

NORTHERN
RANGELANDS
TRUST



Wildlife-Conservancy Management Monitoring System

WILDLIFE COMMS



RANGER-BASED MONITORING
of WILDLIFE & ILLEGAL ACTIVITIES



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A GUIDE TO RANGER-BASED
MONITORING OF WILDLIFE
AND ILLEGAL ACTIVITIES

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PDF versions of this guide and a freeware version of the Wildlife-CoMMS database are available at <http://www.nrt-kenya.org> or by request from the author: julietking@africaonline.co.ke



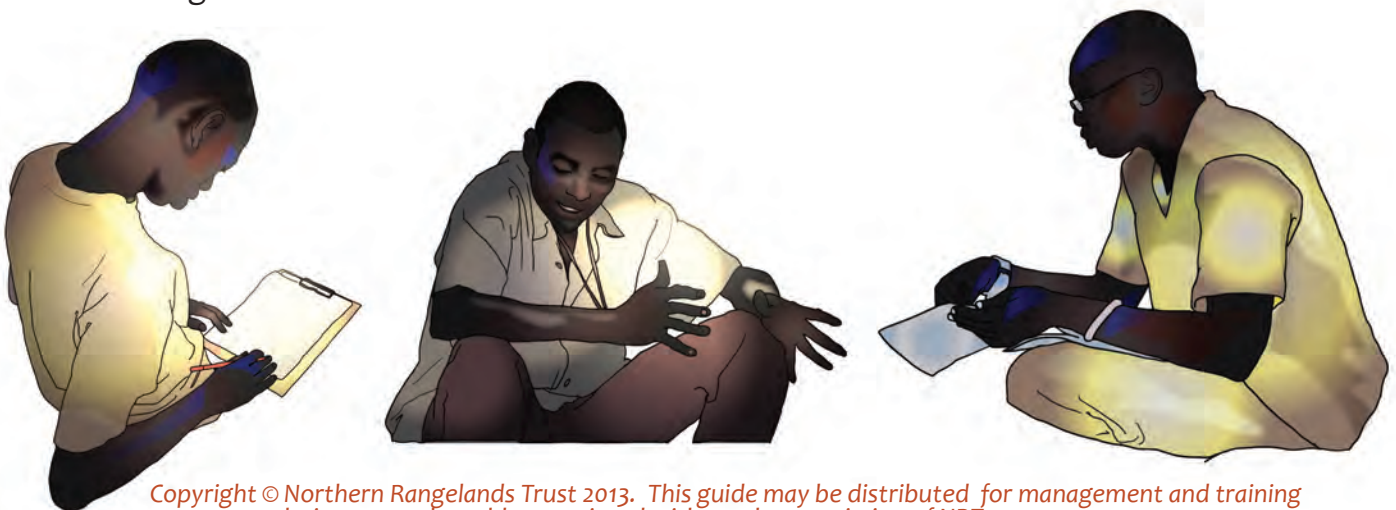


ACKNOWLEDGEMENTS

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These guides are the result of seven years of trialling and implementation of ranger-based monitoring in NRT community conservancies; by the end of 2012, over 300 community rangers had been trained and are implementing *Wildlife-CoMMS* in 17 NRT conservancies. Feedback from Conservancy Managers, Wardens and Rangers has been an essential part of the development of *Wildlife-CoMMS*, in creating a system that is appropriate in the context of community conservancies and is tailored to their needs. In particular, the NRT Research & Monitoring team of *Dominic Lesimirdana*, *Sinyati Lesowapir* and *Mohammed Golicha* has been an integral part of the development of the system through their support and training of rangers in the field. The *Wildlife-CoMMS* database was developed by *Fran Micheltmore Root*, who has also developed a detailed guide to accompany the database.

Input to various components of *Wildlife-CoMMS* and this guide also draws on collaborative work with NRT partners including the *Kenya Wildlife Service*, *Save the Elephants*, *CITES-MIKE* programme, *Grevy's Zebra Trust*, *Laikipia Predator Project*, *Ewaso Lions* and *Samburu-Laikipia Wild Dog Project*. We are grateful to *Jophie Clark* for her work on initial drafts of the guides. Acknowledgement of reference material or organisations providing specific information is given in the relevant guides.



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NORTHERN RANGELANDS TRUST

The Northern Rangelands Trust was established in 2004 as an umbrella organisation for community Conservancies in northern Kenya. Its mission is **to develop resilient community conservancies that transform lives, secure peace, and conserve natural resources**. It does this through raising funds for conservancies, providing advice and mentorship on management, supporting a wide range of training and brokering agreements between conservancies and investors. It also monitors performance providing donors and partners with a degree of oversight and quality assurance.

COMMUNITY CONSERVANCIES

Community conservancies are community-owned organisations which aim to improve biodiversity conservation and livelihoods of local people over a defined area of land traditionally owned, or used, by the constituent community. The long-term success of conservation on community land depends on building strong, well governed community-owned institutions that ensure rights and responsibilities of conservation by local land-owners and equitable benefits to communities from conservation.



WILDLIFE-COMMS & THESE GUIDES

The Wildlife-Conservancy Management Monitoring System (Wildlife-CoMMS) is a simple system for monitoring trends in wildlife and their threats. Monitoring is vitally important as it allows Conservancies to look at changes over time to determine the impact of management on wildlife populations and illegal activities and to assess whether Conservancies are achieving their conservation objectives. Conservancies can then use this information to improve their management.

NRT guides conservancies through all the stages of planning and implementing Wildlife-CoMMS. NRT has developed this comprehensive set of guides to:

- ◆ support the training, implementation and practical day-to-day delivery of Wildlife-CoMMS
- ◆ to encourage self-sufficiency in fully operating and maintaining Wildlife-CoMMS in Conservancies in the long term.



CONSERVATION & CONSERVANCIES

AIM

To support Conservancy staff, this guide introduces the **principles** behind conservation and outlines the purpose and **role of conservancies** in helping communities.

OUR ENVIRONMENT & THE WEB OF LIFE

Environment **is** our life – we depend on it to live and become increasingly poor as it becomes degraded. Since everything in the environment is interconnected, we **all** have a role in this complex web of life.



CONSERVATION AND WISE USE OF RESOURCES



Conservancy communities are tied to the land, and dependent on its natural resources for wealth and livelihood. Livelihoods are directly related to the **health of the environment**. The more

degraded the environment, the poorer people will become and more conflict will occur. It follows therefore that looking after its health (its trees, water, grass, soil, wildlife and biodiversity) is **critical**.

Conservation – **the protection and wise use of natural resources** – enables communities to benefit fully in the long term from their own natural resources. These benefits include food and water

Sandgrouse droppings are an important and very nutritious source of food for livestock in the dry season; birds nests are also used to feed livestock during droughts

KUHIFADHI MAZINGIRA

WHY DOES THE GOAT HERDER NEED THE BEE?

A bee pollinates a flower of the Acacia tree. This pollinated flower produces seeds. These seeds feed the herder's goat during the dry season.

To harvest honey in a damaging way destroys the hive, kills the bees, risks fires breaking out, and the flowers of the Acacia will not be pollinated. No seeds will then be produced and the herder's goats will go hungry.

That is in the short term, yet in the long term there will be no seeds to regenerate the acacia trees that provide shade, no fodder for the goat and no home for insects, birds or wildlife.

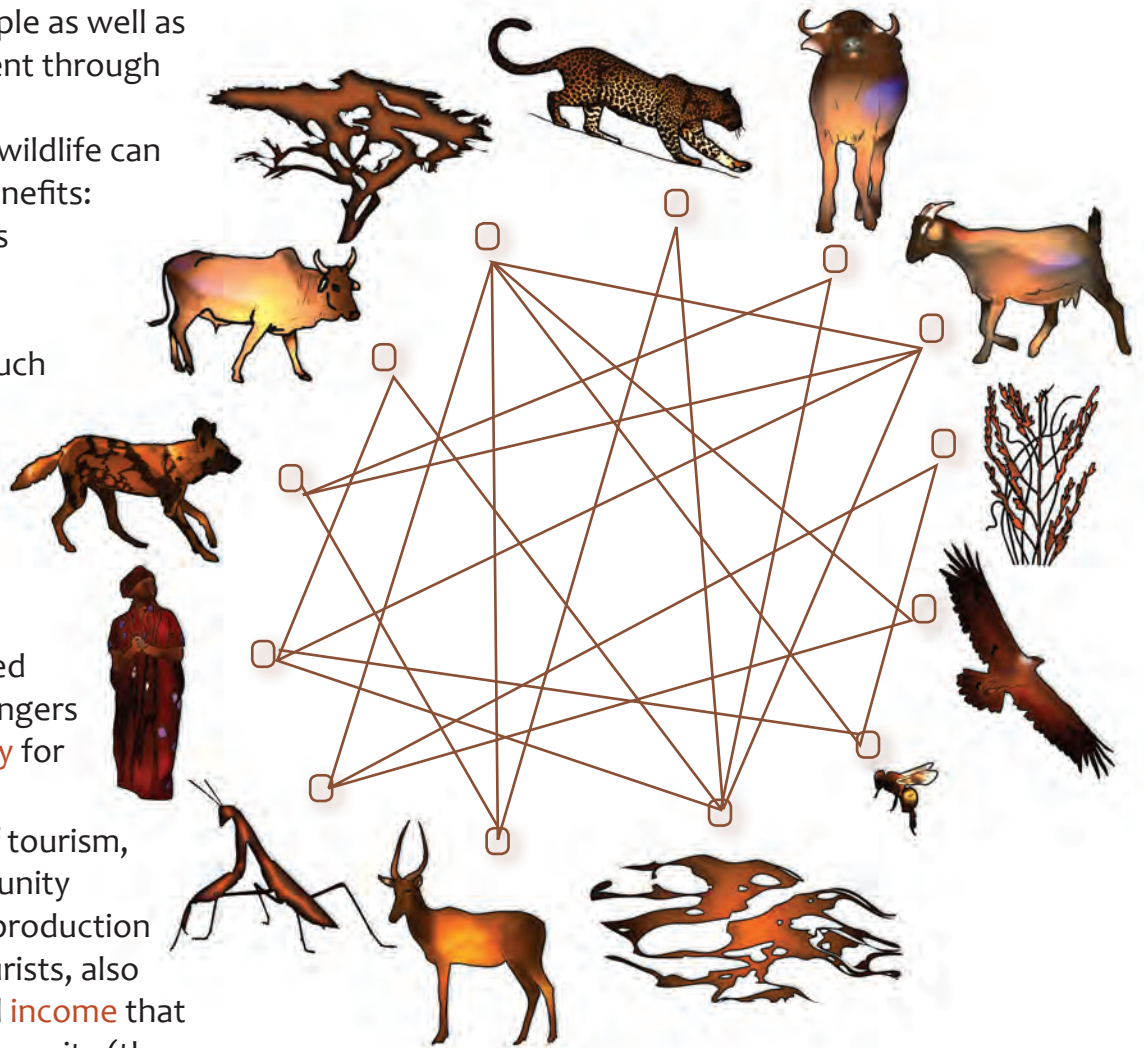
So, lose the bee and consequences follow that are much more than just losing honey!

TRADITIONAL HONEY HARVESTING IS ALL ABOUT 'WISE' COLLECTION OF HONEY!

for livestock and people as well as economic development through wildlife tourism.

Good populations of wildlife can provide a range of benefits:

- ◆ **Wildlife** provides the basis for which external organisations, such as KWS, form **partnerships** with the community and Conservancy;
- ◆ **Protection** of wildlife by trained Conservancy Rangers provides **security** for the community;
- ◆ **Development** of tourism, including community lodges and the production of goods for tourists, also creates jobs and **income** that benefit the community (these may include educational scholarships, water and health projects);
- ◆ Many **cultural** and religious values, together with deeper **spiritual** values have a strong connection with wildlife.



What would the world be like if it was empty of wildlife?

In your community what uses and values do you have for wildlife?

If tourism were not there and all the tourists stop coming, would we still conserve wildlife?

USIMAMIZI BORA YA RASILIMALI

GREEN BELT MOVEMENT:

“Unless we change course, the coming generations will inherit an impoverished environment that will mean a hungrier, less fertile, and more unstable world. More conflicts will erupt”.

CHIEF SEATTLE, CREE INDIAN:

“When the last tree has been cut down, the last river has dried up and the last animal has been killed, we will know we cannot eat money”

WHAT IS THE PURPOSE OF YOUR CONSERVANCY?

MALENGO YA CONSERVANCY YAKO?



In the 'web of life' conservation and wise-use of resources



plays the most important part in the health of our land.

Community conservancies

improve the livelihoods of local people by addressing **environmental, social** and **economic** needs such as:

- ◆ **Security** for people through peace meetings, rangers and radio network
- ◆ **Access** to transport via conservancy vehicles
- ◆ **Employment**
- ◆ **Bursaries** for students through tourism revenue
- ◆ **Water** for households
- ◆ Support for **health clinics**
- ◆ **Market** for local crafts through tourism
- ◆ **Cohesion** among communities

Long-term success depends on building strong **community Conservancies** that ensure rights and responsibilities of conservation by local communities and benefits from conservation are shared by all.

ROLES OF CONSERVANCY STAFF

CONSERVANCY MANAGER



Central to driving the principles of conservation and sustainable management, the role of the Conservancy Manager also requires **communicating** these



What other benefits does your conservancy provide to the community?

principles among the different communities. The success of any Conservancy depends on **maintaining partnerships** with other organisations, as well as **developing** social and

economic benefits for the community, whether in health, education, water or wildlife – all a part of management!

CONSERVANCY WARDEN & RANGERS



A vital role of the Conservancy is provision of **security for people and wildlife**. The task of the

Ranger is to:

- ◆ Safeguard wildlife and the environment
- ◆ Provide security for people and **reduce tribal mistrust** (through bringing communities together);
- ◆ Create **awareness** of conservation and its importance within respective communities.

As members of their own community, rangers are also required to:

- ◆ **Uphold** by-laws of the Conservancy
- ◆ **Ensure** leaders and management uphold good governance of the Conservancy.

PRINCIPLES OF WILDLIFE COMMS

AIM

NRT has developed a simple **system** for monitoring the trends in wildlife and their threats in Community Conservancies, called the **Wildlife - Conservancy Management Monitoring System** (Wildlife-CoMMS). This guide introduces the principle phases of W-CoMMS and identifies the personnel and equipment required to implement it.

WHY IS MONITORING IMPORTANT?

Observing the environment carefully, or **monitoring**, allows us to record changes over time. Monitoring within the Conservancies is vital since it:

- ◆ provides information on **trends** in the abundance of key wildlife species and their **threats**. These threats include human-wildlife conflict, poaching, insecurity and environmental destruction;
- ◆ helps determine the **impact of**



- management** on wildlife populations;
- ◆ enables **assessment** as to whether conservation objectives are being achieved. Conservancies can then use this information to make their own management decisions.

KEY FEATURES OF WILDLIFE-CoMMS



Tailor-made: developed in close partnership with conservancies, Wildlife-CoMMS uses local knowledge of wildlife, threats and landscape;



Builds the capacity of rangers: gives power and purpose to Rangers and assists them to plan and implement patrols;



Phased introduction: balanced use of technology allows management and Conservancy capacity to grow over time;



Easy to use: simple methods for data collection are integrated into daily patrol

activities. The spatial information gathered from GPS and location maps is used in database and GIS mapping;



Run and managed entirely by the Conservancy: local personnel are entirely responsible for the collection, analysis and interpretation of data, empowering Conservancies to make informed management decisions;



Sustainable: once established, W-CoMMS requires little external 'scientific' input and has minimal overhead costs or need for additional equipment.

KEY ROLES AND RESPONSIBILITIES WITHIN WILDLIFE-CoMMS

Designed to integrate into the work of Conservancy personnel, the varied responsibilities within Wildlife-CoMMS ensure it runs effectively:

RANGERS

- ◆ daily patrols and collection of data
- ◆ Operational support by radio



WARDEN

- ◆ Oversight of rangers and system administration (filing, data entry, analysis and reporting)
- ◆ Data interpretation that informs management



MANAGER

- ◆ Informing and adapting management
- ◆ Feedback to Boards and community on status of wildlife in conservancies
- ◆ Reporting to partners and donors on conservancy progress



WHAT INFRASTRUCTURE AND EQUIPMENT IS NEEDED?

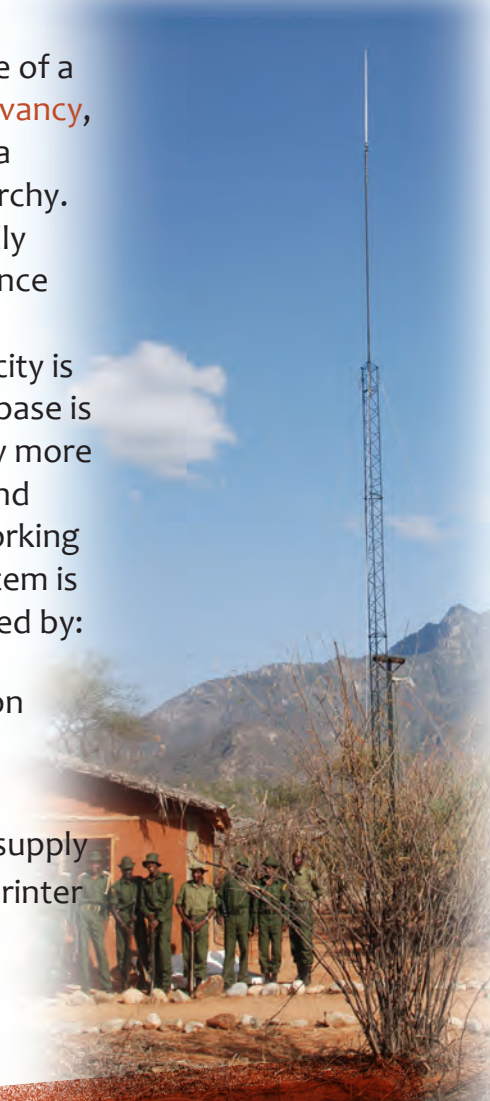
Wildlife-CoMMS is designed to work within the structure of a **Community Conservancy**, with employees in a management hierarchy. The system is initially paper-based, but once infrastructure and management capacity is established, a database is introduced to allow more complex analysis and mapping. When working effectively, the system is eventually supported by:

- ◆ Radio communication
- ◆ GPS units
- ◆ Binoculars
- ◆ Office power supply
- ◆ Computer & printer

PLANNING AND USE OF WILDLIFE-CoMMS

There are five key stages to establishing Wildlife-CoMMS fully within a conservancy:

- ◆ **Organise** the basic information needed for the system
 - ◇ Map patrol blocks and locations
 - ◇ Identify monitoring objectives and key species
 - ◇ Train rangers in accurate data collection
- ◆ **Assess** progress and introduce paper-based summaries
 - ◇ Modify patrol blocks and species where necessary
 - ◇ Train Conservancy Managers and Wardens in paper-based reporting and interpretation
- ◆ **Introduce** use of **computers** to manage data
 - ◇ Train rangers in computer skills
 - ◇ Purchase laptop computers with solar power systems for conservancy headquarters
- ◆ **Develop** the **database** that is tailored to a given conservancy
 - ◇ Train Conservancy Manager, Warden and rangers in database use and data interpretation
- ◆ **Review** and **modify** database and further training
 - ◇ Provide training in advanced database operation, maintenance, reports and maps





SETTING UP WILDLIFE COMMS

AIM

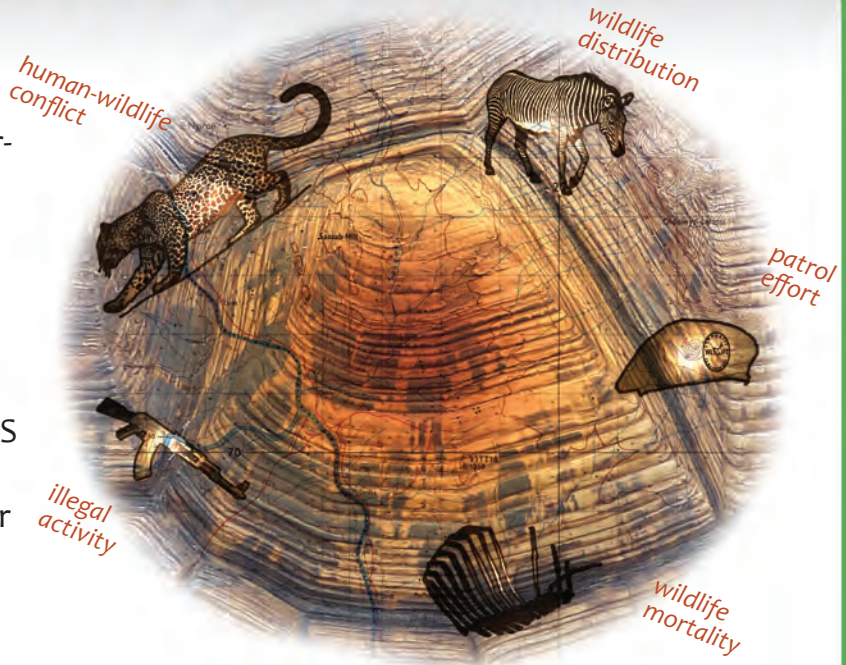
To identify the **key objectives** for the ranger-based Wildlife-Conservancy Management Monitoring System (Wildlife-CoMMS) and determine the area over which monitoring will be carried out.

SETTING UP

The first phase of setting up Wildlife-CoMMS involves answering:

- ◆ What are the monitoring objectives for the Conservancy?
- ◆ Which areas of land are to be monitored?

This discussion is held between Conservancy rangers and managers, and decisions made by the entire group are



based on local knowledge of the area, the significance of the wildlife species and their habitats and any threats facing these.

OBJECTIVES

The Wildlife-CoMMS objectives for monitoring would normally include gathering information on:



WILDLIFE DISTRIBUTION AND ABUNDANCE

Determine trends in abundance and distribution of key wildlife species



WILDLIFE MORTALITY

Provide a full picture of the extent of illegal killing and poaching, disease outbreak, impact of drought, predation.



ILLEGAL ACTIVITIES

Assess threats to wildlife, habitats and people. These may include activities such as charcoal burning,

commercial logging, livestock theft, road banditry, bush-fires, and snares and traps.



HUMAN-WILDLIFE CONFLICT

Assist management to determine site-specific conflict mitigation methods. This means understanding the severity and locations where conflict with wildlife occurs.



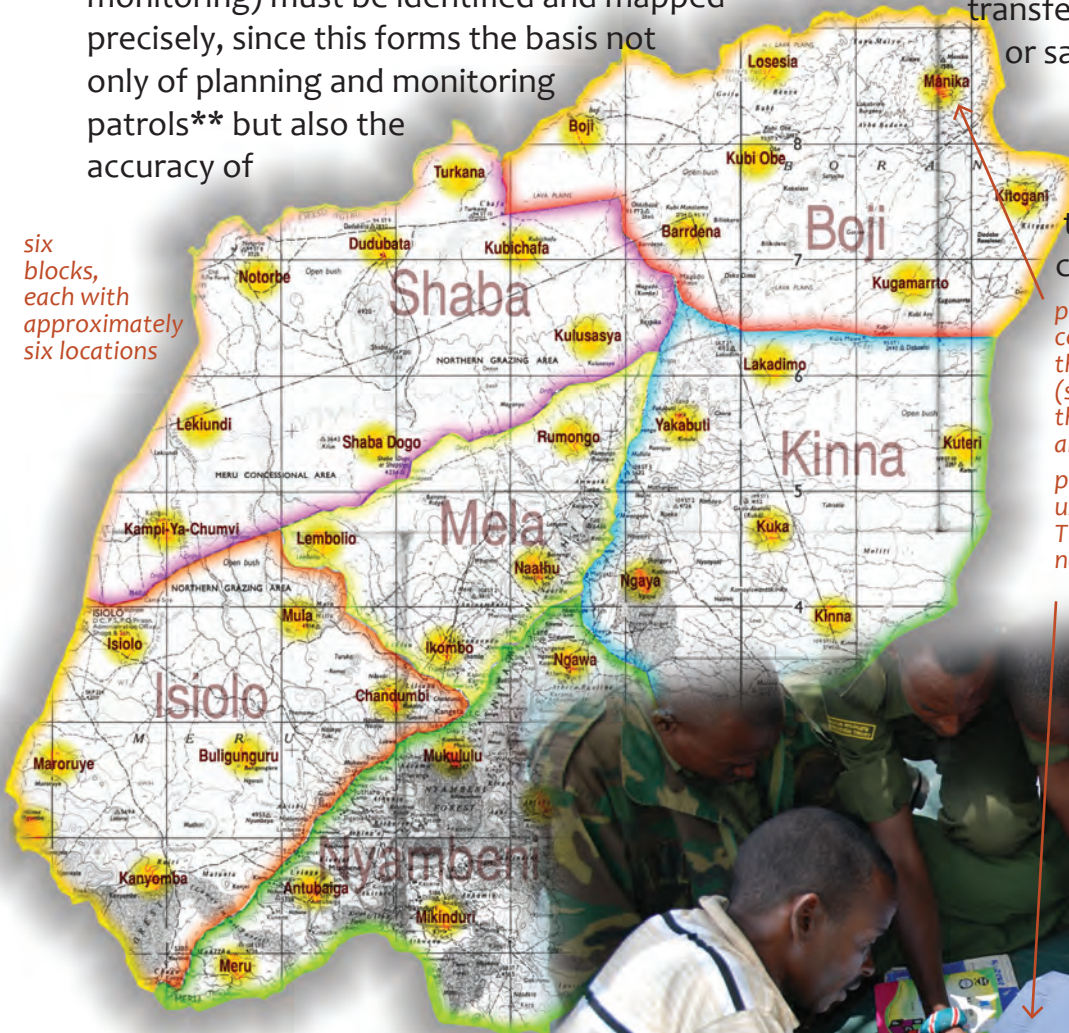
PATROL EFFORT

Effectiveness of patrol coverage across the Conservancy. This patrol data helps to validate the wildlife trends that come from the Wildlife-CoMMS database, by cross-referencing wildlife abundance.

PATROL BLOCKS AND LOCATIONS

A correct block/location map is essential to the work of Wildlife-CoMMS. The area covered by patrols (and therefore by monitoring) must be identified and mapped precisely, since this forms the basis not only of planning and monitoring patrols** but also the accuracy of

six blocks, each with approximately six locations



- ◆ Mark existing features like headquarters, outposts, towns and lodges on the map.
- ◆ Divide the entire conservancy area into patrol blocks and identify locations within each block. Block sizes may vary, however location sizes should be approximately the same and equally distributed throughout the blocks.
- ◆ The number of blocks will vary and depend on the size of conservancy and its existing infrastructure. (the Wildlife-CoMMS database restricts the number

recorded information coming from this work.

Mapping is carried out by rangers and managers who participate in creating a large map, using a 1:50/250,000 topographic map as a back-ground (if one is not available, then a sketch map may be developed and later transferred to a topographic map or satellite image).

A facilitator with experience in map reading leads the discussion to ensure locations are correctly placed on the map.

patrol blocks cover an entire area of a conservancy, irrespective of whether they are patrolled regularly or not (some patrol blocks may lie outside the defined Conservancy area if these areas are accessible to rangers).

patrol blocks are given local names, using criteria agreed by the group. These are usually demarcated by natural boundaries (roads, rivers etc.)



of possible blocks to eight and the number of locations within each block to twelve).

The outcome is a correct Block/Location map and list that it is standardised for data collection. It is also critical as back-up to the collection of spatial information. Prior to the availability of GPS units (or in cases when GPS batteries run out, fail or are otherwise not available for use), an accurate map is essential



Planning: Principles of Wildlife-CoMMS Monitoring Patrol Effort



SETTING UP PATROLS

AIM

Setting up effective Ranger patrols within a Conservancy is essential for the protection, management and monitoring of wildlife. Planning and implementing these patrols forms the subject of this guide.

PATROLS & MONITORING

The majority of Rangers' work involves carrying out regular daily patrols that have widespread coverage of the conservancy.

Setting up effective patrols is essential for the protection, management and monitoring of wildlife. The Wildlife-Conservancy Management Monitoring System (Wildlife-CoMMS) is designed to be carried out as part of the daily patrols of Rangers within a conservancy and will therefore only be useful if:

- ◆ patrols are planned and implemented well;
- ◆ there is regular and widespread coverage of the conservancy by patrols.

ROUTINE PATROLS

Creating a presence (coverage) and obtaining information (monitoring) across as much of the conservancy area as possible forms the central aim of a patrol. However, since this depends on the size of the Conservancy and number of patrol teams available, consistency in the level of patrol effort across the conservancy is key.



PATROL AIMS

Patrolling generally has three aims:



MONITORING

Obtain information on wildlife presence and illegal activities



COVERAGE

Create a presence in an area and ensure sufficient coverage of the conservancy.



ENFORCEMENT

Apprehend offenders

ENFORCEMENT PATROLS

Most commonly deployed in response to intelligence information or reports of illegal activities, enforcement patrols have the aim of apprehending offenders.

COMMUNICATIONS AND EQUIPMENT

Patrol teams keep in regular communication with the Radio Operator to provide updates on location, status of the team and any observations of unusual or suspicious activities. More specific information on urgent reporting over the radio is covered in the *Monitoring and Specialist Monitoring Guides*.

For security reasons, it is imperative that routine communication times are agreed and fixed (morning, mid-day, evening).

For general or routine patrols, Rangers should carry the following equipment :

- ◆ Rucksack
- ◆ Binoculars
- ◆ CoMMS Data sheets
- ◆ First aid kit
- ◆ GPS unit + spare batteries



- ◆ Hand held VHF radio and spare battery
- ◆ Sufficient water and rations
- ◆ Weapon, ammunition and webbing (in the case of armed Rangers)

For multi-day patrols the following additional equipment should be carried:

- ◆ Sleeping bag/blanket
- ◆ Mosquito net
- ◆ Tent/fly-sheet/ground-sheet

PLANNING & IMPLEMENTATION

A successful patrol must consider the:

AIM

Monitor, Cover, Enforce, or a combination of these

METHOD

On foot, vehicle or a combination of these (any decision on the appropriate method will consider the aim of the patrol and the terrain)

COMPOSITION

Being strong enough to enable it to carry out its aim effectively, the strength of a patrol will be determined by its aim, method and the number of personnel available

BRIEFING

Before departure Patrols are briefed on:

the **aim** of the patrol; **trends** in poaching in the area; appropriate preventative **action** to be taken; **locations** to be visited; **intelligence reports**; **assistance** from other patrol teams; intended **duration** of patrol; required **equipment**; **emergency** procedures

DE-BRIEFING

Returning patrol rangers should de-brief their supervisors with the following information:
areas patrolled; **general status** of the area and wildlife; **unusual sightings** or activities; and, in the event of encounters with poachers or bandits, a full **security report** is submitted, together with details of any arrest. All monitoring datasheets are submitted.



WILDLIFE OBSERVATION

AIM

Selecting the key species to be monitored, collecting correct and accurate data, and completing the *Wildlife observations datasheet* are all covered in this guide.

THE PRINCIPLES TO COLLECTION

Information collected by Rangers is vital to:

- ◆ Show **changes** in wildlife populations over time;
- ◆ Identify **key areas** for different wildlife;
- ◆ Help make important **management decisions** in relation to wildlife.

As different Rangers collect a lot of information, it is important to ensure that all data is collected accurately and rangers ensure that:

- ◆ **Only correct datasheets** are used
- ◆ False or inaccurate information will **damage the Conservancy**
- ◆ Rangers have the **correct equipment** to assist in data collection (e.g. GPS with spare batteries)

The Conservancy Warden should ensure that:

- ◆ There is always a **good supply** of blank datasheets available
- ◆ Data sheets are **checked** to ensure the information has been recorded correctly.



ACCURACY

the information recorded onto the datasheet should be correct in all details

CONSISTENCY

the information should be recorded in the same way every time, whether the datasheet is filled in by the same, or different, Rangers

IDENTIFYING KEY WILDLIFE SPECIES

To identify the key species to be monitored, Management and rangers discuss and agree a list of all the wildlife species present within the conservancy (using common and local names) and highlight any rare species, or species in decline. From this list, key species for monitoring are chosen.



- Elephant.....Aarb..... Etom
- Giraffe.....Sotowa..... Ekori
- Wild dog.....Yahi..... Epewit
- Buffalo.....Gafars..... Ekosowan
- Oryx.....Sala..... Edir
- Waterbuck.....Thomso..... Chalakute

When choosing the key species, consider:

- ◆ Wildlife species that are **uncommon** or **difficult to observe** are therefore difficult to monitor;
- ◆ Species that are **very common** detract from other objectives of the patrol and therefore waste time;
- ◆ Species that are **not well known** make identification difficult and likely inaccurate, should not be monitored.

If any new species recolonizes a conservancy, then these animals need to be recorded on the datasheet.

FILLING OUT THE WILDLIFE MONITORING DATASHEET

WILDLIFE MONITORING DATASHEET

CONSERVANCY NAME:

PATROL ID: NAME:

| Date | Time | Block Name | Location Description | |
|------------|-------|------------|----------------------|----|
| 01/09/2012 | 07:15 | Kauro | Airstrip | 35 |
| 01/09/2012 | 07:50 | Kauro | Lenkolii | 36 |
| 01/09/2012 | 08:05 | Kauro | Lenkolii | ? |

NUMBER OF PEOPLE IN PATROL:

| UTM | Species | No. | Scat/Spoor | NOTES |
|--------|----------|-----|------------|-----------------------|
| 117113 | Elephant | 12 | | |
| 132333 | Lion | | | radio-collared female |
| 13251 | Eland | 5 | 2 | |

RECORDING WILDLIFE SIGHTINGS AND SIGNS

All sightings or signs of wildlife are recorded on the Wildlife Monitoring Datasheet. This information is used to determine trends in wildlife abundance and distribution.

As part of the agreed list of key species to be monitored, a few species may be selected for monitoring observations of footprints or droppings (spoor/scat). These are likely to be rare or declining species.

Notes: record any information which might be of interest e.g. if the animal is: In poor health, very thin etc • Is injured or wounded • mating behaviour, heavily pregnant or has small young • anything else unusual.

Scat/Spoor: remember that the species to be monitored for sightings and indirect signs (footprints/droppings) are agreed in advance. If the animal is not seen yet signs of it are found, then note the number of animals that would have likely produced the spoor or scat.

Wildlife: Record the species seen and the number of animals. Ensure you are clear about what species you need to record (see above).

Annex: Datasheet Templates
 Planning: Setting Up CoMMS
 Specialist Guides: Using a GPS
 Specialist Guides: Predator Spoor



WILDLIFE CARCASSES

AIM

Effective investigation of the scene of a wildlife carcass to determine **cause** and **means** of death is an essential skill for a ranger. Correct procedures for **recording** and **reporting** incidents of wildlife mortality are vital.

REASONS FOR INVESTIGATION

As well as monitoring living animals, it is important that rangers monitor **dead** ones, since this provides information on whether:

- ◆ Animals are dying naturally through old age, injury, drought, predation (what are called **Natural mortality** rates)
- ◆ **Diseases** and outbreaks;
- ◆ **Illegal killing** and **poaching** associated with deliberate human involvement.

note: If the carcass is an elephant, please refer to the [Monitoring Elephant Carcasses](#) guide

SAFETY FIRST

On approaching and investigating a carcass, appropriate care is needed since:

- ◆ **Predators** or poachers may still be around the carcass;
- ◆ **Poisoning** may be the cause of death (some poisons are extremely dangerous to humans);

INFORMATION REQUIRED

The *Wildlife Carcass Datasheet* is key to recording all the following information: **date**, **what species** of carcass, **block name**, **location** and **GPS**.



- ◆ **Disease** is usually invisible - diseases such as anthrax are deadly and easily spread to livestock and humans.

WILDLIFE CARCASS

DATASHEET



CONSERVANCY NAME: Melako

NAME: Alfred PATROL ID: MS4 DATE: 12.09.11 TIME: 07:15

BLOCK NAME: Merille LOCATION: Lchorro

GPS LOCATION: 37N 367153 UTM 157695

CARCASS SPECIES: Buffalo

blood and body fluids are still evident, leaving a dark stain on surrounding ground indicates that this is a fresh carcass, less than 3 weeks



without sign of human involvement in the death of this animal, and no bones removed or meat taken away, this suggests a natural death



AGE & SEX OF THE ANIMAL?

If the animal was an adult, sub-adult or juvenile (young still dependent on mother). Looking closely at clues such as **horns**, **body size**, **genitals** will help determine whether the carcass was male or female.

CAUSE OF DEATH: Natural Conflict Poached Unknown Control Illegally killed

SEX OF CARCASS: Male Female Unknown

AGE CLASS OF ANIMAL: Juvenile Sub-adult Adult Unknown

identifiable footprints on the scene of the carcass will greatly help determine cause and means of death



CARCASS AGE

Estimating exactly how long an animal has been dead may be difficult, yet determining the **approximate** time of death into one of the following categories is usually possible:

FRESH (less than 3 weeks)

RECENT (3 weeks – 1 year)

OLD (more than 1 year)



FRESH (< 3 wks old)

- ◆ Strong smell
- ◆ Flesh beneath skin giving rounded appearance
- ◆ Pool of blood/body fluids moist on ground (rot patch)
- ◆ Signs of vultures or predators eating carcass
- ◆ Meat still left on bones



RECENT (3wks – 1 yr)

- ◆ Bones mostly in place
- ◆ Less meat and skin on bones – not quite white
- ◆ No blood or fluid seen-rot patch dry around carcass
- ◆ Bare ground around carcass even in rainy season (no plants growing in rot patch)



OLD/VERY OLD (> 1yr old)

- ◆ likely to only find old bones of large bodied animals such as giraffe, buffalo, eland
- ◆ White/grey bones are scattered, often only the skull remains
- ◆ Vegetation has re-grown around the carcass
- ◆ No signs of predators coming

REPORTING & FOLLOW-UP

Rangers should follow up all fresh carcasses as a result of **human-wildlife conflict, poaching incidents** and **suspected diseases** a radio signal should also be sent to KWS. Other than in the case of a poaching incident, a single carcass on its own may not give immediate cause for concern. However, where several carcasses occur in the same location, this may indicate the onset of drought, a poisoning incident or a disease epidemic.

DESCRIBING REMOVAL OF PARTS OF THE CARCASS

It is important to record any part of an animal that has been removed by people. The **claws, teeth, skin**, may well be a possible reason why the animal was killed.

Also report **anything unusual** about a carcass. Have parts of the animal been removed for meat that wouldn't traditionally be eaten?

CAUSE & MEANS OF DEATH

Determining whether the animal died from natural causes, or whether the animal was killed by humans (either deliberately or accidentally) is usually possible where the carcass is not too old.

On approaching a carcass for the first time, look to see if there might have been deliberate human involvement in the death of the animal (see next page).



SIGNS & MEANS OF DEATH:

- ? Chunks of meat or bones **cut out** using panga or an axe
- ? **Footprints** of people around the carcass
- ? Signs of a **fire** used to cook meat, or **cut branches** laid nearby to put meat on
- ? For smaller animals there may just be a **head** left from a fresh carcass
- ? **Snares** actually seen or marks left by snares on the carcass legs or neck
- ? Gunshot/spear or arrow **wound** visible
- ? **Bullet case** found in the vicinity of the carcass
- ? Carcass found near human **settlement**, livestock boma or farm
- ? **More than one** carcass in the immediate area
- ? KWS or Conservancy **personnel** sent to either dart or shoot an animal
- ? Animal has obvious **injury** or signs of **disease** and has to be put down

SIGNS & MEANS OF DEATH

- ? No obvious signs of human involvement
- ? No obvious signs to allow accurate assessment
- ? Flesh and bones obviously **chewed** by predator
- ? Signs of predator chase and kill nearby the carcass (**footprints** and **drag marks**)
- ? Animal is **very thin**, may be **several** carcasses in same location (carcasses are found during drought)
- ? **Teeth** may be **worn**, animal is thin and may have **patchy fur**
- ? **Blood** coming out of mouth, nose, anus
- ? Several carcasses of the same or **similar species** are found in the general area over a short period of time
- ? Animal has fallen into a well, fallen over a cliff, or been hit by a vehicle (any human involvement is **not intentional**)

DELIBERATE HUMAN INVOLVEMENT

Cause:

CONTROL

(killed under specific instruction from KWS as animal posed threat to people or was injured)

Cause:

POACHED

(killed for meat or trophies e.g. skins, horns)

Cause:

CONFLICT

(killed in self defence or protection of livestock, crops or property)

Cause:

ILLEGAL KILLING

(not clear why it was killed)

NO DELIBERATE HUMAN INVOLVEMENT

Predation • Drought • Old age •
Disease • Accident

Cause:

NATURAL

Cause:

UNKNOWN

(no obvious signs to allow assessment or carcass is too old)

Annex: Wildlife Carcass Datasheet
Monitoring: Elephant Carcasses
Monitoring: Human-Wildlife Conflict
Specialist Monitoring: Disease



WILDLIFE CARCASS

DATASHEET



CONSERVANCY NAME:

NAME: PATROL ID: DATE: TIME:

BLOCK NAME: LOCATION:

GPS LOCATION: 37N: UTM:

CARCASS SPECIES:

CARCASS AGE: Fresh (less than 3 weeks) Recent (3 weeks – 1 year) Old (more than 1 year)

CAUSE OF DEATH: Natural Conflict Poached Unknown Control Illegally killed

MEANS OF DEATH:

Disease Predation Old age Drought Speared Arrow Accident
Gunshot Poisoned Snared Problem Animal Control Euthenazia Other

SEX OF CARCASS: Male Female Unknown

AGE CLASS OF ANIMAL: Juvenile Sub-adult Adult Unknown

ELEPHANT TUSKS:

Left Intact Missing Naturally absent Tusks cut out Tusks pulled out
Right Intact Missing Naturally absent

Describe any parts of the animal that have been taken by people (e.g. skin, meat, tusks, horns etc):



WILDLIFE CARCASS

DATASHEET



CONSERVANCY NAME:

NAME: PATROL ID: DATE: TIME:

BLOCK NAME: LOCATION:

GPS LOCATION: 37N: UTM:

CARCASS SPECIES:

CARCASS AGE: Fresh (less than 3 weeks) Recent (3 weeks – 1 year) Old (more than 1 year)

CAUSE OF DEATH: Natural Conflict Poached Unknown Control Illegally killed

MEANS OF DEATH:

Disease Predation Old age Drought Speared Arrow Accident
Gunshot Poisoned Snared Problem Animal Control Euthenazia Other

SEX OF CARCASS: Male Female Unknown

AGE CLASS OF ANIMAL: Juvenile Sub-adult Adult Unknown

ELEPHANT TUSKS:

Left Intact Missing Naturally absent Tusks cut out Tusks pulled out
Right Intact Missing Naturally absent

Describe any parts of the animal that have been taken by people (e.g. skin, meat, tusks, horns etc):



HUMAN-WILDLIFE CONFLICT

AIM

Collecting and completing data on human-wildlife conflict, and providing ideas on managing conflict situations are the subject of this guide.

WHY COLLECT THIS DATA?

The extent and severity of human-wildlife conflict within the Conservancy cannot be understood without **conflict data**. Identifying **problem areas** and what **wildlife** is involved, forms the critical purpose of this data. Based on this information, wherever possible, site-specific **conflict mitigation** is put in place.

INFORMATION REQUIRED

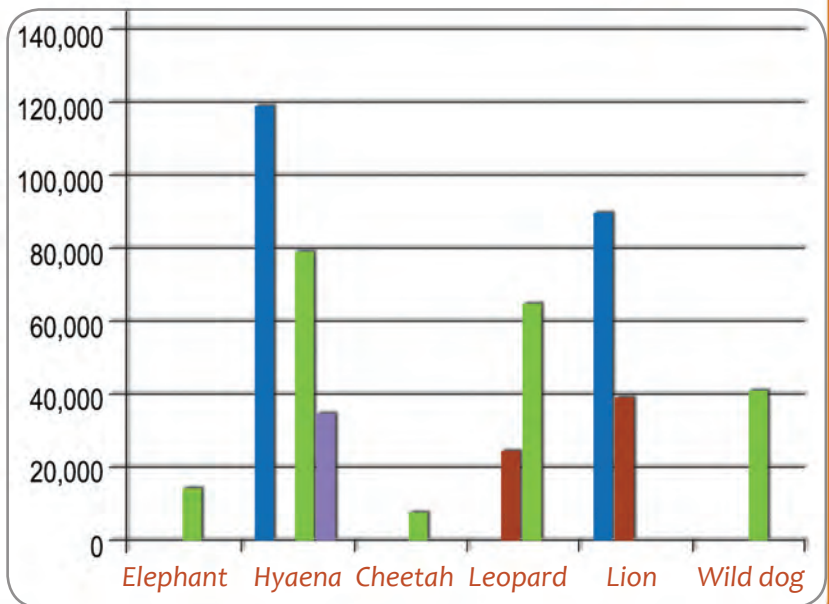
Information on conflict is recorded not only by rangers visiting the scene of a conflict incident, but also by radio operators receiving information from community members. Talking to community members involved, investigating the scene when necessary and completing the *Wildlife Conflict Datasheet* as accurately as possible, are key to solving conflicts.

It is essential to report any conflict incidents involving **human death or injury** to the Kenya Wildlife Service (KWS). This should be sent via radio to the respective KWS station.



If a **wildlife carcass** has been found that is caused by human-wildlife conflict, ensure that the *Carcass Datasheet* has also been completed.

- Camel
- Cattle
- Donkey
- Shoat



Annual trend in Conflicts for 2011, estimated Stock Loss in Kenya Shillings

GENERAL INFORMATION

Block name and Location, and GPS location (if you visit the scene)

WILDLIFE CONFLICT DATASHEET

CONSERVANCY NAME:

NAME: PATROL ID: DATE: TIME:

BLOCK NAME: LOCATION:

GPS LOCATION: UTM

WILDLIFE CONFLICT SPECIES:

CONFLICT TYPE:

HUMAN DEATH Human Injury Livestock Death Livestock Injury

CROP RAIDING Property Damage Other

CONFLICT TYPE

Note the type of conflict involved. If the 'other' box is ticked, then provide details about the incident under 'Additional Information'.

WILDLIFE CONFLICT SPECIES¹

Determining the species involved in the human-wildlife conflict will use sightings, scat and spoor as well as any local knowledge of community members present at the scene.

EXTENT OF CONFLICT

Record the number of people or livestock affected

NUMBER OF PEOPLE Killed Injured

NUMBER OF LIVESTOCK Killed Injured

TYPE OF LIVESTOCK: cattle shoats camel donkey

TIME OF CONFLICT Day Night Unknown

inside boma outside boma livestock without herder

ADDITIONAL INFORMATION:

ADDITIONAL INFORMATION

Use this space to record any other information that relates to the incident. For someone following up the case later, the name of the person involved in the incident (or the name of the livestock owner) and where they come from, will be essential detail.

WHERE AND WHEN CONFLICT HAPPENED

Record where and when the conflict incident happened. In the case of livestock being injured or killed, also record whether the livestock were with a herder, or unattended.



BOMAS

Ensure boma secured with a solid gate. Using a flattened 200 ltr drum or metal sheet for gate, and pieces of tyre or old shoe as hinges can work.



WELLS

Rangers can assist community to dig out shallow wells destroyed by elephants

COMMUNITY RELATIONS AND RESOLVING CONFLICT

Where an **increase** in the number of human-wildlife conflicts occurs (trends in the data will show this), the Conservancy Manager will decide on the long term management actions that may be needed to reduce this. These might be:

- ◆ Requesting **predator traps** from KWS in the case of hyena and leopard conflict;
- ◆ Requesting **assistance** from KWS or else authorisation for the Conservancy to eliminate individual problem animals (in

the case of human attack it is essential that the right animal is tracked);

- ◆ Installing **separate water points** for wildlife, away from those used by livestock and people;
- ◆ Finding **conservation partners** able to assist in reducing certain forms of conflict. Predator-proof livestock bomas or wildlife-proof fences for crops may well require expertise and funding.

COMMUNITY RELATIONS AND RESOLVING CONFLICT

The Conservancy **MUST** respond and visit the scene if the conflict involves human death or injury and when wildlife has been killed at the site.

Visiting the site, both to verify the information and to assist the community where possible, provides help and advice² that might prevent future incidents occurring such as:

- ◆ **Predator-proofing** of bomas includes strengthening walls and ensuring no gaps; increasing the height of walls; ensuring there is only one entrance to the boma and, where possible, it is secured with a solid gate
- ◆ Advising **adults** to tend livestock rather than children
- ◆ Advising **herders** not to take livestock to areas of thick bush where predators may be hiding

- ◆ Advising herders **where predators** have recently been seen
- ◆ Advising on the use of **deterrents** such as loud noises, light and fire, and the use of night guards
- ◆ Advising community members to **bury rubbish** far from the boma in order to avoid attracting hyenas
- ◆ If Wild Dogs are in the area, advise herders to keep **domestic dogs** in the boma and not take them out with their livestock during the day (barking dogs attract Wild Dogs)
- ◆ Helping to **re-dig** wells destroyed by elephants
- ◆ Helping fix **fences** destroyed by elephants
- ◆ It may be useful for Rangers to stay in the area for several days if conflict is high. e.g. at certain times of year elephants will raid crops and cause conflict at water points

▶ Planning: Setting Up Wildlife-CoMMS
Specialist Guides: Using a GPS
Specialist Guides: Predator Spoor

1 Large Carnivore Identification Guide (Wildlife Conservation Society & Zoological Society London)
2 Predator conflict mitigation: Living with Lions, Laikipia Predator Project, Ewaso Lions, Samburu-Laikipia Wild Dog Project



WILDLIFE CONFLICT

DATASHEET



CONSERVANCY NAME:

NAME: PATROL ID: DATE: TIME:

BLOCK NAME: LOCATION:

GPS LOCATION: 37N: UTM:

WILDLIFE CONFLICT SPECIES:

CONFLICT TYPE:

Human Death Human Injury Livestock Death Livestock Injury
Crop Raiding Property Damage Other

NUMBER OF PEOPLE Killed Injured TYPE OF LIVESTOCK:

NUMBER OF LIVESTOCK Killed Injured cattle shoats camel donkey

TIME OF CONFLICT Day Night inside boma outside boma livestock without herder

ADDITIONAL INFORMATION:



WILDLIFE CONFLICT

DATASHEET



CONSERVANCY NAME:

NAME: PATROL ID: DATE: TIME:

BLOCK NAME: LOCATION:

GPS LOCATION: 37N: UTM:

WILDLIFE CONFLICT SPECIES:

CONFLICT TYPE:

Human Death Human Injury Livestock Death Livestock Injury
Crop Raiding Property Damage Other

NUMBER OF PEOPLE Killed Injured TYPE OF LIVESTOCK:

NUMBER OF LIVESTOCK Killed Injured cattle shoats camel donkey

TIME OF CONFLICT Day Night inside boma outside boma livestock without herder

ADDITIONAL INFORMATION:



ILLEGAL ACTIVITIES

AIM

Collecting information on illegal incidents, insecurity, and destruction of the environment, is extremely important as provision of **security** for people and **wildlife**, and **protection of the environment** is a core purpose of the Conservancy.

WHY COLLECT THIS DATA?

Illegal activities threaten people (raids and banditry) and wildlife (poaching, snares and traps). There are also activities that threaten the environment e.g., by destroying riverbeds (sand-harvesting), forests and grasslands (bush-fires, logging and charcoal burning).

One of the most important responsibilities of Rangers is to provide **security** and **protection** for the whole Conservancy.

When illegal activities occur, it is extremely important that information on the incident is recorded as accurately as possible. This is so

'REPORT RECEIVED FROM'

the source of information about the Security Incident. If it did not come from Community, Police/KWS or another Conservancy, record the source under 'other'



that the Conservancy can take further action if needed and so that steps can be put in place to **reduce illegal activities** in the future.

WHAT INFORMATION IS REQUIRED?

Fill out the *Illegal Incident Datasheet* as accurately as possible providing information on the following:

ILLEGAL INCIDENT

CONSERVANCY NAME:

NAME: PATROL ID: DATE: TIME:

REPORT RECEIVED FROM: Community Police/KWS another conservancy other source

BLOCK NAME:

INSIDE CONSERVANCY: Yes No

DATASHEET

LOCATION:

KWS/OTHER SOURCE:

'GENERAL INFORMATION'

Block name and Location, and GPS location if visited the scene

'SECURITY INCIDENT TYPE' Note the type of incident. (where there has been a poaching incident that has left a carcass, also fill out the Wildlife Carcass datasheet)

GPS LOCATION: 37N: UTM:

SECURITY INCIDENT TYPE:

Automatic Gunshots heard Single Gunshots heard Poachers campfire Poachers tracks Livestock raid

Banditry/theft Encounter with armed poachers Bush fire Logging Snare/trap Charcoal Other

DETAILS OF INCIDENT

LIVESTOCK TYPE:

Camel Cattle Shoats

No. stolen No. injured No. killed No recovered Estimated value of property stolen

SUSPECT DETAILS:

NUMBERS: Encountered Arrested Killed Injured



'DETAILS OF INCIDENT'

It is important to record any other additional information about the incident that may be useful in follow-up by the Conservancy, KWS and Police such as: names of suspected bandits or poachers, number of people injured or killed in an incident, number of livestock stolen etc.

This information should form the basis of the Security Incident Report submitted via radio to KWS and Police, and may also be used for court cases involving prosecution of suspects.

REPORTING SERIOUS INCIDENTS

All serious incidents involving illegal activities such as road banditry, livestock theft, encounters with armed poachers etc. should be reported to KWS and the Police using a **Radio Signal**.

USING DATA ON ILLEGAL ACTIVITIES

Data gathered on illegal activities will help you to determine where most incidents occur and how often they are taking place. This information should be compared with the

data on **Patrol Effort** to determine whether patrol teams are covering areas where illegal activities are frequently occurring – if not then the patrol regime should be adjusted to increase coverage in these areas.

You should pay particular attention to any increase in trends of illegal activities in your Conservancy and ensure the Boards, Management and Rangers are working together with your community to address the issue.

▶ Planning: Setting Up Wildlife-CoMMS
Specialist Guides: Using a GPS
Monitoring: Patrol Effort



ILLEGAL INCIDENT

DATASHEET



CONSERVANCY NAME:

NAME: PATROL ID: DATE: TIME:

REPORT RECEIVED FROM: Community Police/KWS another conservancy other source

Block NAME: Location:

INSIDE CONSERVANCY: Yes No

GPS LOCATION: 37N: UTM:

SECURITY INCIDENT TYPE:

Automatic Gunshots heard Single Gunshots heard Poachers campfire Poachers tracks Livestock raid
Banditry/theft Armed poacher Encounter Bush fire Logging Snare/trap Charcoal Other

DETAILS OF INCIDENT

LIVESTOCK TYPE:

Camel Cattle Shoats
No. stolen No. injured No. killed No. recovered

COMMUNITY MEMBER DETAILS:

No. killed No. injured Estimated value of property stolen

SUSPECT DETAILS:

No. encountered No. arrested No. killed No. injured **WRITE ADDITIONAL INFORMATION OVER THE PAGE**



ILLEGAL INCIDENT

DATASHEET



CONSERVANCY NAME:

NAME: PATROL ID: DATE: TIME:

REPORT RECEIVED FROM: Community Police/KWS another conservancy other source

Block NAME: Location:

INSIDE CONSERVANCY: Yes No

GPS LOCATION: 37N: UTM:

SECURITY INCIDENT TYPE:

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COMMUNITY MEMBER DETAILS:

No. killed No. injured Estimated value of property stolen

SUSPECT DETAILS:

No. encountered No. arrested No. killed No. injured **WRITE ADDITIONAL INFORMATION OVER THE PAGE**



PATROL EFFORT

AIM

The importance of gathering data on patrol effort and filling out the *Patrol Effort Datasheet* is explained in this guide. Monitoring patrol effort is an essential part of good management and integral to Wildlife-CoMMS.

WHY COLLECT THIS DATA?

Extent and location of patrols is important to monitor in order to determine **effectiveness of patrol coverage** across the Conservancy, to highlight which areas are not being visited by patrols and help Conservancy management and patrol leaders to plan their patrols. Good **patrol planning** should ensure there is regular and widespread coverage of the conservancy.

Patrol effort data is also used to correct for wildlife trends in the Wildlife-CoMMS database, by calculating **indices of abundance** of wildlife sightings which take into account the number of patrol days per location.



PATROL EFFORT

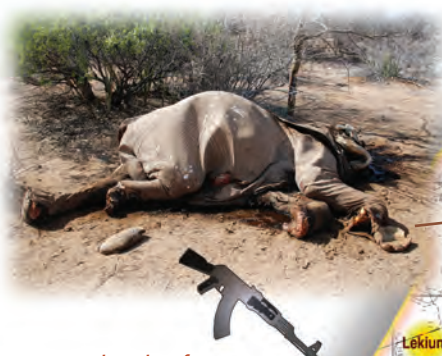
Conservancy Name: Sera

Patrol ID: SES Name: Lemerketo

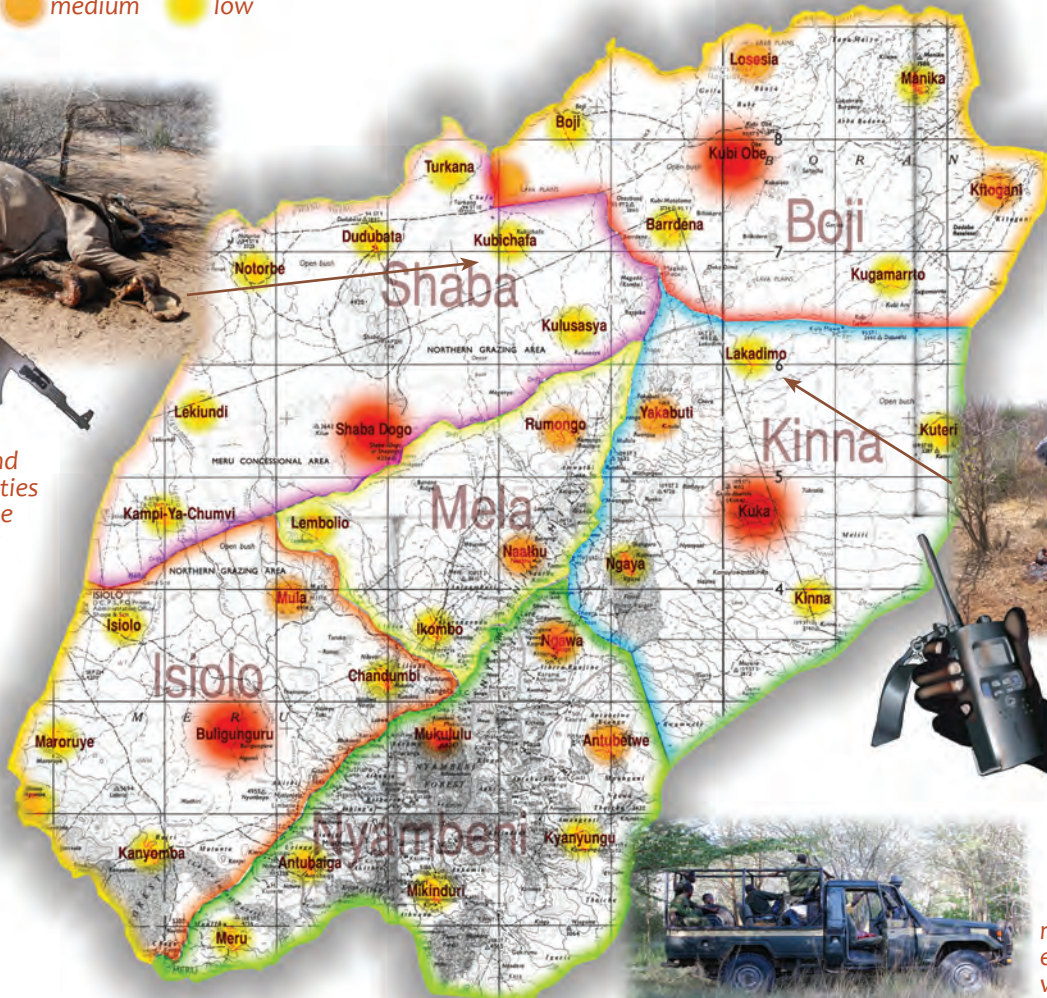
| Date | Block /Area | Locations |
|------------|-------------|-----------|
| 11/09/2012 | Kauro | Airstrip |
| 11/09/2012 | Kauro | Remot |
| 11/09/2012 | Lontopi | Kinya |
| 11/09/2012 | Lontopi | Ntumot |
| | | Nalala |
| | | Namparpar |
| | | Ntumot |
| | | Kapai |

at the end of each day, rangers complete the Patrol Effort Datasheet

number of patrol days per location



levels of poaching and illegal activities may increase in areas less frequently patrolled



elephant poaching likely to occur in areas not covered by regular patrols



record patrol effort for both vehicle and foot patrols

WHAT INFORMATION IS REQUIRED?

At the end of each day, fill out the *Patrol Effort Datasheet*, providing information on the *Blocks* and *Locations* visited during that day, either on **foot** or **vehicle** patrols. Each block should have its own line with all locations visited within that block listed on the same line. A patrol team may cross over more than one block during the course of a daily patrol.

ANALYSING PATROL EFFORT INFORMATION

At the end of each month, the Conservancy Warden can determine which blocks and locations have been visited most frequently during that month by counting up the

number of times a location is listed on the datasheets for that month. Each time a location is visited by a patrol team is equivalent to '1 patrol day'. This enables the Conservancy Warden to plan for patrol teams to visit other parts of the conservancy during the following month to ensure regular and **widespread coverage** of the conservancy.

The Wildlife-CoMMS database also enables you to map the number of '**patrol days per location**' for the time period you are interested in. This helps to see which areas are being visited regularly and which areas are not being reached by patrols.

The Conservancy Warden should use this information to plan for effective patrol coverage aiming to cover as much of the conservancy as possible. This will ensure effective **monitoring** and **enforcement** across the Conservancy.

▶ Planning: Setting Up Wildlife-CoMMS
Planning: Setting Up Patrols
Annex: Datasheet templates



DATA MANAGEMENT PRINCIPLES

THE AIM

Managing data well is **critical** to ensuring Wildlife-CoMMS runs smoothly and will generate **useful information** from the data collected. The role of key conservancy personnel in managing this data is outlined in this guide.

WHAT ARE THE PRINCIPLES OF GOOD DATA MANAGEMENT?

Once the planning phase of Wildlife-CoMMS is complete and data collection underway, the process of data management and reporting can start.

Key principles of good data management are that:

- ◆ Data should be entered **accurately** and in a **standard format** (this applies to paper sheets and to computer databases);
- ◆ Data entry should be done **regularly** (at least every month) and not left to pile up;
- ◆ A systematic **filing system** is needed for data sheets and reports;
- ◆ **Routine back-ups** are critical to computer-based data and paper forms

DATA MANAGEMENT

Management of datasheets by **Conservancy Warden**

- ◆ All datasheets should be compiled by patrol team commanders and collected from Ranger outposts at the end of each month and filed at HQ;



- ◆ Ensure that Monitoring Datasheets are filed immediately, and kept in an area that is protected from water and insects (e.g. filing cabinet or cupboard).
- ◆ Files should be clearly labelled with separate files for:
 - ◆ **Data Not Entered** (data for the current month that has not been summarised or entered into the database);
 - ◆ **Wildlife Observations** (separate file or section for each year)
 - ◆ **Wildlife Carcasses**
 - ◆ **Conflict**
 - ◆ **Illegal Activities**
 - ◆ **Patrol Effort**

- ◆ Files should be kept at HQ in case incidents need to be followed up at a later date.
- ◆ The CW should ensure all outposts are supplied with new datasheets and GPS batteries at the end of the month, when collecting the completed datasheets

DATA ON ILLEGAL ACTIVITY AND CARCASSES OF KEY WILDLIFE SPECIES (E.G. ELEPHANTS)
 This information will be recorded in the **Occurance Book** by the Radio Operator and reported to KWS/Police/NRT via a **Radio Signal**. Ensure that monitoring datasheets and OB entries contain the same information.

COMPILING MONTHLY SUMMARIES

For conservancies that do not yet have the Wildlife-CoMMS database, paper-based **Monthly Reports** are compiled by the CW. These reports are filled by hand and summarise the following information (either in table or graph format):

- ◆ Number of patrol days per block/ location
- ◆ Number of sightings of key wildlife
- ◆ Summary of wildlife carcasses showing cause of death for different species
- ◆ Details of poaching incidents of any wildlife
- ◆ Summary of illegal activities
- ◆ Summary of human-wildlife conflict incidents

WHO OWNS THE DATA?

Monitoring data **belongs to the Conservancy**. Releasing data to other people/organisations remains at the discretion of the Conservancy. When supplying data to others, it is recommended to have an MoU and ensure acknowledgement of the Conservancy as being the source of the data, or else request financial contribution towards Conservancy costs. Ensure too that they provide copies of reports, posters and publications that have used the data.

ROLES & RESPONSIBILITIES

All Conservancy staff should be aware of their individual roles and responsibilities:

RANGERS

DATA COLLECTION & DATA ENTRY

- ◆ accuracy
- ◆ repeatability
- ◆ filling datasheets
- ◆ value of additional information and local knowledge
- ◆ good understanding of what data is required
- ◆ assist in interpreting results using local knowledge
- ◆ reporting incidents over the radio

WARDEN

DATA ENTRY & DATA MANAGEMENT

- ◆ Filing and file management, supplies of datasheets
- ◆ Following up action points
- ◆ Backing-up
- ◆ Feedback to rangers and Manager (discussion of results)
- ◆ Compiling monthly reports
- ◆ Using data to inform management decisions (e.g. illegal activities and patrol effectiveness)

MANAGER

REPORTING & FEEDBACK

- ◆ Reviewing and interpreting monthly reports together with Warden
- ◆ Compiling bi-annual and annual reports
- ◆ Using data to inform management decisions
- ◆ Feedback to Conservancy Board and community
- ◆ Communicating results to external partners (KWS, Donors, etc.)

THE DATA MANAGEMENT STEPS

- 1 data **COLLECTION** by Rangers in the field using the data recording sheets
- 2 data **ENTRY** by Warden/Rangers (onto paper summary sheets or into computer database)
- 3 data **MANAGEMENT** by Warden
- 4 data **ANALYSIS** and **REPORTING** by Warden and Manager
- 5 **FEEDBACK** and **ADJUSTMENT** to management decisions

1

| | | 37N | UTM | SPECIES | No. | SCAR/ SPOOR | |
|----------|--|--------|--------|---------------|-----|-------------|---------------------|
| Arstrip | | 357713 | 117113 | Elephant | 12 | | radio-collar female |
| Lenkolii | | 361328 | 113233 | Lion | | 2 | |
| Lenkolii | | 361337 | 113251 | Eland | 5 | | |
| Lenkolii | | 361327 | 113242 | Grevy's zebra | 6 | | |

2

MONTHLY SUMMARY SHEET

Month & Year: 12.09.11

WILDLIFE

| species | total observations | total individuals | max group size |
|---------------|--------------------|-------------------|----------------|
| Elephant | 18 | 104 | 15 |
| Giraffe | 10 | 31 | 5 |
| Impala | 12 | 114 | 12 |
| Grevy's Zebra | 34 | 102 | 13 |
| Gerenuk | 42 | 81 | 3 |
| Lesser Kudu | 17 | 27 | 2 |

ACTION REQUIRED TO SAFEGUARD DATA

A Data collected daily on monitoring datasheets



File datasheets immediately into 'Data Not Entered' file

B Computer Database on site? **Yes**



Enter data from datasheets into computer as soon after collection as possible.

Check data for accuracy.

Store original datasheets in files in secure place at HQ.

C Computer database on site? **No**



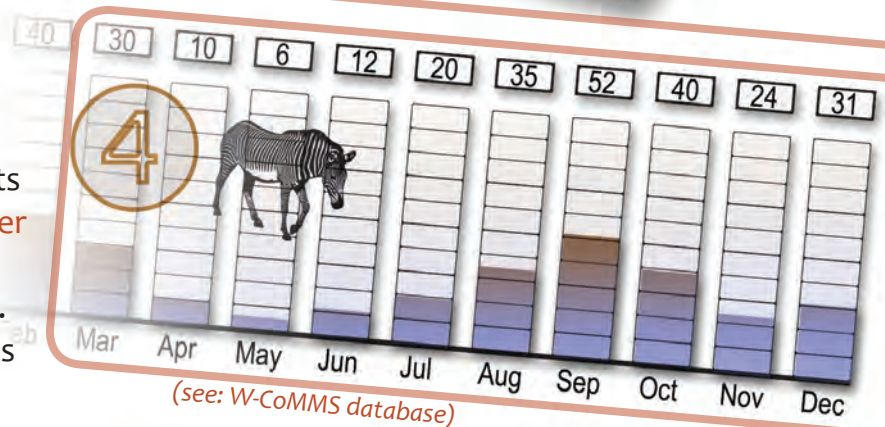
Compile paper **Monthly Summary** in triplicate

Submit all datasheets to NRT at the **end of each month** for NRT to carry out data entry

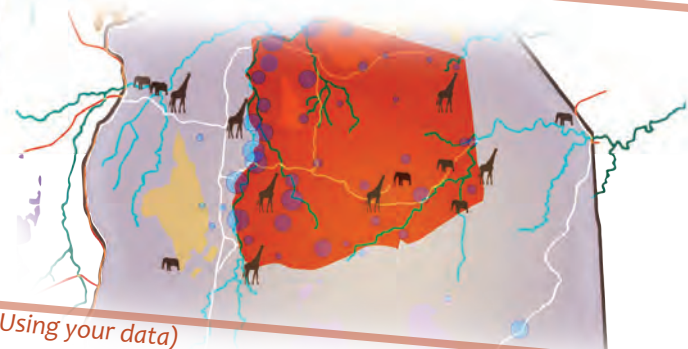
3



4



5



Planning Section
Monitoring Section
Annex: Datasheet Templates
Data Management: W-CoMMS Database
Data Management: Using your data



WILDLIFE-COMMS DATABASE

(co-author: Fran Michelmore Root)

THE AIM

The aim of this guide is to provide a brief introduction to the Wildlife-CoMMS database. Detailed guidance accompanies the database.

WHAT IS THE WILDLIFE-COMMS DATABASE?

The Wildlife-CoMMS database was designed by NRT Conservancies to process monitoring data gathered by rangers on their daily patrols. The information entered on Wildlife-CoMMS data sheets is entered in to the database, which then enables Conservancy management to answer important questions about the status of wildlife and illegal activities.

The database automatically analyses wildlife monitoring data to provide trends in wildlife sightings over time, and summarises conflict, wildlife mortality, illegal activities and patrol effort information; at the touch of a button.

The database also enables the user to easily map spatial information through the use of a simple freeware GIS programme (ESRI ArcExplorer Educational Edition, AEJEE). Maps of wildlife distributions, patrol effort, illegal activities etc. can automatically be prepared either using GPS points, or co-ordinates of the nearest patrol location. As closely as possible, database data entry 'forms' on the computer match the Wildlife-CoMMS data sheets.



observations of predator sightings mapped onto a datamap

HOW DOES THE WILDLIFE-COMMS DATABASE SYSTEM WORK?

The CoMMS 'database' is split in to two separate, but linked, databases. The 'front-end' is the interface between the user and the database (the part you see and deal with directly as a user); the 'back-end' is the database that stores the data.

Unless the BE database is set up on a central server, with users linked on a network, all data entry MUST be carried out on only ONE Computer/Database. The most up-to-date version of the back-end can be attached to front-ends on different computers allowing more than one person to use the database for analysis, reports and mapping.

DATABASE INSTALLATION AND TRAINING

Training on the Wildlife-CoMMS database system can be accomplished in 3 days. 2 for data entry, editing, updating, querying and reporting procedures, and 1 for mapping and backup protocol training.

Database users must be computer literate, or have basic skills in computer use prior to the training. Database users are commonly computer-literate rangers, the Conservancy Warden and Conservancy Manager.

WILDLIFE MONITORING DATASHEET Conservancy Name: Sera
 Patrol ID: 565 Name: Lemerketo Number of people in patrol: 4

| Date | Time | Block Name | Location Description | GPS Location | Species | No. | Scat/Spoor | NOTES |
|------------|-------|------------|----------------------|---------------|----------|-----|------------|-----------------------|
| 01/09/2012 | 07:15 | Kauro | Airstrip | 367713 117113 | Elephant | 12 | | radio-collared female |
| 01/09/2012 | 07:50 | Kauro | Lenkolii | 361328 113233 | Lion | | 2 | |
| 01/09/2012 | 08:05 | Kauro | Lenkolii | 361337 113251 | Eland | 5 | | |

Species: Select a value -
 Eland
 Elephant
 Hyena
 Leopard
 Lion
 Zebra

Bar Chart Data (Cumulative Observations):
 2008: ~42
 2009: ~18
 2010: ~42
 2011: ~32
 R² = 0.0783

mapping observation into data reports. (from the top) lion tracks are identified. The observation is entered onto the datasheet. The sheet data is transferred to database. The database report shows cumulative observations (2008-2011)

Follow-up training, ideally 'in situ' in the Conservancy, should be conducted after about 6 months following the introduction of the CoMMS database.

To fully customize the Wildlife-CoMMS database for new Conservancies, a basic understanding of MS Access is required, together with a basic understanding of GIS. This is provided by NRT.



Fran Michelmore Root, September 2012, CoMMS Database Freeware User Guide V3

USING YOUR DATA

THE AIM

Producing reports from the data collected in the field, and providing feedback to staff, Boards and the community are critical to improving management of the Conservancy; this guide aims to help managers use the data from Wildlife-CoMMS.

WHY ARE REPORTS PRODUCED?

Producing reports is a vital part of Wildlife-CoMMS, it is important:

- ◆ To keep Conservancy staff and the community updated with the status of **trends in wildlife** and **illegal activities** in their Conservancy;
- ◆ To **summarise** key issues and incidents;
- ◆ To track **progress** of the Conservancy in improving conservation of wildlife and the environment, and **security** for people;
- ◆ As a **decision-making** tool, to help inform and adapt management. For example, data may show that human-wildlife conflict is concentrated in a particular area and that community awareness and methods to reduce livestock predation need to be concentrated there.



PRODUCING REPORTS

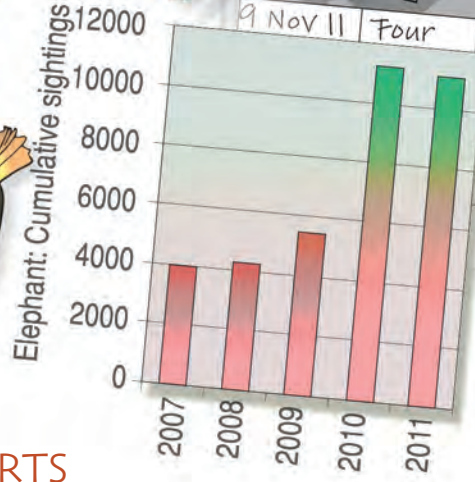
Monitoring is part of good management. It enables and empowers Conservancies to make better management decisions. BUT without **regular analysis, reporting and feedback** to guide and adapt management, the monitoring process is meaningless

Regular feedback to rangers is vital, it helps managers find out additional information that might explain trends, builds ownership of monitoring within rangers and motivates them in their work



WILDLIFE CARCASSES

| Species | Number of carcasses... | | | | | additional notes |
|---------------|------------------------|------------------|----------|---------|---------|---------------------------------|
| | poached | illegally killed | conflict | natural | unknown | |
| Elephant | 1 | 0 | 0 | 1 | 0 | |
| Grevy's Zebra | 0 | 0 | 0 | 3 | 0 | 3 killed by vehicles on main rd |
| | | | | | | |
| | | | | | | |



| Date | Block | Location | Species | No. of carcasses | Age of carcass | Age & sex of animal | Cause of death |
|----------|-------|---------------|----------|------------------|----------------|---------------------|----------------|
| 9 Nov 11 | Four | Ndikir Eldama | Elephant | 1 | fresh | adult male | |
| | | | | | | | |
| | | | | | | | |

WHO ARE REPORTS PRODUCED FOR?

- ◆ Conservancy staff (Rangers, Warden, Manager)
- ◆ Conservancy Board members and the community
- ◆ Partners e.g. NRT, KWS
- ◆ Donors

WHAT TYPES OF REPORTS ARE PRODUCED?

Monthly and annual reports are initially paper-based and compiled manually until a computer and Wildlife-CoMMS database are introduced. Reports should be:

- ◆ Checked for spelling and grammatical errors before they are circulated;
- ◆ Sent out on time;
- ◆ Duplicated where possible and copies stored securely in a separate location, in case the originals are damaged or lost.

MONTHLY

- ◆ Warden – monitoring summaries (by hand until database installed)
- ◆ Manager - includes highlights from Warden's report in monthly report
- ◆ Reports circulated to partners/donors (e.g. KWS, NRT)

QUARTERLY

- ◆ Warden –summarises monitoring highlights of previous three months for Board meetings

BI-ANNUAL

- ◆ Manager – includes highlights of previous 6-months monitoring reports in bi-annual performance reports
- ◆ Reports circulated to partners/donors

ANNUAL

- ◆ Warden - annual report of all monitoring data for the year and trends with previous years
- ◆ Manager - highlights from Warden's report in annual performance report
- ◆ Reports circulated to partners/donors

USING THE REPORTS: INFORMING MANAGEMENT AND FEEDBACK

Feedback of monitoring results and using data to inform management is the responsibility of the Conservancy Manager and Warden.

Feedback of monitoring results to Rangers is important because:

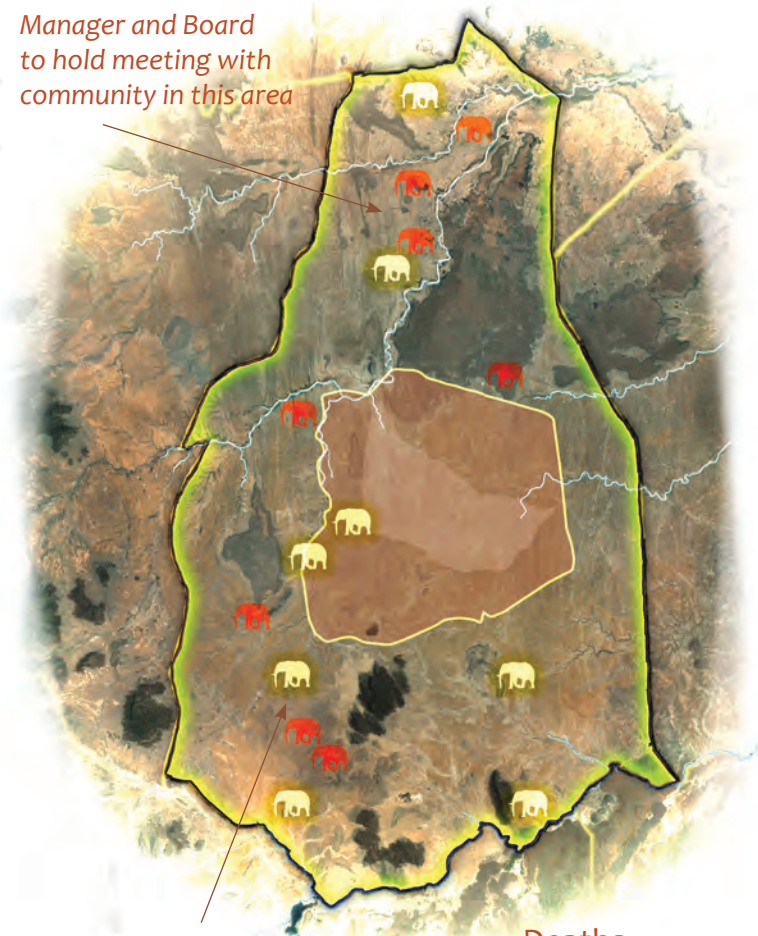
- ◆ It allows you to **interpret** information better by discussing any unusual or interesting trends in the data to ensure that the trends are not as a result of errors in the monitoring data;
- ◆ Find out **additional** information that might explain trends e.g. a decrease in wildlife sightings in one part of a conservancy may be due to low patrol effort in that area due to lack of a vehicle;
- ◆ Enables rangers to see how important their monitoring work is and how it is being used to **benefit wildlife and people** in their Conservancy, and when changes to management are being made as a result of their monitoring;
- ◆ It builds **ownership** of monitoring within the Conservancy and motivates Rangers in their work.

Monitoring information should be used to **inform and direct day to day management** decisions in the Conservancy by ensuring:

- ◆ Action points arising from information in the reports are **followed-up** and implemented (e.g. adjusting patrols);
- ◆ Reports are discussed with the people that can help **guide the management** of the Conservancy to make it more efficient and successful.

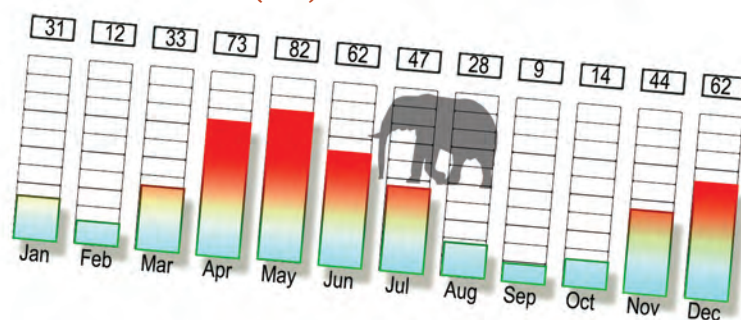
Feedback of reports to Board members, Conservancy partners and donors may lead to changes in the **long-term management** of the Conservancy; it may stimulate more **in-depth research** and interest from external

Manager and Board to hold meeting with community in this area



Management action increased mobile patrols in this area – establishment of Observation Points (OPs) on hills

Deaths natural
poaching



seasonal movement of elephants into the conservancy in the wet season, rangers to plan extensive mobile patrols at this time

partners, and provides a measure of the **progress** of the Conservancy in wildlife conservation.

Feedback should be provided through:

- ◆ Monthly **staff meetings**
- ◆ **Board Meetings** and Conservancy AGM
- ◆ Submission of **reports**
- ◆ Presentations, conferences and seminars
- ◆ **Training** sessions and monitoring reviews

Planning: Conservation & Conservancies
Data Management: Data Management Principles
Data Management: Wildlife-CoMMS Database



USING A GPS

AIM

The aim of this guide is to explain how you:

- ◆ Record locations accurately;
- ◆ Mark and re-name waypoints;
- ◆ Use co-ordinates given to you to find a location.

WHY DO YOU NEED AN ACCURATE LOCATION?

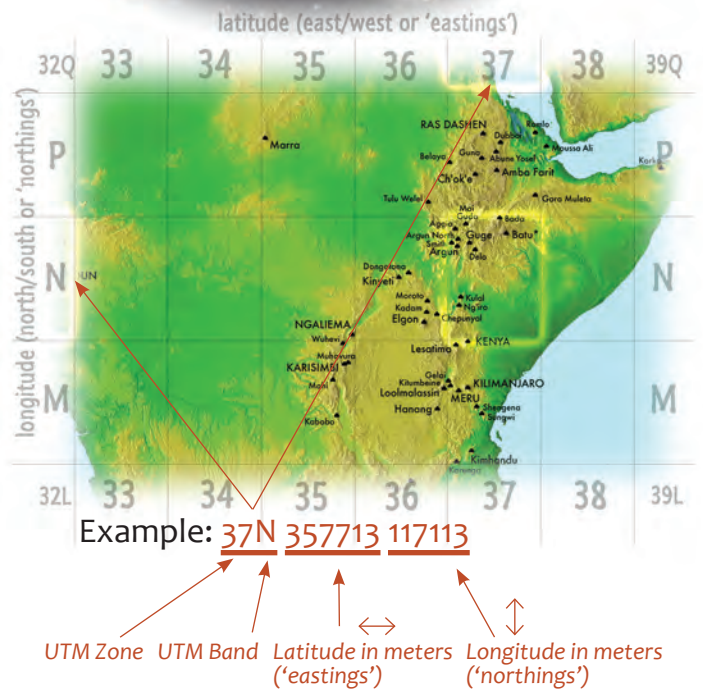
Knowing exactly where you are will allow you to:

- ◆ Record wildlife sightings and will help build up an accurate picture of where animals are and how they are using the Conservancy;
- ◆ Return to the exact position again e.g. returning to a carcass or a poaching incident;
- ◆ Find someone or something at a location given to you by another person e.g. using a GPS position given over the radio;
- ◆ Ensure that all monitoring data will be accurate along with any maps that are produced;
- ◆ Get help or assistance quickly in case of an emergency situation, (either help people find you or you find them)

BASIC FUNCTIONS OF A GPS

A hand-held GPS (e.g. a Garmin e-Trex) uses satellite technology to enable you to:

- ◆ Determine your exact location by providing co-ordinates for where you are;
- ◆ Mark and store a location or a Waypoint so you can find it again;



- ◆ Guide you to a location: If you have the coordinates for a place you want to go to (for example if someone is giving you coordinates over the radio) the GPS can direct you to it by giving you a straight-line bearing and distance to your destination.

USING THE GPS

Ensure that you know how to use following functions of the GPS, (more details are provided in the GPS manual).

SELECTING PAGES

To select a page: Press **POWER** to turn on the unit and then press **PAGE/QUIT** to move through the following main pages:

- 1 **SkyView** displays the GPS receiver status and strength of satellites
- 2 **Map** shows where you are located and as you travel the animated figure leaves a track log. The map also shows waypoint names and symbols.
- 3 **Pointer** this page helps to guide you to your location. When navigating, the pointer page shows the name, the distance, time to go and a direction arrow in the compass ring. It also shows your current **LOCATION** at the bottom of the screen.
- 4 **Trip Computer** this page contains five data fields to show travel information. use the **CHANGE FIELDS** option to select **LOCATION** as one of the display fields on the trip computer page.
- 5 **Menu** this page leads on to the advanced features you will need. Use the **Menu** page to access the following features:
 - ◇ **Mark Waypoint:** use to create a waypoint
 - ◇ **Waypoints:** select a waypoint to edit and locate the nearest waypoints or delete user waypoints.
 - ◇ **Routes:** navigate using one of three methods **GO TO**, **TRACKBACK** and **ROUTES**.
 - ◇ **Tracks:** The track log includes information about each point it plots including time and position.
 - ◇ **Setup:** Use this page to change the coordinate systems, map datums, and distance units, and to change the time format, north reference, mode, contrast and back light timeout.



SETTING UP THE GPS

Access the **SETUP** option in the **MENU** page and ensure that the following settings are in place on the GPS:

- ◆ Under **UNITS**: Select **POSITION FORMAT: UTM/UPS**
- ◆ (Example: 37N 357713 117113. Here 37N identifies the map zone, 0357713 is the east/west ('easting') number, while 0117113 is the north/south or ('northing') number
- ◆ Under **UNITS**: Select **MAP DATUM: WGS84, METRIC and METERS**
- ◆ Under **HEADING**: Select **DEGREES and TRUE NORTH, angle**
- ◆ Under **TIME OF**: Select **12 HOUR**

Trip computer

4



a continual record of data whilst moving

nb: the GPS only works when moving

field can be changed to show current location on the screen

Menu

5



key all options shown here

to create a waypoint

to edit and find waypoints

for **GoTo**, **TRACKBACK** and **ROUTES**

info on routes and times

general info

FINDING YOUR CURRENT LOCATION:

Start up GPS and a **WAIT TRACKING SATELLITES** message will appear on the **SkyView** page, which also displays the GPS receiver status and strength of satellites. This is followed by a **READY TO NAVIGATE** message when a location fix has been found. Use the page button to move to the **POINTER** page, this shows your current **LOCATION** at the bottom of the screen.

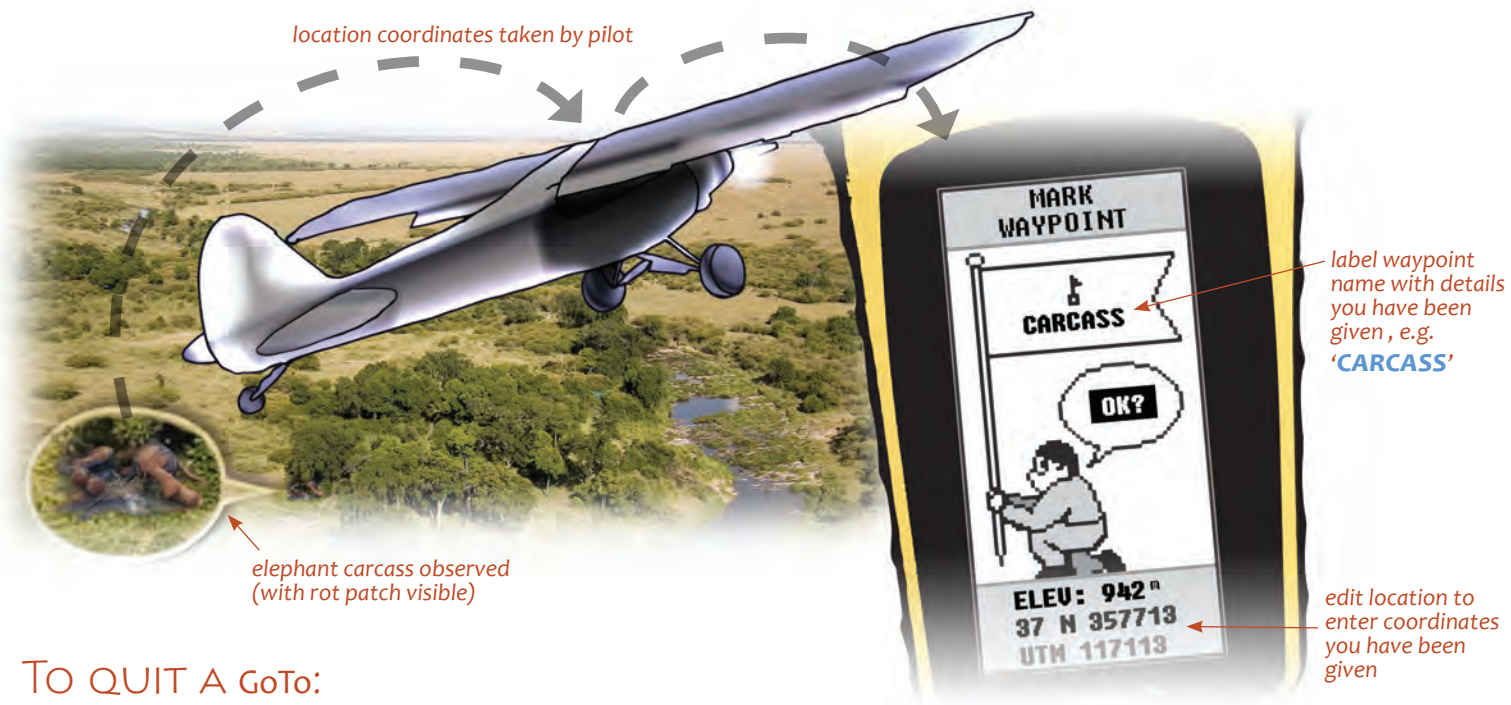
TO MARK AND RENAME A WAYPOINT

- ◆ Press and hold **ENTER** to open the **Mark Waypoint** page.
- ◆ If you want to rename the waypoint, select arrow keys to highlight the waypoint number and rename it.
- ◆ Select **OK** and press **ENTER** to mark as a Waypoint.

TO GO TO A WAYPOINT:

- ◆ Press **PAGE** and switch the to the **Menu** page. Press **UP** or **DOWN** to select waypoints.
- ◆ Press **UP** or **DOWN** to select the tab containing the waypoint you want to go to and press **ENTER**.
- ◆ Press **UP** or **DOWN** to select **GoTo** and press **ENTER**.

Use the Pointer page to help guide you to a **GoTo** destination. The pointer gives direction to the destination. Walk in the direction of the pointer until it aligns with the direction line at the top of the compass ring. When the pointer is straight up you are on the correct track to your location.

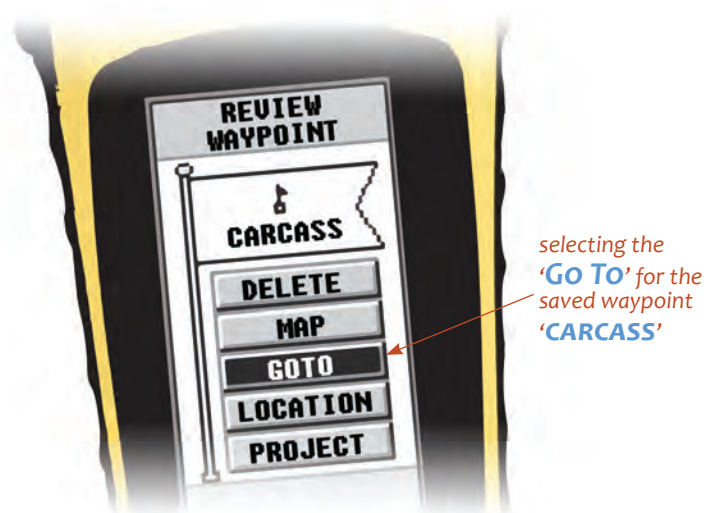


TO QUIT A GoTo:

- ◆ Press **PAGE** and switch to the Pointer page.
- ◆ Press **ENTER** to view the options menu.
- ◆ Select **STOP NAVIGATION** and press **ENTER**.

TO ENTER AND GO TO A POSITION GIVEN TO YOU BY SOMEONE ELSE

- ◆ Mark a waypoint (as per above)
- ◆ Select the **LOCATION** and use the arrows to select and change the numbers of the existing waypoint coordinates to the coordinates you have been given.
- ◆ Press **UP** or **DOWN** to select **GoTo** and press **ENTER**



TIPS: ACQUIRING SATELLITES & LOOKING AFTER YOUR GPS!

- ◆ Do not change the settings on the GPS once already set.
- ◆ To provide reliable navigational information, including your position, a GPS receiver needs to receive good signals from a clear view of the sky (i.e. not inside a building).

- ◆ You can sometimes acquire satellites faster if you turn it off, then turn back on.
- ◆ Be sure you have spare batteries with you at all times.
- ◆ Do not leave your GPS in the sun and do not let it get rained on.
- ◆ Do not leave your GPS on as it will run down the batteries, turn your GPS off after you have recorded the information you need.



PREDATOR SPOOR

THE AIM

The aim of this guide is to help identify some key predator species from their spoor (footprints).

WHY USE SPOOR?

In your conservancy, when you list the wildlife species for Monitoring, you should also agree a list of species for which you will record scat or spoor. It may not always be possible to observe actual individuals of the predator species you are interested in monitoring as these animals may be shy, difficult to see or be mainly active at night.

It is important that you can accurately identify predator species from their spoor, and is also useful when investigating carcasses and incidents of human-wildlife conflict.

Ensure you can identify the following five main predators from their spoor:



- ◆ Lion
- ◆ Leopard
- ◆ Cheetah
- ◆ Wild Dog
- ◆ Spotted-Hyena

when a suitable measure is unavailable, then it can be useful to know the dimensions of your hand, especially how 10cms maps to your fingers and knuckles

Lion

Leopard

Cheetah

Hyaena

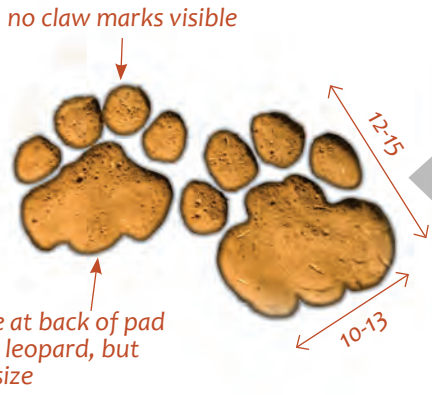
Wild dog



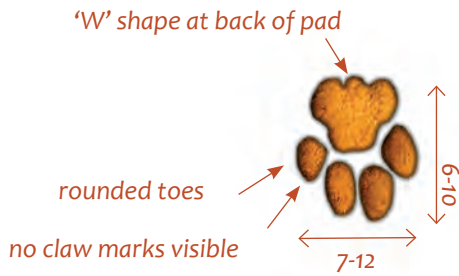
IDENTIFYING SPOOR

(in cms):

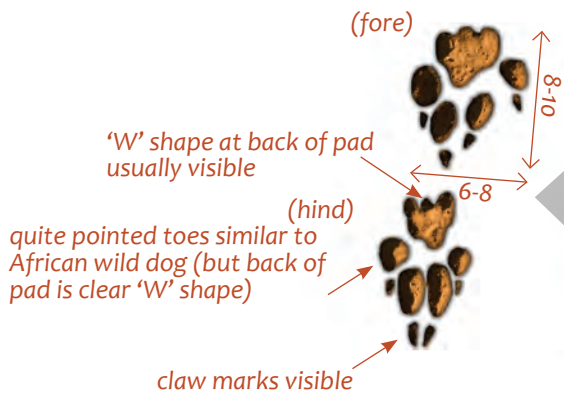
LION



LEOPARD



CHEETAH



HYENA



WILD DOG



Monitoring: Wildlife Observations
Monitoring: Human-Wildlife Conflict

adapted from Large Carnivore Identification Guide
(Wildlife Conservation Society & Zoological Society London)



ELEPHANT CARCASSES

AIM

Investigating an elephant carcass to determine the cause and means of its death and outlining the recording and reporting procedures for mortality is the purpose of this guide.

REASON TO DO IT

Given national and international concern over **ivory poaching**, the reporting of elephant deaths is vitally important.

Any data collected by Conservancies feeds directly into the Kenya Wildlife Service National Elephant Mortality Database and the Monitoring of Illegal Killing of Elephants (MIKE) programme under CITES (Convention on International Trade in Endangered Species).

INVESTIGATING THE SCENE

Before investigating the carcass, Rangers should gather as much information as possible from the surrounding scene. To avoid walking on potentially useful evidence, first observe from a distance:

- ◆ What information can be found from **people reporting the carcass** or anyone nearby.
- ◆ If it is a fresh carcass, **do not approach** straight away. Survey the area for signs of humans or predators, who might still be nearby – safety first!
- ◆ Look for **signs of human activity**, this will give clues as to the cause of death and help the follow-up of suspected poachers e.g. footprints.
- ◆ If **immediate follow-up** of suspected poachers is required, follow procedures



for **tracking** and **apprehending** suspects or ask for back-up via the radio-room.

- ◆ If no immediate poaching follow-up is required, proceed with gathering information by filling out the *Wildlife Carcass Data Sheet*. Ensure this is filled in for poached elephants **immediately** the anti-poaching follow-up is completed.
- ◆ Details of all elephant carcasses, for all causes of death, must be **reported immediately** via a **Radio Signal** to KWS, Lewa & NRT.

REQUIRED INFORMATION

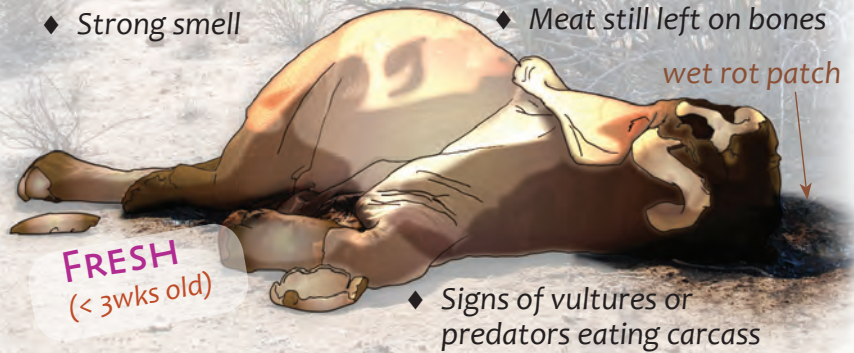
The *Wildlife Carcass Datasheet* is key to recording vital information, such as date, block name, location. Recording a **GPS location** is essential in case future follow-up and verification of the carcass is needed.

CARCASS AGE

Estimating how long an elephant has been dead for may be difficult. Try to determine the approximate time of death into one of the following categories:

- ◆ **FRESH** (less than 3 weeks)
- ◆ **RECENT** (3 weeks – 1 year)
- ◆ **OLD** (more than 1 year)

- ◆ Flesh beneath skin giving rounded appearance
- ◆ Pool of blood/body fluids moist on ground (rot patch)
- ◆ Strong smell
- ◆ Meat still left on bones



CAUSE & MEANS OF DEATH

SIGNS & MEANS OF DEATH:

- ? Tusks or meat **cut out**
- ? **Footprints** of people around the carcass
- ? Carcass **covered with branches**
- ? **Snares** actually seen or marks left by snares on the carcass legs
- ? Gunshot/spear or arrow **wound** visible
- ? **Bullet case** found in the vicinity of the carcass
- ? Carcass found near human **settlement**, or farm
- ? **More than one** carcass in the immediate area (poison?)
- ? KWS or Conservancy **personnel** sent to either dart or shoot an animal
- ? Animal has obvious **injury** or has to be put down

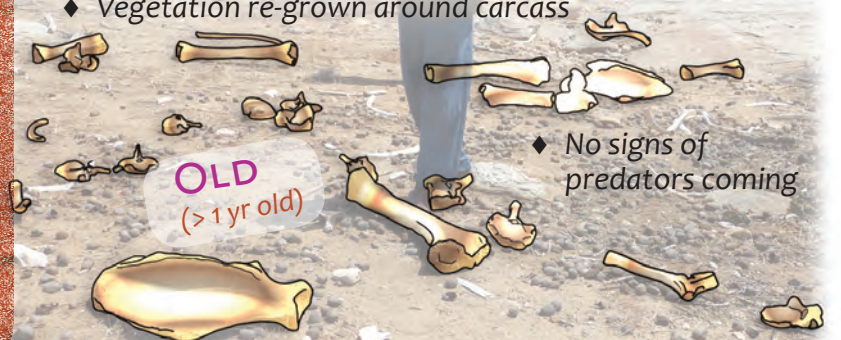
(above and below) nb head bones cut away by poachers

- ◆ No blood or fluid seen-dry around carcass
- ◆ Less meat on bones – not quite white
- ◆ Skin and bones partly in place
- ◆ Even in rainy season bare ground around carcass



bare ground, no plants growing in rot patch

◆ Vegetation re-grown around carcass



- ◆ White/grey bones scattered, often only skull and large bones remain

DELIBERATE HUMAN INVOLVEMENT

Cause:
Control
Poaching
Conflict
Illegally killed

Means:
Gunshot
Spear
Arrow
Snare
Poison

NO DELIBERATE HUMAN INVOLVEMENT

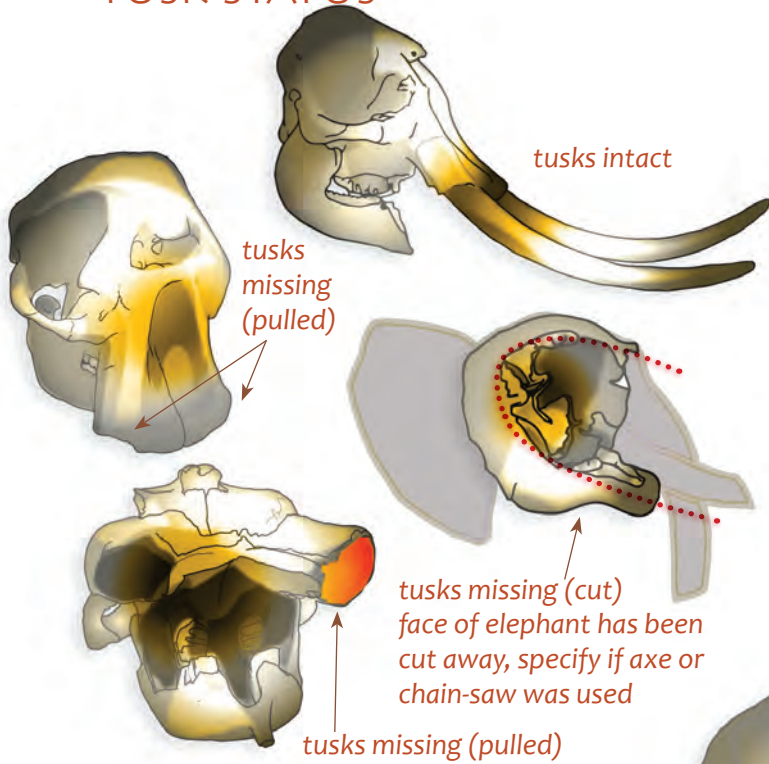
Cause: Natural
Unknown

Means: Predation
Drought
Old age
Disease
Accident

SIGNS & MEANS OF DEATH

- ? No obvious signs of human involvement
- ? No obvious signs to allow accurate assessment
- ? Animal is **very thin**, may be **several** carcasses in same location (carcasses are found during drought)
- ? **Teeth worn**, animal is thin and looks old
- ? **Blood** coming out of mouth, trunk, anus
- ? Animal has fallen into a well, fallen over a cliff, or been hit by a vehicle (any human involvement is **not intentional**)

TUSK STATUS

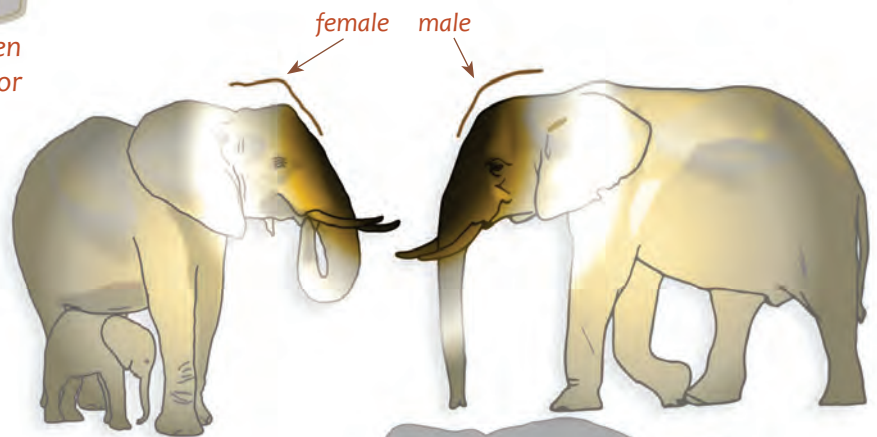


If tusks are present, rangers must guard the carcass until they can get assistance from the Conservancy or KWS to remove the tusks (hand-over of all tusks to KWS must be recorded in the Occurrence Book with full details of the receiving officer).

It is important to note on the *datasheet* whether the tusks are present. They may be naturally absent (e.g. in very young calves, or occasional animals which never grow tusks) or have been removed. If removed, then note if they were pulled out after the carcass had decomposed, or if they were cut while still fresh. Record information for both Left and Right tusks.

SEX OF CARCASS

Obvious signs of the sex of the carcass include the penis in males and mammary glands in adult females. However, the head or skull of the elephant may help determine whether the carcass was male or female. A ridge extends forward over the top of the forehead of females, resulting in a pointed appearance, not present in males.

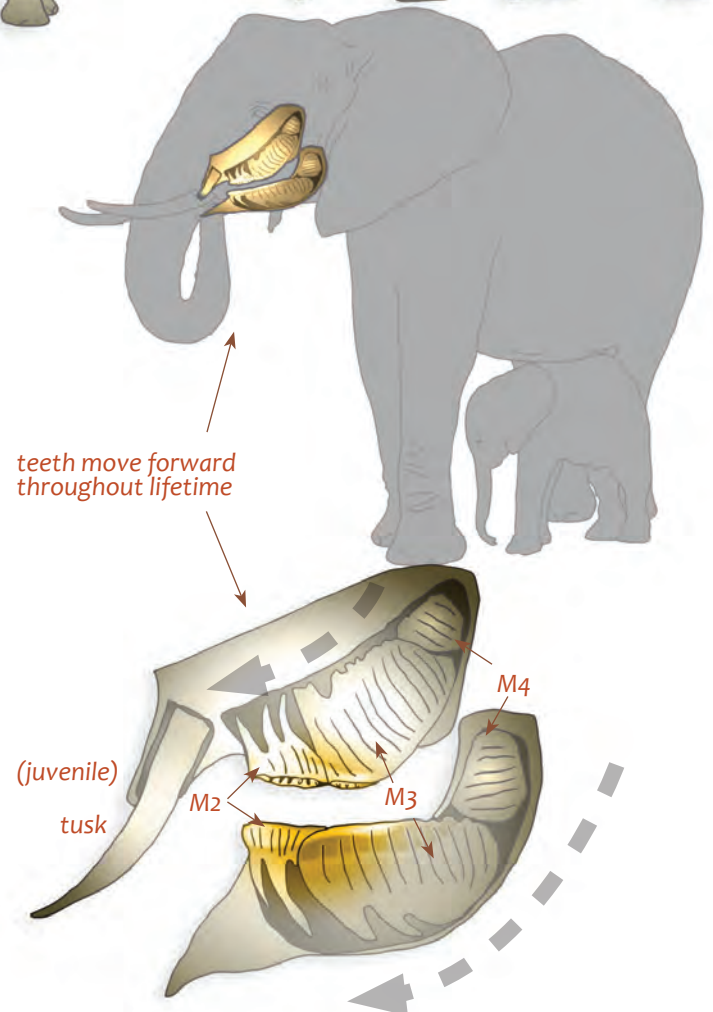


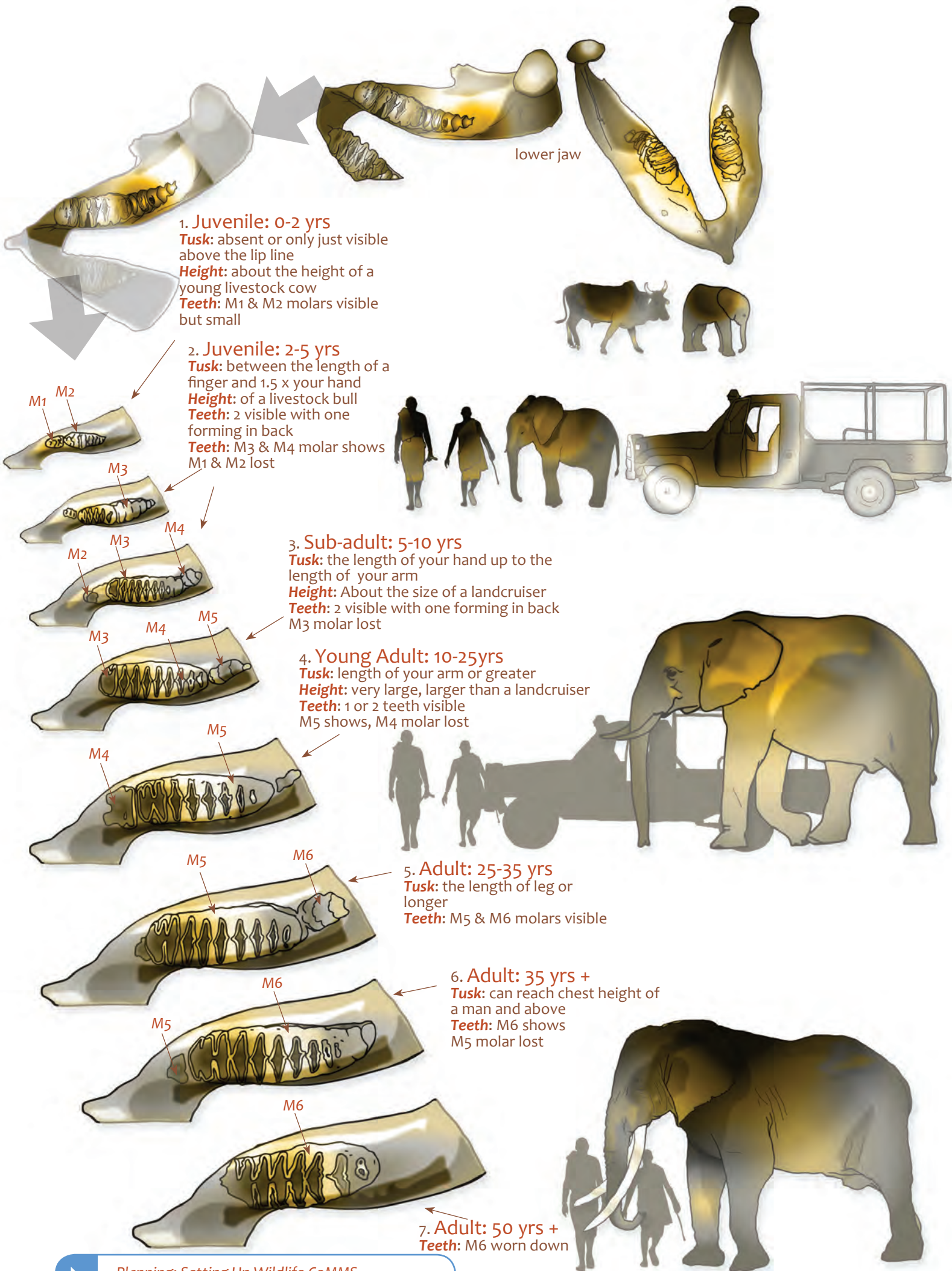
AGE OF ELEPHANT

Elephants can be aged into categories reasonably accurately using information about the tusks, teeth (molar) and body size.

Throughout its life an elephant has **six teeth** in each half of the top and bottom jaw but only two of the six teeth will be in use at the same time. Teeth grow from the back of the jaw and **move forward** very slowly along the jaw as they get worn out. Each tooth will drop out in turn once it has been completely worn away.

In very old animals, once the sixth and last tooth wears out, the elephant is unable to chew food and will likely die from starvation. Very old animals tend to be found in swampy areas where there is softer vegetation.





▶ Planning: Setting Up Wildlife-CoMMS
 Special: Using a GPS
 Monitoring: Wildlife Carcasses

Adapted from Laws 1969 & Jackmann 1984
 Save the Elephants/ CITES-MIKE programme

WILDLIFE DISEASE

AIM

The aim of this guide is to provide practical guidance on **signs** and **symptoms** of **common diseases** affecting wildlife, particularly when investigating a carcass.

DISEASE

Disease can impact on wildlife populations, livestock and in some cases human health (e.g. Anthrax, Rabies, Mange etc). Rangers play an important role in **reporting suspected disease outbreaks** which will then be dealt with by the relevant authorities. **Quick response** to suspected disease outbreaks is essential in order to prevent the spread of disease which can result in deaths of many animals.

Generally, diseases are difficult to diagnose in carcasses without detailed veterinary sampling and investigation, however, there are some more obvious signs and symptoms of common diseases that can be observed in sick animals, or fresh carcasses, and these can help determine the cause of death. Some diseases can be passed on to humans, it is therefore important that if Rangers suspect a carcass might be diseased, that the carcass is not touched unless the ranger is wearing protective gloves and clothing, including a dust mask.

The following are examples of diseases that might be identified in carcasses and which should be investigated with caution, as they can affect humans:



ANTHRAX

- ◆ Has been reported in hartebeest, topi, rhino, buffalo, hippo, impalas, zebra, elephants;
- ◆ outbreaks involving the death of 10s or 100s of Grevy's Zebra have been reported
- ◆ Outbreaks coincide with high temperatures in drought periods, particularly in dry areas
- ◆ Signs include **oozing dark watery blood** from mouth, nose and anus; it may not be very obvious in wildlife species.

If disease is suspected the Conservancy should send a Radio Signal to KWS with a description of the symptoms of the disease, the species and number of live animals or carcasses that are affected.

RABIES

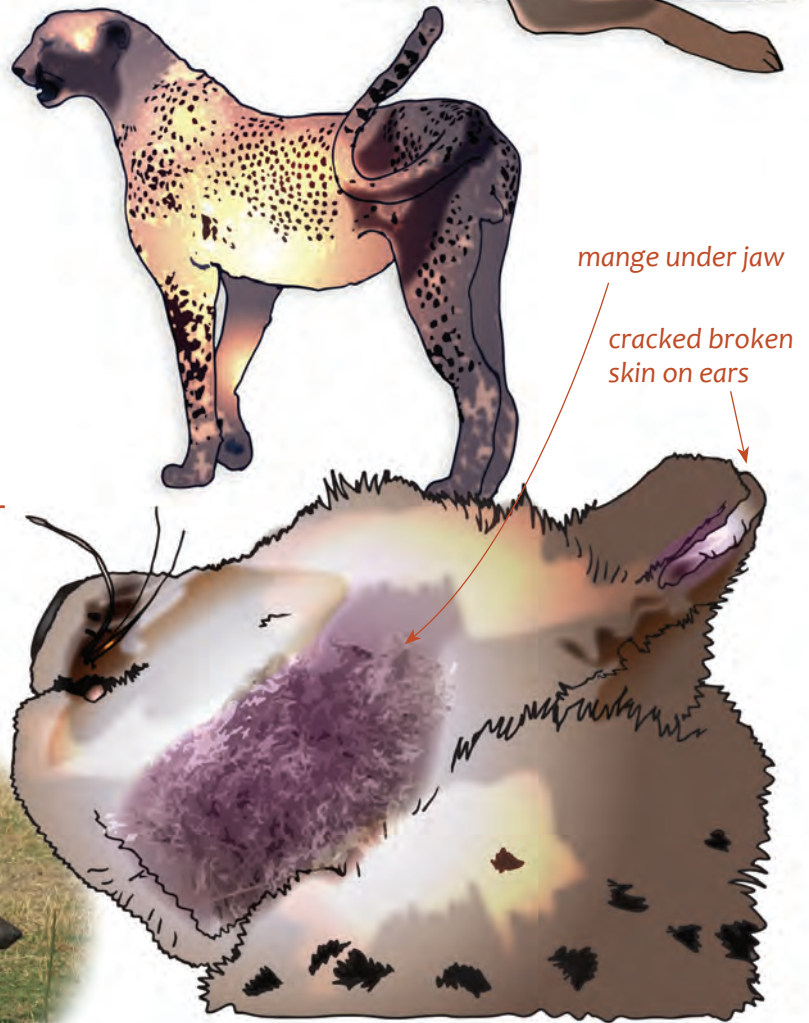
- ◆ Rabies can occur in both carnivores and herbivores (domestic and wild).
- ◆ Transmission between domestic dogs and wildlife does occur (and has been reported on many occasions involving African Wild Dogs, entire packs of Wild Dogs can be killed by the disease over a short period).
- ◆ In living animals, symptoms in the final stages of the disease include **paralysis** and **saliva drooling** from the mouth.



saliva drooling from the mouth

MANGE

- ◆ Mange can affect many wildlife species, particularly predators and has been reported in cheetah, lions and wild dogs. It also affects domestic animals especially dogs; and human infection is possible.
- ◆ Infection of mange results in **loss of hair** and **cracked skin**, hair loss may be over the entire body of the animal. Severe cases can result in death of the animal.



mange under jaw

cracked broken skin on ears



hairless wild dogs with mange



Annex: Wildlife Carcass Datasheet
Specialist Guides: Using a GPS

KWS Veterinary Department
Samburu-Laikipia Wild Dog Programme
Grevy's Zebra Trust



GAMEBIRD MONITORING

AIM

The aim of this guide is to provide detailed guidance on carrying out gamebird counts for sandgrouse, using the data to:

- ◆ estimate **population sizes** and trends; and
- ◆ allocating **shooting quotas**.

INTRODUCTION



There are two species of sandgrouse that are monitored.

- ◆ **Chestnut-bellied**

Sandgrouse (*Pterocles exustus*).

- ◆ **Black-faced Sandgrouse** (*Pterocles decorates*).

- ◆ Birds rely on water and must **drink every day**.
- ◆ As water becomes scarce during the dry season, remaining small pockets of water will attract sandgrouse in large numbers.
- ◆ The best time to count birds is at the **end of dry season** when water is in short supply and many birds have to use the same water.
- ◆ Birds may travel distances of **10-15km** to congregate at these sites.
- ◆ Sandgrouse lay clutches of 2-3 eggs, and the chicks are **dependent** upon the **adult male** for water for **1-2 months** after hatching.

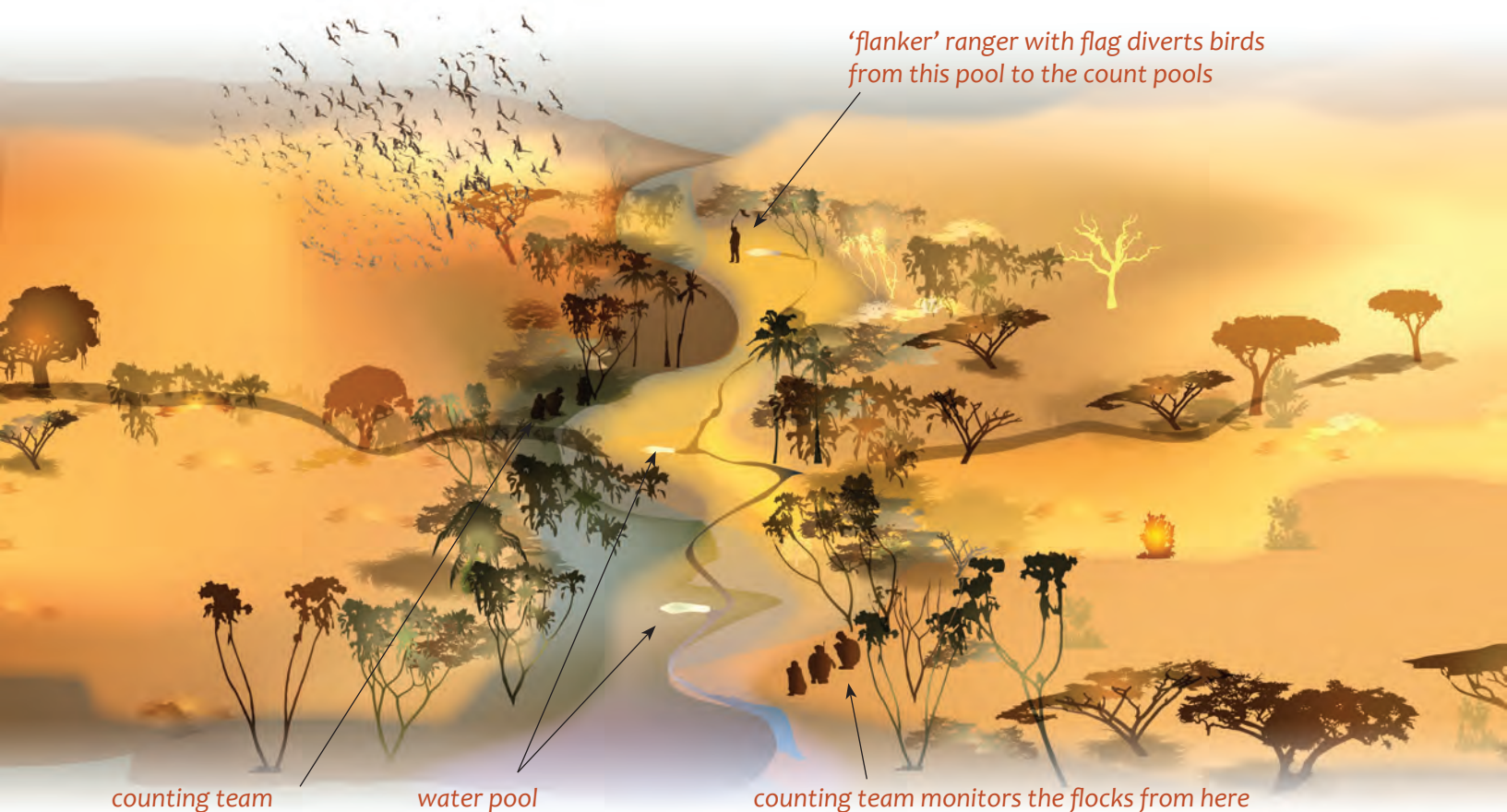


- ◆ Sandgrouse are therefore likely to be in either **breeding condition** or with dependent chicks from **May–September** and **January-March**.

WHY COUNT?

Sandgrouse congregating in such large numbers makes them attractive to Game Shooters. If the birds are going to be used as a resource by the Conservancy, then setting a bag-quota will ensure **wise use of the resource** and prevent over-shooting. In order to set a quota, it is important to try and estimate the size of the population as accurately as possible.

Since shooting coincides with the breeding season for Sandgrouse in particular, hunting quotas should be conservative i.e. **less than 10% of the population** in the Conservancy.



'flanker' ranger with flag diverts birds from this pool to the count pools

counting team

water pool

counting team monitors the flocks from here

PRE-COUNT PLANNING

Timing of the counts is critical.

- ◆ The optimum time will be towards the **end of the dry season** (end of September) when water is most limited and birds only have a few available drinking sites.
- ◆ The optimum time during the day for counting Chestnut-bellied and Black-faced sandgrouse will be from about **6.30 am to 8.30am**.

A pre-count site visit is advisable as this will determine:

- ◆ The location and **number of water points** that the birds are using;
- ◆ **How many teams** of people will be required to carry out the count (it is useful to have **one or two observers** and **one person recording** in each team at each drinking point)
- ◆ where each team will be **positioned**

It may be useful to have extra people at the count to **'flank'** (prevent birds from landing at) any drinking points not able to be counted if observer numbers are limited, or to keep

people and livestock away from the site until the count is over.

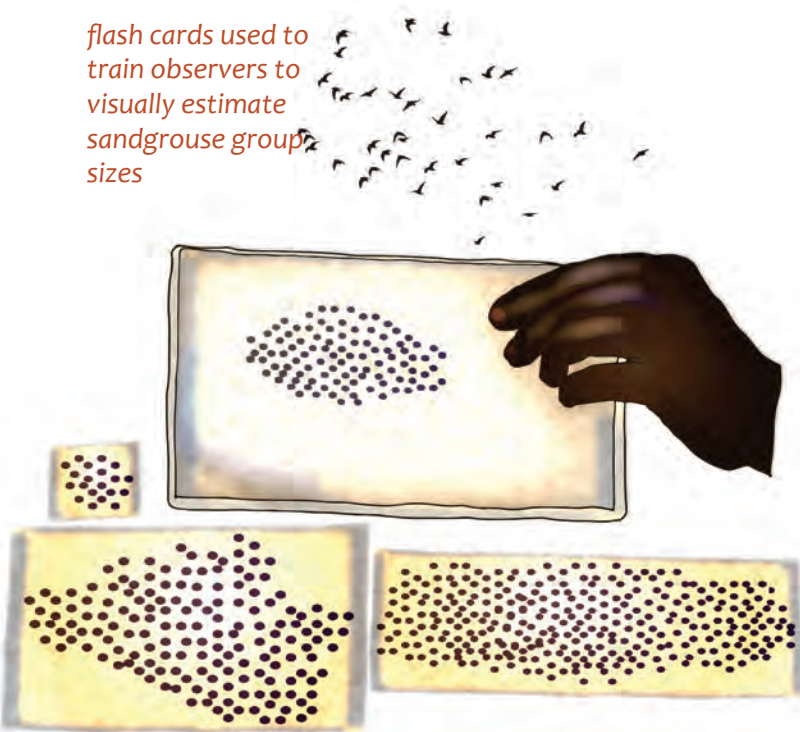
TRAINING OF OBSERVERS PRIOR TO THE COUNT

Groups of birds land, drink and take off again in a matter of a few seconds, so it is essential observers are able to quickly **estimate sizes of groups** as accurately as possible. Training using **'flash cards'** may help observers reduce error.

A practice count might be helpful to allow the count team to get used to techniques and counting.



flash cards used to train observers to visually estimate sandgrouse group sizes



COUNT TECHNIQUE

At each drinking point birds will generally fly around before drinking and groups may land and congregate in larger groups before coming to drink. Each group will spend only **a few seconds drinking** at the point before taking off. To count effectively:

- ◆ The team should find location next to the drinking point where birds can be clearly seen arriving and leaving but not too close to scare birds.
- ◆ Observers estimate the size of the group only as it **takes off from the drinking point after drinking**. Estimates are done in multiples of **10, 20 or 50**.
- ◆ Observers call out clearly each group size for the recorder to note down on the datasheet.
- ◆ The count may last for approximately **1-1.5 hours**. During this time the team must concentrate so as not to miss any groups.
- ◆ Once the team is confident no more birds will visit the drinking point, the team adds up all the groups numbers on the data sheet.

POST-COUNT BRIEF

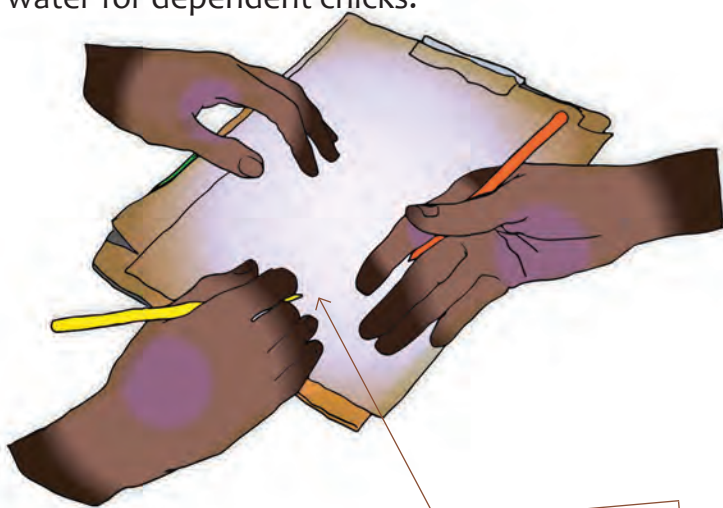
- ◆ At the end of the count, all teams should gather to collate all the results to give a **total estimate of birds** that visited the site.
- ◆ Members of the count team should also provide feedback about how they felt the count was conducted. If there are concerns that count was not representative of the population or that the count may have been under-counted/over-counted, a decision should be taken to carry out a re-count the following day.

POPULATION ESTIMATES AND SETTING BAG QUOTAS

Counts are repeated at **all water points** within the conservancy area on **consecutive days** to determine a 'Conservancy' population estimate.

Once the team is confident that the population has been estimated as accurately as possible, the shooting quota can be set.

It is recommended that the quota is set at **10% of the final count**. This relatively low percentage is to ensure a sustainable harvest of birds and **reduce the impact of shooting** 'belly-soaking' adults which may be providing water for dependent chicks.



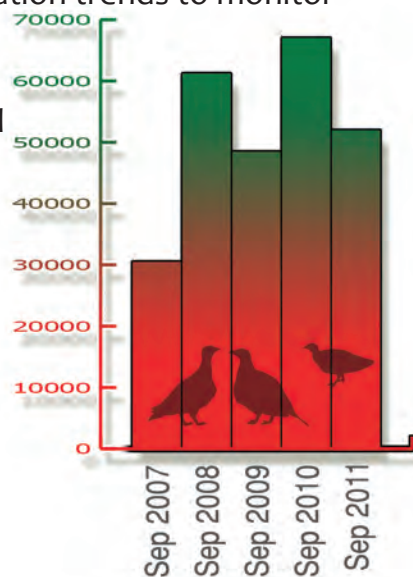
| Site 1 | Site 2 | Site 3 |
|-------------------|--------|--------|
| 3,720 | 5,450 | 15,210 |
| Conservancy total | | 24,380 |
| 10% quota | | 2,438 |



(clockwise from top left) 1: incoming birds; 2: taking off; the moment of count; 3: flag flanker; 4: counters

POPULATION TRENDS

Comparison of population estimates from year to year will enable the conservancy to determine population trends to monitor if sandgrouse numbers start to decline which will require further management consideration.



MONITORING SHOOTING ACTIVITY

A record of all birds shot during a hunt must be kept by filling in the 'Hunting log sheet', this is submitted to KWS and a copy retained by the Conservancy. At the end of each hunting season the Conservancy compiles a total number of birds shot and ensures shooting does not exceed the annual quota set during the count.

Annex: datasheet templates

- 1 Njoroge, P., Lens, L., Sutton, J. & Bennun, L.A. 1997. The validity of open seasons for sandgrouse shooting: analysis of an 11-year data set from Kenya. *African Journal of Ecology* 35: 186-193.
- 2 Lloyd, P. 2004. Baseline study of gamebird populations and recommendations on sustainable use and monitoring of game birds in Sera Wildlife Conservancy, Kenya. Unpublished Report. University of Cape Town, Percy FitzPatrick Institute of African Ornithology.

HIROLA

AIM

Gathering information on age and sex of individual hirola is the aim of this guide. This data is useful in determining information such as calving seasons; survivorship of calves, juveniles and adults; and the sex ratio of hirola herds or populations.

CONSERVATION STATUS OF HIROLA

Hirola (*Beatragus hunteri*) are a critically endangered antelope, only 500 animals remain. Their numbers declined from about 15,000 in the early 1980s to less than 2,000 over a two year period between 1983 and 1985 – this was most likely as a result of disease and drought. Since then, their numbers have continued to drop. Predation, poaching and loss of grasslands on which they depend are the causes of continued decline.



AGEING AND SEXING HIROLA

Gathering information on the demography of hirola will enable us to better-understand why their numbers are not increasing and what conservation measures can be taken to save this species from extinction.

Male and female hirola look very similar, so it is difficult to differentiate without careful observation. Males are slightly larger and darker than females and have a thicker neck, and a thickening of skin at the base of the horns. The male's penis sheath is just visible, however the testicles are held up high between the thighs and not easily seen.

Age of animals can be determined from the horns size and shape.



Adult males reach over 100kg in body weight and shoulder height of up to 130cm; females are slightly smaller and give birth to 1 calf per year with a gestation period of 7 months

YOUNG
(0-6 mths)

A: Calf 0-3 months:
without horns or with
horns just protruding

B: Juvenile 4-6 months:
straight horns up to
length of ear

straight horns,
longer than length
of ear, no horn
ridges

SUB-ADULT
(7mths – 2 yrs)

10 - 12 mths: horn tips start
pointing inwards, horn ridges
just visible at base of horns

13 - 15 mths: horn tips point
inwards and horns wider apart
at centre, horn ridges visible up to
about half length of horn

16 mths - 2 years: horn
ridges visible along 3/4
length of horn

ADULT
(over 2 yrs)

horns heavily ridged, shape may vary with horn tips spread out
or pointing inwards, base of horns straight then curve back
and outwards.

male

female

males have thicker
and more strongly
ridged base of horns
than females

Andanje, S. 2002 Factors limiting the abundance and
distribution of hirola (*Beatragus hunteri*) in Kenya.
PhD thesis, University of Newcastle Upon Tyne