralle National Park  | 10  |
| 2. Policy and Legal Framework for the Conservation of Giraffe in Ethiopia  | 11  |
| 2.1 The Constitution of the Federal Democratic Republic of Ethiopia  | 11  |
| 2.2 The Policy and Strategy for Wildlife Development   | 11  |
| 2.3 Ethiopian Wildlife Act   | 11  |
| 2.4 International Laws   | 12  |
| 2.4.1 Convention on Biological Diversity (CBD) of 1992   | 12  |
| 2.4.2 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)  | 12  |
| 2.4.3 Convention on Migratory Species (CMS)  | 12  |
| 2.4.4 Ramsar Convention  | 12  |
| 2.4.5 Model of sustainability from the International Financial Corporation (IFC) Environmental and Social Performance Standards                  | 12  |
| 3. Threats   | 13  |
| 3.1 Habitat Loss, Fragmentation and Degradation  | 13  |
| 3.2 Climate Change   | 13  |
| 3.3 Illegal Hunting (poaching) and Illegal Trade of Giraffe Products   | 15  |
| 3.4 Disease  | 15  |
| 4. Vision, Goal and Strategic Objectives   | 16  |
| 4.1 Purpose and Process  | 16  |
| 4.2 Vision   | 16  |
| 4.3 Goal   | 16  |
| 4.4 Strategic Objectives   | 16  |
| 5. Implementation of the Ethiopian Giraffe Conservation Action Plan 2023-2027  | 24  |
| 6. Conclusion  | 25  |
| 7. References  | 26  |
| 8. Appendices  | 28  |
| Appendix I: Terms of Reference for the Giraffe Technical Working Group (GTWG)  | 28  |
| Appendix II: List of Participants of the Giraffe Strategy and Action Plan Workshop, Ethiopia 6-7 September 2022, Addis Ababa, Grand Eliana Hotel | 28  |

# Executive Summary

This Ethiopian Giraffe Conservation Action Plan 2023-2027 provides an opportunity to formulate and coordinate management interventions and actions essential for the protection and conservation of viable giraffe populations in Ethiopia. Primarily, the Action Plan aims to establish a monitoring and research framework to guide management decisions and planning processes for giraffe conservation over the next five years. It further outlines the threats that giraffe face in the country as well as appropriate mitigation measures. The Action Plan also provides strategies for the assessment of the historical and current giraffe conservation status in key conservation landscapes throughout Ethiopia. Finally, this Action Plan recognises the importance of tangible outcomes and indicators of progress. Regular assessment will be key to achieving the desired objectives during the implementation period.



# Acknowledgements

A giraffe with a brown and white spotted pattern is shown in profile, facing right. It is standing in a dry, golden-brown savanna landscape under a clear blue sky. The giraffe's head is slightly lowered, and its long neck is prominent. The background shows a vast, open plain with some distant hills or mountains under a bright sky.

The compilation of the Ethiopian Giraffe Conservation Action Plan 2023-2027 was a collaborative effort, spearheaded by the Ethiopian Wildlife Conservation Authority (EWCA) with support from the Giraffe Conservation Foundation (GCF) and input from other local and international experts and organisations. The guidance, contributions and support received during the process are acknowledged and highly appreciated. During the development of this Action Plan, rigorous local, regional and international consultations with stakeholders and partners in wildlife conservation and management were conducted. The key stakeholders consulted include the Ethiopian Wildlife and Natural History Society (EWNHS), the Institute of Biodiversity Conservation (IBC), and the Addis Ababa University (AAU). The EWCA is grateful to all of the stakeholders for their input towards the development of this Action Plan. Special thanks go to the technical team, who supported the drafting and editing of this Action Plan.

# Acronyms and Abbreviations

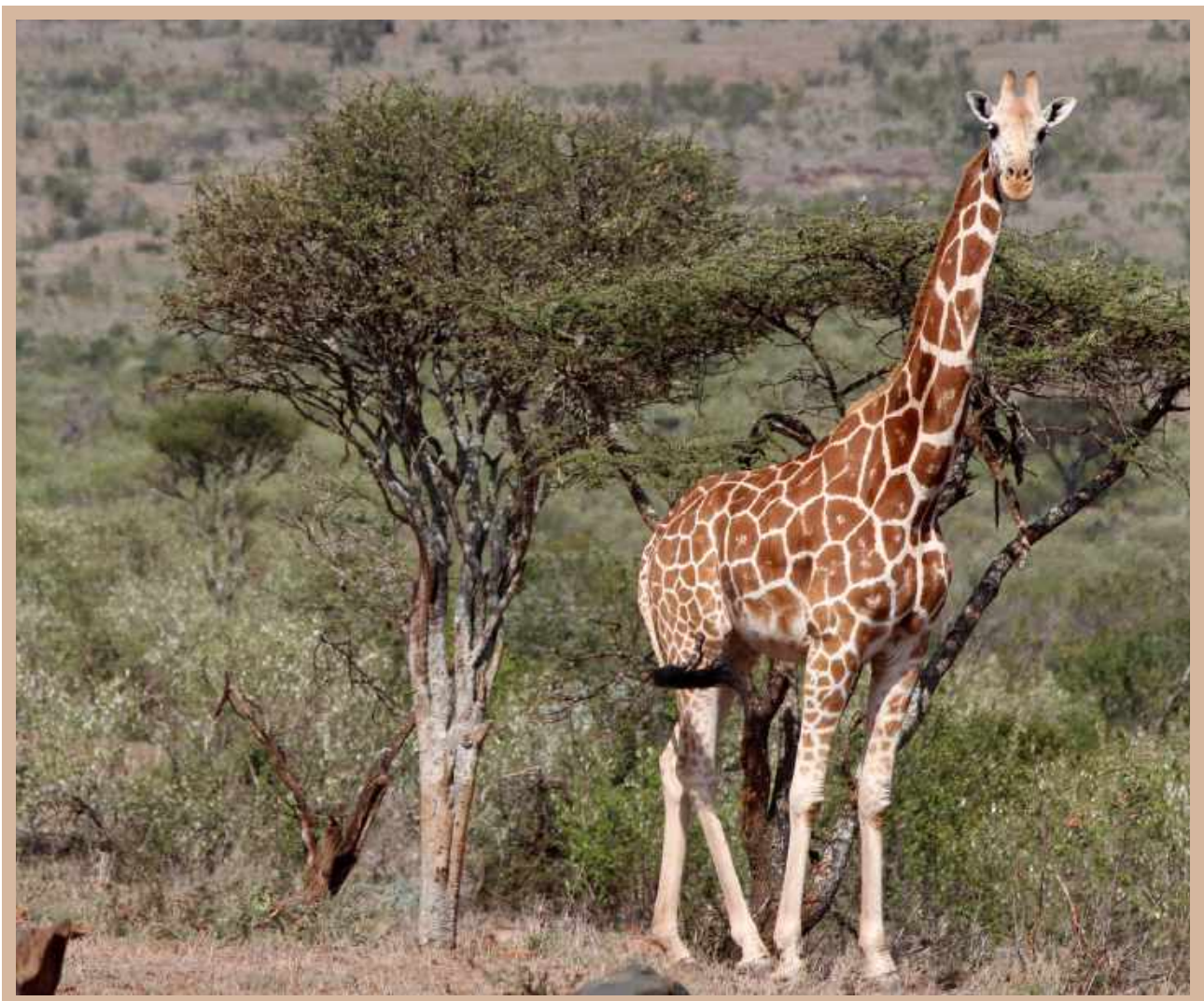


|              |   |
|--------------|---|
| <b>CITES</b> | Convention on International Trade in Endangered Species of Wild Fauna and Flora |
| <b>EWCA</b>  | Ethiopian Wildlife Conservation Authority                                       |
| <b>FDRE</b>  | Federal Democratic Republic of Ethiopia   |
| <b>GCF</b>   | Giraffe Conservation Foundation   |
| <b>GTWG</b>  | Giraffe Technical Working Group   |
| <b>IUCN</b>  | International Union for Conservation of Nature                                  |
| <b>NGO</b>   | Non-governmental Organisation   |
| <b>NP</b>    | National Park   |
| <b>WR</b>    | Wildlife Reserve  |



# Glossary

- Extinct** A taxon is considered extinct when it no longer has living members in a particular area where it previously existed.
- Extirpated** A species that has been completely eradicated or destroyed in an area where it previously existed.
- Extralimital population** A wildlife population introduced outside the species' natural range.
- Extralimital introduction** The process of introducing a wildlife population outside the species' natural range.
- Invasive species** A plant or animal that tends to spread, causing damage to the environment, humans or animals.
- IUCN Red List** A list of globally threatened species that represents the categories Extinct, Critically Endangered, Endangered, Vulnerable, Near Threatened, or Least Concern. The IUCN Red List has become an important tool for defining conservation status and subsequent action at international, national, and thematic levels; the existing definitions are based on a series of criteria.



# Preface

This Ethiopian National Giraffe Conservation Action Plan 2023-2027 was jointly initiated by the Ethiopian Wildlife Conservation Authority (EWCA) and Giraffe Conservation Foundation (GCF). A national workshop, which included representatives from a range of key stakeholders, was held in Addis Ababa, 6-7 September 2022. The first draft was prepared by consultants, after which comments and suggestions were received. The final draft was presented to the EWCA and GCF. This Action Plan broadly follows the revised format for Single Species Action Plans approved by the IUCN Species Survival Commission (SSC).

Species Action Plans are a key component of species conservation. They outline the conservation actions necessary for minimising impacts of known threats, improving habitat conditions, and streamlining efforts to conserve them. Together with stakeholders, the EWCA has developed targeted Species Action Plans to address species-specific needs identified through Biological Status Review Reports. The implementation of Species Action Plans is an ongoing action and involves efforts from both the EWCA and its conservation partners. All Species Action Plans have accompanying information, including the state of the species, biological descriptions, technical assistance for conservation practices, strategies to avoid negative impacts, and population trends.

This Action Plan provides the framework for the conservation and management of the Ethiopian giraffe population and it notes the importance of appropriate landscape and transboundary conservation management. While the primary objective of this Action Plan is to ensure that the long-term, nation-wide giraffe populations are either stable or increasing across their existing ranges, an additional important objective is to ensure that habitat management is prioritised to help maintain these populations. The final objective is to confirm the taxonomic status of the giraffe populations in the country and their level of conservation and protection.

As with all of the country's large mammals, the major threats facing Ethiopia's giraffe today primarily include anthropogenic-related impacts that result in habitat loss, degradation, and fragmentation. Additionally, isolated giraffe populations are vulnerable to local extinction from disease outbreaks, fire, drought, a low gene flow, and climate change. To achieve this Action Plan's objectives, the giraffe species and their habitats must be maintained through science-based management and engagement with public and private entities. Successful conservation of these species will require effective coordination among all the stakeholders: local communities, regional states, federal agencies, non-governmental organisations (NGOs), academia, and the general public. While the EWCA takes the lead for the implementation of this Action Plan, various partners have also committed their technical and logistical support for the implementation of key actions.





# Foreword



This Ethiopian Giraffe Conservation Action Plan 2023-2027 is designed to guide the implementation of national activities for the conservation of giraffe in Ethiopia. This Action Plan sets out our government's pathway for giraffe conservation and recovery over the next five years. Ethiopia's unique biodiversity is part of our national identity. Our plants and animals are central to the cultural identity of the people, who have managed the Ethiopian environment over millennia and continue to shape the landscape through their stewardship. Our biodiversity is fundamental to the health of our environment, economy and community.

Ethiopia is one of the most biodiverse countries on Earth; however, many of our endemic species are threatened with the risk of extinction. If we keep doing what we are doing, more of the country's plants and animals will *become* extinct. Our wildlife and ecosystems continue to be threatened by climate change, natural disasters, invasive species, and human activities. Ethiopia and its people need to change what is being done in order to protect our unique wildlife and ecosystems for the future. This Action Plan sets ambitious targets, such as preventing the extinction of any giraffe population. We plan to drive action where it is needed most and to deliver flow-on benefits to other threatened plants and animals in the same habitats. It is in our national interest to see to it that Ethiopia maintains healthy giraffe populations. We will, therefore, take all the necessary actions to ensure the long-term viability of their populations in Ethiopia. The Ethiopian Wildlife Conservation Authority is committed to working with local communities and various stakeholders to protect these iconic species throughout their entire and present range in Ethiopia. This Action Plan was developed with input from conservation groups, local community members, scientists, academia, and others. A heartfelt thank you is extended to the many people who have contributed. We are dedicated to this noble cause, and we look forward to collaborating with anyone who shares our desire to conserve and sustainably manage giraffe and all other wildlife populations in Ethiopia.

Kumara Wakjira  
Director General, EWCA



# 1. Introduction

## 1.1. Background

Giraffe (*Giraffa* spp.) are native to sub-Saharan Africa. Their historical distribution ranged widely across much of the continent; however, it is estimated to have reduced by 90% in the last three hundred years (Brown et al., 2021). Today, their ranges remain largely fragmented, which are found mostly in national parks and reserves, conservancies and private ranches, and surrounding community land. Giraffe range throughout the northern and southern savannah regions and open woodlands, predominantly avoiding dense forest and desert environments, with a distinctive broad strip of moist miombo woodland separating their broader southern and northern range (Muller et al., 2018; O'Connor et al., 2019; Brown et al., 2021). The current total population of all four species of giraffe is estimated at 117,000 individuals remaining in the wild – down from >150,000 in the 1990s (Brown et al., 2021). The home range for individual giraffe varies markedly between habitats, from as low as 13 to 50 km<sup>2</sup> in mesic environments of Kenya and Tanzania, to >1,000 km<sup>2</sup> in arid environments such as northwest Namibia and Niger (Brown et al., 2021). Giraffe are not territorial, exhibiting a fission-fusion social structure. The major threats facing giraffe today primarily include anthropogenic-related impacts that result in habitat loss, degradation, and fragmentation.

In Ethiopia, two species of giraffe occur. The Nubian giraffe (*G. camelopardalis camelopardalis*), a subspecies of the Northern giraffe (*G. camelopardalis*), inhabit the Gambella National Park (NP) and the area bordering South Sudan, and small, fragmented populations most likely inhabit the southern lowlands east of the Omo River, mainly in the Omo NP. The reticulated giraffe (*G. reticulata*) occurs in the Tamma Wildlife Reserve (WR), Mago NP and Geralle NP, as well as in the surrounding areas of Borana and Ogaden. Giraffe population numbers and distribution in Ethiopia have diminished over the past century because of habitat loss, fragmentation and degradation, illegal hunting, civil unrest, the absence of comprehensive land use planning, climate change, and disease.

The preparation of this Action Plan began with the identification of local, regional and international stakeholders (both at individual and institution levels) for consultation, which was led by the Ethiopian Wildlife Conservation Authority (EWCA) and supported by the Giraffe Conservation Foundation (GCF). The identified stakeholders include EWCA staff and local and international conservation experts from academic, government, non-governmental and research institutions. Background information and documents for the development of the Action Plan were collected and compiled through primary and secondary data gathering (EWCA data, field data surveys, academic institutions and NGOs, and direct consultations at local, national and international levels). An international consultative workshop was held in Addis Ababa, 6-7 September 2022, where the vision, goals, strategic objectives, activities, time frame, and responsibilities were formulated into a logical framework. This species Action Plan has been developed to cover a period of five years (2023-2027), with an annual Working Group review and formal review after five years to ensure its progress. Consultants from ZESMAN Consultancy facilitated the consultative workshop and compiled the document.

## 1.2. Giraffe Conservation Status and Distribution in Africa

### 1.2.1. Taxonomy and Scientific Classification

Giraffe are the tallest and largest even-toed ruminants, and belong to:

Kingdom: Animalia  
Phylum: Chordata  
Class: Mammalia  
Order: Artiodactyla  
Family: Giraffidae  
Genus: *Giraffa*

In 2016, the International Union for the Conservation of Nature (IUCN) completed the first detailed assessment of the conservation status of giraffe, revealing that they are in peril by listing them as *Vulnerable* on the IUCN Red List of Threatened Species. Their plight



was further emphasised when most of the IUCN-recognised subspecies were assessed separately in 2018, where some were listed as *Critically Endangered*. While this conservation status update further confirms the real threat to one of Africa's most charismatic megafauna, it also highlights a confusing aspect of giraffe conservation: how many species/subspecies of giraffe are there? The IUCN currently recognises one species (*G. camelopardalis*) and nine subspecies of giraffe (Muller et al., 2018), historically based on outdated assessments of their morphological features and geographic ranges (e.g. Coimbra et al., 2021; Winter et al., 2018; Fennessy et al., 2016). The IUCN-recognised subspecies comprise the 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*), Luangwa (Thornicroft's) giraffe (*G. c. thornicrofti*), and West African giraffe (*G. c. peralta*).

However, GCF and their partners, including the Senckenberg Biodiversity and Climate Research Centre (BiK-F), performed the first-ever comprehensive DNA sampling and analysis (genomic, nuclear, and mitochondrial) of all the major natural populations of giraffe throughout their range in Africa, which has resulted in an updated understanding of giraffe taxonomy. The study revealed that there are four species of giraffe and most likely seven subspecies (Coimbra et al., 2021; Winter et al., 2018; Fennessy et al., 2016). The four species are Masai giraffe (*G. tippelskirchi*), northern giraffe (*G. camelopardalis*), reticulated giraffe (*G. reticulata*) and southern giraffe (*G. giraffa*). The northern giraffe has three subspecies: Nubian giraffe (*G. c. camelopardalis*), Kordofan giraffe (*G. c. antiquorum*) and West African giraffe (*G. c. peralta*). The southern giraffe has two subspecies: Angolan giraffe (*G. g. angolensis*) and South African giraffe (*G. g. giraffa*). Two of the former subspecies have been subsumed within other taxa as data supports that they are genetically identical: the Rothschild's giraffe (*G. c. rothschildi*) is synonymous with the Nubian giraffe (*G. c. camelopardalis*) and the Luangwa giraffe (*G. t. thornicrofti*) is a subspecies of the Masai giraffe (Coimbra et al., 2021; Winter et al., 2018; Fennessy et al., 2016). Two of the former subspecies have been raised to a specific rank: *G. c. reticulata* is now the reticulated giraffe (*G. reticulata*) and *G. c. tippelskirchi* is now the Masai giraffe (*G. tippelskirchi*). Based on this research, the updated giraffe taxonomy of four species is used in this Action Plan.

### 1.2.2 Geographical Distribution and Trends in Africa

Historically, giraffe ranged throughout sub-Saharan Africa in open savannah, shrublands, and dry forests. Today, giraffe occupy only a fraction of their former range, including parts of West and Central Africa, increasingly fragmented regions of East Africa, and parts of Southern Africa in 21 countries. Specifically, giraffe naturally occur in Angola, Botswana, Cameroon, Central African Republic, Chad, Democratic Republic of the Congo, Ethiopia, Kenya, Mozambique, Namibia, Niger, Somalia, South Africa, South Sudan, Tanzania, Uganda, Zambia, and Zimbabwe. Extralimital populations have been introduced to Eswatini, Malawi, Rwanda, and Senegal. Giraffe have become locally extinct in at least seven countries: Burkina Faso, Eritrea, Guinea, Mali, Mauritania, Nigeria, and Senegal (Brown et al., 2021; Muller et al., 2018).

Recent studies have identified dramatic declines in many giraffe populations. For example, GCF and IUCN's most recent status assessment determined that the total number of giraffe throughout Africa has plunged by approximately 30% in 35 years, with the population currently estimated at 117,000 – up from approximately 98,000 identified by IUCN in 2015 (Brown et al., 2021; Mullet et al., 2018). While the overall population trend of giraffe in recent decades (and most likely for the last three hundred years) is downward, trends vary significantly across the different taxa. These differences in population trends throughout Africa present the crisis in numbers as a complicated and complex situation. For example, Kenya, Tanzania, and South Africa are currently home to about 70% of all giraffe. Giraffe numbers have doubled in both South Africa and Namibia, which, ironically, allow legal hunting as well as private and conservancy ownership and/or management of giraffe on conservancies and private land. On the other hand, the Masai giraffe, which is frequently found in zoos around the world, has diminished in numbers by close to 60% in Kenya and Tanzania.

The overall decline resulted in the uplisting of giraffe as one species from *Least Concern* to *Vulnerable* on the IUCN Red List of Threatened Species (Muller et al., 2018). Between 2018 and 2019, all the subspecies (excluding the South African giraffe) were assessed for separate IUCN Red List classifications – many for the first time. In evaluating the conservation status at the IUCN-described subspecies level, the diversity of giraffe conservation issues becomes more apparent. Some (sub)species are



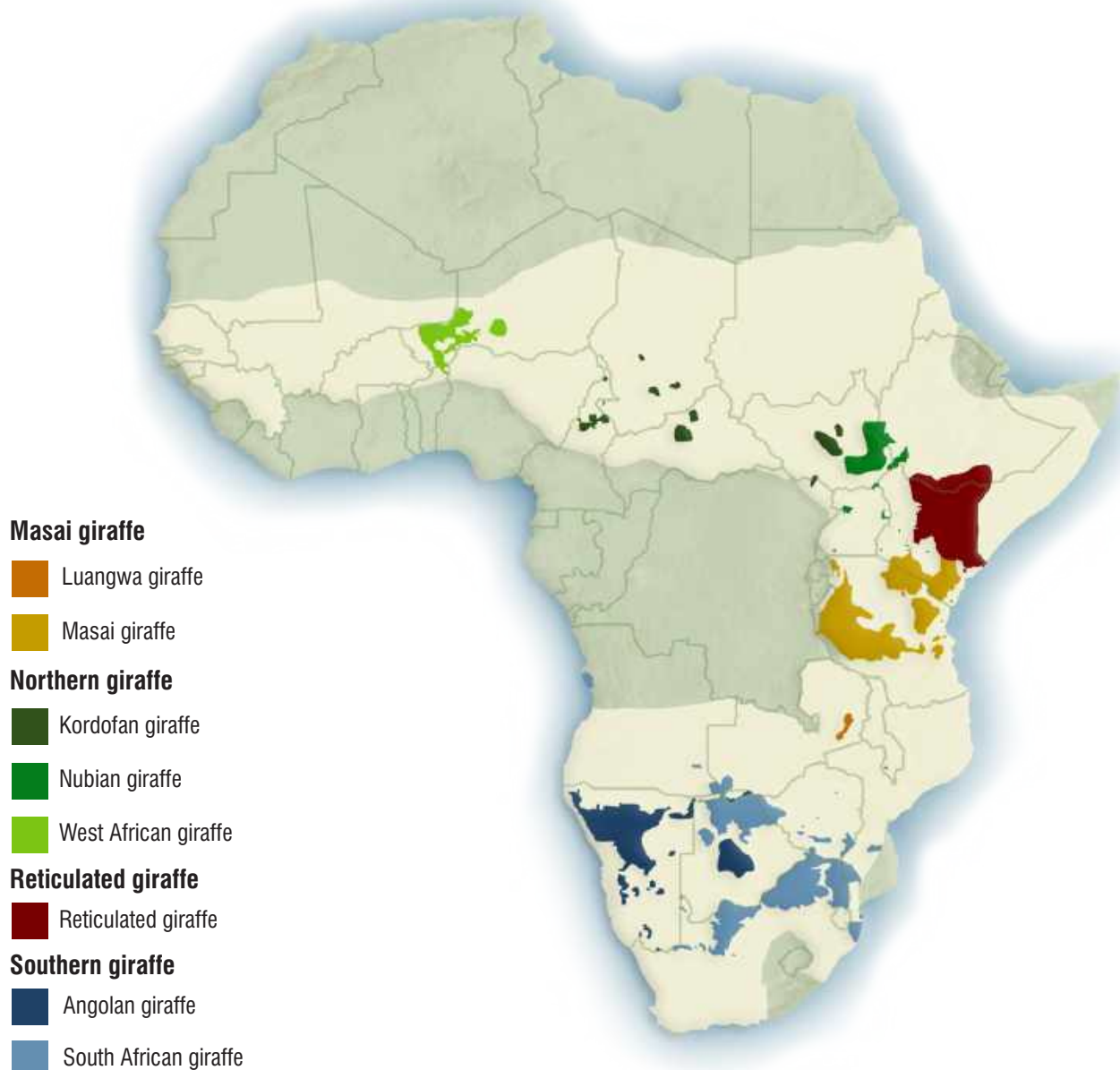
categorised as more imperilled, such as the Kordofan giraffe (*Critically Endangered*), Nubian and subsumed Rothschild's giraffe (*Critically Endangered*), reticulated giraffe (*Endangered*), and Masai giraffe (*Endangered*). Other taxa exhibit a lesser conservation threat level, such as the West African giraffe (*Vulnerable*) and the Luangwa (*Thornicroft's*) giraffe (*Vulnerable*). Conversely, other taxa, particularly those in southern Africa, are generally considered to be of lesser conservation concern. The rapid decline in many giraffe populations and the reduction in the species' geographic range is widely attributed to habitat loss, land degradation, climate change, and illegal poaching, all of which have significantly altered and reduced the geographic range of giraffe throughout Africa (Brown et al., 2021; O'Connor et al., 2019). An updated review of giraffe conservation status by IUCN using the taxonomic classification of four species is overdue.

### Masai giraffe

Masai giraffe currently inhabit much of northern and central Tanzania and southern Kenya, where the Luangwa subspecies occurs only in Zambia. Populations have declined from about 66,450 in 1980 to about 31,610 in 2020 (Brown et al., 2021; Bolger et al., 2019).

### Northern giraffe

Kordofan giraffe are currently found in Cameroon, Central African Republic, Chad, and the Democratic Republic of the Congo. Populations have declined from about 4,000 in 1986 to about 2,000 in 2020 (Brown et al., 2021; Fennessy et al., 2018). Nubian giraffe are found as isolated populations in Uganda and Kenya, and remnant populations are found in south-western Ethiopia



**Figure 1:** Current distribution of giraffe throughout their natural range in Africa (Source: Giraffe Conservation Foundation 2022)

and eastern South Sudan. Populations have declined from about 21,000 in 1982 to about 3,000 in 2020 (Brown et al., 2021; Fennessy et al., 2018; Wube et al., 2018).

West African giraffe are currently found in south-western and central Niger. There were fewer than 50 individuals in 1996, but populations have since rebounded to >600 (Brown et al., 2021; Fennessy et al., 2018). Because of their small population size and restricted range, the West African giraffe are one of the most threatened subspecies, despite the recent increase in their numbers.

### **Reticulated giraffe**

Reticulated giraffe currently range across much of north-eastern Kenya and remnant populations can also be found in southern Ethiopia. Populations have declined from approximately 40,000 in the 1990s to approximately 15,700 in 2018, with the majority occurring in northern and north-eastern Kenya (Brown et al., 2021; Muneza et al., 2018).

### **Southern giraffe**

Angolan giraffe have been extirpated from their historic range in Angola; however, they are being re-introduced. They are currently widely distributed across Botswana and Namibia. Some populations also occur in southern Zambia, western Zimbabwe, and South Africa. Angolan giraffe populations have increased from approximately 15,000 in the 1970s to an estimated 20,190 in 2020 (Brown et al., 2021; Marais et al., 2018).

South African giraffe currently range across much of north-eastern South Africa, north-eastern Eswatini, south-western Mozambique, and southern Zimbabwe. The total population has increased from about 8,000 in the 1970s to about 29,675 in 2020 (Brown et al., 2021; Muller et al., 2018).

### **1.2.3. Behaviour and Biology**

Giraffe are the tallest living land animal and the largest ruminant. Their spotted pelage (coat) patterns are as unique as human fingerprints, and their iconic long neck and legs allow for the utilisation of food sources that are unavailable to most other browsers. They are deemed indispensable for important ecological processes such as seed dispersal and stimulating the growth of new forage (GCF, 2021). Despite this unique adaptation, giraffe can increase their versatility and survive in a myriad of different vegetation types and habitats by browsing on a wide range of trees and shrubs (GCF, 2021). Giraffe are highly mobile, and some subspecies have demonstrated a capacity to move long distances in pursuit of sufficient forage or mating opportunities, especially in arid landscapes (Flanagan et al., 2016).

The lifespan of a healthy giraffe varies between populations; however, little to no long-term monitoring of individuals has been undertaken in the wild. The best estimates indicate that some giraffe can live >30 years, although on average their lifespan is likely to be less (GCF pers. comm.). Giraffe have a low reproductive output. Female giraffe become sexually mature at three to four years, but on average the first calving is not until around six years (Mitchell, 2021). Gestation is about 15 months and, typically, only one calf is born. Calves stay with their mothers for about 22 months. Sexual maturity for males occurs at three to four years old, and the first mating usually occurs around eight years old (Mitchell, 2021). The oldest documented age for giving birth in the wild is 24 years (GCF pers. comm.); thus, female giraffe have a maximum breeding lifespan of 18 years, over which time they may give birth to one calf every 677 days, or about nine to ten calves in a female's lifetime. Calf survival varies between populations; some studies indicate that half of all the calves born die before reaching adulthood, while others highlight a much higher survivorship (Hart et al. 2021; Bercovitch & Berry, 2009).

Giraffe are social animals that live in loose, fission-fusion, non-territorial open herds that range in size from a few individuals to more than one hundred. They inhabit large ranges in semi-arid subtropical savannah habitats that vary from open to closed woodlands and dense shrubby thickets (Furstenburg, 2013; Muller et al., 2018). Giraffe are mainly browsers and spend most daylight hours feeding on a variety of trees and shrubs, leaves, stems, flowers, and fruits (Dagg, 2014; Pellew, 1984). In general, giraffe prefer open scrub and woodlands, commonly inhabiting areas dominated by *Acacia* (*Vachellia* and *Senegalia*) trees. Giraffe tend to avoid dense forests and prefer to avoid areas where predators such as lions (*Panthera leo*) and hyaena (*Crocuta crocuta*) may be located.

Sexual dimorphism is evident within all species of giraffe. Male giraffe stand at about 5.2 m tall, with a body mass of about 1,200 kg; and female giraffe stand at about 4.3 m tall, with a body mass of about 800 kg (Mitchell, 2021). The shoulder height of adult males varies from 2.4 to 3.5 m and of adult females from 2.1 to 3 m. To drink, giraffe will spread their forelegs and/or bend their knees to lower their necks to reach the surface of water. Despite their body mass, water is not a necessity as they can absorb sufficient



moisture from their food plants, which indicates a lack of water dependence, even when an abundance of water is available (GCF, 2021; Fennessy, 2004).

### 1.3. Status and Distribution of Giraffe in Ethiopia

#### 1.3.1. Taxonomic Status of Giraffe in Ethiopia

The following (sub)species of giraffe are found in Ethiopia and listed on the IUCN Red List:

**Northern giraffe** (*G. camelopardalis*)

**Nubian giraffe** (*G. c. camelopardalis*) – Critically Endangered (Wube et al., 2018)

**Reticulated giraffe** (*G. reticulata*) – Endangered (Muneza et al., 2018)

The taxonomic status of giraffe in Ethiopia has been problematic. The Nubian giraffe is believed to have ranged along the western lowland corridor adjacent to the Sudanese border. The reticulated giraffe occur east of the Omo River, and are distributed in the Mago NP, Tama WR and Geralle NP, as well as in the surrounding areas of Borena in the Southern Oromia Regional State and the Ogaden area of the Somalia Regional State. The Borena and Ogaden populations are the least known in Ethiopia. Taxonomically, the Nubian giraffe population in the Gambella NP is the only one that has been formally assessed; all the others are still to be verified through a taxonomic evaluation.

#### 1.3.2. Distribution of Giraffe in Ethiopia

Ethiopia is home to a unique and characteristic array of diverse ecosystems that contain fauna and flora with a high level of endemism. Two of the 34 biodiversity hotspots of global significance exist in Ethiopia. Ethiopia is also part of the Worldwide Fund (WWF) for Nature's 200 EcoRegions and BirdLife International's Endemic Bird Areas (EBA) (Williams, 2005). Interestingly, the country is one of the eight Vavilov Centres of Crop Domestication and Origin. Recognising Ethiopia's importance to biodiversity conservation of wildlife, 14% of the country is dedicated to protected areas and conservation (EWCA, 2014). The presence of giraffe in Ethiopia is well documented by early chroniclers and travellers. Cosmos, an Egyptian monk, saw tame giraffe and African savannah elephant (*Loxodonta africana*) in Axum in 525 AD (Pankhrust, 1961; Gebre-Michael et al., 1992). Giraffe formerly occurred in the western and southern lowlands of Ethiopia (East, 1999; Yalden et al., 1984). However, as a large portion of the country is covered by high-altitude montane and Afroalpine ecosystems, the distribution of giraffe has probably never been much more extensive, being limited by the foothills of the central plateau, the dense forests of the southwest, and the Shebelle River (Fust, 2009; Yalden et al., 1984). According to historical records, Nubian giraffe occurred in the western and south-western parts of the country and reticulated giraffe in the south-eastern part (East, 1999; Yalden et al., 1984; Blower, 1968). The Omo River, which flows into the top end of Lake Turkana (formerly Lake Rudolf), was thought to act as an ecological barrier between the two species (Yalden et al., 1984; Blower, 1968).

According to Dagg (1962), reticulated giraffe were abundant along the southern border of the country; occurring in eastern Ethiopia along the borders of the Danakil Desert and in the Ogaden Region. In contrast to East (1999), Yalden et al., (1984), Blower (1968) and Dagg (1962) did not refer to the occurrence of Nubian giraffe in the western and south-western parts of the country. Kingdon (1979) suggested that giraffe once extended throughout the Ogaden Region and included the Danakil Desert as part of their range. However, Yalden et al., (1984) indicated that there was no firm evidence to support Kingdon's belief of giraffe incidence in the Danakil Desert. Hunt (1951) suggested that local place names are indicative of the former presence of the species in northern Somalia. Blower (1968) noted the occurrence of giraffe in the southern Ogaden Region, but did not indicate the subspecies concerned, and expressed doubt regarding their continued survival in the region by the late 1960s.

Giraffe population numbers and range in Ethiopia have diminished over the past century as a result of illegal hunting, habitat loss and degradation, civil unrest, the absence of comprehensive land use planning, climate change, and disease (Abate & Abate, 2017). Additionally, giraffe in the south of Ethiopia were seriously depleted in number at the hands of a heavily armed local populace and military by the late 1960s (Blower, 1968).

A marked decrease in Ethiopia's giraffe populations, mostly because of illegal hunting, was evident by the early 1970s (East, 1999). In 1971, the total number of giraffe in Ethiopia was estimated by the government at between 1-2,000 individuals (Dagg & Foster, 1982). Bolton (1973) noted very few sightings from southern Ethiopia and implied a considerable decline in numbers in this area.

**Table 1:** Population trends of giraffe in Ethiopia since 1971 (see Figure 2)

| No. | Giraffe Numbers | Year    | Taxon                  | Locality                |
|-----|-----------------|---------|------------------------|-------------------------|
| 1   | 1,000-2,000     | 1971    | Reticulated and Nubian | National                |
| 2   | 800-1,600       | 1978    | Reticulated            | Omo-Mago-Tama Complex   |
| 3   | 200             | 1994    | Reticulated            | Omo-Mago-Tama Complex   |
| 4   | 160             | 1999    | Nubian                 | Omo NP and Tama WR      |
| 5   | 140             | 1999    | Reticulated            | Borena and Ogaden areas |
| 6   | 20              | 2006    | Reticulated            | Omo NP                  |
| 7   | 90              | 2009    | Nubian                 | Gambella NP             |
| 8   | <150            | Current | Nubian                 | Gambella NP             |
| 9   | 20              | Current | Nubian                 | Omo NP and Tama WR      |
| 10  | 20              | Current | Reticulated            | Borena and Ogaden areas |

Large (relative) numbers of giraffe were however observed in the Ubela area during 1973 (Duckworth, 1974). Stephenson & Mizumo (1978) estimated giraffe populations in the Omo-Mago-Tama Complex (consisting of the Omo NP and Mago NP, as well as the Tama WR, which links the previous two NPs) at between 800-1,600 individuals.

Hillman (1993) suggested the prevalence of giraffe in the Gambella, Mago and Omo NPs and in the Yabello Sanctuary, but gave no indication of the subspecies or the estimated population sizes. An aerial census of the Omo-Mago-Tama Complex in 1994 estimated the giraffe population at 200 individuals, where most were documented in the Omo NP and two herds in the Mago NP (Lamprey, 1994). As a significant number of giraffe were observed in the Tama WR, outside of the surveyed protected areas, Lamprey (1994) suggested that the status of the giraffe population in the area might have been healthier than the census data indicated. However, less than 40 giraffe were counted during an aerial survey of the Omo NP in 1996 (Graham et al., 1996). East (1999) reported the disappearance of giraffe from the Mago NP, and estimated a small, declining population at about 160 individuals occurring in the Omo NP and Tama WR and possibly elsewhere in the country's west and southwest. An estimate of about 140 reticulated giraffe survived in the Borana Province and, as reported by local inhabitants, they still occur in south-western Ogaden (East, 1999).

As no official census has been undertaken, the current numbers and distribution of giraffe in the country remains uncertain. However, as large herbivores have almost completely disappeared from the south of Ethiopia, it is assumed that giraffe have also become extinct in the same area (Borghesio & Giannetti, 2005). A few reticulated giraffe might have survived in the Ogaden Region bordering Somalia (Fust, 2009), but there is no recent evidence to substantiate this. Although East (1999) suggested that giraffe became extinct in the Mago NP, incidental observations in 2006 suggested the existence of a remaining giraffe population, which looked distinctly different from the animals in the Omo NP on the opposite side of the Omo River. However, during a recent survey and interviews with park wardens, it is likely that no giraffe occurred in the Mago NP (Wube, 2013; EWCA, pers. comm.).

A small population of giraffe remains in the Omo-Tama and Borana areas along the border with Kenya (Fust, 2009). These animals are in a critical situation and most likely close to local extinction (Renaud, 2006). Less than 20 giraffe were observed during an aerial survey of the Omo NP in 2006, indicating further decimation of the population over the last decade (Renaud, 2006). According to anecdotal information, giraffe still occur in the Tama WR, but their status is unclear and most likely less than 20 individuals exist



(Wube, 2013). Controversy remains regarding the occurring subspecies in the Omo NP and Tama WR. Morphological and geographic assumptions suggest that they could possibly be Nubian (formerly Rothschild's) giraffe (East, 1999; Yalden et al., 1984; Blower, 1968; Renaud, 2006).

Based on a census carried out between 2013 and 2015, along with information from EWCA staff in late 2018, the presence of giraffe in the Gambella, Geralle and Omo NPs and Tama WR was confirmed (Abdella & Ayalew, 2018). However, their population status, distribution and major threats need further assessment. Despite the critical condition of giraffe in Ethiopia, they are not well studied and conservation efforts and initiatives do not exist (Abdella & Ayalew, 2018). Based on available data that was compiled by GCF in the Country Profile of Ethiopia (Marais et al., 2013), giraffe numbers show a more than 75% decline since 1971 (GCF, 2021). The following table summarises the population trends of giraffe in Ethiopia since 1971 (Wube, 2015).

### 1.3.2.1 Gambella National Park

The Gambella NP is situated in the Gambella Regional State of Ethiopia. The park was initially proposed in 1973, but it never received official status on a national or federal level. Primarily, the park was proposed to protect its outstanding biodiversity, its important wetland habitats, and two key mammal species: the white-eared kob (*Kobus kob leucotis*) and the Nile lechwe (*K. megaceros*). It is known that in recent years wildlife populations in the region have been negatively affected by a combination of illegal hunting and habitat change. As the park boundaries were never ratified on a national or federal level and with only very few resources allocated for management, encroachment and illegal hunting have resulted, reducing the range and numbers of many of the mammal species in the park. Accordingly, as a background to conservation planning, the EWCA proposed to examine the nature of wildlife distribution and habitats, as well as human land use in the region. Several organisations were involved in planning and running the survey, including the EWCA, Horn of Africa Regional Environmental Centre and Network (HOAREC&N), Sustainable Development for Protected Areas System of Ethiopia (SDPASE), Wildlife Conservation Society (WCS), and African Parks Network (APN).

The Gambella NP and surrounding areas constitute a primarily flat plain with little relief, which is surrounded by highland areas that provide catchments for the rivers in this landscape. The elevation in the region ranges from 300 to 2,200 m. The major rivers include the Baro, Alwero, Gilo and Akobo, which generally flow east-west. Much of the landscape, particularly in the west along the Sudanese border, is seasonally flooded. Although the natural vegetation is widely varied, it comprises predominantly (64%) open woodland, crisscrossed with riverine vegetation along the drainage channels. Most of the woodlands are fire-adapted. The region is home to a wide variety of mammals, birds, fish and reptiles, including some species that are of international importance. The region represents a large and important proportion of the wildlife of Ethiopia.

Two major local communities, the Anuak and Nuer, live in and around the park. The Anuak, who are more dependent on crop production, live permanently along four major rivers in the eastern part of the park. The Nuer live in the western part of the park; however, as agro-pastoralists, the communities and cattle herds move with the rise and fall of the main rivers. In the rainfall season (June to November), the rivers overflow their banks and flood the plains. During this period, the Nuer reside in the higher/upland areas, mainly the woodlands. In November, when the rivers' volumes decrease, they move down to the banks of the Baro River and stay there from December to May. According to these rainfall patterns, the Nuer have two cropping seasons in a year: from April to August, during the rainfall season in the higher/upland areas; and from October to February, when the flooding recedes on the bank of the Baro River.

An aerial survey of wildlife, livestock and human activity conducted in the Gambella NP's dry season in 2013 counted a total of 68 giraffe, with a density of 0.08 giraffe/km<sup>2</sup>. They were observed in eight separate groups and estimated at 447 giraffe (Aerial Survey Gambella, 2013). The Nubian giraffe population in the Gambella NP is very low and faces many threats. Their home range seems to be enclosed between the settlements in Gilo (west of the Akobo area) and the South Sudan border, which exposes them to illegal hunting and habitat loss. However, transboundary movements to the Boma NP, South Sudan, have been observed; therefore, this is an important area to conserve and maintain with regards to these international movements.

### 1.3.1.2 Omo National Park

Located in the south-western limit of the Omo River and east of the Maji Highlands, the Omo NP lies at the lower Omo River Delta. It is bordered by the Neruz River to the south and the Sai Highlands to the north and currently covers a total area of 5,225 km<sup>2</sup>. The vegetation types are mainly open grassland and dense woodland. Small patches of riverine forests along the major rivers also occur, as well as *Euphorbia* thickets in the east along the Omo River.

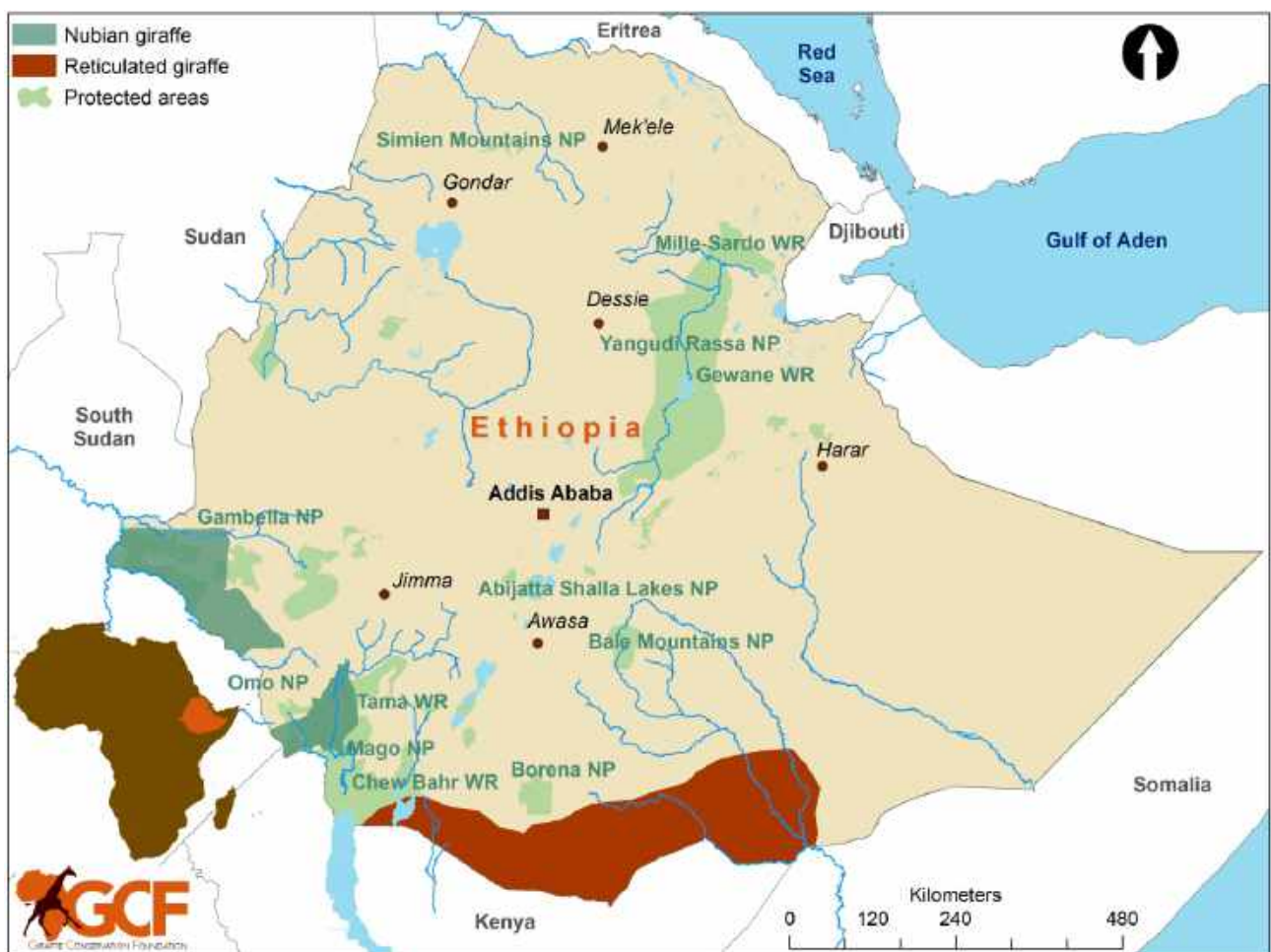






**Table 2:** Current giraffe population estimates in each area across Ethiopia (resulting from the Action Plan Consultative Workshop 2022)

| Protected Area                             | Population No. | Notes           |
|--|----------------|-----------------|
| Gambella National Park                     | 68             | 2015            |
| Omo National Park                          | 21             | Park Record     |
| Tama Wildlife Reserve                      | 18             | Park Record     |
| Mago National Park                         | 0              | Assumed extinct |
| Geralle National Park and surrounding area | 100            | 2014            |
| <b>Total</b>                               | <b>189</b>     |                 |



**Figure 2:** Current distribution of giraffe in Ethiopia (Source: Giraffe Conservation Foundation, 2021).

The area receives a mean annual precipitation of 810 mm, and two rainfall seasons: long rains (March-May) and short rains (September-November). The area is drained by the Omo River and its tributaries (Mui, Kuma, Neruz and Sharom Rivers) from the west. Other intermittent rivers exist in different parts of the park, but most of them disappear before joining the Omo River. In addition, watering points are located in different parts of the park, including a hot spring, which is the only water source in the southern part of the park. A study conducted in 1999 indicated the presence of 160 giraffe in the Omo NP and Tama WR. An aerial survey in 2006 suggested the presence of at least 20 individuals in the Omo NP (Wube, 2015). Currently, the park estimates a count of 21 individuals (Nuru Park Warden, pers. comm.).

### 1.3.1.3. Tama Wildlife Reserve

The Tama WR is situated west of the Mago NP and east of the Omo NP, at an altitude between 500-700 m. When it was established as a wildlife reserve 50 years ago, the area comprised 3,269 km<sup>2</sup>; however, due to significant land use changes occurring over the years, including the Welshet Sala controlled hunting area, the remaining habitat is now very small with a conservative estimate of 320 km<sup>2</sup> (Abdella & Ewentu, 2021). The reserve's vegetation type is similar to the two adjacent parks with dominant open grasslands. The area, which is inhabited by the Bodi and Mursi tribes, is under heavy grazing pressure and a wide range of the habitat is highly degraded. The resulting habitat change is significant, particularly as most of the open grassland has changed into *Acacia* (*Vachellia* and/or *Senegalia*) bushland.

### 1.3.1.4 Mago National Park

The Mago NP is situated in south-western Ethiopia, west of the main Rift Valley, and covers an area of 2,162 km<sup>2</sup> with a varying altitude from 400 m in the lowland plains in the south to 1,776 m on top of Mt. Mago. The central portion of the park is a flat plain and the periphery is formed by mountains and chains of hills. Two permanent rivers, the Mago and Neri, traverse the park from north to south. The Omo River borders the park in the south and southwest. The Mago NP is bordered by three conservation areas: Omo NP to the southwest, Tama WR to the west, and Murle Controlled Hunting Area to the south. The park is surrounded by settled agriculturists and semi-pastoralists consisting of six tribal groups: the Ari, Bena, Hammer, Mursi, Karo, and Bodi tribes.

The climate is characteristically dry and semi-arid with a high mean annual temperature, and the dry season extends from December to early March (Stephenson & Mizuno, 1978). There are two distinctive rainfall seasons: heavy rains (March to April) and lighter rains (August to September) (Urban and Brown, 1968). The vegetation is mainly bush (over 50%), savannah grassland, savannah bushland, open grassland and small patches of forest. *Tamarindus indica*, *T. brownie* and *Ficus sycamorus* are important components of the forest vegetation (Stephenson & Mizuno, 1978). Previous observations indicate a sharp decline in the giraffe population size over the past three decades. In 1978, the Mago NP and Tama WR population was estimated at between 800-1,600 individuals; however, the original population reduced drastically by 20-30% (to only 200 individuals) within a matter of 16 years. By 1999, it was reported that the giraffe population in the Mago NP had disappeared. Recent reports and incidental observations indicate that giraffe no longer exist in the Mago NP, but it is highly probable that some individuals still occur in the Tama WR (Wube, 2013; Abdella & Ewnetu, 2021). However, their status is unclear and the conservation and protection of the Mago NP and Tama WR is weak to non-existent.

### 1.3.1.5. Geralle National Park

The Geralle NP occurs in the Somali National Region State of Ethiopia, 712 km south of Addis Ababa. The headquarters are stationed at Hudet in the Dawa Zone of the Somali Region. Melka Meri, which is a distinct management block of the park, is located approximately 200 km from the park headquarters and separated by human settlements from the Dodo park block by 70 km. The entire park covers a total area of 1,176 km<sup>2</sup> (Dodo block, 697 km<sup>2</sup>; Melka Meri block, 1,019 km<sup>2</sup>). The park is predominantly flat land with an altitude of 900-1,200 m above sea level. The rainfall pattern in the area is similar to the south-western area's: major rain from March to May and light, erratic rain from August to September. The park's vegetation type is generally classified as open grassland, bushland and wooded grassland. The Melka Meri block, which is the habitat for giraffe, is wooded grassland dominated by *Commiphora-Acacia* (*Vachellia* and/or *Senegalia*) woodland. The Geri tribe of the Somali ethnic group inhabits the surrounding area. An isolated population of giraffe is found in the same region, in three districts of Chereti in the Afder Zone and Goro Baqaqsa and Guradamole in the Liben Zone (Abdella & Nega, 2021).



## 2. Policy and Legal Framework for the Conservation of Giraffe in Ethiopia

### 2.1 The Constitution of the Federal Democratic Republic of Ethiopia

The Constitution of the Federal Democratic Republic of Ethiopia (FDRE) states that “the State shall ensure the ecological balance is maintained and, by ensuring the conservation and development of natural resources, particularly land, water, forest, and wildlife, it shall guarantee their utilization for the benefit of the working people. The state shall ensure that human settlement patterns correspond to the distribution of natural resources in order to create favourable conditions for development.” (Article 10/1; Constitution of FDRE, 1995). The Constitution also states that “Ethiopians have the duty to protect and conserve nature and natural resources, especially to develop forest and to protect and care for soil and water resources.” (Article 55/3; Constitution of FDRE, 1995).

### 2.2. The Policy and Strategy for Wildlife Development

The Ethiopian government formulated a wildlife development and protection policy and strategy in tune with the objective reality of the country as well as the existing international natural resources development and protection principles (FDRE Wildlife Policy, 2008). The objective of the policy is to arrest the decline of wild animal populations and to enable the country to realise the maximum benefit from the sub-sector, thereby creating a conducive environment by which the country's wildlife and their habitats are protected and developed in a sustainable manner and enabling the sector to play an important role in the economic development of the country.

Accordingly, it has become imperative to produce a viable policy and strategy to protect and properly develop the country's wildlife resources, conserve natural resources and rare and endemic wildlife for posterity, support the country's economy through the revenue generated from wildlife resource development, avert the looming danger towards the nation's wildlife resources, establish participatory and sustainable wildlife development, and put into effect the international wildlife conventions and agreements. The FDRE Wildlife Policy (2008) affords special attention to the protection and conservation of threatened and endemic species.

The specific strategies highlighted include the following:

- *In-situ* conservation of threatened and endemic species will be undertaken by conducting relevant studies on the taxonomy, biology, population status and distribution of wildlife species.
- Studies will be made to identify the root causes of the population decline of the country's endemic wildlife and appropriate measures will be taken to address the problems.
- Favourable conditions will be facilitated to translocate threatened wildlife to protected areas or to facilities where *ex-situ* conservation may take place.

### 2.3 Ethiopian Wildlife Act

Under Proclamation No. 575/2008 of the People's Representatives Council to provide for the establishment of the Ethiopian Wildlife Conservation Authority, it states that “Ethiopia possesses diverse, rare and endemic species of wildlife which are of great value to tourism, education and science; it is necessary to undertake appropriate conservation and development of wildlife for its sustainable use; by halting the ever-growing wildlife threatening conditions and enabling the country to obtain economic and social benefits from its wildlife resource, it has become necessary to strengthen the sub-sector in accordance with the current global development utilization and conservation standard.” Following this, under Article 24 of the Council of Ministers Regulations No.163/2008, which provisioned for wildlife development, conservation and utilisation, no person is allowed to hunt the species listed in Table 10 of the regulations, including giraffe, except with a special hunting licence acquired in accordance with Article 22 of the regulations. The same regulation also prohibits unlawful possession of wildlife and wildlife products:

- No person may possess, deal in, export or import any unlawfully obtained wildlife or wildlife products.
- Any unlawfully possessed wildlife or wildlife product shall be seized and, upon the order of a competent court, shall be owned by a licensing body.

- Where unlawfully possessed wildlife or wildlife product is confiscated in accordance with the provisions of sub-article (2) of this Article, 30% of its value shall be paid, as a commission, to the person acted as an informant leading to its recovery and 10% of its value to the person who actually seized it, or 40% of its value to the person who accomplished both such deeds.

## 2.4. International Laws

### 2.4.1. Convention on Biological Diversity (CBD) of 1992

This convention obliges member states to establish a system of protected areas; develop guidelines for the selection, establishment, and management of protected areas; promote the protection of ecosystems and natural habitats, and the maintenance of viable populations of species in natural surroundings; and promote the integration of sustainable utilisation of natural resources in national strategies. Ethiopia became a signatory to the convention in 1993.

### 2.4.2 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

This convention of 1973 obligates member states to regulate international trade in endangered species of wild fauna and flora through international cooperation. The EWCA is the responsible management authority of CITES in Ethiopia. The CITES CoP 18 approved the listing of giraffe in Appendix II in August 2019.

### 2.4.3 Convention on Migratory Species (CMS)

This convention of 1979 obligates Ethiopia to conserve migratory species of wildlife across their migratory range. It requires Ethiopia to cooperate with other states that form part of the migratory range of wildlife resources found or migrating through the country. In October 2017, giraffe were listed on Appendix II of the CMS.

### 2.4.4. Ramsar Convention

Parties to the Ramsar Convention are expected to demonstrate their commitments to wetland management through three 'pillars' of action: (1) the wise, or sustainable, use of wetlands; (2) the identification of internationally important wetlands for inclusion in the Ramsar List; and (3) international cooperation and the sharing of information and expertise. Although Ethiopia has made significant progress with regards to implementing the principles of this convention, it is still, however, not a signatory to the Ramsar Convention.

### 2.4.5. Model of sustainability from the International Financial Corporation (IFC) Environmental and Social Performance Standards

The IFC Performance Standards (IFC, 2012) are an international benchmark for identifying and managing environmental and social risks, which have been adopted by many organisations as a key component of their environmental and social risk management. The IFC's Environmental, Health, and Safety (EHS) Guidelines (IFC, 2007) provide a technical overview with general and industry-specific examples of good international industry practice to meet the IFC's Performance Standards. PS 6 recognises that protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living natural resources are fundamental to sustainable development. The requirements set out in this Performance Standard have been guided by the Convention on Biological Diversity, which defines biodiversity as “the variability among living organisms from all sources including, *inter alia*, terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species, and of ecosystem.

The major threats affecting giraffe in Ethiopia are human induced. Habitat loss, fragmentation and degradation (often caused by human encroachment, deforestation and infrastructure development), climate change, illegal hunting (poaching), loss of wildlife due to civil unrest, and diseases are the key identified threats (Muller et al., 2018). Due to these threats, wildlife populations in Ethiopia have diminished in diversity, density, and distribution over the past century. Currently, the presence and severity of these threats vary across their range within the country. For example, pastoralists set fires in the Omo NP to stimulate new palatable grass growth for their livestock. Large herds of livestock can be observed grazing in the park, as well as the movement of humans with and without livestock in the conservation areas (EWCA, pers. comm).



## 3. Threats

### 3.1. Habitat Loss, Fragmentation and Degradation

An estimated 95% of the original vegetation in Ethiopia has been degraded because of human impact (Tessema, 2017). Habitat loss is the major threat to giraffe populations in Ethiopia. Key habitats for giraffe across their range are used by pastoralist communities to water and graze their livestock in the same area. Settlements and their associated impacts are becoming an increasing threat in all giraffe ranges in the country. For example, human settlements and activities generally overlap with wildlife distributions in the Gambella NP.

Based on a recent study, it is evident that there is a gradual shift from pure pastoralism to agro-pastoralism, which further threatens wildlife and their habitats as this type of livelihood results in increased sedentary settlements and clearing of the vegetation (Jabessa et al., 2015). The concentration of subsistence agriculture in the Tama WR and Gambella NP is problematic as it fragments landscapes; however, due to the low density of human settlements, wildlife still remains within the local community areas. Large-scale commercial agricultural investments, however, have and continue to have an impact on the Omo and Gambella NPs. The land and water requirements of commercial agriculture are incompatible with wildlife conservation. To date, large clearings upriver from and adjacent to the wetland areas are likely to impact the wetlands, which currently provide valuable dry-season refuge or permanent habitats. The clearing and construction along the eastern border of the Omo NP has the potential to completely fragment wildlife habitats, and such developments (increased human population and roads) generally lead to a reduction in numbers.

The disturbance caused by sugar factories' irrigation schemes in the Omo NP has affected wildlife movement and grazing. Serious habitat fragmentation is evident, particularly in the main habitats of the Sai Plains and Tinigne Meda. The channel constructed along the Omo River has completely stopped access to the main dry season watering ground for wildlife. The expansion of settlements (labourers' accommodation) along the eastern edges of the hills is another concerning development regarding the fragmentation of wildlife habitats in the park. Small-scale trading in Dirga is also flourishing inside the southern part of the park, close to the Illilbaye Hot Springs. This has attracted traders from nearby urban centres, such as Jinka, Maji and Hanna, because of the demand exerted by the Kuraz Sugar Plantation. The fires set by pastoralists in the Tama WR are intended to increase clearings for local farming purposes, to encourage new shoot growth, and/or to clear the area of dense foliage for security reasons. It should be noted that the Tama WR has already been apportioned for different purposes, including controlled hunting areas such as Welishet Sala and Murle, and further allotted for agricultural investment. Also, some years ago a private investor established a cattle ranch within the reserve and within close distance of the Kuraz Number Two Sugar Factory. High human pressure is prevalent in the Mago NP and as a result, no giraffe have been sighted in the last few years.

The Geralle NP faces similar challenges to the Omo NP, except for the prevalence of fire. New human settlements are flourishing, bringing with them an increase in human and livestock movements, which result in disturbances to wildlife and their habitats. This development is causing a reduction in the ecological connectivity of the Melka Meri block (which is part of the park and far from Dodo, approximately 80 km) with the other main block of the park, which is further compounded by the many pastoralist villages that exist in-between. As habitat fragmentation is most likely causing the isolation of giraffe populations to patches of formerly contiguous habitat, it therefore impedes natural movements, restricts gene flow between populations, and reduces the options for migration in response to climate-driven range shifts.

### 3.2. Climate Change

The effects of climate change are becoming increasingly important for wildlife management. The recurrent droughts in the north, south and south-eastern parts of the country are a growing concern. Reduced rainfall has resulted in considerable impacts on wildlife, livestock and humans. Drought can result in reduced vegetation quantity and quality, resulting in wildlife migration, adaptation of forage preferences or death from starvation. These circumstances have been evident in the southeast over the last few decades.







### 3.3. Illegal Hunting (poaching) and Illegal Trade of Giraffe Products

Illegal hunting (poaching) of giraffe has been a common phenomenon throughout their range in Ethiopia. During the periods of civil unrest, guns were readily available through Ethiopia's black market and, as a result, illegal hunting increased throughout the country, including giraffe (Jacobs & Schloeder, 2001). The EWCA has reported on-going illegal hunting of wildlife in the Mago, Omo and Gambella NPs – all of which have been important refuges for giraffe (Duckworth, 2002; Jacobs & Schloeder, 2001). Giraffe are primarily hunted with automatic rifles by people living adjacent to the park for their tail hair, which is used to make strings for the production of highly-prized traditional necklaces, and for their meat (Wube, 2013). Insufficient human and financial resources are made available for the management of parks (Wube, 2013); as such, protected areas struggle to provide sufficient protection from increasing human effects (Fust, 2009).

Pastoralist groups have indicated that, in part, the increase of illegal hunting pressure hails from Kenya and that improved security measures against illegal hunting in the Melka Meri block of the Geralle NP are needed. Additionally, recent ethnic conflicts have occurred and the area remains the centre of these conflicts. The Hammer people believe that men have a better chance of gaining a wife if they wear necklaces made from giraffe tail hair, which they present as gifts to the prospective wife as a dowry. In contrast, the Mursi people do not pose as large an illegal hunting pressure on the adjacent giraffe population. In the Geralle NP and adjacent areas of Borena and Ogaden, the local people commonly kill giraffe for their meat and neck skin, and for their tail hair to produce necklaces (as per other areas) and bracelets. Giraffe neck skin is used to make buckets (*Erkota*) for fetching water from deep wells, which are dug during the dry season to water the livestock. The giraffe neck-skin bucket is highly prized and a high price is paid for it (S. William, pers. comm.).

### 3.4 Disease

Diseases, such as rinderpest and anthrax, have a history of wildlife population devastation in most parts of Africa. Rinderpest was introduced to sub-Saharan Africa in 1887, when infected cattle from India were imported into Ethiopia to feed Italian soldiers. The disease infected local cattle and other wild ungulates, resulting in a 90% mortality rate, and spread across the continent over the next decade (Dugassa, 2018). Fortunately, rinderpest was officially eradicated in Ethiopia in 2009 and globally in 2011 (MoARD, 2011).

Anthrax has had a devastating impact on African wildlife. It occurs periodically, killing a wide variety of wildlife species, including giraffe in most of its range in Ethiopia. However, the number of giraffe deaths have been relatively low. Even so, in 1994 the disease had devastating impacts on most ungulates in the Mago NP and Tama WR (Shiferaw et al., 2002). Giraffe are susceptible to several skin diseases, including sarcoptic mange, ear disease, and lumpy skin disease (Muneza et al., 2015). While the etiological agents of these diseases have been studied, we know very little about the emerging infectious skin disease for giraffe, which exhibits both spatial and temporal variations across the range of the different giraffe populations and which has been broadly referred to as Giraffe Skin Disease. The different skin diseases manifest as chronic and severe scabs, but they do not appear to be life threatening (Muneza et al., 2015).

## 4. Vision, Goal and Strategic Objectives

### 4.1 Purpose and Process

The preparation for this Action Plan began with the identification of local, regional and international stakeholders for consultation. The stakeholders include EWCA, GCF, EWNHS, BirdLife International, Born Free Foundation, and local and international conservation experts from academic, educational, government, non-governmental and research institutions. Background information and data was collected by experts in conjunction with conservation science researchers, veterinarians and conservation managers.

### 4.2 Vision

To see a thriving Ethiopian giraffe population in healthy and secure ecosystems through the concerted engagement of all stakeholders.

### 4.3 Goal

To reverse the declining giraffe population trend over the next five years.

### 4.4. Strategic Objectives

- 4.4.1. Assess and monitor the conservation status of giraffe and their threats throughout Ethiopia.
- 4.4.2. Increase the institutional capacity for giraffe conservation in Ethiopia.
- 4.4.3. Raise public awareness on the need to conserve giraffe among various levels of stakeholders.
- 4.4.4. Combat habitat loss, fragmentation and degradation by maintaining and improving habitat connectivity.
- 4.4.5. Enhance the law enforcement capacity to curb illegal killing of giraffe.
- 4.4.6. Apply climate change mitigation strategies for giraffe conservation in Ethiopia.
- 4.4.7. Implement and monitor the Ethiopian Giraffe Conservation Action Plan 2023-2027.





## Schedule 1:

Strategic Objective 4.4.1: Assess and monitor the conservation status of giraffe and their threats throughout Ethiopia

| Target   | Activity  | Indicator   | Timeline       | Actor/s                      |
|--|---|---|----------------|------------------------------|
| 1.1. Better understanding of the current giraffe population's distribution and threats                         | 1.1.1. Conduct a national aerial giraffe survey in the dry and wet seasons    | Survey reports produced   | Year 1         | EWCA, partners               |
|  | 1.1.2. Map giraffe distribution across their range                            | GIS layers produced<br>Giraffe distribution maps available  | Year 1-2       | EWCA, universities, partners |
|  | 1.1.3. Assess and identify threats of giraffe and their habitats              | Assessment report finalised   | Year 2-3       | EWCA, universities, partners |
|  |   | Distribution, threats, population dynamics and status of habitats for different populations better understood | Year 1-5       | EWCA, universities, partners |
|  | 1.1.4. Establish a national giraffe identification database                   | National giraffe identification database established with current information from the field                  | Year 1-5       | EWCA, universities, partners |
| 1.1.5. Establish monitoring programmes for giraffe within their range in Ethiopia and transboundary landscapes | Monitoring reports of seasonal distribution and movement of giraffe available | Year 1-5  | EWCA, partners |                              |



## Schedule 2:

Strategic Objective 4.4.2: Increase the institutional capacity for giraffe conservation in Ethiopia

| Target  | Activity  | Indicator   | Timeline | Actor/s        |
|---|---|---|----------|----------------|
| 2.1. Assign giraffe focal-point persons in Ethiopia                 | 2.1.1. Establish a giraffe focal person at the EWCA HQ to collate data from point persons from giraffe ranges   | Number of focal points established  | Year 1   | EWCA           |
|   | 2.1.2. Provide training to members of the focal units on the basic issues of giraffe conservation   | Number of people trained  | Year 1   | EWCA, partners |
|   | 2.1.3. Conduct local and transboundary conservation experience exchange visits in core giraffe areas  | Number of experience exchange visits<br><br>Number of individuals participating in experience exchange visits   | Year 3-5 | EWCA, partners |
| 2.2. Strengthen collaborative partnerships for giraffe conservation | 2.2.1. Conduct an assessment report on capacity gaps and needs for EWCA   | Assessment report produced  | Year 1   | EWCA           |
|   | 2.2.2. Identify potential partners (donors, universities, NGOs, research institutions, etc.) and sign a memorandum of understanding on giraffe conservation efforts with collaborative partners | Number of partners identified<br><br>Number of MoUs signed and implemented                                      | Year 1-5 | EWCA, partners |
|   | 2.2.3. Develop giraffe conservation research projects with universities and research institutions   | Number of research projects initiated in collaboration with universities and research institutions              | Year 1-5 | EWCA, partners |
| 2.3. Acquire financial and material resources                       | 2.3.1. Acquire financial and material support from donors   | Amount of funding raised from donors and grants<br><br>Number and type of material support acquired from donors | Year 1-5 | EWCA, partners |
| 2.4. Trained and skilled personnel                                  | 2.4.1. Conduct training on the giraffe conservation status, focusing on field-based monitoring  | Number of individuals trained   | Year 1-5 | EWCA, partners |
|   | 2.4.2. Conduct GIS and remote-sensing technology training   | Number of individuals trained   | Year 1-5 | EWCA, partners |
|   | 2.4.3. Increase capacity on human dimensions of giraffe conservation  | Number of individuals trained   | Year 1-5 | EWCA, partners |
|   | 2.4.4. Train veterinarians on best practices for wildlife immobilisation  | Number of veterinarians trained   | Year 1-5 | EWCA, partners |



### Schedule 3:

Strategic Objective 4.4.3: Raise public awareness on the need to conserve giraffe among various levels of stakeholders

| Target   | Activity  | Indicator   | Timeline                              | Actor/s                               |
|--|---|---|---------------------------------------|---------------------------------------|
| 3.1. Enhance public awareness of giraffe   | 3.1.1. Conduct awareness gap surveys within communities in the giraffe range  | Number of surveys conducted and reports available                       | Year 1                                | EWCA, regional line offices, partners |
|  | 3.1.2. Develop and distribute conservation education materials (booklets, posters, brochures, fliers, videos, etc.)   | Number and type of conservation education materials produced            | Year 1-5                              | EWCA, regional line offices, partners |
|  |   | Number and type of conservation education materials distributed         |                                       |                                       |
|  | 3.1.3. Identify and sensitize local communities and local administrations on giraffe conservation issues  | Number of individuals sensitized  | Year 2-5                              | EWCA, regional line offices, partners |
|  | 3.1.4. Raise public awareness of habitat protection (regarding fire, grazing, deforestation, development activities, agricultural expansion, etc.) through workshops and media outreach | Number of individuals participating in workshops and outreach campaigns | Year 1-5                              | EWCA, regional line offices, partners |
|  | 3.1.5. Conduct seminars or workshops for conservation partners for raising an awareness of giraffe conservation   | Number of seminars and workshops conducted                              | Year 1-5                              | EWCA, regional line offices, partners |
|  |   | Number of people trained  |                                       |                                       |
|  | 3.1.6. Provide training and public awareness to environmental clubs and educational institutions  | Total training provided   | Year 1-5                              | EWCA, regional line offices, partners |
| Number of people trained   |   |   |                                       |                                       |
| 3.1.7. Disseminate and broadcast information about giraffe conservation using mass media | Total broadcast hours   | Year 1-5  | EWCA, regional line offices, partners |                                       |
| 3.1.8. Celebrate World Giraffe Day (21 June) annually                                    | Number of events and participation reports  | Year 1-5  | EWCA, regional line offices, partners |                                       |

**Schedule 4:**

Strategic Objective 4.4.4: Combat habitat loss, fragmentation and degradation by maintaining and improving habitat connectivity

| Target                                 | Activity   | Indicator                           | Timeline | Actor/s        |
|--|--|-------------------------------------|----------|----------------|
| 4.1. Maintain existing giraffe habitat | 4.1.1. Assess the status of habitat loss, degradation, and fragmentation   | Report completed and made available | Year 1   | EWCA, partners |
|  | 4.1.2. Improve and restore degraded giraffe habitats   | Area of habitat restored            | Year 1-2 | EWCA, partners |
|  | 4.1.3. Maintain connectivity between potential giraffe habitats  | Area of corridors restored          | Year 3-5 | EWCA, partners |
|  | 4.1.4. Enhance transboundary collaboration with Kenya and South Sudan to protect giraffe and their habitats  | Number of agreements signed         | Year 1-2 | EWCA, partners |
|  | 4.1.5. Lobby relevant institutions to ensure development infrastructure does not interfere with giraffe movement and giraffe habitat requirements are appropriately considered in ESIA's | Number of meetings                  | Year 1-5 | EWCA, partners |





## Schedule 5:

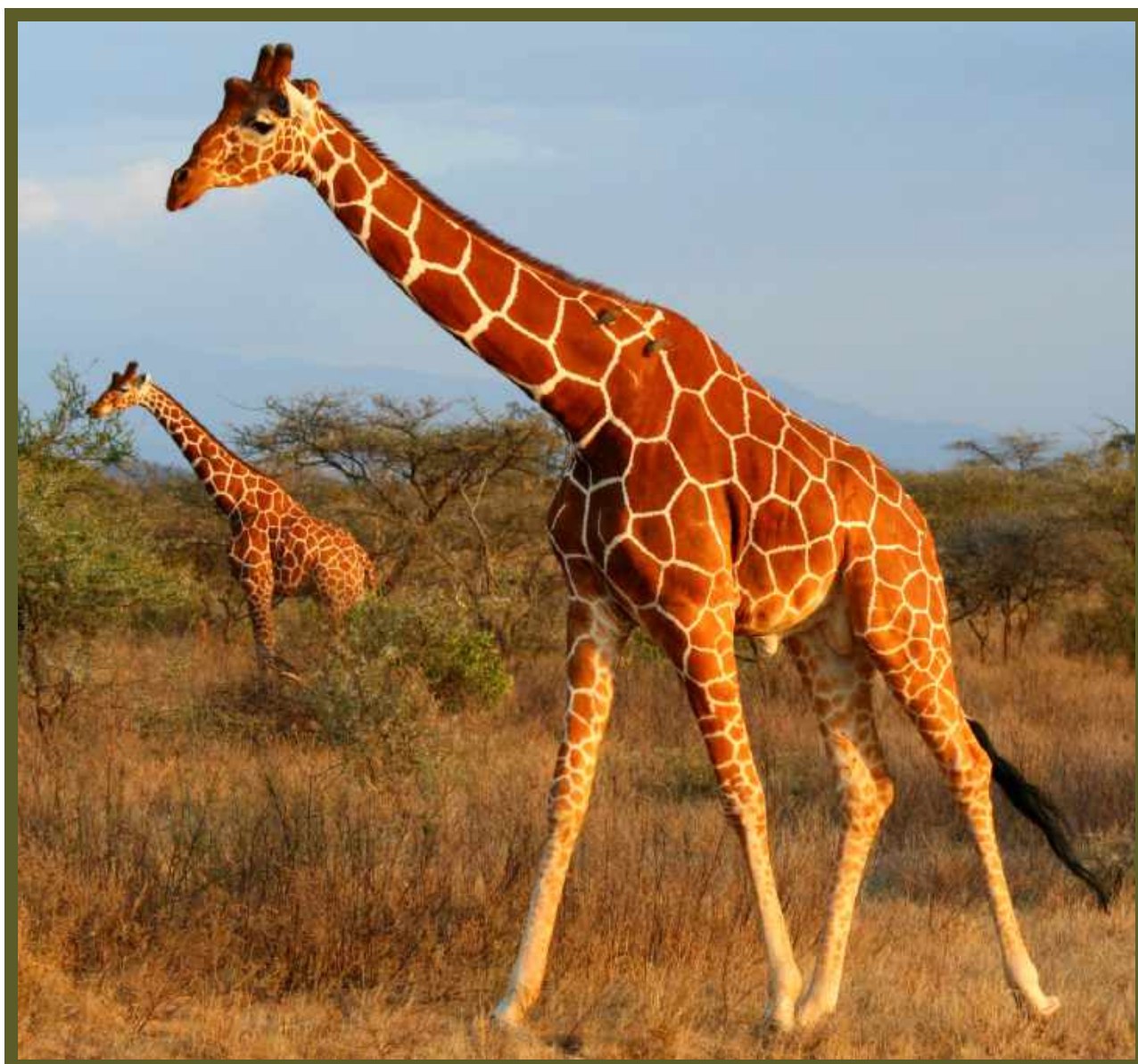
Strategic Objective 4.4.5: Enhance the law enforcement capacity to curb illegal killing of giraffe

| Target  | Activity  | Indicator  | Timeline | Actor/s                               |
|---|---|--|----------|---------------------------------------|
| 5.1. Improve patrol efficiency in protected areas in giraffe ranges | 5.1.1. Develop a status report on the capacity and equipment needs for law enforcement rangers in protected areas (PAs)                 | Status report produced   | Year 1   | EWCA, partners                        |
|   | 5.1.2. Develop standard operating procedures (SOPs) for PA rangers  | SOPs developed and disseminated  | Year 1   | EWCA, regional line offices, partners |
|   | 5.1.3. Provide capacity-building training for rangers   | Number of rangers trained  | Year 1-5 | EWCA, regional line offices, partners |
|   | 5.1.4. Procure and distribute equipment for PA rangers  | Number and type of equipment procured and distributed  | Year 1-5 | EWCA, regional line offices, partners |
|   | 5.1.5. Create synergy between local bylaws (traditional practices) that protect giraffe and national laws that relate to wildlife crime | Number of meetings<br>Number of (by)laws reviewed/endorsed   | Year 1-5 | EWCA, regional line offices, partners |
| 5.2. Improve capacity of law enforcement actors                     | 5.2.1. Build capacity of law enforcement actors (rangers, police, prosecutors, magistrates, etc.) in wildlife crime investigation       | Number of individuals trained  | Year 1-5 | EWCA, regional line offices, partners |
|   | 5.2.2. Enhance cooperation between national governments to tackle international illegal trade of giraffe and their products             | Number of meetings<br>Number of agreements   | Year 1-5 | EWCA, regional line offices, partners |
|   | 5.2.3. Raise awareness with the general public in relation to penalties of wildlife crime   | Number and types of outreach campaigns   | Year 1-5 | EWCA, regional line offices, partners |
|   | 5.2.4. Reduce the demand for giraffe products for cultural uses by promoting artificial replacements                                    | Number and types of artificial replacements produced<br>Number and types of artificial replacements supplied | Year 1-5 | EWCA, regional line offices, partners |
|   | 5.2.5. Monitoring and evaluation of giraffe-related cases   | Number of cases reported and completed   | Year 1-5 | EWCA, regional line offices, partners |

## Schedule 6:

Strategic Objective 4.4.6: Apply climate change mitigation strategies for giraffe conservation

| Target   | Activity  | Indicator                                  | Timeline | Actor/s                               |
|--|---|--|----------|---------------------------------------|
| 6.1. Better understanding of the impacts of climate change on giraffe survival | 6.1.1. Assess impacts of climate change on giraffe survival in Ethiopia                       | Report finalised                           | Year 1-5 | EWCA, regional line offices, partners |
|  | 6.1.2. Scaling up best practices of community knowledge to mitigate impacts of climate change | Number of best practices adapted           | Year 1-5 | EWCA, regional line offices, partners |
|  | 6.1.3. Prepare site-specific conservation strategy in giraffe ranges                          | Number of conservation strategies produced | Year 1-2 | EWCA, partners                        |





## Schedule 7:

Strategic Objective 4.4.7: Implement and monitor the Ethiopian Giraffe Conservation Action Plan 2023-2027

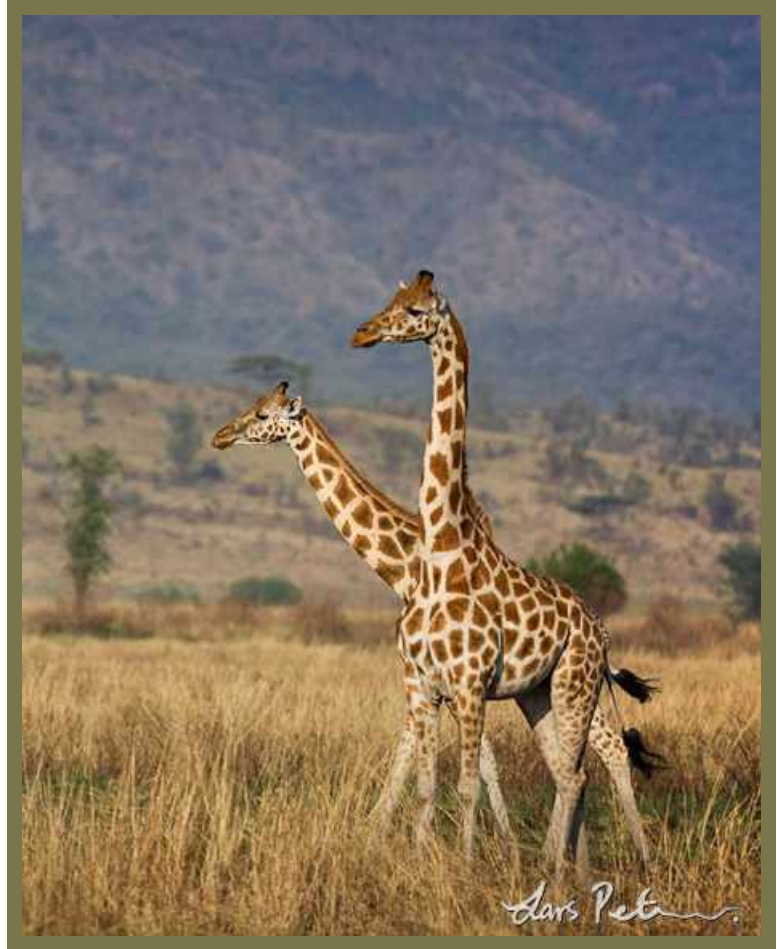
| Target                                       | Activity   | Indicator   | Timeline | Actor/s                               |
|--|--|---|----------|---------------------------------------|
| 7.1. Develop a progressive monitoring system | 7.1.1. Establish a national steering committee to monitor and evaluate the implementation of the giraffe conservation strategy and action plan | National steering committee established                             | Year 1   | EWCA, regional line offices, partners |
|  | 7.1.2. Disseminate the giraffe conservation strategy and action plan to relevant stakeholders  | Number of copies disseminated<br>Action Plan made available         | Year 1-5 | EWCA, regional line offices, partners |
|  | 7.1.3. Develop an annual work plan for the implementation of the Action Plan   | Annual work plans developed<br>Year 1-5 National steering committee |          |                                       |
|  | 7.1.4. Develop and disseminate annual reports to relevant stakeholders   | Number of copies disseminated<br>Annual reports made available      | Year 2-5 | National steering committee           |
|  | 7.1.5 Harmonize activities between Ethiopian species conservation strategies or Action Plans   | Number of complementary activities harmonized                       | Year 1-5 | National steering committee           |





## 5. Implementation of the Ethiopian Giraffe Conservation Action Plan 2023-2027

The Ethiopian Giraffe Conservation Action Plan 2023-2027 is only a tool and the implementation of actions on the ground are key to achieving the objectives. Therefore, there is a need for a structure to oversee this implementation and to monitor its progress. Once the Action Plan is completed and approved by the EWCA management, it will be officially launched and stakeholders will be invited to support its implementation. A Giraffe Technical Working Group, whose main responsibility will be to oversee the implementation of the Action Plan, will be established. The committee will comprise individuals from the EWCA (Chair), GCF, Ethiopian Wildlife and Natural History Society (EWNHS), Institute of Biodiversity Conservation (IBC), and Addis Ababa University (AAU). The Terms of Reference for the Giraffe Technical Working Group are reflected in Appendix II. It is expected that the Working Group will develop an annual work schedule to implement this Action Plan.

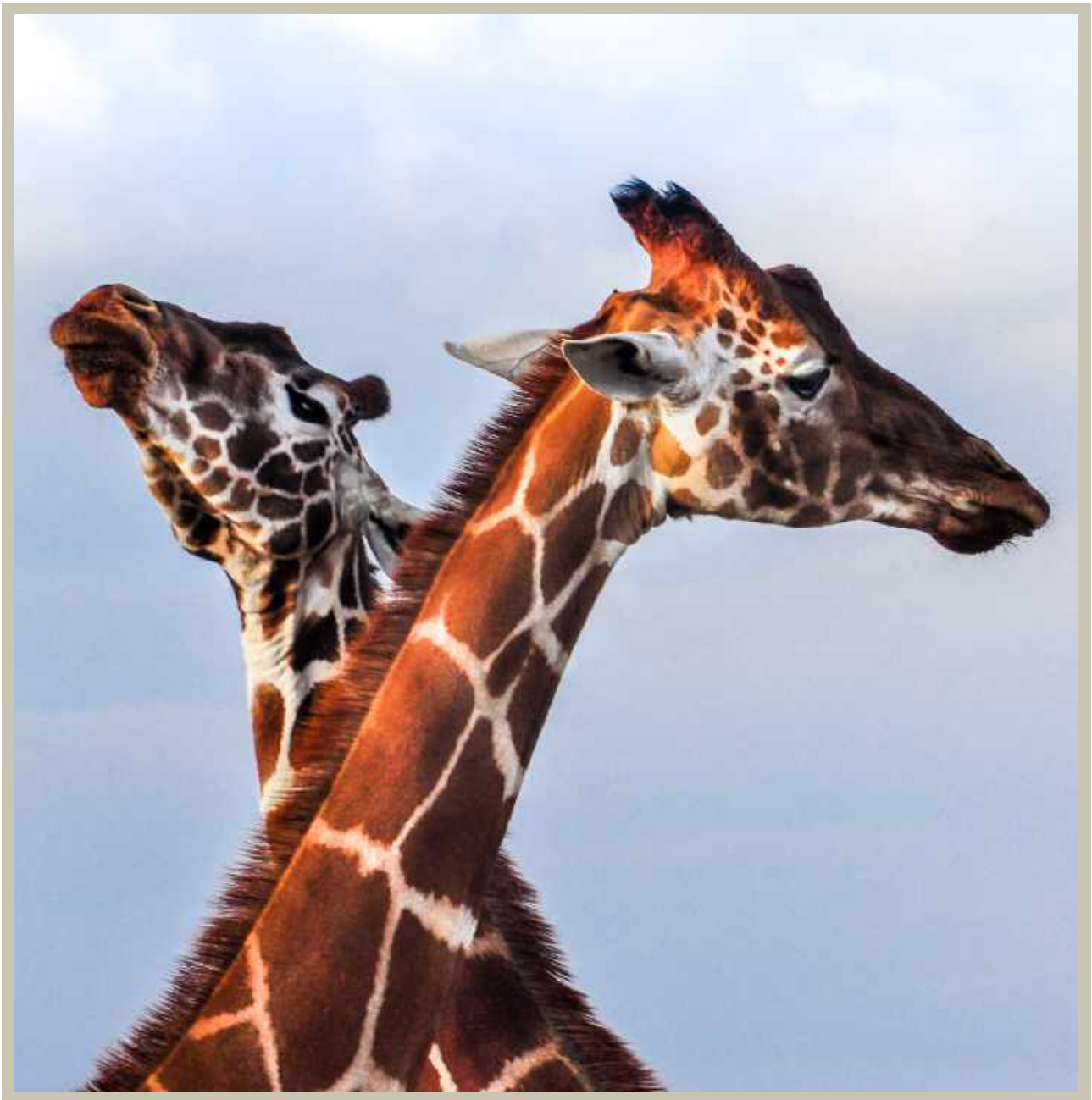




## 6. Conclusion

The emphasis of this Ethiopian Giraffe Conservation Action Plan 2023-2027 is on the implementation of the identified actions to realise the objectives. Prior to this Action Plan, few activities were being implemented, and all of which in an ad hoc manner. With this Action Plan in place, the implementation of giraffe conservation activities will be streamlined, which will require additional funding. For too long, giraffe and their habitats have attracted little attention, but now with this Action Plan, there is an opportunity to increase focus and support. The fact that Ethiopia and development partners are conservation-oriented affords the hope that they will engage in the implementation of this Action Plan.

The future and survival of giraffe in Ethiopia cannot depend on the EWCA's efforts alone. Importantly, conservation partners and management NGOs and communities that neighbour key giraffe protected areas will always play a key role in giraffe conservation. Local communities are key partners, and this Action Plan proposes incentives to encourage them to participate in the conservation of giraffe to achieve larger and more viable populations across various ranges in Ethiopia.



# 7. References

- Abate, D. & Abate, T.** (2017). Factors Affecting the Survival of Giraffe in Ethiopia. *Researchgate* 55, p. 6.
- Abdella, F. & Ewnetu, M.** (2021). Field report on giraffe assessment in Geralle, Mago and Omo National Parks and Tama Reserve. EWCA archive unpublished Field Report, Ethiopia.
- Abdella, F. & Nega, W.** (2021). Report on wildlife assessment in three districts of Somali National Regional State of Ethiopia. EWCA archive unpublished Field Report, Ethiopia.
- Abdella, F. & Ayalew, G.** (2018) Baseline information for Ethiopian Giraffe Conservation Action Plan. EWCA archive unpublished Report, Ethiopia.
- Blower, J.** (1968). The wildlife of Ethiopia. *Oryx* 9: 276-285.
- Bolton, M.** (1973). Notes on the current status and distribution of some large mammals in Ethiopia (excluding Eritrea). *Mammalia* 37(4): 562-586.
- Bolton, M.** (1973). Notes on the current status and distribution of some large mammals in Ethiopia (excluding Eritrea). *Mammalia* 37(4): 562-586.
- Borghesio, L. & Giannetti, F.** (2005). Habitat degradation threatens the survival of the Ethiopian bush crow *Zavattariornis stresemanni*. *Oryx* 39: 44-49.
- Brown, M.B., Kulkarni, T., Ferguson, S., Fennessy, S., Muneza, A., Stabach, J.A. & Fennessy, J.** (2021). Conservation status of giraffe: evaluating contemporary distribution and abundance with evolving taxonomic perspectives. In: *Imperilled: The Encyclopedia of Conservation* (1st ed. pp. 1-17).
- Coimbra, R.T., Winter, S., Kumar, V., Koepfli, K.P., Gooley, R.M., Dobrynin, P., Fennessy, J. & Janke, A.** (2021). Whole-genome analysis of giraffe supports four distinct species. *Current Biology* 31(13): 2929-2983.
- Dagg, A.I.** (1962). *The distribution of the giraffe in Africa*. School of Graduate Studies, University of Waterloo, Waterloo, Ontario, Canada.
- Dagg, A.I. & Foster, J.B.** (1982). *The giraffe: Its biology, behaviour and ecology*. Krieger Publishing Company, Malabar, Florida, USA.
- Duckworth, F.W.** (1974). Gambella 1973 – a wildlife resort. *Walia* 5: 9-11.
- East, R.** (1999). *African Antelope Database 1998*. IUCN/SSC Antelope Specialist Group. IUCN, Gland, Switzerland and Cambridge, UK.
- Enawgaw, C., Deksios, D. & Timer, G.** (2011). *Existing challenges: Plantation Development versus Wildlife Conservation in the Omo-Tama-Mago Complex*. Unpublished report, Ethiopian Wildlife Conservation Authority, Ethiopia.
- EWCA.** (2010). *Aerial survey report: Gambella reconnaissance 2009 & census 2010*. [http://africanelephantdatabase.org/system/population\\_submission\\_attachments/files/000/000/315/original/svyFEETGAM2010AS.pdf](http://africanelephantdatabase.org/system/population_submission_attachments/files/000/000/315/original/svyFEETGAM2010AS.pdf) Downloaded May 2019.
- Fennessy, J., Bidon, T., Reuss, F., Kumar, V., Elkan, P., Nilsson, M.A., Vamberger, M., Fritz, U. & Janke, A.** (2016). Multi-locus analyses reveal four giraffe species instead of one. *Current Biology* 26(18): 2543-2549.
- Ferguson, S., Marais, A.J., Fennessy, S. & Fennessy, J.** (2020). *Country Profile: A rapid assessment of the giraffe conservation status in Ethiopia*. Giraffe Conservation Foundation, Windhoek, Namibia.
- Fust, P.** (2009). Influences of anthropogenic activities on the giraffe (*Giraffa camelopardalis*) population of Omo National Park. *Giraffa* 3(1): 29-31.
- Gebre-Michael, T., Hundessa T., & Hillman J.C.** (1992) The effect of war on world heritage sites and protected areas in Ethiopia. In Thorssel, J. and J. Swayer (eds) *World Heritage Twenty Years Later*. IUCN and UNESCO, Gland, Switzerland.
- Giraffe Conservation Foundation (GCF)** (2021). *Africa's giraffe: a conservation guide*. Windhoek, Namibia. p. 27.
- Graham, A., Enawgaw, C. & Netserab, B.** (1996). *Trends in large herbivores of Omo and Mago National Parks*. DHV consultants. National Parks Rehabilitation in Southern Ethiopia Project. Technical Report No. 5. Addis Ababa, Ethiopia.
- Hillman, J.C.** (1993). *Compendium of Wildlife Conservation Information*. Vol 1: Wildlife Conservation in Ethiopia 553-569. Ethiopian Wildlife Conservation Organization, Addis Ababa, Ethiopia.
- Hunt, J.A.** (1951). *A General Survey of the Somaliland Protectorate 1944-1950*. Waterlow & Sons, London.
- International Finance Corporation (IFC)**. 2012. IFC performance standards on environmental & social sustainability: A Guidebook.
- International Finance Corporation (IFC)**. 2007. Environmental, health, and safety guidelines for breweries. Environmental, health, and safety guidelines. *World Bank Group, Washington*.
- Jacobs, M. & Schloeder, C.** (2001). Impacts of conflict on biodiversity and protected areas in Ethiopia. Biodiversity Support Program, World Wildlife Fund, Inc., Washington, D.C., USA.



- Jebessa, H., Teshome and Zelealem, B.** (2015). A Literature Review Report on Understanding the Context of People Transitioning out of Pastoralism (TOPs) in Ethiopia.
- Kingdon, J.** (1979). *East African Mammals: An Atlas of Evolution in Africa*, Vol. 3, and Part B: Large Mammals 231-249. Chicago, University of Chicago Press.
- Lamprey, R.H.** (1994). *Aerial census of Omo and Mago National Parks, Ethiopia*. Environment and Development Group, Oxford / Ethiopia Wildlife Conservation Organisation (EWCO), Addis Ababa.
- Marais, A.J., Fennessy, S. & Fennessy, J.** 2013. Country Profile: A rapid assessment of the giraffe conservation status in Ethiopia. Giraffe Conservation Foundation, Windhoek, Namibia.
- Muller, Z., Bercovitch, F., Brand, R., Brown, D., Brown, M., Bolger, D., Carter, K., Deacon, F., Doherty, J.B., Fennessy, J., Fennessy, S., Hussein, A.A., Lee, D., Marais, A., Strauss, M., Tutchings, A. & Wube, T.** (2018). *Giraffa camelopardalis* (amended version of 2016 assessment). The IUCN Red List of Threatened Species 2018:e.T9194A136266699. <https://dx.doi.org/10.2305/IUCN.UK.20163.RLTS.T9194A136266699.en>. (Accessed 9 January 2022).
- Muneza, A. B., Doherty, J.B., Hussein, A.A., Fennessy, J., Marais, A., O'Connor, D. & Wube, T.** (2018). *Giraffa camelopardalis* ssp. *reticulata*. The IUCN Red List of Threatened Species. 2018: e.T88420717A88420720. (Accessed 9 January 2022).
- Muneza, A. B., Montgomery, R.A., Fennessy, J. T., Dickman, A. J., Roloff, G.J. & Macdonald, D.W.** (2016). Regional variation of the manifestation, prevalence, and severity of giraffe skin disease: A review of an emerging disease in wild and captive giraffe populations. *Biological Conservation* 198: 145-156.
- Muneza, A., Fennessy, J., Dickman, A., Macdonald, D., & Montgomery, R.** (2015). Regional variation, prevalence, and severity of Giraffe Skin Disease: A review of an emerging disease affecting giraffe populations. *Giraffid Newsletter of the IUCN SSC Giraffe & Okapi Specialist Group* 9:2, pp.12-16.
- O'Connor, D., Stacy-Dawes, J., Muneza, A., Fennessy, J., Gobush, K., Chase, M.J., Brown, M.B., Bracis, C., Elkan, P., Zaberirou, A.R.M. & Rabeil, T.** (2019). Updated geographic range maps for giraffe, *Giraffa* spp., throughout sub-Saharan Africa, and implications of changing distributions for conservation. *Mammal Review* 49(4): 285-299.
- Pankhurst, R.** (1998). *The Ethiopians*. Blackwell Publishers, Massachusetts, USA.
- Renaud, P.C.** (2006). *Omo National Park report for the Wet season aerial survey*. African Parks Foundation, Ethiopia.
- Shiferaw, F., Abditcho, S., Gopilo, A., & Laurenson, M. K.** (2002). Anthrax outbreak in Mago National Park, southern Ethiopia. *Veterinary Record*, 150(10): 318-320. <https://doi.org/10.1136/vr.150.10.318>
- Stephenson, J. & Mizuno, A.** (1978). *Recommendations for the conservation of wildlife in the Omo-Tama-Mago Rift Valley of Ethiopia*. Report to the Wildlife Conservation Department of the Provincial Military Government of Socialist Ethiopia.
- Tessema, M. E.** (2017). Wildlife crime assessment in Ethiopia. IUCN National Committee of the Netherlands, Amsterdam. [https://www.iucn.nl/files/publicaties/wlc\\_doc-ethiopie\\_small.pdf](https://www.iucn.nl/files/publicaties/wlc_doc-ethiopie_small.pdf).
- Winter, S., Fennessy, J. & Janke, A.** (2018). Limited introgression supports division of giraffe into four species. *Ecol. Evol.* 8: 10156-10165.
- Wube, T., Doherty, J.B., Fennessy, J. & Marais, A.** (2018). *Giraffa camelopardalis* ssp. *camelopardalis*. The IUCN Red List of Threatened Species. 2018: T88420707A88420710.
- Wube, T.** (2015). Status of Giraffe in Ethiopia—the case of Gambella National Park. *Giraffid Newsletter of the IUCN SSC Giraffe & Okapi Specialist Group* 9:2, pp.12-16.
- Wube, T.** (2013). The Status of Giraffe in Ethiopia- the case of Mago National Park and Tama Wildlife Reserve. *Giraffid Newsletter of the IUCN SSC Giraffe & Okapi Specialist Group* 7:1, pp. 3-4.
- Yalden, D.W., Largen, M.J. & Kock, D.** (1984). Catalogue of the mammals of Ethiopia. *Artiodactyla. Monitore Zoologico Italiano Vol 5*, N.S. Supplemento 19(4): 67-221.

## 8. Appendices

### Appendix I: Terms of Reference for the Giraffe Technical Working Group (GTWG)

The draft Terms of Reference for the Ethiopian Giraffe Technical Working Group (GTWG) are as follows:

- Review the Ethiopian Giraffe Conservation Action Plan on a regular basis.
- Guide the implementation of this Ethiopian Giraffe Conservation Action Plan.
- Review recent developments that pertain to giraffe conservation in Ethiopia.
- Set annual activity plans for giraffe conservation and review accordingly.

### Appendix II: List of Participants of the Giraffe Strategy and Action Plan Workshop, Ethiopia 6-7 September 2022, Addis Ababa, Grand Eliana Hotel

| No. | Name of Participant     | Institution         | Position   |
|-----|-------------------------|---------------------|--|
| 1.  | Mr Kumera Wakjira       | EWCA                | Director General                                 |
| 2.  | Mr Solomon Mekonnen     | EWCA                | Vice Director General                            |
| 3.  | Dr Fekede Regassa       | EWCA                | Director - Ecological Monitoring and Research    |
| 4.  | Dr Fanuel Kebede        | EWCA                | Project Coordinator                              |
| 5.  | Dr Tilaye Wube          | AAU                 | Ecologist & Physiologist                         |
| 6.  | Dr Habte Jebesa         | AAU                 | Associate Professor of Biodiversity Conservation |
| 7.  | Dr Mekbeb Eshetu        | Wildlife Think-Tank | Biodiversity Consultant                          |
| 8.  | Dr Gatluak Gatkoth      | Gambella University | Associate Professor of Environmental Planning    |
| 9.  | Dr Julian Fenessy       | GCF                 | Director of Conservation                         |
| 10. | Dr Arthur Muneza        | GCF                 | East Africa Coordinator                          |
| 11. | Dr Sara Fergusson       | GCF                 | Giraffe Health Coordinator                       |
| 12. | Dr Zelealem Tefera      | ZESMAN Consultancy  | Biodiversity Conservation Consultant             |
| 13. | Dr Tesfu Fekensa        | EBI                 | Director   |
| 14. | Mr Yilma Delelegn       | Nature Concern      | Biologist  |
| 15. | Mr Girma Timer          | EWCA/GITECNPA       | Expert   |
| 16. | Mr Berket Girma         | Born Free Ethiopia  | Head of BFF Ethiopia                             |
| 17. | Mr Lakew Birhanu        | GFA                 | Team Leader                                      |
| 18. | Mr Shimelis Tekletsadik | EWCA                | Wildlife life Monitoring and Counting Expert     |



| No. | Name of Participant     | Institution                     | Position                                       |
|-----|-------------------------|---------------------------------|--|
| 19  | Mr Simeneh Admasu       | GFA/GIZ                         | Advisor for Protected Areas                    |
| 20  | Mr Desta Bedaso         | EWCA                            | Director of Protected areas                    |
| 21  | Mr Samson Zeleke        | EWNHS                           | Environmental Expert                           |
| 22  | Mr Abiot Hailu          | EWCA                            | Ecological Monitoring and Research Expert      |
| 23  | Mr Aklilu Kebede        | EWCA                            | Ecological M & R Directorate Researcher        |
| 24  | Mr Nakachew Birlew      | EWCA                            | Public Relations Directorate Director          |
| 25  | Mr Milkias Wochay       | Omo National Park               | ONP Community Partnership Team Leader          |
| 26  | Mr Ganabul Bulmi        | Mago National Park              | Warden of Mago NP                              |
| 27  | Mr Melkamu Aychew       | Geralle National Park           | Warden of Geralle NP                           |
| 28  | Mr Defar Elias          | Jinka University                | Biologist and Head of Department               |
| 29  | Mr Abdurahiman Kubsa    | ZESMAN Consultancy              | Biodiversity Conservation Consultant           |
| 30  | Mr Mihret Ewnetu        | EWCA                            | Wildlife Monitoring & Counting Team Leader     |
| 31  | Mr Fedlu Abdela         | EWCA                            | Ecological Monitoring and Research Expert      |
| 32  | Mr Mesfin Hailesilassie | EWCA                            | Associate Researcher                           |
| 33  | Mr Tilahun Teklu        | EWCA                            | Wildlife Monitoring & Counting Expert          |
| 34  | Mr Aden Hussein         | Somali Region Culture & Tourism | Wildlife Expert                                |
| 35  | Mrs Mamitu Abebe        | Gambella National Park          | Warden of Gambella National Park               |
| 36  | Mr Daniel Assefa        | EWCA                            | Director of Wildlife Law Enforcement           |
| 37  | Mr Alehegn Taye         | SNNPR Culture & Tourism Bureau  | Senior Wildlife Expert                         |
| 38  | Mr Alemu Tuyasa         | Geralle NP                      | Ecological Monitoring & Research Junior Expert |
| 39  | Mr Henok Seyoum         | ECTJA                           | President                                      |





