REPUBLIC OF KENYA
MINISTRY OF TOURISM
AND WILDLIFE

National Single Species Action Plan for the Conservation of the Grey Crowned Crane *(Balearica regulorum gibbericeps)* in Kenya (2025 - 2034)

KENYA
WILDLIFE
SERVICE

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KENYA WILDLIFE SERVICE

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Council of Governors

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Contributors

The compilers of this Action Plan gratefully acknowledge the invaluable contributions of all those individuals from various institutions who provided information, comments, and other assistance during the production process. Three stakeholders' validation workshops were held in Kisumu on 3rd April 2024, Eldoret on 4th April 2024, and in Naivasha on 23 April 2024 to allow a wider participation and provide additional expert input. Lists of participants in each workshop are provided in the Annexes.

Interest Groups

Kenya Cranes Working Group and Kenya National Bird Taskforce (Chaired by Kenya Wildlife Service).

Credits

Compilation

The compilation of this Single Species Action Plan was made possible through contributions from the Kenya Crane Working Group (KCWG) which is constituted of members from four government institutions, namely Kenya Wildlife Service, National Museums of Kenya, National Environment Management Authority and Wildlife Research and Training Institute in collaboration with the International Crane Foundation/Endangered Wildlife Trust/Community Action for Nature Conservation Partnership, and Cranes Conservation Volunteers.

Support

The production of this Action Plan was supported by funds from the ICF/EWT Partnership through CANCO and Nature and Biodiversity Conservation Union (NABU, BirdLife Germany) through Cranes Conservation Volunteers and with technical and scientific advisory input from the Kenya Crane Working Group.

Geographical Scope

This document is a Single Species Action Plan for the conservation of the Kenyan population of the Grey Crowned Crane covering all range areas within the country where the species is known to occur.

Revisions

Implementation of this Action Plan will cover a period of 10 years (2025-2034) with a mid-term review in the fifth year (2029) and end-term evaluation in 2034. An emergency review may be undertaken if there is a significant change in the species' status before or after the 2029 scheduled mid-term review to inform its revision.

Citation

Kenya Wildlife Service, (2025), National Single Species Action Plan for the Conservation of the Grey Crowned Crane (*Balearica regulorum gibbericeps*) in Kenya (2025-2034), Kenya Wildlife Service, Nairobi, Kenya.

Photo Credits

Front cover photo: A pair of adult Grey Crowned Cranes in the grasslands of Lake Ol' Bolossat, Nyandarua County where the second largest population of the species have been recorded in Kenya (©GN Muigai).

Back cover photo: A paif of adult Grey Crowned Cranes resting in a mudflat at Ndara watering point in Tsavo East National Park, Taita-Taveta County (©W. Wamiti).

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The Kenya Cranes Working Group (KCWG) was constituted and commissioned by the Kenya Wildlife Service (KWS) to undertake the compilation of this Action Plan and to champion cranes conservation efforts in Kenya. This Action Plan has been completed in accordance with KCWG's terms of reference and is considered final and ready for implementation. Users of this document are welcome to consult KWS and KCWG and or share information regarding activities highlighted herein. For more information, please contact KWS at kws@kws.go.ke

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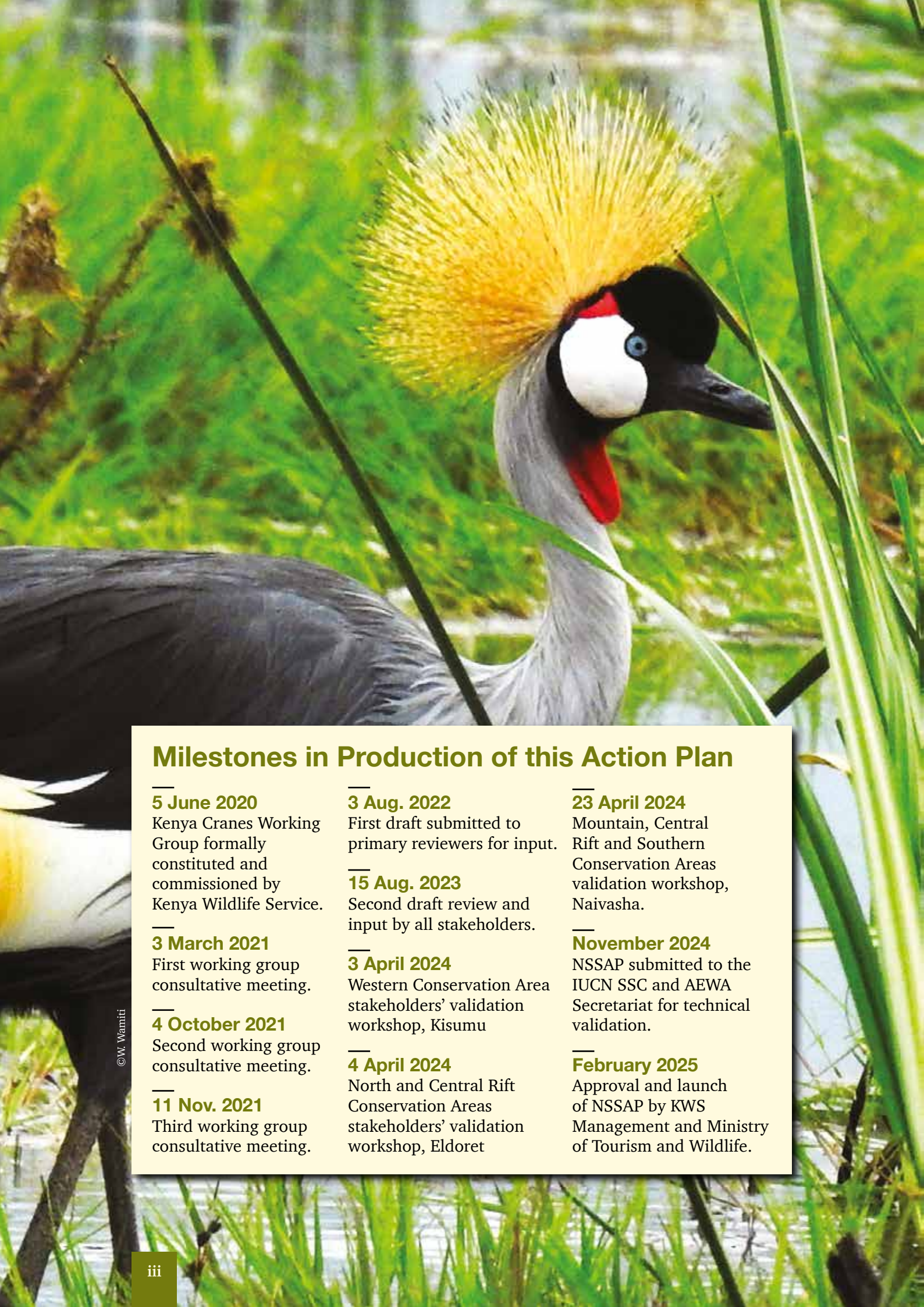

Milestones in Production of this Action Plan

5 June 2020
Kenya Cranes Working Group formally constituted and commissioned by Kenya Wildlife Service.

3 March 2021
First working group consultative meeting.

4 October 2021
Second working group consultative meeting.

11 Nov. 2021
Third working group consultative meeting.

3 Aug. 2022
First draft submitted to primary reviewers for input.

15 Aug. 2023
Second draft review and input by all stakeholders.

3 April 2024
Western Conservation Area stakeholders' validation workshop, Kisumu

4 April 2024
North and Central Rift Conservation Areas stakeholders' validation workshop, Eldoret

23 April 2024
Mountain, Central Rift and Southern Conservation Areas validation workshop, Naivasha.

November 2024
NSSAP submitted to the IUCN SSC and AEWA Secretariat for technical validation.

February 2025
Approval and launch of NSSAP by KWS Management and Ministry of Tourism and Wildlife.

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List of Acronyms

AEWA	Agreement on the Conservation of African-Eurasian Migratory Waterbirds
AFEW	African Fund for Endangered Wildlife
CANCO	Community Action for Nature Conservation
CBD	Convention on Biological Diversity
CBOs	Community-Based Organizations
CCG	Cranes Conservation Germany
CCV	Cranes Conservation Volunteers
CDTF	Community Development Trust Fund
CECM	County Executive Committee Member
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMS	Convention on the Conservation of Migratory Species of Wild Animals
CoG	Council of Governors
CoP	Conference of Parties
EAWLS	East African Wild Life Society
EIA	Environmental Impact Assessment
EMCA	Environmental Management and Coordination Act
EWT	Endangered Wildlife Trust
FAO	Food and Agriculture Organization of the United Nations (Kenya)
FBOs	Faith-Based Organizations
GCC	Grey Crowned Crane
GEF	Global Environmental Facility
GoK	Government of Kenya
ICF	International Crane Foundation
ISSAP	International Single Species Action Plan
IUCN	International Union for Conservation of Nature
KAA	Kenya Airports Authority
KALRO	Kenya Agricultural and Livestock Research Organization
KATO	Kenya Association of Tour Operators
KCWG	Kenya Cranes Working Group
KEFRI	Kenya Forestry Research Institute
KenGen	Kenya Electricity Generation Company PLC

KEPHIS	Kenya Plant Heath Inspectorate Service
KETRACO	Kenya Electricity Transmission Company Limited
KP	Kenya Power (Kenya Power and Lighting Company PLC)
KPS	Kenya Police Service
KWS	Kenya Wildlife Service
MEAs	Multilateral Environmental Agreements
MCA	Member of County Assembly
MoALD	Ministry of Agriculture and Livestock Development
MoE	Ministry of Education
MoECCF	Ministry of Environment, Climate Change and Forestry
MoINA	Ministry of Interior and National Administration
MP	Member of Parliament
NABU	Nature and Biodiversity Conservation Union
NBSAPs	National Biodiversity Strategy and Action Plans
NEMA	National Environment Management Authority
NGAOs	National Government Administration Officers
NGOs	Non-Governmental Organizations
NK	Nature Kenya
NLC	National Land Commission
NMK	National Museums of Kenya
NPS	National Police Service
NSSAP	National Single Species Action Plan
ODPP	Office of the Director of Public Prosecutions
PPCB	Pharmacy and Poisons Control Board
UNDP	United Nations Development Program
UN SDGs	United Nations Sustainable Development Goals
SoK	Survey of Kenya
SSC	Species Survival Commission
SSGs	Site Support Groups
WCK	Wildlife Clubs of Kenya
WCMA	Wildlife Conservation and Management Act
WRA	Water Resources Authority
WRTI	Wildlife Research and Training Institute

Foreword

The Grey Crowned Crane *(Balearica regulorum gibbericeps)* is listed as an Endangered species on the IUCN Red List of Threatened Species and as a protected species under the WCMA CAP 376. The species experienced a very rapid population decline of up to 80% over the last 50 years across their range in Africa. Estimated at 35,000 individuals in 1985, the population of the Grey Crowned Crane in Kenya had declined to c.10,000 individuals in 2023, translating to a >70% decline over a period of nearly four decades. Even though the Grey Crowned Crane is the most abundant of the four species of cranes recorded in Kenya, it is the fastest declining of all the 15 species of cranes in the family Gruidae. The other thrre species of craces recored in Kenya are Black Crowned Crane, Common and Demoiselle Cranes.

The main causes of the Grey Crowned Crane population decline are, but not limited to, the collection of eggs and removal of chicks from the wild (for captive keeping, illegal trade and consumption), trapping, killing and persecution of adults due to crop depredation, and a precipitous loss and degradation of the species' wetland and grassland habitats. Further, power infrastructure has also been documented to be an emerging threat to the species.

The Wildlife Conservation and Management Act (Cap 376) calls for the protection of all wildlife species and their habitats and mandates Kenya Wildlife Service to collaborate with stakeholders noting that significant populations of wildlife occur outside protected areas. For example, as per the 2023 countrywide census of the species over 95% of the Grey Crowned Crane thrives outside national parks and national reserves. It is therefore important that all relevant stakeholders are involved in the implementation of this Action Plan which outlines key conservation actions required to reduce or halt further loss of cranes, and their habitats as outlined in the Government's Bottom-Up Transformation Agenda (BETA) and the Presidential Directive on tree growing and rehabilitation of degraded habitats.

The four pillars of the National Wildlife Strategy (2018–2030) namely, resilient ecosystems, engagement by all Kenyans, evidence-based decision-making, and sustainability and governance are important considerations in development and implementation of endangered species Recovery and Action Plans if the desired outcome is to be achieved. This Action Plan is anchored in relevant national laws and policies, as well as the international treaties and agreements which Kenya is Party. It specifically responds to

Kenya's obligations under the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) and the Convention on the Conservation of Migratory Species of Animals (CMS), the Convention on Biological Diversity (CBD) and the United Nations Sustainable Development Goals, among others.

The Ministry of Tourism and Wildlife is committed to providing the required support in collaboration with relevant government agencies, county governments and stakeholders to facilitate implementation of this Action Plan.

Hon. Ms. Rebecca Miano, EGH
Cabinet Secretary, Ministry of Tourism and Wildlife

Preface

The Grey Crowned Crane *Balearica regulorum*, which is endemic to Africa, has been described as an icon of Africa's wetlands and grasslands. There are numerous threats facing wild populations of the species across its range in Africa, many of which are anthropogenic in nature. These threats are further exacerbated by loss and degradation of wetlands on which the cranes depend and impacts of climate change with unpredictable weather patterns becoming a frequent occurrence.

To address these challenges, the Ministry of Tourism and Wildlife through KWS approved the development of a National Single Species Action Plan for the Conservation of Grey Crowned Crane *Balearica regulorum gibbericeps* in Kenya on 5th June 2020. Development of the Action Plan is anchored on the International Single Species Action Plan for the Conservation of Grey Crowned Crane developed in 2015 as approved by the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) and Wildlife Conservation and Management Act of 2013.

The drafting process was undertaken through a consultative process with representation from relevant National Government institutions, County Governments, non-governmental and community-based organizations, institutions of higher learning, civil society and local communities to secure the required support and commitment to enhance conservation and management of the species and its habitats in Kenya.

This Action Plan is the fifth to have been developed to guide on the implementation of actions towards recovery and conservation of threatened bird species in Kenya. The other four Action Plans are for Spotted Ground Thrush (*Geokichla guttata*; Endangered, 2004), the two Taita Hills Forests endemics i.e. Taita Thrush (Turdus helleri) and Taita Apalis (*Apalis fuscigularis*) (both Critically Endangered, 2015), and the recently launched Vultures Multi-species Action Plan (2024-2034).

Noting that the significant populations and critical habitats for the Grey Crowned Cranes occur outside Protected Areas, collaboration with local communities and landowners is key to safeguard the future of wildlife while ensuring tangible benefits through structured frameworks to tap into the emerging biodiversity economies such as the carbon credits and other benefits from the natural capital.

The Government has prioritized efforts to safeguard the Country's wildlife resources and their habitats for posterity through enactment of relevant laws and policies. The Ministry has prioritized implementation of the Presidential directive through actions aimed at restoration of degraded habitats, enhancing connectivity of landscapes, supporting nature-based livelihoods through increased benefits from conservation while addressing human-wildlife conflict which has been on the rise and reducing local communities' tolerance towards wildlife.

This Action Plan presents for implementation a clear framework for coordinated engagement of all stakeholders in the conservation andanagement of the Grey crowned cranes and its habitats and act as a catalyst for the conservation of other waterfowls and wetlands in the country.

Ms. Silvia Museiya Kihoro, CBS
Principal Secretary, State Department for Wildlife

Acknowledgements

Kenya Wildlife Service gratefully acknowledges the financial support from the International Crane Foundation/Endangered Wildlife Trust Partnership through Community Action for Nature Conservation. The Nature and Biodiversity Conservation Union (BirdLife Partner, Germany) through Cranes Conservation Volunteers provided additional support for the preparation and production of this National Single through Crane Conservation Volunteers provided additional support Species Action Plan for the Conservation of the Grey Crowned Crane in Kenya.

In particular, the efforts and technical input from the Secretariat of the Kenya Cranes Working Group comprising of Dr. Joseph Mwangi, Solomon Kyalo, Lucy Muita, Linus Kariuki, Caroline Muriuki, Dr. Peter Njoroge, Dr. Philista Malaki, Dr. Judith Nyunja, George N. Muigai, and Dr. Wanyoike Wamiti, is highly acknowledged.

The invaluable input of individual experts who contributed and dedicated their time and knowledge that helped in enriching the document is highly appreciated. Representation of relevant Governments Agencies, County Governments, institutions of higher learning, Civil Societies, NGOs, CBOs, private landowners and local communities was very instrumental in the development of this Action Plan.

We call upon all the stakeholders to partner with the Service in implementation of this Action Plan which will go a long way in addressing the challenges facing the conservation and management of the Grey crowned crane and its habitats.

Prof. Erustus Kanga, PhD, EBS, HSC
Director General, Kenya Wildlife Service

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Executive Summary

The Grey Crowned Crane (*Balearica regulorum*), an African endemic, has been described as an icon of Africa's wetlands and grasslands. The species is found scattered across its range in sub-Africa, which extends from South Africa in the south, to Uganda and Kenya in the north. Physically divided by the Zambezi River system, two subspecies are recognized, namely the Eastern Africa Grey Crowned Crane (*B. r. gibbericeps*) in the north, and the Southern Africa Grey Crowned Crane (*B. r. regulorum*) in the south. Due to the species' population decline of up to 80% over the past 50 years and a continued loss of habitats, it is listed as Endangered on the IUCN Red List of Threatened Species. Grey Crowned Cranes are found in mixed wetland–grassland and open savanna habitats as well as in agricultural fields. Foraging mainly in grasslands and croplands, they are dependent on wetlands for nesting, roosting, foraging, resting, and flocking (socialization).

Grey Crowned Cranes are highly sought-after for captive facilities because of their charisma and beauty. There is therefore constant pressure on wild populations across Africa for wild-caught chicks. In addition, human disturbance prevents adult cranes from tending to their nests, and chicks, significantly contributing to reduced breeding success. These threats are further exacerbated by loss and degradation of wetlands on which cranes depend, which is often caused by agricultural encroachment, afforestation, changes in hydrology, mining and siltation facilitating access to wetlands and increasing disturbance to breeding cranes. Electrocution and collision with power lines, as well as human-wildlife conflict arising from crop depredation and the resultant deaths of cranes through poisoning and intentional killing are currently emerging as other serious threats.

There are significant knowledge gaps on the species' ecology, including the status and demography of cranes across the country; lack of understanding of the extent and distribution of crop damage and effective crop depredation deterrent methods; the variability of characteristics of wetlands that cranes depend on for nesting and other needs; the availability and distribution of such habitats; the plans for and potential impacts of infrastructural development at key sites for cranes; and a full understanding of the trade chains and market demands that are impacting negatively on the wild populations. Understanding these aspects is important in developing and implementing effective site-level conservation actions.

This Action Plan focuses on activities aimed at stabilizing and increasing populations of Grey Crowned Cranes while maintaining their current range and areas of occurrence in Kenya. The objectives are aimed at reducing adult and juvenile mortality; loss of birds; increasing breeding success and reproductive rates; significantly reducing further loss, fragmentation and degradation of grassland and wetland habitats; and filling key knowledge gaps. Proposed actions include mainstreaming legislation and law enforcement; increasing awareness about the plight of the species; addressing the illegal trade involving cranes; reducing the impact of power infrastructure, securing sites important to crane (e.g. through gazettement and creation of sanctuaries); and ensuring the sustainable management and utilization of those sites. The actions will be implemented through a collaborative approach involving the national and county governments, National and International NGOs, research institutions, energy utility companies and other organizations, in a multi-disciplinary and multi-pronged manner to secure the future of the species in Kenya and across its range in Africa.

1.0 Introduction

1.1 Biological assessment

Cranes belong to the avian family Gruidae that comprises 15 extant species found in all regions of the world except Antarctica, and only marginally in the Neotropics (South America) (Archibald & Meine, 1996; Harris & Mirande, 2013). They are cited as one of the most threatened of all bird families in the world (Meine & Archibald, 1996; Wamiti *et al*., 2020; BirdLife International, 2022). Six out of the 15 species of Gruidae have been recorded in Africa. These are the Grey Crowned Crane *Balearica regulorum*, Black Crowned Crane *B. pavonina*, Blue Crane *Anthropoides paradiseus*, Wattled Crane *Bugeranus carunculatus*, Demoiselle Crane *Anthropoides virgo* and Common Crane *Grus grus* (Harris & Mirande, 2013). The first four species are residents in Africa and the other two are migrants from the Oriental (East Asia) and Palearctic (Eurasian) regions, respectively.

In Kenya, four species of cranes have been recorded: Grey Crowned Crane (the most numerous and widely distributed species), Black Crowned Crane, Demoiselle Crane and Common Crane (Plate 1) (Zimmerman *et al*., 1996). Grey Crowned Crane is abundant in Kenya and Uganda (Meine & Archibald, 1996), with Kenya thought to host the largest population (BirdLife International, 2020b). This species occupies mixed wetland-grassland habitats throughout eastern and southern Africa (Walkinshaw, 1964) and is also increasingly found in agricultural land such as cultivated crop (especially maize, oats and wheat) fields, fallow land and irrigated fields (rice paddies) (Mutunga & Mitau, 2017; Austin *et al*., 2018; Nowald *et al*., 2018; Wamiti *et al*., 2021).

Plate 1: Portraits of the four species of cranes recorded in Kenya.
Clockwise: Grey Crowned, Black Crowned, Common and Demoiselle.

Morrison (2015) has described the Grey Crowned Crane as an icon of Africa's grasslands and wetlands because of the species' association with and high dependence on these habitats. It is an excellent indicator species of healthy grassland and wetland ecosystems (Rodwell & Morrison, 2020). Cranes in general are large, graceful, wading and terrestrial birds with a long neck and legs and stand at between 90 and 196 cm (Archibald & Meine, 1996). In flight, the neck is outstretched and held lower than the body (Plate 2).

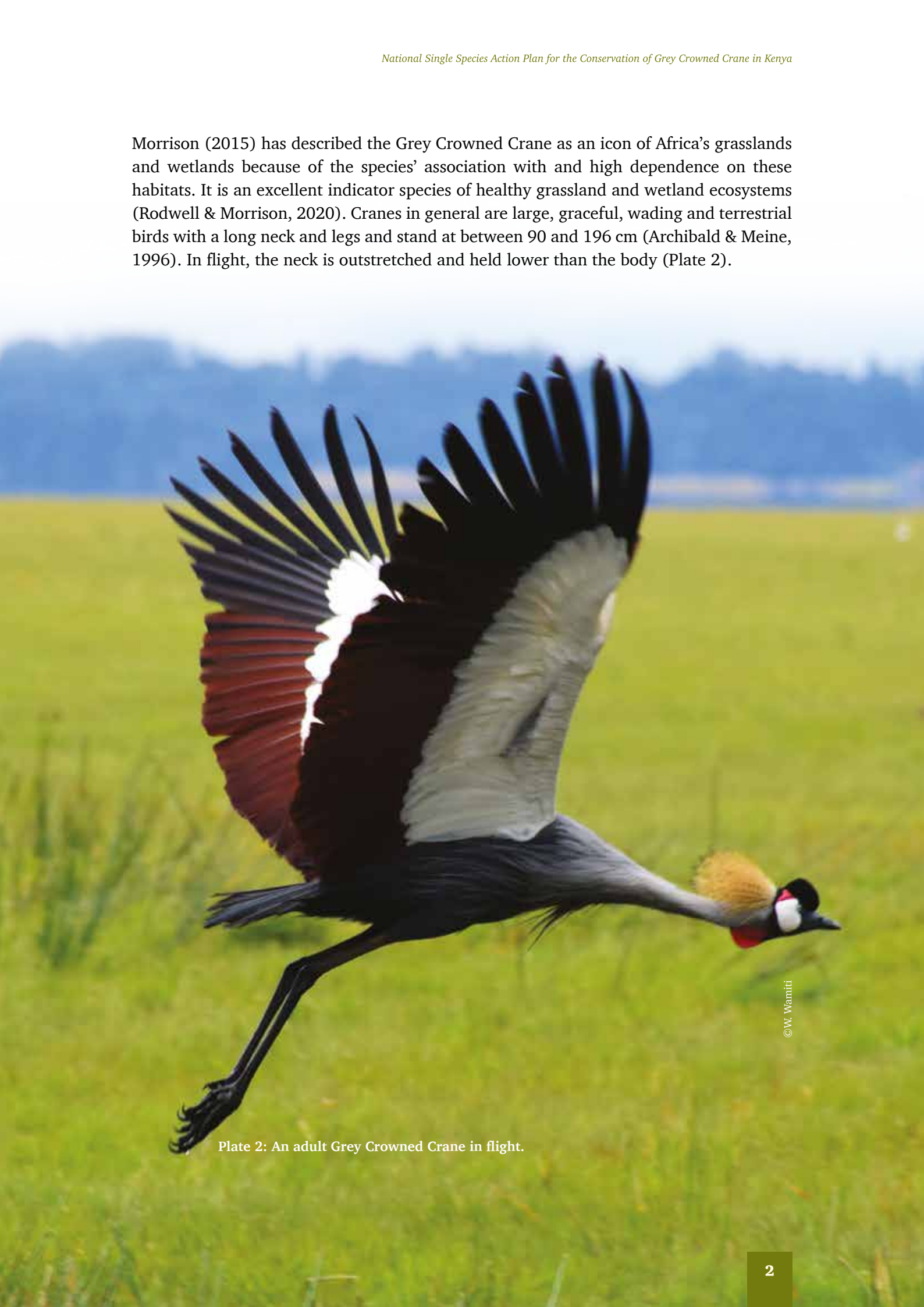

Plate 2: An adult Grey Crowned Crane in flight.

1.2 Taxonomy and systematics

Walkinshaw (1964), Archibald & Lewis (1996) and others have given a detailed taxonomy of the crane family, Gruidae, and the crowned cranes of Africa in particular. Gruidae is divided into two subfamilies, Balearicinae (crowned cranes) and Gruinae ('typical' cranes). Balearicinae are exclusively African and are distinguished from all the other cranes by their ability to roost (perch) in trees, loose plumage, straight non-coiled trachea, and colorful facial markings (Archibald & Lewis, 1996) as well as by their head having a crown of black-tipped stiff golden feathers, and most of their body feathers being lanceolate in shape (Evans, 1900). Their ability to roost in trees is enabled by having a long hind toe (hallux) that grasps branches.

The subfamily Balearicinae has only two species, the Grey Crowned Crane *Balearica regulorum* (Bennett 1834) and Black Crowned Crane *Balearica pavonina* (Linnaeus 1758). The Grey Crowned Crane occupies savannas from Uganda and Kenya to South Africa, while the Black Crowned Crane is a species of the Sahel region from Senegal to Ethiopia and northern Kenya (Archibald & Lewis, 1996). The Grey Crowned Crane has two subspecies, the East African Grey Crowned Crane *B. r. gibbericeps* and the South African Grey Crowned Crane *B. r. regulorum* (Walkinshaw, 1964), their separation being a generally recognized biogeographical boundary following the Zambezi River valley (Morrison, 2015), without clear morphological differences.

Scientific classification of the East African Grey Crowned Crane

Class: Aves (Birds)
Order: Gruiformes ("Crane-like" birds e.g Crakes, Rails etc)
Family: Gruidae (Cranes)
Subfamily: Balearicinae (crowned cranes)
Genus: *Balearica*
Species: *regulorum*
Subspecies: *gibbericeps*

Kenyan vernacular names: Mûhau (Gíkûyû), Mûwauu (Embu), Bûng'au (Kirinyaga), Ntiili (Ameru), Ng'oli (Abaluhya), Ongowang' (Dholuo), Kong'onyot (Kalenjin), Ekonga (Abagusii), Ngaitore (Samburu), Eng'ool (Maasai), and Kuwal (Turkana). In Swahili, Kenya's national language, the bird is known as Korongo Taji wa Kijivu.

Description: A newly hatched young crane (Plate 3[B]) is covered in buffy down and has a slaty grey bill, pale ivory egg tooth and brown eyes (Walkinshaw, 1964). Johnsgard (1983) describes juvenile birds (Plate 3[C]) as generally greyish with a spiky golden and buffy crest, brown irises and legs and toes in transition from pink to horn and finally black. The adult plumage is attained at c.12 months (Johnsgard, 1983), while the adult eye colour and full development of the throat wattle (also known as the gular sac) and facial colour are attained at c.24 months (Pomeroy, 1980). Adult male and female cranes of all species are identical in their external features, although males are usually somewhat larger than females (Johnsgard, 1983; Archibald & Lewis, 1996) (Plate 3[A]).

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Plate 3: Images of different age categories of Grey Crowned Crane.
[A] Adult [B] Brood of newly hatched chicks from 3-egg clutch that hatched asynchronously;
[C] An estimated 18-20 weeks' old juvenile.

1.3 Distribution of Grey Crowned Crane in Kenya

Walkinshaw (1964), Johnsgard (1983), Morrison (2015) and Austin et al (2018) have detailed the distribution of the Grey Crowned Crane in its native African range. In Kenya, Johnsgard (1983) reported the species as being most common in south-western areas east of the Lake Victoria while Morrison (2015) cited the western part of the country (i.e. north-east of Lake Victoria Basin, Busia Grasslands, King'wal Swamp and Saiwa wetlands) as the main areas. However, recent work (e.g. Wamiti *et al*., 2020, 2021) has shown that other areas in Kenya, within and east of the Rift Valley, also hold substantial populations.

Among the key areas hosting the Grey Crowned Crane include Kenya's Ramsar sites (e.g., Lake Elementeita and Naivasha), Protected Areas (e.g., Meru, Nairobi, Amboseli and Lake Nakuru National Parks), Important Bird Areas (e.g., Dandora Sewage Treatment Ponds, Lake Ol' Bolossat and Kinangop Grasslands), Conservancies (e.g., Ol' Pejeta, Mugie and Lewa Wildlife Conservancies), and private farms practising mixed crop-livestock farming (e.g., Northlands and Kakuzi). There are also records of Grey Crowned Cranes in some of the sewerage treatment plants e.g. Thika and Limuru where they are reported to breed. Some of the urban wetlands. e.g. in Nairobi City and Thika town, are also important as breeding and foraging sites for the species.

Table 1 shows the localities in different counties where cranes were recorded during the second countrywide census (Wamiti *et al*., 2023).

Table 1: Sites in Kenya where Grey Crowned Cranes were recorded during the second countrywide census in 2023.

Name of County	Specific localities where cranes were recorded
Baringo	Poror, Iboror, Sanich, Eldama Ravine, Sakulek farm, Spa Resort, Maji Moto, Lake 94, Kamnarok National Reserve and Torongo.
Bomet	Kabiangek, Daraja sita, Tarakwa, and Kipkelok.
Bungoma	Mabanga, Kimilili, Maeni, and Khachonge.
Busia	Bunyala Rice Scheme.
Elgeyo-Marakwet	Kipriria, Moiben, Kessup Conservancy, Kamariny, Kapteren, Cheptongei Swamp, Uswo, and Lolkarin Dam.
Embu	Ena-Kawanjala.
Homa Bay	Thethra, Ruma National Park, Olare, Lake Simbi Nyaima, Maugo, Kauma, Nyangweso, Kaura, Alum, Kuoyo Kochia, Ondago Swamp, Kagan, Kimira Luoch, Kendu Bay Pier, and God-Bondo.
Isiolo	Buffalo Springs National Reserve.
Kajiado	Namelok, Kiserian, Amboseli National Park, Esambu, Isineti, Olosuyani, Ostrich Farm, Umma University, and Shompole swamp.
Kakamega	Shikusa prison farm, Sienga, Iguhu, Chekalini, Kaburengu, Pan Paper and Turbo.
Kericho	Kabitungu, Chepseon Dam, Kichawir, Barkiro, Kapnawai, Chemosit, Kipsitabay, and Koyabei.
Kiambu	Northlands, Karai, Kikuyu, Lari, Thika sewage ponds, Kiganjo, Delmonte, Gataka tea estate, Katindiri dam, Kiboko cottage, Kiora farm, Bathi River (Lari), Migaa golf course, Oakland dam, Ondiri swamp, Roromo swamp, Sage Junior school dam/marshes and Tifia, Limuru.
Kirinyaga	Nderu, Mwea rice paddies, and Sagana.
Kisumu	Ahero rice scheme, Nyang'ande and Kano Kabonyo.
Laikipia	Ol' Maisor Ranch, Ol' Pejeta Conservancy, Kanyungu village in Rumuruti, Ethi, Karaba, Kwa-Wanjiku, Maili Saba, Topad Dam, Kinamba, Laikipia University, Mikurabone, and Nanyuki sewage ponds.
Makueni	Rea Vipingo in Kibwezi and Sultan Hamud.

Name of County	Specific localities where cranes were recorded
Meru	Ethi/Lolomarik farm, Lewa Wildlife Conservancy, Marura Springs, Lake Mbututia, Nkunga Sacred Lake, Meru National Park, Meru town, Nguthiru-Imgadan dam and Lake Mboroko swamp.
Migori	Nyakweri Sagama, River Kuja floodplain, Migori Airstrip and Uriri Bridge.
Murang'a	Gikono dam, Mukaba dam, Tripple A flowers dam, Gakonya, Greenfield dam, Mugera dam, Kakuzi PLC.
Nairobi City	Nairobi National Park and Kamiti prison sewage.
Nakuru	Marura farm, Kuresoi, Subukia, Marura farm, Akina ponds, Kaptarakwa, Wileli conservancy, Egerton centre, Eldama Ravine, Lake Elmenteita, Lake Nakuru National Park, Lake Solai, Mau Narok, Mau Summit, and Njoro.
Nandi	University of Eastern Africa Baraton, Mara Segero, Kipsasuron, Chepkongony, Choimim, Segut, Chesuwee, Choimim, Kibirong, Kimondi, Mateget, Chemundu, Cheptigit, Mosoriot, Saniak, Chebarbar, Kagomei, Mogon, Mugundoi, Sironoi, and Tulon.
Narok	Maasai Mara National Reserve, Enarau Conservancy, Mararieta Conservancy, and Ololung'a.
Nyamira	Saigaingiya, Kineni, Nyansiongo, Simbauti and Sironga.
Nyandarua	Lake Ol' Bolossat, Magari farm, Hudge's dam, Mutonyora dam, Fuleni, Mukindu, Kagwathi, Githungucu, Kianjata, Primarosa, Ngurumo, Baari, Equator, Gichungo, Karandi, Manyatta, Njunu, Karuga, Losogwa, Gikingi, Kiandege, Kingi, Mathakwa, Matura, Mugamba Ciura, Ng'ombe Nguu, Thaba and Wahome's dam (Boiman).
Nyeri	Lusoi-Kabira dam, Solio-Brookside-Naro Moro Road, Solio Ranch, and fields near Sangare Conservancy.
Taita Taveta	Tsavo East National Park
Trans Nzoia	Tuigoin, Koykoy, Endebess, Maili Nne, ADC Kadongo, Meteitei, ADC Zea, Chepkatet, Kiminini, Maliki, Kapkoi, Maridadi, Suam, Kittony Bridge, Kwanza, Chepchoina, ADC Genetics, Biribiriet, Chematich, Karara, Kiwanja ndege, and Mowlem.
Uasin Gishu	Maji mazuri farm, Kuinet, Moiben, Kruger Farm, Department of Defence, Kabenes, Paul Boit, Karuna, Kerita, Kesses, Ndarakwa, Ngeria, Cheptiret, Ziwa, Chepkoilel, Sergoit, Nangili, Kapsang, Kapyemit, Mumetet, Kileges, Kiplombe, Lessos, Soy, Tendwo, Kapseret, Mark Too farm, Eldoret Airport, Amani Farm, Cheplaskei, Kaptumo, Kipsangui, Lelmolok, Merewet, Olboit, Sinonin and Tugen Estate.
West Pokot	Makutano wetlands (South of Kapenguria)

Recent population mapping of Grey Crowned Cranes by Mwangi et al. (in prep.) from a three-year survey commissioned by the ICF/EWT/CANCO Partnership in western parts of Kenya has confirmed that the region is a stronghold of the species with significant breeding and flocking sites recorded in the Lake Victoria basin (Kisumu and Homa Bay), Uasin Gishu, Nandi, Homa Bay, Trans Nzoia, Kisumu, and Migori Counties.

The Grey Crowned Crane is reported to undertake variable local and seasonal movements in response to the abundance and distribution of food and nesting sites (Pomeroy, 1980). Ongoing research at Lake Ol' Bolossat is revealing new information on the movements of a few satellite-tagged individuals, one of which is shifting locations within an area of c.10,000 sq. km., with core areas being Lake Naivasha, Kinangop, Thika north of Fourteen Falls, Nyeri/Karatina, Naro Moru/Solio Ranch and Lake Ol' Bolossat basin. The western Kenya population is also thought to make cross-border movements from Kenya to Uganda and back through the corridor between Lake Victoria and Mt. Elgon (Morrison, 2015), and likely north of the Suam border crossing in the foothills of Mt. Elgon (M. Wanjala, *pers. comm*., 2023). Likewise, the Amboseli basin and Maasai Mara/Migori populations could be moving across Kenya and Tanzania. It is therefore important that more individuals (preferably chicks of known age and origin) are tagged to establish these movements and foster joint cross-border conservation efforts.

There is also a need to undertake localized surveys (such as the ongoing work in western Kenya by ICF/EWT/CANCO and around Lake Ol' Bolossat basin and western Laikipia by CCV and partners) to establish all specific sites where cranes occur (and especially the sites where they breed) across the country. This would be useful data for planning future countrywide censuses and in prioritizing conservation actions. Figure 1 (left) shows distribution of Grey Crowned Crane from records held by the Kenya Bird Map Project (http://kenya.birdmap.africa/species/24) and from the most recent countrywide census (right) (Wamiti *et al*., 2023 courtesy of GIS Laboratory, ICF, Baraboo).

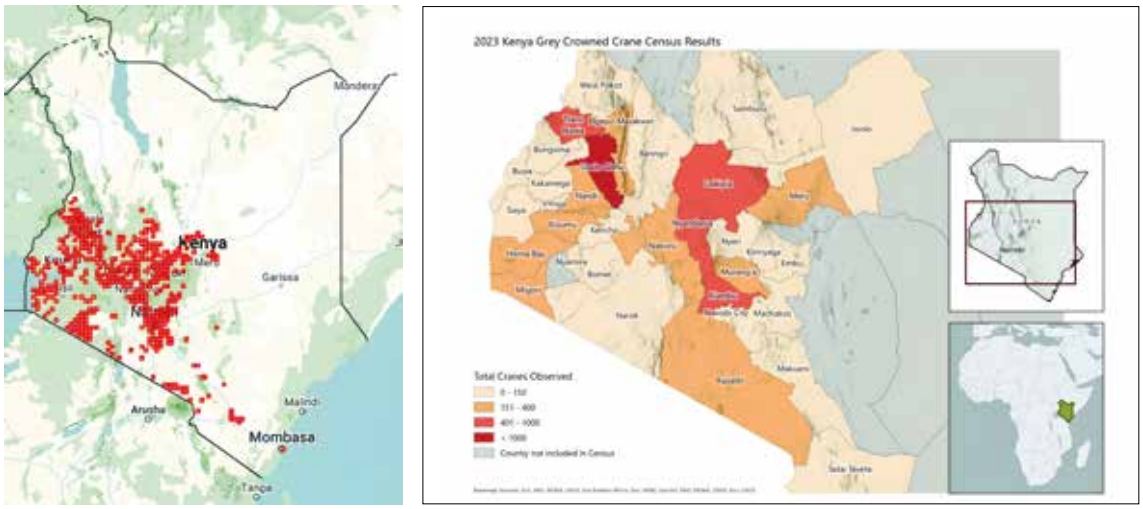

Figure 1: Distribution maps of Grey Crowned Cranes in Kenya.

The status of the Black Crowned Crane population in Kenya and regular monitoring of this species (alongside that of Grey Crowned Cranes) also need to be established. A Sahel region species, it is reported as a vagrant to Lake Turkana (Zimmerman *et al.*, 1996), with the only available published information on its population in Kenya being Gitahi (1996), who reported a population of 104 birds near Lotagipi Swamp, Turkana County. A flock of c.25 has since been observed near Todonyang (Fleur Ng'weno *pers. comm*, 2014). A thorough survey of the County is desirable given that the species is listed as globally threatened (Vulnerable) (Bird Life International, 2020a) and in CITES Appendix I (CITES, 2020). As the chicks of these two species are difficult to separate, both could be threatened by illegal trade.

1.4 Habitat requirements

Landscapes: Morrison (2015) cited Grey Crowned Cranes as icons of Africa's wetlands and grasslands because of their high dependence on these habitats. Although some species, such as Blue and Demoiselle Cranes, are more associated with savanna grasslands, all species of cranes rely on wetlands at some point during their annual life cycle for nesting, foraging and protective cover (Austin *et al.*, 2018). Grey Crowned Cranes, which are associated with open country, are often found in mixed wetland-grassland habitats (Johnsgard, 1983; Pomeroy, 1987; Archibald & Meine, 1996) and are increasingly seen foraging in agricultural fields (Gichuki, 1993; Mutunga & Mitau, 2017; Austin *et al.*, 2018; Nowald *et al.*, 2018).

Food: Cranes in general are omnivorous (Walkinshaw, 1964; Pomeroy, 1980; Johnsgard, 1983; Archibald & Meine, 1996). Their plant diet consists of seeds, leaves, tubers and stems, while animals that they eat include a variety of terrestrial and aquatic invertebrates, and small vertebrates like lizards, frogs and small fish (Archibald & Meine, 1996). In wetlands and grasslands, they often stamp the ground to disturb and scare up insects which they grasp using their bills especially when they have young chicks (Pomeroy, 1980; Archibald & Meine, 1996, Wamiti, *et al.*, 2022),). Their use of cultivated fields (Plate 4) especially harvested and newly planted wheat, oats, barley, and maize fields, is also noteworthy.

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Plate 4: A flock of Grey Crowned Cranes foraging in an agricultural field overgrown with weeds near Ol' Joro Orok, Nyandarua County.

Breeding habits, productivity, survival and life history: Cranes are monogamous, establishing pair bonds at two or three years of age that may weaken if the pair is not successful in reproduction (Archibald & Meine, 1996). Constructing their nests in shallow wetlands with low emergent vegetation (Gichuki, 1993), Grey Crowned Cranes may breed throughout the year in East Africa (Pomeroy, 1980). Wamiti *et al*. (2022), established that three factors seem to be influential in nest-site location for the Grey Crowned Crane. These are: water depth (minimum of 50 cm), vegetation height (60-90 cm), and an offshore distance to the nest (30-100 m).

The species nests within or on the edges of permanent or temporary wetlands (Morrison, 2015) and has twice been reported nesting on trees in Kitale and King'wal swamp, Kenya (Mwangi & Damaris, *pers. obs*., 15 Jan. 2020). A study conducted at Lake Ol' Bolossat mapped 103 territorial pairs inside the lake's natural marshes, out of which 63 had active nests (Wamiti *et al*., 2021). An additional 25 territorial pairs were mapped in man-made upland wetlands around the lake. In Kitale area, Gichuki (1993) observed a total of 146 pairs nesting in all types of permanent wetlands including river marshes, man-made dams, natural and fishponds. Other waterbird species observed sharing breeding habitat with cranes at Lake Ol' Bolossat include African Spoonbill *Platalea alba* and African Swamphen *Porphyrio madagascariensis* (Wamiti, *pers. obs*., February 2019).

Breeding records have been reported from areas such as Homa Bay (Ruma NP and along the Lake Victoria shoreline), Nandi (King'wal swamp, Kaboswa Estate), Uasin Gishu (Eldoret, Timboroa), Trans Nzoia (Kitale area including Saiwa Swamp NP), Narok (Maasai Mara National Reserve), Nakuru (Milmet Farm in Solai, Subukia, Lakes Nakuru, Elmenteita and Naivasha), Nyandarua (Lake Ol' Bolossat basin, Dundori and several man-made wetlands in Kinangop and Kipipiri), Laikipia (several wildlife conservancies and dryland swamps), Meru (Lewa Wildlife Conservancy), Nyeri (Solio Ranch), Murang'a (wetlands east of Makuyu), Kiambu (Limuru, Paradise Lost, Northlands farm and a chain of man-made dams upstream of Ruiru), Kajiado (Amboseli NP), Nairobi (Nairobi NP, Kabete, Gigiri), and Taita Taveta (a sole record from Tsavo East NP, reported by Viktoria Schaule, 6 March 2019). It will be necessary to map all the breeding sites across the country, and document the status of pairs utilizing them, with a view to implementing site-level management interventions to ensure successful breeding and contribute to reversing the current downward population trend.

The nest is built in a secluded spot within the territory where 1-4 eggs are laid, the most common clutch size being two eggs (Gichuki, 1993; Archibald & Meine, 1996). A four-egg clutch (Plate 5) is very rare, with only six records having been reported in Kenya. Gichuki (1993) had two such clutches in the Kitale area while Wamiti & Ndung'u (unpubl. data) made observations in Mugie Wildlife Conservancy (18 May 2018) and Lake Ol' Bolossat (15 Oct. 2019). The fifth record was from Maasai Mara NR (Stratton Hatfield, *pers. comm*., 2 March 2020), who observed a family with four juveniles aged c.6-7 weeks. A six-egg clutch (Plate 5) that didn't hatch has only been observed once in a Rhodes grass terrestrial nest in Trans Nzoia, and was thought to be as a result of female's hormonal imbalance (Wamiti & Nekesa, *pers. obs*., October 2023).

Incubation is done by both sexes and lasts between 28 and 32 days. Although Archibald & Meine (1996) reported that egg hatching in the Grey Crowned Crane is synchronized,

Wamiti (*pers. obs*., 14 Feb. 2019) observed a 3-egg clutch that hatched an egg each day at Lake Ol' Bolossat, with a similar observation by Eva Cherotich (pers. comm., October 2021), where a 4-egg clutch hatched an egg a day. Both parents feed their precocious young, which fledge at 50-100 days (Archibald & Meine, 1996) and may stay together with the parents as a family for 7 to 9 months (sometimes over a year if the habitat conditions are not suitable for nesting). Thereafter the family breaks up, with the parents going back to their nesting sites and the juveniles joining the non-breeding flocks (Walkinshaw, 1964).

Plate 5: Nest, eggs and nesting habitats of Grey Crowned Crane.
Clockwise: Clutch of 4 eggs in Lake Ol' Bolossat; Clutch of 6 eggs in Trans Nzoia; the only tree nest recorded in Kenya at Wiyeta, Trans Nzoia County; and incubation, in Nairobi National Park.

Archibald & Meine (1996) recommended a proportion of 10-15% of juveniles for a healthy population of cranes, and the determination is best done before dispersal or the start of the next breeding season, when the juveniles/immatures are still easy to distinguish from the sub-adults and adults (Wamiti, *in prep*). To improve reproductivity, the issues underlying the breeding success should be investigated and appropriate interventions taken. In Kenya, the recommended proportion has only been reported for the Kitale area population, which was 12.8% (Gichuki, 1993), and for Lake Ol' Bolossat basin population, which was 11.65% (Wamiti *et al*., 2021). Conservationists working in different parts of the country should determine this ratio after each breeding season.

Grey Crowned Cranes are reported to live up to 22 years in the wild and 27 years in captivity (Allan, 1996). However, crane chicks marked in mid-1986/87 (Gichuki & Gichuki, *pers. comm*., 21 May 2019) at Lake Ol' Bolossat have been resighted in the wild recently (George Ndung'u, pers. comm., 10 January 2024) indicating these cranes are now 38 years old. Likewise, in Kipsaina near Kitale, a crane marked in the early 1990's has also been reported (Maurice Wanjala, *pers. comm*., 25 February 2019). Marking of young cranes of known origin and age is highly recommended in different regions across the country, both to study cranes' dispersal and movements and to understand more of their life history traits, such as longevity and age at first breeding. Morrison (2015) and others (e.g. Pomeroy, 1987; Muheebwa, 2001; Archibald *et al*., 2020) have provided an in-depth discussion on the life history of this species.

Roosting

Cranes typically roost on the ground or while standing in shallow water (Johnsgard, 1983). Information on roosting sites in Kenya is scarce and would require key roosting sites to be studied and mapped, with the aim of protecting them alongside other areas of the landscape where cranes nest and forage. At Lake Ol' Bolossat basin, cranes have been observed aggregating in at least three communal roosts in the lake's marshes (George Ndung'u, pers. comm., 23 June 2018), and have been seen several times in the canopies of trees with horizontally lying branches, mainly Eucalyptus and Cypress) and on *Acacia sp.* In Uganda, Ndibaisa (2013) reported cranes utilizing high voltage pylons in Kampala for roosting. A pair periodically roosted on the ground along the edge of a small, open water, chain-link fenced, man-made dam along Ol' Kalou-Nyahururu road (Wamiti, *pers. obs*., December 2017). A pair was also observed arriving to roost on a nearly flat, iron sheet roof of a pit latrine near Lake Ol' Bolossat (Wamiti, *pers. obs*., January 2019). Vivian Kitui (*pers comm*., 2020) has also observed cranes roosting on tele masts in Eldoret town.

1.5 Population estimates

BirdLife International (2020) has reported that the global population of the Grey Crowned Crane has been declining over the years. The Kenyan population has also been declining (Morrison, 2015) (Figure 5). Urban *et al*. (1986) estimated a population of 35,000 individuals in Kenya in 1985 whereas Gichuki (1993) and Daut (1994) estimated it at 22,000-27,000 and 20,000 individuals, respectively, while Morrison (2015) gave a figure of 10,000-12,500 individuals. During Kenya's first countrywide census, which recorded 7,776 individuals, Wamiti *et al*. (2020) approximated the population at 8,000-10,000 individuals. The population decline is attributed mainly to habitat loss, the subdivision

of large-scale farms into smaller units, and a change in land use to crops less suitable for cranes (Morrison, 2015), among several other causes (threats) as discussed in the threats section of this plan.

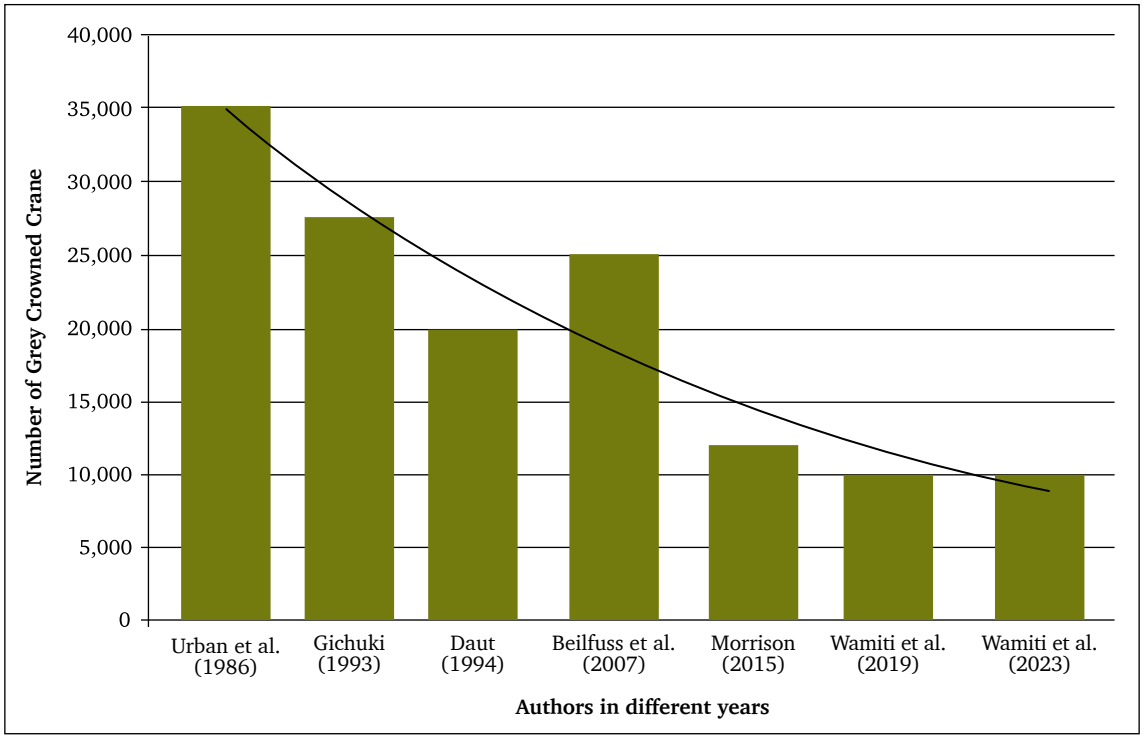

Figure 2: Estimates and trend of Kenya's Grey Crowned Crane population at different times.

During Kenya's first countrywide census conducted in February-March 2019, a total of 7,776 Grey Crowned Cranes were recorded in 28 Counties (Wamiti *et al*., 2020), while during the second countrywide census in 2023, a total of 8,314 cranes were recorded in 34 counties in the wild and 20 were being held in captive facilities. The Kenyan population was therefore reliably estimated to lie between 8,500-10,000 individuals, showing that the population is relatively stable. The proportion of young cranes (chicks, immatures, and sub-adults) recorded during the 2019 and 2023 censuses did not vary and stood at 2.23%. The 2023 survey showed that only a very small proportion (4.73%) of Kenya's Grey Crowned Crane population was present in Protected Areas while the largest proportion (95%) occurred on private farms, community and private wildlife conservancies and sanctuaries, land owned by government departments or parastatals (e.g., KALRO) and unprotected public wetlands and grasslands. The number of cranes held in captive facilities, both licensed and unlicensed, and by extension either kept in licensed and unlicensed facilities (private homes, fun parks, and hotels) across Kenya, is suspected to be higher and these facilities are the main markets for wild-caught chicks and juveniles as well as adults. The status of the captive population in the country needs to be established and strictly managed so that it no longer poses a threat to the wild population.

Table 2: Minimum population estimates in 34 Counties in Kenya where Grey Crowned Cranes were recorded in the wild during the 2023 countrywide census.
(Source: Wamiti *et al*., 2023).

National Rank	Name of County	No. of sites surveyed	No. of sites with cranes	Total Cranes	% of total population
1	Uasin Gishu	95	78	2,227	26.8
2	Nyandarua	76	36	969	11.7
3	Trans Nzoia	36	35	830	10.0
4	Laikipia	52	14	716	8.6
5	Kiambu	75	20	590	7.1
6	Nakuru	62	23	381	4.6
7	Kisumu	14	7	378	4.5
8	Homa Bay	31	25	364	4.4
9	Nandi	37	34	334	4.0
10	Elgeyo-Marakwet	14	12	200	2.4
11	Meru	27	14	175	2.1
12	Murang'a	39	7	170	2.0
13	Migori	15	8	163	2.0
14	Kajiado	37	27	153	1.8
15	Nyeri	26	14	142	1.7
16	Nyamira	7	6	102	1.7
17	Kericho	14	10	86	1.0
18	Busia	14	1	82	1.0
19	Kakamega	9	7	76	0.9
20	Kirinyaga	11	3	51	0.6
21	Baringo	24	11	49	0.6
22	Narok	23	16	35	0.4
23	Bomet	7	5	12	0.1
24	Bungoma	8	4	10	0.1
25	Nairobi City	8	3	6	0.0
26	Makueni	11	2	4	0.0
27	West Pokot	3	1	3	0.0
28	Taita-Taveta	15	1	2	0.0
29	Embu	6	1	2	0.0
30	Isiolo	1	1	2	0.0
31	Vihiga	7	0	0	0.0
32	Siaya	6	0	0	0.0
33	Samburu	5	0	0	0.0
34	Machakos	4	0	0	0.0
	Total	**819**	**426**	**8,314**	**100**

Burke (1965) estimated the density of cranes at 0.4 cranes/km2 in Kisii while Pomeroy (1980a) reported a 1.0 cranes/km^2 in Uganda. A few later studies have shed more light on this. For example, Gichuki (1993) reported a density of 1.57 cranes/km^2 (in June) and 2.89 cranes/km^2 (in August) in the Kitale area, while Amulike *et al*. (2020) recorded a density of 2.4 cranes/km^2 during the wet season compared to 20.2 cranes/km^2 in the dry season in Ngorongoro Conservation Area in Tanzania. A recent study in Lake Ol' Bolossat (Wamiti *et al*., 2021) has established a density ranging from 0.99 (during the wet, breeding season) to 2.12 cranes/km^2 (in the dry, non-breeding season). More studies on densities at different times, targeting a variety of sites, is desirable.

Following Shanugu & Phiri (2015), it is important to regularly monitor national populations of cranes. Wamiti *et al*. (2020) recommended an annual counting of cranes at sites that recorded over 100 cranes during the 2019 countrywide census, and once every five years for the countrywide census, until such time as the population stabilizes and/or shows an increase, after which the census can be repeated up to once a decade. The lack of a comprehensive countrywide census in Kenya before 2019 may have contributed to a delay in taking of appropriate conservation actions that could have reversed the downward trend sooner. This Action Plan calls for prioritizing population estimates, which could also be used to gauge the effectiveness of conservation measures at the site as well as at the national levels. A simultaneous census across the species range States has been strongly recommended by Wamiti *et al*. (2020) to give an understanding of the global population status in each country, including South Sudan, where the species' range has extended in recent years (Morrison, 2015).

1.6 Cranes and man: Socio-cultural aspects

The Grey Crowned Crane is highly revered by many cultures and valued for its beauty and charisma (Morrison, 2015). The world over, cranes hold special positions in many local communities, cultures, and lives. In some cultures, they are regarded as symbols of freedom, intelligence, good fortune, longevity, long-lasting marriage, and maternal love. The Grey Crowned Crane also represents elegance and prosperity.

Cranes, although sometimes confused with storks and herons, are important in the spiritual lives of many societies across the world. In Christianity, for example, the spring's return of cranes is a symbol of Christ's resurrection and incarnation, and mentioned in the Bible (e.g., Isaiah 38:14 and Jeremiah 8:7). Among Muslims, cranes are favored animals, alongside other waterbirds, occupying preferred places in the architecture and decoration of palaces, and in fables and legends appearing in ordinary scenes, assuming roles usually played by humans (Rodrigues, 2008).

While the Black Crowned Crane is the national bird of Nigeria, the Grey Crowned Crane holds the same status in Uganda, where it appears on that country's flag and coat of arms. In Kenya, it graces the logo of the following organizations: Nairobi City County, University of Nairobi, Kisii University, Crane Eco-care Foundation, Kitale School, Korongo Farm, and Cranes Conservation Volunteers to name just but a few. In some Kenyan indigenous local communities, such as the Kalenjin, the Grey Crowned Crane is regarded as a totem (spiritual animal guide) by some of their clans.

1.7 Threats

1.7.1 Threats causing reduced adult and juvenile survival/increased functional loss of birds

Direct persecution

Direct persecution of cranes in Kenya is mostly because of retaliation due to crop depredation. Cranes with bodily injuries including broken limbs have been observed in the field, such injuries have been caused by people throwing blunt objects at them to scare them from crop fields. Carcasses with deep injuries, indicating that these birds had been hit with blunt objects, have been collected and examined both at Lake Ol' Bolossat and in western Kenya.

Significance: High

Illegal removal from wild or Hunting/Poaching

Adult cranes and chicks are sometimes hunted or trapped and killed for food or sold for ornamental purposes. Around Lake Ol' Bolossat, the collecting of eggs and chicks and trapping of adults for local consumption and/or trafficking used to be widespread until around 2015/16. Although no surveys on this have been carried out recently in Kenya, the likelihood is that hunting/poaching of cranes could be rampant in western Kenya. Mysterious disappearances of chicks in the wild are usually suspected to be from their illegal removal for trade as ornamental birds. As charismatic birds known for their monogamous nature, adult cranes are also hunted for their body parts which are used in traditional medicine.

Significance: High

Poisoning

The African Crane Conservation Program (ACCP) poisoning incidents record/database at EWT indicates that there have been 152 cases of crane poisoning in Kenya since the year 2000. There are isolated cases of deaths among cranes at Lake Ol' Bolossat that have been suspected to be from poisoning by farmers complaining of damage to their crops by cranes. In one case, a total of 18 cranes succumbed to poisoning after feeding on poisoned sown wheat seeds (George Ndung'u, *pers. comm*., 12 April 2021). Recently, two cranes in a flock of five succumbed to suspected poisoning in Trans Nzoia County (Vivian Kitui, *pers. comm*., 2 November 2022). Poisoning incidents have also been reported from Busia and Kisumu in western Kenya. Although the chemicals used to dress the seeds are yet to be established, carbamate is highly suspected to be the toxin involved. This is an insecticide/nematicide for seed dressing treatment at sowing/planting of crops for the control of soil-borne and early foliar "pests". Its use may therefore be directly or indirectly targeted at cranes.

Significance: High

Collision with power lines and electrocution

There have been reports of cranes flying into power lines and distribution infrastructure causing deaths by collision and/or electrocution. For example, Wamiti & Ndung'u (2021) reported 13 cranes having perished because of interaction with power infrastructures in Nyandarua County between 2016 and 2021. In western Kenya, six cases of powerline collisions in Nandi County (Eva Cherotich, *pers. comm*., 22 November 2022) within a span of two years, one case each of collision and electrocution in Kakamega and Uasin Gishu (Collins Luseka, *pers. comm*., 22 November 2022) Counties respectively have been recorded. However, many cases go unreported, and the numbers presented here may grossly underrepresent the actual figures on the ground. With the increasing electricity connection across the country particularly within the strongholds of the Grey Crowned Crane, this threat could be highly significant and likely to increase tremendously. Mitigation measures will require the participation and involvement of KETRACO, Kenya Power, KenGen and NEMA.

Significance: unknown

Predation by Dogs

With the increasing human population around Grey Crowned Crane habitats across Kenya, stray dog numbers could also be rising. This could be true in areas where dogs are used for running down animals or to provide security in homesteads or accompanying herdsmen during livestock grazing. Cases of dog predation on eggs are commonly reported in western Kenya while dogs are sometimes seen in marshes around Lake Ol' Bolossat. Recently, a stray dog preyed on five crane eggs in a nest in Uasin Gishu (Vivian Kitui, *pers. comm*., 2 November 2022) while a crane chick was preyed on by a stray dog just a day after it had been rung in Nandi County (Eva Cherotich, *pers. comm*., 15 November 2022). Besides community sensitization efforts on effects of stray dogs, mitigation measures may need to involve the relevant County Government departments including Public Health and Veterinary to exterminate such unowned animals.

Significance: Moderate

Collision with Aircraft/Bird strikes

The Grey Crowned Cranes may be involved in bird strikes at aerodromes during flocking (Owino *et al*., 2004). Although Kenya Airports Authority has a fully-fledged unit of wildlife control in Kenyan mainstream Airports, cases of bird strike still arise. Efforts are needed from stakeholders to work with the unit in implementing appropriate control measures.

Significance: Low

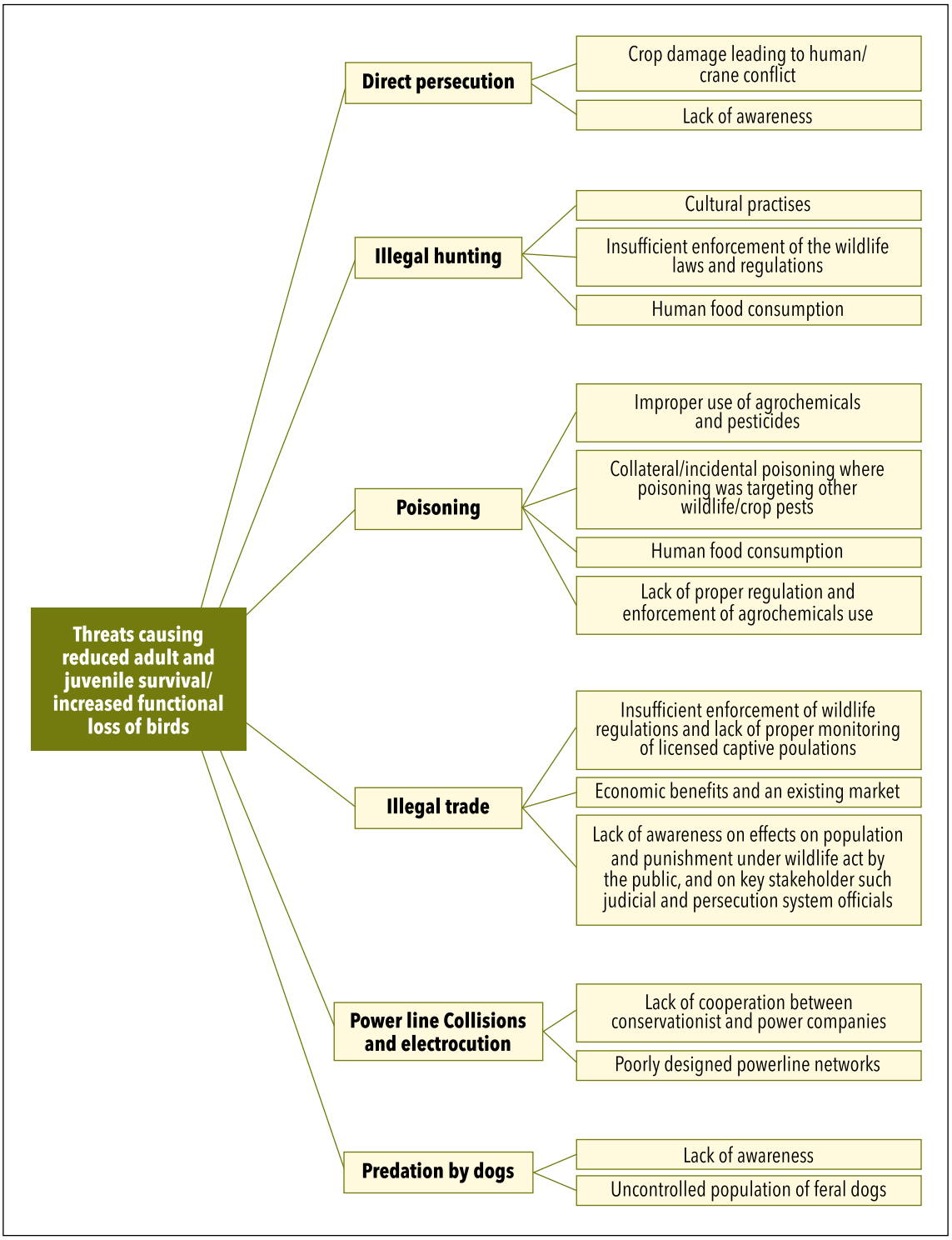

Figure 3: Problem tree of threats causing reduced adult and juvenile survival/increased functional loss of birds.

1.7.2 Threats causing reduced breeding performance.

Human disturbance

the Grey Crowned Crane, although one of the most adaptable of all crane species, is particularly sensitive to human activity near their nesting and/or chick-rearing sites. Human disturbance keeps adult cranes from tending to their nest and chicks. High levels of human activity and disturbance will often result in nest sites no longer being used or chosen. If used, the pair's time is spent more on watching for danger than on incubating, feeding, or rearing the chicks, often resulting in the mortality of one or more of the chicks. Forms of disturbance include livestock herding, hunting/poaching, free-roaming dogs, harvesting of wetland vegetation for livestock fodder and craft making, fishing and the movements of fishermen between sites, collection of water for domestic use, and farming activities. In most cases, there is a significant lack of awareness of the people in the vicinity of the nest site, particularly regarding their impact on the birds.

Significance: High

Habitat destruction and wetland clearing for agriculture

The loss and degradation of wetlands on which Grey Crowned Cranes depend is largely due to pressures being placed on this habitat as human populations grow, including agricultural encroachment, afforestation, water development projects, mining, and activities related to fishing. These make it easier to access the wetlands, which usually results in increased disturbance of adult cranes and vulnerability of chicks.

The key areas for Grey Crowned Cranes in Kenya have high potential for agriculture and are also characterized by a high and increasing human population which on top of inadequate land use planning and scarcity of land. results in encroachment of agriculture into wetlands and grasslands. Local communities rely on these lands for their daily livelihoods and for moderate income generation. Commercial intensification of crops such as flowers, sugarcane, rice, and maize as well as subsistence agriculture, have led to increased fragmentation of land and disturbance, rendering these areas unsuitable for crane nesting and chick-rearing.

Significance: High

Fencing and conversion of wetland for crop farming and grazing

The demand for land to support a growing human population across the range of the Grey Crowned Crane has contributed to increased sub-division of private farms into smaller family units for inheritance and more conversion of wetlands to agricultural land. With land tenure policies differing across the species' range, ways in which challenges can be resolved are further complicated.

The ongoing su-bdivision of larger parcels of land is also leading to their fencing. This has a negative impact on large birds such as cranes, which have to spend more energy as they fly from one field to another while foraging (Wu et al., 2009).

Significance: Very High

Burning of wetland vegetation

Deliberate burning of vegetation in the wetlands has the potential to destroy crane eggs, kill flightless chicks, and pose a potential danger to adult breeding cranes, particularly during the nesting season. This in turn has the potential to impact on breeding success, although that may be dependent on the intensity, timing, frequency, and extent of the fires. According to Gee & Russman (1996), fires may affect breeding success of cranes if they occur before breeding or during the late stage of incubation. When that happens, the possibility of re-nesting is minimized due to atrophy (reduction or decrease in the size of an organ e.g. due to hormonal changes) of the cranes reproductive system.

Significance: Low

Flooding and drought

Grey Crowned Cranes depend on wetlands for nesting and require a hydrological regime which is wet enough to provide protection for the nest and small chicks, and yet dry enough for the eggs not to be in water when laid on a platform. Changes in the hydrological regime of wetlands, such as increased flooding arising from climate change, significantly affect cranes' breeding habitat and productivity.

Human activities affecting the hydrological regime include dam construction resulting in flooding of sections of wetlands and drying of other areas downstream. Water diversions and water abstraction for agriculture both affect wetlands by reducing the volume of water in the system. These human-induced changes are often caused by a lack of awareness of the impact that such development has on the ecosystem services and a lack of proper enforcement of environmental legislation.

Significance: Low

Egg collection

There are reported incidents of eggs being collected for consumption in most areas where cranes occur and breed. Feral dogs have also been observed feeding on waterfowl eggs in sites such as Lake Ol' Bolossat and King'wal wetland, swimming across to the marshes where birds nest.

Significance: High

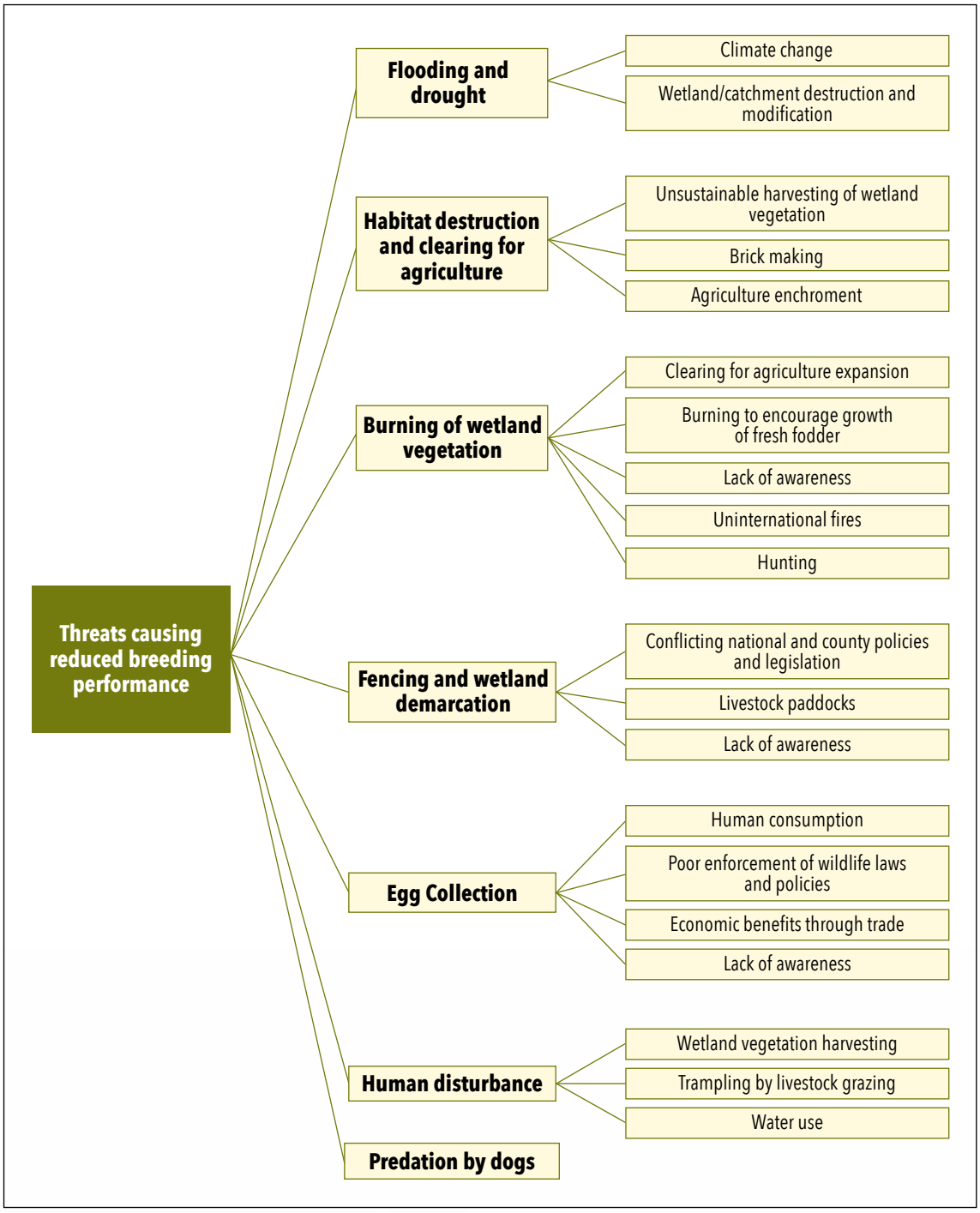

Figure 4: Problem tree of threats causing reduced breeding success and reproductive rates.

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1.7.3 Threats causing a high degree of habitat loss, fragmentation and degradation.

Habitat loss and degradation

The principal threat to Grey Crowned Crane populations is the loss or degradation of suitable wetland and grassland habitats, due to an increasing human population accelerating the demand for agricultural land and freshwater sources. Increased grazing pressures subtly alter wetland habitats and influence the abundance of insect prey and the availability of nesting habitat. Habitats are also lost or degraded because of wetland damming, drainage, increased sedimentation through deforestation and the use of agricultural pesticides.

Significance: High

Invasive and alien species

The infestation of wetlands by alien invasive species can change the hydrology and natural vegetation composition of wetlands, making them less suitable habitats for Grey Crowned Cranes. This is particularly evident in Lake Ol' Bolossat, which has been invaded by the non-native rodent *Myocastor coypus* (which is thought to forage on reeds that form part of cranes' nesting habitats), Louisiana crayfish *Procambarus clarkii,* water fern (or Kariba weed) *Salvinia molesta* (which forms a matt that blocks light from penetrating thus affecting primary production and the entire food chain) and Mosquito fern *Azolla pinnata*. In western Kenya, the spread of *Mimosa pigra* has rendered large parts of the Sio-Siteko swamp floodplain completely unsuitable to cranes. This weed is also invading wetlands in Homa Bay and water canals in Ahero rice scheme in Kisumu County.

Significance: Medium

Burning of wetland vegetation

While some fires occur naturally in African grasslands and savannas, burning vegetation has often been used as a management tool to encourage growth of palatable forage and to control ticks while also maintaining the integrity of savanna and grassland ecosystems. However, fire frequency and intensity have varying effects on the ecological integrity of ecosystems.

Controlled fires when used as a management tool for habitat improvement in grasslands and wetlands can benefit Grey Crowned Cranes by providing suitable habitats required for nesting and foraging. Uncontrolled fires caused by poorly planned burning, due to a general lack of awareness of the consequences, can have detrimental effects on the ecosystems, and sometimes on the local communities that live within or adjacent to them. As Grey Crowned Cranes breed in the wet season, it is unlikely that fires will directly result in chick loss. However, habitat degradation may well result in reduced breeding success.

Significance: High

Unsustainable harvesting of wetland vegetation

Unsustainable harvesting of wetland vegetation for livestock fodder and craft making have been noted for causing disturbance to Grey Crowned Crane's nesting sites. They are known to have a sensitivity to human activity when near nesting or chick-rearing sites. High levels of activity and disturbance will often result in nest sites no longer being used or chosen. Watching for danger rather than incubating, feeding, or rearing the chicks, often results in the mortality of one or more of the chicks.

Significance: Low

Afforestation of grasslands

Conversion of grasslands to tree plantations or orchards reduces the foraging habitat for cranes, pushing them towards agricultural land. Even well-meaning tree planting drives can be a threat: visiting dignitaries and community groups often plant trees in grasslands or seasonal wetlands, unaware that the trees will either not survive, or will destroy the grassland or wetland habitat on which cranes and other species of wildlife e.g. reptiles, amphibians, insects, molluscs etc. depend on for survival.

Significance: Medium

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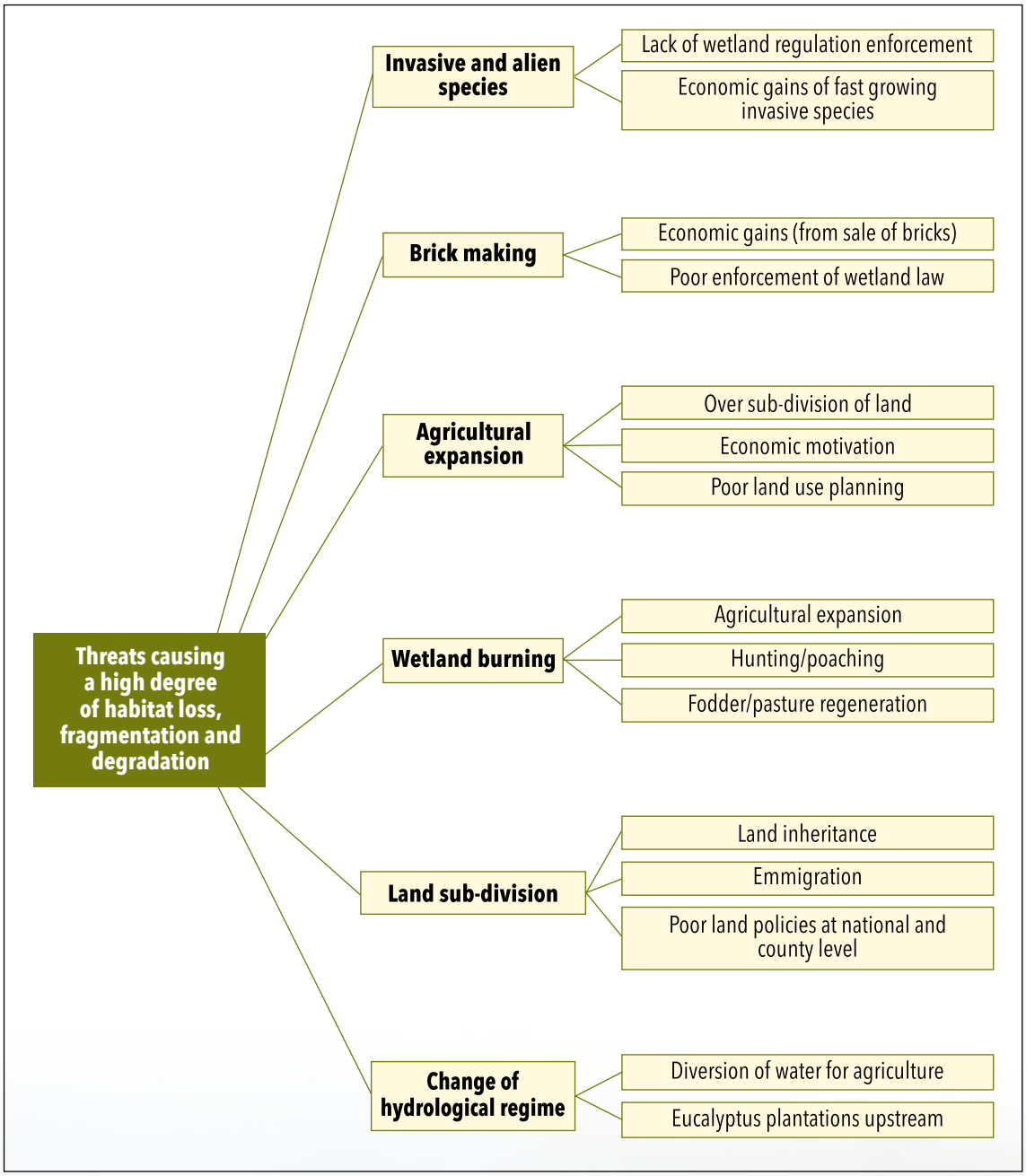

Figure 5: Problem tree of threats causing reduced breeding success and reproductive rates.

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1.8 Knowledge gaps and needs

The lack of enforcement of environmental legislation further exacerbates these threats as the individuals involved realize that they are unlikely to be prosecuted, or the enforcement officers are easy to manipulate (corruption).

There is currently no legal domestic trade in wild-caught cranes. However, lack of regulations, proper enforcement and awareness all contribute to this threat. Of particular concern is the trade in wild-caught chicks under the pretense of being captive bred, when traders legalize these through pairs that they keep under a license.

Collisions of cranes with power lines and their electrocution are emerging ignificant threats, which have the potential to significantly increase across East Africa as the region's electrification programs expand.

Knowledge gaps that require some attentions are:

i. Crop depredation and measures to reduce crane poisoning.
ii. Enforcement of environmental legislation and policies.
iii. Inadequate awareness among relevant institutions and the public.
iv. Cranes' ecology (population, distribution, movements, habitat use etc.).
v. Trade in live cranes (channels, market chains, sources, levels, economics).
vi. Status of the captive crane population (population size, distribution of facilities, licensed/unlicensed, etc.).
vii. Need for establishment of crane care and rescue centers to handle the increasing incidents of injured and poisoned individuals, orphaned chicks, and long-term care of individuals that cannot return to the wild and survive on their own.
viii. Mitigation measures of existing and upcoming powerline infrastructure that often lead to collisions and electrocutions.
ix. Innovative ways to engage media stations as well as use of appropriate social media platforms to focus on Grey Crowned Crane's awareness and conservation programs, threats, need for collaboration, and local communities' participation in cranes and wetlands conservation efforts.

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2.0 Review of Policy, Legal and Institutional Frameworks

The formulation and implementation of the National Single Species Action Plan for the conservation of Grey Crowned Crane is guided by national and international requirements for the conservation and management of the species. Kenya is party to a number of wildlife -related Multilateral Environmental Agreements (MEAs) that call for cooperation in the conservation and management of migratory waterbirds among them the Grey Crowned canes and wise use of wetlands. The relevant key national laws and international instruments, regulations and policies that govern conservation and management of natural resources in the country are discussed below.

2.1. National Legislation and Policies

2.1.1 Supreme Law and Acts of Parliament

Constitution of Kenya 2010

The Constitution of Kenya is the Supreme Law that puts emphasis on respect for the environment. In Chapter Four "The Bill of Rights", Article 42 on Environment states that "Every person has the right to a clean and healthy environment, which includes the right — (a) to have the environment protected for the benefit of present and future generations through legislative and other measures, particularly those contemplated in Article 69.

Article 69 (1), in Chapter Five, lists obligations in respect of the environment. It provides that, "(1) The State shall— (a) ensure sustainable exploitation, utilization, management and conservation of the environment and natural resources, and ensure the equitable sharing of the accruing benefits; (d) encourage public participation in the management, protection and conservation of the environment; (e) protect genetic resources and biological diversity; (f) establish systems of environmental impact assessment, environmental audit and monitoring of the environment; (g) eliminate processes and activities that are likely to endanger the environment; and (h) utilize the environment and natural resources for the benefit of the people of Kenya. (2) Every person has a duty to cooperate with State organs and other persons to protect and conserve the environment and ensure ecologically sustainable development and use of natural resources.

The protection and wellbeing of wildlife is thus enshrined within the Constitution. When human beings secure a clean and healthy environment and embrace sustainable use of natural resources, this translates to conducive habitat conditions for wildlife species including the Grey Crowned Crane.

Wildlife Conservation and Management Act (WCMA; CAP 376) [Amended 2019]

The WCMA, 2013 mandates KWS, in collaboration with stakeholders, to conserve wildlife and their habitats wherever they occur.

Section 48 of the Act provides restrictions on carrying out any activity involving a specimen of a listed species without a permit granted by the Service. The Act lists in its Sixth schedule, national species that are rare, critically endangered, endangered, threatened and those species that are protected by law. Section 49 requires KWS to develop and implement recovery plans for the conservation and management of all the species listed in the Sixth Schedule. The Grey Crowned Crane is listed in this Schedule as a Protected Species and thus the requirement for the development of a Recovery Action Plan.

The Wildlife Conservation and Management Act, is the primary national legislation that domesticates the provisions of the wildlife related multilateral environmental agreements for effective national implementation and cooperation in the work of Intergovernmental bodies. Among the relevant MEAs are the Convention on the Conservation of Migratory Species of Wild Animals (CMS) and its family of instruments including the Agreement for the Conservation of African -Eurasian Migratory Waterbirds (AEWA), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Ramsar Convention on Wetlands and the International Union for the Conservation of Nature (IUCN) programs. The Grey Crowned crane as a migratory waterbird is listed in Annex 2 of AEWA. As a species that is traded internationally, the species is listed in Appendix II of CITES for purposes of regulating its trade.

One of the key objectives under this Action Plan is to establish the current ecological and conservation status of Grey Crowned Crane and develop site-specific management plans and interventions to enhance stabilization and recovery of the population in Kenya. As a species listed in both the IUCN Red Data List of Threatened Species and CITES Appendix II, we are obliged as a country to provide for their protection as well as of their habitats.

Environmental Management and Coordination Act 1999 (EMCA, CAP 387) [Revised 2012]

Section 50 of this Act on conservation of biological diversity states that the National Environment Management Authority (NEMA), in consultation with relevant lead agencies, shall prescribe measures necessary to ensure the conservation of biological diversity in Kenya and in particular, NEMA shall, in part:

a) Determine which components of biological diversity are endangered, rare or threatened with extinction.
b) Identify potential threats to biological diversity and devise measures to remove or arrest their effects; and
c) Undertake measures intended to integrate the conservation and sustainable utilization ethic in relation to biological diversity in existing government activities and activities by private persons.

Section 51 on the conservation of biological resources in-situ states that, NEMA shall, in consultation with the relevant lead agencies, prescribe measures adequate to ensure the conservation of biological resources in-situ, and in this regard shall issue guidelines for:

a) Land use methods that are compatible with conservation of biological diversity.
b) The selection and management of protected areas to promote the conservation of

the various terrestrial and aquatic ecosystems under the jurisdiction of Kenya.
c) Selection and management of buffer zones near protected areas.
d) Special arrangements for the protection of species, ecosystems and habitats threatened with extinction.
e) Prohibiting and controlling the introduction of alien species into natural habitats.
f) Integrating traditional knowledge for the conservation of biological diversity with mainstream scientific knowledge.

Section 52 on conservation of biological resources ex-situ states that, The Authority shall, in consultation with the relevant lead agencies:

a) Prescribe measures for the conservation of biological resources ex-situ especially for those species threatened with extinction.
b) Issue guidelines for the management of germplasm banks; botanical gardens; zoos or aquaria; animal orphanages; and any other facilities recommended to the Authority by any of its committees or considered necessary by the Authority.
c) Ensure that species threatened with extinction which are conserved ex-situ are re-introduced into their native habitats and ecosystems where: the threat to the species has been terminated; or a viable population of the threatened species has been achieved.

The protection of species is again well articulated under this legislation, by involving multi-stake holders and ensuring species protection both *in-situ* and *ex-situ* through sustainable land use practices.

The Forests Act 2016

This Act provides for participation of local communities, local authorities, traditional institutions, NGOs, and other stakeholders in sustainable forest management. This is achieved through the development of participatory forest management plans undertaken in accordance with Section 35 (1) of the Act. The plan documents all the resources found within the forest, the threats to the forest and challenges in the management of the forest and prescribes a set of programs to address forest conservation/protection issues. Grassland patches that occur within forest ecosystems, often forming wetlands, act as habitats for Grey Crowned Cranes, hence protection of the forest as an ecosystem is beneficial to the survival of the species. Stakeholder engagement especially with local communities, is key to successful conservation initiatives, as local communities are the custodians of the natural resources.

Grass Fire Act 2012 (CAP 327)

The Grass Fire Act provides for protection of vegetation by regulating burning of bushes, shrubs, grass, crops, and stubble through the issuing of permits to carry out planned burning processes within protected areas, on trust land and on private land.

Burning as a natural resource conservation measure helps in controlling pests and invasive plant species. Grey Crowned Crane are usually found in grasslands close to water bodies. They often feed in open and wooded savannas and grasslands. Organisms such as insects,

reptiles and amphibians that also form part of cranes' diet, are often victims of fire. Fire also has negative effects on soil moisture, nutrients, and microorganism's biota. Thus, any management practice that employs fire as a tool in grasslands should abide by this Act for prescribed burning to avoid negative effects on the species' habitats and ecosystems functions and integrity in general.

National Museums and Heritage Act, (No. 6 of 2006; CAP 216)

In its Preliminary Section, Part I (2), the Act, in part, defines a 'natural heritage' as natural features consisting of physical and biological formations or groups of such formations, which are of outstanding universal value from the aesthetic or scientific point of view, and as delineated areas which constitute the habitat of threatened species of animals and plants of outstanding universal value from an aesthetic or a scientific point of view, conservation or natural beauty.

In Section 4(a), the Act mandates NMK to serve as a place where research and dissemination of knowledge in all fields of scientific, cultural, technological, and human interest may be undertaken. The Act also tasks NMK to conduct EIAs in Section 5 (1) (n) subject to the provisions of EMCA (No. 8 of 1999) while Section 17 gives NMK powers to undertake scientific research whose findings may be disseminated by various means including lectures and publications.

The role of NMK in implementation of this Action Plan is therefore fundamental. As a keystone species the Grey Crowned Crane plays a key role in the culture of some local communities and so its protection is enshrined within their cultural beliefs. The species therefore qualifies as part of Kenya's natural heritage due to its outstanding aesthetic value and especially when cranes gather in flocks. NMK holds important biodiversity collections that are critical for public awareness and serves as a repository of information from various research being undertaken on the Grey Crowned Crane among other species.

Pharmacy and Poisons Act (CAP 244)

This Act aims at making better provision for the control of the pharmacy profession on trade in drugs and poisons. The Pharmacy and Poisons Board is established as a corporate body to oversee the enforcement of the provisions of the Act including listing and control of licensing the distribution and sale of poisons for mining, agricultural or horticultural purposes. The increasing incidents of cranes' and other wildlife species' poisoning, either directly or indirectly, is worrying and requires the intervention of the Board to place stricter controls on some of the poisons being used, and whose commercial names or labels remain largely unknown. Identifying which chemicals are being used is important in taking action to prevent further loss of cranes and other wildlife from poisoning.

Water Act (No. 43 of 2016) (CAP 372)

The purpose of this Act is to provide for the regulation, management and development of water resources and water and sewerage services in line with the Constitution, the responsibility of which is bestowed to Water Resources Authority as a National Government regulator. While there are several relevant Sections of this Act, Section 22 gives powers to

the Authority to gazette and take special measures to protect and conserve a vulnerable water resource including part of a catchment area. Section 29 provides guidelines in establishment and functions of water resource users associations. The regulation/control, protection, conservation, and management of water resources is important as a human right as emphasized in Section 63 of this Act, and as stipulated in Article 43 of the Constitution.

The Land Act (No. 6 of 2012; CAP 280)

Giving effect to Article 68 of the Constitution, the Land Act of 2012 revises, consolidates, and rationalizes land laws in the country. It aims at providing for sustainable administration and management of land and land-based resources. As far as this Action Plan is concerned, some of the Sections of interest are 8 (management of public land) and 9 (conversion of land). Additionally, Section 10 provide guidelines on the management of public land including giving the NLC powers to prescribe appropriate guidelines, while Section 11 mandates NLC to take appropriate action to maintain public land that has endangered or endemic species of flora and fauna, critical habitats or protected areas. In sub-section 11(2), NLC is further mandated to identify ecologically sensitive public land in consultation with relevant institutions dealing with conservation. Section 15(1) stipulates the procedure to be followed when NLC might want to have a public land reserved for a specific purpose. In Sections 16 and 17, NLC may place care of a reserved land to a management body. Section 19 puts emphasis on conservation (and management) of land-based natural resources. Given the situation surrounding key crane sites in Kenya such as Lake Ol' Bolossat, Section 113 and 115 on award and payment of compensation, respectively, is of great interest.

Kenya Plant Health Inspectorate Service Act (No. 54 of 2012; CAP 349)

Among other functions, KEPHIS is charged with implementation of various Acts including The Suppression of Noxious Weeds Act (CAP 325). Some of the weeds declared as noxious weeds under Section 3 of this Act and which may affect or invade crane's terrestrial and aquatic habitats include: *Datura spp*., Water hyacinth *Eichhornia crassipes*, and *Salvinia spp*. Given that some of the wetlands where cranes occur (e.g. Sio-Siteko wetland in Busia County), Lake Victoria shorelines, and Lake Ol' Bolossat basin (including some of the satellite upland wetlands) are invaded by invasive weeds, it is imperative that KEPHIS has a major role to play in suppression of these weeds to secure cranes and other wildlife species' habitats. Further, Section 10 empowers the local authorities (currently the County Governments), with the consent of the Director, to make by-laws for securing the eradication of any noxious weed from land within its area and for compelling owners or occupiers of land to cause any such weed to be eradicated from their land.

Prevention of Cruelty to Animals Act (CAP 360)

This Act aims at making better provision for the prevention of cruelty to animals and control of experiments on animals, among other things. It lists acts and omissions which amount to cruelty to animals (including trimming captive crane's wing feathers to inhibit flight) and it prohibits confinement of an animal that could cause unnecessary suffering, including failure to give attention to injuries and diseases. It also makes the administration

of poison or injurious drugs (including deliberate coating of seeds/grain with a poisonous substance) to an animal as an offence. Those keeping animals in captivity are also required to provide them with utmost care. Under the provisions of this Act, cranes kept in captivity whose primary and secondary wing feathers are trimmed to inhibit flight is therefore an act of cruelty to an animal, and especially where they are healthy individuals who can survive on their own in the wild.

2.1.2 Policies, Strategies and Regulations

Kenya Vision 2030

Kenya Vision 2030 is the country's development blueprint covering the period from 2008 to 2030 (Government of Kenya, 2007). It aims at transforming the country into a newly industrialized, "middle-income country providing a high-quality life to all its citizens by the year 2030". The vision is founded on three pillars: economic, social, and political. The social pillar seeks to build a just and cohesive society with social equity in a clean, sustainable, and secure environment by the year 2030 and thereafter. The economic pillar identifies tourism as a leading factor in achieving the goals of the vision through diversification of the tourism products and better marketing of little visited areas to bring more tourists to both protected and non-protected areas. Given their charisma, the Grey Crowned Cranes have the potential to attract tourists, especially when they flock and perform their courtship dance. The social pillar embedded in this blueprint has the potential of enhancing the overall environment that the species' wellbeing in the ecosystem.

Kenya National Biodiversity Strategy Action Plan (NBSAP) (2019-2030)

Kenya's commitment to the protection of biodiversity for the benefit of current and future generations is demonstrated in the NBSAP 2019-2030 through a series of targeted strategies and actions. Goal 3 is critical to safeguarding ecosystems, species, and genetic diversity. Strategic target 18 spells out that by the year 2030, the extinction of known threatened species will have been prevented and the status of degraded Key Biodiversity Areas (KBAs) improved. Effective implementation of the goals as stated in the document will positively impact the survival of Grey Crowned Cranes while reversing any declines in their populations.

National Wetlands Conservation and Management Policy 2015

Kenya has a variety of wetlands that stretch from coastal and marine wetlands to inland freshwater lakes, rivers, dams and swamps as well as the saline lakes of the Rift Valley system, constructed wetlands in irrigation schemes and sewerage treatment systems as well as the mountain bogs, peat and glacier lakes. These are also critical habits for the Grey Crowned Cranes. Some of these wetlands are recognized as important conservation areas like National Parks, National Reserves, Ramsar Sites, Key Biodiversity Areas and World Heritage Sites. Apart from being biodiversity hotspots, the wetland resources are equally crucial for income generation, livelihoods support and well-being of the local communities. Despite their high ecological value, these ecosystems are also the most threatened both locally and internationally.

The goal of the National Wetlands Conservation and Management Policy is to ensure sustainable management of wetlands to enhance sustenance of their ecological and social-economic functions for the present and future generations. Wetlands are critical habits for the Grey Crowned Cranes. The policy seeks to enforce all relevant laws that promote ecological integrity of wetlands ecosystems. Further, the policy promotes and supports conservation measures to maintain wetlands health. The policy highlights the need to undertake research and monitoring of the wetlands ecosystem to ensure sustainability of wildlife habits and reservoirs such as the Grey Crowned Cranes. The policy spells out 8 objectives, one of these being to protect biological diversity and improve life supporting systems of the wetland, as well as awareness creation to enhance participation of a wider stakeholder in protection of the species dependent on these wetlands.

National Wildlife Strategy 2030

The strategy is a roadmap for transforming wildlife conservation in Kenya and is aligned to Kenya's Vision 2030 and the Government's Big Four Agenda on health, food security, infrastructure, and industrialization. It has five (5) year priority conservation goals and strategies: resilient ecosystems, engagement by all Kenyans, evidence-based decision making, and sustainability and governance. The strategy establishes an implementation framework to enhance communication, coordination, and collaboration to inspire engagement and participation, and catalyze conservation actions with all stakeholders. The Government is committed to the sustainable management of Kenya's wildlife resources, to contribute to the development of the country and enhance the livelihoods of our people. This Strategy encapsulates that commitment. The strategy has also re-engineered and redesigned the institutional architecture of the wildlife sector to ensure effective coordination, collaboration and synergy amongst the multiple state and non-state actors who have different mandates, roles, capacities, and resources. Stakeholder engagement is the strongest pillar in achieving the Grey Crowned Crane conservation goals. The Action Plan is developed with a multi-stakeholder approach that seeks to outline institutional mandates geared towards protection of the Grey Crowned Crane and sites at different levels.

National Wildlife Conservation and Management Policy 2020

The policy provides a coordinated framework for wildlife management in Kenya considering other sectoral policies and the roles of various agencies. Section 2 of the Situational Analysis, part 2.3 recognizes that Kenya's megafauna has declined by 68% in the last 40 years alone and most of this decline has occurred outside the gazetted Protected Areas where 33 mammalian, 28 avian, and 356 plant species in Kenya are under severe threat of extinction. This is of great concern since the country has experienced an estimated 14% of biodiversity loss based on land use change of intact natural habitats since the year 2000. The goal of the policy is therefore to ensure sustainable management of Kenya's wildlife resources through effectively and equitably managed, ecologically representative, and well-connected systems of Protected Areas and other effective area-based conservation measures and integrated into the wider landscapes and seascapes to provide for the social, economic, ecological, cultural, and spiritual needs of present and future generations. It is also aimed at contributing to the sustainable development of the country and enhancing the quality of human life. The implementation of this policy

is important to protecting species and ecosystems. It also focuses on areas not currently gazetted that cover most of the Grey Crowned Crane range.

Captive Wildlife Management and Welfare Policy Guidelines, 2015

These guidelines define a captive animal as one that is held under confinement and is dependent on humans for provision of all its needs. Prescriptions are provided for which wildlife shall be kept in captivity, sources of such animals, and the procedures and measures for acquiring, housing, handling, caring, and using captive animals under various considerations. Overall, the minimum standards for captive wildlife management in Kenya are specified. The guidelines also highlight additional statutory provisions that govern keeping and use of wildlife in captivity such as the Prevention Against Cruelty to Animals Act (CAP 360; see below), Public Health Act (CAP 364), and the Veterinary Surgeons and Veterinary Paraprofessionals Act of 2011 (CAP 366). The welfare of captive Grey Crowned Cranes held within local communities is also provided for under these guidelines. This will ensure safe custody of captive cranes and regular condition monitoring of their condition to enhance high standards within the captive facilities.

Wildlife Conservation and Management (Protection of Endangered and Threatened Ecosystems, Habitats and Species) Regulations 2017

These regulations provide a very strong support to WMCA by putting an emphasis and providing direction on protection of threatened species and ecosystems.

Wetlands, Riverbanks, Lake Shores and Sea Shore Management Regulations 2009

The regulations provide for the protection of all wetlands including the riparian reserves which are the breeding grounds for the Grey Crowned Cranes. Regulation 12 spells out the permitted uses of wetlands and riparian reserves such as sustainable harvesting of papyrus and medicinal plants to promote sustainability of these resources. In addition, Regulation 17 makes it mandatory to undertake an EIA prior to any developments adjacent to wetlands in the country with an aim of safeguarding the integrity and health of these ecosystems.

2.2 International Conventions, Treaties and Agreements

IUCN Red List of Threatened Species

The IUCN Red List of Threatened Species provides an assessment of the global conservation status of a species. The status of a species is determined by the available information on the species' population, distribution, habitat, trade, and threats affecting its survival and existence. The status of a species under this listing is thus a powerful tool to inform on which priority management and conservation decisions are required to secure the species and its habitat(s). The Grey Crowned Crane has been listed as Endangered since 2012 meeting criteria A2(a)(c)(d) and 4(a)(c)(d), because threats such as habitat loss and illegal removal of birds and eggs from the wild have driven rapid population decline during the past four decades (45 years). An Endangered species is thus one that is very likely to become extinct soon should the current forces driving its population and/or

habitat decline continue to act. Proposed activities in this Action Plan are therefore aimed at reversing the downward trend of the species' population and to secure its habitats so that its gradual recovery (across its range) leads to its downlisting from the Endangered to another lower and safer category.

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

Kenya is a party to CITES, which is an international agreement between governments for the regulation of international trade in specimens of endangered species listed in the Appendices of the Convention. Its aim is to ensure that international trade in specimens of wild animals and plants do not threaten their survival. Eight (8) species of cranes (Gruidae) are listed on Appendix I while the rest (7 species) are listed in Appendix II of this Convention. The Grey Crowned Crane is listed in Appendix II, and therefore, all international trade involving specimens of the species whether live, dead or its derivatives must be regulated through issuance of CITES permits by the designated national CITES Management Authority. The Convention provides prohibition of any trade in specimens of the species conducted in contravention of the Convention and confiscation/seizure of any such illegally traded specimens. Further the Convention provides for the penalization of trade conducted in contravention of the convention. The Wildlife Conservation and Management Act, 2013 domesticates the provisions of the Convention.

Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA)

AEWA is part of the Convention on the Conservation of Migratory Species of Wild Animals (CMS of 1979). The Eastern Africa subspecies of Grey Crowned Crane is listed in Annex 2 of AEWA. Table 1 (Column A) in Categories 1(b) and 2 (UNEP/AEWA, 2008). Respectively, species in these two categories are those which are listed as threatened on the IUCN Red List of Threatened Species, and whose populations are numbering between around 10,000 and around 25,000 individuals. The species is listed as Endangered (Bird Life International, 2020b). Morrison (2015) reported that the Eastern African sub-species was experiencing a long-term population decline with a fragmenting range and a rapidly contracting area of occupancy and estimated the population at between 19,500 and 26,000 individuals as of 2014.

Under this agreement, among others, Contracting Parties are obliged to take measures to conserve migratory waterbirds, giving special attention to endangered species as well as to those with an unfavorable conservation status. This includes undertaking several specific and general conservation measures and actions as specified in Article III of AEWA, including species conservation, habitat conservation (and protection), management and control of human activities, research and monitoring, education and information, and implementation of the agreement.

Ramsar Convention on Wetlands

The Ramsar Convention on Wetlands was adopted in the Iranian City of Ramsar on February 2, 1971, as the first of the modern global nature conservation Conventions to protect wetlands as habitats for waterfowls. Ornithologists were the first to support wetland conservation, because they wished to maintain the diversity of migratory waterfowls. Thus, the proposal for an international treaty to conserve wetlands first emanated from ornithological circles.

The Convention on Wetlands is an intergovernmental treaty whose mission is "the conservation and wise use of all wetlands through local and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world". To date, the adoption of wise use strategy has continued to be the anchor practice for wetlands beyond waterfowl habitats.

To protect Kenya's wetlands, the country signed this Convention on October 5, 1990, and ratified it on June 5, 1991. To date, the country has designated six Ramsar Sites, namely, Lake Nakuru (1990), Lake Naivasha (1995), Lake Bogoria (2001), Lake Baringo (2002), Lake Elmenteita (2005), and River Tana (2012). Ramsar Sites play a significant role as habitats for the Grey Crowned Crane and other waterbirds, therefore, by enhancing their protection as habitats for these species, the wetland's ecological integrity is also maintained.

Lusaka Agreement Task Force (LATF)

LATF is an intergovernmental law enforcement agency established in 1999 with the Secretariat and operational arm of the Lusaka Agreement on Co-operative Enforcement Operations directed at controlling Illegal Trade in Wild Fauna and Flora. That agreement, which is listed as a United Nations Environmental Treaty No. XXVII.11, was adopted in 1994 in Lusaka, Zambia.

Kenya is a party to the agreement along 6 other parties and 3 Signatories, all African countries, that seek to "reduce and ultimately eliminate illegal trade in wild fauna and flora". LATF is mandated to combat transnational illegal trade in biodiversity resources mainly through fostering inter-state cooperation and collaboration among agencies through executing and coordinating national, regional, and multi-regional enforcement operations focused on intelligence and investigations into violations of biodiversity laws and presenting evidence to the appropriate countries for action. The Grey Crowned Crane is a species that is highly targeted for trade. Even though markets in Kenya have not been well studied, there is evidence of an ongoing trade especially in eggs and chicks. The enactment of this agreement therefore serves to regulate any such trade within the country and across regional borders.

East African Community Protocol on Environment and Natural Resources

This Treaty was signed in Arusha on November 30, 1999, by the three East African Heads of State for Kenya, Uganda and Tanzania which established the East African Community (EAC). The treaty which has been in force since July 7, 2000, provides a legal and

institutional framework under which the regional management of the transboundary ecosystems are addressed, through the community's policy organs, such as the committee on environment and natural resources. It also recognizes the importance of biodiversity conservation and ecosystem management while at the same time meeting the livelihood needs of the people that depend upon these ecosystems. In addition, the framework provides a forum for harmonizing policies in the management of shared ecosystems within the signatory states such as Lakes Jipe and Chala between Kenya and Tanzania, and Lake Victoria which is shared among the three States.

Greater emphasis is accorded to areas of common interest including protection of the environment and management of wildlife areas lying astride the common borders. This also requires joint protection and management to achieve environmental and development objectives including a regional tourism strategy to create a larger market and increased tourist arrivals.

2.3 Legislative Gaps and Recommendations

Analysis of the above policies, legislations and guidelines points to various gaps and challenges. The key challenge is the implementation and enforcement of policies and laws by relevant arms of government. the specific gaps are discussed below.

- EMCA 1999 does not address birds in general as well as specific species needs such as the critical habitat of the Grey Crowned Crane (alongside other wetland and grassland-dependent species). It is therefore recommended that specific guidelines are developed to consider emerging issues affecting the fate of globally and nationally threatened species and their associated habitats.

- User rights control under Section 48 of the WCMA needs to be amended to inhibit the possibility of harvesting Grey Crowned Cranes from the wild populations. Currently, no successful breeding from captive populations has been reported in Kenya. Hence, the source and replenishment of the captive populations can only be coming from the wild. It would also be prudent if captive keeping were restricted to species that are not globally listed as threatened, and whose Kenyan population is secure. This weakness if continued will have detrimental impacts on the wild populations of all wildlife in general.

- So far as the Grey Crowned Crane is concerned, there is a gap regarding the status of individuals held in captivity such as population size, source of individuals, health status, condition of facilities, and number and details of facility owners. There is therefore a need to reinforce guidelines on management of captive crane populations with stricter, regular impromptu inspections of facilities and ensuring adherence to minimum space requirements, number of cranes held in each facility, and age category of each crane. Further, KWS should regulate transfer of cranes from one facility/owner to another to minimize disease risks and control opportunities for trade or movement of illegally acquired individuals. Further, mandatory reporting of nesting attempts (and outcome of such attempts), demise of individuals, and arrival of new cranes in any given facility including the source(s) may be necessary. Specific guidelines on standards of the facility, dietary and health requirements

need to be provided to captive facility owners including additional requirements and conditions as might be deemed necessary for the appropriate management of captive populations. An amnesty call in a gazette notice and circulated in different media requiring all Kenyans holding cranes in captivity with/without a license to register (upon payment of a fee per individual crane) their bird(s) would be a first step in addressing this law enforcement gap. A surrender option should also be extended to those not willing to continue holding cranes, to which a plan to receive such individuals would need to be in place.

3.0 Framework for Action

3.1 Vision, Aim and Objectives of the National Single Species Action Plan for the Conservation of the Grey Crowned Crane in Kenya.

Vision: To ensure a healthy and viable population of Grey Crowned Cranes in Kenya.

Aim: To reverse the decline of the Grey Crowned Crane population in Kenya.

Strategic objectives: This Action Plan has seven key objectives.

1. Reduce threats causing reduced adult and juvenile survival/increased functional loss of birds.
2. Reduce threats causing reduced breeding performance.
3. Reduce threats causing a high degree of habitat loss, fragmentation and degradation.
4. Address current knowledge gaps and legislative goals and recommendations thereof towards the Grey Crowned Crane conservation in Kenya.
5. Mainstream relevant policies and ensure implementation to enhance the conservation of the Grey Crowned Crane.
6. Mobilize resources to facilitate implementation of activities targeted at the species' conservation.
7. Undertake conservation education and public awareness about the plight of the Grey Crowned Cranes and their habitats.

3.2 Action Plan Matrix

Table 3 provides a matrix of this Action Plan with details for each of the objectives including expected results, activities, indicators, means of verification, priority, timescale, and lead implementing organization(s). The cost/budget of each proposed activity will vary from time to time and localities and is therefore not included in the matrix. KCWG will be happy to help with budget-making for any activity that an individual or organization might be interested in implementing.

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Table 3: Matrix of the National Single Species Action Plan for the Conservation of the Grey Crowned Crane in Kenya.
Objective 1: Reduce threats causing reduced adult and juvenile survival/increased functional loss of birds

Result/Output	Action	Indicator(s)	Means of Verification	Priority	Timescale	Organizations involved
1.1 Stop direct persecution of Grey Crowned Cranes	1.1.1 Create and raise awareness on wildlife penalties and other legal implications because of direct crane persecution.	Number of attendees and forums; Number of people aware	List of attendees, photographs, number of surveys, number of events	High	Continuous	KWS, CoG, NGOs, NMK, NEMA
	1.1.2 Strengthening enforcement on crimes related to direct persecution of cranes	Number of cases handled	Record of direct persecution incidences	Essential	Continuous	KWS, CoG, NEMA, NGAOs, The Judiciary
	1.1.3 Promote GCC custodians among groups and individuals.	No. of groups and individuals participating in crane conservation	No. of persecution incidents/ records shared	Essential	Continuous	NGOs, NMK, CBOs, FBOs, Communities
	1.1.4 Develop and/or identify, and promote cost-effective and affordable methods that reduce crop depredation	Number of farmers practicing/ adopting practices that reduce crop depredation	Seminars, published guidelines, promotion materials	Essential	Long term	NGOs, WRTI, KWS, NMK, CBOs
1.2 No poaching is taking place.	1.2.1 Training of Crane Custodian/ village representatives and community scouts in crane monitoring	No. of trainees and individuals; No. of training sessions held participating in crane conservation	No. of poaching incidents/records shared	High	Continuous	NGOs, NMK, CBOs, FBOs, Communities
	1.2.2 Promoting alternative sources of livelihoods to increase income	Number of farmers practicing alternative sources of livelihoods	Income generated from alternative sources of livelihoods	High	Continuous	NGOs, NMK, CBOs, FBOs, WRTI, Communities
	1.2.3 Strengthening enforcement on crimes related to poaching	Number of cases handled	Record of reported poaching incidences/prosecution/arrests/ penalties and fines	Essential	Continuous	KWS, CoG, NEMA, NGAOs, The Judiciary
	1.2.4 Increased patrols by KWS rangers	Number of patrols conducted; number of arrests	Compliance with wildlife regulations	High	Continuous	KWS
1.3 Poisoning incidents do not contribute to the decline in the Grey Crowned Crane population.	1.3.1 Review and strengthen existing legislation to increase environmentally responsible chemical use, limit importation of harmful (banned) chemicals, govern possession and define punitive measures	Public participation forums Legislative review taskforce Legislative amendments	Number of public participatory forums Legislative review reports Number of Legislative amendments	High	Mid-term	KWS, PPCB, MoALD, MOTWH

Result/Output	Action	Indicator(s)	Means of Verification	Priority	Timescale	Organizations involved
	1.3.2 Strengthen enforcement on possession, import and use of listed wildlife poisons	Number of reported poisoning incidents, Arrests, Fines	Record of reported poisoning incidences/prosecution/arrests/ penalties and fines arising from possession, import and use of listed wildlife poisons	High	Continuous	KWS, NMK, NEMA, PPCB
	1.3.3 Create and build capacity for rapid response to poisoning incidents at key crane sites	Number of trained and equipped rapid response teams, Number of rapid response trainings	Training manuals and response protocol, Records of response training sessions focusing on cranes	High	Short term	KWS, ICF/EWT/CANCO
	1.3.4 Establishing regional crane rehabilitation and care centers	Number of established crane care/rehabilitation centers, Number of cranes rehabilitated	Number of cranes rescued and released, permits for the care centers, monitoring reports	Medium	Long term	KWS, WRTI, NGOs, NMK, NEMA
	1.3.5 Support registration of Anthraquinone in Kenya for use as a crop depredation deterrent to cranes.	Registration of Anthraquinone across Kenya as a crop damage prevention	Number of companies with Anthraquinone registration certificate Inclusion of Anthraquinone in the relevant legal frameworks.	High	Midterm	KALRO, NMK, KWS, NGOs, WRTI, PPCB, Universities and learning institutions
	1.3.6 Establish cost effective use of Anthraquinone by small scale farmers.	Adoption of Anthraquinone by small scale farmers	Number of small-scale farmers using Anthraquinone	High	Mid-term	KALRO, NGOs, Universities, Smallholder farmers
	1.3.7 Focus distribution of Anthraquinone on key crane flocking and foraging sites across Kenya	Adoption of Anthraquinone on key crane flocking and foraging sites across Kenya.	Acreage/number of key crane flocking and foraging sites across Kenya utilizing Anthraquinone.	High	Mid-term	KALRO, NGOs, Universities, MoALD
	1.3.8 Develop and/or identify, and promote alternative cost-effective and affordable methods that reduce crop depredation	Number of alternative techniques/ methods identified and/or being promoted.	Adoption of alternative techniques (apart from Anthraquinone) by farmers	High	Mid-term	KARLO, NGOs, NMK, WRTI, KWS, Universities
	1.3.9 Identify and map crane poisoning hotspots in Kenya.	Number of surveys conducted, number of crane poisoning areas identified and mapped	Database of crane poisoning hotspots, crane poisoning hotspot maps	Essential	Continuous	NGOs, NMK, WRTI, KWS, Universities, citizen scientists
	1.3.10 Identify and bring together all stakeholders working on wildlife poisoning so that a coordinated, consolidated effort is undertaken.	Number of workshops/ meetings of stakeholders working on wildlife poisoning	Workshop reports and minutes	High	Short term	KWS, NGOs, CBOs, PPCB, Farmers, County Governments

Result/Output	Action	Indicator(s)	Means of Verification	Priority	Timescale	Organizations involved
	1.3.11 Customize the KWS response protocol to wildlife poisoning incidents in Kenya (2018) to a crane poisoning response protocol.	Number of workshops/ stakeholder meetings held to customize the protocol	Crane poisoning response protocol Reports on crane poisoning incidences	High	Short term	KWS, NGOs, NMK, WRTI, CBOs, PPCB, Farmers, County Governments
	1.3.12 Form and train a crane poisoning response team in identified hotspots.	Number of crane poisoning response teams established	Existing crane poisoning teams	High	Short term	KWS, NGOs, CBOs, Farmers, County Governments
	1.3.13 Train and equip crane poisoning response teams.	Number of trained and equipped crane poisoning response teams, number of crane poisoning toolkits issued to the teams	Active Crane poisoning response teams, response to crane poisoning incidences	High	Short term	KWS, NGOs, CBOs, Farmers, County Governments
	1.3.14 Implement the crane poisoning response protocol.	Number of rescued cranes, number of scene decontamination incidents, number of post-mortems, data collection tool (e.g., Survey123) developed for crane poisoning.	Crane poisoning reports, evidence collection, poisoning incidents database	High	Short term	KWS, NGOs, NMK, WRTI, CBOs, Farmers, County Governments
	1.3.15 Create awareness on responsible use of insecticides and pesticides among all stakeholders.	Number of awareness campaigns, number of campaign messages and associated awareness materials designed.	Awareness campaigns, reduced use of harmful pesticides/ insecticides	High	Short term	KWS, NGOs, CBOs, Farmers, MoALD, County Governments
1.4 No illegal trade in Grey Crowned Cranes is taking place.	1.4.1 Strengthen capacity of law enforcement agencies to enforce regulations on illegal trade	Number of arrests, prosecutions, and convictions	Gaps and barriers to enforcement addressed	High	Short term	KWS, NGOs, NPS, The Judiciary, ODPP, MoINA
	1.4.2 Strengthen and enforce captive population permitting system.	All captive population permitted.	Proportion of captive population permitted.	High	Short term	KWS
	1.4.3 Enforce permanent marking and monitoring of the captive crane population.	All captive population permanently marked.	Proportion of captive population permanently marked.	High	Short term	KWS, NGOs, NMK, WRTI
	1.4.4 Building the awareness and capacity of law enforcement agencies, KWS intelligence, judicial system, customs, and border point veterinary officials.	Number of training sessions, number of officials capacitated.	Certified law enforcement agencies, judicial system, and customs officials.	Essential	Mid term	KWS, NGOs, The Judiciary, ODPP, NPS

Result/Output	Action	Indicator(s)	Means of Verification	Priority	Timescale	Organizations involved
	1.4.5 Develop and enforce protocols and guidelines for management of captive populations.	Developed protocols and guidelines.	Protocol document	Essential	Continuous	KWS, WRTI, NGOs
	1.4.5 Develop a database of captive wildlife facility owners and number of GCCs under their care.	Number of owners and captive GCC registered in the database.	Functional database of captive GCC owners and GCCs under their care.	High	Continuous	NMK, KWS, WRTI, NGOs
	1.4.6 Build capacity of key relevant institution mandated with monitoring captive populations and captive facility owners.	No. of training sessions; No. of trainees	Training manual on captive management of GCC (adopted from IUCN Crane Husbandry manual)	High	Mid-term	NMK, KWS, Communities
	1.4.7 Raise awareness within the local communities and within the crane market chain on the illegality of Grey Crowned Crane trade.	Number of designed, published, and distributed awareness materials.	Awareness materials, print and broadcast media, social media messages.	High	Short term	NMK, KWS, NGOs, Communities, County Governments
1.5 Minimal impact of power infrastructure collisions and electrocution	1.5.1 Mapping power infrastructure collisions and electrocution hotspots.	Number of hotspots identified and mapped.	Map of identified hotspots	High	Continuous	KWS, NMK, WRTI, NGOs
	1.5.2 Engage with the Power utility companies on mitigation on the design and configurations of powerlines	Number of engagement meetings held; number of structural mitigation measures identified	Proportion of newly constructed bird safe power infrastructure, only bird friendly structures are constructed	Medium	Long-term	KWS, NMK, WRTI, NGOs, KP
	1.5.3 Strengthen deliberate engagement and participation in the SEA/EIA review process and AEWA/BirdLife guidelines	Power lines erected according to best practice and EIA guidelines.	SEA/EIA reports	High	Continuous	KWS, NMK, WRTI, NEMA, NGOs, KP, MoE
	1.5.4 Ensure implementation of power infrastructure and electrocution prevention measures	Proactive mitigation (bird flight diverters and insulation) on new and existing infrastructure/	Proportion of power infrastructure that are bird safe	Essential	Continuous	KWS, NMK, WRTI, NEMA, NGOs, KP, MoE
	1.5.5 increased awareness of the bird electrocutions and collisions among the power utility companies based on case studies etc.	Number of awareness meetings held with the power utility companies	Powerline collisions and electrocutions database	High	Continuous	KWS, NGOs, KP, MoE
	1.5.6 Identify training and capacity development needs within power utility companies.	Number of utility companies assessed	Training and needs assessment survey and report	Medium	Longterm	KWS, NGOs, KP, MoE
1.6 Collisions with aircraft/bird strikes incidents are understood	1.6.1 Work with airport Wildlife Control Unit to develop potential crane collision prevention measures	Number of collision incidences, meeting minutes, number of wildlife hazard meetings attended.	Collisions data from KAA, Bird Strike Prevention Protocol	Low	Continuous	KAA, WRTI, NGOs, NMK

Objective 2.0: Reduce threats causing reduced breeding performance

Result/Output	Action	Indicator(s)	Means of Verification	Priority	Timescale	Organizations involved
2.1 Impact of drought and flooding	2.1.1 Implementation of Climate Smart Agriculture	Number of CSA practices, number of farmers and acreage under practice of CSA	Farmers practicing CSA	High	Continuous	MoALD, NGOs, KALRO, Farmers
	2.1.2 Engage with the agencies responsible for the development of Catchment Management Plans (CMPs) to ensure biodiversity and ecosystem requirements are included	Number of engagements with agencies responsible for the development of CMPS	Developed CMPs that include biodiversity and ecosystem requirements.	Long term	Continuous	KWTA, KFS, NGOs, WRA, NEMA
	2.1.3 Ensure involvement in implementation platforms formed as part of CMPs.	Number of crane stakeholders represented in CMPs implementation platform	Participation in CMPs implementation platforms	Medium	Long term	KWTA, KFS, NGOs, WRA, NEMA
	2.1.4 Initiate climate smart agricultural practice projects and technologies consistent with conservation of GCC, their habitats and livelihoods practices	Number of climate smart agricultural projects initiated; number of climate smart technologies identified	Climate smart agriculture projects and technologies under implementation	High	Short term	MoALD, KALRO, NGOs, WRTI, NMK, NEMA
	2.1.5 Raise awareness amongst relevant target groups on ecosystem services of wetlands.	Number of stakeholders reached with awareness campaigns	Understanding of role of ecosystem services among stakeholders	High	Short term	NGOs, NEMA, NMK, KWS
2.2 No further draining of Grey Crowned Crane wetland sites	2.2.1 Restore degraded wetland sites Acreage of intact wetland sites, number of breeding cranes, acreage of wetland habitats restored	Acreage of intact wetland sites, number of breeding cranes, acreage of wetland habitats restored	Restored wetlands, successful breeding of cranes	High	Continuous	NEMA, WRTI, NGOs, KEFRI, KFS, County Governments
3 Planned afforestation does not impact on GCCs in and around wetlands	2.3.1 Engage KFS, County Governments and MoECCF on a more sustainable use of the wetlands	Number of engagement meetings and workshops	Awareness on sustainable use of wetlands	High	Short term	NEMA, NMK, KWS, WRTI, NGOs, KFS, County Governments, MoECCF
	2.3.2 Proactively seek prevention of planned afforestation potentially impacting on GCC habitat (e.g., Eucalyptus and Bamboo).	Number of advocacy campaigns and meetings with relevant stakeholders, number of relevant EIA/SEA reports commented on	Awareness of the effect of afforestation on crane habitats, EIA/SEA reports	High	Continuous	NEMA, NMK, KWS, WRTI, KWTA, NGOs, KFS, County Governments, MoECCF
	2.3.3 Introduce and /or review current legislations on afforestation and wetlands to determine its suitability to GCC ecological requirements for breeding.	Number of policy/law review workshops, number of introduced or reviewed legislations	Reviewed legislations/policies, workshops held	Medium	Long term	NEMA, KFS, KWTA, NGOs

Result/Output	Action	Indicator(s)	Means of Verification	Priority	Timescale	Organizations involved
	2.3.4 Enforce regulations and/or promote strengthening of legislation on afforestation in and around wetlands.	Number of arrests and convictions, acreage of wetlands complying with recommended afforestation legislation.	Suitable wetlands for breeding cranes	High	Short term	NEMA, NGOs, KFS, KWTA, WRTI, KEFRI
2.4 Impact of habitat destruction and clearing for agriculture does not affect breeding performance	2.4.1 Promote Crane and wetland friendly livelihood practices	Increase in breeding cranes and healthy wetlands adjacent to farmlands	Acreage and number of farmers practicing wetland friendly livelihood practices	High	Continuous	ICF/EWT/CANCO, CCV, CoG
	2.4.2 Acquire land to establish crane breeding sanctuaries	Number of established sanctuaries	Increase in breeding performance of cranes	Medium	Long-term	Donors, NGOs
	2.4.3 Recognize landowners with substantial crane breeding population	Developed protocol to award farmers. Number of cranes breeding on farms	Number of awarded farmers	High	Continuous	ICF/EWT/CANCO, CCV
	2.4.4 Designate important crane breeding areas as protected sites/ wetlands, Ramsar sites, IBAs/KBAs	Increase in number of breeding cranes	Increase in breeding fledging success	High	Long-term	NEMA, KWS, NMK
	2.4.5 Restore degraded crane breeding areas	Total acreage restored, increase in number of breeding cranes on restored areas.	Proportion in acreage, and condition of restored breeding areas	High	Long-term	NGOs
2.5 Wetland vegetation burning is controlled	2.5.1 Promote fodder cultivation.	Farmers stop utilizing wetland vegetation as fodder.	Proportion of households cultivating fodder.	Medium	Mid-term	NGOs
	2.5.2 Develop Wetland management plans for key crane wetlands	All key crane wetlands are under enhanced participatory management	Proportion of wetlands under enhanced participatory management	High	Long-term	NEMA, KWS, WRA, NGOs
	2.5.3 Use existing country processes to develop, or strengthen where appropriate, management or land use plans for crane sites	Number of Land use/ management plans developed or strengthened	Land use/management plans being implemented	High	Mid-term	NEMA, KWS, WRA, NGOs, MoALD, KALRO
2.6 Fencing and demarcation of wetlands is stopped	2.6.1 Enforce Environmental Management and Coordination Act (EMCA) on wetland use	All wetlands are not fenced or demarcated	Proportion of unfenced/ not demarcated wetlands	High	Continuous	NEMA, KWS
	2.6.2 Engage relevant Government agencies to review wetland boundaries Area/number of wetland boundaries	Area/number of wetland boundaries secured	All wetland boundaries secured	High	Continuous	NEMA, SoK

Result/Output	Action	Indicator(s)	Means of Verification	Priority	Timescale	Organizations involved
2.7 Egg collection does not occur	2.7.1 Strengthen enforcement on crimes related to Grey Crowned Crane eggs collection	Number of arrests and prosecutions, number of patrols by law enforcement agencies, number of key breeding sites where eggs are being collected are identified	Enforcement report and prosecution records, report on key breeding sites	High	Continuous	KWS, NGOs, KPS
	2.7.2 Train Crane Custodians and community scouts to conduct crane breeding monitoring	Number of trainings, number of monitoring activities	Curriculum/course manual, breeding monitoring database	High	Short term	KWS, NGOs, NMK, WRTI
2.8 Human disturbance on crane breeding sites is controlled and reduced	2.8.1 Designate water abstraction points for humans and livestock	Number of identified sites with breeding pairs that require intervention.	Designated water abstraction points.	High	Short term	WRI, NEMA, County Governments, NGOs
	2.8.2 Perimeter fence of water reservoirs with potential for crane breeding.	Number of sites which require fencing.	Survey report, secured breeding sites.	High	Short term	WRI, NEMA, County Governments, NGOs
	2.8.3 Create awareness on impacts of human disturbance on breeding cranes	Number of awareness meetings, number of stakeholders and individuals reached with awareness messages.	Knowledge on crane conservation enhanced, awareness messages	High	Continuous	NEMA, County Governments, NGOs
	2.8.4 Encourage sustainable and controlled harvesting of wetland vegetation outside the breeding season	Number of sites and acreage with developed wetland vegetation harvesting schedules	Vegetation harvesting schedules, communities utilizing harvesting schedules	High	Short-term	WRTI, NMK, NEMA, NGOs, County Governments, KALRO
2.9 Predation by feral dogs is reduced to a minimum	2.9.1 Strengthen enforcement of County by-laws on feral animals	Number of counties that have and are enforcing by-laws to control feral dogs	County by-laws to control feral dogs	Medium	Continuous	MoALD, County Governments, NGOs
	2.9.2 Engage in one-on-one dialogue with dog owners and herders.	Number of dialogue forums, number of dog owners reached and sensitized	Sensitization schedule	Medium	Long-term	MoALD, County Governments, NGOs
	2.9.3 Enhance protection measures during breeding season by giving incentives to crane custodians	Number of crane custodians receiving incentive s as a benefit of protecting cranes	Acceptable incentives	Medium	Long-term	County Governments, NGOs

Objective 3.0: Reduce threats causing a high degree of habitat loss, fragmentation, and degradation

Result/Output	Action	Indicator(s)	Means of Verification	Priority	Timescale	Organizations involved
3.1 Area covered by invasive and alien species on crane habitats is reduced	3.1.1 Identify and map Grey Crowned Crane sites in need of invasive alien species control	Number of invasive species identified, area of wetlands with invasive species mapped	Invasive species report (species and sites)	High	Short-term	NMK, KEFRI, WRTI, KWS, NGOs, Universities, County Governments
	3.1.2 Reduce areas colonized by invasive alien species using various acceptable methods.	Acreage of land previously colonized by invasive species restored	Manual, biological and conservation friendly chemical techniques being utilized to control invasive species	High	Short-term	NMK, KEFRI, WRTI, KWS, NGOs, County Governments
	3.1.3 Raise awareness amongst local communities on the impact of invasive alien species on wetlands and their ecosystem services	Number of people recognizing and removing invasive alien species	Community assessment and evaluation reports	High	Medium-term	KEFRI, WRTI, KWS, NGOs, County Governments
	3.1.4 Integrate Invasive Alien species monitoring into breeding site monitoring protocols to prevent invasion by alien species	Number of data collection protocols and survey tools incorporating data on invasive alien species	Monitoring Database, invasive species vulnerability assessment report, Developed/revised breeding protocols that integrate invasive alien plants monitoring	Essential	Short-term	NMK, WRTI, KWS, NGOs, County Governments
	3.1.5 Promote compliance of relevant international and national regulations on invasive species	Number of meetings held with legal authorities in relation to invasive alien species regulations and control, number of relevant international and national regulations domesticated for national and local use respectively	Reduced non-conformity of relevant international and national regulations on invasive species, domestication of international regulations on invasive alien species	High	Long-term	NMK, KEFRI, WRTI, KWS, NGOs, County Governments
	3.1.6 Promote and provide incentives for invasive alien species use e.g., Biochar, furniture, biogas, fur and dog mean from coypu etc.	Number of alternative methods and technologies for sustainable utilization of invasive alien species, number and forms of incentives created; number of people/communities involved	Developed forms and methods of utilizing invasive alien species	High	Short-term	NMK, KEFRI, WRTI, KWS, NGOs, Universities, County Governments
	3.1.7 Monitor invasive species and their impacts on Grey Crowned Crane habitats.	Quantity of data submitted to monitoring database on invasive alien species	Monitoring database	High	Short-term	NMK, KEPHIS, KEFRI, WRTI, KWS, NGOs

Result/Output	Action	Indicator(s)	Means of Verification	Priority	Timescale	Organizations involved
	3.1.8 Develop National Invasive Alien Species Action Plan that is aligned with national and international legislation for crane habitats.	Number of workshops, stakeholder engagements held	Invasive Alien Species Action Plan, workshop reports	Medium	Long-term	KEPHIS, NMK, KEFRI, Universities, WRTI, KWS, NGOs, County Governments
3.2 Abstraction of wetland resources does not degrade crane habitats (e.g., clay and sand mining, papyrus harvesting, water abstraction etc.)	3.2.1 Monitoring the extent of abstractive human activities in wetlands, conducting studies on the effect of human abstractive activities on the integrity of crane habitats	Quantity of data uploaded in monitoring database of human activities; number of studies conducted to map out influence of human activities on cranes habitats	Operational database of influence of human activities on crane habitats	Essential	Short-term	NMK, KEFRI, Universities, WRTI, KWS, NGOs, County Governments
3.3 Introduce and/or enforce regulations on sand harvesting on river channels and lake shorelines, and clay mining in wetlands	3.3.1 Review the existing regulations and identify enforcement gaps	Number of resources abstraction regulations developed; number of arrests and prosecutions during enforcement	New or reviewed regulations	High	Medium-term	NEMA, County Governments, MoECCF, NGOs, WRTI, NMK
3.4 Agriculture expansion does not impact on Grey Crowned Crane habitats	3.4.1 Provide alternative livelihoods to reduce extent of agriculture and protect ecosystem services in key Grey Crowned Crane areas	Number of alternative livelihoods adopted	Mapping report on areas practicing alternative livelihoods	High	Continuous	KALRO, KWTA, NGOs, KWS, WRTI, Universities, County Governments, NMK
	3.4.2 Identify suitable sites for establishment of crane breeding sanctuaries and encourage land owners to support establishment of the sanctuaries	Area of land acquired/secured. No of sites identified and No of sanctuaries established	Sanctuaries in place	medium	Long-term	KWS, WRTI, County Governments, NLC, NGOs, NEMA, SoK
	3.4.3 Restore habitats in degraded areas	Acreage of degraded habitat restored. Number of breeding pairs using restored areas.	Restored habitats	High	Long term	MEF, NGOs, WRTI, County Governments, NMK, NEMA, KFS, KEFRI, KALRO
	3.4.4 Enhance and enforce conservation of riparian zone	Acreage of riparian zone secured for cranes	Riparian zone conserved	High	Long term	NEMA, County Governments, WRA, NGOs
3.5 Siltation of Grey Crowned Crane sites is minimized	3.5.1 Conduct studies on causes, extent and impacts of siltation of GCC habitats	Number of studies conducted; key areas affected by siltation mapped; Acreage of wetland areas desilted using recommended methods.	Siltation assessment reports	High	Short-term	NEMA, County Governments, MoALD, KALRO, NGOs, WRTI,

Result/Output	Action	Indicator(s)	Means of Verification	Priority	Timescale	Organizations involved
3.6 Minimize impacts of land sub-division on Grey Crowned Crane habitats	3.6.1 Map farm sizes; Create awareness on minimum and recommended farm sizes	Number of farms with minimum recommended acreage	Maps of land holding in crane habitat sites; Reduced land sub-division	High	Long-term	KALRO, MoALD, NMK, NGOs
3.7 Provide best practice guidelines for environmentally friendly agriculture at Grey Crowned Crane sites	3.7.1 Determine existing agricultural management guidelines from within the agricultural sector. Identify suitable existing guidelines and incorporate GCC management recommendations. Train and support communities to implement environmentally friendly agricultural practices using the guidelines.	Number of existing guidelines assessed; number of trainings conducted	Environmentally friendly farming guidelines.	High	Short-term	KALRO, MoALD, NMK, NGOs
	3.7.2 Enforce regulation on agriculture development in and around wetlands	Number of culprits arrested and prosecutions	Adherence to wetlands/ agriculture regulations	Essential	High	NEMA, MoALD, KARLO, NGOs, KWS, WRA
3.8 Carry out environmental audit and enforcement of mitigation of large-scale commercial agricultural schemes in Grey Crowned Crane sites	3.8.1 Provide GCC information and requirements to and EIA/SEA lead experts for large farms to ensure the farms are established according to best practice and EIA/SEA guidelines.	Number of EIAs on large farms, number of large farms implementing the provisions of the EIAs	EIA reports	High	Medium-term	NEMA, MoALD, KARLO, NGOs, KWS

Objective 4.0: Adress current knowledge gaps in Grey Crowned Crane conservation

Result/Output	Action	Indicator(s)	Means of Verification	Priority	Timescale	Organizations involved
4.1 The population size is estimated, and population trends determined	4.1.1 Develop standardized monitoring protocols and conduct population surveys	Standardized monitoring protocol developed; population estimates of GCC.	Monitoring protocol in place, pop. survey report	Essential	Continuous	NMK, KWS, NGOs, WRTI, local communities, County Governments
4.2 Breeding status data are collected to determine the baseline and to monitor trends	4.2.1 Develop standardized monitoring protocols and systems to collect data on breeding productivity, and use the ICF/ EWT database to store data centrally	Breeding status data collected.	Breeding status report, database	Essential	Continuous	NMK, KWS, NGOs, WRTI, NK (SSGs), local communities, County Governments, Universities
	4.2.2 Provide training to all relevant crane experts on the monitoring protocols	Number of trainings conducted	Trainings report	High	Continuous	NGOs, KWS, NMK, WRTI
	4.2.3 Conduct monitoring at key GCC sites and at sites where crane conservation projects are active.	Number of monitoring activities; quantity of data submitted to the database.	Monitoring database	High	Continuous	NGOs, KWS, NMK, WRTI
	4.2.4 Analyze data annually to determine the baseline and trends thereafter.	Number of publications	Publications, conference presentations, reports, habitat suitability models, breeding distribution maps	High	Continuous	NGOs, KWS, NMK, WRTI, Universities
4.3 Factors influencing breeding productivity understood	4.3.1 Analyze available data for preliminary determination of factors influencing breeding productivity	Number of reports and publications	Publications, preliminary breeding suitability maps, conference presentations, reports	High	Short term	KWS, NMK, WRTI, NGOs, Universities
4.4 Adult and juveniles' survival and mortalities are known	4.4.1 Develop a standardized protocol and system for collecting data on mortalities and provide training to all species experts on its use (for example ringing, tracking, powerline surveys).	Standardized protocol developed; number of trained experts	Monitoring protocol, training reports	High	Short term	KWS, NMK, WRTI, NGOs, Universities
4.5 Understand the habitat requirements of cranes	4.5.1 Conduct studies to understand cranes' habitat requirements	Number of studies conducted, number of models and methodologies developed, number of publications.	Report and publications on GCC habitat requirements	High	Short term	KWS, NMK, WRTI, NGOs, Universities

Result/Output	Action	Indicator(s)	Means of Verification	Priority	Timescale	Organizations involved
4.6 Impact of climate change on the habitat and the species is understood	4.6.1 Conduct an overview of current climate change implications for GCC and the relevance of methodologies for researching the impact of climate change on GCC.	Number of studies conducted, number of models and methodologies developed	Report on CC impact on GCC, habitat suitability prediction models due to CC, survey protocols/ methodologies on the impact of CC	High	Continuous	NMK, WRTI, NGOs, Universities, NK, local communities, County Governments
4.7 Improved understanding of poisoning occurrence.	4.7.1 Conduct studies and map crane poisoning hotspots and poisons used, levels of impacts and mitigation measures taken.	Number of studies conducted, extent of coverage of poisoning incidents, number of mitigation measures proposed and in use	Mapping report	Essential	Continuous	KWS, NMK, WRTI, NGOs, Universities
4.8 Understand the aspects and implications of crane-human interaction, and the economic and socio-cultural value of GCCs.	4.8.1 Conduct research at selected sites to better understand the damage in terms of crop types and extent of damage that GCCs cause to crops both in small-scale and commercial agricultural landscapes.	Number of studies conducted; number of funded projects	Reports, publications, theses, conference papers and presentations	High	Continuous	ICF/EWT/CANCO, NMK, WRTI, CCV/NABU, Universities
4.9 Spatial and temporal movement patterns are understood	4.9.1 Expand the ringing program to ensure that a viable number of cranes are ringed. (NB: If opportunities arise, place satellite trackers onto GCCs in key sites to better understand movement patterns).	Number of banded cranes or those fitted transmitters	Reports, movement, dispersal, and home-range maps	Essential	Continuous	KWS, WRTI, NMK, NGOs, County Governments
4.10 The potential risks arising from strategic long-term urban, infrastructure, energy, and land-use development plans, analyzed and assessed	4.1.10.1 Provide relevant GCC information to developers and in SEA/EIA advocating strongly that the information is incorporated into the decisions made.	Number of SEA/EIA reports submitted that incorporate comments from GCC experts	SEA/EIA reports	Medium	Continuous	NEMA, NMK, KWS, WRTI, NGOs, Universities
4.11 The genetic profile of Grey Crowned Cranes across the country is mapped	4.11.1 Develop a protocol that includes the collection of two sexing samples from all GCCs in hand, one for sexing and one for genetic profiling.	Protocol developed	Protocols for samples collection	Medium	Continuous	NMK, KWS, WRTI, NGOs, Universities

Result/Output	Action	Indicator(s)	Means of Verification	Priority	Timescale	Organizations involved
4.12 Feasibility of habitat restoration is known	4.12.1 Conduct studies to improve our understanding of the restoration of the habitat	Number of studies on habitat restoration for cranes; number and performance of pilot habitat restoration sites	Habitat restoration reports and publications	Medium	Long-term	NMK, KWS, WRTI, NGOs, Universities
4.13 Enhance GCC and habitats monitoring	4.13.1 Develop and adopt a national monitoring protocol.	National monitoring protocol established	Adopted monitoring protocol document.	High	1 year	NMK, KWS, WRTI, NEMA, NGOs,
	4.13.2 Multi-institutional team to coordinate countrywide research on cranes	Team constituted and functional	Research proposals, technical reports, and scientific publications	Medium	1 yr	NMK, KWS, WRTI, NEMA, NGOs
	4.13.3 Initiate capture and marking programs.	Number of cranes marked.	Reports, publications, conferences attended. Terms of Reference developed and adopted. Ringing schedules updated	Medium	1 yr	WRTI, NMK, KWS, ICF/EWT/ CANCO, CCV/NABU/CCG
	4.13.4 Create a network of citizen scientists.	Number. of shared records Number. of active citizen scientists.	Occurrence and population data. Map of GCC sightings.	Medium	2 years	NK, NMK, KWS, WRTI, NEMA, NGOs
	4.13.5 Package information for different target audience	Publicity materials distributed.	Copies of educational materials	Medium	Continuous	Media, NMK, KWS, CANCO, NK, CoG, Communities
	4.13.6 Hold public forums and run media campaigns	No. of programs aired/shared. No. of public events organized.	Attendance lists, Photographs, Media briefs and recordings	Medium	Continuous	Media, NMK, KWS, CANCO, NK, CoG
4.14 Adoption of cranes conservation by the communities.	4.14.1 Hold public forums to create awareness at target sites	Number of forums; Number of attendees; Number of adoption programs.	Attendance lists, Photographs	Medium	Continuous	KWS, ICF/EWT/CANCO, CCV/ NABU, County Governments
4.15 Recognition of landowners with substantial crane numbers and/or breeding crane population.	4.15.1 Develop an awarding guideline and identify eligible landowners	Finalized awarding protocol; Number of landowners and acreage identified	Protocol document: Number of farms accorded eco-labelling, issued with certificates, awards among others.	Medium	Annual	CANCO, Communities, Private Landowners

Objective 5.0: Mainstream relevant policies and ensure implementation to enhance the conservation of GCC

Result/Output	Action	Indicator(s)	Means of Verification	Priority	Timescale	Organizations involved
5.1 Legal and policy gaps are identified and filled	5.1.1 Review all relevant legislation, policies and regulations.	Policy gaps identified; Number of policies reviewed; Number of legislations amended.	Finalized policy gap report submitted for consideration, copies of amended legislations.	Essential	3 months	NMK, KWS, NEMA, KARLO, CoG, Relevant Government Ministries
5.2 Site-specific management plans (SMP) for key GCC wetlands.	5.2.1 Identify and map the key sites	Key GCC wetland map	Wetlands map	Essential	3 years	NMK, KWS, NEMA, FAO-KE
	5.2.2 Setting up of management plan taskforces	Management taskforces set-up and functional	Minutes of stakeholder consultation	Essential	6 months	NMK, KWS, NEMA, FAO-KE
	5.2.3 Development of the SMPs	Number of finalized SMPs.	Final site management plans documents	Essential	6 months	NMK, KWS, NEMA, FAO-KE
	5.2.4 Validate and adopt the plans	Adopted MP	Validation workshops attendance list	Essential	6 months	NMK, KWS, NEMA, FAO-KE
	5.2.5 Develop GCC Policy Briefs	Number of policy briefs developed		Essential	1 year	NMK, KWS, NEMA
5.3 Effective management and monitoring of captive GCC populations	5.3.1 Domesticate and enforce protocols and guidelines for management of captive populations	Domesticate protocols and guidelines.	Protocol document	Essential	Continuous	KWS, WRTI
	5.3.2 Undertake an inventory of captive facilities with GCC and regularly undertake audits to ensure compliance with permit term and conditions	Functional database of captive GCC owners and GCCs under their care	Number of owners and captive GCC registered in the database.		Continuous	NMK, KWS, WRTI
	5.3.3 Build capacity of key relevant institutions mandated with monitoring captive populations and captive facility owners.	Training manual on captive management of GCC (adopted from IUCN Crane Husbandry manual).	No. of training sessions No. of trainees		Annual	NMK, KWS, Communities

Objective 6.0: Mobilize resources to facilitate implementation of activities targeted for species conservation

Result/Output	Action	Indicator(s)	Means of Verification	Priority	Timescale	Organizations involved
6.1 Availability of adequate funds to implement the plan	6.1.1 Develop fundraising targets, budget, and timelines.	Fundraising strategy guideline	Fundraising document	Essential	Continuous	KWS, NEMA, NMK, WRTI, ICF/EWT/CANCO, NK
	6.1.2 Identify target donors.	Donors database (with relevant information).	Number of identified donors.		Continuous	KWS, NEMA, NMK, WRTI, ICF/EWT/CANCO, NK
	6.1.3 Develop proposals for resource mobilizations.	Proposals submitted to private entities, donors, and government. Number of government	Number of proposals submitted and funded.		Continuous	KWS, NEMA, NMK, WRTI, ICF/EWT/CANCO, NK
	6.1.4 Mainstream GCC conservation into government work plans	institutions that have included GCC conservation in their work plans.	Number of GCC conservation activities undertaken by Government institutions		Continuous	Relevant Government Ministries, Departments, Agencies and County Governments

Objective 7.0: Undertake conservation education and public awareness on Grey Crowned Cranes

Result/Output	Action	Indicator(s)	Means of Verification	Priority	Timescale	Organizations involved
7.1 Improved level of awareness and social accountability in conserving the GCC	7.1.1 Sensitization on sustainable land use practices (LUP) in areas adjacent to GCC habitats	No. of landowners adopting sustainable LUP	Reports on sustainable practises adopted; Number of sensitization forums held; Attendance schedule	Essential	Continuous	KWS, NEMA, NMK, WRTI,ICF/ EWT/CANCO, NK, County Governments and other conservation partners
	7.1.2 Conduct civic education on the existing regulatory frameworks on GCC	Reduction in number of conflicts in GCC habitats	Number of meetings; workshops reports;	Essential	Continuous	KWS, NEMA, NMK, WRTI,ICF/ EWT/CANCO, NK
	7.1.3 Conduct education and awareness campaigns on importance of GCC (incl. cultural beliefs, taboos, myths & values) at all levels	Number of outreach forums; Awareness reports; Awareness materials. TV/Radio programmes organized; Policy briefs	Number of meetings; workshops reports;	Essential	Continuous	KWS, NEMA, NMK, WRTI,ICF/ EWT/CANCO, NK

3.3 Planned and ongoing initiatives

These are activities that are relevant to the successful implementation of this Action Plan.

These may enhance or complement the implementation of the plan in several ways. This is especially so if they are aimed at conserving the habitats of the Grey Crowned Crane. The following are some of the ongoing (or expected) projects in Western Kenya and the Central regions of the country (Table 4).

Table 4: Ongoing Grey Crowned Crane conservation activities in Kenya.

#	Range site	Activity
1	**ICF/EWT/CANCO's Kenya Crane and Wetland Conservation Project** in 5 Counties of Western Kenya: Trans Nzoia, Uasin Gishu, Nandi, Kisumu and Homa Bay.	Alternative livelihood projects through empowering the community to diversify their income generation activities and contributing to poverty reduction. The project has trained 87 community members in modern beekeeping, 46 community members in modern poultry farming, 30 community members in running a tea and tree nursery as a business and trained over 1,000 farmers in climate smart agriculture and establishing 30 demonstration gardens on farming methods that are resilient and responsive to climate change.
		Holding an annual Cranes Festival to create awareness on the plight of cranes and educating the community on the importance of wetlands as both a human resource and a habitat for cranes, fish and other wildlife species.
		Mapping of crane sightings in the Western region and identifying threats across 11 Counties in Western Kenya i.e. Uasin Gishu, Nandi, Trans Nzoia, Bungoma, Vihiga, Kakamega, Busia, Kisumu, Homa Bay, Migori and Siaya.
		Breeding sites and nesting activities monitoring to establish nesting and fledging success of Grey Crowned Cranes.
		Bi-monthly fixed route surveys on crane numbers, breeding and habitat use/land use change in five counties (Trans Nzoia, Uasin Gishu, Nandi, Kisumu and Homa Bay).
		Involvement and engagement with local stakeholders in project areas including the National Government Administration Officers, NGOs, County Governments, learning institutions, and local community groups and individuals.
		Participation in the first and second countrywide censuses that were conducted in 2019 and 2023, respectively.
		Crane chicks ringing and observation and reporting of re-sighted individuals for studies of cranes dispersal, movements and habitat selection and use at different times of the year.
		Collecting data on incidents of crane poisoning, electrocutions and collisions with powerline infrastructure.

#	Range site	Activity
2	**CCV/NABU/CCG/David Fox & Family (UK) and a PhD research** activity in Greater Nairobi and Central parts of Kenya: Lake Ol' Bolossat basin, Kinangop, western Laikipia, and Nakuru (Subukia).	Awareness and conservation education campaigns around Lake Ol' Bolossat since 2015 that have since been expanded to western Laikipia (around Rumuruti).
		Nesting and breeding activities monitoring in and around Lake Ol' Bolossat.
		Annual local Grey Crowned Crane population census in and around Lake Ol' Bolossat.
		Completed (in 2022) a PhD-level study at the University of Nairobi on the population size, distribution, habitat selection, flocking behavior, nesting habits and threats and conservation of the cranes population around Lake Ol' Bolossat (outcome: two peer-reviewed publications and a thesis, and two additional manuscripts under preparation).
		Ongoing PhD-level study at Kenyatta University on the Greater Nairobi area's cranes population focusing on identification of hotspots, habitat characterization, population size estimates and distribution, and influence/impacts of land use changes on crane habitats. This work is supported by the Leiden Conservation Foundation through the ICF/EWT Partnership.
		Experimenting on harvesting and alternative use of Kariba weed *Salvinia molesta* for use in agriculture (kitchen gardens farming and soil water and fertility enhancement with support from Snow leopard Procets GmbH and NABU.).
		Established a bird's research and conservation center in Equator Estate, Nyahururu. The center is hosting volunteers for the African Waterfowl Census, students on attachment and conservation-related meetings and workshops.

3.4 Priority National Projects

In additional to the ongoing programs and routine activities, the following projects will be undertaken (Table 5).

Table 5: Proposed priority projects at the national level.

#	Project	Budget	Total
1	Census/surveys/use of citizen science. Undertaken every 3 years, last census undertaken in 2023.	3 censuses @ Ksh. 1,500,000	4,500,000
2	Identification and mapping fly ways	Ringing of cranes in identified sites	1,500,000
3	Securing and restoration of degraded habitats/wetlands	750,000 * 5 sites	3,750,000
4	Identify and explore potential options for active management programs (*in situ* and *ex situ*) to enhance population recovery	2 pilot programs, 1 @ Ksh. 750,000 for each of the two ranges sites	1,500,000
5	Undertake an inventory of captive facilities hosting Grey Crowned Cranes across the country.	Field	1,000,000

3.5 Risks and Opportunities in the Implementation of the Plan

Several strengths, weaknesses, opportunities, and threats already exist and can positively or negatively contribute towards the successful or failure of implementation of this Action Plan.

STRENGTHS

- KCWG constituted (and open to a wider membership in post launch of the plan).
- Institutional support from both Government and NGOs.
- Communities actively involved in monitoring cranes in western and central Kenya.
- Relevant legislations, policies, and guidelines in place.
- International interest in supporting local cranes conservation initiatives.
- A growing interest in research and study of cranes among Kenyans.
- Some private landowners who have shown interest and/or monitoring cranes in their farms.

OPPORTUNITIES

- Some of the sites where cranes have some form of protection, while others are IBAs/KBAs.
- Conservation organizations participating in implementation of the plan are recognized by the Government.
- Some legislation and policies that favour conservation of wild birds already exist.
- There is local community involvement in conservation at some sites and the number of local people interested in birds' conservation is rising, e.g., bird guides.
- School's wildlife clubs, bird watching groups and ecotourism activities are active in some of the crane sites.
- Existing international and regional networking and cooperation can be used to liaise in implementing the plan.
- There is an increase in the number of professional conservationists. Some expertise is therefore available, and this provides opportunities for further capacity building.

WEAKNESSES

- Lack of specific policies on bird conservation.
- Challenges in countrywide efforts for cranes monitoring and conservation.
- Challenges in policies and laws implementation and enforcement.
- Weak enforcement of guidelines on captive wildlife populations.
- Lack of a central depository of crane observations data and coordination of countrywide conservation activities.

THREATS

- Some of the crane sites are privately owned and it is thus challenging to control what activities can be carried out.
- Regional cooperation is lacking, especially for conservation of cross-border habitats and/or populations that have movements.
- Funds and resources for implementing proposed actions are limited.
- Some projects in the plan do not provide direct tangible benefits to local communities and may lack local buy-in.
- Opportunity costs for implementing actions may be high.
- Poverty is high in most places where the species is found and may be directly contributing to increased threats.
- Conflict of interest may arise among participating organizations in the government and private sector (CBOs/NGOs).

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3.6 Stakeholder Analysis

Table 6 (borrowed and modified from Sande et al., 2005) identifies various groups of stakeholders, level of involvement (1, national or 2, international) and how (potential activities) they are involved. A stakeholder may therefore play more than one role in the implementation of this Action Plan. A column on key stakeholders is just an indication of expected organizations and doesn't bar anyone considered as being capable of contributing.

Table 6: Details of Stakeholders participating in the implementation of the NSSAP.

#	Stakeholder group	Level of involvement	How they are involved (proposed NSSAP Activities)	Examples of Stakeholders
1	Species interest groups, Scientific Experts	1	• Conduct research to fill or supplement identified knowledge gaps (ecology, population, distribution, breeding etc.) • Raise awareness about NSSAP. • Coordinate NSSAP implementation. • Develop research proposals. • Organize and coordinate training workshops and countrywide cranes census. • Rewarding and branding best performers in cranes conservation. • Develop a specific App to collect cranes occurrence and distribution data.	NMK, WRTI, KWS, NEMA, KCWG, Cranes Conservation Germany, CANCO
		2	• Fundraise to support NSSAP implementation specific activities. • Provide technical assistance during NSSAP writing and implementation. • Write a forward for NSSAP	ICF/EWT, NABU, AFEW
2	Donors	1, 2	• Provide technical and financial support to the process. • Support community development projects in key crane sites. • Finance research projects at local and national levels.	AEWA, Rufford Small Grant, National Geographic Society, African Bird Club, Darwin Initiative, World Bank, UNDP-GEF, CDTF
3	Media	1, 2	• Publicize NSSAP through their channels (print, TV, social platforms). • Raise awareness on plight of the Grey Crowned Crane	Kenya Broadcasting Corporation, Nation Media Group, Standard Group, Royal Media Services, TV Africa Holdings

#	Stakeholder group	Level of involvement	How they are involved (proposed NSSAP Activities)	Examples of Stakeholders
4	Education Sector	1	• Sponsor competitions and trips to conservation areas. • Prepare presentation materials containing cranes e.g., radio programmes on wildlife of Kenya and tourism. • Encourage students to undertake academic research on cranes. • Environmental education to wildlife clubs and CBOs.	Ministry of Education, Kenya Institute of Curriculum, WCK, AFEW (Giraffe Centre), Universities and Colleges
5	Business & Corporates	1, 2	• Support activities such as countrywide cranes census e.g., fuel, vehicles. • Financing environmental activities e.g., tree planting towards rehabilitation and restoration of degraded catchment areas. • Write articles in their magazines highlighting the plight of the cranes.	DT Dobie, Safaricom Foundation, Toyota Kenya, Kenya Airways, Total Energies, Commercial Banks
6	CBOs	1, 2	• Provide indigenous knowledge on the cranes. • Include cranes conservation in their activities e.g., conduct local cranes census, report sightings, and share other data. • Provide information on other ongoing activities beneficial to cranes and their habitats. • Undertake measures to minimize threats affecting cranes at the local level. • Work with local administration to address serious threats like poisoning, trapping adults and collection of eggs and chicks. • Form crane conservation interest groups (where none exists). • Attend village-level barazas/meetings to give a presentation.	Nature Kenya's Site Support Groups, Kipsaina Cranes & Wetlands Conservation Group, CCV
7	NGOs, Civil Society	1, 2	• Host validation workshop. • Provide information on funding to implementing agencies. • Publicity, advocacy, facilitate legislation and policy guidelines, including reviews.	EAWLS, NK, BirdLife International (Africa Secretariat), Wetlands International

#	Stakeholder group	Level of involvement	How they are involved (proposed NSSAP Activities)	Examples of Stakeholders
8	Tourism, Safari Operators, Bird watchers	1, 2	• Finance community ecotourism investments. • Report on crane sightings within circuits. • Encourage visitors to visit areas to see cranes.	KATO, Kenya Tourism Federation, Ministry of Tourism & Wildlife, Ecotourism Kenya, County Departments of Tourism, Kenya Tour Guides Association
9	International Conventions	1, 2	• Fulfilling our national obligation. • Reporting.	Lead institutions for the various MEAs.
10	County Governments	1, 2	• Host validation workshop. • Form and support a county cranes conservation strategy/ working group to oversee implementation of NSAAP at county level. • Support local cranes counting during the countrywide census. • Pass appropriate Legislations in the County Assembly e.g., gazettement of wetlands as wildlife sanctuaries.	All counties where cranes occur e.g., Nyandarua, Laikipia, Uasin Gishu, Trans Nzoia, Nandi, Nairobi City, Kiambu, Homa Bay and Kisumu.
11	Large–scale Farmers, Estates & Conservancies	1, 2	• Habitat restoration, modifications, and manipulations in favor of cranes. • Support countrywide cranes census at property or local area level. • Publicize plight of cranes and companies' role in their conservation e.g., through magazines, reports, and products.	Kakuzi PLC, Swara Wildlife Sanctuary (Athi River), Northlands, Conservancies in Laikipia, Narok and Kajiado Counties
12	Government of Kenya Agencies & Departments	1, 2	• Provide information required and support e.g., processes gazettement. • Enforcement of legislation, policies, and guidelines. • Timely conclusion of investigations, prosecution and delivery of judgement of court cases.	KARLO, KFS, KEFRI, NLC, Kenya Police, The Judiciary, Customs Department
13	Senior Government Officials, Personalities	1, 2	• Officiate opening/closing of workshops. • Presentation and endorsement of NSSAP at work. • Mobilize resources (funds, transport) to support local and/or national cranes conservation activities.	NGAOs, Cabinet Secretaries, Governors, CECMs. MCAs, MPs, Senators, Women Reps., Sport Champions

#	Stakeholder group	Level of involvement	How they are involved (proposed NSSAP Activities)	Examples of Stakeholders
14	Faith-Based Organizations	1	• Raise awareness through preaching and teaching what the Bible and Quran calls for in nature conservation and care of God's creation.	Religious leaders (Christians, Muslims, Hindu etc.)
15	Energy Sector	1, 2	• Implement mitigation measures to curb the problem of collision and electrocution with power lines. • Share data on incidences. • Conduct EIAs for new projects and Audits for ongoing and completed projects. • Consider wildlife needs at the design stage of projects.	KETRACO, Kenya Power, KenGen, Wind Energy Companies (e.g., KIPETO).
16	Wetlands resource users	1	• Ensure there is minimum to no disturbance to nesting cranes and their chicks during the breeding season. • Share information on nesting and breeding activities. • Report activities that could impact negatively on cranes and their habitats to relevant government authorities and/or local conservation organizations. • Adhere to good practices such as sustainable harvesting of wetland vegetation.	Fishermen, boat operators, livestock herders/owners, Water & Sewerage Companies
17	Captive animal facilities		• Cooperate with government authorities in registration of cranes in captivity. • Follow guidelines on care and management of cranes in captivity. • Provide access to officers and scientists while vising facilities to collect data. • Keep up-to-date records on their captive individuals.	Private facilities, animal orphanages, animal (birds) care clinics, environmental education centers, WRTI, KWS, NMK, ICF/EWT

3.7 Governance and Institutional Arrangement on Implementation of this Action Plan

Implementation of the NSSAP for the conservation of the Grey Crowned Crane will be coordinated by the Kenya Wildlife Service through the Kenya Cranes Working Group as the National Coordination Mechanism.

The Working Group, chaired by the Service, will draw representation from the following institutions: Kenya Wildlife Service as the Administrative Authority for AEWA, CMS and Ramsar Convention (Chair), National Museums of Kenya as the AEWA/Ramsar Convention National CEPA Focal Point, National Environment Management Authority, International Crane Foundation/Endangered Wildlife Trust/ Community Action for Nature Conservation Partnership, Nature Kenya, Wildlife Research & Training Institute, Water Resources Authority, Council of Governors, Secretariat, and nominated County Governments representatives from the areas harboring the largest crane population as informed by the national census.

A Secretariat of the Working Group will be hosted by the Service with technical support from NGOs and CBOs and other organizations working on cranes conservation, wetland conservation and community conservation among related fields others. It will follow up on the implementation of the Action Plan, supporting the Kenya Cranes Working Group and the two range Committees in western Kenya and Central Kenya/Nairobi area and consolidation of data & information on the species.
Reporting on Implementation of the GCC NSSAP will be in line with National and International Obligations as follows:

a. Site committee annual reports.
b. National Grey Crowned Crane Working Group and National Bird Taskforce reports
c. National Wildlife Conservation Status Report (Biennial) by the Ministry of Tourism and Wildlife
d. National reporting obligation on Multilateral Environmental Agreements (MEA's) to CMS/AEWA Technical Committee (Biennial).
e. Institutional monthly, quarterly and annual reports.

4.0 Monitoring and Evaluation (M&E) Plan for the Kenya Grey Crowned Crane Action Plan

4.1 Introduction

The Kenya Grey Crowned Crane Conservation Action Plan (GCCAP) is aligned with the International Grey Crowned Crane Single Species Action Plan (IGCCSSAP) and aims to strengthen the conservation of the Grey Crowned Crane Balearica regulorum in Kenya. This Monitoring and Evaluation (M&E) plan outlines the approach to assess the implementation of activities under the Action Plan, determine progress, and evaluate outcomes to ensure the long-term survival of the species.

The GCC NSSAP will have a 10-year implementation period from 2024-2033. Tracking progress and assessing performance on implementation of the identified actions/activities against set targets in the implementation framework under each of the seven strategic objectives to achieve the expected results and the vision and aim/goal of the Action Plan. Monitoring and evaluation will be undertaken annually based on activities being undertaken in specific sites, mid-term at 5 years and an end-term review. The Action Plan will be improved on a need basis from lessons learnt and emerging issues during its implementation. This exercise shall be undertaken through site committees at the field level and the Kenya Crane Working Group KCWG) and National Bird Taskforce (NBTF) supported by the secretariat at the national level.

This M&E plan will ensure that the implementation of the Kenya Grey Crowned Crane Action Plan remains on track and achieves the desired conservation outcomes. The use of a comprehensive results chain, coupled with regular monitoring and adaptive management, will allow for evidence-based adjustments to enhance the plan's effectiveness in conserving the Grey Crowned Crane population in Kenya. This will help to ensure smooth implementation of the identified activities through a coordinated approach among relevant stakeholders and ensure efficient use of available resources.

4.2 Objectives of the M&E Plan

1. To ensure the timely implementation of the activities outlined in the GCCAP.
2. To measure progress against specific conservation targets and indicators.
3. To identify successes, challenges, and areas for improvement through adaptive management.
4. To document lessons learned and inform future conservation efforts.

4.3 Results Chain Framework

The M&E plan will use a results chain framework that links inputs, activities, outputs, outcomes, and impact.

- **Inputs:** Resources (financial, human, technical) allocated for the implementation.
- **Activities:** Specific tasks designed to achieve conservation goals, such as habitat restoration, community engagement, and policy advocacy.

- **Outputs:** Tangible products resulting from activities (e.g., number of cranes counted, wetlands restored).
- **Outcomes:** Short and medium-term effects of the outputs, such as improved crane populations or reduced habitat loss.
- **Impact:** Long-term survival and sustainability of the Grey Crowned Crane population in Kenya.

4.4 Key Monitoring Indicators

The M&E process will involve the selection of indicators at each stage of the results chain.

Objective 1: Conservation of Grey Crowned Crane Habitats
Activity: Protect and restore critical wetland habitats.
Indicator 1.1: Number of hectares of wetland restored or protected.
Indicator 1.2: Percentage increase in suitable habitat for Grey Crowned Crane.
Outcome Indicator: Rate of habitat degradation reduced by 20% in critical crane habitats by 2025.

Objective 2: Reduction of Threats to Grey Crowned Crane
Activity: Mitigate human-wildlife conflict and reduce illegal activities (e.g., egg collection, crane trapping).
Indicator 2.1: Number of reported human-wildlife conflicts resolved.
Indicator 2.2: Number of successful prosecutions for crane poaching or illegal activities.
Outcome Indicator: Reduction in reported illegal activities by 30% by 2025.

Objective 3: Community Involvement and Awareness Raising
Activity: Conduct education and awareness programs in local communities.
Indicator 3.1: Number of community members trained on crane conservation.
Indicator 3.2: Awareness level changes among target local communities (measured via surveys).
Outcome Indicator: Increased community support for crane conservation efforts, as measured by a 40% increase in participation in local conservation activities.

Objective 4: Policy Advocacy and Institutional Support
Activity: Engage with government agencies to integrate Grey Crowned Crane conservation into national policies.
Indicator 4.1: Number of policies or regulations revised to support crane conservation.
Indicator 4.2: Amount of government funding allocated for crane conservation.
Outcome Indicator: Institutionalization of Grey Crowned Crane conservation in at least two key national policy documents by 2026.

4.5 Data Collection and Analysis

Frequency: Monitoring will be conducted quarterly, while evaluations will occur annually.
Methodology

- Field surveys for population counts and habitat assessments.
- Community feedback via surveys and focus groups.
- Regular review of law enforcement and policy developments.

- Data Management: A centralized database will be maintained to track progress and store data collected by field teams and stakeholders.

4.6 Roles and Responsibilities

- National Crane Monitoring Team: Responsible for field data collection and habitat assessments.
- Community-Based Organizations (CBOs) and Local NGOs e.g. Nature Kenya, ICF CANCO: Engaged in grassroots conservation efforts, Advocacy and local and resources for the M&E process.
- Kenya Wildlife Service (KWS): Lead governmental agency for enforcement and policy advocacy.
- National Museums of Kenya: Provide technical support in monitoring.
- Wildlife Research and Training Institute: Provide research guidance.

4.7 Adaptive Management

The M&E system is designed to be adaptive, allowing for modifications based on monitoring results. If progress towards objectives is insufficient, strategies will be revised, and new approaches will be incorporated.

4.8 Budget

Adequate resources should be allocated for M&E activities, including:

- Field monitoring costs (transport, equipment, etc.)
- Data analysis software and training
- Stakeholder engagement meetings

4.9 The Reporting and Review Cycle

To ensure continuous tracking and improvement in the implementation of the Kenya Grey Crowned Crane Action Plan (GCCAP), the Monitoring and Evaluation (M&E) process will follow a structured Reporting and Review Cycle. This cycle is essential for keeping stakeholders informed, reviewing progress, and making necessary adjustments to the Action Plan based on emerging evidence and lessons learned.

The Reporting and Review Cycle ensures that the implementation of the Kenya Grey Crowned Crane Action Plan remains transparent, evidence-based, and adaptive to changing circumstances. The cycle will engage all stakeholders regularly, enabling continuous learning and improvement while ensuring accountability and effective use of resources in the conservation of the Grey Crowned Crane in Kenya.

4.10 Reporting

Reporting obligations: Reporting will be undertaken through appropriate means and forums as per institutional, national and international obligations as follows;

a) Activity reports and publications
b) Committees reports, management reports and policy briefs
c) Species status reports and population trends reports
d) Monitoring and evaluation reports (Annual, midterm and end term)
e) National Wildlife Conservation Status Report by Ministry of Tourism and Wildlife (Biennial)
f) National reporting obligation on Multilateral Environmental Agreements (MEA's) to AEWA

Quarterly Reports: These will focus on short-term outputs and activities. Each report will summarize:

- Activities conducted.
- Immediate outputs (e.g., hectares of habitat restored, number of cranes counted).
- Any challenges encountered during implementation.
- Recommendations for any immediate adjustments.
- Responsible parties: Field teams (Kenya Wildlife Service, partners, and community-based organizations).
- Annual Reports: These will provide a more comprehensive review of progress made toward the medium- and long-term outcomes outlined in the Action Plan.

Each report will:

- Evaluate progress toward annual targets.
- Analyze success factors, challenges, and gaps.
- Include feedback from local communities and stakeholders.
- Recommend strategic changes and adaptations for the next year.
- Responsible parties: M&E team (national and local level) in collaboration with stakeholders.
- Final Report (End of Implementation Period):

At the conclusion of the Action Plan's implementation period, a comprehensive final report will be produced. This will:

- Assess overall achievements against all the plan's objectives and targets.
- Include a detailed evaluation of the species population trends and habitat status.
- Summarize lessons learned, challenges, and the overall conservation impact.
- Provide recommendations for the next phase of Grey Crowned Crane conservation efforts.
- Responsible parties: National Crane Monitoring Team, Kenya Wildlife Service, partners (e.g., Nature Kenya), and external evaluators if necessary.

4.11 Review Frequency

Quarterly Internal Reviews: Following each quarterly report, an internal review will be conducted by the core M&E team and stakeholders to assess ongoing progress. This will include:

- Reviewing key performance indicators.
- Identifying and addressing any immediate challenges.
- Adjusting fieldwork schedules or methodologies where necessary.
- Outcome: Adjustments to quarterly work plans, immediate troubleshooting, and realignment of resources.

Annual Review Workshop: An annual review workshop will be convened with all key stakeholders, including local communities, conservation partners, government agencies, and international collaborators. During this workshop:

- Annual reports will be discussed.
- Stakeholders will review progress against the plan's objectives and conservation targets.
- Adaptive management strategies will be developed to address gaps or unforeseen challenges.
- Outcome: Revised work plan and priorities for the next year based on the findings of the review.

Mid-Term Review: A mid-term review will be conducted halfway through the Action Plan's implementation period (typically after 5 or 6 3 years). This review will:

- Provide an in-depth analysis of the Action Plan's performance.
- Reassess conservation priorities based on new ecological data or external factors.
- Make any necessary strategic shifts, including reallocation of resources, partnerships, or policy focus.
- Outcome: Revised strategies for the second half of the implementation period.

Final Review (End of Implementation Period): At the end of the Action Plan period, a final review will be held to assess the overall success of the plan and determine the next steps for Grey Crowned Crane conservation. This review will:

- Summarize the outcomes and impacts of the plan.
- Provide insights into long-term population recovery and habitat restoration.
- Make recommendations for future Action Plans or continued conservation efforts.
- Outcome: A final decision on next steps for the Grey Crowned Crane Action Plan, which may include drafting a new Action Plan or transitioning into routine monitoring.

Reporting and Review Timeline

Reporting and review timelines of this Action Plan is as proposed in the following table (Table 7).

Table 7: Proposed review and reporting of the NSSAP and expected outcomes.

Period	Reporting	Review	Outcome
Bi-annual	Bi-annual progress reports	Internal review by M&E team	Adjustments to activities and immediate troubleshooting
Annually	Comprehensive annual report	Annual review workshop with stakeholders	Adaptive management and strategy refinement
Mid-Term (Year 5)	Mid-term report	In-depth analysis and review	Strategic shifts for the second half of implementation
End of Plan Period	Final implementation report	Final review with stakeholders	Recommendations for next steps and future actions

4.12 Logical Framework for the Kenya Grey Crowned Crane Action Plan

The Logical Framework (Log Frame) serves as a structured matrix that outlines the key elements of the Kenya Grey Crowned Crane Conservation Action Plan (GCCAP). It establishes the logical connections between the objectives, expected results, indicators, and means of verification, while identifying potential risks and assumptions that may influence the achievement of the goals.

This Log Frame provides a structured approach for tracking progress, managing risks, and ensuring that the Kenya Grey Crowned Crane Conservation Action Plan achieves its conservation goals.

Table 8: Logical Framework for Grey Crowned Crane Conservation in Kenya.

1. Objective: Reduce threats causing adult and juvenile mortality					
Narrative Summary	**Target**	**Indicator**	**Means of Verification**	**Frequency and Timing of Collection**	**Risks/Assumptions**
Outcome: Reduced mortality and injury of Grey Crowned Cranes due to human activities.	Direct persecution, poaching, and illegal trade reduced by 80% by 2029.	% Reduction in direct persecution, poaching, and illegal trade	Annual GCC population report and incident reporting	Annually	Coordinated reporting from all stakeholders and regions.
Output 1.1: Direct persecution of cranes significantly reduced.	No direct persecution taking place by 2029.	% reduction in direct persecution of cranes	Number of reported direct persecution incidents in GCC annual population report	Annually	Stakeholder willingness to cooperate in reporting and data collection.
Activity 1.1.1: Conduct anti-persecution campaigns in key areas.	80% of key GCC areas covered by 2027	% of key areas with active anti-persecution campaigns	Campaign reports	Semi-annual	Effective community engagement in anti-persecution efforts.
Output 1.2: Illegal poaching significantly reduced.	Poaching reduced by 80% in 5 years.	% reduction in poaching incidents	Number of poaching incidents reported in annual GCC report	Annually	Law enforcement effectiveness in anti-poaching efforts.
Activity 1.2.1: Strengthen poaching surveillance and law enforcement.	90% reduction in poaching activities in identified hotspots by 2029	% of hotspots under active surveillance	Surveillance reports	Quarterly	Strong collaboration between law enforcement and local communities.
2. Objective: Reduce threats causing reduced breeding performance					
Outcome: Improved breeding success and reduction of factors limiting reproduction.	Breeding performance improved by 60% by 2029.	% increase in successful breeding outcomes	GCC breeding success reports	Annually	Climate conditions remain stable for breeding success.
Output 2.1: Impact of drought and flooding minimized on breeding sites.	Developed guidelines on drought and flood response by 2027.	% reduction in losses due to climate events	Number of successfully prevented losses	Annually	Sufficient capacity of crane conservation teams to implement guidelines.
Activity 2.1.1: Develop and disseminate drought and flood response guidelines.	Guidelines available and in use by 2027	% of crane conservation areas using guidelines	Training and dissemination reports	Semi-annual	Stakeholder engagement in adopting guidelines.

Narrative Summary	Target	Indicator	Means of Verification	Frequency and Timing of Collection	Risks/Assumptions
Output 2.2: Wetland habitat destruction minimized.	No further draining of critical wetlands by 2029.	% of wetland area preserved	Wetland maps showing vegetation change	Every three years	Willingness of stakeholders to protect private wetland habitats.
Activity 2.2.1: Collaborate with landowners to protect wetlands.	Agreements with 80% of wetland landowners by 2026	% of wetland areas protected by agreements	Land use agreements and wetland protection records	Annually	Goodwill from landowners to preserve wetland areas.
3. Objective: Reduce habitat loss, fragmentation, and degradation					
Outcome: Improved quality of Grey Crowned Crane habitats.	Habitat restoration and protection increased by 70% by 2029.	% of habitat restored or protected	Annual habitat restoration reports	Annually	Restoration projects are supported by local communities.
Output 3.1: Invasive species controlled in critical crane habitats.	90% of invaded areas restored by 2029.	% of previously invaded areas restored	Restoration project reports	Annually	Effective collaboration with local environmental authorities.
Activity 3.1.1: Implement invasive species removal projects.	80% of invasive species removed from identified areas by 2027	% of areas cleared of invasive species	Field reports from removal teams	Semi-annual	Continuous funding for removal projects.
Output 3.2: Agriculture expansion controlled in crane habitats.	Agriculture expansion reduced by 60% in key habitats by 2029.	% of agricultural land converted back to crane habitats	Agriculture audit reports and satellite imagery	Annually	Willingness of farmers to adopt alternative livelihoods.
Activity 3.2.1: Promote sustainable agricultural practices in crane habitats.	70% of farmers adopting crane-friendly agriculture by 2026	% of critical crane areas under sustainable agriculture	Field monitoring reports	Quarterly	Adoption of sustainable agricultural practices by local farmers.
4. Objective: Address knowledge gaps in crane conservation					
Outcome: Increased knowledge and data availability for Grey Crowned Crane conservation.	Population trends and breeding data collected annually until 2029.	% increase in data on GCC population and breeding trends	Population and breeding reports	Annually	Effective data collection tools and techniques.

Narrative Summary	Target	Indicator	Means of Verification	Frequency and Timing of Collection	Risks/Assumptions
Output 4.1: Population size and trends estimated and monitored.	GCC population trends determined by 2027.	% of crane range monitored	Annual population survey reports	Annually	Access to all crane habitats for surveys.
Activity 4.1.1: Conduct annual population surveys in key crane habitats.	100% of key crane habitats surveyed annually	% of key habitats included in the survey	Field survey reports	Annually	Sufficient human and financial resources for surveys.
Output 4.2: Breeding status data collected and analyzed.	Breeding status baseline determined by 2026.	% of breeding sites monitored	Breeding status reports	Annually	Community cooperation in monitoring breeding sites.
Activity 4.2.1: Establish monitoring systems for breeding sites.	80% of breeding sites monitored annually by 2026	% of breeding sites covered by monitoring systems	Field monitoring reports	Annually	Availability of resources to sustain monitoring systems.
5. Objective: Mainstream relevant policies and ensure implementation					
Outcome: Strengthened policy frameworks supporting GCC conservation.	Policy gaps identified and amended by 2027.	% of policy gaps addressed	Policy reviews and legal documents	Annually	Government commitment to policy reforms.
Output 5.1: Site-specific management plans (SMPs) developed.	100% of key crane wetlands covered by SMPs by 2026.	% of key crane wetlands with active SMPs	Management plan documents	Annually	Willingness of stakeholders to adopt and implement SMPs.
Activity 5.1.1: Develop and implement SMPs for key wetlands.	80% of key crane wetlands covered by 2026	% of wetlands covered by management plans	Field reports on SMP implementation	Annually	Active participation of all stakeholders in SMP development.

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6.0 Annexes

Annex I: List of participants in the stakeholder's validation workshop for the National Single Species Action Plan held in Kisumu, 3 April 2024.

	Name	Gender	Institution/Affiliation
1.	Damaris Kisha	F	ICF/EWT/CANCO
2.	Collins Luseka	M	ICF/EWT/CANCO
3.	Maurice Wanjala	M	ICF/EWT/CANCO
4.	Dr. Wanyoike Wamiti	M	ICF/EWT/CANCO
5.	Christine J. Boit	F	KWS (Kisumu)
6.	Adan Daudi	M	KWS (Western Conservation Area)
7.	Lekishon Kenana	M	KWS (Conservation Science Program)
8.	Bethuel Thiong'o	M	KWS (Trans Nzoia)
9.	Eunice Mutunga	F	KWS (Siaya)
10.	David Oyugi	M	KWS (Homa Bay)
11.	Vasco Nyaga	M	WRTI (Homa Bay)
12.	Jackson Kibor	M	KWS (Homa Bay)
13.	Christine Winja	F	KWS (Conservation Science Program)
14.	Polycarp Okuku	M	KWS (Kisumu)
15.	Bakari Chongwa	M	KWS (Western Conservation Area)
16.	Benson D. Leparmorijo	M	Ministry of Interior (Kisumu)
17.	Charles Lwanga	M	Ministry of Interior (Homa Bay)
18.	Susan W. Waweru	F	Ministry of Interior (Siaya)
19.	Ken K'Oyooh	M	County Government of Kisumu
20.	Philly Nyarindi	F	County Government of Kisumu
21.	Francis Obwanga	M	County Government of Homa Bay
22.	Beryl Akinyi	F	WRA (Kisumu Basin)
23.	Erick Oduor	M	NEMA (Siaya)
24.	Margaret Wangare	F	NEMA (Trans Nzoia)
25.	Josiah Nyandoro	M	NEMA (Homa Bay County)
26.	Naomy Kipchumba	F	National Irrigation Authority
27.	Irene Nyakango	F	NMK (Kisumu Museum)
28.	Cecil Otieno	M	KeFS (Kisumu County)
29.	Hesbon Okal	M	KeFS (Kisumu)
30.	George Okoth	M	KeFS (Homa Bay)
31.	Emmanuel Situma	M	WCK (Kisumu)
32.	Josephine Wareta	F	Kenya Broadcasting Corporation (Radio)
33.	Kennedy Apalat	M	Kenya Broadcasting Corporation (Radio)

Annex II: List of participants in the stakeholder's validation workshop for the National Single Species Action Plan held in Eldoret on 4th April 2024.

	Name	Gender	Institution/Affiliation
1.	Eva Bii	F	ICF/EWT/CANCO
2.	Cynthia Wandare	F	ICF/EWT/CANCO
3.	Dr. Joseph Mwangi	M	ICF/EWT/CANCO
4.	Vivian Kitui	F	ICF/EWT/CANCO
5.	Dr. Wanyoike Wamiti	M	ICF/EWT/CANCO
6.	Neema Obiero	F	ICF/EWT/CANCO
7.	Bakari Chongwa	M	KWS (Western Conservation Area)
8.	Titus Mitau	M	KWS (Nakuru)
9.	Baret Wechuli	M	KWS (Nandi)
10.	Lekishon Kenana	M	KWS (Conservation Science Program)
11.	Samuel N. Wanuthua	M	KWS (Nakuru)
12.	Joseph Dadacha	M	KWS (Central Rift Conservation Area)
13.	Christine Winja	F	KWS (Conservation Science Program)
14.	Martin Werunga	M	KWS (Nakuru)
15.	Paul Sigilai	M	KWS (Kericho)
16.	Daniel Serem	M	KWS (Central Rift Conservation Area)
17.	Johnstone Emedele	M	KWS (Western Conservation Area)
18.	Musa Bett	M	KWS (HQ's)
19.	Okal Roy Reginald	M	Ministry of Interior (Uasin Gishu)
20.	Felix Kipkorir	M	Ministry of Interior (Elgeyo-Marakwet)
21.	Julius Maiyo	M	Ministry of Interior (Elgeyo-Marakwet)
22.	Dr. Anthony O. Oteng'o	M	University of Eastern Africa Baraton
23.	Erick Oriero	M	University of Eldoret
24.	Dr. Johnstone Kimanzi	M	University of Eldoret
25.	Rael Jepkemboi	M	County Government of Uasin Gishu
26.	Margaret Ayabei	F	County Government of Uasin Gishu
27.	Naomi Cheruto	F	County Government of Uasin Gishu
28.	Anne Chepkoech	F	County Government of Uasin Gishu
29.	John Sitienei	M	County Government of Uasin Gishu
30.	Daniel Lagat	M	County Government of Uasin Gishu
31.	Philip Lagat	M	County Government of Uasin Gishu
32.	Abigael Kipkurgat	F	County Government of Elgeyo-Marakwet
33.	Dr. Philemon Bureti	M	County Government of Nandi
34.	Nelson Koros	M	County Government of Nandi
35.	Risper C. Tarus	F	County Government of Nandi
36.	Jonah K. Biwott	M	County Government of Nandi
37.	Charles Korir	M	County Government of Bomet
38.	Omondi Omondi	M	NEMA (Uasin Gishu)
39.	Joshua Kolondo	M	NEMA (Elgeyo-Marakwet)
40.	Kisoro Kemboi	M	KAA (Eldoret International Airport)
41.	Linda Achieng'	F	FAO (Kenya)

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Plate 6: Participants of the central and north rift regional stakeholder's validation workshop held on 3 April 2024 in Eldoret..

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Annex III: List of participants in the stakeholder's validation workshop for the National Single Species Action Plan held in Naivasha on 23rd April 2024.

	Name	Gender	Institution/Affiliation
1.	Cynthia Wandare	F	ICF/EWT/CANCO
2.	Neema Obiero	F	ICF/EWT/CANCO
3.	Damaris Kisha	F	ICF/EWT/CANCO
4.	Vivian Kitui	F	ICF/EWT/CANCO
5.	Dr. Joseph Mwangi	M	ICF/EWT/CANCO
6.	Dr. Wanyoike Wamiti	M	ICF/EWT/CANCO
7.	Collins Luseka	M	ICF/EWT/CANCO
8.	Mwanahamisi Twalib	F	KWS (Nairobi National Park)
9.	Paul Wambugu	M	KWS (Nyahururu)
10.	Catherine W. Warui	F	KWS (Corporate Communications)
11.	Christine Winja	F	KWS (Conservation Science Program)
12.	Linus Kariuki	M	KWS (Species Program)
13.	James K. Kilel	M	KWS (Community Service Nakuru)
14.	Lydia Illa	F	KWS (Management Planning)
15.	James Nyaga	M	KWS (Ngong)
16.	Francis Mutuku	M	KWS (Naivasha)
17.	Rose A. Malenya	F	KWS (Laikipia)
18.	Elema Hapicha	F	KWS (Mountain Conservation Area)
19.	Paul Wambi	M	KWS (Amboseli National Park)
20.	Lekishon Kenana	M	KWS (Conservation Science Program)
21.	Solomon Kyalo	M	KWS (MEAs)
22.	Oundo N. Agnes	F	KWS (HQs)
23.	Theophilus Mutwiri	M	KWS (Mountain Conservation Area)
24.	Fredrick Sambu	M	KWS (Amboseli National Park)
25.	Daniel Serem	M	KWS (Central Rift Conservation Area)
26.	Joseph Dadacha	M	KWS (Central Rift Conservation Area)
27.	Fredrick Kisera	M	KWS (Kiambu County)
28.	Irene-Rose Madindou	F	NMK (Nairobi)
29.	Manei Lydia Rimpem	F	WRTI (Naivasha)
30.	Samuel Mungai Njeri	M	WRTI (Naivasha)
31.	Dr. Judith Nyunja	F	WRTI (Naivasha)
32.	Mary Njoki	F	County Government of Nakuru
33.	Samuel Bakari	M	County Government of Nyandarua
34.	Caroline Muriuki	F	NEMA (Nairobi)
35.	Joseph Nzainga	M	KAA (Jomo Kemyatta International Airport)
36.	Oben N. Mose	M	Ministry of Interior (Nakuru)
37.	Caroline Maina	F	Kenyatta University
38.	Celline Achieng'	F	Laikipia Wildlife Forum
39.	Catherine Mungai	F	IUCN (Nairobi)
40.	Francis Kithure	M	Cranes Eco-Care Foundation, Meru
41.	Dr. George Njagi	M	Wildlife Clubs of Kenya (Nairobi)
42.	John Gitogo	M	Friends of Kinangop Plateau
43.	Theresa Aoko	F	East African Wild Life Society
44.	George Ndung'u Muigai	M	Crane Conservation Volunteers
45	Paul Gacheru	M	Nature Kenya

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Plate 7: Participants from the Central Rift, Mountain, and South Conservation Areas in the validation workshop held in Naivasha on 23 April 2024.

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Annex IV: Institutions that participated at the regional and national validation workshops

COUNCIL OF GOVERNORS

REPUBLIC OF KENYA
MINISTRY OF TOURISM AND WILDLIFE

Ministry of Interior and Coordination of National Government

MINISTRY OF ENVIRONMENT, CLIMATE CHANGE & FORESTRY

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NatureKenya
THE EAST AFRICA NATURAL HISTORY SOCIETY

IUCN

FAO
FIAT PANIS


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ISBN 978-9914-37-166-6
9 789914 371666