Proposal to the African Elephant Fund

1.1 Country: Kenya

1.2 Project Title: Enhancing prosecution of elephant poachers through training, ivory stockpile genotyping and construction of African Elephant DNA library.

1.3 Project Location: Kenya

1.4 Overall Project Cost:
AMOUNT Requested from African Elephant Fund: USD 89,355

1.5 Project Duration: 2 years

1.6 Project Proponent: Joel W. Ochieng (UoN); Moses Yongo (KWS), Hastings Ozwara (NMK), Dominic Mijele (KWS), Jared K. Serem (UoN)

1.7 Name of Project Supervisor: Joel W. Ochieng, PhD

1.8 Address of Project Supervisor: Box 29053 00625 Nairobi

1.9 Telephone Number: +254711121359

1.10 Email: jochieng@uonbi.ac.ke

1.11 Fax:

1.12 Date proposal submitted: 11 November 2017

2.0 Project Summary: (not more than 250 words)

African elephants (*Loxodonta africana* and *L. cyclotis*) are threatened mainly by poaching for ivory, which has drastically reduced their numbers and eroded the genetic diversity and adaptive potential. The Kenya Wildlife Service (KWS) has the responsibility to protect wildlife, and collaborates with the University of Nairobi in promoting wildlife conservation and ecosystem management in order to preserve Kenya's natural biodiversity. In line with this

mandate, the proposed project aims to enhance monitoring of poaching and ivory trafficking and prosecutorial capacity of KWS through the following objectives: (1) Build forensic laboratory capacity to monitor elephant poaching, train first responders on elephant scenes of crime management to secure court admissible evidence, hence leading to increased conviction (2) Enhance the capability of the newly established Wildlife Forensic and Genetics laboratory at KWS to extract DNA from Ivory and other difficult samples such as bones and skin (3) Genotype samples collected before the largest ever ivory stockpile destruction in Kenya in April 2016 (over 100 tonnes) to expand the Kenyan elephant genetic library.

An important development impact of this project will be the conservation of elephants, ecosystems and natural biodiversity for Kenya and cross-border conservation areas. In turn, this will lead to sustainable growth in the tourism sector through improved KWS revenue collection.

3.0 Which Priority Objectives and Activities (there may be more than one) in the African Elephant Action Plan does this project fall under? (For ease of reference, Priority Objectives are attached under Appendix 1)

Priority Objective 1: Reducing illegal killing of elephants and illegal trade in elephant products

4.0 Project Rationale – why is this project necessary and urgent? What threats face this elephant population (give, for example, what information you have regarding population details, trends in population (downward or upward), ivory seizure information, details about levels of poaching, human/elephant conflict, etc.).

Prior to 2013, the KWS prosecuted many cases of poaching and ivory trafficking, leading to convictions. However, the penalties were considerably low, providing little deterrence with some offenders paying off the fines (a paltry USD 100) from the proceeds. The enactment of the Wildlife conservation and management Act 2013 spelt tougher penalties for perpetrators of wildlife crimes, especially endangered species such as the African Elephant. Conviction of offences involving elephant poaching or trafficking now attracts a fine of not less than twenty million Kenya shillings (approx USD 200,000) or imprisonment for life or to both. This has increased the threshold of evidence required to sustain litigation. Under the new Law, the current morphological methods of identification are insufficient to get a conviction. DNA evidence is increasingly becoming a minimum standard for litigations, and KWS has embraced the use of wildlife molecular genetics as a forensic tool for sample identification. Consequently, the KWS recently (2015) set up a forensic and genetics lab to provide court admissible scientific evidence to support prosecutions of wildlife crimes. However, the KWS lab currently has no capacity to extract DNA from bone and other difficult samples and this poses a challenge and hinders prosecution of ivory traffickers.

Due to this inability to extract DNA from ivory, KWS currently sends forensic samples to the University of Washington, Seattle for analyses, an

arrangement that has faced several challenges, including: (1) Unnecessary delay in litigation (2) The need to fly in the expert who analysed the samples to appear in court, and as many times as the legal process determines – including case postponements (3) The high costs of shipment and sample analysis, owing to the large number of samples that the forensic lab receives from the field (4) Rigorous licensing pursuant to Nagoya protocol – complexities in obtaining CITES export and import permits for ivory samples. Further, airlines through the IATA arrangement have strict instructions not to accept ivory on board and have severally declined ivory samples being sent to the US for analysis purposes (5) Intellectual property (IP) fears and security of samples – there is no guarantee that the samples will be used exclusively for the intended purpose, a threat to controlled exploitation of Africa's natural resources.

The University of Nairobi (UoN) has developed laboratory and human resource capacity for analyzing difficult samples such as ancient bones, dry skin, and scales, and has developed protocols for recovering high quality DNA from such samples. The UoN also has a robust training capacity and a major training programme on wildlife conservation and management, which was a joint venture with KWS. Further, UoN has collaborated with KWS and the National Museums of Kenya (NMK) Institute of Primate Research on a number of research projects including DNA barcoding for species traded for bushmeat, and optimization of DNA extraction and processing from illegally traded Pangolin scales. The proposed project plans to have these skills and capacity transferred to KWS. The wildlife agency and UoN will then jointly optimize protocols for extracting and genotyping of ivory samples, for a reliable and sustainable sample processing and prosecution.

5.0 Detailed Proposal – including activities to be carried out, milestones (at least quarterly milestones), timelines, equipment to be purchased , reporting procedures, etc. (not more than 1000 words). It will be helpful in evaluating this Project Proposal if you to divide it into Phases such as Planning; Procurement; Implementation; Evaluation and Reporting

Should include anticipated benefits (including benefits to the conservation and management of elephant populations and communities) and outputs from the project, and how the project will be monitored and evaluated.

Planning meeting:
Activity 1: One day planning and inception meeting – The collaborating scientists from KWS, UoN, and NMK will hold a two day meeting to plan and schedule the implementation.
Activity 2: One day training of project staff, associates and other personnel handling requisition of laboratory and field materials and expenditure, on procurement and grants management.

Procurement:
Activity 3: Procurement of project items and supplies

Objective: Build human resource capacity to monitor poaching, collect, handle and preserve court admissible evidence:

Successful prosecution requires that forensic samples are collected following chain of custody procedures that ensures the evidence meets a threshold. This project proposes to train first responders on protocols for scene of crime processing, entailing among others: securing crime scenes, evidence documentation such as combing the crime scene for evidence such as bullet shells, heads left behind by poachers, following footprint using patrol dogs among others. Additionally, first responders will be trained on standardized MIKE procedures and data collection on Illegal Killing of elephants.
Activity 4.1: Preparation of scenes of crime protocols, monitoring, and training manuals
Activity 4.2: Training of frontline field officers on the scene of wildlife crime management including use of forensic bags for exhibit collection, and on monitoring illegal killing of elephants

Objective: Enhancing the capability of the Wildlife Forensic and Genetic lab at KWS to extract DNA from ivory and other difficult samples:
Activity 5.1: Optimizing DNA extraction and genotyping protocol for Ivory samples
Activity 5.2: Train project personnel by organizing laboratory training using freezer mill technology for DNA extraction, microsatellite genotyping
Activity 5.3: Train KWS forensic laboratory personnel on Bioinformatics analyses that include assignment analyses and provenance matching

Objective: Expand the Kenyan elephant genetic library by genotyping ivory stock piles:
Activity 6.1: Additional sampling of tissue and poached or diseased elephants using the network of Mobile Wildlife Veterinary units and KWS security.
Activity 6.2: DNA extraction from elephant Ivory and tissue.
Activity 6.3: Genotyping of all samples at 20 micro-satellite loci for ivory stockpiles and additional samples recovered from natural mortality, problem animal control and from ivory recovered from poached elephants of known location within Kenya
Activity 6.4: Sequencing of Elephant ivory at three mitochondrial gene loci
Activity 6.5: Integrating the new data and expanding the library held at the Kenya Wildlife Forensic and genetic laboratory to create a large sample size for the determination of random match probabilities and tracking the provenance of illegally trafficked ivory within Kenya. Further,
Activity 6.6: From the large mitochondrial and microsatellite loci library generated, establish a spatial genetic structure of the East African elephant populations using a spatial and landscape genetic approach, to aid in the determination of ivory provenance and hotspots of elephant poaching within Kenya and patterns of local ivory trafficking within Kenya and the East African region.

Evaluation and reporting
Activity 7: Final Project evaluation (M&E will be a periodic activity)

Final reports
Activity 8: Final reports to African Elephant Fund as per the agreed timelines, followed by publication in leading journals. Project reports will be prepared

quarterly and shared with African Elephant Fund. A terminal report will also be compiled at the end of the funding period.

Anticipated benefits:
This project will strengthen prosecution by providing molecular forensic evidence for the prosecution of ivory poachers and traffickers. We will also conduct training of enforcement officers in monitoring of illegal killing of elephants, chain of custody procedures in the collection of forensic samples, and securing scene of crime following legally acceptable procedures.

Benefits to KWS: One of the key beneficiaries of this project will be KWS, and the office of public prosecution, the lead institutions responsible for prosecution of elephant poachers and trafficking among other duties. Kenya Wildlife service will benefit from this project through the acquisition of the technology to extract molecular forensic evidence from ivory and other difficult samples, bioinformatics analyses, and improved training of frontline officers involved in detection and monitoring of wildlife trafficking on scene of crime management.

The African elephant: The project will reduce elephant poaching and trafficking of elephant products (ivory). This will lead to stabilization and/or increase in elephant populations allowing natural process to maintain healthy elephant populations. Consequently, the project will alleviate physical and social trauma resulting from poaching. Poaching can lead to many elephants escaping poaching episodes with injuries and many orphaned calves in this socially complex species. Orphaned calves have been shown to suffer physiological and social trauma just like humans. Because elephants play critical ecological roles in African ecosystems through nutrient recycling, maintaining habitat heterogeneity, healthy elephant population will lead to maintenance of ecologically healthy conservation areas.

Communities in conservation areas: The ripple effects of increased tourism to the rural poor as a result of reduced ivory trafficking and improved elephant protection and conservation will be realized. Many protected areas in Kenya are surrounded by the rural poor and in some locations by conservancies managed by local communities. Examples of protected areas with conservancies surrounding protected areas in Kenya include the Maasai Mara National reserve which is surrounded by several conservancies all managed by local people for conservation and income generation through tourism. Therefore protection of elephant populations will directly translate to poverty alleviation as neighbouring communities can benefit directly from tourism revenue through sale of art and crafts, land rent for camping sites to tour companies, agricultural produce to hotels among other income generating activities.

6.0 Project Timeline – outline the timeline for proposed activities within this project. You may find it helpful to relate the timeline to the Phases identified in Section 5.0 above.

Project timeline

		YEAR 1				YEAR 2			
		Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
Planning meeting:	Activity 1: Planning meeting	X							
	Activity 2: Training of project staff and associates	X							
Procurement:	Activity 3: Procurement of project items and supplies	X							
Objective: Building human resource capacity for field officers	Activity 4.1: Preparation of scenes of crime protocols and training manuals	X	X						
	Activity 4.2: Training of frontline field officers		X	X	X	X	X		
Objective: Enhancing capability of KWS Forensic lab to extract DNA from ivory	Activity 5.1: Optimizing of Extraction and genotyping protocol			X					
	Activity 5.2: Train project personnel			X	X	X			
	Activity 5.3: Train KWS forensic lab personnel on Bioinformatics	X	X			X	X	X	
Objective: Expand the Kenyan elephant genetic library by genotyping ivory stock piles:	Activity 6.1: Additional sampling			X	X				
	Activity 6.2: DNA extraction from elephant Ivory and tissue.				X	X			
	Activity 6.3: Genotyping of all samples at 20 micro-satellite loci				X	X	X		
	Activity 6.4: Sequencing of Elephant ivory						X	X	
	Activity 6.5: Integrating new data and expanding library held at KWS						X	X	
	Activity 6.6: Establish a spatial genetic structure of the EA elephant							X	
Evaluation and reporting	Activity 7: Final Project evaluation (M&E will be a periodic activity)							X	X
Final reports	Activity 8: Preparation of final report to Elephant Fund, and publication in journals of high standing							X	X

BUDGET

7.0 Has this project received or been pledged any other sources of funding (external)? Give all relevant details (for example, amount, source of funds, timetable, any restrictions): NONE

7.1 Please provide a detailed proposed budget for this project (in US$). You may find it helpful to relate expenditure to the Phases you have set out in Section 5.0
Details included in Table annexed to the document: (Budget annexed)
Any other budget lines:

7.2 Please specify the proponents contribution towards the project
Office space for use in this project
Specialized analysis laboratories
Staff time for staff involved in the project
Server for hosting databases and providing multi-institutional secure access
High speed Internet for data analysis
Salaries for staff involved in the project

Please submit the completed proposal, either by:
Email:
Fax:
You should receive acknowledgement of receipt of your proposal within 14 days. If you do not receive such an acknowledgement, please telephone:

Further details on any of the above details may be requested by the Steering Committee of the African Elephant Fund.

TEMPLATE FOR PRESENTATION OF PROJECT BUDGET TO THE AFRICAN ELEPHANT FUND

(Section 7.1 of the Project Proposal template)

Activity	Description	Item	Cost (USD)
Project planning and inception meeting	Planning and inception meeting for collaborating scientists in Naivasha Preparation of status review manuscript	Accommodation and meals costs 6 pax @ 100 per day for 3 days	1,800
Training of project staff and associates on procurement and grants management	Project staff, associates and other personnel handling requisition of laboratory and field materials and expenditure	Meals (Teas and lunches) for 30 pax @ 10	300
Preparation of scenes of crime protocols, monitoring, and training manuals	3 days Writeshop to prepare scenes of crime protocols, monitoring, and training manuals	Accommodation and meals costs 6 pax @ 100 per day for 3 days; Stationery@ 300; Printing of 200 manuals and protocols @ 4	2,900
Additional sampling of tissue and poached or diseased elephants	Forensic sample collection in six key elephant conservation areas (Tsavo, Mara, Samburu, Amboseli, Mt Elgon, Aberdares).	4 researchers (vet, ecologist, forensic expert, elephant coordinator) accommodation and meals for 6 areas, 8 days per site @ 100 per day; Car fuel and vehicle maintenance @ 600 per site	22700
	Consumables for field sample collection at six elephant conservation areas	Liquid nitrogen, sample collection tubes, EDTA tubes, FTA cards, hand gloves, fecal pots	2,000
Training of frontline field officers on the scene of wildlife crime management including use of forensic bags for exhibit collection, and on monitoring illegal killing of elephants	Training of 120 frontline field officers in six conservation areas	Trainee provision for meal costs and transport @25 per day for 3 days; 4 trainers and 1 driver accommodation and meal costs @ 100 per day for 4 days per site for 6 sites; Car fuel and vehicle maintenance @ 600 per site; Training materials @300 per site	26,400
	Procurement of 100 forensic evidence bags for processing elephant scenes	100 @ 60	6,000
Optimizing DNA extraction and genotyping protocol for Ivory samples Train project personnel on freezer mill technology for DNA extraction, microsatellite genotyping Train KWS forensic laboratory personnel on Bioinformatics; assignment analyses and	Laboratory consumables and supplies for genotyping and analyses for 2000 samples	Optimization reactions; Genotyping of 2500 samples @ 6.4 per sample; Bioinformatics analyses	16,000
	Procurement of laboratory homogenizer, pipettes and high sensitivity weighing scale	Homogenizer @ 1500; a set of 4 Pipettes @ 500	2,000
	Procurement of a computer and softwares to support bioinformatics analyses	1 computers @ 1000; Genotyping software @ 1000	2,000

TEMPLATE FOR PRESENTATION OF PROJECT BUDGET TO THE AFRICAN ELEPHANT FUND

(Section 7.1 of the Project Proposal template)

provenance matching DNA extraction from elephant Ivory and tissue Genotyping at 20 micro-satellite loci and mitochondrial sequencing for ivory stockpiles and additional samples Integrating the new data and expanding the library held at the KWS Forensic lab for random match and tracking the provenance of illegally trafficked ivory.			
Final Project evaluation Final reports to African Elephant Fund Establishing a spatial genetic structure of the East African elephant populations	Closing workshop and report preparation; Preparation of final manuscript	Accommodation and meals costs 6 pax @ 100 per day for 3 days	1,800
Project management	Project communication costs for 2 years	50 per month for 24 months	1,200
	Administrative overheads	5%	4,255
TOTAL	TOTAL		**89,355**

Joel W. Ochieng

x