

Enhancing elephant conservation and protection in East Africa with molecular genetic tools

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Partnerships for Enhanced
Engagement in Research
(PEER)



KENYA
WILDLIFE
SERVICE



The Forensic and Genetics lab at KWS

- Commissioned in May 2015
- Fully equipped by various donors (all equipment to perform genetic analyses are present)
- Canadian Global Peace and Security Fund
- Taiwan Forestry Bureau
- Abott Laboratories
- Qiagen Germany
- Smithsonian Institution/Google Award Project

Background: The Forensic and Genetics lab at KWS

- Sequencing is the only service outsourced
- Freeze-mill for extraction of DNA from Ivory (or bone material) has been procured
- Current operating cost are donor funded (except staff salaries)

Mandate of the Forensic lab

- Provide accurate identification of wildlife products and species in order to strengthen prosecution, certification and licensing
- Support the Intelligence and Investigation on Wildlife crime within KWS
- Support the KWS Prosecutors by providing expert evidence
- Conduct wildlife genetic research and disease diagnosis and detection to enhance species conservation

The Forensic and Genetics lab

- Bush meat Analyses (87 cases already in court 4 concluded successfully)
- Rhinoceros DNA indexing (RhoDIS) in collaboration with University of Pretoria
- Ivory and stocks sampled
 - (~2000 ivory sampled from various locations)
 - 1000 rhino-horn sampled
 - Ivory from various seizures sampled and provenance established (Collaboration with University of Washington, Seattle)

Challenges for the Forensic and Genetics lab

- Sequencing facility is lacking could pause problems in chain of custody
- Operational costs are inadequate owing to the high cost of genetic analyses

The Elephant genetics project:

Objective 1

Develop a genetic library for elephant populations in Kenya, Tanzania and Uganda for the determination of random match probabilities for linking elephant carcasses and trophy (ivory) to aid the prosecution of perpetrators of elephant poaching in the legal courts of law

The elephant genetics project:

Objective 2

Establish a spatial genetic structure of the East African elephant populations to aid in the determination of ivory provenance and hotspots of elephant poaching and trafficking within the region



Elephant Genetics project:

Objective 3

Establish a genetic monitoring system for elephant populations in forested and heavily wooded habitats in Kenya for accurate baseline elephant population estimates

Elephant Genetics project:

Objective 4

Develop the molecular forensic expertise of the Kenya Wildlife Service, as well as create critical linkages between East African scientists working on wildlife forensics and trafficking

Future Elephant Genetics work

- Currently microsatellite markers are being used (Samuel Wasser)
- Mt DNA currently in development under PEER

Future Elephant projects

- Development of Single Nucleotide Polymorphism for ivory provenance based on nuclear markers to supplement current work on mitochondrial markers
 - More repeatable and can be standardized across labs
 - Can utilize publicly available datasets in GenBank.

THANK YOU

