Forensic science in illegal trade on wildlife

Moses Otiende
Molecular Biologist
Kenya Wildlife Service
Presentation outline

• Introduction
• Illegal trade in wildlife
• Wildlife crimes in Kenya
• Forensic in wildlife and their potentials
• Challenges in use of forensic science
• Use of forensics in KWS
• Conclusion
Introduction

- Forensic - The application of scientific knowledge to legal matters

- Wildlife forensics is a relatively new field of wildlife criminal investigations.

- Goals:
  1. Use scientific procedures to examine, identify, and compare evidence from wildlife crime scenes
  2. Link this evidence with a suspect and a victim
Forensic science has a key role to play in curbing wildlife crimes

Illegal trade in wildlife and wildlife products affects the survival of species

Populations of rhinos and elephants have declined in recent years as a result of trade in their products.
The factors contributing to illegal trade in wildlife and wildlife products

- Poverty – unsustainable use
- Human population growth and encroachment to wildlife areas
- Ineffective legal deterrent measures
- Low input costs involved in the trade
- Deepening antipathy towards wildlife by landowners
Illegal trade in wildlife(2)

Issues that feature prominently in illegal trade on wildlife & their products

- What is the identity of the specimen in question?
- What is the provenance of the specimen in question?
- What is the cause of death or injury?
- Can a suspect be connected to wildlife crime scene?
• Kenya's invaluable wildlife resources are a target of illegal activities such as poaching and illegal exploitation.

• These illegal activities threaten the country’s wildlife resources and their habitats

• E.g
Illegal trade on a wide spectrum of wildlife products has become a serious threat and a major conservation challenge to Kenya Wildlife Service.
• Target Trophies
  ✓ Ivory
  ✓ Rhino horns
  ✓ Skins
  ✓ Corals and shells
Among the many fields of forensic science the most applicable in illegal trade in wildlife is Forensic Biology.

Many forensic techniques can be utilized to investigate illegal trade on wildlife & other contraband products.

Forensic science can support effective enforcement of national wildlife legislation.

Forensic science has other wider applications in wildlife conservation.
Forensic methods in wildlife crime

- The ouchterlony immuno diffusion methods
- The precipitin method using the electrophoresis
- The DNA material analysis
  - mitochondrial DNA
  - nuclear DNA – micro satellites
    - multilocus fingerprints

Molecular based techniques, which are highly sensitive and specific are perhaps the ultimate forensic tools to curb trade in wildlife products
Forensic Potential

- **Smooth surfaces** –
  - Fingerprints/footprints/tool marks
  - DNA

- **Absorbent surfaces** – (paper/wood/cloth)
  - DNA
  - Fingerprints (ninhydrin)
  - Chemical/Morphometric analysis

- **Fluid** – (Blood/saliva)
  - DNA
  - Toxicology
  - Spatter pattern analysis
Wildlife crime scene assessment

- Identify all forensic trace evidence
- Identify which will assist to investigate the offence
- Preserve, recover and record the appropriate evidence
- Deliver to the laboratory in a condition and with a chain of custody which allows it to be used as evidence.
Challenges in use of forensic science in wildlife crimes

- Identification of trace evidence that can assist your case by –
  - Proving an offence has taken place
  - Identifying an offender
  - Linking an offender to a crime scene
  - Linking items removed from a crime scene with that scene

- In some cases no reliable methods for identification of wildlife products are available
In the year 2002, KWS embarked on developing a forensic technique for detecting bush meat.

- KWS employed the immuno-diffusion technique for wildlife meat identification. This method, developed with assistance from University of Nairobi is considered easier and less expensive.

- KWS collaborates with the Government Chemist to identify suspected meat samples using precipitin method.

- The molecular based approach (using DNA) is yet to be used despite its complexity and cost factors.
Challenges in combating wildlife crimes in Kenya

- Lack of human resource
- Court and litigation procedures
- Weaker laws on wildlife forensics
- Costs and protocols
Conclusion (1)

- All standard forensic techniques are applicable to wildlife law enforcement cases.

- Forensic opportunities to assist a case are many and available.

- Many of the techniques can be applied long after the crime has taken place so long as good crime scene preservation and recovery of evidence has been carried out.
Conclusion (2)

Forensic requirements in wildlife sector

- Modern laboratory
- Capacity building and training in forensic sciences for wildlife officers
- Improved collaboration with local and international partners including INTERPOL
- Appropriate policies that enhance compliance and enforcement of wildlife laws
SOME THREATENED/ENDANGERED SPECIES