



**DISTRICT**

**QUOTA SETTING**

**TOOLBOX**

**WILDLIFE MANAGEMENT SERIES**





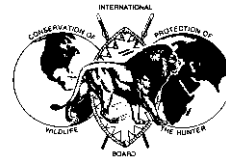
**DISTRICT**

**QUOTA SETTING**

**TOOLBOX**



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Safari Club International

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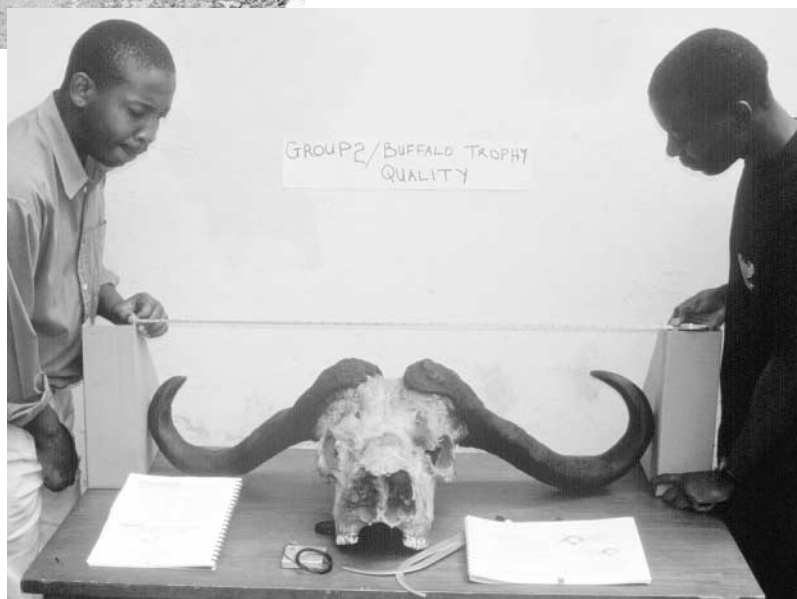
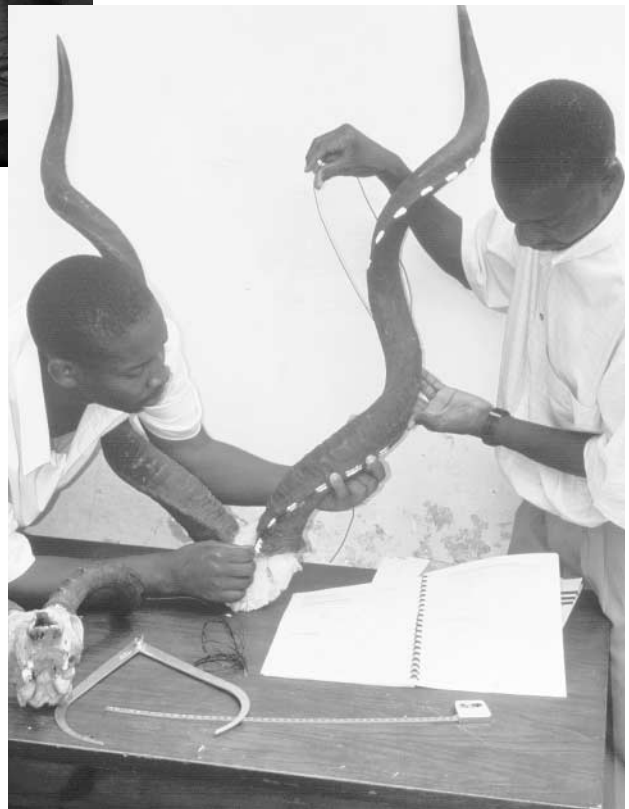
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Workshop participants measuring trophy quality



## INTRODUCTION TO THE DISTRICT QUOTA SETTING TOOLBOX

### What is the purpose of the district quota setting toolbox?

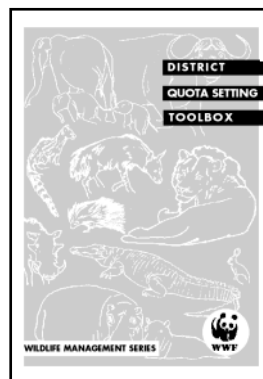
The district quota setting toolbox is a set of activities for participatory quota setting at district level. It provides detailed instructions on the methods and activities which can be used by a facilitator at a district level quota setting workshop.

This toolbox is the second in a series of publications dealing with participatory quota setting in CAMPFIRE. The first guidebook was the 'Quota Setting Manual' which gave background information on quota setting such as: the factors which affect the size of the quota, methods to assess wildlife populations and the allocation of quotas between different uses. A third publication in this set is a toolbox of activities for use at the ward and village level.

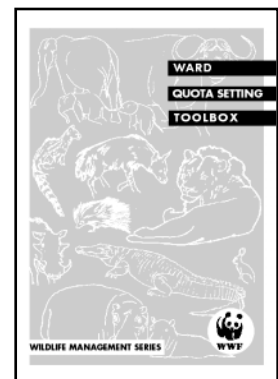
### The relationship between the Quota Setting Manual and the District and Ward Quota Setting Toolboxes



**Quota Setting Manual:**  
Provides background information for quota setting



**District Quota Setting Toolbox:**  
Provides details of how to run a quota setting workshop at district level



**Ward Quota Setting Toolbox:**  
Provides details of how to run a quota setting workshop at sub-district level

### How was the toolbox developed and tested?

This toolbox was developed by WWF's Support to CAMPFIRE Project together with selected districts and communities. These activities have been used and tested in district level quota setting workshops under the Quota Setting Project implemented by Safari Club International (SCI), WWF and Zimbabwe Trust. However it is very important to consider the toolbox as a guide only. The activities should be adapted and modified by the trainers to suit their needs. Feedback to WWF on any improvements or changes you can recommend is encouraged.

### Why is participatory quota setting important?

In wildlife management, a quota represents the number of animals that can be safely removed or harvested from a population each year without damaging that population.

Setting quotas ensures that wildlife populations maintain themselves and continue to survive into the future. Only through the continued survival of these populations can financial and economic benefits be ensured. To do this we need to know how many animals there are and how many of these animals can be used. A combination of local knowledge and scientific methods will greatly help the process of establishing trends in animal numbers and setting quotas.

Before CAMPFIRE, biologists working for the DNPWLM used to set the quotas with little, if any, consultation with the key stakeholders. The objective of CAMPFIRE is to transfer greater authority and management of wildlife to the communities living with wildlife. If local people are excluded from one of the most important decisions about its use, for example, the number of animals to be hunted, their feelings of ownership will be diminished. For this reason their participation in quota setting is crucial. The DNPWLM still has an important role in participatory quota setting because it provides the overall legal framework for quotas.

Effective participation and control by wildlife producer communities over quota setting provides the rationale for their other wildlife management activities such as ground counts and the enforcement of local level rules and regulations. But wildlife management in the communal lands often involves more stakeholders than just the 'producer community'. Both the process of quota setting, and the final quota, are improved if all the major stakeholders are participants in the workshops.

### **Arrangement of this toolbox**

The toolbox has five sections. The next section (**Section Two**) discusses the key steps upon which participatory quota setting depends. These are:

- training
- visualisation and analysis
- participation.

**Section Three** covers the planning and organisation of a typical district quota setting workshop.

**Section Four** presents the activities which can be used for a quota setting workshop. These are:

- Topic One: Counting animals
- Topic Two: Use of the quota
- Topic Three: Monitoring and evaluation
- Topic Four: Triangulation.

Useful information and checklists are provided in **Section Five**. These are:

- A checklist of materials and where they can be purchased
- Both SCI and Rowland Ward methods for measuring trophy quality
- A conversion table for weights and measures.

Participatory quota setting depends on three essential steps. These are:

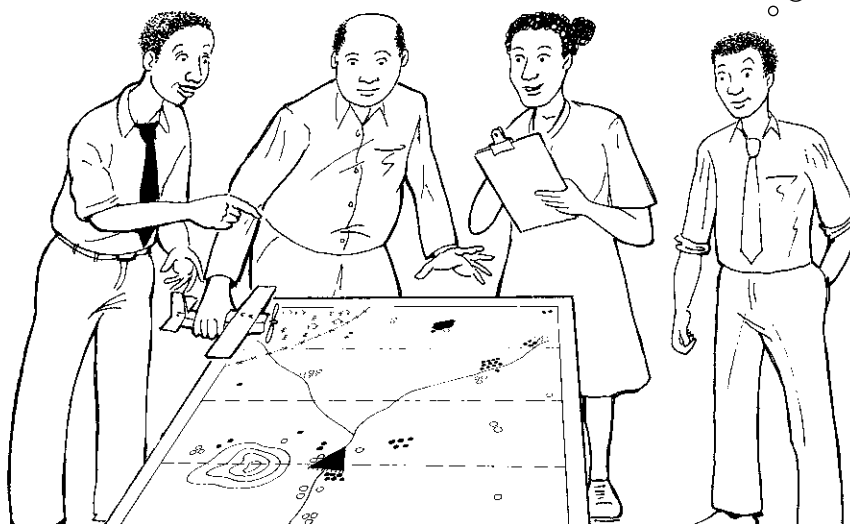
- training
- visualisation and analysis
- participation.

#### STEP ONE–TRAINING

For most of the stakeholders participatory quota setting is a new process. For all the participants to contribute effectively to quota setting, they need to acquire the necessary skills and background information. The training component of the quota setting toolbox aims to develop an understanding, amongst the participants, of the importance of the different sources of data, and how they are collected and analysed. On completion of this step, participants will have:

- improved their understanding of how to estimate numbers of animals,
- learned how to measure trophies, and
- developed a range of analytical skills

For example: Activity 1.1 ‘The aerial survey and sampling theory game’ improves the participants understanding of the advantages and disadvantages of aerial surveys, how they are conducted and how the results are analysed and used.



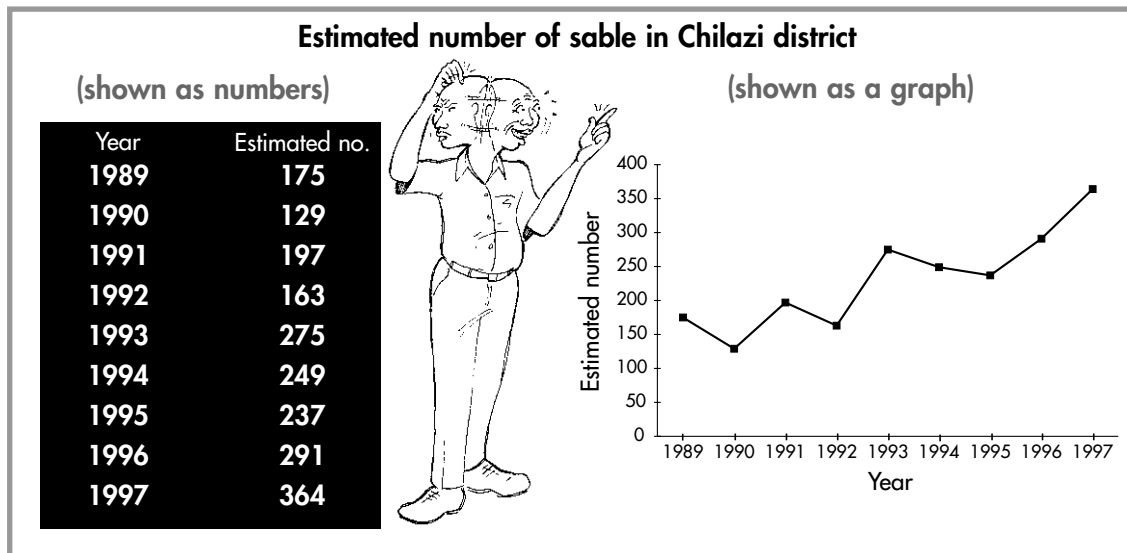
Regular annual quota setting workshops with the same group of participants will reduce the emphasis that needs to be placed on the training activities. However, experience has shown that there are always new participants who are attending their first quota setting workshops and that there is little harm in repeating the activities in full. In these situations the facilitators can transfer some of their responsibilities to those persons who have attended previous workshops.



## STEP TWO-VISUALISATION AND ANALYSIS

An important part of quota setting is being able to determine the trends in different data sets. For most people determining trends from sets of numbers is very difficult. Graphs are commonly used to turn a set of numbers into a readily visible format so that it is easier to find the trends. For participatory quota setting, visualisation of the results from monitoring activities (such as: aerial surveys, ground counts, trophy quality) makes it easier for participants to find and agree on trends. It also allows equal access to the information by every member of the group.

### Graphs are used to visualise data

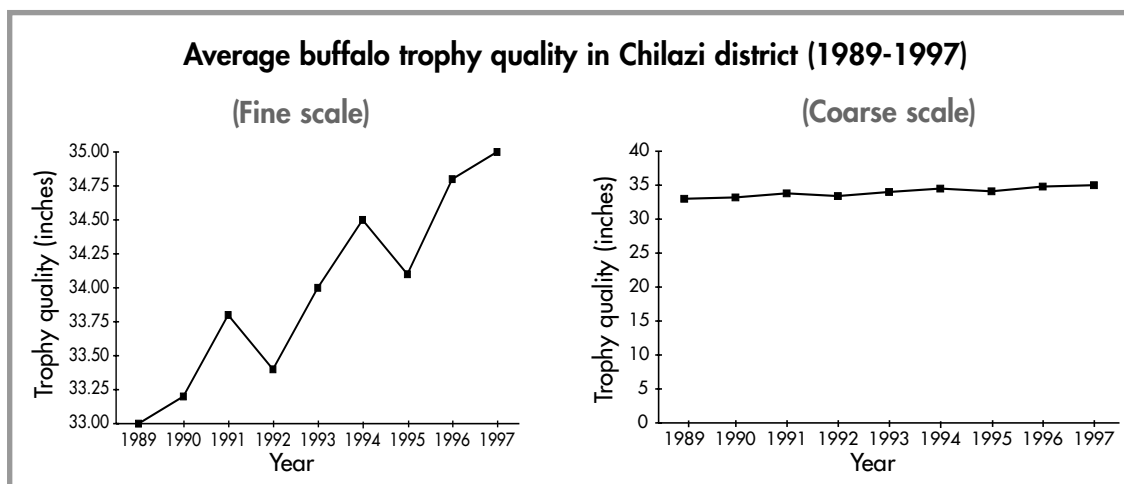


Most of the participants at a quota setting workshop will not have had much training, or experience, in producing graphs. The following points are intended to guide workshop facilitators in assisting participants to produce the necessary graphs:

#### 1. Scale:

The scale of a graph will affect the participants interpretation of trend. At fine scales trends appear to be very significant, while at coarse scales the trends appear to be much less significant. An example of the visual effect of scale is shown below in two graphs of buffalo trophy quality. Both graphs use the same data.

### The use of the appropriate scale is important

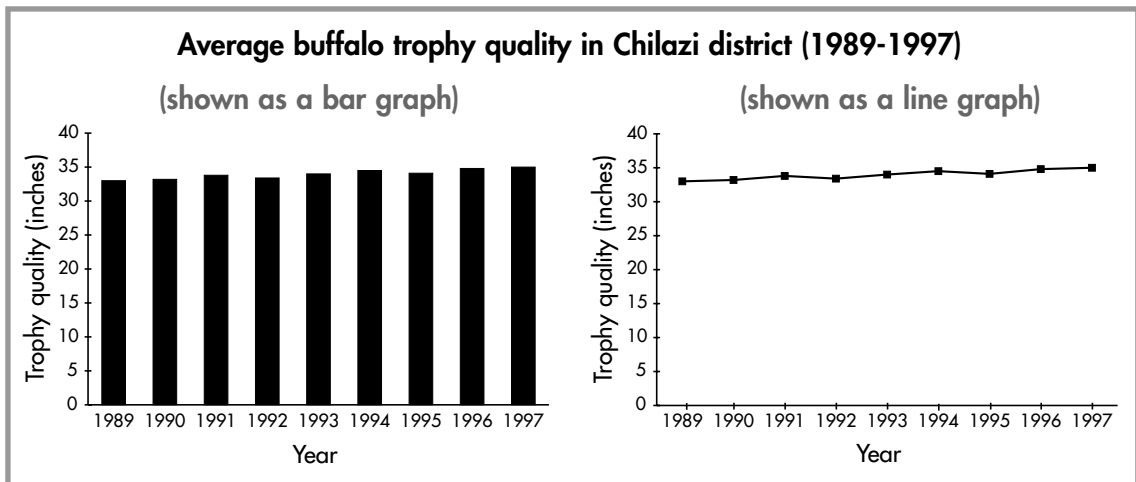


The first graph uses a very fine scale, starting at 33 inches and finishing at 35 inches. Without considering the scale, the visual impression created by the graph is that trophy quality has increased significantly. The second graph uses a coarse scale, starting at zero and finishing at 40 inches. Without considering the scale, the visual impression created by this graph, is that there has been very little change in trophy quality. As a suggestion, use graphs with a finer scale, which will highlight small, but important changes, for analysing trends in trophy quality. For other data, with a high level of variability, a coarser scale is usually more appropriate. Most importantly, facilitators should try and be consistent in their choice of scale.

## 2. Type of graph:

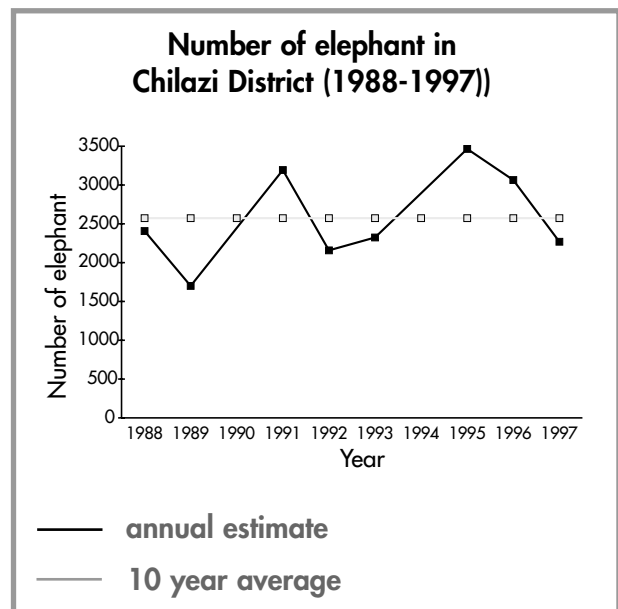
The graphs are used by participants to analyse trends and answer the question: are the results indicating an increase, a decrease or no change in the population? In this situation it is strictly more correct to use bar graphs. However, it is often easier for participants to follow line graphs rather than bar graphs.

### Either bar graphs or line graphs can be used to show trends



## 3. Interpretation of variable data:

Some of the data sources used for quota setting, especially aerial survey results, can be highly variable. This can make the analysis of trends difficult. When this is a problem, one approach is to calculate the long-term average estimate for the data available. This gives a straight line across the graph. Participants must then examine the most recent population estimates with respect to this long-term average in order to decide upon a trend.



## STEP THREE–PARTICIPATION

Participation by those living with, using and managing the wildlife, is essential to the success of the quota setting process. Participatory quota setting is based on a process called ‘triangulation.’ This is where different kinds and sources of information are brought together to make a decision. The participants use this process to analyse the available data and agree on a sustainable offtake. The workshop facilitator plays a crucial role in getting the different stakeholders to agree on the quota.

Completing the triangulation matrix uses both visualisation and analytical skills. For effective participation the trends in the indicators are visualised with arrows:

- an up arrow indicates an increase in the population,
- a down arrow indicates a decrease in population, and
- a horizontal arrow indicates that there has been no change in the population.

The arrows and the matrix allow the individual participants to build a mental picture of the trends and to contribute to the collective decision on the population status and sustainable offtake for the species.

**Table One: The participants, their roles and the information which they can bring to a quota setting workshop**

Participant	Role	Information
Producer communities	Live with the wildlife.	Ground count data and information on illegal activities and problem animals.
RDC executive officers	Assist with CAMPFIRE and manage wider RDC activities.	Sport hunting data for example: trophy quality, number of animals killed, trophy prices. Aerial survey results.
Safari operator	Uses the quota of animals.	Sport hunting data for example: the hunting effort, changes in markets, trophy quality, illegal activities.
DNPWLM	Manage wildlife in adjacent protected areas. Final approval of quota.	The overall status of wildlife use in the region, and wildlife regulations. Aerial survey results.



#### **When should quotas be set?**

Quotas and sport hunting follow the calendar year (January to December). Because DNPWLM require the recommended quotas before the end of September of each year, quota setting workshops should be held well before this time.

#### **Where should participatory quota setting begin?**

Knowing at what level to start quota setting (district, ward, village) is often a difficult decision. Many districts have only one quota and so it is possible to develop a systematic approach starting with ward level workshops and then holding a consolidated district level workshop. In those districts with multiple quotas, the quota setting process can be developed systematically from the ward level but has to be based on the area covered by the different quotas. Where there are multiple quotas, it might be necessary to check that there is no conflict between the quotas for different areas. This will contribute to the sustainability at the district level.

#### **Where does the data for quota setting come from?**

The methods described in this toolbox depend on results from good long-term monitoring activities. Without monitoring, the necessary trends cannot be established. This means that producer communities and rural district councils need to ensure that they have accurate and useable records of trophy quality, offtake rates, aerial surveys, illegal activities and ground counts. Without this information it is very difficult to set sustainable quotas. The toolbox does not replace the need for this information.

#### **How long will a quota setting workshop take?**

A well organised district level quota setting workshop for a single quota or lease area should not take longer than a day. Generally the length of a workshop will be determined by the facilitator who will take into account the complexity of the quota and the previous experience of the participants. If it is the first participatory quota setting workshop to be held in the district or area, it is advisable to extend the workshop so that the training activities can be fully completed.

#### **Who should be invited?**

Ideally all the stakeholders in the districts' wildlife industry should attend the workshop (see Table One, page 6). In addition to 'representation and participation' the facilitator should also be aware of the support that is needed to run some of the exercises simultaneously. If the workshop is too large, then it will be difficult to ensure the activities are properly done and their objectives will not be fully achieved. However, certain participants can also be used as co-facilitators. For example: the safari operator can assist with the activities based on trophy quality, and the DNPWLM representative can assist with the aerial survey game. The facilitator should liaise with possible co-facilitators before the workshop to ensure that they will attend, are happy to assist and understand the activities they will be asked to help with.

## What sort of venue is needed?

Because quota setting emphasises group work, a venue should be chosen which comfortably accommodates at least four working groups. The disruption caused by wind usually means that outside venues and/ or unenclosed meeting areas are generally not appropriate for quota setting workshops. Large community halls and the bigger council chambers make ideal venues.

## What materials are needed for the workshop?

The activities and the methodology do not need sophisticated and expensive inputs. The main materials are flip charts, markers and some trophies. Most trainers should have adequate supplies of stationery. A permanent set of trophies can easily be obtained from the safari operator. A check list of materials is provided in Section Five.

## How should group work be organised?

Ideally every participant should be exposed to each training activity. The easiest way of doing this is to rotate groups of participants around a circuit of activities. Once they have completed the training exercise, for example measuring trophy quality or playing the aerial survey game, they can visualise and analyse the workshop data required for the triangulation activity. Table Two gives a simplistic example of how this might be done, using four groups and four different activities from the toolbox. With careful planning the trainer can develop 'specialist groups.' For example Group One will have visualised and analysed all the elephant data. They will become the 'elephant specialist group.'

<b>Table Two: Organising group work in a quota setting workshop</b>				
	<b>First quarter</b>	<b>Second quarter</b>	<b>Third quarter</b>	<b>Fourth quarter</b>
<b>Group One</b>	<b>Aerial survey game</b>	<b>Measuring trophy quality</b>	<b>Species abundance matrix</b>	<b>Quota utilisation</b>
Elephant	Visualise: aerial survey results for elephant	Visualise: trophy quality for elephant	Visualise: ground counts for elephant	Visualise: quota utilisation of elephant
<b>Group Two</b>	<b>Measuring trophy quality</b>	<b>Species abundance matrix</b>	<b>Quota utilisation</b>	<b>Aerial survey game</b>
Buffalo	Visualise: trophy quality for buffalo	Visualise: ground counts for buffalo	Visualise: quota utilisation of buffalo	Visualise: aerial survey results for buffalo
<b>Group Three</b>	<b>Species abundance matrix</b>	<b>Quota utilisation</b>	<b>Aerial survey game</b>	<b>Measuring trophy quality</b>
Impala	Visualise: ground counts for impala	Visualise: quota utilisation of impala	Visualise: aerial survey results for impala	Visualise: trophy quality for impala
<b>Group Four</b>	<b>Quota utilisation</b>	<b>Aerial survey game</b>	<b>Measuring trophy quality</b>	<b>Species abundance matrix</b>
Leopard	Visualise: quota utilisation of leopard	Visualise: aerial survey results for other species (sable)	Visualise: trophy quality for leopard	Visualise: ground counts for leopard

## TOPIC 1: COUNTING ANIMALS

### Activity 1.1 Aerial Survey and Sampling Theory Game

Time required: 40-60 minutes

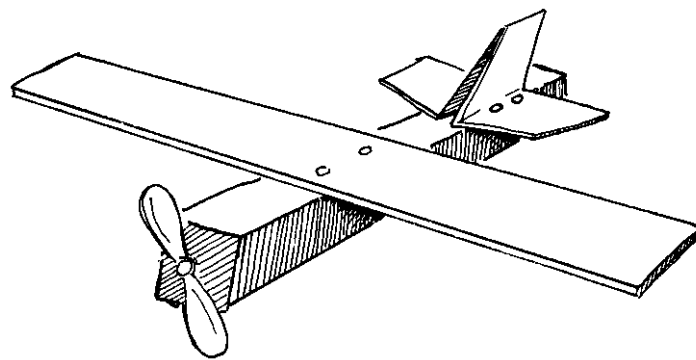
#### Purpose

The purpose of this activity is to:

- explain the principles of aerial surveys, with particular emphasis on sample surveys.
- allow participants to analyse aerial survey data for their areas.
- produce appropriate graphs for use in the 'triangulation' activity.

#### Resources required

- A model aircraft. This can be easily made by taking a small block of wood (15cm x 3cm x 3cm) and adding cardboard wings and tail. This should be done before the first workshop, but once it has been made it can be used in all subsequent workshops.
- 40 or 50 beans or stones to represent animals.

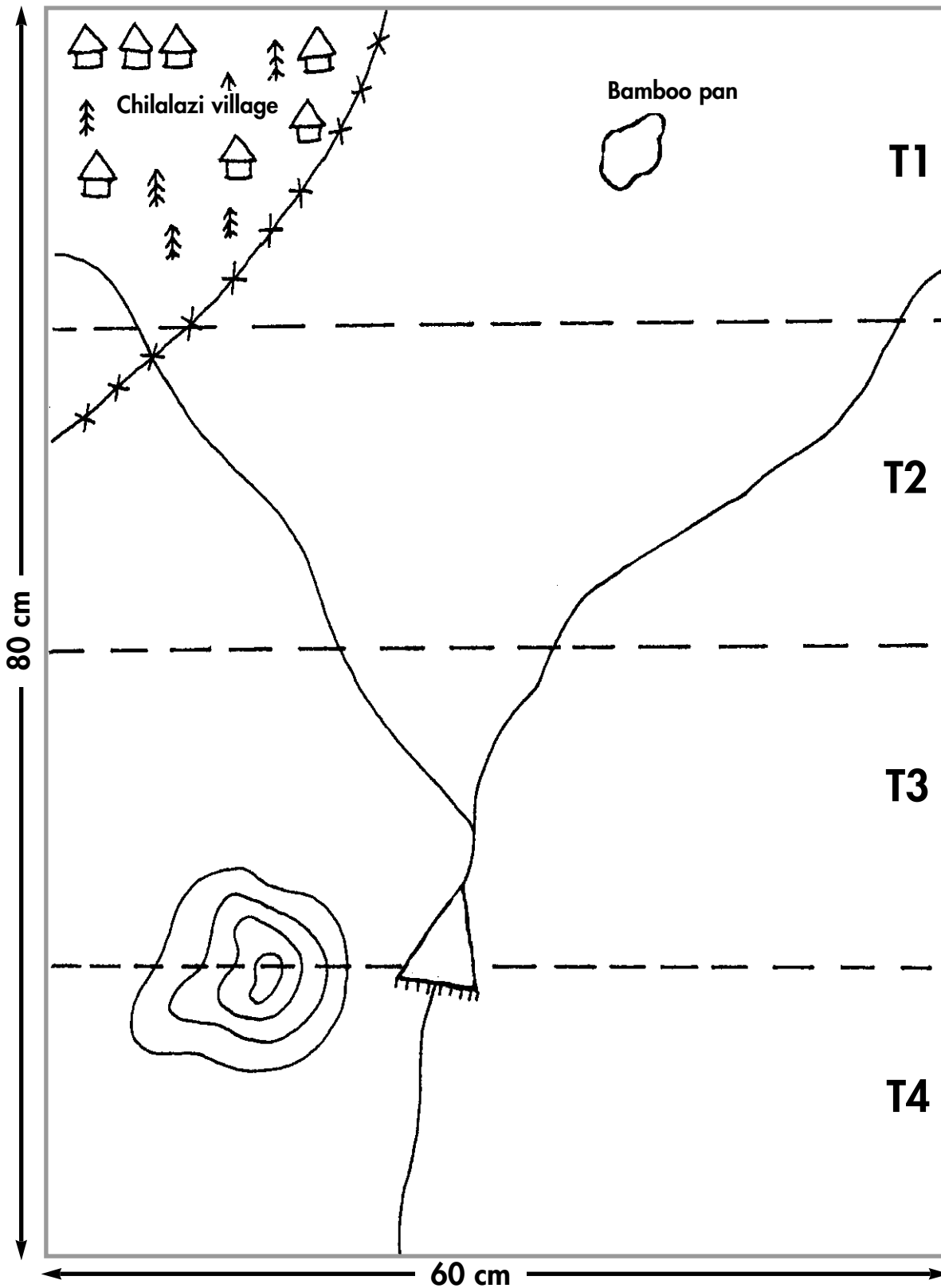


- A map of the wildlife area in the district on a flip chart or brown paper. If time allows this should be drawn by the participants. If not, use a map you have already prepared. Indicate features such as rivers, pans, human settlements and the aerial survey transects. The map does not need to be to scale. A specimen map is shown on page 10.
- Aerial survey data from WWF or DNPWLM for the district where the workshop is being held.

This activity requires that at least some of the participants are literate and numerate so that the total population estimate can be calculated from the sample. The participants should already be familiar with the idea of 'sample counting.' Further guidance on sample counting can be found in Chapter 4 'Assessing the wildlife population' of the Quota Setting Manual .



A sample sketch map of a wildlife area to be used for the aerial survey game.  
Note the transects cut across the drainage line.



**Facilitator's Hint:** An ordinary piece of flipchart paper is perfect for the activity.

## Introduction

In the first stage, participants simulate a sample aerial survey of a wildlife area so that they are able to improve their understanding of sample counting and aerial surveys in general. If time allows, the activity can be repeated several times to show the variability which can be expected from sample counting but also the convergence of the results to the actual figures.

In the second part of the activity, actual aerial survey data for the district for several years is plotted on a graph. This allows the participants to analyse the changes in estimated wildlife numbers over time, for their area.

## Advantages

The activity will:

- improve participants understanding of how aerial surveys are carried out.
- allow participants to plot and analyse aerial survey data for their area.

## Disadvantages

- the activity does not perfectly replicate an aerial survey and requires some interpretation.
- it is unsuitable for large groups.

## Training Method

### STEP 1–PLACING ANIMALS

Once the map is drawn, identify with the participants two or three species which will be represented on the map and how they will be shown. For example different types of beans, stones or other small objects can be used to represent different animals. The total number of each species in the area should be agreed upon with the participants before the exercise. Ask the participants to place the animals on the map according to their wildlife knowledge, ie elephants in small family herds and singly for older bulls, and buffalo in a few large herds.

### STEP 2–DESIGNING THE SAMPLE SURVEY

With the facilitator's assistance, the group needs to decide how many transects will be flown over the wildlife area. This requires the facilitator to explain the principles of sample counting to the group by using community based examples. The following example taken from the Quota Setting Manual (page 23-24) may be used:

#### How is sample counting used?

Since it is not usually possible to count every animal in a large wildlife area, a smaller area or sample is usually taken in which all the animals are counted. From this we can predict numbers for the whole wildlife area, provided that the animals are spread throughout the whole area evenly. This will give us an estimate of numbers. Most importantly, counts should be applied in a consistent and repeatable manner on each occasion.

For example, let us suppose that our wildlife area is 40 square kilometres and we sample 10 square kilometers, in which there are 6 elephants. Since the sample area is one quarter the size of the whole area, the number of elephant in the whole area is estimated to be 24.

Total area = unshaded area + shaded area

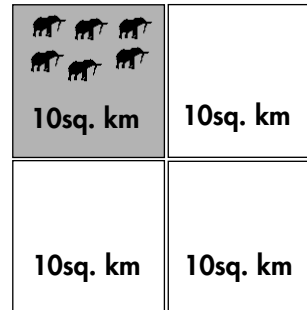
$$40 \text{ sq. km} = 30 \text{ sq. km} + 10 \text{ sq. km}$$

In 10 sq. km the survey counted 6 elephants

Therefore in 1 sq. km there are  $\frac{6}{10}$  elephants

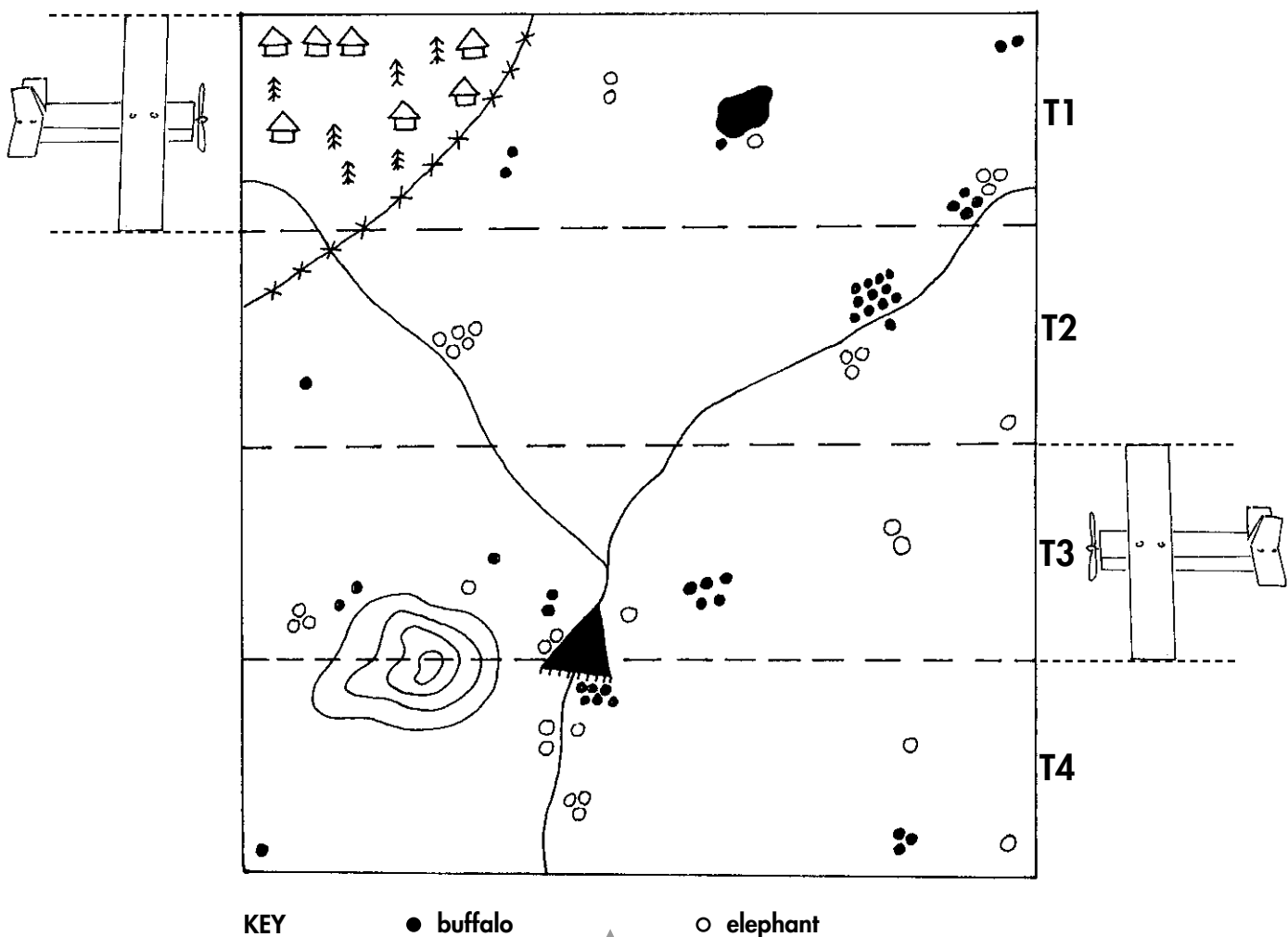
Therefore in 40 sq. km there will be  $\frac{6}{10} \times 40$  elephants

Therefore the population estimate is 24 elephant



The width of each transect should be made equal to the width of the aircrafts wings because this represents the area being sampled. Using the width of the aircrafts wings, the total width of the wildlife area can be calculated. It is then possible to decide how many transects should be flown.

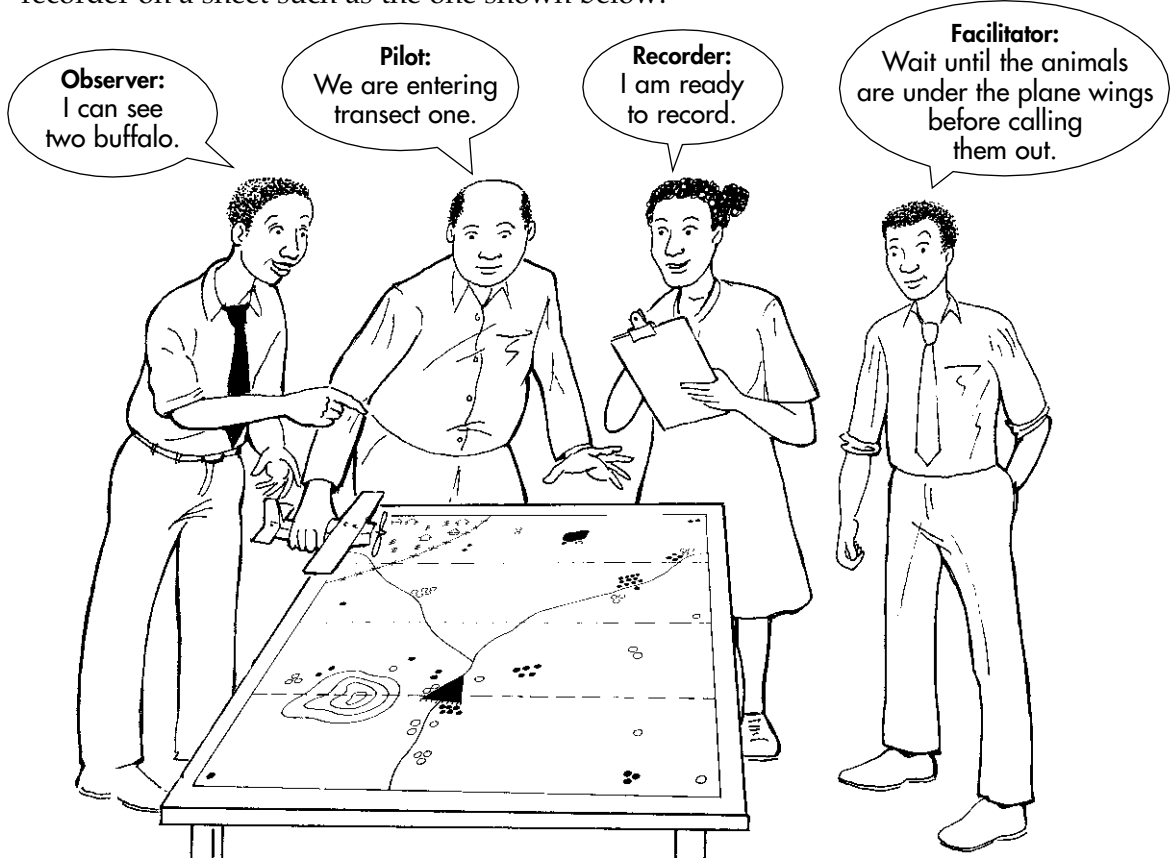
**Facilitator's hint:** The number of transects should be chosen so as to simplify the estimates of total population. For example, if the area is 4 wingspans wide, then count in 2 transects so that the sample counts are multiplied by 2 to calculate the population estimate. Once agreement has been reached on how many transects there should be and where they are to be, they should be ruled onto the map to assist the pilot.





### STEP 3—FLYING THE SURVEY

A pilot for the aircraft, an observer and a recorder should be selected by the participants. The pilot slowly ‘flies’ the aircraft along the pre-defined transects, while the observer counts the number of animals by species which are under the wings of the plane. The observer should shout out the observations so that all the members of the group can follow the count. These numbers should be written down by the recorder on a sheet such as the one shown below:



AERIAL SURVEY GAME								
Recording Sheet								
	T1		T2		T3		T4	
	Elephant	Buffalo	Elephant	Buffalo	Elephant	Buffalo	Elephant	Buffalo
	2	2			2	5		
	1	1			1	2		
	3	4			2	1		
		2			1	1		
					3	1		
<b>Totals</b>	<b>6</b>	<b>9</b>			<b>9</b>	<b>10</b>		

■ Sampled transects

The facilitator needs to ensure that the observer counts only the animals under the wings, which define the transect width; and understand why this is so. The 'animals' should not be moved during this exercise. When the survey has been completed the results need to be compiled so that all the members of the group can see and follow the calculations.

### Examples of the results from the aerial survey game.

#### Species: Elephant

<u>Transect number</u>	<u>Number of animals seen</u>
1	6
3	9

**Total number of animals seen 15**

In two transects **15 elephant** were seen

Therefore in one transect there are  $\frac{15}{2}$  elephant

Therefore in four transects (the whole area) there will be  $\frac{15}{2} \times 4$  elephant

**Therefore the total population estimate is 30 elephant**

#### Species: Buffalo

<u>Transect number</u>	<u>Number of animals seen</u>
1	9
3	10

**Total number of animals seen 19**

In two transects **19 buffalo** were seen

Therefore in one transect there are  $\frac{19}{2}$  buffalo

Therefore in four transects (the whole area) there will be  $\frac{19}{2} \times 4$  buffalo

**Therefore the total population estimate is 38 buffalo**

## STEP 4-THE TOTAL COUNT

When the results of the survey have been calculated, the participants should undertake a total count of the area. This will mean flying over the whole area and counting all the 'animals'. The results should be recorded in a table so that they can be compared with the sample aerial survey results

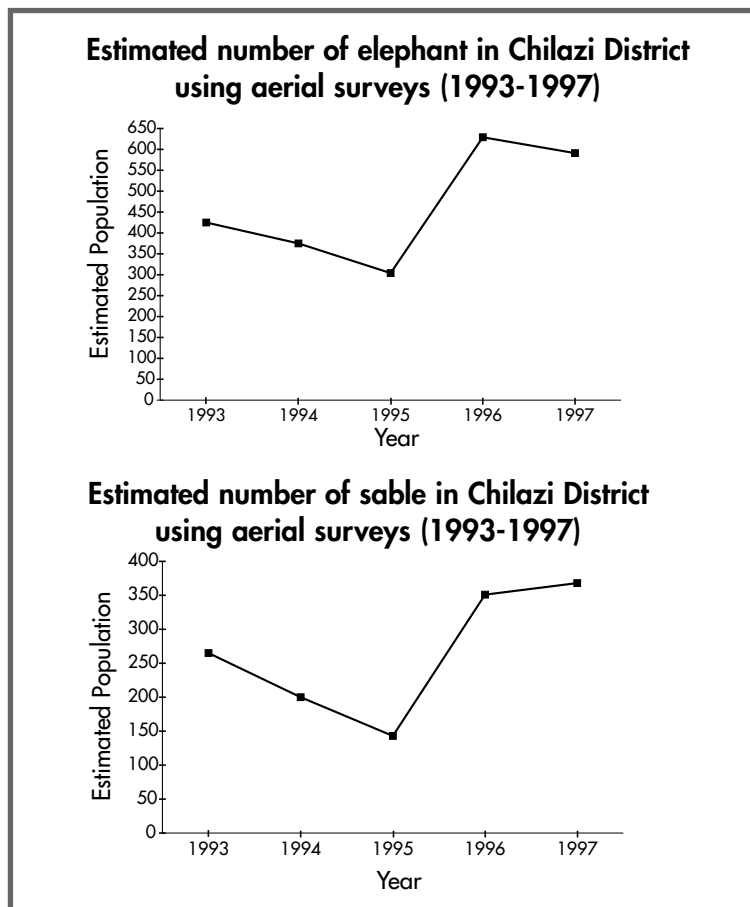
Sample and total counts compared		
Species	Sample Count	Total Count
Elephant	30	32
Buffalo	38	42

If time allows, it is useful to discuss the advantages and disadvantages of sample and total counts. The facilitator should also refer to the Wildlife Management Series Manual (Number 7) 'Counting Wildlife' for the advantages and disadvantages of different methods for counting wildlife.

### STEP 5—USING AERIAL SURVEY DATA

The second stage of the activity is the analysis of the aerial survey data for the district or the quota area. Using this information, participants draw charts for one or more of the key species for the area on a flipchart or brown paper provided by the facilitator. The graphs should be large and have a simple scale (see Section Two, Step Two, pp 4). Only one species should be put on each graph. The reason for this is that graphs showing more than one animal can become confusing and make it difficult for participants in the triangulation exercise to see the trends.

#### Sample graphs produced by participants



#### Summary

On completion of the activity participants should have:

- a better knowledge of sample counts, aerial surveys and some of their problems.
- analysed one or more sets of actual aerial survey data and understood the results.
- prepared a chart of the aerial survey results of one or more key species.

## Activity 1.2 Drawing up a resource abundance matrix

Time required: 30 minutes

### Purpose

The purpose of this activity is to:

- allow participants to visualise their understanding of changes in their environment
- allow participants to discuss the reasons for these changes

### Resources required

- flip chart/brown paper
- counters such as beans, seeds or stones
- marker pens

### Introduction

A resource abundance matrix is a visual representation of the changes in natural resources over time. The horizontal or x-axis usually represents time and the vertical or y-axis represents the number or status of the resource. It can be helpful in analyzing the current status of species (including domestic livestock, human populations, and other resources) within a certain area. The matrix can be used at the district, ward or village level.

This activity is optional and can be used:

- as an additional activity to 1.1 when the number of participants is large
- as 're-enforcement' if there is an indication that participants are experiencing difficulties in interpreting trends on graphs

### Advantages

The activity will:

- present a clear picture of how the participants perceive the numbers of key species to be changing.
- provide a very useful forum for discussing the reasons for the observed changes.

### Disadvantages

- the activity is based on peoples perception rather than systematically collected data.
- often it is difficult to get consistency between the estimates for different years.



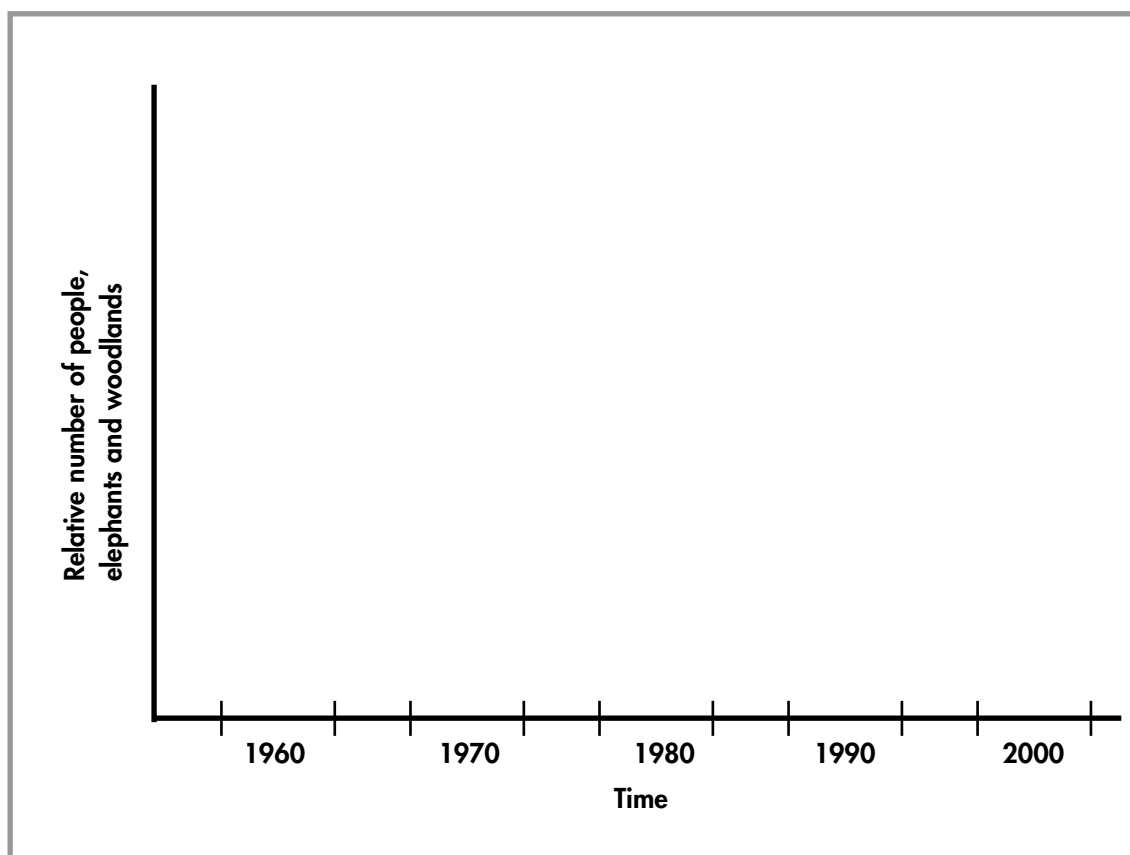
**Facilitator's hint:** It is important to ensure that the participants are using a constant and well defined area for each estimate.

## Training method

### STEP 1—DRAWING THE MATRIX

Decide on which resources are going to be represented in the matrix. Draw the matrix on brown paper or on the ground. Agree with the participants on how far back they would like to show change in the status of these resources. On the horizontal axis, write the years, for example 1960, 1970, 1980, 1990, present (2000) and the future (2010).

#### A sample resource abundance matrix



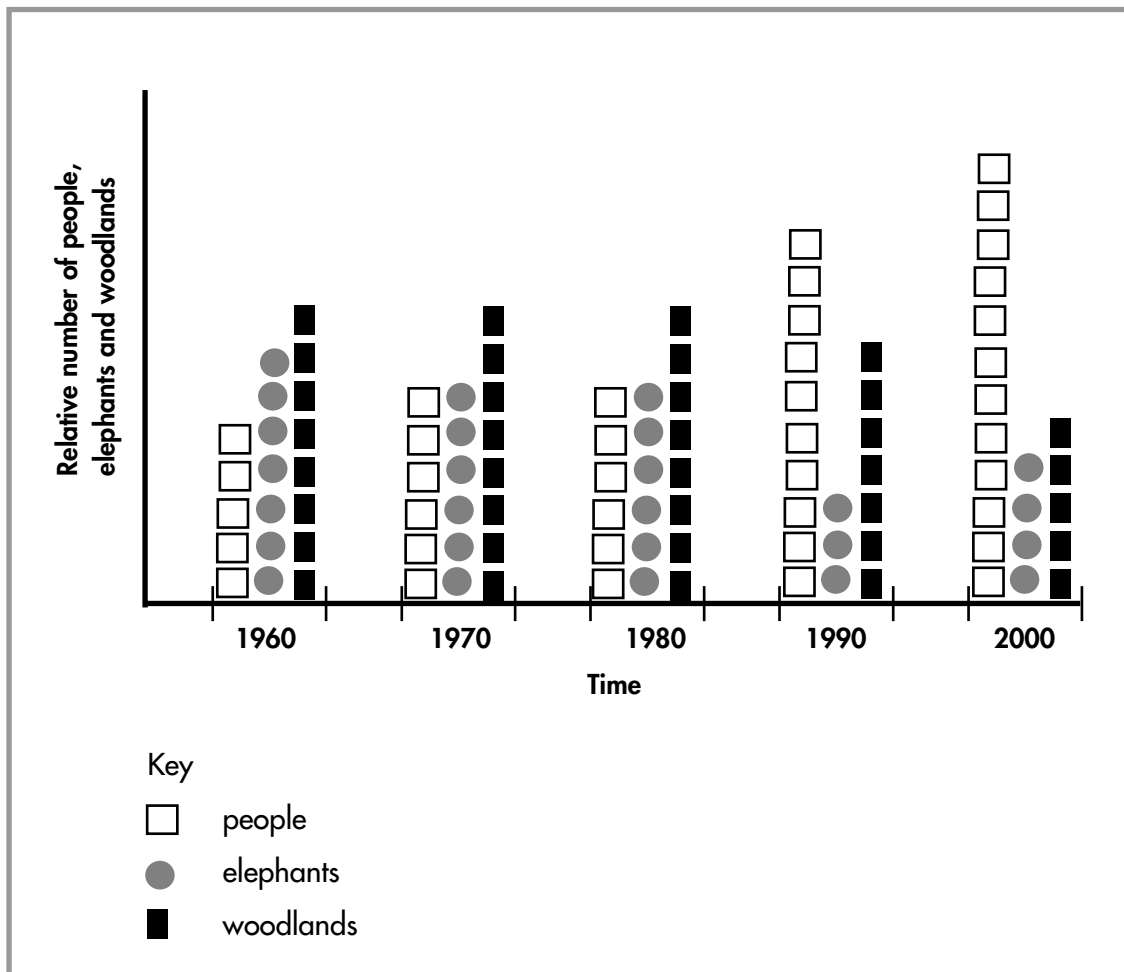
### STEP 2—COMPLETING THE MATRIX

Provide counters such as beans, seeds or stones with which to visualise the status and changes of the chosen species or resources over time. The logic of the matrix is that fewer counters mean lower numbers or availability of the resource. Ask participants to use a scale of 0-20 beans to represent the availability or status of the resource for each time period, with 20 as the maximum. Each time period should be completed before moving onto the next time period.



**Facilitator's hint:** Remind participants to be consistent when deciding on the number of counters. For example: 20 beans are used to represent the number of animals which were believed to have been present in 1970, and 10 represent the number present in 1980. This means that there are only half the number of animals in 1980 compared with 1970.

**A sample resource abundance matrix showing the relative numbers of people, elephants and woodlands in Chilazi District**



### STEP 3—RECORDING THE MATRIX

When the matrix has been completed, it can be recorded on flipchart paper, or the number of beans can be counted in each cell and the total written in. Record the names of the participants and the date, on the matrix for reference purposes.

### Summary

An important part of the activity is the discussion of the changes and trends represented by the matrices. For example, participants may find it interesting to draw up a matrix showing the trends in human and domestic animals in their area and to compare this with the matrix for wildlife populations. This comparison often livens up the discussion as it shows the relationship between human population increase and the decrease in wildlife numbers due to settlement and the loss of wildlife habitat. Conversely the adoption of CAMPFIRE might have resulted in an increase in certain wildlife species.



## TOPIC 2: USE OF THE QUOTA

### Activity 2.1 Plotting the location of the offtake

Time required: 30-40 minutes

#### Purpose

The purpose of this activity is to:

- assist participants to identify key wildlife habitats within the hunting area.
- assist participants understanding of the financial value of different species.
- assist the participants understanding of how wildlife revenue is being allocated.

#### Resources required

- Ordinance survey map of the hunting area.
- Or a sketch map of the hunting area.
- Clear plastic sheeting (for covering the ordinance survey maps).
- Brown paper, glue, marker pens.
- Hunt return forms showing the location of animals hunted.

#### Introduction

This activity shows participants where different species have been shot by the safari operator within a wildlife area. This is important information because it affects:

- the allocation of revenue earned from sport hunting.
- landuse planning.
- the zonation of wildlife utilisation activities like sport hunting and tourism.

The activity can be done in two different ways:

- Using ordinance survey maps from the Surveyor General and plotting the actual kill sites on the clear plastic covering the maps using the grid references from the hunt return forms.
- or
- Using a sketch map of the wildlife area, which shows the ward boundaries and key habitats and identifying the areas in which the animals have been killed or hunted.

Alternatively, there is no reason why a combination of the two options cannot be used.

#### Advantages

The maps will:

- indicate key hunting areas within the wildlife areas.
- show the relationship between areas of human settlement and areas of wildlife habitat.

#### Disadvantages

- if there is a lot of data, it may become a lengthy and boring exercise.
- if actual grid references and ordinance survey maps are used the exercise is restricted to people with map reading skills.
- only small numbers can participate at any one time.

## Training method

### STEP 1—PREPARING DATA

Before the workshop, collect information on the location of the kill sites for one or two years using the hunt return forms submitted to the district by the safari operator. Then use the information to make handouts or flipcharts for use by the participants.

### STEP 2A—PLOTING THE DATA

Decide what each group is going to plot on their maps. The groups can be divided by years or species (see Table Two, page 8).


A correctly completed hunt return form gives the grid reference of where each animal was killed. If the participants are working from a prepared handout, it should give the following information:

- The animal killed (e.g. elephant).
- The grid reference (e.g. ZP017122.)
- The Ward/VIDCO name (e.g. Nenyunga).
- The price paid by the safari operator to the RDC for the animal (e.g. US\$9,000).

Alternatively participants can extract the required information directly from the hunt return forms submitted by the safari operator.

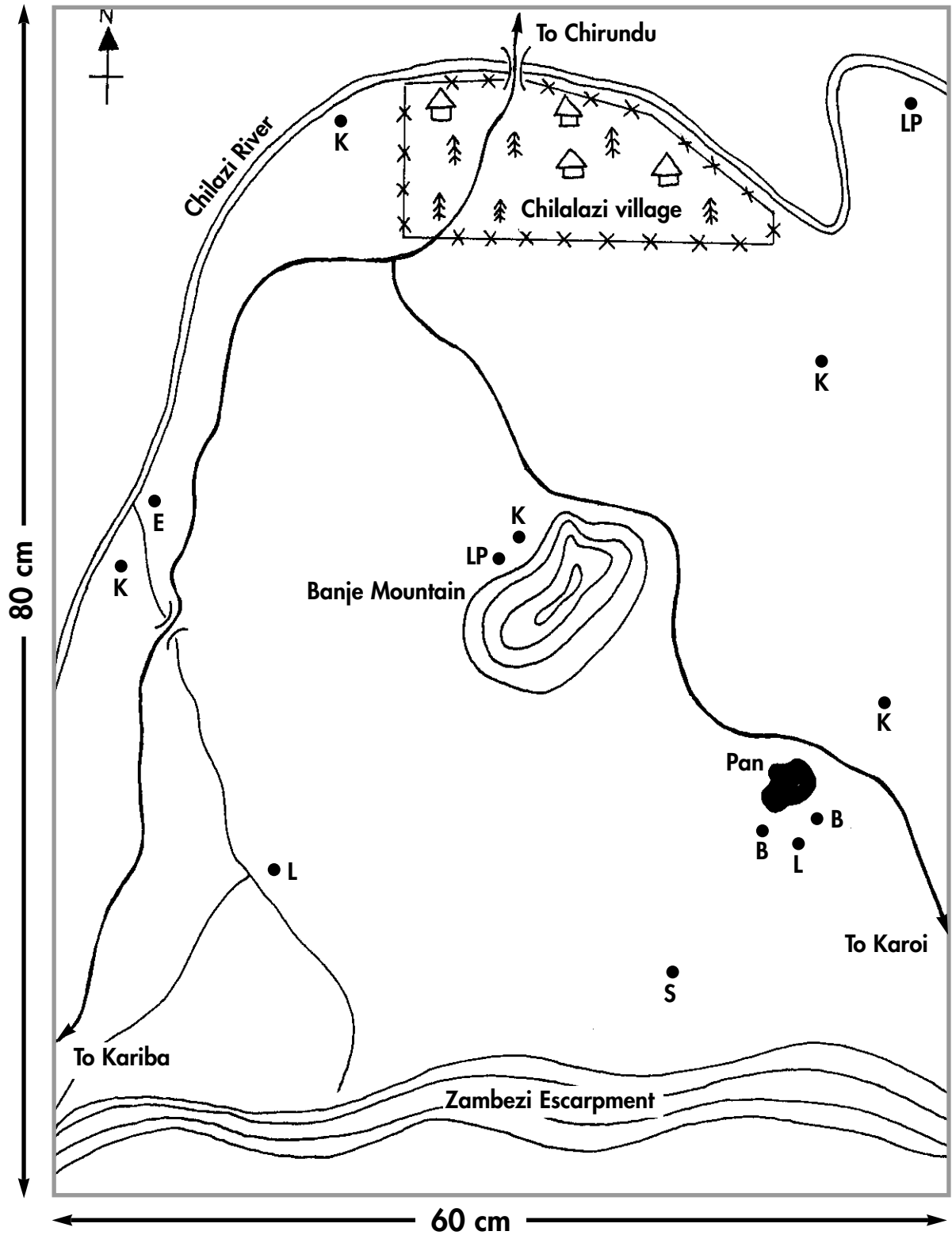
If ordinance survey maps are being used, then clear plastic can be placed over the map and the location data and other key reference points plotted onto the plastic. Consecutive years can be plotted on separate sheets of plastic using a different colour for each year. These can be overlaid to show key wildlife areas and compared to show any changes that might have occurred.

If a sketch map is used then the trainer will need to ask each group in turn to identify where the animals were killed and then to mark the sites on the sketch map. Participants will often give a local name for a site. This can be reviewed and endorsed by the group before being marked on the sketch map. If possible, the locations should be cross referenced with an ordinance survey map to improve the accuracy of the activity.

 **Facilitator hints:** The safari operator can assist by facilitating this exercise and leading the discussion as to WHY animals are being hunted in given locations.

Before the activity, agree with the participants which colours and symbols should be used; otherwise the maps can easily become confusing and unusable.

A sketch map showing the location of species shot in Ward One, Chilazi District (1998).



**Key**

- |              |              |
|--------------|--------------|
| B = buffalo  | L = lion     |
| E = elephant | LP = leopard |
| K = kudu     | S = Sable    |

Scale: 1cm = 1km

## STEP 2B—INCOME BY WARD

A slight modification to this activity is to ask each group to calculate the value of the animals shot by ward. These figures should then be compared with the actual revenue received by the ward from the Rural District Council. This raises issues of how the money is distributed between wards and what proportion of the total revenue the rural district council is disbursing.

<b>Table Three: Species shot, revenue earned by Chilazi RDC and revenue devolved to Wards One and Three</b>				
<b>Species</b>	<b>Numbers shot in Ward One</b>	<b>Trophy fee paid to RDC</b>	<b>Revenue received by RDC</b>	<b>Revenue received by Ward One</b>
<b>Elephant</b>	1	\$9,000	\$9,000	\$4,860
<b>Buffalo</b>	2	\$1,500	\$3,000	\$1,620
<b>Sable</b>	1	\$1,500	\$1,500	\$810
<b>Eland</b>	0	\$700	\$0	\$0
<b>Lion(m)</b>	2	\$2,500	\$5,000	\$2,700
<b>Kudu</b>	5	\$450	\$2,250	\$1,215
<b>Leopard</b>	2	\$1,600	\$3,200	\$1,728
			<b>\$23,950</b>	<b>\$12,933</b>

<b>Species</b>	<b>Numbers shot in Ward Three</b>	<b>Trophy fee paid to RDC</b>	<b>Revenue received by RDC</b>	<b>Revenue received by Ward Three</b>
<b>Elephant</b>	0	\$9,000	\$0	\$0
<b>Buffalo</b>	4	\$1,500	\$6,000	\$3,240
<b>Sable</b>	1	\$1,500	\$1,500	\$810
<b>Eland</b>	2	\$700	\$1,400	\$756
<b>Lion(m)</b>	0	\$2,500	\$0	\$0
<b>Kudu</b>	1	\$450	\$450	\$243
<b>Leopard</b>	3	\$1,600	\$4,800	\$2,592
			<b>\$14,150</b>	<b>\$7,641</b>

## STEP 3—DISCUSSING THE DATA

While the discussion does not feed directly into the participatory quota setting process, it does raise important issues about where the hunting is taking place, where hunting might take place, the financial value of different species and the distribution of hunting revenue by the rural district council.

### Summary

At the end of the activity, the participants will have improved their understanding of:

- where wildlife is found.
- where and why the safari operator is hunting.
- the financial value of different species.
- how the revenue earned by wildlife is distributed.

## Activity 2.2 Examining the use of the quota

Time required: 40-50 minutes

### Purpose

The purpose of this activity is to:

- introduce participants to the quota.
- show how the quota has been allocated between sport hunting, problem animal control (PAC) and cropping (if appropriate).
- show the success rate of the safari operator.
- show changes in the use of the quota which have occurred over time.

### Resources required

- Completed hunt return forms for the previous four years.
- Quotas from the previous four years.
- A flip chart.
- Marker pens.

### Introduction

This activity introduces quotas to the participants. It does not need detailed information and provides important trend information for the triangulation activity. If the safari operator is present he can give first hand explanations to questions which arise.

### Advantages

- It provides an opportunity to discuss the quota and how it is being used.
- It illustrates the importance of keeping accurate up-to-date records.

### Disadvantage

- It may become boring if the data used is not restricted to key species and a few years.

### Training method

#### STEP 1—THE QUOTA AND ITS ALLOCATION FOR ONE YEAR

Participants draw-up and complete Table Four on a flip chart. They will use the quota for the current year. The first step is important for stimulating discussion about the quota. The facilitator of the activity should refer to the Quota Setting Manual for discussion about the quota, why it is necessary and how it has been set.

Species	Total quota	Sport hunting	PAC	Cropping
Elephant	12	9	2	1
Buffalo	18	15	0	3
Leopard	4	4	0	0
Impala	22	21	0	1
Sable	3	3	0	0

## STEP 2–THE USE OF THE QUOTA

The second step of the activity is to compare the number of animals used with the quota and its allocations. For this step the hunt return forms or a hunting summary for the appropriate year are required. The same chart can be used and the figure for the number of animals used should be inserted before the quota and separated by an oblique line (see Table Five).

Species	Total quota	Sport hunting	PAC	Cropping
Elephant	12/12	7/9	2/2	1/1
Buffalo	18/18	15/15	0	3/3
Leopard	3/4	3/4	0	0
Impala	16/22	15/21	0	1/1
Sable	1/3	1/3	0	0

**Facilitator’s hint:** If there are four working groups, and four years of data available, then each group can do one year. This will give four years historical data on the use of the quota. If there is time it might be useful to plot graphs of the utilisation of key species (for example elephant, buffalo) over the four years.

## STEP 3–DISCUSSION AND ANALYSIS OF THE USE OF THE QUOTA

It is very important that some discussion is developed around this activity. Participants must question why:

- there were changes in the quota (“why has the number of sable on quota declined?”)
- there were changes in the way the quota was allocated (“why has an elephant been allocated to the cropping quota rather than the sport hunting quota?”)
- the implications for income (“why has the total value of the quota declined over four years?”)

### Summary

At the end of this activity the participants should understand:

- how the previous quotas issued by DNPWLM have been used by the safari operator and the district.
- why the quotas have been used in these ways.
- how the number and species on the quota affects the income earned by the safari operator, the district and the community.



## TOPIC 3: MONITORING AND EVALUATION

### Activity 3.1 Measuring and calculating trophy size

Time required: 30-45 minutes

#### Purpose

The purpose of this activity is to:

- demonstrate how to measure sport hunted trophies and the importance of doing this for quota setting.
- enable participants to calculate and analyse changes in trophy quality for key species over time.
- prepare graphs for Activity 4.1. (Triangulation of data for setting the quota).

#### Resources required

- Horns for kudu, buffalo and one other horned antelope.
- The skin or skull of a leopard or lion.
- A pair of elephant tusks (where possible).
- Steel tape, a scale, steel cable (for measuring horns such as kudu).
- Set of wooden boards or inside and outside calipers.
- Copy of Rowland Ward measurement instructions (see Section Five).
- Pencil, marker pens, wooden metre ruler, hand calculator.
- Notebook and graph paper or flip chart paper with a suitable axis and scale prepared by yourself.
- Hunt return measurements for the species in the area being reviewed over 3-5 years (compiled from the hunt return forms).
- Calculated annual average trophy quality by species.

Ideally a safari operator or professional hunter should be involved in this activity to provide advice.

#### Introduction

This is often a favourite activity for participants at a quota setting workshop. It allows them to handle and examine trophies as well as learn about sport hunting. It should be done at every workshop.

#### Advantages

- It provides practice in measuring trophy quality, determining average trophy sizes and examining trend data and the implication for the quota.
- It allows participants to discuss the 'mystique' of trophy hunting with a professional hunter, and measure trophies.

#### Disadvantages

- The activity requires that at least some members of each group are numerate and understand how to calculate simple averages.



**Facilitator's hint:** This can be a difficult exercise to facilitate in a large workshop. The facilitator should use assistants from within the workshop to help. A good person to use is the safari operator and/or the professional hunter.

## Training Method

### BACKGROUND

This activity must begin with a discussion of the objectives of sport hunting; why people hunt, what they want to hunt and the importance of trophy quality (see Quota Setting Manual). The facilitator should then introduce the participants to trophy measurement techniques as given in Section Five, Appendix Two of this toolbox. This should include a demonstration.

### STEP 1 – COMPARING INDIVIDUAL TROPHY MEASUREMENTS

Number three to five trophies of the selected species (impala, sable, buffalo). Arrange the trophies, by species, on separate tables. Divide the participants into small groups. Each group should select one trophy, which is then measured by all the members of that group. Participants should compare their measurements and discuss how and why the differences might have arisen. The correct method should be agreed on and understood. The measurements can be recorded in a table, if this will assist the discussion.

### STEP 2 – MEASURING A RANGE OF TROPHIES

The next step is for the group to measure and record all the trophies for a given species and calculate the average trophy quality for the sample. These results should be summarised as in the table below.

<b>Trophy number</b>	<b>Impala</b>	<b>Sable</b>	<b>Buffalo</b>
1	22	41	38
2	23	39	37
3	19	40	42
4	15	43	41
5	17	38	42
<b>Average</b>	<b>19.2</b>	<b>40.2</b>	<b>40</b>

Throughout the activity the facilitator should emphasise:

- why trophy quality is a good index of the status of the population of trophy animals.
- the importance of standardising the methods of measurement.
- the importance of accurate measurements.
- who should be making these measurements.
- who should be keeping a record of the measurements.

### STEP 3 – CALCULATING MEAN TROPHY QUALITY VALUES

Provide each group with a set of actual data that has been previously compiled for each species using the information from the hunt return forms. Each group should then calculate the average trophy size by year for the given species. The time series should be as long as possible.



**Facilitator's hint:** You should have previously calculated these average trophy sizes so that you can easily spot mistakes made by the participants

1997 Pamberi District Impala Trophy Quality	
	22 inches
	20 "
	19 "
	23 "
	21 "
	18 "
<b>Total</b>	123
<b>Average</b>	<b>20.5 inches</b>

### STEP 4 – GRAPH TRENDS IN TROPHY QUALITY

Assist each group to graph the average trophy quality by year. It should be either a bar or line graph. The years should be on the horizontal axis and the average trophy size on the vertical axis.

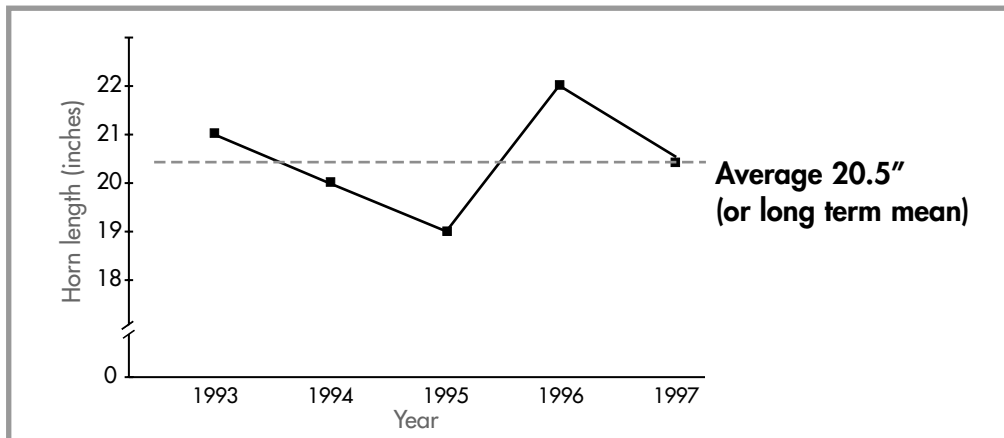


**Facilitator's hints:** Remember the importance of scale when assisting the participants to produce their graphs. All graphs should be clearly labeled.

To make the activity easier and to save time, the facilitator can prepare blank graphs for the participants to plot their results on.

Average Trophy Quality for Impala Pamberi District 1993-1997					
	1993	1994	1995	1996	1997
<b>Impala</b>	<b>21"</b>	<b>20"</b>	<b>19"</b>	<b>22"</b>	<b>20.5"</b>
<b>5 year average</b>	<b>20.5"</b>				

## Impala Trophy Quality Trends Pamberi District 1993-1997



When finished each group should discuss their graph amongst themselves. They should focus on the analysis of the information by asking the question: “what is this graph telling us about the status of this population?”

At the conclusion of the activity, stress that accurate measurements and reliable monitoring of trophy quality are essential to quota setting. With appropriate trophy monitoring and quota setting systems in place, Zimbabwe and CAMPFIRE districts are more likely to maintain an attractive and competitive sport hunting industry.

### Summary

By the end of this activity, participants should be able to:

- measure and monitor trophy quality and understand its importance as a monitoring tool.
- calculate the average trophy quality for at least one key species over a period of five years based on actual records from the area.
- plot the changes in trophy quality on a graph which will be used in Activity 4.1 (Triangulation of data for setting the quota).

## TOPIC 4: TRIANGULATION

### Activity 4.1 Triangulation – comparing different sources of information in order to set a quota

Time required: 3-4 hours

#### Purpose

The purpose of this activity is to:

- enable participants to analyse and agree on changes in the status of wildlife populations.
- enable participants to agree on a quota for the following year.

#### Resources required

- Flip chart and sheets of brown paper.
- Markers.
- Aerial survey estimates and charts (Activity 1.1).
- Matrix showing the existing and previous approved quotas for the district and information about how they were utilised (Activity 2.2).
- Graphs of trophy quality for different species (Activity 3.1).

Most of the information for this activity should already have been prepared by the participants during the previous activities recommended in this toolbox. Extra information for use in the triangulation activity such as illegal hunting (poaching) can also be supplied by participants during the activity.

#### Introduction

This is the central quota setting activity. It should enable participants to bring together all the information that they have discussed and analysed during previous activities. It uses symbols to show the trends in wildlife populations by species. The matrix or 'triangulation chart' is based on the following information:

- The previous quota and the utilisation of the previous quota.
- Aerial survey estimates.
- Trophy quality data.
- Safari operator's opinions.
- Community information.

However, should other sources of data/information be available such as the results of a ground counting exercise, habitat monitoring or other specific community information, this can easily be included as another column. The process of bringing all the information together is called 'triangulation' and needs careful facilitation to ensure that the opinions of all stakeholders are represented. The facilitator must follow the principle that 'all opinions are valid' and no-one stakeholder should be allowed to dominate. Since the activity will be used to develop a new quota, it should involve all the people who have been attending the quota setting workshop. The facilitator should organise this activity so that all the graphs produced by the participants are easily available and can be displayed and seen by all the workshop participants.

## Advantages

- It allows complex information to be simplified through the use of symbols.
- It allows participants to make informed decisions about changes in the quota.

## Disadvantage

- The process is time consuming and should be allocated up to half a day to complete.

## Training method

### STEP 1 – USING A MATRIX

A matrix similar to the one below, using information from the district or lease area, should be drawn on a large sheet of paper. The facilitator will need to explain the triangulation process to the participants. The matrix simply allows the participants to visually represent the agreed trend for each indicator for each species. The process of triangulation then involves working along each row and reaching an overall trend for the status of that species. Participants must then decide whether the agreed trend justifies the maintenance of the current quota, an increase in the current quota or a decrease in the current quota.

### The basic structure of a triangulation matrix

Species	Utilisation /Current Quota	Aerial Survey Trends	Trophy Quality Trends	Safari Operator	Community Information	Proposed Quota	Comment

Key to Table			
↑ : population increasing	↔ : population stable	↓ : population decreasing	X : information not available/ irrelevant

### STEP 2 – COMPLETING THE MATRIX

Participants should consider all the available evidence concerning the changes in the population of each species. This is the point at which the graphs prepared by the groups after each activity are used. For example if the facilitator starts with elephant, then all the visualised data for elephant must be visible to the workshop participants. Each indicator must be considered in turn and agreement on the status of the population reached. Simply, the workshop is aiming to establish whether the population is increasing, decreasing or constant. When consensus on the status of a population of a given species is reached by the workshop participants, it is represented by an arrow in the relevant 'cell' in the matrix. The symbols used are:

- An up arrow (↑) to indicate an increasing population.
- A horizontal arrow (↔) to represent a stable population.
- A down arrow (↓) to indicate a declining population.



The extent of the change can be represented by the number of arrows, so one arrow (↑) represents a small change, two arrows (↑↑) a medium change and three arrows (↑↑↑) a large change.

The facilitator should be aware that a combination of arrows within a single cell is quite possible reflecting the natural uncertainty of the indicator. In the example below the arrows in the elephant aerial survey cell show a stable to increasing population. A stable to decreasing population can be represented in the same way (for example elephant trophy quality). This technique allows participants and the facilitator to visualise the uncertainty which exists in the estimation of many wildlife populations.

### Summary of the key indicators and the proposed 1997 quota for Pamberi District

Species	Utilisation / Current Quota	Aerial Survey Trends	Trophy Quality Trends	Safari Operator	Community Information	Proposed Quota	Comment
Elephant Bulls	19/20	↔↑	↔↓	↔	↑	20	8 PAC
Elephant Cows	2/6	↔↑	X	↔	↑	10	10
Buffalo Bulls	100/110	↔	↔	↔	↓	110	10 PAC or cropping
Buffalo Cows	21/40	↔	X	↔	↓	40	
Lion	4/8	X	X	↓	↔	6	
Lioness	0/2	X	X	↓	↔	2	PAC only
Hyaena	1/8	X	X	↑	X	4	
Crocodile	6/6	X	↔	↑	↔	10	Population seems to be increasing
Sable	7/8	↔	↔	↔	↔	10	
Bushbuck	30/32	X	↔	↔	↔	32	
Waterbuck	28/30	X	X	↓	↑	30	
Impala Male	910	↓↓↓	↓	↓↓	↓↓	160	Trophy only
Impala Female	790	↓↓↓	X	X	↓↓	40	Bait only

Key to Table			
↑ : population increasing	↔ : population stable	↓ : population decreasing	X : information not available/ irrelevant


### STEP 3—AGREEING ON AN OVERALL TREND AND RECOMMENDING A QUOTA

Once all the 'cells' or 'indicators' of species have been completed, the third step is for the participants to work along the row of the matrix to agree on:

- the overall trend given by the indicators.
- a recommended quota.

This process is called 'triangulation.' It starts with the quota and its utilisation in the previous year, for example the facilitator will summarise: "Last year we had 20 elephant on quota and nineteen were hunted." The facilitator then summarises the status of the elephant population as given by the direction of the arrows in the individual cells. For example: "the aerial survey shows a stable to increasing population, the trophy quality is stable to decreasing, the community feels that there has been a slight increase." The final question can be posed to participants: "how does this information affect the current quota—is an increase in the current quota justified, is a decrease in the current quota needed or should it remain the same?" At this point the facilitator needs to allow the participants to debate their proposals and justifications.

The facilitator should only insert a number in the 'proposed quota' cell when there is agreement amongst all the workshop participants.

 **Facilitators hint:** If one species is particularly contentious, one approach is to delay the decision on a final figure and return to the problem when most of the matrix has been successfully agreed upon.

### STEP 4—WORKSHOP DOCUMENTATION

The triangulation matrix and supporting analyses should be used in the workshop report. It is useful to include other supporting material such as a map of the quota area and a brief summary of the key discussion points for each species. This document can be used both as a submission to DNPWLM and as a report for workshop participants.

#### Summary

The completion of the matrix allows the quota for the following year to be set with a wide range of participants. This should mean that the quota received from the DNPWLM should be very similar to the quota recommended by the workshop unless there are very good reasons for it to differ. Furthermore, all the participants should understand the quota and how the decisions were made.

**CHECKLIST OF MATERIALS REQUIRED FOR A QUOTA SETTING WORKSHOP  
(Trainer's checklist)**

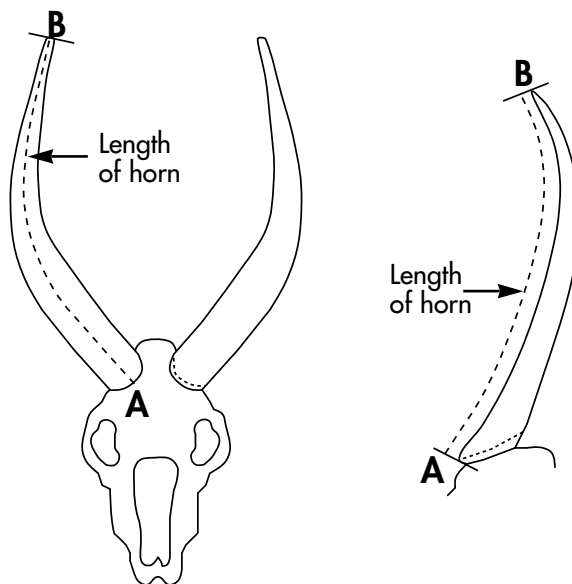
Number needed	Item	Activity	Source
1	Flip chart stand	All	RDC
2	Flipcharts	All	Stationer
5	Sheets of brown paper	1.2; 2.1; 4.1	Stationer
5 of each colour	Marker pens (assorted colours)	All	Stationer
1 packet	Sticky stuff	All	Stationer
4	1m wooden ruler	All	Stationer
1	Pair of scissors	All	Stationer
5	Trophy measuring kits	3.1	SCI
five species	Set of trophies (wide variety)	3.1	Safari operator RDC stores
1 box	Map pins	All	Stationer
large	Plastic sheet	2.1	Stationer
2	Wooden boards 35cm x15cm x2cm	3.1	Hardware
4	30cm rulers	All	Stationer
1 set	Ordinance Survey maps for the wildlife area	2.1	Surveyor General, Harare
1	Model aircraft	1.1	Facilitator to make
4	Quota Setting Manuals	All	RDC/WWF
4	Calculator (4 is ideal number)	1.1; 2.1; 3.1; 4.1	Stationer
40-50	Beans/seeds at least two different colours	1.1; 1.2	Supermarket
	Aerial survey records	1.1	RDC/WWF/DNPWLM
	Trophy quality records	3.1	RDC WWF/ CAMPFIRE Association
	Previous quotas/ utilisation records	2.1; 2.2; 4.1	RDC/DNPWLM/WWF
	Other wildlife data	4.1	RDC

The difference between the two trophy measurement recording systems using waterbuck as an example.

Rowland Ward.....Method 7

1. Measure the length of the longest horn on the front curve from the lowest edge of the base to the tip (A-B).
2. **Example:**  
 Length of left horn = 30.75 inches  
 Length of right horn = 30.75 inches  
 Horns are equal length.

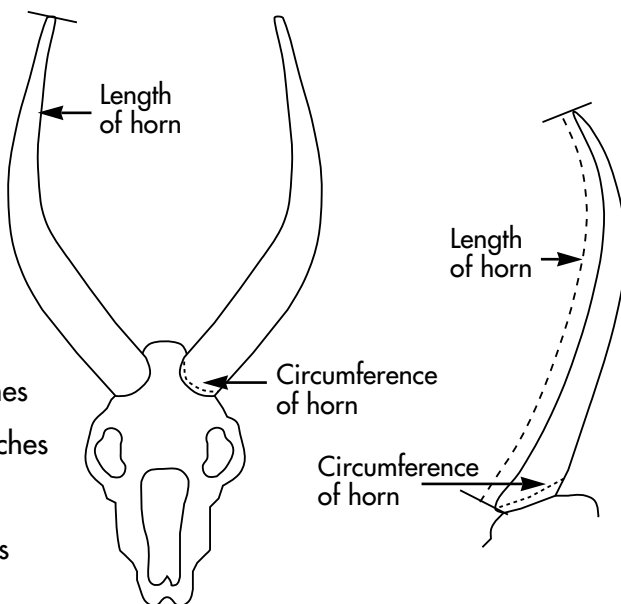
**The Rowland Ward Score = 30.75 inches**



SCI.....Method 1

1. Length of horn:  
 Measure the length of each horn on its front surface.
2. Circumference of horn:  
 Measure the circumference of each horn at the base.
3. Total Score:  
 Total all measurements.
4. **Example:**  
 Length of left horn = 30.75 inches  
 Length of right horn = 30.75 inches  
 Base of left horn = 8.75 inches  
 Base of right horn = 8.75 inches

**The SCI Total Score = 79 inches**



## INSTRUCTIONS FOR TAKING AND RECORDING TROPHY MEASUREMENTS UNDER THE ROWLAND WARD AND SCI SYSTEMS

### Introduction

The abbreviated instructions for taking and recording trophy measurements have been included in this toolbox for two reasons:

- Because the maintenance and/or improvement of trophy quality is essential to sustainable sport hunting and it is important that the facilitators, trainers and wildlife managers understand how the measurements are taken
- Topic 3; Activity 3.1 is based on participants measuring trophies. In the absence of a professional hunter or a safari operator this appendix can be used as a reference for the activity.

The Rowland Ward System of measurement has been the traditional method of horn and tusk measurement by sport hunters. Over the years successive records have been accumulated and entered into a series of record books, published as Rowland Ward's Record of Big Game. In the late seventies, North American trophy hunters introduced and formalised the Safari Club International Record Book of Trophy Animals (for example: SCI 1978 and 1980). This measurement system builds upon the original Rowland Ward system. The main difference between the systems is that the Rowland Ward System uses a single measurement while the Safari Club International System is based on a total score derived from more than one measurement. An example for waterbuck is given on page 34.

It is crucially important that trainers, facilitators and wildlife managers know which measurement system and which units (metric or imperial) have been used. It is vital to be consistent. The CAMPFIRE Hunt Return Form clearly requests safari operators and professional hunters to use the ROWLAND WARD System.

### Rowland Ward General Instructions for Taking and Recording Measurements

#### Background

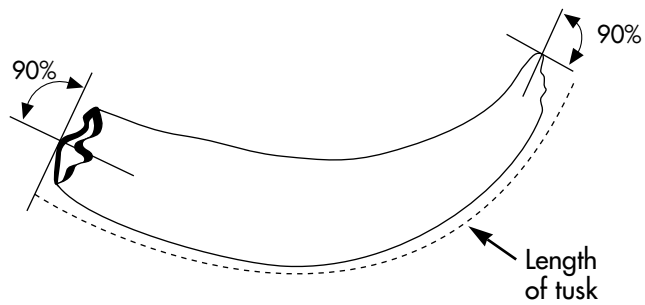
1. All measurements must be taken with a steel tape or official steel cable approved by Rowland Ward Publications.
2. Measurements may be taken either in centimeters or inches, and weights may be recorded either in kilograms or in pounds. When using centimeters, record to one decimal place, except:
  - i. in the case of skull measurements of carnivores which should be taken to two decimal places.
  - ii. field measurements of crocodilians should be taken to the nearest centimeter.
  - iii. Weight of ivory should be taken to the nearest half-kilogram or to the nearest pound depending on what units are being used.
3. Measurements taken in inches or centimeters and weights taken in pounds or kilograms are equally acceptable. Conversion of measurements or weights will be made in accordance with a standard conversion table.
4. Standard conversion tables are given in Appendix III.

## Trophy measurement methods

The following section describes the methods which are applicable to southern African species only. However the reference numbers refer to the world-wide Rowland Ward measuring and recording system.

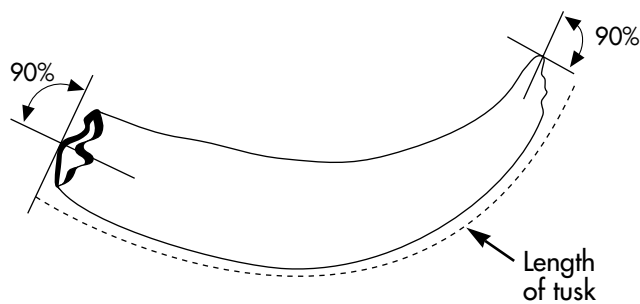
### Method 5: For bushpig and hippopotamus

1. Measure the length of the two lower tusks on the outer curve
2. Record and rank on the basis of the length of the longest tusk.



### Method 6: Warthog

1. Measure the length of the longest upper tusk on the outer curve.
2. Record and rank on the basis of the longest tusk.

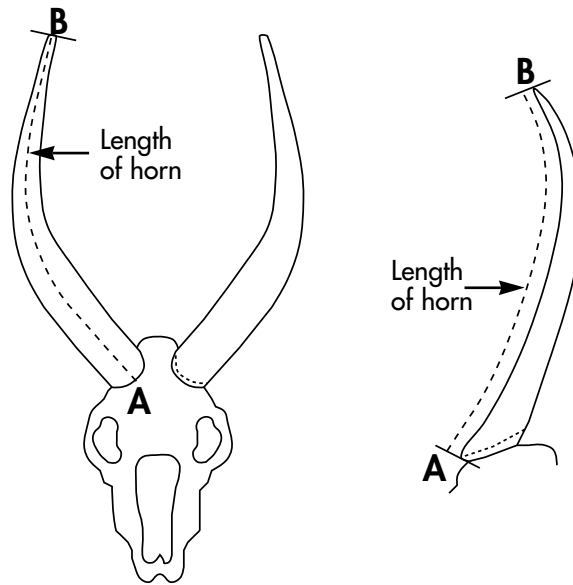




### Method 7: For species with unbranched and uncurled horns

For example: sable, roan, waterbuck, tsessebe, reedbuck, impala, klipspringer, duiker, steenbok, grysbok and suni.

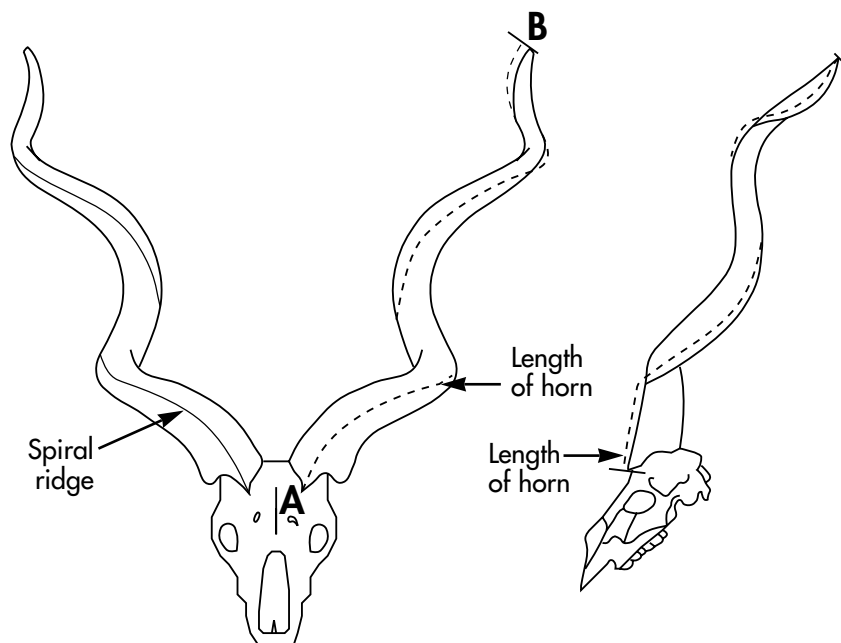
1. Measure the length of each horn on the front curve from the lowest edge of the base to the tip (A-B).
2. Record and rank on the basis of the longest horn.



### Method 8: For spiral-horned antelope

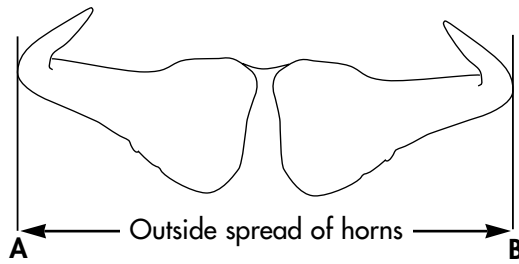
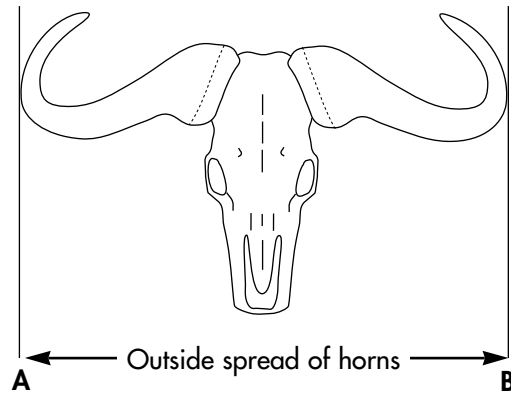
For example: kudu, bushbuck, eland, sitatunga and nyala.

1. Measure the length of each horn around the spiral, keeping the tape on top of the spiral ridge, starting at the lowest point at the front of the base and proceeding to the tip (A-B).
4. Record and rank on the basis of the longest horn.



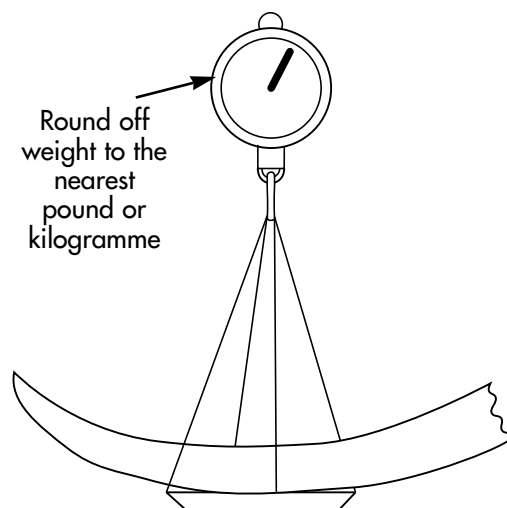
### Method 12: For buffalo and wildebeeste

1. Measure the greatest outside spread of the horns at right angles to the axis of the skull and in a straight line (A-B).
2. Record and rank on the basis of this measurement.



### Method 16: Elephant

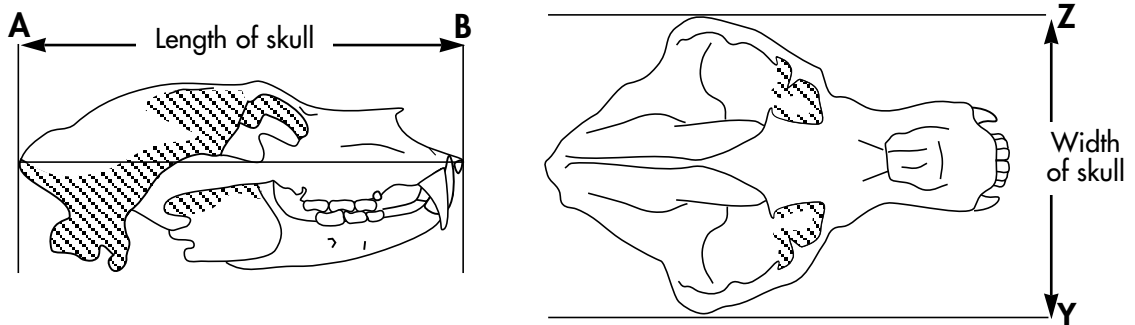
1. When ivory is weighed in pounds, it should be recorded to the nearest pound. When ivory is weighed in kilogrammes it should be recorded to the nearest half kilogramme. Note that the weight of each tusk is to be recorded.
2. Record and rank on the basis of the weight of the heavier tusk.



### Method 17: For all carnivores

All measurements should be to the nearest 1/16th of an inch or two decimal places.

1. Measure the length of the skull (A-B).
2. Measure the width of the skull (Z-Y).
3. Record and rank on the total of the sum of measurements 1 and 2.



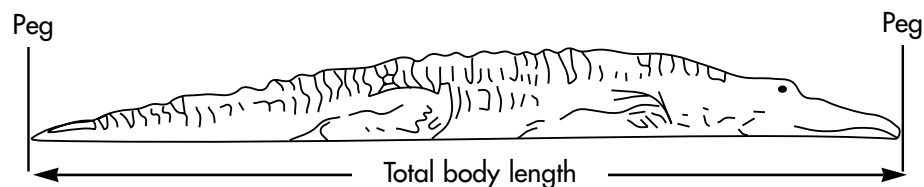
### Method 17b: Alternative to Method 17

This is a field measurement taken before skinning.

1. Measure the body length from the tip of the nose to the tip of the tail. Keep the tape tight and do not push into depressions.
2. Record and rank the body length in feet and inches.

### Method 18: Crocodiles

This is a field measurement, taken before skinning, of the total body length including the length of the tail. Pull the nose and tail to get them into a straight line, then drive in pegs at the end of the nose and tail. Take the measurements between the pegs and not by following the line of the body. Measurements should be taken to the nearest quarter-inch or centimeter.



## SCI (Safari Club International) Trophy Measurement Methods

### Background

Safari Club International suggests that the following tools are required for accurate and precise trophy measurements:

- plastic coated steel cable
- a flexible steel measuring tape



The following are useful but not essential:

- callipers



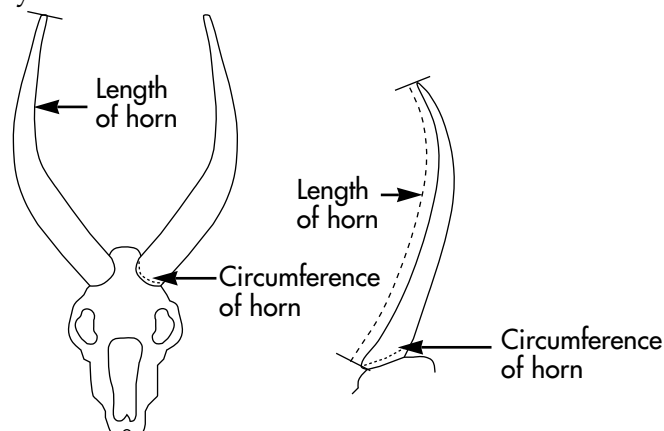
- carpenter's folding extension rule for use in taking the measurement of outside spread of African buffalo horns and common (blue) wildebeest horns.
- a measurer's manual

### Method 1: For most animals with simple horns

For example: sable, roan, waterbuck, tsessebe, reedbuck, impala, klipspringer, duiker, steenbok, gysbok and suni.

1. Length of Horn: Measure the length of each horn in its front surface.
2. Circumference of Horn: Measure the circumference of each horn at the base
3. Total Score: Total all measurements. Record fractions of 1/16th of an inch for duikers and other pygmy antelopes.

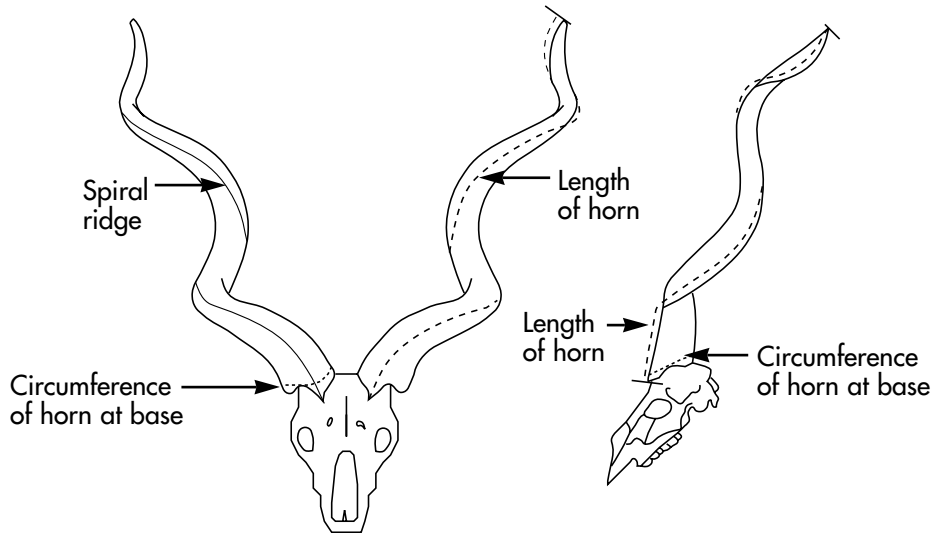
With all reedbucks measure horn length only. Circumference measurements are no longer recorded. These should still be measured without pulp and recorded on the form for reference only.



## Method 2: For spiral-horned animals

For example: eland, kudu, nyala, sitatunga and bushbuck.

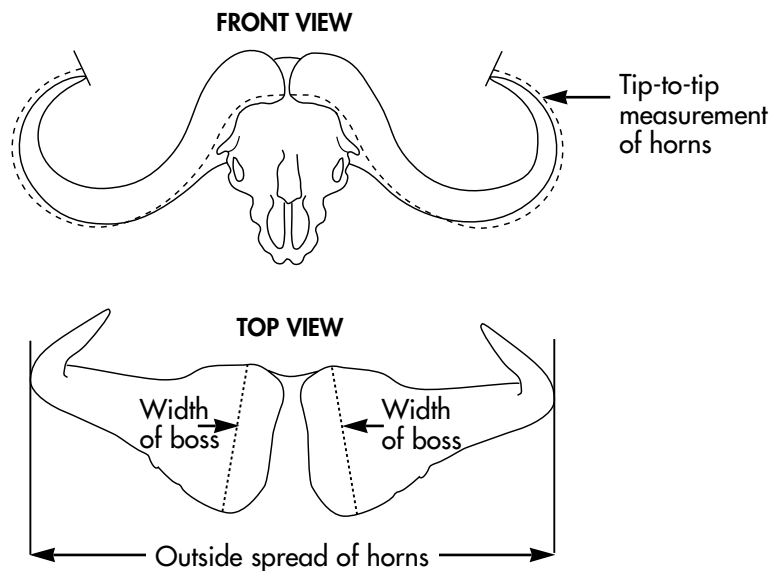
1. Length of Horn: Measure the length of each horn around its spiral twist, from the base to the tip.
2. Circumference of horn: Measure the circumference of each horn at its base, or as close to the base (or hairline as possible).
3. Total Score: Total all measurements. Record fractions in 1/8ths of an inch.



## Method 4: African buffalo

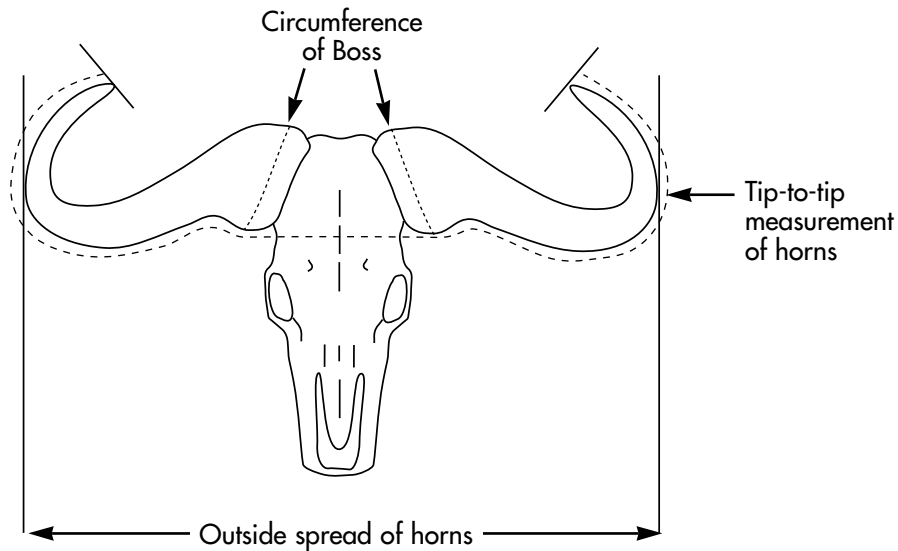
Be careful to measure only hard, black horn that will not boil away. Do not measure green horn, hair, skin or bone. When measuring a mounted head, do not measure fibreglass or other taxidermic material.

1. Length of Horn: Measure the combined lengths of both horns from tip to tip across the forehead.
2. Width of Boss: Measure the surface width of each horn boss at its widest place.
3. Total Score: Total all measurements. Record fractions in 1/8ths of an inch.



### Method 5: Wildebeest

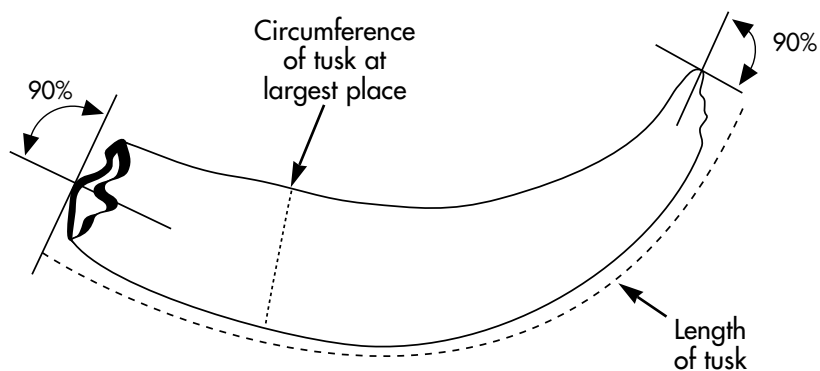
1. Tip to Tip Measurement: Measure the combined lengths of both horns from tip-to-tip across the forehead.
2. Circumference of Boss: Measure the circumference of each horn boss at its largest place.
3. Total Score: Total all measurements. Record fractions in 1/8ths of an inch.



### Method 12: For hippopotamus, bushpig and warthog

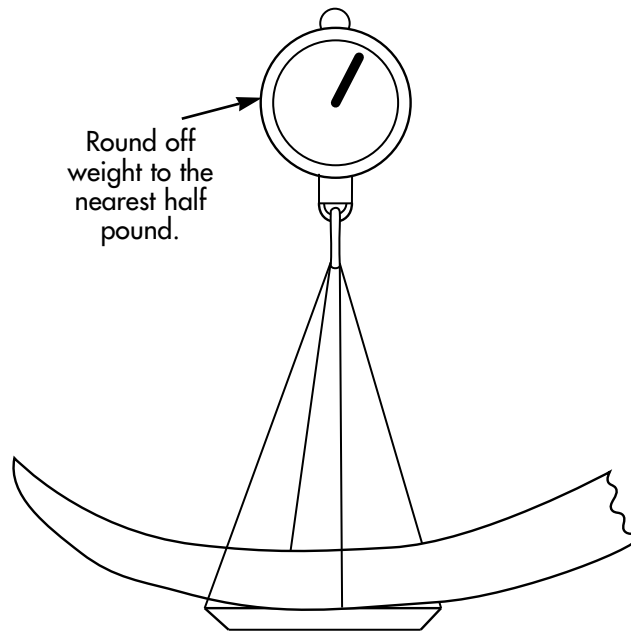
For hippopotamus and bushpig measure the two lower tusks. For warthog measure the upper tusks. When the base of a tusk is filled with plaster or taxidermic material, be careful to measure only the actual tusk.

1. Length of Tusk: Measure the length of each tusk on its outer curve from the farthest point on the base to the tip.
2. Circumference of Tusk: Measure the circumference of each tusk at its largest place, usually the gumline.
3. Total Score: Total all measurements. Record fractions in 1/16ths of an inch.



### Method 14: Elephant

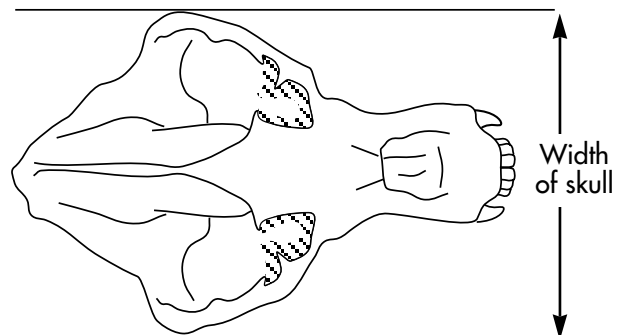
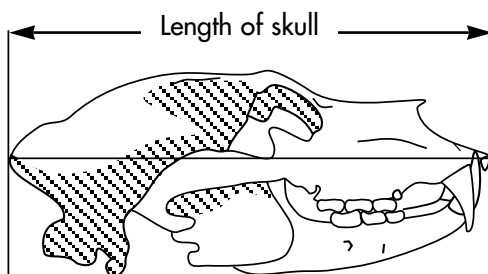
1. Weight of Tusk: Weigh each tusk to the nearest half pound.
2. Total Score: Total the weights. Record to the nearest half pound.



### Method 15: For all carnivores

On damaged skulls, only existing skull material may be measured. Missing skull material is not to be estimated or allowed for. Details of any skull damage must be noted on the entry form.

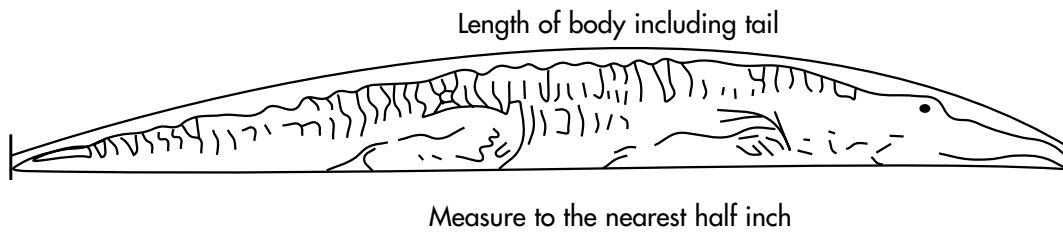
1. Length of Skull: Measure the length of the skull parallel to its longitudinal axis. This measurement may include the lower jaw and teeth if that will increase the measurement.
2. Width of Skull: Measure the width of the skull at a right angle to its longitudinal axis. This measurement is taken across the zygomatic arches, or cheek-bones.
3. Total Score: Total the measurements. Record fractions in 1/16ths of an inch.



## Method 16: Crocodiles

This is a field measurement, taken before skinning, of the total body length including the length of the tail.

1. Length of Body: Measure the body length from the tip of the nose to the tip of the tail. Keep the tape tight and do not push it into depressions.
2. Total Score: The total score is the body length in feet and inches.





## CONVERSION TABLE FOR WEIGHTS AND MEASURES

Length			Weight		
Centimeters		Inches	Kilogrammes		Pounds
2.54	1	0.394	0.454	1	2.205
5.08	2	0.787	0.907	2	4.409
7.62	3	1.181	1.361	3	6.614
10.16	4	1.575	1.814	4	8.819
12.70	5	1.969	2.268	5	11.023
15.24	6	2.362	2.722	6	13.228
17.78	7	2.756	3.175	7	15.432
20.32	8	3.150	3.629	8	17.637
22.86	9	3.543	4.082	9	19.842
25.40	10	3.937	4.536	10	22.046
50.80	20	7.874	9.072	20	44.092
76.20	30	11.811	13.608	30	66.139
101.60	40	15.748	18.144	40	88.185
127.00	50	19.685	22.680	50	110.231
152.40	60	23.622	27.216	60	132.277
177.80	70	27.559	31.752	70	154.324
203.20	80	31.496	36.287	80	176.370
228.60	90	35.433	40.823	90	198.416
254.00	100	39.370	45.359	100	220.462

## FACILITATOR'S NOTES



This toolbox provides facilitators with a set of activities for participatory quota setting. It should be read along with the Quota Setting Manual and the Ward Quota Setting Toolbox.

The WWF Wildlife Management Series provides information and guidance to members of villages, wards and rural district councils involved in the management of CAMPFIRE projects. These booklets are linked to training programmes being undertaken by members of the CAMPFIRE Collaborative Group.

Booklets in the Wildlife Management Series include:

1. Problem Animal Reporting
2. Electric Fencing Projects
3. Marketing Wildlife Leases
4. Managing Safari Hunting
5. Quota Setting Manual  
District Quota Setting Toolbox
6. Maintaining Electric Fences

WWF is a member of the Collaborative Group supporting the CAMPFIRE programme in Zimbabwe and has provided support and training to communities in the establishment of wildlife management systems.