

Response Protocol to Wildlife Poisoning Incidents in Kenya FEBRUARY 2018



Response Protocol to Wildlife Poisoning Incidents in Kenya

FEBRUARY 2018





I LIST OF ABBREVIATIONS AND ACRONYMS

GPS	Geographic Positioning System
KWS	Kenya Wildlife Service
Labs	Laboratories
NGOs	Non-Governmental Organizations
OB	Occurrence Book
SoC	Scene of Crime
Vets	Veterinarians
Vet	Veterinarian
WCMA	Wildlife Conservation and Management Act
JKUAT	Jomo Kenya University of Agriculture & Technology

Copyright Kenya Wildlife Service, 2018

Recomended Citation:

KWS (2018) Response Protocol to Wildlife Poisoning Incidents in Kenya, Kenya Wildlife Service, Nairobi, Kenya

TABLE OF CONTENT

List of Abbreviations and Acronyms	. 2
Preface	. 4
Acknowledgement	5
1.0 Introduction	. 6
1.1 Wildlife Poisoning and its Drivers	6
1.2 Common Chemicals Used to Poison Wildlife in Kenya	6
1.3 The Poisoning Response Protocol	6
1.4 Relevant National Legislation	7
2.0 Wildlife Poisoning Response Protocol	. 9
2.1. Poisoning Incident Response Plan	9
2.2. Poisoning Incident Reporting	9
2.3. Response Team	9
3.0 Postmortem Process	12
3.1 General Observation	12
3.2. External Examination of the Carcass	12
3.3. Internal Examination of the Carcass	12
4.0. Sample Collection and Storage	14
4.1. Types of Samples to Collect	14
4.2. Baits and Poisons	15
4.3. Dead and Moribund Animals	15
4.4. Labeling of Samples, Specimens and Exhibits	15
5.0. Samples Submission for Laboratory Analysis	16
5.1. Preservation and Transporting of Samples	16
5.2. Recommended Laboratory lests and Laboratories	16
6.0. Clean-up and Decontamination of the Wildlife	
Poisoning Scene	17
6.1. Clean-up of Balts and Small Carcasses	17
6.2. Disposal of Contaminated Large Animal Carcasses	. 17 10
	10
7.0. Diagnosis and Treatment	19
8.0. Chain of Custody	20
8.1. Scenarios in Chain of Custody Process	20
References	21
A	22
Annex 1: Basic Wildlife Crime Scene Equipment Checklist	22
Annex 2 Crime Scene Procedure Checklist	23
Annex 3: Some of the Clinical Symptoms to Look for in Suspected Poisoned Animal	26
Annex 4: Treatment and Management of Wildlife Poisoning Cases	. 27
Annex 5: Contact Details of Animal Rehabilitation Centers in Kenya	27
Annex 6: Sample Chain of Custody Form	. 28
Annex 7: Sample of Kenya Police Exhibit Memo	. 29
Annex 8: Wildlife Poisoning Response Protocol Development Note	30

PREFACE

Wildlife conservation is faced with various challenges including habitat loss and fragmentation, insecurity and human-wildlife conflicts among others. Increased human population has led to displacement of many wildlife species from their former natural habitats and it has led to the overharvesting of wildlife resources for animal-based proteins.

Currently large wildlife species are largely confined to a few protected areas and wildlife corridors. However, substantial populations of wildlife still occur outside of protected areas. This has led to frequent and constant human-wildlife-livestock interaction and competition for water and pasture across many ecosystems in Kenya. This has led to increased cases of human-wildlife conflict. Wildlife poisoning has emerged as one of the major threats affecting our wildlife populations in Kenya. Aggrieved persons have resorted to using poisonous chemicals in retaliation for human-wildlife conflict cases, poaching for trophies and game meat, or even accidental poisoning due to environmental pollution. For example, in December 2015 two lions from the famous Marsh Pride and 15 White-Backed Vultures were poisoned alongside other species in the Maasai Mara ecosystem as a result of retaliatory killing due to conflict.

Poisoning of birds, including migratory species, occurs year-round in Kenya's rice schemes and in other water bodies. Fish are also harvested using poisons and both poisoned fish and birds make their way to local markets where they are often sold to unsuspecting customers with potentially grave impacts for human health.

The Wildlife Conservation and Management Act 2013, has identified wildlife poisoning as one of the major wildlife crimes that is punishable by law. Poisoning has had a profound negative effect on our carnivores: lions, hyenas, leopards, cheetahs, and wild dogs, and on birds of prey: vultures, eagles and other scavengers. Aquatic species including fish have also been affected due to water pollution with poisonous chemicals. There is need for concerted efforts among government agencies, conservation stakeholders and local communities to come up with clear strategies for control of wildlife poisoning cases and create awareness against wildlife poisoning.

This protocol will go a long way in sensitizing conservation partners, communities and government agencies on how to professionally deal with poisoning incidents in wildlife conservation areas across the country in order to minimize wildlife mortalities.

The KWS mission is to sustainably conserve, manage, and enhance Kenya's wildlife, its habitats in collaboration with stakeholders. Rapid and effective response to poisoning incidences including education and awareness is key for addressing wildlife poisoning cases in Kenya and to pre-empt such cases before they occur. I call upon all stakeholders to adhere to the use of this protocol to enhance wildlife and environment conservation in Kenya.

Julius Kimani Acting Director General Kenya Wildlife Service

ACKNOWLEDGEMENT

We would like to recognize and appreciate the contributions to the development process of this protocol on managing wildlife poisoning incidences. To the contributors, Alayne Cotterill (Lion Landscapes), Prof. Anthony Gachanja (JKUAT), Andre Botha (Endangered Wildlife Trust), Kariuki Ndang'ang'a (Birdlife International),Darcy Ogada (The Peregrine Fund), Domnic Mijele (KWS), Francis Gakuya (KWS), Joseph Sarara (KWS), Linus Kariuki (KWS), Masumi Gudka (Birdlife International), Moses Ochieng' Odhiambo (KWS), Munir Virani (The Peregrine Fund), Nadia de Souza (Lion Guardians), Nic Elliot (Mara Lions), Paul Gacheru (Nature Kenya), Thumbi Mwangi (Washington State University), Titus Kaitho (KWS), Tobias Otieno (Ewaso Lions), Salisha Chandra (Lion Guardians), Shivani Bhalla (Ewaso Lions).We also appreciate our stakeholder partners whose comments, critique and ideas helped shape this protocol.

This protocol was compiled by; Domnic Mijele, Monica Chege, Linus Kariuki, Titus Kaitho, Moses Ochieng'Odhiambo and Paul Gacheru.

This process was financially supported by Fondation Segre, The Band Foundation through Nature Kenya and Birdlife International in partnership with Kenya Wildlife Service.

1. INTRODUCTION

Poisoning has been identified as one of the leading factors causing the decline of a wide range of wildlife species across Africa (Ogada 2014). It is a silent killer that indiscriminately kills large numbers of animals and is harmful to human and ecological health. A poison is any substance that can cause severe organ damage or death if ingested, breathed in or absorbed through the skin. Traditionally, plant and animalbased toxins have been used to kill wildlife but more recently with the increased availability of synthetic agro-chemicals, they are becoming the poison of choice in Kenya and other parts of Africa. The use of poison to kill wildlife is silent, cheap and easy and has therefore become a common method used in the illegal control of damage-causing animals, harvesting fish and bush meat, harvesting animals for belief-based uses, poaching for wildlife products, and killing of wildlife sentinels.

1.1 Wildlife Poisoning and its Drivers

Poisoning of wildlife in Kenya is most often as a result of human-wildlife conflict, particularly problems of crop raiding by elephants and depredation of livestock by predators. Farmers and herder resort to illegal control of problem animals primarily through the use of poison baits where either fruit (elephant control) or livestock carcasses (predator/carnivore control) are laced with a toxic substance poisonous to wildlife if ingested. Carnivores, particularly hyenas and jackals but also lions and leopards are most frequently targeted by livestock farmers/herders (Ogada 2014). This type of indiscriminate poisoning has also resulted in tremendous impacts on unintended victims like avian scavengers e.g. vulture species. Whitebacked Vultures are usually the most numerous victims of any species at a poisoning incident. Furthermore, it has been documented that there is intentional poisoning of birds by some communities, particularly in rice cultivating areas (e.g. Bunyala and Mwea) for both subsistence and commercial human food consumption (Odino 2011).

1.2. Common Chemicals Used to Poison Wildlife in Kenya

There are a number of toxic chemicals such as agro-chemicals, plant-based extracts and heavy metals which have been used in the illegal poisoning of wildlife in Kenya. Over the last 8 years, the majority of poisoning incidents have been carried out using agro-chemicals which can be broadly classified as pesticides, herbicides, fungicides, acaricides. The most commonly used pesticides are organophosphates, pyrethroids and carbamates.

During the period between 2009 and 2017, some of the wildlife poisoning incidents and chemical compounds identified are summarized (Table 1).

1.3 The Poisoning Response Protocol

Wildlife poisoning is a crime in Kenya and is punishable by law. However despite legislation being in place, wildlife poisoning continues to be a serious problem to the long-term survival of wildlife in the country. Several factors are considered to be behind this;

- Poisoning is often carried out in remote areas, typically outside of protected areas on communal or private land making it difficult to discover and respond to incidents on time;
- ii. The majority of incidents are seldom reported to authorities compared to other wildlife crimes e.g. poaching;
- iii. A standardized protocol for responding to wildlife poisoning incidents is not available in Kenya
- iv. Resources and capacity of respondents are often limited to enable effective response.
- v. Chemical substances like agro-chemicals which are highly toxic to wildlife are easily available and cheap to purchase across the country

The protocolaims to facilitate the implementation and enforcement of the Wildlife Conservation and Management Act 2013 and other relevant laws for effective and timely response to poisoning incidents by ensuring;

- a. The chain of custody is respected to enable prosecution;
- b. Samples are appropriately collected, stored and transported for analysis;
- c. The poisoning site is adequately decontaminated to prevent further poisoning.

The protocol is applicable to a wide range of stakeholders including: Kenya Wildlife Service, Kenya Police, prosecutors, magistrates, County Governments, local community, conservancy managers, field scouts, conservation NGOs

Year	Month	Species	Number	Chemical	Location	County
		affected	affected	(Compound)		
				Indentified		
2009	Apr	Lion	1	Carbamate	Maasai Mara	Narok
2009	Apr	Vultures	40	Carbamate	Maasai Mara	Narok
2010		Vultures	20	Amitraz (Acaricide)	Maasai Mara	Narok
2011	Feb	Fish	Mass die	Pyrethroid	Maasai Mara	Narok
			off			
2011		Elephant	1	Ouabain (Plant	Siyapei	Narok
				extract)		
2014		Lions	5	Carbamate	Ngurumani	Kajiado
2015	July	Lions	1	Carbamate		Laikipia
2015	Nov	Lion	2	Carbamate	Maasai Mara	Narok
2015	Nov	Vultures	15	Carbamate	Maasai Mara	Narok
2016	Feb	Elephants	2	Carbamate	Maasai Mara	Narok
2016		Elephant	1	Ouabain (Plant	Tsavo	Taita Taveta
				extract)		
2017	May	Elephants	2	Pyrethroid	Ngurumani	Kajiado

Table 1; Summary of chemical compounds, wildlife species affected, location and year(KWS, 2017)

and other local conservation agencies working in collaboration to combat wildlife poisoning incidents in Kenya. This protocol will work in consistence with the current wildlife Management and conservation act 2013 and any other relevant law.

The main components of this poisoning response protocol are as follows:

- 1. Poisoning incident reporting
- 2. Treatment and diagnosis
- 3. Postmortem process
- 4. Sample collection and storage
- 5. Submission of samples for poison identification and analysis
- 6. Clean-up and decontamination of the poisoning scene
- 7. Chain of custody

1.4 Relevant National Legislation

Poisoning of animals has been classified by several pieces of legislation as a criminal offence. These include:

- The Constitution of Kenya, 2010 Chapter 5, Part 2 Environment and Natural Resources, Section 69 Clause 1 & 2, Section 70 Enforcement of Environmental Rights
- ii. Wildlife Conservation and Management Act 2013, Part xiii—Enforcement and Compliance

Section 112 (7) which states that "Any person who, without authorization conveys into a wildlife conservation area, or being within the area thereof, is in possession of, any weapon, ammunition, explosive, trap or poison, commits an offence."Section 77 (2) states that it is an offence to kill a problem animal in a protected area, or use any poison, pitfalls or snare for the killing of such an animal.

- iii. The Prevention of Cruelty to Animals Act Cap 360), Part II Section 5(b) states that "A person who knowingly puts or places, or causes or procures any person to put or place, or knowingly is a party to the putting or placing in or upon any land or building any poison, or any fluid or edible matter (not being sown seed or grain) which has been rendered poisonous, is guilty of an offence"
- iv. Pharmacy and Poisons Act, Chapter 244 (rev.2012) "poison" means a poison included in the poisons list referred to in Section 25 Environmental Management and Co-ordination Act, Rev. ed. Cap 387 (2012) Section 72 (Part viii) states that for defilements in aquatic ecosystems but not in terrestrial ecosystems which are also known to significantly suffer from poisons such

as is the case for poisoning of mega fauna including predators, scavengers and human beings, a person is liable for conviction.

- v. Pest Control Products Act, Rev. ed. Chapter 346 (2012), Section 12 Prohibition: No person shall use a pest control product in a manner that is inconsistent with the directions or limitations respecting its use as shown on the label.
- vi. Fisheries Act, Rev. ed. Chapter 378, (2012), Part V – Offences and Enforcement, section 15 [on] Prohibited methods of fishing: poisonous or noxious substances are outlawed and even more specifically, the subsidiary section 49 [emphasizes] prohibition on use of explosives and poison.

- vii. Agriculture Act, Chapter 318
- viii. Public Health Act, Chapter 242
- ix. Veterinary Surgeons and Veterinary Paraprofessionals Act, Chapter 366
- x. Water Act, Chapter 372

International framework and Obligations Kenya is signatory to;

- Convention of Migratory Species
- Convention on Biological Diversity

Any person, who violates the provisions of the legislations above, shall be liable for prosecution and subsequent penalties as prescribed by the law.



Image 1: The Pharmacy and Poison, Pest Control Products and Prevention of Cruelty to Animals Acts. PHOTO: www.kenyalaw.org

2. WILDLIFE POISONING RESPONSE PROTOCOL

2.1 Poisoning Incident Response Plan

Wildlife poisoning cases should be treated as an emergency that requires multi-disciplinary response to:

- 1. Prevent further poisoning and wildlife losses
- 2. Save the affected species by treatment or rescue
- 3. Minimize environmental contamination
- 4. Assist to systematically collate information to support prosecution where necessary

For all poisoning incidents it is vital to follow all proper crime investigation procedures to ensure;- orderly, thorough and procedurally lawful collection, storage, handling, processing, analysis, investigation and collation of evidence in order to secure a conviction. In all possible cases crime scene processing and investigation should be conducted by, or in conjunction with, appropriately trained and mandated law enforcement officers.

All suspected cases of wildlife poisoning should be handled by well-trained, experienced and equipped personnel to prevent exposure to potentially lethal substances. Every effort must be made to prevent further poisoning to other wildlife at the scene and environmental contamination.

2.2. Poisoning Incident Reporting A. First responders

First responders are anyone or group (patrol teams or civilians) who first encounter either a sick and dying animal (wildlife or domestic) displaying a peculiar behaviour or one or more carcasses of either wild or domestic animals (the domestic animal may be the poison bait), this scene is what is subsequently considered to be the suspected poisoning incident/ crime scene. The nature of the investigation will depend on the history given by first respondents. History can provide the following information:

- Date of incident
- Location (Use a GPS or describe the location in detail)
- Species involved
- Number of animals affected, and were they found alive and/or dead
- Reasons for poisoning (e.g. retaliation, human-wildlife conflict, cultural, accidental, hunting for food, etc.)

- Suspected chemical used
- Suspected source of the chemical used
- Any suspected culprit

B. Report Scene - The first responders to report detailed observations of the suspected poisoning incident to relevant authorities (KWS, Police, County/Local Administration, and Conservancy Managers). Provide a detailed report of observations without contaminating the scene. Therefore, do not walk/drive into, around or over the area where the poisoned carcass/es or bait is located. Based on the report of observations provided to relevant authorities, the response team will be determined. (Image 2).



Image 2: Suspected poisoning scene in Laikipia County. PHOTO J. WAHOME

C. Secure Area – The relevant authorities to invite the response team and secure the scene until they arrive.

2.3. Response Team

Once the reported incident has been identified by the investigative team as a poisoning crime scene, post-mortems, sample collection, and treatment of injured animals should only be undertaken by authorized personnel and registered experts such as KWS, government or private registered veterinarians - registered by Kenya Veterinary Board and authorized by KWS. Lead investigator should either be from the Kenya Police or KWS in consultation with Police and any other co-opted expert in consultation with KWS





Step 1: Secure Scene - Exclude all unauthorized personnel from scene, so that the area is not overcrowded. Exclude all animals from the scene, however in aquatic environment, professional diligence shall apply.

Step 2: Determine Case - Identify if the scene is a poisoning and report as a crime scene. Investigators should examine the scene to establish if a crime has been committed or not. For crime scene investigation identify the following; what happened, where, when, by who, why and how (5W 1H)

- a. Establish whether a crime has been committed (what crime)
- b. Where the crime was committed
- c. When was it committed
- d. Who are the perpetrators
- e. Why Establish if the crime is deliberate or not
- f. How was it committed? (for this case, suspected poisoning)

Step 3: Evidence collection and recording – Marking signs and objects that could be used or collected as evidence (Image 3). Photograph overall scene and individual pieces of evidence, and record all details of evidence and scene. Annex 1 gives a check list of wildlife crime scene equipment and Annex 2 gives a check list wildlife crime scene procedures.

Step 4: Conduct postmortem and collect biological samples – Post mortem examination and sample collection to be done by duly registered veterinarian authorized by KWS. The purpose of any postmortem examination is to establish as precisely as possible the causes and circumstances of animal mortality. The necropsy should therefore be orderly, systematic and exhaustive. It must be conducted by a trained and registered veterinarian with updated knowledge of the fundamental aspects of legal necropsy.

Some of the basic post mortem equipment and materials required for responding to wildlife poisoning incidents include the following:

- i. Personal protective equipment: latex gloves and face masks
- ii. Disinfectants and detergents for self and equipment disinfection

- iii. Post-mortem kits
- iv. Matches and fuel for burning contaminated carcasses
- v. Transport and machinery for disposal of large animal carcasses
- vi. Digital camera, take photos at every stage

(Annex 1 provides a Comprehensive list of equipment)

Step 5: Record investigation in crime scene procedure checklist (Annex 2)

Step 6: Clean-up and Decontamination of the Poisoning Scene

Step 7: Diagnosis and treatment of affected animals (*Annex 3* gives an outline of some clinical signs to look out for in a poisoned animal. *Annex 4* provides guideline procedures to be followed if treatment of poisoned animal is to be carried out)

Step 8: Submission of Samples for Poison Identification and Analysis



Image 3: Evidence to be photographed and collected. PHOTO: ENDANGERED WILDLIFE TRUST

3. POSTMORTEM PROCESS

The purpose of any necropsy/postmortem examination is to establish as precisely as possible the causes and circumstances of animal mortality. The necropsy should therefore be orderly, systematic and exhaustive. It must be conducted by a trained and registered veterinarian with updated knowledge of the fundamental aspects of legal necropsy.

3.1 General Observation

The veterinarian conducting the postmortem should make thorough observations on the surrounding environment and take note of the following:

- 1. Any containers, packaging materials for poisonous chemicals
- 2. Signs of struggle
- 3. Vomitus on the animal or ground
- 4. Signs of diarrhoea
- 5. Color of fecal droppings
- 6. Left-over foods or decomposed materials in the surroundings
- 7. Any color changes on the surrounding vegetation
- 8. Soil color
- 9. Any unusual observation on water bodies nearby

3.2 External Examination of the Carcass

This involves making an observation of the carcass without cutting it open, it may involve turning the carcass to observe any important finding that can lead to diagnosis (Image 4 and 5). Some of the information to be collected includes the following:

- Species affected,
- Age of animals,
- Sex of animals,
- If pregnant, what stage of gestation
- Whether lactating or not
- Body condition
- Color changes of the mucous membranes
- Signs of diarrhea (e.g. matting of the perineum)
- Signs of physical injuries on the body
- Unusual smell of chemicals
- Signs of fractures or dislocation
- Burns on the skin or oral cavity
- Signs of ante-mortem hemorrhages
- Presence of ecto-parasites



Image 4: Veterinarian performing external examination of a lion carcass suspected to have been poisoned. PHOTO: KWS



Image 5: Suspected poisoned, but alive, Rüppell's Vulture. Notice vomitus next to its head circled. PHOTO J. WAHOME

3.3 Internal Examination of the Carcass

Perform systematic organ-to-organ postmortem examination of the carcass. If possible the carcass can be placed in supine position and dissected in the manner to suit the particular animal species and at the discretion of the veterinarian. All the internal organs have to be observed in-situ and ex-situ to note any gross pathological signs or lesions.

An exhaustive examination will then be made of each organ/system and samples taken. Take as many digital photos of the observed lesions. Special attention should be paid to the presence of hemorrhage, congestion of viscera, exudates, color of the ingesta, type of ingesta and edema, the state of gastrointestinal mucous membrane and presence of gastro-intestinal parasites (Image 6 and 7).



Image 6: Internal examination of a lion carcass suspected to have been poisoned. PHOTO: KWS



Image 7: Internal organs of a suspected poisoned lion. PHOTO: ENDANGERED WILDLIFE TRUST

4. SAMPLE COLLECTION AND STORAGE

Take samples from as many animals as possible, including from the source of the poison. The type of samples to collect will always depend on the suspected type of poisoning. Remember, poisons are usually ingested via the mouth and then travel through the digestive system. Therefore, when only a few samples can be collected, or the carcass is not fresh, concentrate sample collection on the organs mostly likely to have come in direct contact with the poisons. These include the tongue, teeth, stomach, crop for birds, esophagus, and secondarily the claws or paws for carnivores.

Samples collected from old and degraded carcasses can also be valuable for detecting poisonous residues. Samples to collect are teeth, beaks and claws. Depending on the poison and local environmental factors, residues may be able to be detected up to two weeks after a poisoning incident has taken place.

It is important to check every poisoned individual for tracking (collars) devices or in the case of birds, rings. Tracking devices should be removed and returned to the owner. There will be a contact number somewhere on the unit. These tracking units contain valuable monitoring data, which can be used. Note the ring numbers, or remove them if possible and return them to the rightful owner where possible.

4.1. Types of Samples to Collect

- i. Ingesta/stomach contents/crop contents this is the single most valuable sample for ingestion of poisonous substances
- ii. Vomitus- vomit content
- iii. Tissue samples including the liver, kidneys, spleen, heart muscles, lungs, brain tissue, and other parts of the body in-contact with the suspected chemical including the skin should be collected in leak proof screw-capped containers and sealed in well labeled zip-lock plastic bags free from environmental contamination
- iv. Blood
- v. Urine samples for chemicals excreted through urine
- vi. vi. Skin, hair and feather samples e.g. for topical acaricide chemicals
- vii. Bones can be collected and put in sealed zip-lock bags and may determine toxins such as lead accumulation, but not recent single event effects.
- viii. Contaminated bait or samples from the bait should be collected
- ix. Collect dead insects lying around the carcass or bait
- x. Collect any container, packaging material, other suspected material used to deliver the poisonous chemical and any other foreign material found at the scene that can aid in investigation.



Image 8: Use of permanent marker pen for labeling specimen. PHOTO: D. OGADA



Image 9: Use of numbered marker flags in the field. PHOTO: F. BROEKHUIS

4.2. Baits and Poisons

- Conservation personnel should be acutely aware of fruits, vegetables, carcasses and other baits which are out of place and positioned along game paths or near to water or feeding points
- All baits and poisons must be photographed, identified, counted, marked & geo referenced (in relation to the crime scene), labelled and sampled for laboratory analysis.
- The nature of the bait must be recorded as it gives an indication of intended or target species e.g. vegetable bait for elephant vs. meat baits for predators which might support indictment for intent to poison a given target species.

4.3. Dead and Moribund animals

- All dead and moribund animals must be photographed, identified, counted, marked and geo referenced (in relation to the crime scene), labelled and sampled.
- All dead and moribund animals must be correctly identified Small animals particularly fish, birds or mammals approximately ≤50kg can be sampled "whole" with appropriate tagging/labelling.
- In the case of animal that are still alive, a decision on whether to attempt treatment or to euthanize and sample should be made on a case-by-case basis and will be influenced by a number of considerations ranging from the conservation status of the species concerned, prognosis, availability of veterinary care and medications as well as on animal welfare.

4.4. Labeling of Samples, Specimens and Exhibits

- The collected specimens should be properly labelled using tamper-proof labels and indelible permanent markers. Labeling should include sample number, type of specimen, species if known, location/GPS, date and time, and name of collector (Image 8)
- Use masking tape to seal the ziploc bag and the collector must sign the seal to ensure it is tamper-proof.
- Where stickers are used for labeling they should be securely attached to the sample bag or container.
- If possible collect all the samples in triplicate or duplicate to facilitate multiple tests in different laboratories and for archiving
- Tissue samples from different animals should be kept separate to avoid cross contamination.
- Non-tissue specimen should be collected in separate bags or containers
- All sampling collection bags and containers should be sterile
- Numbered marker flags to be used systematically to indicate specimen or exhibit numbers (Image 9).

5. SAMPLES SUBMISSION FOR LABORATORY ANALYSIS

To attain reliable and credible results, toxicological samples must be collected in adequate quantities and preserved in recommended containers and methods. They should also be accompanied by laboratory test request form and other relevant documentation.

5.1. Preservation and Transporting of Samples

Biological samples meant for toxicological analysis should be stored at -4°C and presented to the laboratory as soon as possible. When samples are being transported they should be placed in a cool box with ice packs or dry ice (preferable) to maintain them at low temperatures to prevent further decomposition of the tissue.

NB: Samples meant for toxicological analysis should **NOT** be preserved in alcohol or ethanol.

5.2. Recommended Laboratory Tests and Laboratories

Unless it is obvious, there is a need to test for

poisonous substances and or disease causing pathogen(s) in the samples collected.

A toxicological lab report is mandatory for suspected wildlife poison(s). It is a good practice to do toxicological tests and tests for pathogens. Histopathology or histo-chemical analysis or report may at times be necessary. Any fractures or heavy metal poisoning should be confirmed through radiology.

All wildlife poisoning samples intended for analysis and evidence collection for prosecution purposes shall be submitted to Government Chemist.

Other accredited laboratories (local and foreign) to be considered for second opinion on a need basis as approved by KWS, for example; Jomo Kenyatta University of Agriculture and Technology:- Analytical Science Laboratory Department of Chemistry, University of Nairobi:-Department of Public Health, Pharmacology & Toxicology, Department of Veterinary Pathology, Microbiology & Parasitology among others.



Image 10: Preparation of samples for transportation. PHOTO: A. BOTHA

6. CLEAN-UP AND DECONTAMINATION OF THE WILDLIFE POISONING SCENE

After completion of poisoning scene analysis and investigation it is important to clean up and decontaminate the scene to avoid further wildlife poisoning incidents. It is important that the scene be cleared of residual baits, poisons, contaminated carcasses and materials.

6.1. Clean-up of Baits and Small Carcasses

Collect, record and remove all baits, poisons, contaminated carcasses and materials from the scene. Those items in excess of evidence/ sample/analysis requirements should be removed and either:

- Completely incinerated by burning (Image 11) and/or
- 2. Buried deeply (beyond reach of scavengers) with a strong solution of sodium hydroxide or quick lime (CaO) to promote breakdown of toxins and baits.

6.2. Disposal of Contaminated Large Animal Carcasses

- Large animal carcasses should be adequately disposed by deep burial or burning or both to ensure the scene is properly decontaminated.
- In case of a large carcass, such as an elephant laced with poison and cannot be easily burnt or buried, logical steps should be taken to reduce further environmental contamination. The following can be considered to facilitate full disposal;
 - i. Cut out and remove all parts of the carcass which are visibly contaminated or laced with high concentrations of poison and dispose off the portions by burning or burying.
 - ii. Drench the carcass and contaminated soil with recommended concentrations of Sodim Hydroxide, (NaOH) or



Image 11: Ensure complete burning of carcasses for decontamination purposes. PHOTO: ENDANGERED WILDLIFE TRUST

quicklime (CaO) to create a moist alkaline environment which increases the rate of breakdown for carbamates such as Aldicarb and Carbofuran.

- iii. Camouflage the carcass from any scavengers by wrapping in plastic, shade-cloth or similar.
- iv. Drench the carcass and surrounds with diesel, citronella oil or similar strongsmelling / unpleasant-tasting substance which might discourage scavengers from ingesting contaminated material.
- v. The use of "bird aversion tape" commercially available for the deterring/ scaring of pigeons, crop-raiding birds, seagulls and other birds – might well work for vultures and, although there is no documentation as to efficacy in deterring scavenging birds or raptors, this "scare-crow" method should be trialled to deter vultures and raptors from scavenging contaminated carcasses.
- vi. The carcass should be physically guarded if necessary to deter scavengers.

6.3. Dealing with a Contaminated Water Source

In the case of a water source being poisoned this should be regarded as being an emergency of utmost importance as there is real potential to poison many non-target animals including humans. Due to the non-targeted nature of water poisoning and the far-reaching ecological and pollution implications these cases should be prosecuted using appropriate legal framework. The emphasis should remain on reducing contamination, safe disposal of contaminated material and prevention of ingestion by other animals and people. Fortunately, most pesticides, including carbamates, are much more labile and break down more rapidly in the aquatic environment.

When dealing with a contaminated/poisoned water source one might consider:

- a. Remove any visible material or substance suspected to be the cause of poisoning
- b. In case of a small water pan fed by artificial water source, consider covering the contaminated waterhole with soil and diverting pipes to establish an alternative water-pan.
- c. Consider physically preventing animals from accessing the contaminated water through use of barriers and/or manual patrols until such time when the contaminant is sufficiently broken-down or diluted.
- d. Degradation of carbamates, which happens faster in water than in dry soil, may be enhanced by addition of alkalis such as Calcium Oxide (quicklime) to the water followed by dilution/flushing.
- e. In case of springs and rivers which have dynamic water inflow and outflow, poisons are ultimately diluted and flushed out but may take some considerable time depending on the hydrodynamics of the contaminated pool/stream/spring or river.

Caution: Even though the water source might seem to have been flushed, it is important to bear in mind that contaminants may have formed sediment which could be stirred up later.

7. DIAGNOSIS AND TREATMENT

Clinical symptoms of poisoning vary widely depending on the type of poison involved, amount ingested, and animal species (Annex 3). Generally clinical symptoms of wildlife poisoning are similar to other diseases and symptoms cannot be used as standalone diagnosis of poisoning.

All wildlife poisoning cases requiring wildlife treatment should be handled by qualified veterinarians registered by Kenya Veterinary Board and authorised by Kenya Wildlife Service. The veterinarian should humanely capture and perform clinical examination to the affected animal to enable an understanding of whether or not poison was used, and if so, which poison involved. Then make a professional decision as to whether the animal can be treated or not and take an appropriate action (Annex 4). For further case management, the animal should be taken to an authorized wildlife rehabilitation centres in Kenya (Annex 5).



Image 12: A poisoned vulture receiving treatment. PHOTO: A. BOTHA

8. CHAIN OF CUSTODY

Chain of custody is guided by detectives/ investigators and the veterinarians to support the prosecution processes. Chain of custody forms (Annex 6) must be filled by both expert teams (Crime scene detectives & veterinarians).

8.1. Scenarios in Chain of Custody Process

- a. When suspect is arrested
 - The incident will be reported and booked in both KWS and Police Occurrence Book (OB) also find a police exhibit memo (Annex 7)
 - The suspect will be charged in court with the relevant offence as per the WCMA 2013 and other related legislation

- The prosecution will give direction on what to do with the evidence collected from the scene (e.g. laboratory analysis)
- Court procedures to take the due process, various experts e.g laboratory personnel, veterinarians and investigation officers may be involved where necessary. If there is no arrest
 - The incident will be reported and booked in both KWS and Police Occurrence Book (OB)
 - Investigations will proceed to identify and apprehend the culprits
 - Processing of findings from scene of crime will continue (both from the investigators and the veterinarians) and a report shall be provided (Annex 7)



Image 13: A Kenyan court room. PHOTO: COURTESY

REFERENCES

- 1. Agriculture Act, Rev. ed. *Chapter 318* (2012) Kenya.
- 2. Environmental Management and Coordination Act, Rev. ed. Chapter 387 (2012) Kenya
- 3. Fisheries Act, Rev. ed. *Chapter 378* (2012) Kenya.
- 4. Land Act, Rev. ed. No. 6 (2012). Kenya
- 5. Odino, M. 2011. Measuring the conservation threat to birds in Kenya from deliberate pesticide poisoning: a case study of suspected carbofuran poisoning using Furadan in Bunyala Rice Irrigation Scheme. *Carbofuran and Wildlife Poisoning: Global Perspectives and Forensic Approaches.*, pp.53-70.
- 6. Ogada, D.L.2014. The power of poison: pesticide poisoning of Africa's wildlife. *Annals of the New York Academy of Sciences* 1322: 1-20.
- 7. Pest Control Products Act, Rev. ed. *Chapter 346* (2012). Kenya.

- 8. Prevention of Cruelty to Animals Act, Rev. ed. Chapter 360 (2012). Kenya
- 9. Public Health Act, Rev. ed. *Chapter 242* (2012). Kenya.
- Rapid Response to Wildlife Poisoning Workshop Report 2016
- 11. The Constitution of Kenya (2010) Kenya.
- 12. Veterinary Surgeons and Veterinary Paraprofessionals Act, Rev. ed. *No. 29* (2012). Kenya.
- 13. Water Act, Rev. ed. *Chapter 372* (2012). Kenya
- 14. Wildlife Conservation and Management Act, Rev. ed. (2013)
- 15. Wildlife Offences in Kenya (2016). A Rapid Reference Guide for the Investigation and Prosecution of Wildlife Related Offences 2nd Edition; Including Standard Operating Procedures and Sample Charges

ANNEXES

Annex 1: Basic Wildlife Crime Scene Equipment Checklist

WILDLIFE CRIME SCENE EQUIPMENT CHECKLIST

ITEM	ITEM	ITEM	ITEM
RECORDING	CAMERA	PROCEDURE AIDE ME	SMOKE GRENADES
EQUIPMENT	BATTERIES	MOIRE	
CAMERA 35 mm x 2	LOUD		BOW SAW & SPARE
	HAILERBAITERIES	INVENTORY	BLADES
VIDEO CAMERA	METAL DETECTOR	CLIPBOARD	SCALPEL KIT
	BATTERIES		
GPS	GPS BATTERIES	MARKING /	PLIERS
DIGITAL CAMERA	FLASH BATTERIES	STICKY LABELS	SPADE
LONG TAPE MEASURE	<u>FOOTPRINT</u> LIFTING KIT	NUMBERED SEALS	TROWEL
MICROCHIP SCANNER	NON STICK	MASKING TAPE	TARPAULIN x 3
	COOKING SPRAY		
RANGE FINDER	POWDER	PLASTIC DISCS ON	TWEEZERS
NUMBERED CARDS 1-	1 GAL. ZIP LOCK	CRIME SCENE TAPE	UMBRELLAS
RULER	TALCUM POWDER	BRAISING RODS	WHISTLES
DICTAPHONE	A4 SIZE MIRROR	STRING (300 METERS)	25 L WATER X 2
EVIDENCE	4 X NUMBER	TAGS	SOAP
ENVELOPES (SMALL)	10 kg DENTAL	GENERAL	HAMMER
ENVELOPES (LARGE)	SPOON	SOLAR PANEL	GRASS SLASHERS
PLASTIC BAGS	4 X SPOOR BOXES	CELL PHONE CAR	TOOTHBRUSH
FILM CANISTERS	HAIRSPRAY	SUN SCREEN LOTION	MATCHES
COOL BOX	STATIONARY	FACEMASK	LIGHTER
BUBBLE WRAP SHEET	SCISSORS	CAMPING EQUIPMENT	TICK REPELLANT
TEST TUBES	CONTACT	SPOTLIGHTS	METAL DETECTOR
	TELEPHONE		
	NUMBER LIST		
TOILET PAPER	MAPS	SKINNING KNIVES	DENTAL FLOSS X 500M
ROLL BROWN PAPER	SPARE	BUSH KNIVES	RAGS
WHITE PACKAGING	PENCIL	FILE	NO ENTRY SIGN
EVIDENCE	ERASER	AXE	LOUD HAILER
PRESERVATIVE			
FORMALIN	SCENE REPORT	MAGNIFYING GLASS	ICEPACKS
SATURATED SALT	CHAIN OF	CRIME SCENE	SEALABLE EVIDENCE
SOLUTION	CUSTODY SHEETS	CONTROLLER JACKET	BOXES
70% ETHANOL	BLACK MARKER	RUBBER GLOVES	RATION PACKS
SPARES BATTERIES	FOLIO PAPER	BINOCULARS	SPARE FILM
TORCH BATTERIES	RULER	WHETSTONE	12V INVERTER
MICROCHIP SCANNER	NUMBERED	RAKE	FIRST AID KIT
BATTERIES	STAKES		
DICTAPHONE	NUMBERED CONES	COMPASS	RhODIS FORENSIC KITS
BATTERIES			

Annex 2:	Crime	Scene	Procedure	Checklist
----------	-------	-------	-----------	-----------

	Action	
1.	Before leaving for the scene, you should:	
	1.1 inform the Vet	
	1.2 inform the Police / Investigators	
	1.3 inform the Police Crime Scene Investigators / Dog Unit	
	1.4 inform the Defense Force / Army	
	1.5 inform the Park Warden / NGO for that area	
	1.6 inform your Supervisor / Rhino Coordinator	
	1.7 inform your local intelligence network	
	1.8 collect your crime scene equipment	
2.	Approach to the scene:	
	2.1 stop correct distance from scene	
	2.2 identify and cordon off holding area	
	2.3 appraise scene from a distance	
	2.4 debrief person pointing out scene	
	2.5 look at large objects	
	2.6 begin note taking	
	2.7 photograph	
	2.8 confirm it is safe to work at the scene (poison, traps)	
3.	Cordon:	
	3.1 select holding area	
	3.2 search holding area and place cordon	
	3.3 appoint guard / holding area controller and give specific instructions	
	3.4 enquire if 1 st person on scene did 360deg patrol	
	3.5 follow same route as in 3.3 above or if he did not, then select route	
	3.6 place "no entry" sign on crime scene cordon	
4.	Entry on to the scene:	
	4.1 investigator and assistant only onto the scene	
	4.2 mark route	
	4.3 single file straight line	
	4.4 look for small objects en route	

5.	Actions at the carcass:	
	5.1 establish place of death (stomach contents on old carcass)	
	5.2 more the encrosed	
	5.2 mark the carcass	
	5.3 photograph carcass	
	5.4 establish species /sex /age	
	5.5 search for microchip / note collar / active transmitter	
	5.6 determine if known animal / photograph ears	
	5.7 make notes	
	5.8 estimate age of carcass	
	5.9 note presence or absence of horns	
	5.10 photograph nose if missing horns	
	5.11 recognize chop marks – present or absent	
	5.12photograph and make notes of chop marks	
	5.13 establish cause of death - external inspection of carcass	
	5.14 flap back skin and inspect for bruising	
	5.15 locate bullet hole/s	
	5.16 show wound channel with bruising rod	
	5.17 masking tape onto rod and number	
	5.18 photograph / note wound channel	
	5.19 ID area for searching, check with metal detector and place trap	
	5.20 locate projectiles with metal detector / photograph / note	
	5.21 inspect bones for bullet marks / photograph / note	
	5.22 collect sample for DNA / photograph / note	
6.	Searching methods:	
	6.1 decide on a searching method	
	6.2 invite assistants onto scene and instruct specifically	
	6.3 hands and knees	
	6.4 plan alternatives searching methods – grid / spiral / segments	
	6.5 bush clearing	
	6.6 metal detector	
7.	Evidence collection:	
	7.1 mark	
	7.2 photograph	
	7.3 take notes	
	7.4 spoor box	
	7.5 photograph all exhibits points in relation to each other	
	7.6 collect all exhibits	
H		

8.	Skull recovery	
	8.1 after cleaning , reinsert correct bruising rods into wound channels	
	8.2 photograph / note	
	8.3 re-check skull with metal detector / X-ray	
	8.4 cut open skull with bow saw if further bullet head /s located	
	8.5 recover bullet heads / photograph / note	
9.	Plans and departure	
	9.1 compile sketch plan and key	
	9.2 take GPS reading at centre of scene	
	9.3 Take necessary measurements for plan	
	9.4 clean up scene	
	9.5 take last photo of scene	

Notes

Annex 3: Some of the Clinical Symptoms to look for in Suspected Poisoned Animal

Clinical symptoms of poisoning vary widely depending on the following:

- Type of poison involved and the amount ingested: In general the poisonous chemicals used are highly toxic and the onset of signs is usually immediate followed by mortalities. However, live animals are often found at poisoning crime scenes because some individuals may not consume adequate lethal dose. These animals are often lethargic, and may try to vomit and/or drink water.
- 2. Animal Species: Clinical signs of poisoning also depend on the animal species affected. Mass die-offs of wildlife typically indicate either a poisoning incident or an outbreak of a highly infectious disease, particularly in waterborne species. The species involved can be a good indicator as to whether poisons or disease is the culprit when vultures or other carnivorous birds are present, suspect poisoning. When herbivorous species are involved, it is most likely to be a disease outbreak, but remember there are always exceptions, particularly in the case of elephants, which are common targets of poisoning.

NB: The clinical symptoms enumerated below are also exhibited by infectious diseases thus should not be considered as pathognomonic signs for poisoning.

Clinical symptoms of poisoned animals Generally, animals display similar symptoms of poisoning depending on their taxa. Poisoned mammals may exhibit one or more of the following symptoms:

- Loss of appetite
- Vomiting
- Diarrhoea
- Severe dehydration
- Drooling of saliva/hyper-salivation

- Increased tearing/hyper-lacrimation
- Lethargy
- Inco-ordination
- Muscle spasms
- Disorientation
- Paralysis
- Convulsions
- Seizures
- Coma
- Death

Poisoned bird species may exhibit one or more of the following symptoms:

- Unable to fly
- Paralysis
- Convulsions
- Drooping wings
- Blood in the droppings
- Skin irritation
- Dropping dead
- Mass-die-offs of birds

Clinical signs of animals killed by poisons

- Posture of the animals will look like a struggle ensued prior to death
- In the case of birds, wings will often be outstretched
- Body position and limbs will be contorted
- In mammals, teeth may be showing as in a grimace
- Vomit maybe found nearby
- Birds may fly away only to die in trees, sometimes nearby

In case of aquatic poisonings, fish and other aquatic species are likely to be seen as a massdie-off and floating in a river, lake or swampy areas

Annex 4: Treatment and Management of Wildlife Poisoning Cases

- a. Identify symptoms of animals to enable an understanding of whether or not poison was used, and if so, which poison.
- b. Make a decision as to whether the animal can be treated or not.
- c. All wildlife poisoning cases requiring treatment should be handled by qualified veterinarians registered by Kenya Veterinary Board and authorised by Kenya Wildlife Service.
- d. Safety first always be in protective gear and only handle wildlife poisoning cases if trained to do so.
- e. Capture (physical or chemical restraint) and secure affected live animals if possible then administer treatment.

- f. Method of treatment is poison dependant, but the veterinarian may consider stocks of Atropine sulphate or Vitamin K and activated charcoal as possible antidotes.
- g. Secure the sick animal in a cool dark area.
- h. Don't force feed or make poisoned animals to drink.
- i. Induce vomiting or remove crop contents.
- j. If possible flush the crop of a poisoned bird.
- k. Contact and consider transport to nearest approved rehabilitation centre, where necessary.

Annex 5: Contact Details of Animal Rehabilitation Centers in Kenya

Poisoning cases that require rehabilitation are to be referred to KWS Nairobi Animal Orphanage or KWS approved orphanages some of which are listed below among others;

Nairobi Animal Orphanage

Kenya Wildlife Service, P.O. Box 40241 - 00100, Nairobi Kenya Tel: 020 2379407 , 020 6002345, 020-2379408 , 020-2379409, 020-2379410, 020-2379411, 020-2379412,020 020-2379413, 020-2379414 Call Center:0800 597 000 or 0800 221 5566

David Sheldrick Wildlife Trust

P.O. Box 15555 Mbagathi, 00503 Nairobi, Kenya Telephone: 0202 301396, 0733 891996 Email: info@sheldrickwildlifetrust.org

Reteti Elephant Sanctuary

info@retetielephants.org Namunyak Wildlife Conservancy, Samburu, Kenya www.retetielephants.org

Raptor Rehabilitation Centre Karen, Nairobi

P.O Box 15377-00509, Nairobi, Kenya Tel: +254721969640/0723829529 Email: raptorrehabkenya@gmail.com http://raptorrehabkenya.org/

DATE AND TIME OF SEIZURE ITEM NO. E. D. $\mathbf{\Omega}$ B. \triangleright SOURCE OF EVIDENCE/PROPERTY (person and/or location) TAKEN FROM: ITEM NO. FOUND AT: **RECEIVED FROM: CHAIN OF CUSTODY** FROM REGION SIGNATURE RELEASING **DESCRIPTION OF EVIDENCE/PROPERTY EVIDENCE/PROPERTY SEIZED BY:** FILE NO. **RELEASING DATE DELIVERED VIA**

Annex 6: Sample Chain of Custody Form

THE KENYA POLICE

EXHIBIT MEMO F	ORM
Station Division C	harge Register No
To:-	Iollerith Code No
I forward herewith*by registered mail	
under escort of	
exhibits enu (*Strike out whichever is applic	merated below for favour of examination. eable)
Exhibits and identification markings	
Exhibits and identification markings	
	•••••
Precis of offence:-	
It is desired to ascertain:-	
Name of complainant	
Name of accused (if known)	
Offence and Section	
Time, date and place committed	
Taken possession of by	
Date Signed	
Exhibit enumerated above received. Signed	Date
<i>Note:-</i> This form to be completed in triplicate. Three copies to accomp report, third copy to be returned as receipt.	any exhibit, second copy to be returned as

|P.T.O

Annex 8: Wildlife Poisoning Response Protocol Development Note

Action	Responsible	Timeline	Status
Constitute a technical team to develop a draft protocol	Nature Kenya- Paul; KWS-H-SCM	July 2017	Completed
Review and validation of the protocol by a core group	Global and National partners	July 2017	Completed
Finalize the protocol	Nature Kenya –Paul; and KWS drafting Team	mid-end August 2017	Completed
COP-Oct. Organize Side event to demonstrate how it works	KWS-Dr. Njogu, BirdLife-Masumi	October 2017	COP conference held. No Side event convened
Workshop to validate the protocol	Nature Kenya- Paul and KWS- H- SCMand HVS	November 2017	Completed
Incorporation of comments from validation workshop	Drafting Team	December 2017	Completed
Protocol adoption and endorsement	KWS DG through Dr. Kasiki	December 2017/ January 2018	Completed
Design, Printing and Distribution	KWS, KWCA and Partners	January 2018	Planning ongoing
Develop a simplified version for field practice	Drafting team	January 2018	Planning ongoing
Implementation - Purchase of Field kits; Workshop to train different stakeholders and Pilot testing of the protocol	Nature Kenya Paul and KWS- H-SCM	February 2018	Planning ongoing

Notes	

Notes	

