WILDLIFE RESEARCH & TRAINING INSTITUTE

Discover Beyond

POLICY GUIDELINES FOR WILDLIFE CENSUSES IN KENYA

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FOREWARD

Article 69(1)(h) of the Constitution of Kenya, 2010 calls for utilisation of the environment and natural resources for the benefit of the people of Kenya, and that 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. Further, the Wildlife Conservation and Management Act, 2013 provides for monitoring mechanisms under section 64(1) which requires the Cabinet Secretary responsible for wildlife matters, on his or her own motion or on recommendation of the Board of the Institute, develop monitoring mechanisms and set indicators to determine: (i) sound management of wildlife resources in Kenya; and (ii) trends affecting Kenya's wildlife conservation and management. Section 64(2) provides that the Cabinet Secretary shall require any person collecting data or information that is relevant to the wildlife resources to regularly report to the Cabinet Secretary on the results of the monitoring mechanisms against the predetermined indicators set out in the national wildlife conservation and management strategy prescribed under the Act. The Act under Section 64(3) provides for at least once every five years, submission to the National Assembly, a wildlife resources monitoring report showing the achievement made in the implementation of the past or subsisting national wildlife conservation and management strategy and avail the said wildlife resources monitoring report to the public. Sustainable conservation of wildlife resources is also emphasized in the National Wildlife Strategy 2030.

Recognising the contribution of wildlife to country's Gross Domestic Product (GDP) and provision of critical ecosystem services upon which millions of community livelihoods depend, the Institute, together with the Kenya Wildlife Service (KWS) and stakeholders has developed this policy guidelines for wildlife censuses to provide guidance in scheduling and standardized methods to employ when undertaking wildlife censuses and other biodiversity monitoring exercises. It is expected that these guidelines will provide harmony and consistency in wildlife data collection and that any variations in results are not attributed to adoption of different methodologies and timings. This will

enable a well-informed wildlife sector, sustainable wildlife conservation and enhanced contribution to Kenya's economy.

The development of this guidelines is in line with the Institute's mandate under section 51 of the Wildlife Conservation and management Act, 2013 on undertaking and coordinating wildlife research. It is the desire of the Institute to provide stewardship on wildlife research and on data archiving, retrieval and dissemination to facilitate sustainable conservation and management of the wildlife resources in the country.

DR. DAVID OLE NKEDIANYE
CHAIR OF THE BOARD

PREFACE

Section 51 of the Wildlife Conservation and Management Act, 2013 mandates the Institute to conduct and coordinate all forms of wildlife research and related emerging issues to support planning and decision making by different stakeholders. Further, section 52(1)(a) of the Act provides for the Institute to collect and analyse wildlife data and information relating to inventory and status of wildlife resources as well as trends and wildlife statistics.

To facilitate carrying out of this function, the Institute in conjunction with KWS and stakeholders developed this guidelines whose purpose is to provide guidance in scheduling and to recommend standardized methods to employ when undertaking wildlife censuses. It is expected that the guidelines will provide certainty that any changes detected when undertaking wildlife censuses are due to factors not attributed to different methodologies and timings. It is also expected that the guidelines will promote ease of planning and executing wildlife censuses; guide stakeholders and researchers on the process for conducting wildlife censuses; encourage sharing of wildlife data and information; and support a process that will monitor and review wildlife data and information flow.

The scope of the guidelines applies to both terrestrial and marine fauna and flora in all areas where wildlife exists in Kenya. They have been based on key guiding principles including the recognition that wildlife is a public resource, the need for applying best scientific methods and data analyses when undertaking wildlife censuses, the need for inclusivity and participatory approach by stakeholders in wildlife censuses, and the importance of data access and sharing among stakeholders. Activities for pre-census logistics and preparations, census designs and methods, data management and analyses, reporting, and a wildlife calendar have been included. An analysis of relevant legal and policy frameworks as well as a list of stakeholders and partners relevant to wildlife censuses has been provided. The latter may not be exhaustive and will be reviewed from time to time.

The implementation of this guidelines will require concerted efforts by all players to ensure successful censuses that will provide accurate data and information to guide management approaches and policy in the wildlife sector.

DR. PATRICK OMONDI, OGW
DIRECTOR/CEO

ACKNOWLEDGEMENT

This census guidelines have been developed with the support of the Institute's internal resources. The Director/CEO approved and initiated this process in order to facilitate standardized wildlife censuses and reporting in Kenya for enhancing evidence-based decisions and policy formulation.

The Institute is grateful to the Board and Management of KWS for supporting the formulation of this guidelines. Many thanks to all the partners and stakeholders who contributed immensely to the enrichment of the guidelines. The Board and Management of WRTI are grateful to all staff who dedicated their time and efforts to coordinate and participate in the development of the guidelines.

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ACRONYMS

CAK	Conservation Alliance of Kenya
DRSRS	Directorate of Resource Survey and Remote Sensing
DTA	Data transfer agreement
GIS	Geographic Information Systems
GPS	Global Positioning System
IDMS	Integrated data management system
IMP	Inventory and Monitoring Plan
IPR	Institute of Primate Research
KEMFRI	Kenya Marine and Fisheries Research Institute
KENTTEC	Kenya Tsetse and Trypanosomiasis Eradication Council
KWCA	Kenya Wildlife Conservancies Association
KWS	Kenya Wildlife Service
NACOSTI	National Commission for Science, Technology and Innovation
NGO	Non-Governmental Organisation
NMK	National Museums of Kenya
WCMA	Wildlife Conservation and Management Act
WRTI	Wildlife Research and Training Institute

DEFINITION OF TERMS

This section defines technical terms used in the text to make it easier for readers to understand the policy guidelines better without having to make reference to a second document or other literature. Many of the definitions are based on those provided in most wildlife ecology as well as wildlife conservation and management books. Citations for other sources are provided with the definition.

TERMINOLOGY	DEFINITION
Accuracy	Accuracy is a measure of bias and precision measures variability in estimate A sample-based estimator is considered accurate when multiple sampling trials give a very similar answer that on average is the same as the true value for the parameter of interest. Survey/sampling design should aim to minimise bias and maximise precision of estimates (Williams *et al.,* 2002)
Adaptive Management	A structured process that promotes flexible, informed decisions that allow us to make adjustments as we better understand outcomes from management actions and other events. Careful monitoring of these outcomes both advances scientific understanding and helps adjust policies or operations as part of an iterative learning process (see Monitoring to inform management below; (Williams and Brown 2012)
Attribute	A feature or process of the environment that can be measured or estimated and that provides insights into the state of a resource or related ecological indicator (Elzinga *et al.,* 2001)
Bias	The difference between the expected value of an estimator and the parameter it is meant to estimate. Biased statistics either overestimate or underestimate the true value (United States Fish and Wildlife Service, 2013).

Data	Raw or unorganised facts (such as alphabets, numbers or symbols, measurements taken during sampling) that refer to or represent, conditions, ideas, or objects, symbols or signals that are input, stored that need to be processed to make it useable (United States Fish and Wildlife Service, 2013).
Central Repository	Central repository of data including metadata and data description and collection process
Detectability	The conditional probability that an individual from a population will be observed or captured on a sampling unit, given that the species is present (Vesely *et al*., 2006).
Indicator	Indirect measure of a biotic or abiotic resource or process targeted in a survey (Elzinga *et al*., 2001).
Influential Scientific Information	To be considered influential, scientific information must be based on objective and quantifiable data and constitute a principal basis for substantive positions adopted by WRTI. Information is influential if the same decision would be difficult to arrive at if that information was absent (United States Fish and Wildlife Service, 2013).
Initial Survey Instructions	Notes or other materials describing survey objectives or some of the procedures used to conduct a Refuge System survey. The term used to describe the initial phase of survey protocol development in WRTI policy (United States Fish and Wildlife Service, 2013).
Inventory	Survey(s) to quantify the presence, abundance and/or distribution of target taxa, habitat extent and structure, and/or abiotic features (United States Fish and Wildlife Service, 2013).
Inventory and Monitoring Plan	Survey(s) to quantify the presence, abundance and/or distribution of target taxa, habitat extent and structure, and/or abiotic features (United States Fish and Wildlife Service, 2013).

Metadata	Description of the content, quality, history, condition, and other characteristics of recorded information. WRTI Scientists must create metadata that meets specific standards for newly collected or produced geospatial and biological data in order to measure progress towards management and conservation goals (United States Fish and Wildlife Service, 2013).
Monitoring	A survey repeated through time to document changes in select attributes of wildlife, plants, habitats, ecological communities, or abiotic resources (United States Fish and Wildlife Service, 2013).
Baseline Monitoring	Monitoring that is not tied to specific predictions of how a natural resource will respond to management or environmental stressors, but instead is designed to document change over time of a natural resource. Also referred to as surveillance monitoring, examples include monitoring climatic parameters, species population trends over time, disease incidence, contaminants, and wilderness character (United States Fish and Wildlife Service, 2013).
Monitoring to Inform Management	Monitoring to assess whether a natural resource is approaching or exceeding a defined threshold or if a resource is responding to a management action or system stressor in a specified manner. This type of monitoring involves defining the threshold values or expected response, then surveying to measure the response or a closely related indicator. Comparing monitoring results with these expected values may indicate the need for initiating, intensifying, or altering management actions. In these guidelines, it generally means monitoring in an adaptive management context to improve management or evaluate progress toward achieving management objectives. Also referred to as targeted monitoring (United States Fish and Wildlife Service, 2013).

Objective, Management	A concise statement of desired outcomes that specifies what we want to achieve, how much we want to achieve, when and where we want to achieve it, and who is responsible for achieving it (United States Fish and Wildlife Service, 2013).
Objective, Sampling	Specifies target levels of accuracy and precision required to reliably interpret the data collected in a survey. These targets determine the level of rigor needed to meet the objectives (United States Fish and Wildlife Service, 2013).
Parameter	A summary value for a variable measured on the sampling units in the sample frame. Examples include the population mean and variance (United States Fish and Wildlife Service, 2013).
Power (Statistical)	The probability of detecting an effect given that there is an effect of specified magnitude. Power calculations require specifying sample size, variability in the data, the specific statistical test, the alpha level, as well as the magnitude of the assumed true effect (United States Fish and Wildlife Service, 2013).
Precision	Variability of measurements within or among samples. The standard error and the coefficient of variation often are used to quantify precision of a parameter. Precision contrasts with bias, which focuses on how the average sample estimate differs from the true value (United States Fish and Wildlife Service, 2013).
Guidelines	Detailed instructions for conducting a survey. This includes information on sampling procedures, data collection, management and analysis, and reporting of results. In this handbook the term guidelines refer to either a census guidelines framework or a site-specific or species-specific survey guidelines (United States Fish and Wildlife Service, 2013).
Information	Data processed, organized, structured or presented in a given context so as to make it useful (United States Fish and Wildlife Service, 2013).

Protected Area	Any unit of the National Wildlife Protected Areas System, including terrestrial and marine parks, reserves, sanctuaries, conservancies, wetland areas, and associated waterfowl production areas (United States Fish and Wildlife Service, 2013).
Reliability	Confidence in the information for making decisions. Reliability is determined by several factors including precision of estimates, scientific rigor of the survey and how data are collected (United States Fish and Wildlife Service, 2013).
Resolution	The ability to distinguish different objects or elements from a background. Clarity or graininess of an observation (Forman, 1995).
Rigor	The standard of quality in the effort invested to obtain results. Survey rigor is derived from the level of effort, scientific and technical expertise, and intensity devoted to planning and gathering data (United States Fish and Wildlife Service, 2013).
Sample Size	The number of units within the sample frame that are selected for sampling. Sample frame. The collection of all possible sampling units from which the sample is selected; used to estimate the chance of selecting a sample unit (United States Fish and Wildlife Service, 2013).
Sampling Units	The units that are selected for collecting data in survey; these units may include individual organisms, quadrats, transects or points on a map (United States Fish and Wildlife Service, 2013).
Standard Operating Procedure (SOP)	A written document or instruction detailing all relevant steps and activities of a process or procedure (paraphrased from EPA 2007) (United States Fish and Wildlife Service, 2013).
Summary Statistic	A summary of measurements from a sample that estimates a parameter (United States Fish and Wildlife Service, 2013).

Survey	A specific data-collection effort to complete an inventory or conduct monitoring of biotic or abiotic resources (United States Fish and Wildlife Service, 2013).
Survey Coordinator	A Institute employee, usually the Scientist, who oversees the implementation of one or more surveys selected in an Inventory and Monitoring Plan (IMP). This includes selection of survey protocols that adhere to standards of scientific excellence. The survey coordinator also ensures that survey data are managed, analyzed and reported, and results are archived in WRTI database. When surveys involve implementation by cooperators or partners, the survey coordinator ensures that the inventory and monitoring (I&M) policy requirements for surveys are met (United States Fish and Wildlife Service, 2013).
Target Universe	The population about which you want to make an inference .(United States Fish and Wildlife Service, 2013)
Type I, Type II Errors	Type I errors are 'false positives' that occur when you wrongly reject a hypothesis of no effect. Type II errors are 'false negatives' that occur when you wrongly fail to reject a hypothesis of no effect (United States Fish and Wildlife Service, 2013).
Uncertainty	The extent to which we cannot reliably predict the outcome or result of an action or event, or prove that something is true. In a monitoring context, it generally refers to the accuracy of conclusions drawn from survey data or models, or the correctness of our predictions as to how a species or habitat will respond to a management action. Sources of uncertainty about management effectiveness include ecological (structural) uncertainty, environmental variation, partial controllability, and partial observability (taken from concepts in) (Nichols *et al.*, 2011).

Wildlife	Means any wild and indigenous animal, plant or microorganism or parts thereof within its constituent habitat or ecosystem on land, or in water as well as species that have been introduced or established in Kenya (WCMA, 2013).
Wildlife Data	Means a set of values with respect to qualitative or quantitative variables related to wildlife (WCMA, 2013).

1.0 INTRODUCTION

1.1 Wildlife populations in Kenya have been negatively affected by changing land-uses and land tenure systems, habitat degradation due to overutilization by livestock and recurrence of droughts as well as habitat fragmentation due to increased human population growth, spread of invasive species, expansion of farms and rural and urban settlements and development of infrastructure (roads and railways) in wildlife habitats.

1.2 Most of the affected species are small to large sized mammals, birds, herpato-fauna, invertebrates and plants. It is therefore important to document the status and population trends of animals and plants in Kenya.

1.3 Wildlife resource monitoring is "the collection and analysis of repeated observations or measurements to evaluate changes in condition and progress toward meeting management objectives (Elzinga *et al*. 1998).

1.4 To be certain that changes detected by monitoring are actually occurring in nature and not simply a result of measurements taken by different people or in slightly different ways, standardised protocols/guidelines with sufficient details needs to be developed and implemented as part of all long-term monitoring programs (Geoghegan *et al*. 1990, Shampine 1993, Geoghegan 1996, Beard *et al*. 1999).

1.5 The Wildlife Census guidelines will be:

a) A key component of quality assurance for wildlife monitoring program in the Country to ensure that data meet defined standards of quality with a known level of confidence,
b) Necessary for the National Wildlife Monitoring Program to be credible so that data stand up to external review,
c) Necessary to detect changes in a population over time, and
d) Necessary to allow comparisons of data among places and agencies.

1.6 As part of planning and designing a long-term wildlife monitoring program for all protected areas in Kenya, WRTI and KWS have developed these guidelines for undertaking wildlife censuses in the Country.

1.7 The guidelines will help overcome the unique challenges posed by long-term monitoring. Wildlife censuses will be guided by these guidelines to monitor population trends and their drivers of change in protected areas and ecosystems under the management of KWS, Community and Private Conservancies as well as in individual or community lands.

2.0 GOAL, OBJECTIVES AND SCOPE OF THE GUIDELINES

2.1 The goal of these guidelines is to standardize wildlife censuses in Kenya to ensure that standard wildlife census methods are used at the appropriate time for scientific comparison of time series wildlife data.

2.2 The overall objective of these guideline is to provide timely wildlife data and information to guide decision making and policy. The specific objectives are to:

a) Provide guidance to Section 64 of the WCMA, 2013 in relation wildlife monitoring mechanisms;
b) Ensure well-planned and executed wildlife censuses;
c) Guide stakeholders and researchers;
d) Encourage a structured mechanism of sharing wildlife data and information; and
e) Support a process that will monitor and review wildlife data, information flow and document the state of Kenya's wildlife to inform policy.

2.3 The scope of the census guidelines covers species listed in Schedule Six of the Wildlife Conservation and Management Act, 2013. The animal species fall within five taxonomic classes namely Amphibians, Birds, Fish, Mammals and Reptiles found in Kenya. The guidelines will also apply to other species not included in Schedule Six of the Act such as invertebrates. They will also apply to plants including terrestrial vascular plants and marine species such as mangroves and

seaweeds. The guidelines focus on census within key wildlife ecosystems in Kenya. These include Key Biodiversity Areas (KBA), forests, wetlands, parks, reserves, sanctuaries, conservancies, ranches, cultural heritage sites, dryland, hilltops, corridors and dispersal areas, and private and community land where wildlife exists.

2.4 The guidelines will ensure that wildlife censuses are scheduled accordingly to facilitate submission of the wildlife resource monitoring report as stipulated by section 64(3) of the WCMA 2013, which states "The Cabinet Secretary shall, at least once every five years, submit to the National Assembly a wildlife resources monitoring report showing the achievement made in the implementation of the past or subsisting national wildlife conservation and management strategy and avail the said wildlife resources monitoring report to the public".

3.0 GUIDING PRINCIPLES

The following guiding principles support these guidelines:

a) That wildlife is a public resource;
b) That standard scientific methods and analysis shall be used;
c) That the approach shall be inclusive and participatory;
d) That there shall be Access and sharing of census data and information; and
e) That the precautionary principle shall apply where necessary.

4.0 PRE-CENSUS LOGISTICS AND PREPARATION

4.1 For any census proposal, the timing of fieldwork is critical for undertaking the census and reporting process. Careful consideration of the necessary lead-time is required, as it may be necessary to undertake census at specific times of the year depending on the ecology of the species.

4.2 Censuses over multiple years may be required where a single year's data is not adequate to detect the species or to address environmental factors.

4.3 There may also be a time lag due to the availability of appropriate species census method expertise. Proponents should make allowance for this lag when planning census projects.

4.4 Commissioning wildlife census as early as practicable in the planning/site selection phase of a census project will help avoid potential delays in approvals by the WRTI.

4.5 Effective census should always begin with a thorough examination of the literature to identify the best times, locations and techniques for census. The profiles in this document provide a basis for effective census for mammal species currently listed as threatened at a national level in Kenya.

4.6 The pre-census logistics and preparations (operational requirements) shall include the following: Budget; Staff time; Schedule; and Coordination.

4.6.1 Budget

Undertaking wildlife censuses will incur costs and therefore a budget that shall be as detailed as possible is required. The common budget items include but are not limited to the following:

a) Personnel costs (local travel and accommodation; transport refunds for participants from other areas)
b) Vehicle (including boats) running expenses e.g. number of vehicles required; expected kms to be coverage
c) Vehicle (including boats) maintenance expenses (usually at 30% of the vehicle running)
d) Stationery (This will include all the stationery required during the census and include the following: printing papers, pencils, pens, note books, erasers, pencil sharpeners, GPS batteries, voice recorder batteries, masking tapes, clip boards, flash disks, external hard drives among others)
e) Purchase of equipment where necessary. These may include GPS units, voice recorders, headphones, camera, rangefinder, and binoculars etc. These shall be procured on need bases but not at each and every census.

f) For aerial surveys, aircraft fuel (Av-Gas and Jet-A1) is a main consumer of the budget. It is important to have a good estimate of the amount of fuel required during the census.
g) Operation base: This will be important as it will be used as an operational base by the team.
h) Personnel movements (air/road). This is applicable when the census area is far, which makes it cheaper for census crew travelling from far to use air or road transport.

4.6.2 Staff time

A list of all participants shall be prepared. The list should have roles of each participant and the number of days of participation per individual during the census. The roles may include: observers, data collection crew, drivers, census administrators, security personnel, technicians, mechanics, and trainers among others.

4.6.3 Scheduling

Appropriate scheduling is important in order to ensure planning is adequately undertaken and all resources (financial, equipment and materials) are acquired on time. By the time the first planning meeting is held, a census concept should be in place for review and adoption.

4.6.4 Coordination

When necessary, major censuses that cover large ecosystems and with multiple stakeholders shall be coordinated by WRTI. Other small-scale censuses shall be coordinated by the leading institution after requisite approvals, but with a representation from WRTI.

For the WRTI led censuses, the Director/CEO in conjunction with KWS Director General shall appoint a Census Planning Committee that shall include field scientists, respective area managers, protected area managers and relevant conservation partners working in the area. This shall aim to ensure transparency in the census methodology and results emanating from the census.

5.0 DESIGN OF A CENSUS

5.1 Study design

Different designs will be used for different census methods (Table 1). For example, for total aerial census including large mammalian species, the census area shall be divided into blocks of about 600km^2. This is to ensure the aircraft assigned to one block completes the wildlife count therein in one day (6 hours, 3 hours in the morning and 3 hours in the afternoon). Even so these smaller blocks shall be developed from larger blocks that shall have been delineated based on certain physical features as rivers, mountains or any other barriers that can influence wildlife movements. For sample aerial censuses, the area shall be divided into grids measuring 5km by 5km and each aircraft will be assigned about 100 units each day (early morning and late afternoon). The DRSRS has since the 1970s conducted such similar sample counts and therefore it is crucial that these counts are continued to allow for statistical analysis of population trends into the future.

For ground census, the area shall be divided into blocks that can be covered in about 4 hours by vehicle. The road networks act as block boundaries. The blocks should have adequate road network to enable the observers to drive within it and using binoculars to count the wildlife therein. Where the ground census is done on foot, the roads are used as bases for starting point of transects.

Detailed outline of sampling designs used to measure habitat and species attributes and count different species of wildlife are provided in the Ecological Monitoring and Procedure Manual (KWS, 2020), cross-border aerial census manual (KWS, TAWIRI and AWF, 2015), and publications by Norton-Grifiths, 1978 and Doughlas-Hamilton, 1996.

5.2 Sampling units, sample frame, and target universe

The sampling units shall be the census blocks, line transects, point transects, plots, and camera stations among others

The checklist of species to be counted and human activities to be established shall form the sampling frame.

The name of the protected area, conservancy and/or ecosystem shall constitute the target universe, including natural, rural, and urban settings.

5.3 Sample selection and size

For estimation of sample size, knowledge on the population size, expected confidence level, margin of error (confidence interval), standard deviation and z-scores shall be important to estimate. Then, the sample size (for unknown population or a very large population) shall be determined using the following formula (Israel, 1992):

Required sample size = $(\text{Z-score})^2 \times \text{StdDev} \times (1\text{-StdDev}) / (\text{Margin of error})^2$

Details on strategies for determination of sample size and its moderation for small and large populations is discussed in details by Israel (1992). The key strategies shall include using a census for small populations, using a sample size of a similar study, using published tables and using a formula to calculate sample size (Israel, 1992). The selected samples shall follow the species number and area curve model that ensures that the number of species identified flattens at given size of area sampled as described by MacArthur and Wilson (1967) and Smith (2013).

The sample selection for aerial surveys shall follow standard methods documented by Norton-Griffiths (1978) and Doughlas-Hamilton (1996).

5.4 Sources of error

The sources of errors/biases during data collection and management include: observer bias, typing errors, double counts, detectability, timing of survey, weather, animal behaviour, sampling, and poor equipment. Method specific biases are found in the Ecological Monitoring and Procedure Manual (KWS, 2020)

6.0 FIELD METHODS

Different field methods shall be used for different species and ecosystems. They shall range from total and sample aerial census, total and sample ground census, carnivore ground census, bioacoustics methods, underwater visual census, and remote sensing technology. These methods are described below.

a) Total aerial census

The method adopts total count methodology developed from peer reviewed methods including by Norton-Griffins (1978) and Douglas-Hamilton (1996), and Standard Operating Procedures applied in Kenya. It is preceded by training for ground and flight crews on the methodology including data collection, species identification, carcass aging, and counting and estimation with confidence among others. The survey aircrafts are flown through predetermined transects spaced at 1 km intervals where the crews count the targeted species and record human activities within 500 metres width on each side of the aircraft.

This method is applied in key biodiversity ecosystems of the Greater Mara, Amboseli-Magadi, Laikipia/Samburu/Marsabit, Meru, Tsavo, Athi-Kapiti, Yatta, Nakuru-Naivasha, and Lamu-Boni; small enclosed conservation areas like Ruma and Lake Nakuru national parks, Mwea national Reserve and Solio conservancy; and marine mega-fauna species.

The method determines the total counts for elephants, buffaloes and giraffes and estimates presence and abundance of other species larger than the dik dik.

b) Sample aerial census

This entails Systematic Reconnaissance Flight (SRF) methodology described by Norton-Griffins (1978). It is preceded by refresher training for ground and flight crews and calibration of aircrafts which includes flying altitude of 400 ft above the ground and counting targeted species within a strip of 300 meters on both sides of the aircraft. The method is used in the northern parts of the country including Garissa, Wajir, Mandera, parts of Marsabit and Turkana.

c) Sample ground census

The method entails walking or driving along established roads or using predetermined transects as prescribed in the KWS Ecological Monitoring and Assessment Manual (2020) and counting wildlife species on both sides of the road/transect. It is applied in key biodiversity ecosystems to complement total and sample aerial census. In forested ecosystems, other approaches including estimation of species abundance using dung counts and camera traps are applied.

In addition, the method is used to count species not included in aerial censuses like birds, primates and small mammals. The method is also used for small mammals like rodents, shrews, bats, amphibians, and reptiles using different tools depending on targeted species including mist nets, sweep nets, pit traps, camera traps, and Sharman traps among others. It is is also used for vegetation surveys during ground counts by applying line or strip transects for woody vegetation and quadrants for herbaceous plants and grass species.

d) Carnivore ground census

Different methods are applied to count carnivore species. These include camera traps, individual identification using Spatially Explicit Capture Recapture (SECR) and Capture Mark Recapture Techniques (CMRT), and call backs of recorded herbivore sounds, and spoors count.

e) Total ground census

The method applies to small enclosed conservation areas like Nairobi and Lake Nakuru National Parks where predetermined counting blocks are surveyed using existing road networks to count all animal species sighted. Daily individual identification and naming is used for critically endangered species like rhinos, Grevy's zebra, Sable antelope, Hirola antelope, and Roan antelope using developed species-specific monitoring programs

Citizen science approach for total ground census is applied for endangered wildlife species especially those in community areas like Grevy's zebra.

f) Bioacoustics methods

The method uses acoustic equipment to identify and estimate abundance of bats and marine species.

g) Under water visual census

The method entails diving into the oceans and other water bodies and using underwater cameras in predetermined survey transects and quadrants, estimation of abundance of various species including corals and sea grasses is made.

h) Remote sensing

This applies use of remote sensing technology to analyse remotely collected data on land use and land cover changes overtime.

Table 1 below provides methods applicable to different ecosystems and species of wildlife.

Table 1: Recommended census methods for different ecosystems and species

Census Method	Census Areas	Fauna & Flora Data Collected	Human Activities Recorded
Total aerial census	key biodiversity ecosystems of the Greater Mara, Amboseli-Magadi, Laikipia/Samburu/Marsabit, Meru, Tsavo, Athi-Kapiti, Yatta , Nakuru-Naivasha, and Lamu-Boni.	• Mammals larger than the dik dik and large birds like ostrich and ground horn bills • Total counts for elephants, buffaloes and giraffes. • Estimation of presence and abundance of other larger than the dik dik and large birds.	Cultivated areas, human settlements, livestock, logging, charcoal kilns, poachers' hideouts, and water points among others
	Helicopter counts for small enclosed conservation areas like Ruma and Lake Nakuru national parks, Mwea national Reserve and Solio conservancy.		
	Marine Ecosystems	Marine mega-fauna like Dugongs, whales, Dolphins, Sharks and Sea Turtles	Fishing nets and boats among others
Sample aerial counts	Northern parts of the country including Garissa, Wajir, Mandera, parts of Marsabit and Turkana.	• Mammals larger than the dik dik and large birds like ostrich and ground horn bills. • Vegetation surveys	Cultivated areas, human settlements, livestock, logging, charcoal kilns, poachers' hideouts, and water points among others
Sample Ground	Key biodiversity ecosystems to complement total and sample aerial	All terrestrial wildlife and plant species	Cultivated areas, human settlements, livestock, logging,

Census Method	Census Areas	Fauna & Flora Data Collected	Human Activities Recorded
Census	census.		charcoal kilns, poachers' hideouts, and water points among others
Carnivore ground census	All wildlife areas	All large carnivore species larger than the jackal	Cultivated areas, human settlements, livestock, logging, charcoal kilns, poachers' hideouts, and water points among others
Total Ground Counts	Small enclosed conservation areas like Nairobi and lake Nakuru National Parks rhinos, Grevy's zebra, Sable antelope, Hirola antelope, and Roan antelope using developed species-specific monitoring programs	All animal species	Cultivated areas, human settlements, livestock, logging, charcoal kilns, poachers' hideouts, and water points among others
Bioacoustics methods	Terrestrial and marine	Estimate abundance of bats and marine animal species	
Under water Visual Census	Marine ecosystems	Under water marine species like corals, sea grass, and macro-algae	Pollution, siltation, bleaching of corals and macro-algae species among others
Remote sensing	Terrestrial ecosystems	Land use and land cover changes	Degraded areas, fires, settlements, infrastructure, and deforestation

7.0 DATA MANAGEMENT AND ANALYSIS

7.1 Data capture, verification, and editing

Data shall be recorded in either dictaphones, Apps, and/or pre-developed data sheets. Data handling personnel shall be well trained on data capture, verification and editing. All the data shall be checked for accuracy and corrected for any errors before any analyses is undertaken.

7.2 Metadata

The cleaned and final metadata shall be organized into one shape file with all attributes stored therein. The metadata shall then be uploaded to the data storage server for secure storage.

7.3 Data security and archiving

The raw data and the cleaned metadata shall be stored and shared with WRTI according to the 'Guidelines for data and information access and sharing for the wildlife sector in Kenya'. Additional data shall be stored in hard drives by respective holders.

7.4 Analyses methods

Data analyses shall follow scientifically proven statistical methods. The choice and selection shall depend on the type of data collected and objectives of the research. Some such recommendations are described by Jolly (1969), Norton-Griffiths (1978), Douglas-Hamilton (1996), and Zar (1996).

For total and sample aerial census, summary tables of the number of wildlife species counted in the census area shall be tabulated. Non-parametric statistics may be used to test the observed number of wildlife species compared to previous census to discern whether population changes are statistically significant during the periods under review (Zar, 1996).

Long sample aerial censuses shall be analysed following procedures described by Jolly (1968) and outlined by Norton-Griffith (1978). Even so, many current and state of the art statistical methods have evolved and therefore these proposed methods do not limit researchers from exploring the best methods to get the most out of the data.

The choice of parametric or non-parametric analysis shall be dependent upon normality. When the distribution of data collected is established to be normal, parametric analysis may be undertaken following procedures described by Zar (1996). If the computed distribution of the data shall be found not normal, the data may be transformed as outlined by Zar (1996). This shall be followed by use of parametric statistics to discern statistical significance of observations under investigations. The interpretation of all analysed data shall follow procedures described by Zar (1996).

Other commonly used biodiversity estimators include indices such as Shannon Wiener Index (H') and Simpson's Index (λ) may be used to estimate diversity and dominance respectively for vegetation among other factors.

Effective communication may be enhanced through visualization. When transects and species distribution maps are necessary, these can be prepared using ArcGIS, R-GIS, Q-GIS or any other geospatial software at the disposal of the researcher.

8.0 REPORTING

8.1 Background

Census methods and level of search effort vary widely between habitats. Therefore, it is vital that census reports include detailed information on the methods used and the level of search effort adopted. This shall include who was involved, what work was carried out and where, when (both date and time of day) and how the census was conducted, as well as the climatic conditions at the time.

The census report shall follow the standard format common to all scientific research. This will facilitate interpretation of the census results and replication of the study for comparative purposes. It will be useful to record the GPS location of all sampling units and provide maps of the study area. Detailed descriptions of the habitat shall be recorded. Information on the condition of the habitat at the time of the census shall also be included, as this may be useful in later analysis. Documenting the habitat occupied by target taxa during the survey process, and a site description, will add value to the census. Documentation of observers and their skills is also important. Presentation of all mammal

taxa recorded will be essential as it can provide a measure of census effort and effectiveness.

It is important that reports contain suitable information to demonstrate the census was sufficient to draw the conclusions. Documenting the survey effort will be particularly important for species that might be present at very low abundance in the project area. Findings shall be supported by information such as photos of equipment used during the census and habitat structure, photos/records of scat or other trace material, summary tables of the results from the census, and photographs of mammals that were counted during the census. Tabulated GPS coordinates (Lat/Long or UTM) of sites and equipment placement will allow precise determinations of occurrence within a project area.

Maps shall be included that show the distribution of the species counted and any other feature of importance in the census area. Maps can also show the location of equipment placement such as trapping equipment, as well as GPS tracks of the transect path taken during active acoustic monitoring or searches. This will allow a better understanding and interpretation of census effort.

Reports shall carry some justification of the census design, whether it be opportunistic, systematic or focused on certain likely habitats. This shall include information on the habitat types present and the survey effort given to each. The design shall also distinguish between known or potential foraging, breeding and commuting habitats. For species that might be present at very low abundance, it will be important to describe the likelihood of presence based on habitat descriptions made as part of the survey. Explanations on the timing of the census, suitability of the weather, the speed and duration of transect travel and observations recorded shall also be given.

Census data shall be made available to National and County Governments and shall be included in the National Wildlife Database.

8.2 **Report contents**

The census reports shall have one standard report format. The report shall include the following sections:

i) **Topic:** The topic shall be short and precise. It shall be catchy to attract readers to want to read the report. An example of a census report could be, "Population Trend of Large Mammals in the Fragmented Landscape of Tsavo Ecosystem"

ii) **Authors:** This shall list all the authors who participated in developing the report. The first author shall have made the highest contribution in designing and developing the report. The authors list shall be arranged according to contribution of each author. This shall be determined by the lead author of the report. The last author shall be the overall supervisor of the census.

iii) **Table of Contents:** This section shall show the pages of the sections inside the report.

iv) **List of Figures:** The section shall list all figures in the report.

v) **List of Tables:** The section shall list all the tables in the census report

vi) **List of photographs (Plates):** This section shall list all photographs used in the report

vii) **Acknowledgements:** This section shall recognize and thank those who supported the census.

viii) **Introduction:** The section shall introduce the report including the justification for the census, goal and specific objectives

ix) **Materials and methods:** This section shall describe the census area, outline the sampling frame and sampling units, state the sample size and why use that sample size, describe how the data was collected and analyzed, sources of errors and outline any assumptions. Appropriate references shall be included for literature reviewed on the census area, methods and data analysis tools and software used as well as interpretation that guides the interpretation of the data.

x) **Results:** This section shall report on the findings after undertaking the census. It should be very precise and specific on the results. Where statistics are used, reports on these statistics shall follow standard procedures of describing statistical results.

xi) **Discussion:** The section shall provide a detailed comparison of the results with other results in the same area, other areas in Kenya and outside Kenya. Reasons for observed results should be provided in this section.

xii) **Conclusions:** Clear conclusions shall be provided in the report. The conclusions shall be based on results obtained from the census and associated reasons for the observed results.

xiii) **Recommendations:** The report shall also have clear recommendations. These shall be drawn from the results and reasons from the observed results. The recommendation shall be expected to guide management interventions and also identify other areas that require further research

xiv) **Reference:** All the references quoted in the report shall be listed in this section. Standard referencing approach shall be used. For WRTI reports, the referencing approach used by the African Journal of Ecology shall be used.

xv) **Annexes:** A list of annexes shall also be included in the reports. This will include the concept developed to source for funding to undertake the census, list of participants, raw census data, key and important photographs not included in the report and general maps not included in the other sections of the report but are important to be part of the report.

8.3 Reporting schedule

The reports shall be prepared immediately after the census. Where the census exercise will be time consuming and tiring, a break of 2-5 days may be necessary to allow the team to rest before they start data cleaning and report writing. Data cleaning and report writing for one census site shall not take more than 10 days. The census team leader shall ensure this schedule is strictly followed to facilitate provision of a draft report 14 days after the census is completed.

Once the draft report shall available, it shall be shared with all the authors for comments. The authors shall be given 5 working days to provide their comments to the lead report author. The lead author shall then incorporate the comments within a maximum of 3 days. Less days can be taken if only few comments are received.

In consultation with the WRTI's Director/CEO and Deputy Director Research, the lead author shall then identify 3 external reviewers for review of the census report. The review by external team shall be on "***pro bono***" basis. The reviewers shall be requested to review the report within 14 days and return the comments to the lead author.

8.4 Report distribution

It will be important to share the final report with the relevant National Government Departments and Agencies, County Governments, Conservation Non-Governmental Organizations, Development Partners, National and International Institutions of Higher Learning, and Conservancies.

Electronic copies of the report shall be uploaded to the websites of the ministry responsible for wildlife, KWS and WRTI. An electronic copy shall also be shared with other partners and institutions listed in Paragraph one above. They shall be requested to upload the final report in their websites.

Hard copies shall be shared with key entities that supported the census as well as libraries of different institutions and partners in Kenya. Other methods to ensure the outcomes are shared including with local communities shall include dissemination workshops. Social media platforms can also be used to share results.

All technical reports shall have an **ISBN Number** from the Kenya National Library services. Two copies of the report shall be deposited with the National Library Services as a Policy and Legal Requirement in the Country.

9.0 WILDLIFE CENSUS CALENDAR

A calendar for wildlife census in the country is summarized in Tables 2 to 4 below. The calendar is summarized for total aerial census, sample aerial census, and ground census for different wildlife species as well as vegetation surveys.

The total and sample aerial census shall be undertaken after every three (3) years (Table 2 and Table 3). For each census area, a dry and wet season census shall preferably be done each year. This shall enable seasonal comparison of population size and distribution of wildlife resulting to provision of data for long-term monitoring of wildlife during the two seasons.

Table 2: Calendar for Total Aerial Censuses

Census Region	Months	
	Dry Season	**Wet Season**
Amboseli-Magadi Ecosystem	September	April
Athi-Kapiti Ecosystem	October	April
Yatta B2 Ranch	October	April
Laikipia-Samburu-Marsabit Ecosystem	February	November
Meru Ecosystem	July	November
Lamu-Lower Garissa Ecosystem	September	May
Maasai Mara Ecosystem	November	May
Mwea National Reserve	July	April
Nasalot-South Turkana-Kerio Valley Ecosystem	August	April
Shimba Hills Ecosystem	September	May
Tsavo Ecosystem	February	April
Naivasha Ranches	August	June
Ruma National Park	February	June
Lake Nakuru National Park	January	June
Solio Ranch	December	June
Marine Ecosystem	September	April

Table 3: Calendar for Sample Aerial Censuses

County	Months	
	Dry Season	**Wet Season**
Mandera	February	May
Wajir	February	June
Garissa	March	June
Tana River	August	May
Turkana	July	April
Marsabit	March	November
Kilifi	February	April

Ground census for waterfowls, birds, herpatofauna (reptiles and amphibian) shall be done during the wet and dry seasons. Priority census sites shall include Important Bird Areas (IBAs), Species hotspots, Protected Areas (Parks, Reserves and sanctuaries), Conservancies and Ranches. Table 4 below provides a calendar for all the ground censuses as well as frequency of the census at each site.

Table 4: Calendar for Ground Censuses

Species	Sites	Census method	Census Period
Elephants	Shimba Hills National Reserve; Aberdare National Park; Mount Kenya National Park & Forest Reserve; Mau Forest Complex; Mount Elgon National Park; Arabuko Sokoke Forest Reserve; Marmanet Forest; and Roroki-Kirisia Forest	Indirect dung count	January, February, July, August, and September (dry season)
Waterfowls	All wetland areas- Amboseli swamp; Lake Nakuru, Lake Olbolosatt; Lake Naivasha; Lake Magadi; Lake Jipe; Lake Barigo; Lake Bogoria; Lake Turkana; Lake Kanyamboli; Lake Victoria; The Tana delta; Kesses dam; and the Seven Forks dams.	Ground count	January - February and November
Sitatunga	Sites as outlined by Waweru et al. (2021)	Ground count	July
Roan antelope	Ruma National Park	Ground count and individual identification	Daily with weekly and monthly reports
Sable	Shimba Hills National	Ground count	Daily with weekly and

Species	Sites	Census method	Census Period
antelope	Reserve	and individual identification	monthly reports
Rhino	All rhino sites except Solio conservancy	Individual identification	Daily with monthly reports to account for all rhinos
Mountain bongo	Aberdare National Pasrk, Eburu, Mount Kenya, Mau Forest Complex, and Mount Kenya wildlife Conservancy	Camera traps and individual identification	Monthly with monthly reports
Grevy's Zebra	Laikipia, Samburu, and Marsabit Counties	Citizen Science	January after every two years
Terrestrial birds and bats	All protected areas, conservancies, ranches, community areas and other important bird areas	Use of mist nets along transects, IBA/KBA monitoring data, bird ringing, and bioacoustics	Wet and dry season (appropriate months to be selected depending on where the survey is being undertaken
Red Colobus and Crested Mangabey	Remnants of Tana River Forests	Ground count	Dry season (July-September)
Herpatofauna (reptiles and amphibians	All protected areas, conservancies and ranches	Pit fall traps along set transects	Wet and dry season (appropriate months to be selected depending on where the survey is being undertaken
Carnivores	All protected areas, conservancies and ranches	Ground count	Dry season (January, February March, July, August, September, October)

Species	Sites	Census method	Census Period
Invertebrates	All protected areas, conservancies and ranches	Sweep nest along set transects	Wet and dry season (appropriate months to be selected depending on where the survey is being undertaken
Vegetation surveys (woody, herbaceous & grasses	All protected areas, conservancies and ranches	Transects (woody vegetation) and quadrants (for herbaceous plans and grasses)	Wet and dry season (appropriate months to be selected depending on where the survey is being undertaken

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11.0 ANNEXES

Annex 1: Standard Operating Procedure

The following standard operating procedure shall be followed for censuses led by WRTI:

1) The Head of WRTI Research Division shall prepare a memo to the Director/CEO expressing the impending activity based on annual work plan.
2) A Census Planning Committee (CPC) is appointed by the Director/CEO, WRTI, in consultation with relevant organizations three months before the date of the census
3) The Chairman of the census committee facilitates preparation of a census concept, three months before the proposed census date
4) The concept will include: Introduction, Justification, Date of census, Personnel required, Work plan, Expected Outputs, Budget and Annexes (if any)
5) The concept is discussed during the first CPC meeting and chairman coordinates collation and input of comments to the concept
6) The revised concept is submitted to the Director/CEO of WRTI for approval.
7) Once concept approved, CPC will initiate planning of the census
8) The CPC chair ensures funds are forwarded to the site where the census will be undertaken
9) The CPC and the field teams hold planning meetings together in the field and ensures all the procurement is undertaken
10) The census is executed
11) Data is cleaned and report prepared not more than 1 month after completion of the actual census exercise
12) Report reviewed and an ISBN applied to the National Library Services through the WRTI Library
13) Digital version of the report is shared with relevant conservation partners and uploaded to the WRTI and KWS websites.
14) The results may further be disseminated to the public through workshops and social media as may arise.

Note that for census organized by other partners and/or students, the normal research authorization process shall be followed and a research permit issued by WRTI. The partner or student shall meet all the costs associated with the census.

WRTI shall partner with the Directorate of Resource Surveys and Remote Sensing (DRSRS) to undertake sample aerial census.

Annex 2: Legal frameworks related to wildlife census

Legislation under which public sector agencies operate, defines the role, responsibility and power of the agency to enable it to carry out a particular function. Partner agencies must ensure they are acting lawfully. Some of the relevant laws and policies are listed below:

Main Statute	Role of Statute	Relevance of Statute
The Constitution of Kenya, 2010	Constitution is the supreme law of the Republic and binds all persons and all State organs at national and county levels of government	**Section 33 - Sub section 1(a –c):** Every person has the right to freedom of expression, which includes, freedom to seek, receive or impart information or ideas, artistic creativity, academic freedom and freedom of scientific research. **Section 33- Sub section 2:** The right to freedom of expression does not extend to: propaganda for war, incitement to violence, hate speech; or advocacy of hatred. **Section 33 - Sub section 3:** In the exercise of the right to freedom of expression, every person shall respect the rights and reputation of others. **Section 35 - Sub section 1-3:** Every citizen has the right of access to information held by the State; and by another person and required for the exercise or protection of any right or fundamental freedom. **Section 46 – Subsection 1(a – d) and Sub section 3:** This Article applies to goods and services offered by public entities or private persons. It states that consumers have the right to the information necessary for them **Section 50 – Sub section 1 and 2**

Main Statute	Role of Statute	Relevance of Statute
		(1) Every person has the right to have any dispute that can be resolved by the application of law decided in a fair and public hearing before a court or, if appropriate, another independent and impartial tribunal or body. **(2)** Every accused person has the right to a fair trial. **Section 232- Sub section 1(f):** The values and principles of public service which include transparency and provision to the public timely and accurate information;
Wildlife Conservation and Management Act, 2013	An act of parliament to provide for the protection, conservation, sustainable use and management of wildlife in Kenya and for connected purposes.	**Section 5 - Sub-section 2 (g) parts (i-iv)** prescribe National Wildlife research and monitoring priorities and information systems. **Section 7 - Sub-section (*l*):** WRTI shall conduct and coordinate all research activities in the field of wildlife conservation and management and ensure application of research findings in conservation planning, implementation and decision-making. **Section 52 - Sub section 1(a) parts (i-iv)**: Collect and analyse wildlife data and information to support planning and decision-making by different stakeholders. **Section 60, 61, 62**
Environmental Management and Coordination Act, 1999, CAP 387, No 8 of 1999	An ACT of Parliament to provide for the establishment of an appropriate legal and institutional framework for	**Section 9 - Subsection 2(h):** undertake and co-ordinate research, investigation and surveys in the field of environment and collect, collate and disseminate information about the findings of such research, investigation or survey.

Main Statute	Role of Statute	Relevance of Statute
	the management of the environment.	**Section 50 (a-g):** The National Environment Management Authority shall, in consultation with the relevant lead agencies, prescribe measures necessary to ensure the conservation of biological diversity in Kenya **Section 51 (a – f):** The Authority shall, in consultation with the relevant lead agencies, prescribe measures adequate to ensure the conservation of biological resources *in-situ* and issue guidelines for management and conservation of biological diversity. **Section 52:** The National Environment Management Authority shall in consultation with the relevant lead agencies prescribe measures for the conservation of biological resources *ex-situ* especially for those species threatened with extinction and issue guidelines for their management.
Environmental management and co-ordination (Amendment) Act, 2015	AN ACT of Parliament to amend the Environmental Management and Coordination Act, 1999	**Section 4.** On access to information. **Part 3A - Sub section 1 and 2:** which states that Subject to the law relating to access to information, every person has the right to access any information that relates to the implementation of this Act that is in the possession of the Authority, lead agencies or any other person.
Access to information Act, 2016	An Act of Parliament which is intended to give effect to the right of access to information by citizens as provided under Article 35 of the	**Section 4 - Sub section 1 (a & b):** States that every citizen has the right of access to information held by the State and another person and where that information is required for the exercise or protection of any right or fundamental freedom. **Section 4 - Sub section 2 (a &b):** every citizen's right to access information is not affected by any reason the person gives for

Main Statute	Role of Statute	Relevance of Statute
	Constitution and provide a framework for public entities and private bodies to proactively disclose information that they hold and to provide information on request in line with the constitutional principles.	seeking access; or the public entity's belief as to what are the person's reasons for seeking access. **Section 4 - Sub section 3:** Access to information held by a public entity or a private body shall be provided expeditiously. **Section 4 - Sub section 4:** Act shall be interpreted and applied on the basis of a duty to disclose and non-disclosure shall be permitted only in circumstances exempted under section 6. **Section 5 (a)-**On disclosure of information by public entities. **Part (vii):**a public entity shall provide sufficient guidance to enable any person wishing to apply for information under this Act to identify the classes of information held by it, the subjects to which they relate, the location of any indexes to be inspected by any person; **Section 6 - Sub section 1(a-h), and Sub Section 2 (a-j &i):** stipulates limitation of right of access to information related to security, intelligence information, and covert operations. **Section 6 - Sub section 4**: Public entity or private body may be required to disclose information where the public interest in disclosure outweighs the harm to protected interests as shall be determined by a Court. **Section 6 - Sub section 5:** A public entity is not obliged to supply information to a

Main Statute	Role of Statute	Relevance of Statute
		requester if that information is reasonably accessible by other means **Section 9 - Sub section 4 (a-c):** As soon as the information access officer has made a decision as to whether to provide access to information, he or she shall immediately communicate the decision to the requester **Section 17 - Sub section 1 and sub section 2 part (a & b):** on management of records by public entities **Section 19:** Where any information provided by a public entity or private body to an applicant under section 11 (on providing access to information) was supplied to the public entity or private body by a third person, the publication to the applicant of any defamatory matter contained in the information shall be privileged unless the publication is shown to have been made with malice.
Copyright Act 2014	An Act of Parliament to make provision for copyright in literary, musical and artistic works, audio-visual works, sound recordings, broadcasts and for connected purposes	**Section 23:** stipulated conditions of copyright by virtue of nationality or residence, and duration of copyright. **Section 24:** Copyright by reference to country of origin, where Copyright shall be conferred by this section on every work, other than a broadcast which is eligible for copyright **Section 25:** Copyright in works of Government and international bodies. **Section 26 – Part (a, d, &h):** On nature of copyright in literary, musical or artistic works and audio-visual works

Main Statute	Role of Statute	Relevance of Statute
		Section 31 - Sub section 1 & 2: On First ownership of copyright **Section 35:** On infringement, it stipulates the situations under which infringement occurs and action to be taken.
Industrial Property Act 2001	An Act of Parliament to provide for the promotion of inventive and innovative activities, to facilitate the acquisition of technology through the grant and Regulation of patents, utility models, technovations and industrial designs, to provide for the establishment, powers and functions of the Kenya Industrial Property Institute and for purposes incidental thereto and connected therewith.	Part III - Part XVIII

Annex 3: Stakeholders

Government Agencies

1) State Department for Tourism and Wildlife
2) Kenya Wildlife Service
3) National Museums of Kenya
4) Kenya Institute of Primate Research
5) Directorate of Resource Survey and Remote Sensing
6) Kenya Marine and Fisheries Research Institute
7) Kenya National Bureau of Statistics
8) Kenya Fisheries Service
9) Kenya Forest Service
10) Kenya Forestry Research Institute

Inter-Government Agencies

1) Regional Centre for Mapping of Resources for Development
2) Lusaka Agreement Task force
3) International Union for Conservation of Nature
4) United Nations Environment Program (UNEP)

Conservation Partners

1) Northern Rangelands Trust
2) African Conservation Centre
3) African Wildlife Foundation
4) Amboseli Trust for Elephants
5) Big Life Foundation
6) Born Free Foundation
7) David Sheldrick Wildlife Trust
8) Ewaso Lions
9) Friends of Nairobi National Park
10) Grevy's Zebra Trust
11) International Fund for Animal Welfare
12) Kenya Wildlife Conservancies Association
13) Kenya Wildlife Trust
14) Kenya Birds of Prey Trust
15) Laikipia Wildlife Forum
16) Lion Gurdians
17) Maasai Wilderness Conservation Trust
18) Mount Kenya Trust
19) Save The Elephants
20) Rhino Ark
21) Peregrine Fund
22) Nature Kenya
23) The Green Belt Movement
24) The Nature Conservancy
25) Space for Giants
26) Tsavo Trust
27) Wildlife Direct
28) World Wide Fund for Nature-Kenya
29) Birdlife International
30) Cheetah Conservation Fund
31) CITES Mike Programme
32) Earth Watch Institute Kenya
33) Eden Wildlife Trust
34) Elephant Research Trust Fund
35) European Union
36) Fauna and Flora International
37) French Development Agency
38) Global Environment Facility

39) International Centre of Insect Physiology and Ecology
40) International Livestock Research Institute
41) Kenya Forestry Working Group
42) Marwell Preservation Trust
43) Mpala Research Centre
44) Parks Canada
45) United States Aid for International Development
46) US Fish & Wildlife Service
47) World Bank
48) Wildlife Clubs of Kenya
49) Mara Elephant Project
50) Conservation Alliance of Kenya
51) Giraffe Conservation Fund
52) Wyss Academy for Nature East African Hub
53) IGAD Climate Prediction and Application Centre