TAWIRI

Tanzania Wildlife Research Institute
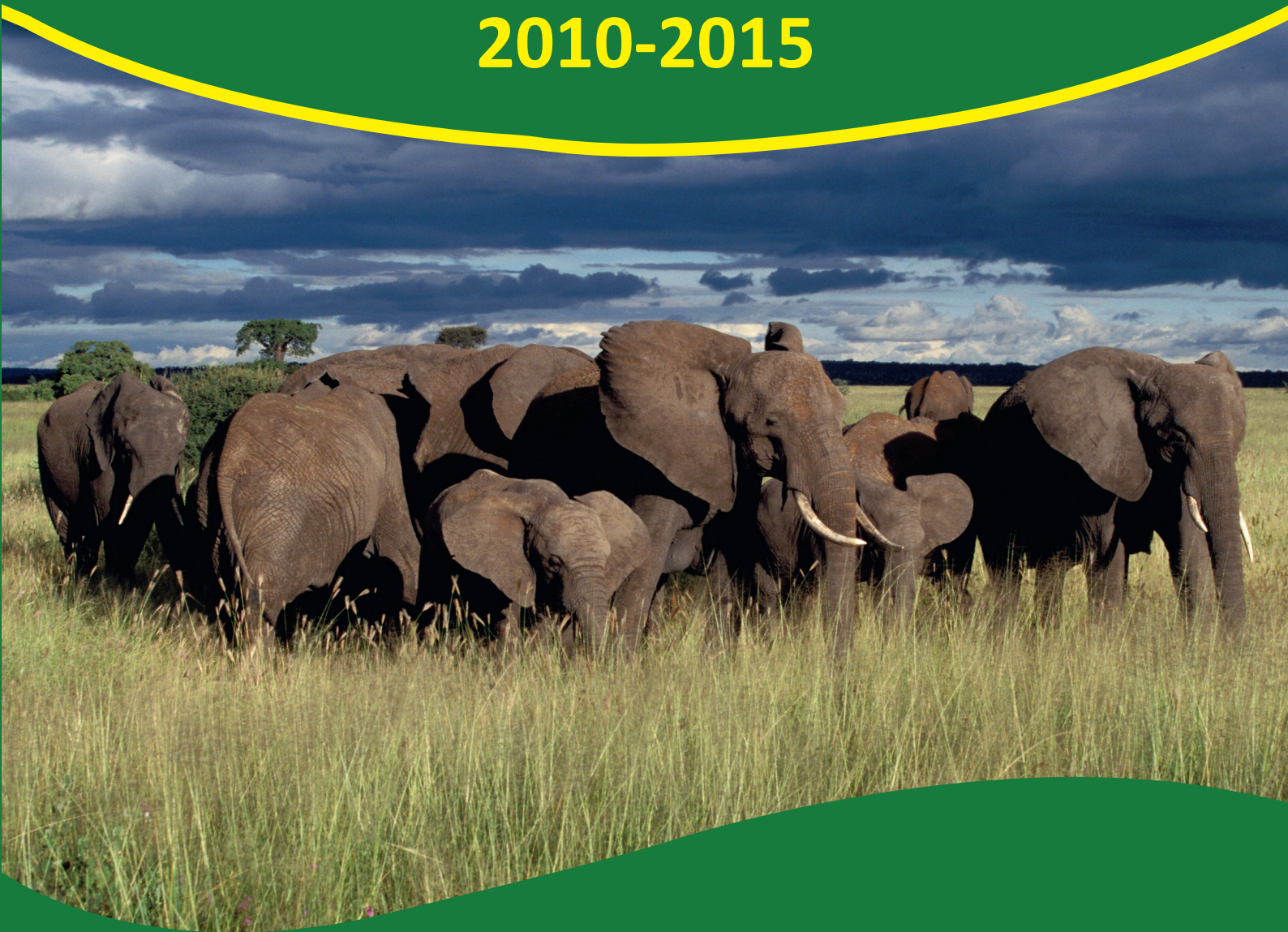
Tanzania Elephant Management Plan

2010-2015

Tanzania Elephant Management Plan

2010-2015

June 2010

ENDORSEMENT

I hereby declare that I endorse the listed activities outlined within this document and call up all stakeholders to support in its implementation.

Signature...

On this 15th day of January 2011

Hon. Ezekiel M. Maige (MP)
MINISTER FOR NATURAL RESOURCES AND TOURISM

Table of Contents

List of Abbreviations and Acronyms

AA	Authorized Association (for WMAs)
APU	Anti-Poaching Unit
AfESG	African Elephant Specialist Group (IUCN/SSC)
AWF	African Wildlife Foundation
APU	Anti Poaching Unit
CBNRM	Community-based Natural Resource Management
CBO	Community-based Organization
CITES	Convention for the International Trade in Endangered Species
CIMU	Conservation Information Monitoring Unit
DC	District Council
DO	District Officer
DGO	District Game Officer
DVO	District Veterinary Officer
DW	Director of Wildlife
ETIS	Elephant Trade Information System
FBD	Forestry and Beekeeping Division
FCF	Friedkin Conservation Fund
FR	Forestry Reserve
FZS	Frankfurt Zoological Society
GCA	Game Controlled Area
GoTz	Government of Tanzania
GPS	Global Positioning System
GR	Game Reserve
HEC	Human-Elephant Conflict
HWC	Human Wildlife Conflict
IUCN	International Union for the Conservation of Nature
KWS	Kenya Wildlife Service
LE	Law Enforcement
LUP	Land Use Planning
MIKE	Monitoring Illegal Killing of Elephants
MMNP	Mahale Mountains National Park
MIST	Management Information System Technology
MNRT	Ministry of Natural Resources and Tourism
MoE	Ministry of Environment
NARCO	National Ranching Company Limited
NCAA	Ngorongoro Conservation Area Authority
NEMC	National Environment Management Council
NGO	Non-Governmental Organization
NP	National Park
PAC	Problem Animal Control
PIKE	Proportion of Illegally Killed Elephants

SOP	Special Operation
SRF	Systematic Reconnaissance Flight (aerial census)
SUA	Sokoine University of Agriculture
TANAPA	Tanzania National Parks
TAWIRI	Tanzania Wildlife Research Institute
TC	Total Count (aerial census)
TEMP	Tanzania Elephant Management Plan
TEP	Tarangire Elephant Project
TNRF	Tanzania Natural Resources Forum
TRA	Tanzania Revenue Authority
TRAFFIC	The Wildlife Trade Monitoring Network
UMNP	Udzungwa Mountains National Park
VIC	Veterinary Information Correspondent
VGS	Village Game Scout
WCA	Wildlife Conservation Act
WCS	Wildlife Conservation Society
WCFT	Wildlife Conservation Foundation of Tanzania
WCST	Wildlife Conservation Society of Tanzania
WD	Wildlife Division
WMA	Wildlife Management Area

Acknowledgements

The Tanzania Wildlife Research Institute (TAWIRI) gratefully acknowledge the financial support from the Government of Tanzania and the following authorities and institutions and wish to thank them for contributing to the making of this valuable document.

THE UNITED REPUBLIC OF TANZANIA (URT)

NGORONGORO CONSERVATION AREA AUTHORITY (NCAA)

TANZANIA NATIONAL PARKS (TANAPA)

WILDLIFE CONSERVATION SOCIETY (WCS)

Vision

To be a world leader in elephant conservation by ensuring populations and their habitats are secured and conserved in harmony with people for the benefit of present and future generations.

Mission

Using the best available scientific, technical and indigenous knowledge, Tanzania will conserve her elephant population and the ecological integrity of elephant habitats, through:

- *Maintaining current protected areas and securing viable corridors and dispersal areas*
- *Reducing human-elephant conflict (HEC) using land use planning and appropriate mitigation methods*
- *Enhancing law enforcement, governance and accountability*
- *Promoting appropriate research, monitoring and information management*
- *Ensuring sustainable use, stakeholder involvement and equitable benefit sharing*

Goal

By 2015, Tanzania will have a naturally functioning elephant population through secured protected areas, corridors, dispersal areas and habitats, reduced human-elephant conflict, enhanced benefit sharing, effective law enforcement, and improved knowledge and its application.

Declaration

We, the participants of this national elephant management planning workshop, on this 28th day of May 2010, commit ourselves and our institutions to work together to achieve the vision, mission, goal and objectives of the Tanzanian National Elephant Management Plan of 2010-2015.

We beseech the conservation authorities mandated with the implementation of the plan to provide due guidance and coordination required for success.

Introduction

Background to the Tanzania Elephant Management Plan 2010-2015

Tanzania is home to the second largest population of African Elephants (*Loxodonta africana*) on the continent, second only to Botswana. At the heart of this hugely impressive record of elephant conservation is Tanzania's protected area system, the country's wildlife protected area's network covers about 36% of the total land area of which about 4.38% is National Parks, 0.88% is Ngorongoro Conservation Area, 12.98% is Game Reserves and 5.54% is Game Controlled Areas, with a further 12% of the total surface area protected as Forest Reserves (MNRT, 2007). Consequently, Tanzania has 17% of her land area devoted to wildlife conservation in protected areas where no human settlement is allowed (National Parks and Game Reserves) and 18% of its surface area to Protected areas where wildlife co-exist with humans. However, while elephants are found throughout, and depend heavily on many of these protected areas (PAs), they are also found in other important habitats (including corridors and dispersal areas) outside PAs. Indeed, current elephant range is estimated at about 39% of the country's surface area.

The Tanzanian Government, through the Ministry of Natural Resources and Tourism (MNRT) initiated the Tanzania Elephant Management Planning process, based at the TAWIRI Headquarters in Arusha. The project operated from April 2009 to July 2010, culminating to this document. Several kinds of data on current population status, demographic patterns, threats to elephants, status of elephant corridors, and levels of human elephant conflict in Tanzania were collected and compiled, and these are summarised in Sections 1.1-1.5 of this Plan.

Concurrently, a national consultative process was undertaken with stakeholders around the country to formulate ideas, strategies and actions for elephant conservation in Tanzania over the next five years. Included were a series of four "zonal workshops" in the north, south, east and western parts of the country between March and May 2010. An overview is provided in Section 1.6 of this document, and a summarized text of the proceedings is included in Appendix II.

Two other important consultative meetings relevant to the process included a workshop of senior national and regional law enforcement officials from the Wildlife Division, TANAPA, NCAA, the Ministry of Home Affairs and the private hunting companies/anti-poaching sector, chaired by the Director-General of TAWIRI in May 2010; and the first meeting of the new National Human Elephant Conflict Forum held in Dar es Salaam in April 2010, attended by relevant government agencies, researchers and NGOs**.**

Finally, a national TEMP workshop took place in Arusha from 25-28 May 2010, officiated by the Director of Wildlife and involving 69 key representative stakeholders and experts in elephant conservation and management from within and outside of Tanzania (Appendix III). These participants were tasked with formulating a 5-year Elephant Management Plan for Tanzania, based on the best available scientific data, technical expertise and advice, recognised sound practice in elephant conservation and management, and incorporating ideas reported from previous Zonal workshops. The Strategic Objectives and associated Log Frames presented here, in Section 2, are based on the final outputs of this intensive national workshop.

Managing Tanzania's elephants: present and future challenges

The last National Elephant Management Plan for Tanzania was produced in 2001. In 2010, with a rapidly growing national human population that has doubled since 1984 and is putting increasing

pressure on Tanzania's exceptionally rich natural resource base, the country faces serious challenges to conserve its elephants and to ensure equitable benefits from these elephants and other wildlife for its people. Human-elephant conflict – the loss of human life and crops to elephants in farmed areas adjacent to elephant range – while not as serious as is often perceived, is an ongoing and widespread problem. It needs to be urgently addressed through coordinated programmes throughout the country to reduce conflict and assist farmers by means of land use planning and training in effective methods to deter elephants from entering fields.

A major threat to the health and integrity of Tanzania's elephant populations is the increasing loss of connectivity between core wildlife habitat areas. All over the country, existing corridors are becoming blocked by expanding agriculture, human settlements and livestock grazing, and destruction of habitats for logging and charcoal production. Confining elephants to 'islands' of suitable habitat in a 'sea' of other non-suitable land use can have negative effects on the remaining habitat and its ecosystem services (e.g. pollination, water), changes the ecology and behaviour of elephants, increases conflict with people, and will render many of Tanzania's elephant populations unviable over the long-term.

A third major issue which is being continually addressed, but which will also benefit from the strategy outlined in this Plan, is how to increase protection for Tanzania's elephant populations. The last three to five years have seen an upsurge in elephant poaching across eastern and central Africa, causing the most significant illegal losses of elephants since the continent-wide poaching crisis of the 1980s. This recent upsurge, driven by increasing demand for ivory in Asia, has also affected some parts of Tanzania. Nationally, according to the latest TAWIRI 2009 national census results, the elephant population is in decline for the first time since 1989 (see Figure 4, pg. 10).

However, following 17 years of continued recovery (1989-2006) the majority of Tanzania's African elephant populations are viable. Results of ground-based demographic surveys during 2009-10 confirm that the majority of populations have relatively healthy demographic structures. Some populations are still increasing and others will stabilise if the current, mostly localised, poaching can be minimised.

Overall, workshop participants agreed that elephant conservation should be the primary objective and driver of the management plan. Sound conservation policies will in turn allow for sustainable utilization, which will accrue and be enhanced through the Strategic Objective outlined in Section 2.4.

The previous two National Elephant Management Strategies (of 1994 and 2001) set preferred national upper limits on the number of elephants (120,000 and 100,600 respectively). For the current Management Plan, it was agreed that upper national limits were no longer appropriate. In scientific terms, the concept has been widely discredited (e.g. South Africa's Scientific Assessment of Elephant Management, 2008). This is because (i) the ecological data required to calculate carrying capacity of different sites are deficient, (ii) ecological circumstances and management objectives can vary greatly across the country, and (iii) more research is needed into the potential effects on elephant range and resource availability of current, ongoing climate change. Moreover, it is recognised that in Tanzania, certain populations (e.g. Selous, Ugalla) are currently stable or decreasing while others are increasing and appear to be at levels below the carrying capacity of their ecosystems, according to available data on population densities prior to the widespread reductions in numbers in the 1970s and 1980s. It is therefore not justifiable presently to set upper elephant density limits, though sound research and monitoring of populations over the next five years and beyond will be vital to future reviews of this policy (see Section 2.6).

A total of nine key strategic objectives were identified for this Management Plan, and complete log frames outlining targets, actions, timelines and actors for each of these objectives are included in the Plan, Section 2.

TEMP Strategic Objectives 2010-15

1. Human-elephant Conflict (HEC)
2. Elephant Corridors
3. Law Enforcement
4. Benefits/Sustainable Utilization
5. Management of Ivory Stockpiles
6. Research and Monitoring
7. Elephant Health and Welfare
8. Cross-border Cooperation
9. Elephant Information Management

1 Elephants in Tanzania: Current Status

1.1 Distribution and Range

The African Elephant Specialist Group elephant database (AED) shows that elephant range in Tanzania has decreased from 458,315km^2 in 1998 (49% of country area) to approximately 370,000 km^2 (39%) in 2009 (Figure 1). It is unclear how much of this range contraction represents an actual decline in distribution rather than being an artifact of improved knowledge and better information gathering of the AED. However it is clear that many areas that formerly supported elephants, in particular corridors, dispersal areas and buffer zones around PAs are being lost (see Section 1.4), as the increasing human population converts greater areas from elephant-compatible habitat to farmland, which is incompatible with use by elephants.
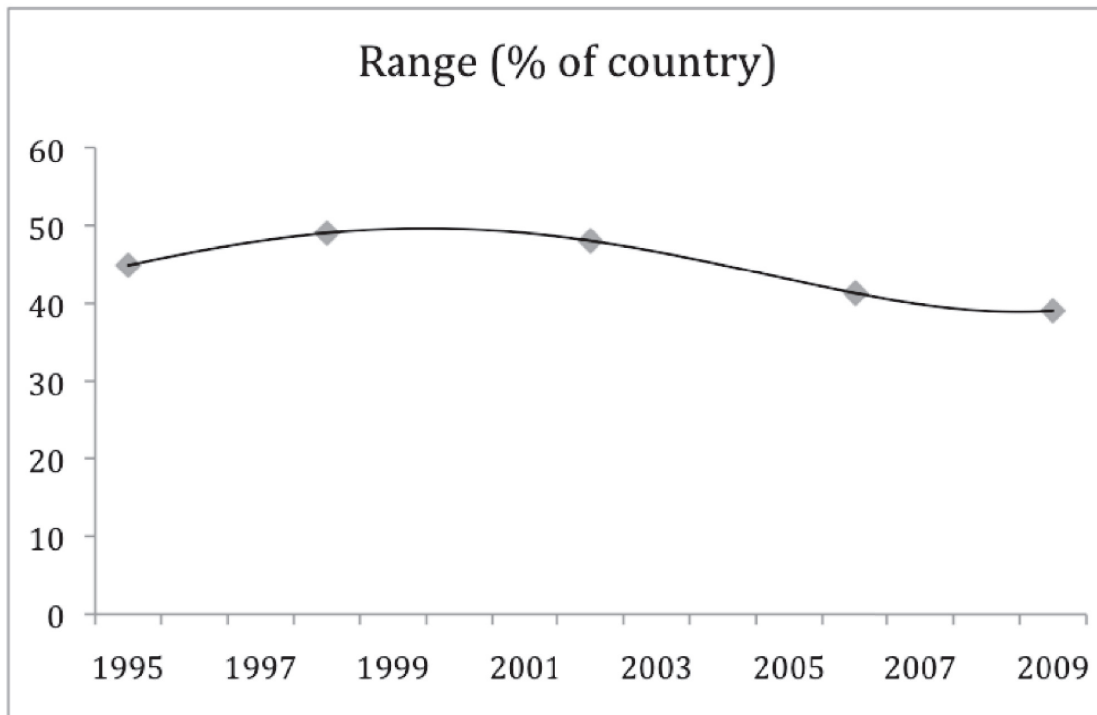
Figure 1. Changes in total elephant range in Tanzania since 1995, expressed as percentage of total country area (945,090 km^2). Current national elephant range is estimated at 370,000 km^2 (39% of the country). Data sources: AED 1995, 1998; AESR 2002, 2007; TAWIRI 2009.

The current, known elephant distribution in Tanzania (Figure 2) uses records from a range of sources submitted to the IUCN African Elephant Specialist Group database for the African Elephant Status report 2007 (Blanc *et al.*, 2007).
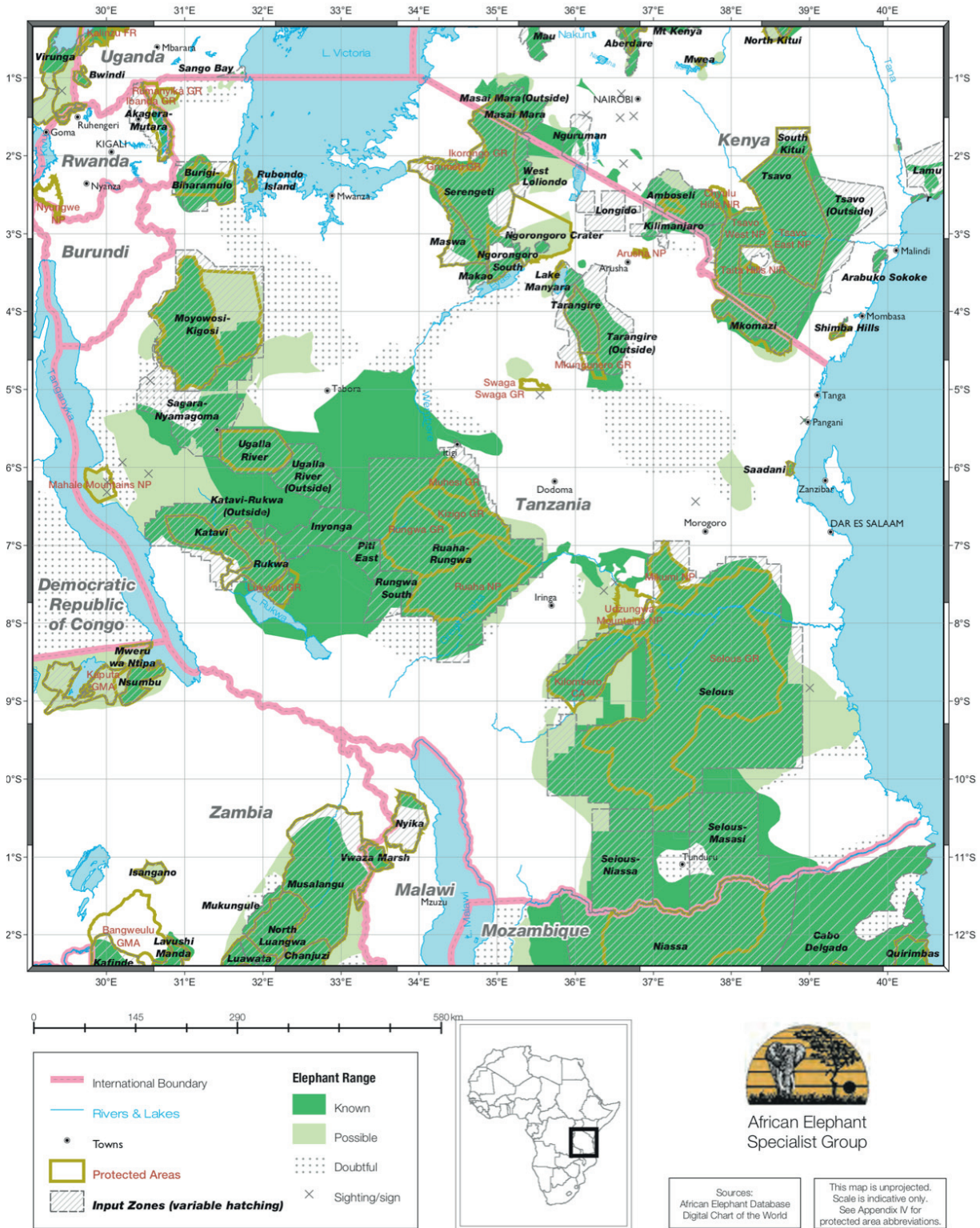
Figure 2. Distribution of elephants in Tanzania in 2007. Map adapted from African Elephant Status Report 2007 (Blanc *et al.*, 2007).

1.2 Abundance

A countrywide aerial census was commissioned by the Wildlife Division and carried out by TAWIRI in 2009 to update the status of elephant populations in Tanzania in 2009. Six ecosystems were surveyed during the dry season from August 27th through October 28th 2009 (Figure 3). Two census techniques were used: Total Count (TC) in the Tarangire-Manyara and Serengeti ecosystems and Systematic Reconnaissance Flights (SRF) in Selous-Mikumi, Ruaha-Rungwa, Katavi-Rukwa and Moyowosi-Kigosi (with Ugalla Game Reserve) ecosystems.

In addition, the most recent surveys or estimates of elephant populations not included in these ecosystems were used to provide a best estimate total for the Tanzanian elephant population (Table 1).
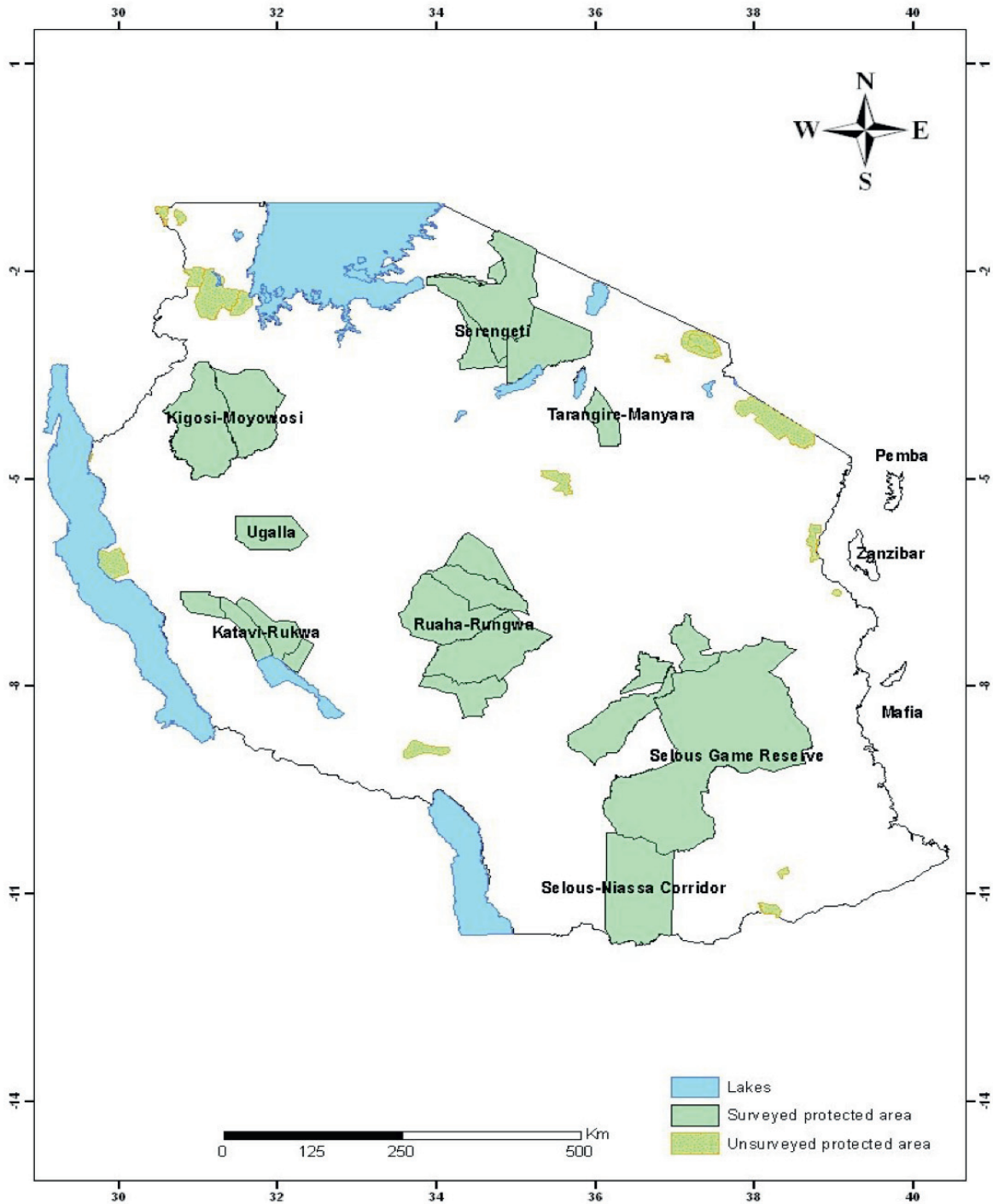
Figure 3: Location of aerial census zones surveyed during the dry season of 2009 and other populations that were not censused in 2009 but for which current estimates are available.

Table 1: Elephant population estimates in Tanzania for 2009 by surveyed area.

Surveyed Area	Estimated Pop'n Size	Standard Error	Size of Surveyed/ Extrapolated area (km²)	Density (individuals/ km²)
Total Count, dry season 2009				
Tarangire-Manyara	2,561	0	12,766	0.2
Serengeti Ecosystem	3,068	0	26,931	0.1
Total (TC)	**5,629**	**0**	**39,697**	
Systematic Reconnaissance Flight, dry season 2009				
Katavi-Rukwa	6,396	1,920	11,876	0.5
Moyowosi-Kigosi	15,198	2,571	42,722	0.4
Ruaha-Rungwa	34,664	4,178	43,641	0.8
Selous-Mikumi	38,975	2,644	80,345	0.5
Selous-Niassa Corridor	4,577	1,126	14,876	0.3
Total (SRF)	**99,810**	**6,001**	**193,460**	
Total (TC + SRF)	**105,439**	**6,001**	**233,157**	
Other minor populations - previous estimates				
Arusha NP (Year 2004, Ground count)	100	0	322	0.3
Burigi-Biharamulo GR (Year 2000, SRF)	1,295	785	7,292	0.2
Kilimanjaro NP (Year, Ground count)	450	0		
Mkomazi NP (Year 1999, SRF)	209	131	3,015	0.1
Rubondo NP (Year, Ground count)	49	0		
Saadani NP (Year 2005, SRF)	255	178	2,502	0.1
Selous Masasi (+Lukwika-Lumesule GR)- (Year 2000, SRF)	1,254	61	12,747	0.1
Total (previous estimates)	**3,612**	**818**	**25,878**	**0.1**
Other minor populations - without estimates				
Ibanda-Rumanyika GR				
Longido GCA				
Mahale Mt NP				
Ngorongoro Forest				
Udzungwa Mountains				
Swaga Swaga GR				
Wami-Mbiki WMA				
Total elephant population estimate	**109,051**	**6,056**	**259,035**	

National and Local Trends

The 2009 national census estimates total abundance of elephants in Tanzania at 109,051 individuals (Table 1, Figure 4). This represents a significant recovery since the late 1980s when the population was estimated at about 55,000 following years of heavy poaching which affected all elephant range states. Following Operation Uhai in Tanzania in 1989 and the international CITES ivory trade ban in 1989, continued enhancement of security throughout Tanzania's National Parks and Game Reserves has enabled the total elephant population to more than double over the last twenty years, which represents an average annual growth rate of 3.3%.

In the late 2000s, together with other East and Central African countries, Tanzania is again facing rising law enforcement challenges. Ivory poaching is increasing in some parts of the country, driven by a resurgent demand for ivory in Asia. Other threats include loss of elephant habitat outside of Protected Areas to agricultural crops, and increased competition from livestock grazing. These issues are reflected in the latest census results, which show that most populations continue to increase, while others have stabilized or are in decline. For example, elephants of the Serengeti and Tarangire populations in northern Tanzania are still increasing (and are predicted to continue increasing, based on their population structures - see Section 1.3 below). In the west, the Ugalla River population is under severe pressure, and in the south, the Selous ecosystem has seen a decline in elephant numbers over recent years, due to a combination of poaching, and loss of protected range outside of the Selous GR (e.g. the Kilombero GCA).

The Selous Ecosystem contains the largest single population of African elephants in Tanzania and the second largest in Africa, and the decline in elephant abundance at this site is the reason for the national trend showing a downturn over the last three years (Figure 4), while most other populations continue to increase.
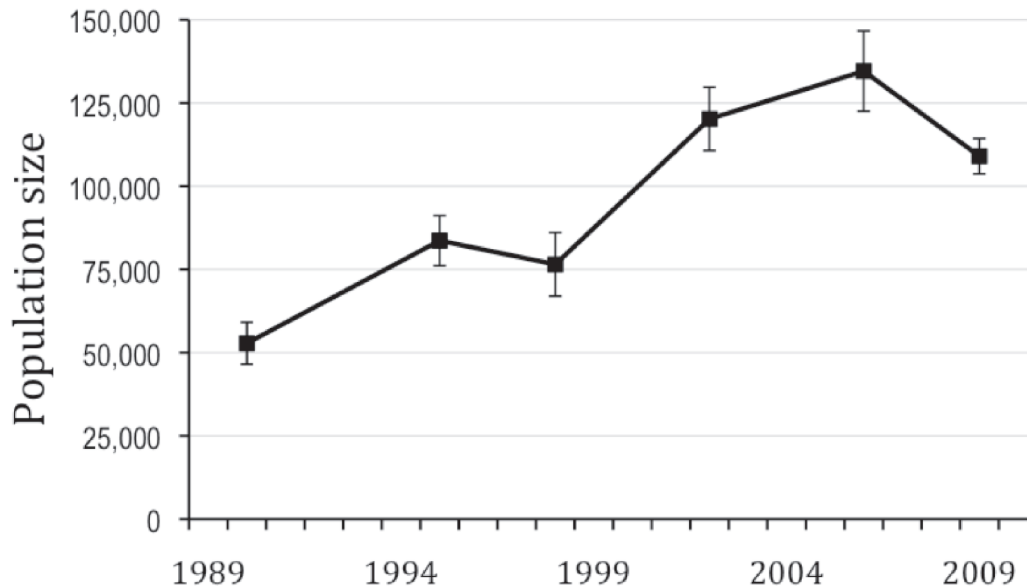
Figure 4. Tanzania's elephant population trend 1989-2009.

Data sources: TAWIRI National Elephant Censuses (1989-2009); African Elephant Database.

1.3 Summary of Population Trends and Demography of the Major African Elephant Populations in Tanzania

In support of updating the National Elephant Management Plan, the current status and trends of six of the largest seven Tanzanian elephant populations (excluding Moyowosi-Kigosi), were assessed on the basis of all available reliable information. In particular, data on demography and population

structure, trends in abundance, and levels of illegal killing were considered for each population (see methodology and results in Appendix I). Several smaller but important elephant populations residing both in other Protected Areas (see Blanc *et al.*, 2007 for full list, and see Table 1) and outside of PAs, e.g. West Kilimanjaro (Kikoti, 2009) were not included in this study of populations and demographics because of their relatively small contribution to the overall numbers.

Data sources:

(i)   Demographic surveys of six Tanzanian elephant populations, which were carried out by researchers from the Tanzania Elephant Management Planning team between May 2009 and February 2010.

(ii)   Aerial censuses of elephant populations carried out since 1976, the most recent of which were carried out from September to December 2009 in the Selous ecosystem and 7 other sites (TAWIRI 2009).

(iii)   Available data on levels of illegal killing at different sites, including official MIKE data (CITES, 2010).

(iv)   Published literature and unpublished reports available on monitoring and research into Tanzanian elephant populations.

(v)   Commentary and information from National Park Chief Wardens and Game Reserve Project Managers, wardens, rangers and other staff, tour operators and hunters, on the status of elephant populations and the extent of illegal killing in the site with which they have experience. The kind of information and perceptions obtained from these interviews can be valuable, but is inevitably of varying accuracy, thus we have considered in our overall assessment only those reports which are either verified by quantitative data obtained elsewhere, or supported by a number of independent reports.

The six summaries below, by major elephant population, are intended to present the current snapshot of the national population, with trends in abundance also included. Data on abundance, demography, behaviour, and illegal killing are used to provide an overall evaluation of the status of the individual population in 2010. Details on the methodology used in the demographic surveys, including an explanation of the different demographic and behavioural parameters, as well as all results compared by each population, including calf-to-mother ratio, breeding male-to-breeding female ratio, percentage of adults over 40 years old, flight distance, and percentage of tusklessness are all presented in Appendix I. MIKE and other data used to summarize illegal killing of elephants by population are also presented in Appendix I.

1.3.a Tarangire

The Tarangire ecosystem encompasses three protected areas: Tarangire National Park, Manyara National Park, and Manyara Ranch (owned by the Tanzania Land Conservation Trust), as well as the Lolkisale Game Controlled area, the Simanjiro plains and Lake Natron. The total ecosystem area is approximately 20,000 km^2.

The Tarangire elephant population has grown steadily since poaching ceased in the late 1980's and there are now approximately 2,500 individuals in the ecosystem (Figure 5). The northern sub-population in Tarangire National Park has been closely studied since 1993 and exhibits one of the highest growth rates ever recorded in an African elephant population (Foley & Faust, 2010).

Demographic surveys for the entire population show a population with a high calf-to-mother ratio, a high ratio of breeding males to females and a high proportion of older individuals of both sexes (see Appendix I), confirming a very healthy population structure, and a population that is growing rapidly, albeit at a lower rate than that recorded for the northern sub-population. The incidence of elephants fleeing from vehicles is very low, though higher in the south of the park which includes the southern

sub-population of elephants that resides much of the year in unprotected land outside Tarangire NP.
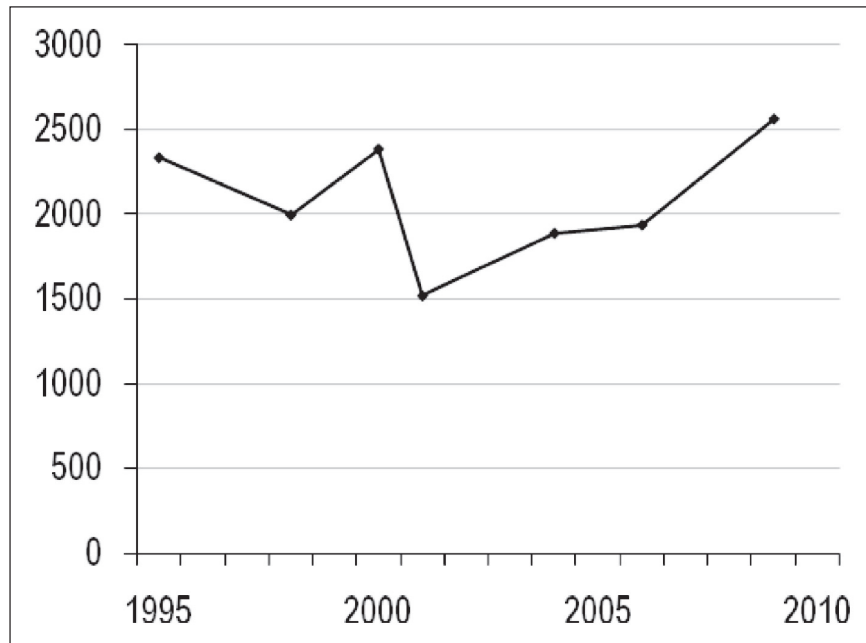
Figure 5. Trends in elephant abundance in the Tarangire-Manyara ecosystem from aerial total counts, 1995-2009 (TAWIRI).

Levels of elephant poaching within Tarangire NP have been consistently very low over the last decade, with the exception of a rise in 2009 (PIKE data, Appendix I). The greatest elephant management problem currently facing the Park authorities is a significant increase in crop-raiding in 2009 and associated human-elephant conflict outside of the Park (Chief Park Warden, pers. comm.). A longer-term problem that could have a significant negative impact on the elephant population is the potential loss of dispersal grounds to the east and north of Tarangire and the resulting isolation of the Park.

1.3.b Serengeti

The Serengeti ecosystem covers approximately 25,000 km² and comprises several protected areas including: the Serengeti National Park, Ngorongoro Conservation Area, Maswa and Ikorongo-Grumeti Game Reserves, as well as the Loliondo Game Controlled Area and the Maasai Mara National Reserve in Kenya. This document refers only to the parts of the ecosystem within Tanzania.

The elephant population in the Serengeti ecosystem has increased steadily during the past 20 years to 3068 individuals in 2009. The majority of the population is concentrated in Serengeti National Park, northern Loliondo, and the southwest plains of the Ngorongoro Conservation Area. The increase in the elephant population from 2006-2009 is too large to be supported solely by intrinsic growth suggesting either immigration from the population in the Masai Mara in Kenya or undercounting of individuals in 2006 (Figure 6).

The demographic survey revealed nearly 40% of the elephants are under 5 years old, and the Serengeti has a higher mother-to-calf ratio than even the Tarangire population, suggesting an annual growth rate of over 5%. The ratio of breeding males to females is high, although the proportion of old bulls in the population is still much lower than in Tarangire (Appendix I). The density of elephants in the Serengeti is low and the population is likely to continue growing rapidly in future years.

Very low levels of poaching were reported in the Park in recent years by wardens and rangers, and these observations are supported by the demographic and abundance trends. In 2009 and 2010 some incidents of elephant poaching were reported from the Loliondo area, close to the Kenyan border, and from Maswa Game Reserve. Six elephants in this population were observed with wounds from

encounters with snares. However all indications are that the population is increasing rapidly.
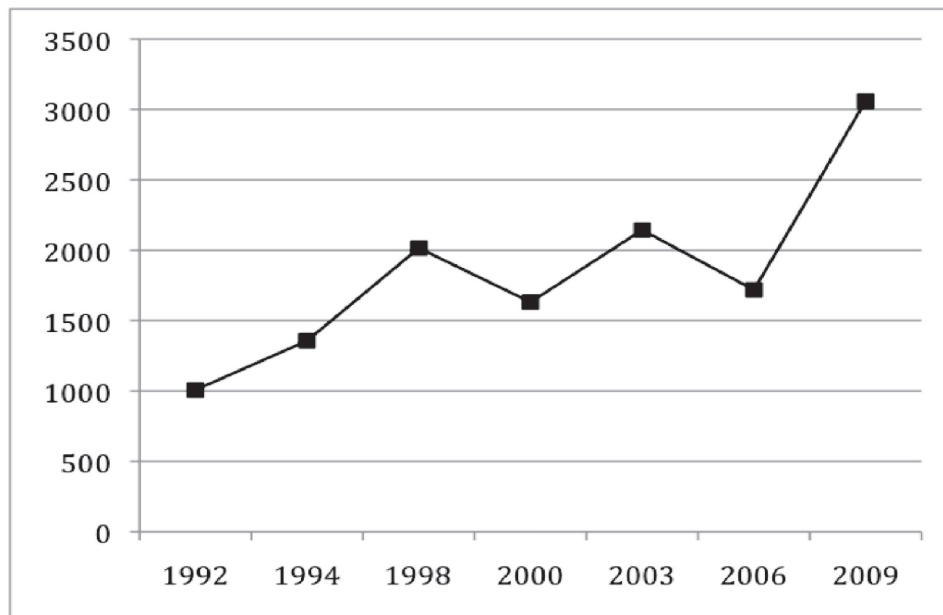
Figure 6. Trends in elephant abundance in the Serengeti ecosystem based on aerial total counts, 1992-2009 (TAWIRI 2009).

1.3.c Ruaha-Rungwa

Ruaha-Rungwa ecosystem covers an area of approximately 43,000 km², and includes several protected areas: Ruaha National Park (including the Usangu swamp), Rungwa, Kizigo and Muhesi Game Reserves, part of the Itigi thicket, and a total of an additional 5,000 km² of non-protected areas to the southwest, southeast, and east of the Park and Game Reserves.

The Ruaha-Rungwa elephant population has been increasing since the mid-1990s (Figure 7), possibly since the early 1990s if the 1996 count is considered an underestimate. The current estimate of 34,664 (S.E 4178) elephants makes this the second largest population in Tanzania, after the Selous, and one of the most important elephant populations in East Africa. Count data suggest that the population in the ecosystem has been growing at an average growth rate of 3% per annum since 1993.

Demographic and behavioural parameters such as calf-to-mother ratio, ratio of breeding males to females, and behavioural response to vehicles, suggest the population is intermediate between the rapidly growing Tarangire and Serengeti populations on the one hand, and the slower growing Selous and Katavi populations on the other (Appendix I). There are significant differences across these parameters between the Ruaha NP sub-population and the Game Reserves, with the former breeding more rapidly and being much more relaxed around vehicles. However, the picture is confusing because in other respects the GR elephants have a higher ratio of breeding males to females, and a greater proportion of older animals of both sexes (this assumes that males were not under-sampled in the Park).

Data on poaching within Ruaha NP since 2005 show levels of illegal killing at a fairly consistent, low rate over the last four years with 14 elephants killed in 2007/2008 and 11 in 2008/2009 (Appendix I) and continuous effective anti-poaching operations within the Park. PIKE data from the area are insufficient to provide meaningful analysis of illegal killing outside of the Park.
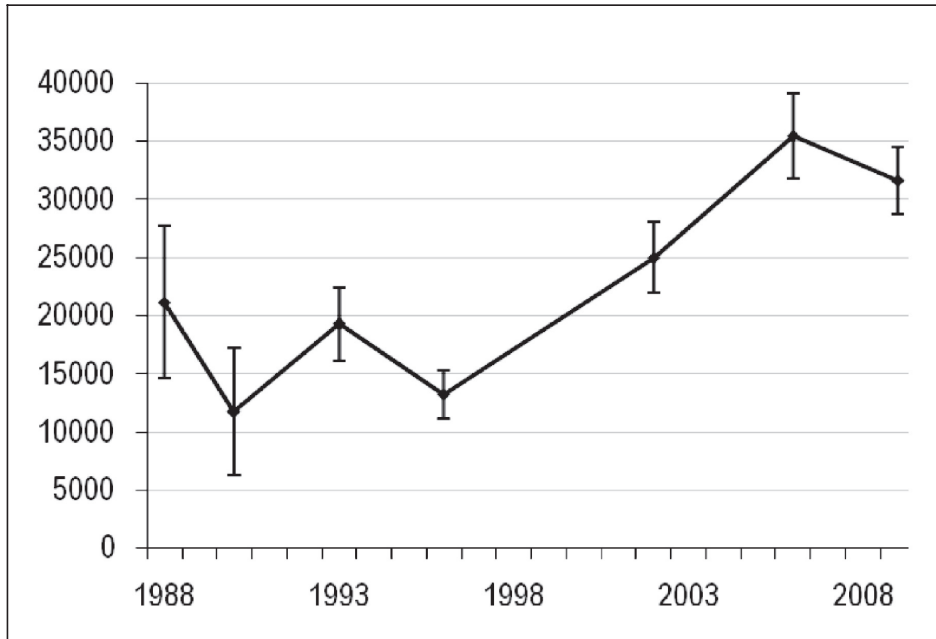
Figure 7. Trends in the elephant abundance (with standard error bars) in the Ruaha-Rungwa ecosystem, based on SRF counts, 1988-2009 (TAWIRI).

1.3.d Selous

The Selous ecosystem covers an area of some 80,000 km² in southeast Tanzania, and includes the Selous Game Reserve, Mikumi National Park, the Kilombero Game Controlled area, and land to the north, east and south of the Selous Game Reserve. The Selous Game Reserve is split into 47 operating blocks, of which 4 are for photographic tourism and 43 for sport hunting. It has the second highest population of elephants in Africa and is therefore critical for elephant conservation in Tanzania. Census records since 1976 show a clear drop from 109,419 elephants in September 1976 to 22,200 in September 1991 (Figure 8), which is attributable to the well-documented poaching of the 1980s. This was followed by a period of steady recovery and population growth during the 1990s and early 2000s (Siege & Baldus, 2000), and then another decline over the last three years, 2006-2009 to the current figure of 38,975 (Figure 8, this includes the Selous ecosystem but not the Selous-Niassa corridor).
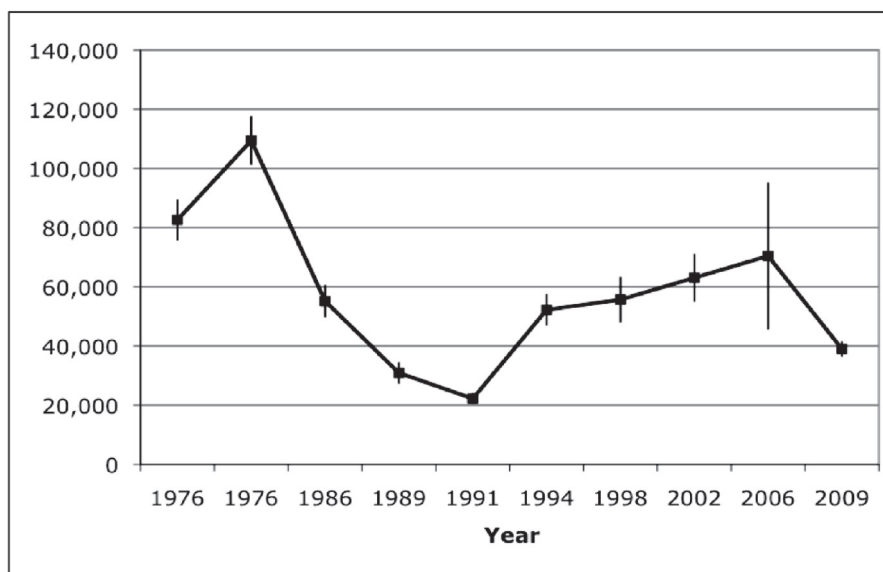
Figure 8. Trends in elephant abundance (with standard error bars) in the Selous ecosystem (excluding Selous-Niassa Corridor), based on SRF aerial counts, 1976-2009 (TAWIRI).

The discrepancy between the 2006 figure of 70,406 (TAWIRI 2006) and the 38,975 figure in 2009 (TAWIRI 2009) suggests a loss of over 30,000 elephants in three years, and this, coupled with accounts documenting increased poaching, has given rise to considerable comment in the national and international press. However, the 2006 census, which has very large standard errors, seems to indicate a considerable overestimate of the population. Indeed, a simple demographic model using the range of known possible elephant population growth rates over several years (up to 5% per year) confirms that it was impossible for the population to have reached 70,000 in 2006 from a low of 20-30,000 in the early 1990s. Assuming an intermediate population figure between the September 1989 (30,889 elephants) and June 1991 (22,208 elephants) counts, and a mean growth rate of 3.3% (the average growth rate for the population in Tanzania since 1989), the population is likely to have reached approximately 50,000 individuals in 2009. This would suggest that the population has indeed experienced a sharp drop resulting from illegal killing but not the dramatic decline suggested by the discrepancy between the two most recent (2006-2009) survey figures.

The carcass ratio of 1.4% for the latest count is lower than would be expected from normal mortality in this ecosystem, suggesting that some carcasses were missed, possibly due to inexperience of the observers (CITES 2010). However, there is no evidence that carcass numbers from either the aerial count or observations on the ground were of the level that would have been generated by illegal killing of 30,000 elephants. The 2009 count was carried out under optimal conditions following a long dry season, when elephants were evenly distributed across the ecosystem, producing low confidence intervals around the mean, and with all groups over 20 elephants being photographed for more accurate counting. A further count will be needed within the next two years, using the same methodology under similar environmental conditions, but with improved observation of carcasses, in order to obtain a stable baseline data of both elephant numbers and carcass ratios.

Though the extent of population decline remains unclear, there is firm evidence that illegal killing has increased in the Selous Ecosystem in recent years (see Section 2.3). This includes PIKE data (Appendix I) suggesting a steady and continuing increase in the proportion of illegal killings. Genetic data indicated that ivory seized in the Far East has come from the Selous ecosystem (Wasser 2009), and reports from Game Reserve staff, as well as tourism and hunting operators indicate increasing numbers of elephant carcasses in the Selous Game Reserve and the adjacent Kilombero GCA. Joint WD/Selous Rhino Project aerial observations and foot patrols also noted a more than threefold increase in elephant carcasses detected between 2006 and 2008 (Appendix I).

In July 2009 an increase in illegal killing in some of the western areas of the Selous GR was addressed through meetings that led to joint, cooperative anti-poaching patrols involving rangers and game scouts from Selous GR, the Udzungwa Mountains National Park, and Mikumi National Park. In December 2009, the well-publicised 'Operation Butterfly' anti-poaching operation was carried out in the Selous Game Reserve, led by the commander of special police operations. This led to the arrest of 70 poachers and the recovery of both elephant and hippopotamus ivory (Midala 2010).

An important factor influencing the protection of the elephant population in the Selous ecosystem has been a marked decrease in funding. Prior to 2005 a Revenue Retention Scheme was in operation, whereby 100% of revenue from photographic tourism, and 50% from hunting operations, was retained for management of the Game Reserve. In 1997 the Reserve earned US $2,300,000 annually and retained US $1,703,000, and by 2003 the revenue retained had increased to US $2,800,000. Following National budget reductions in 2004, the amount retained by the Reserve declined dramatically to approximately US $800,000 in 2008 (UNEP 2008). The drop in revenue coincides with a period of increased poaching in the Reserve and suggests that anti-poaching operations are severely under-funded.

Demographic data also provides evidence of a population that has been affected by poaching, with a

low calf-to-mother ratio and only one breeding-age bull to every 20 breeding-age females, the second lowest ratio recorded, after Ugalla. This could have a negative impact on the long term growth rate of the population. Evidence from previous years, however, suggests that with adequate law enforcement the population is capable of staging a strong recovery.

1.3.e Katavi-Rukwa

The Katavi-Rukwa Ecosystem covers an area of approximately 13,500 km² and includes Katavi National Park and the Rukwa Game Reserve, as well as Uruwira Plateau, Lukwati, Usevia, Nkamba and adjacent areas. This population peaked at approximately 6,800 individuals in 2000 (Figure 9) and has been relatively constant at about 6,500 individuals since 2002. This makes it the fourth largest elephant population by ecosystem in Tanzania.

Demographic surveys indicate the percentage of the population under 5 years old and the calf-to-mother ratio are both low, and there is also a low proportion of adult females over 40 years old (Appendix I). No males over 40 years old were found in the survey area, indicating poaching in this population at some time during this decade. Behaviourally, the majority of cow-calf groups were nervous and unapproachable, with a high proportion fleeing the vehicle, whereas bulls tended to be relaxed and unaffected by the presence of vehicles.

In June 2009 the Katavi NP Protection Department reported low levels of elephant poaching within the Park, while the very low number of carcasses reported to MIKE do not allow for meaningful analysis. However, the demographic and behavioural data, particularly the lack of old bulls, indicate some past and/or present disturbance in the ecosystem.
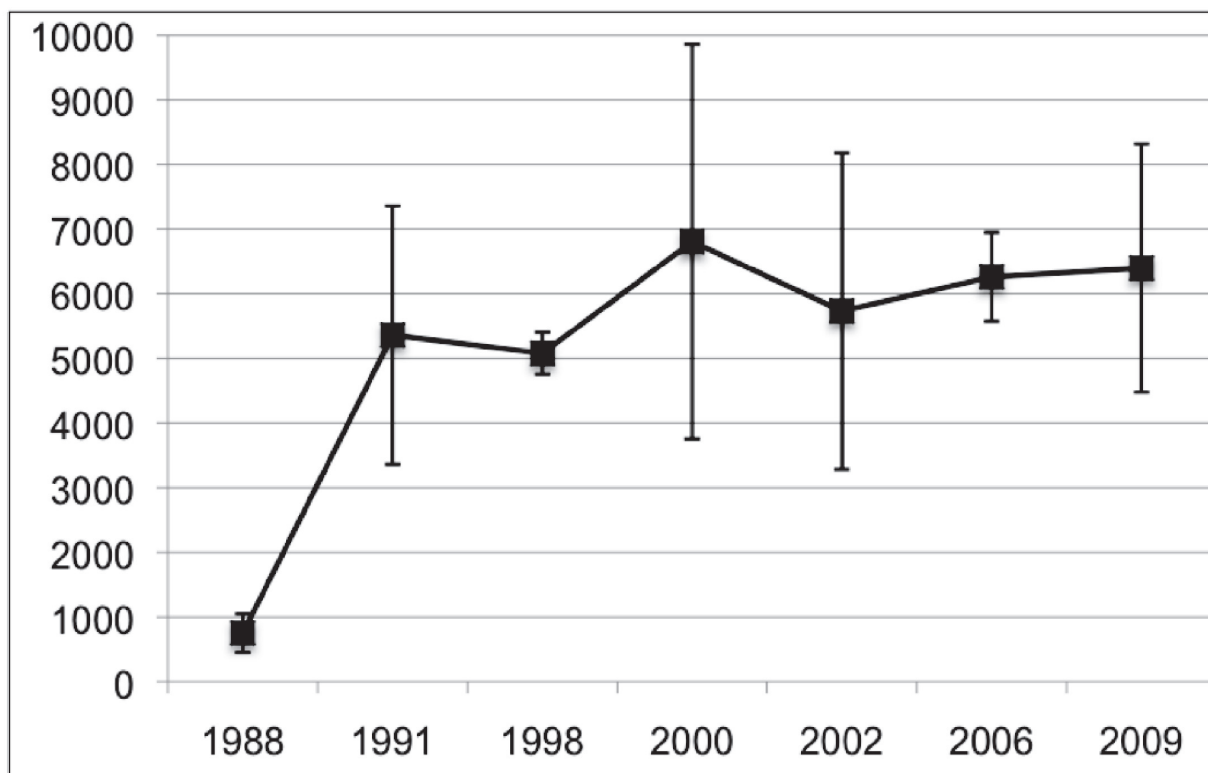
Figure 9. Trends in elephant abundance (with standard error bars) in the Katavi-Rukwa ecosystem, based on SRF aerial counts, 1988-2009 (TAWIRI).

1.3.f Ugalla Game Reserve

The Ugalla Game Reserve covers approximately 4800 km^2 of miombo woodland in western Tanzania. This population peaked in 2006 at approximately 4000 individuals, though by 2009 this had declined significantly to approximately 1000 animals (Figure 10). The drop in the population is strongly linked to poaching in the Game Reserve, where reported incidences of carcasses found by joint Wildlife Division/Friedkin Conservation Fund anti-poaching efforts have increased steadily in recent years: from 15 in 2006, 41 in 2008, to a peak of 78 carcasses in 2009 (Appendix I).
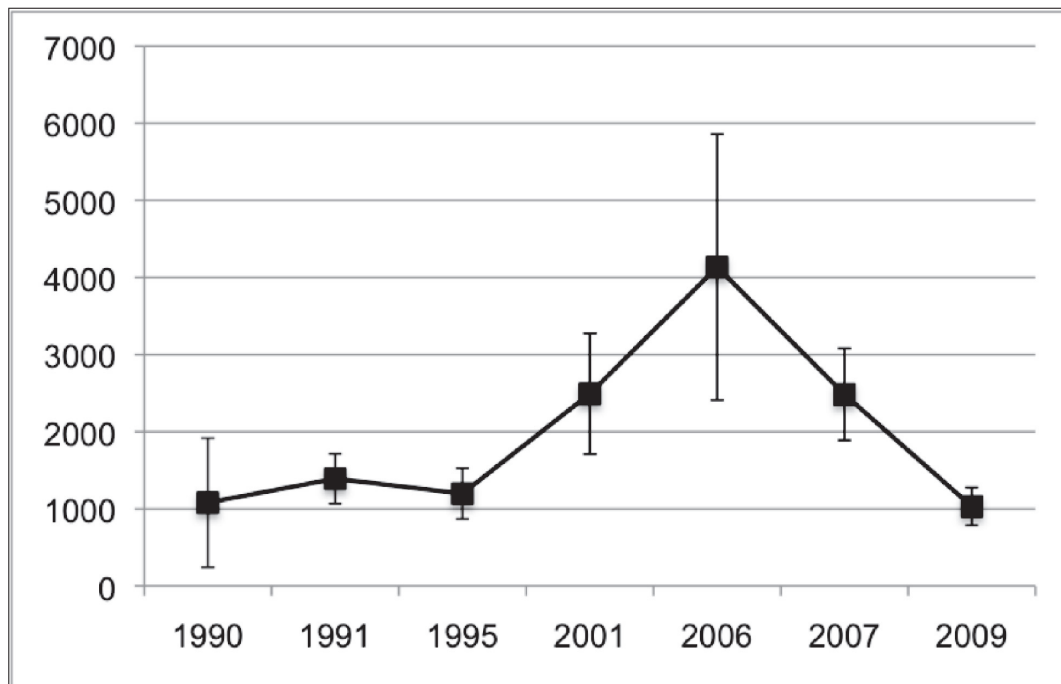
Figure 10. Trends in elephant abundance (with standard error bars) in the Ugalla Game Reserve ecosystem, based on SRF aerial counts, 1988-2009 (TAWIRI).

All elephants observed in the population were very nervous and shy. The population structure shows extremely low ratios of calf-to-mother and breeding males to breeding females, as well as a low proportion of adult females over 40 years old (Appendix I). No males over 40 years old were recorded in the population. The number of calves per mother is the lowest recorded in all populations and suggests that population growth is being impaired either as a result of a reduced conception rate because of high stress among the adult females, or high infant mortality, or both. Overall the demographic data point to a dysfunctional social structure. All demography, behaviour and poaching data from the Ugalla Game Reserve paint a consistent picture of an elephant population under intense pressure from illegal killing and in steep decline.

1.4 Status of Elephant Corridors

Tanzania has an outstanding network of Protected Areas that protect the nation's core habitats for a rich diversity of wildlife populations, including all its major elephant populations. However, peripheral areas and corridors linking these core habitats are also vital for the long-term health and persistence of meta-populations, especially of 'landscape species' with large home ranges such as the African Elephant, as well as for the wider ecological integrity of the nation. A 2009 TAWIRI report (Jones *et al.* 2009[1]), compiled summary information on most of the important wildlife corridors remaining in mainland Tanzania. Information was documented on the status, level of wildlife use, level of threat, description, and location of each corridor. This information was updated by the TEMP team using

---

1 See www.tzwildlifecorridors.org/corridor-types/

information recorded from surveys and interviews during 2009-10. The current status of known elephant corridors in Tanzania is summarised below.

The threats to each corridor were evaluated and graded into three categories:

Extreme   probably < 2 yrs left as a viable corridor
Critical   probably < 5 yrs left as a viable corridor
Moderate   probably < 20 yrs left as a viable corridor

> The term '**wildlife corridor'** means different things to different people – and sometimes it is no more than a concept. When it is a real entity, it can be thought of in two ways:
>
> (i)   An area used by animals to pass from one 'habitat patch' to another; or
> (ii) An area that connects two patches of suitable habitat by passing through a matrix of unsuitable habitat.
>
> In Tanzania, wildlife corridors are often identified through their use by large charismatic mammals (so-called 'landscape-species', such as African Elephant, Wild Dog (*Lycaon pictus*) and cheetah (Acynonyx jubatus)). However, many smaller animals such as duikers, bats, birds and amphibians will also use these corridors. Corridors may be vital for the survival of the species that use them, the habitats between which they move, and the corridor habitat itself.
>
> For the purposes of the Tanzania Elephant Management Plan, a wildlife corridor is defined as:
>
> "an area with no legally protected status lying between two protected areas, through which wild animals are known or believed to move, and which connects the two protected areas by natural vegetation types such as grassland or forest (or where such a connection could be restored)."
>
> Dispersal areas used by animals for significant periods of time (including seasonally) that are located outside protected areas are also included, even though they do not connect with another protected area. The term *wildlife corridor* is not used to describe two protected areas that are adjacent to each other.

The majority of known elephant corridors in Tanzania (n=23) are in poor condition: five are in an 'extreme' condition and a further nine are deemed 'critical' based on current rates of habitat change (Table 2). Furthermore, there is little or no information for eight of the 23 corridors and surveys for those areas are urgently needed. The following five elephant corridors are in 'extreme' condition and may disappear within 2 years. A map with their locations is found in Figure 11.

1. Ngorongoro-Manyara corridor
2. Udzungwa-Selous corridors (confirmed as currently closed)
3. Tarangire-SwagaSwaga corridor
4. Wami Mbiki-Mikumi corridor
5. Wami Mbiki-Saadani corridor

The Tarangire-Swaga Swaga corridor (Figure 11, Table 2) is a particularly important corridor as it is the last known remaining link between the elephant populations in the north and the south of the country. Until recently there were two main corridors linking the two protected areas: one north and one south of Kondoa town, but today only the southern route is still used by elephants and is under severe threat. While protection for this corridor is urgently needed, the challenges are considerable (as is the case for many of the corridors linking protected areas); the corridor is almost 100km long and passes 11 villages across 2 Districts and 2 Regions. Concerted effort and cooperation between different wildlife authorities, research bodies, and both local and national government agencies will be needed to ensure sustainable long-term protection for this area.
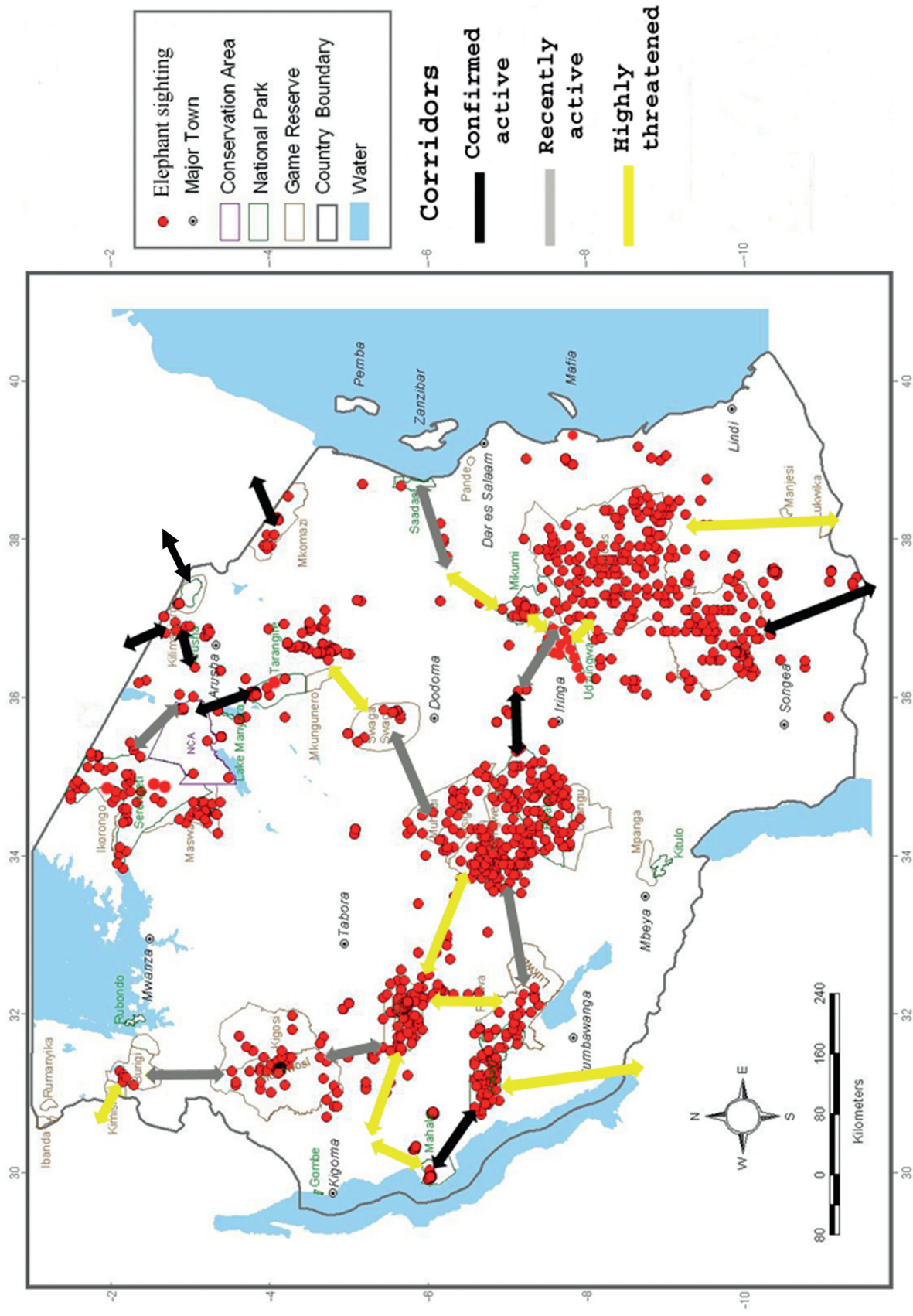
Figure 11. Map of current elephant distribution and corridors in Tanzania. Sources: Jones et al., 2009; Tanzania Mammal Atlas Project; surveys and interviews recorded by TEMP field team during 2009-2010.

Table 2. Elephant Corridors in Tanzania and their known status, July 2010.

Corridor	Regions	Urgency[1] (current)	Ongoing Notes	Projects / References and Contacts
Selous – Niassa (Mozambique)	Ruvuma	Moderate	Relatively well known; ongoing projects	www.selous-niassa-corridor.com Mpanduji, D., Hofer, H., Hilderbrandt, T, Goeritz, F., East, E. (2002). Movement of elephants in Selous-Niassa wildlife corridor, southern Tanzania. Pachyderm 22, 18-31 Baldus, R., Hahn, R., Mpanduji, D., Siege, L. (2003). The Selous-Niassa Wildlife Corridor. Tanzania Wildlife Discussion Paper No 34. Baldus, R. & Hahn, R. (2007). Connecting the world's largest elephant ranges: The Selous-Niassa Wildlife Corridor. In: Saleem, H. A. ed. Peace Parks: Conservation and Conflict Resolution. Cambridge, MIT Press Chapter 7.
Selous - Masasi	Lindi, Mtwara	Unknown		Ntongani, W.A., Munishi, P.K.T, Mbilinyi, B.P. (2007) Land use/cover change and socio-economic factors influencing land cover dynamics in the Selous-Niassa wildlife corridor Nachingwea District, Tanzania. Proceedings of the 6th TAWIRI Scientific Conference. Pesambili, A.A. (2003) Wildlife resources of Lukwika-Lumesule and Msanjesi GR. WWF-TPO.
Udzungwa - Selous (Ruipa and Nyanganje Corridors)	Iringa, Morogoro	Extreme	Frontier monitoring of Ruipa corridor Survey of Nyanganje corridor May 2010 (Frontier-UEMC-UEP) and ongoing monitoring (UEP)	Jones, T, Rovero, F, Msirkale, J (2007) Vanishing Corridors: A last chance to preserve ecological connectivity between the Udzungwa and Selous Ecosystems of Southern Tanzania. http://www.easternarc.or.tz/udzungwa#dl Udzungwa Elephant Project
Katavi - Rungwa	Rukwa, Mbeya, Iringa	Moderate	Rapid assessment by TAWIRI and WCS, April 2010	TAWIRI and WCS (2010) unpublished data Coppolillo et al. (2006) Fish/Wildlife Elephant Grant.
Katavi - Zambia	Rukwa	Unknown	via Kalambo FR, Loasi FR, Lwafi GR	WCS Southern Highlands Conservation Programme
Katavi - Mahale	Rukwa, Kigoma	Critical	Recent assessment by FZS/MMNP	

Corridor	Region	Status	Notes	References
Wami Mbiki - Mikumi	Morogoro	Extreme	Ongoing project Kilimanjaro – Saadani Elephant Research project telemetry study	
Wami Mbiki - Saadani	Morogoro	Extreme	Ongoing project Kilimanjaro – Saadani Elephant Research project telemetry study	
Wami Mbiki - Jukumu/ Gonabis/ NorthernSelous	Morogoro	Critical	Ongoing project Kilimanjaro – Saadani Elephant Research project telemetry study	Kikoti,A.P, 2010. Where are conservation corridors at Saadani-Wami Mbiki ecosystem? www.uri.edu
Wami Mbiki - Handeni/ southern Masai steppe	Morogoro, Tanga	Moderate	Ongoing project Kilimanjaro – Saadani Elephant Research project telemetry study	
Moyowosi - Ugalla	Tabora, Kigoma	Unknown	Unknown	
Ugalla - Masito - Mahale	Rukwa	Unknown	Poorly known	
Burigi - Moyowosi/ Kigosi	Kagera, Shinyanga Kigoma	Critical	No recent assessment	Jambiya, G, Milledge, S., Mtanfo, M. (2007) Night time Spinach. IUCN report. Blanc, J., Thouless, C., Hart, J., Dublin, H., Douglas-Hamilton, I, Craig, G, Barnes, R. (2003) African elephant status report 2002. IUCN paper 29. WTEP (1997) A rapid assessment of large mammal distribution in Biharamulo and Shinyanga, Tanzania. Report to IUCN/SSC African Elephant Specialist Group
Kilimanjaro – Amboseli (Kitendeni)	Kilimanjaro, Arusha	Protected	Corridor established in 1994. Later expanded in 2002.	Grimshaw G.M and Foley C.A.H 1991. Kilimanjaro Elephant Project 1990 Final Report, 122pp Friends of Conservation: London. Kikoti AP. 2009. Seasonal home range sizes, transboundary movements and conservation of elephants in northern Tanzania. PhD dissertation. University of Massachusetts Amherst, Amherst, MA. http://www.awf.org/content/solution/detail/3705 Elephant use and conflict leads to Tanzania's first wildlife conservation corridor. Kikoti, A.P., Griffin, C.R., Pamphil, L. Pachyderm in press.

Corridor	Regions	Priority	Status	References
Ngorongoro - Manyara (Upper Kitete/Selela)	Arusha, Manyara	Extreme	Well known Kilimanjaro Elephant Research project	Mangewa, L. (in press) Ecological Viability of Upper Kitete-Selea Migratory Corridor in the Tarangire-Manyara Ecosystem, Tanzania: Implications for African elephant and buffalo movements. Proceedings of TAWIRI Conference 2007. Kikoti AP. 2009. Seasonal home range sizes, transboundary movements and conservation of elephants in northern Tanzania. PhD dissertation. University of Massachusetts Amherst, Amherst, MA.
Tarangire – Manyara (Kwakuchinja)	Manyara	Critical	Well known Projects ongoing (e.g. WCS – Tarangire Elephant Project, Kilimanjaro Elephant Research Project)	Hassan, S.N. (2007) Impacts of space use by humans on large mammal species diversity in the Kwakuchinja-Mbugwe wildlife corridor, northern Tanzania. *Tanzania Journal of Forestry and Nature Conservation* 76:134-143. Goldman, M.J. (2006) Sharing pastures, building dialogues: Maasai and wildlife conservation in northern Tanzania. PhD thesis, Department of Geography, University of Wisconsin-Madison. Kikoti AP. 2009. Seasonal home range sizes, transboundary movements and conservation of elephants in northern Tanzania. PhD dissertation. University of Massachusetts Amherst, Amherst, MA.
Manyara Ranch – Lake Natron	Manyara, Arusha	Moderate	Well known	WCS Tarangire Elephant Project
Tarangire - Simanjiro	Manyara, Arusha	Critical	Well known Project ongoing (WCS – Tarangire Elephant Project)	Space and habitat use of the African Elephant in the Tarangire-Manyara ecosystem, Tanzania : Implications for conservation. Galanti, V., Preatoni, D., Martinoli, A.. Wauters, L.A., and Tosi, G. (2006) Mammalian Biology 71 : 99-114 Bolger, T., Newmark, W., Morrison, T., Doak, D. (2008) The need for integrative approaches to understand and conserve migratory ungulates. *Ecology Letters* 11:63-77. Mwalyosi R. (1991) Population growth, carrying capacity, and sustainable development in southwest Maasailand. *Journal of Environmental Management* 33:175-187.
Tarangire - Makuyuni	Manyara	Moderate	Well known	WCS Tarangire Elephant Project
Tarangire - Mkungunero / Kimotorok	Manyara	Moderate	Well known	WCS Tarangire Elephant Project Space and habitat use of the African Elephant in the Tarangire-Manyara ecosystem, Tanzania : Implications for conservation. Galanti, V, Preatoni, D., Martinoli, A.. Wauters, L.A., and Tosi, G. (2006) Mammalian Biology 71 : 99-114

Corridor	Region	Urgency[1]	Status	Source
Tarangire - SwagaSwaga	Manyara	Extreme	Rapid assessment by TAWIRI and WCS, Feb 2010	TAWIRI and WCS, unpublished data
Ruaha- Bahi - Swaga Swaga	Dodoma	Critical	Rapid assessment by TAWIRI and WCS, March 2010	TAWIRI and WCS, unpublished data
Udzungwa - Mikumi	Morogoro	Critical	Preliminary assessment (Epps) but data deficient	Epps C.W. (2008) Past and Present Connectivity of Wildlife Populations in Tanzania. TAWIRI-COSTECH final report (unpublished).
Udzungwa - Ruaha	Iringa	Critical	Recently assessed (Epps) MSc project planned for 2010-11 (SUA/UEP)	Epps C.W. (2008) Past and Present Connectivity of Wildlife Populations in Tanzania. TAWIRI-COSTECH final report (unpublished). Udzungwa Elephant Project WCS Ruaha-Rungwa Landscape Program
Igando-Igawa	Iringa	Moderate	WCS (on-going project)	WCS Southern Highlands program

[1] Urgency defined as: **Extreme** = probably < 2 years left as a viable corridor
Critical = probably < 5 years left as a viable corridor
Moderate = probably < 20 years left as a viable corridor

1.5 Human-Elephant Conflict in Tanzania

Conflict between humans and wildlife is a problem throughout Africa and often leads to human mortality and injuries, damage to crops and livelihoods and to negative attitudes towards wildlife. Although the most serious damage to crops and food supplies is caused by insects, rodents, birds, primates and wild pigs, most concern focuses on the larger species such as African elephants, African buffalo, Hippopotamus, Nile crocodile and larger carnivores, whose actions are often much more dramatic and potentially injurious to humans. Of these, the African Elephant is perceived as the most serious cause of human-wildlife conflict. Human-elephant conflict (HEC) is not a new occurrence in Tanzania. It was already a serious problem in parts of the country during the 1920's prompting the establishment of an elephant control department to tackle the issue (WCS 2009). However, the increasing migration of people into elephant range has greatly exacerbated HEC in recent times, and the topic is receiving far more attention in the press and is becoming increasingly politicised locally (Hoare 2007).

In 2009 the TEMP research team conducted a survey of HEC to ascertain the scale and distribution of HEC by district across Tanzania in order to identify potential HEC hotspots. Questionnaires were sent to all district Natural Resource Officers (n=108), with 15 questions covering a variety of topics, including:

- Current and historical levels of HEC in the district
- Top five wards experiencing HEC
- Methods and capacity for reporting, recording, and processing data
- Crop raiding incidents, perceived severity, and trends
- Reported human injuries and casualties
- Elephants killed for Problem Animal Control (PAC)
- Presence of government, NGO, CBO mitigation projects

The capacity of districts to record incidences of HEC is likely variable, and some districts may have been under-reporting the problem, though there were insufficient data on recording effort to control for this.

Results

A total of 81% of districts returned questionnaires (87 of all 108 districts). Of those 74% (64 districts) of districts reported having elephant populations, and of these 94% (60 districts) reported HEC in 2007-2009. The four districts where no HEC was reported, but where elephants are present were: Muleba (Kagera), Mufindi (Iringa), Urambo (Tabora), Korogwe (Tanga). Many districts (60%) reported serious or very serious HEC, while 40% of districts reported minor HEC (<10 incidents/year) (Figure 12). The two districts reporting the highest level of HEC (500+ incidents in 2009) were Rombo (Kilimanjaro District) and Bunda (Mara District) (Figure 12). Only 15% of the districts reported an increase in HEC between 2007-2009 (though half of the districts did not have sufficient data to report a trend) (Figure 13).

HEC incidents per year by District

- ☐ Extreme (500+)
- ☐ Very serious (100-500)
- ☐ Serious (10-100)
- ☐ Minor (1-10)
- ☐ None reported
- ☐ No data
- ☐ National Park or Game Reserve

Bunda

Rombo
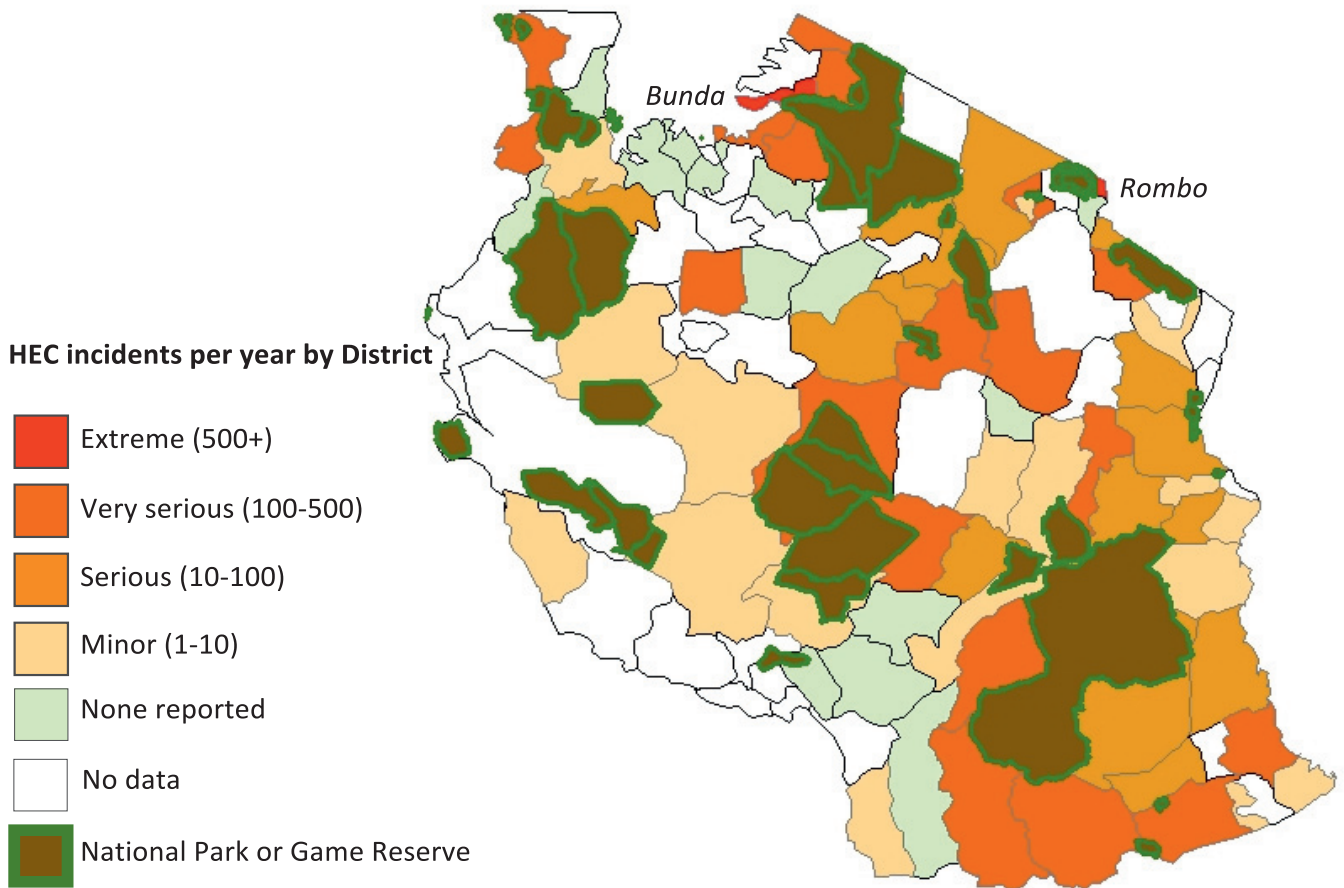
Figure 12: HEC Severity by District (2007-2009)

Decreasing; 11%

Increasing; 15%

No Data; 46%

Stable; 28%
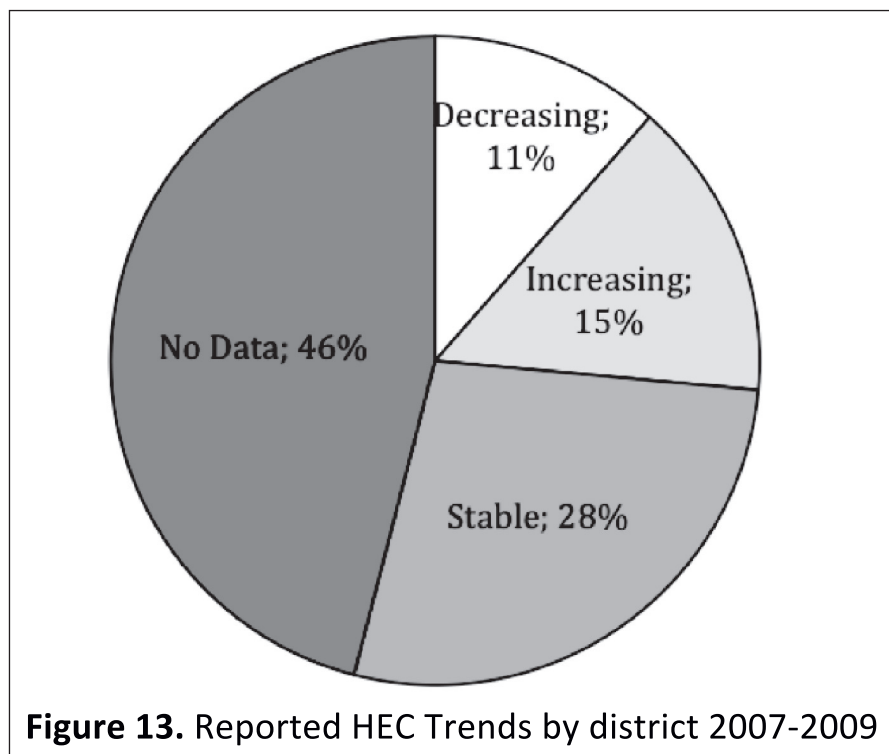
Figure 13. Reported HEC Trends by district 2007-2009

Figure 13. Reported HEC Trends by district 2007-2009

Human Mortality and Injuries

District records show that elephants kill approximately 40 – 50 people every year and injure a further 30-40 people each year across the country (Figure 14). The highest reported incidences occur to the south of the Selous GR (Tunduru, Namtubo, Kilwa) , Tarangire NP (Kondoa) and the NCAA (Karatu) (Figure 15).
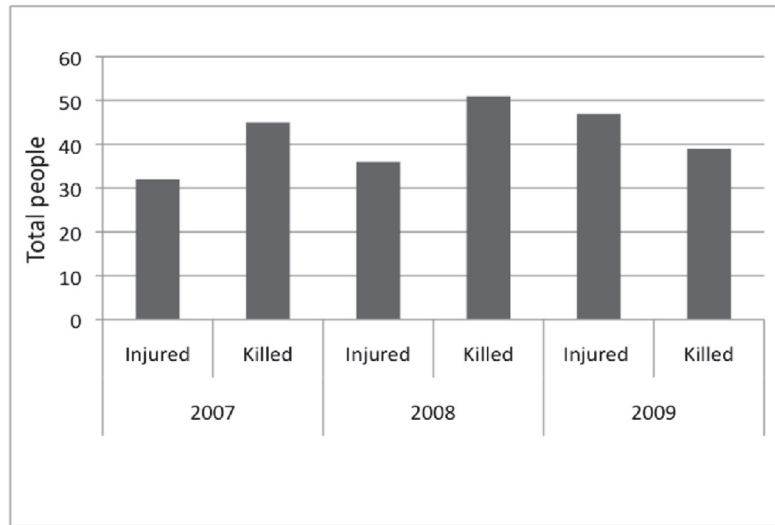
Figure 14. Reported human mortality and injuries caused by elephants, 2007-2009.
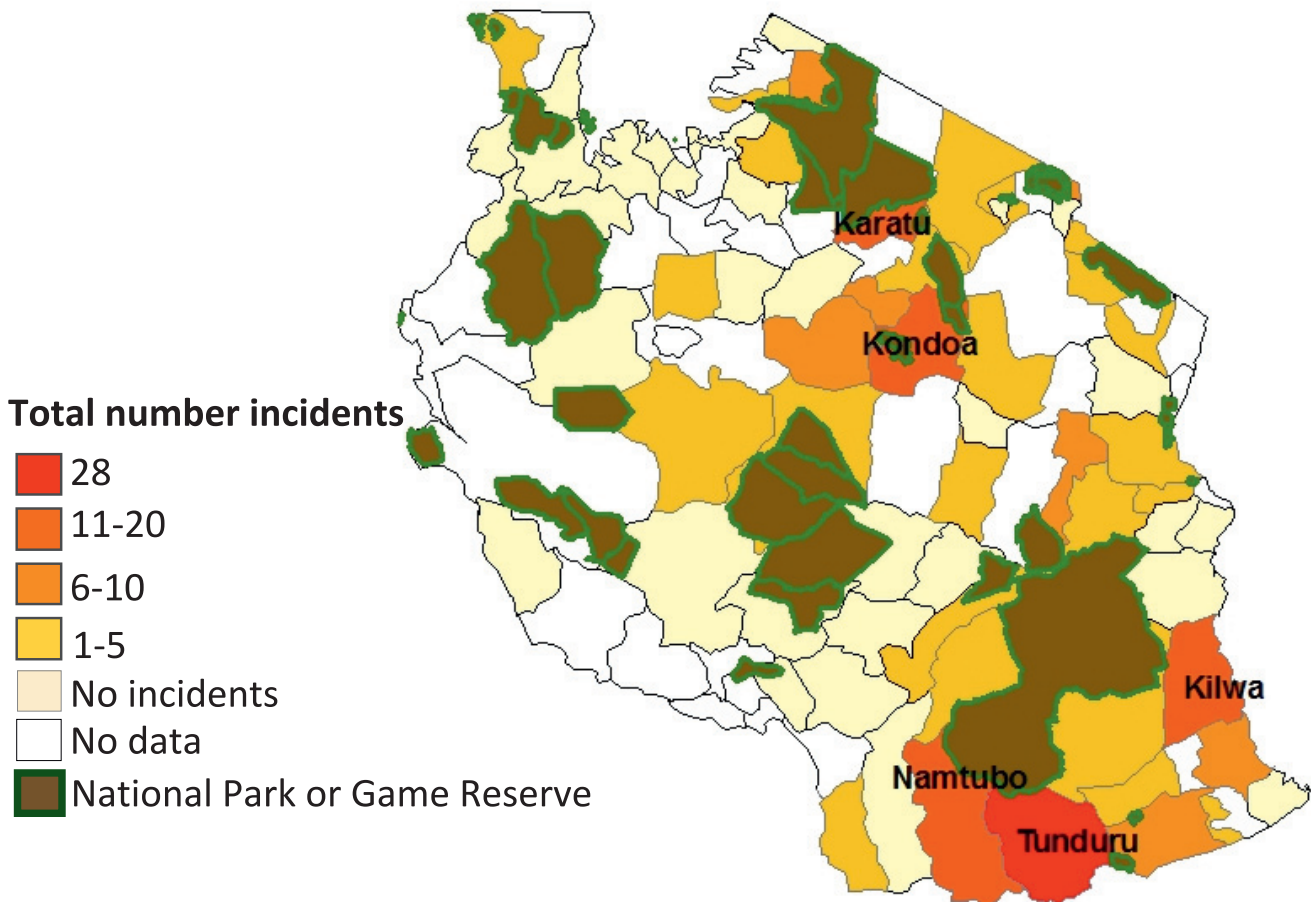
Figure 15. Human mortality and injuries caused by elephants, by district 2007-2009

Mitigation of Human-Elephant Conflict

Deterrence Methods

Across Africa there have been numerous attempts and experiments to devise the best methods of deterring elephants, including fencing, the use of watchmen with fires and noise-making, chilli plants or products, and even recordings of swarming bees, or a combination of various methods.

Although commonly used methods (such as fire and noise) are often not effective because elephants become habituated and application is often uncoordinated, HEC amelioration can be very successful, as shown in communities around the Serengeti, Selous and Tarangire protected areas. In Mtepera village (Selous), farmers using experimental methods harvested maize crops in 2004 for the first time in years without destruction by elephants (WCS 2009). In the western Serengeti HEC incidents fell from 749 in 2005/06 to only 86 in 2008/09, following the introduction and effective utilisation of chilli-based deterrents (WCS 2009).

Despite the success of mitigation techniques there has been little coordinated action to publicize and promote their use. Reports to TEMP from District Wildlife officers indicated that HEC mitigation projects of any kind were reported in only 23% of districts with HEC (14 districts) and the particularly effective deterrents based on chilli (growing chilli hedges, chilli bricks, or chilli-engine oil fences) were reported from only 10% of districts with HEC (6 districts).

Problem Animal Control

The Wildlife Conservation Act permits the killing of problem animals by wildlife officers to safeguard human lives and property. In 2009, 58% (37 of 64 districts) reported at least one problem elephant shot, with the mean number of elephants shot being 1.72/year per district. The number of problem elephants shot is currently decreasing (see Figure16). Killing 'problem' elephants as an HEC mitigation effort is generally not effective, and is subject to difficulties in accurately identifying the problem elephant. The number of problem elephants shot (Figure 17) does not always reflect the severity of HEC (Figure 12 above), and suspicions have been raised that HEC is sometimes used as a pretext for illegal killings (Malima *et al* 2005).
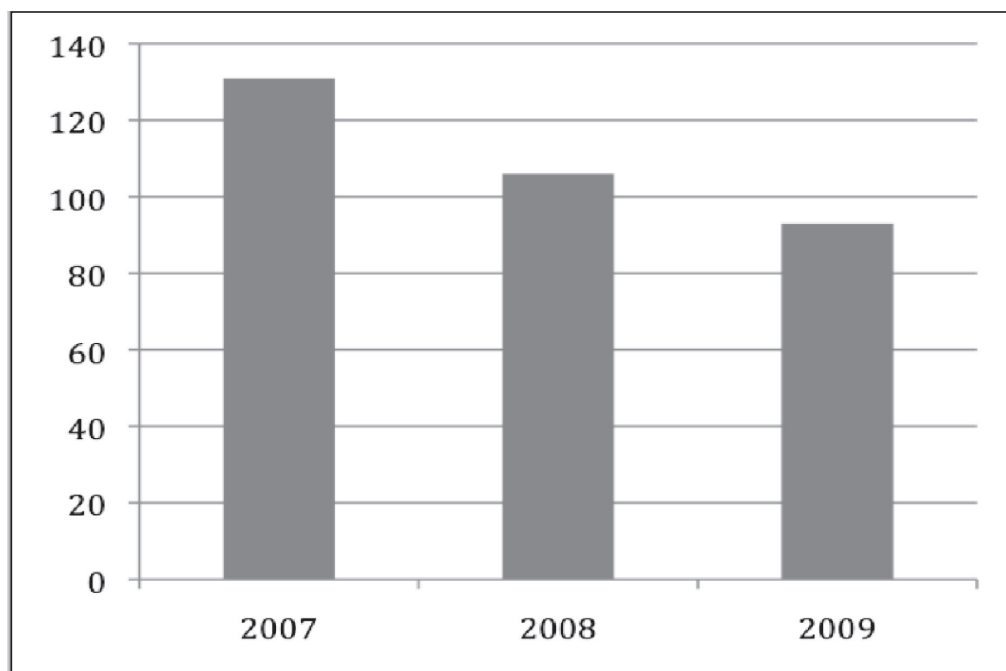
Figure 16. Reported problem elephants shot, by year, 2007-2009
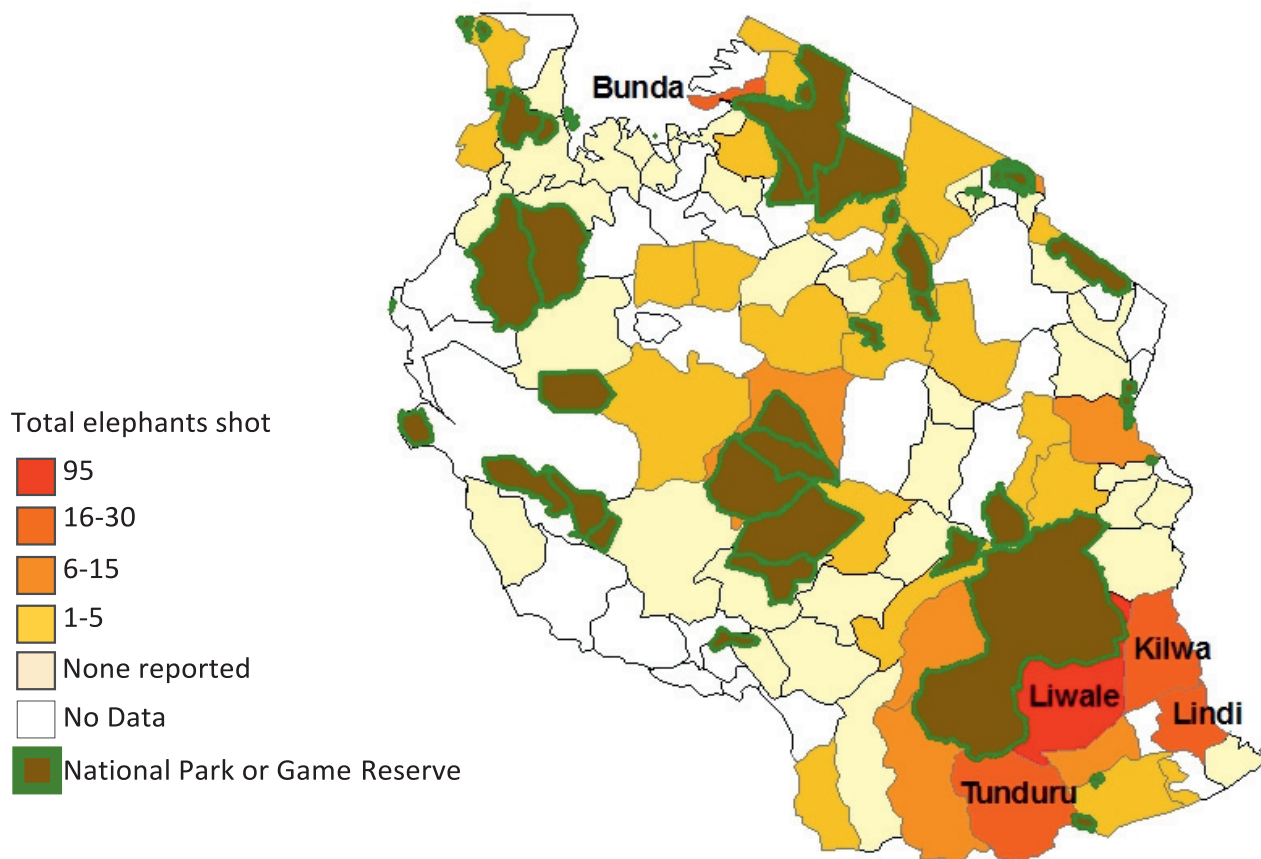
Figure 17. Total Problem animals shot, by district, between 2007-2009

1.6 Overview of the four Participatory Zonal Workshops

In order to canvass opinions on elephant conservation and management from as wide a sector of the Tanzanian population as possible, representatives of a wide variety of stakeholders from around the country, both public and private, were invited to four zonal participatory workshops which were held in Arusha, Tabora, Songea and Morogoro during April and May 2010.

The main goal of the four workshops was to generate information that would feed into the development of the Tanzania Elephant Management Plan 2010-15. Specifically the workshops focused on examining various trends that affected elephant management, identifying issues facing elephant conservation and examining the desired future situation and strategies for conservation and management of the African Elephant in Tanzania. The workshops also analyzed the current and future ivory trade and management of ivory stocks as well as the relevant roles/influence of different stakeholders on elephant management in Tanzania. Finally the workshops developed indicators for management/monitoring and evaluation of elephant populations in Tanzania.

The participatory workshop process adopted a Nominal Group Process (NGP) together with plenary discussions in the generation of the ideas documented in the Proceedings, which is summarised in Appendix II.

An examination of trends that affected elephant management for the past twenty years was conducted by looking at the economic/financial, ecological, social/cultural, policy & legislative, political, institutional and technological factors. Evident from this examination was that most of the economic, ecological, political and social/cultural changes have had negative effects on the conservation of elephants in Tanzania for the last twenty years. These factors contributed to human-elephant conflicts (HEC), increased poaching and reduced law enforcement capacity of management institutions in

Tanzania. According to the stakeholders, institutional decentralization by removing district wildlife officers from the payroll of the Wildlife Division also had negative effects on the population dynamics of elephants outside core protected areas. Policy and legislative, institutional and technological trends were reported to have more positive effects, in particular through the provision of opportunities for communities to protect elephants, with policies, legislation and regulations supporting such provisions.

Key issues, problems and concerns facing elephant management in Tanzania raised by stakeholders revolved around poaching, human elephant conflict, habitat loss, blockage of corridors, livelihood and benefits sharing issues, inadequate law enforcement capacity, inadequate stakeholder coordination and inadequate community involvement. Others include climate change, inadequate conservation education amongst communities, poor communication infrastructure, corruption and the lack of accessibility to data for management decision making.

These workshops also examined issues of ivory stockpiles. They analyzed causes of ivory stock piling, implications of the piles and suggested some measure to address causes of stock piling. Major causes of stock piling were identified as killing of elephants through problem animal control programmes, impounded ivory from poachers and restrictions imposed by international conventions (CITES) on the disposal of ivory. Implications of stock piling included high cost of storage and security of ivory, declining trophy quality and lost opportunity for earning foreign currency needed to support conservation law enforcement. Measures suggested to minimize effects of stock piling were strengthening of law enforcement, reconsider the agreement with CITES for its relevancy and benefit to the country and continue with the efforts to lobby for selling of our stockpiles.

Ten strategies for elephant management were agreed upon against which policy statements and actions were developed. The strategies are: (1) Elephant Number Management, (2) Ivory Stockpiling Management, (3) Elephant Ivory Trading, (4) Community Benefits and Involvement, (5) Human-Elephant Conflicts, (6) International Relations, (7) Elephant Protection and Law Enforcement, (8) Elephant Utilization, (9) Elephant Conservation Education and Awareness, and (10) Landscape System Management Approach.

To ensure successful implementation of the plan, it was mentioned that Tanzania needed to collaborate with a variety of stakeholders. Participants to these planning workshops identified individuals, institutions, groups, parties or states with interests in elephant conservation (both negative and positive). The analysis went on to describe the degree of influence and the role which can be played by different stakeholders. The analysis further identified deficiencies in each stakeholder that may affect elephant conservation efforts. This analysis of stakeholders will help identity which stakeholders should be involved at different stages of design, appraisal, implementation and evaluation of the Elephant Management Plan 2010-2015. The list of stakeholders includes conservation organizations, Non-Governmental Organisation (NGOs), research and training institutions, Community-Based Organisations (CBOs), central and local governments. Others key stakeholders include the media, local human communities, religious institutions, politicians, and defence forces.

To be able to gauge the performance of the plan, it was agreed to put in place indicators to accurately measure whether the objectives of TEMP are achieved or not. A set of indicators was developed which included elephant population driver indicators, pressure indicators, state of elephant population indicators, elephant impact management indicators and societal response indicators.

The key results of the zonal workshops were presented at the main TEMP workshop prior to the formulation of the goals, objectives and targets of the main document. See Appendix II for a summary of all the major topics of discussions and participants' views from the zonal workshops.

2. Strategic Objectives and Log frames

2.1 Strategic Objective 1: Human-Elephant Conflict

Objectives

1. Enhance research and monitoring of HEC incidences and mitigation.
2. Expand the use of HEC mitigation methods/techniques in affected areas by 50% (from baseline established through Objective 1).
3. Promote development and implementation of participatory LUP in elephant ranges taking into account elephant movement patterns.
4. Formulate HEC and PAC regulations as per new Wildlife Conservation Act No. 5 of 2009.
5. Promote cross-sector and scaled-integration of HEC mitigation strategies.

Background

For a more detailed introduction to HEC see section 1.5 above. Much research and effort has gone into ameliorating the effects of human-elephant conflict (HEC) in both Africa and Asia. Several options for mitigation are available, including human vigilance, barriers and deterrents. Mitigation trials have demonstrated that no single intervention will adequately control HEC, and often several different combinations of measures need to be combined to avoid elephant habituation and to produce an effective 'synergy'. Instead an integrated approach to reducing HEC is often the most effective solution; incorporating several simple, low cost methods that can be easily applied by communities, such as chilli deterrents, cooperative guarding, simple alarms and buffer zones. Local communities quickly adopt mitigation methods when even minor successes are achieved, and simple self-defence measures can reduce dependence on WD officers and other authorities when communities using HEC mitigation realize they can take primary responsibility for crop protection. This is more likely to occur when villages are involved in community-based conservation programs, where communities who bear the cost of living with elephants derive a share of the benefits from their sustainable utilization.

There is also great potential for using land-use planning at local, district and national levels to try and to prevent HEC from emerging, or to reduce HEC to acceptable levels. Land use planning can involve better zoning to avoid agriculture near key elephant habitats and migration routes, and changing location of fields to facilitate communal defence against problem elephants. Much can be achieved at the local level (e.g. through the land-use planning process required as part of WMA establishment) but the best way to achieve success in the long-term is to integrate HEC considerations in regional and national land-use planning processes; all sectors involved in current or potential developments in wildlife areas should take HEC and human-*wildlife* conflict (HWC) considerations into account during their planning and feasibility assessments (WWF 2008). Studies indicate that relatively high densities of elephants and people can co-exist if land transformation is not too widespread, and if elephants are not subjected to high levels of deliberate disturbance (Parker *et al* 2007).

Land-use planning at higher administrative levels (district, regional or national) is typically a long-term process. National-level land-use planning is best to be designed through a coordinated approach involving all the appropriate Government departments, as well as relevant development projects. For example, it is often the Ministry of Agriculture or the Land Use Commission in the Ministry of Lands that are responsible for deciding how and where various land-use activities will take place, and these decisions ultimately determine how much HEC/HWC occurs. If they fail to take HWC into account during their planning, the Ministry of Environment and the Ministry of Natural Resources and Tourism are called in to solve the problem when HWC inevitably occurs (WWF 2008). If HEC is not considered during land use planning or is not coordinated between the relevant authorities, this can lead to an increase in HWC (Lamarque *et al* 2008).

A new Wildlife Conservation Bill was tabled in Parliament in February 2009 (URT 2009) and passed on the condition that a series of regulations are drafted on a number of issues including human-wildlife conflict and benefit sharing. One of the objectives of the Bill is to "*mitigate human-wildlife conflicts wherever they occur*". The Bill proposes two main methods for "resolving human-wildlife conflicts", (1) paying "consolation for loss of life or crops, or injury caused by problem animals" and (2) "killing problem animals for purposes of saving human life". The regulations are currently being drafted.

Successful long-term management of HEC requires solid support from all levels of government, strong commitment from wildlife management authorities and communities, and the informed use of available tools and methods. Continuing research and active monitoring are also essential. Experience from other countries suggest that it is unrealistic to expect total prevention of conflict and the strategy must be one of mitigation and integrated management to reduce the problem to levels that are tolerable by local communities.

	Objective 1. Enhance research and monitoring of HEC incidence and mitigation.				
Target	Action	Timeline	Actors	Indicator	
1. Manage HEC by sound data collection and analysis.	1.1 Centralise, standardise and harmonise data collection and reporting system through clear protocols (AfESG) implemented by stakeholders, training and operational database system.	By end of 2011	WD, TAWIRI, TANAPA, relevant stakeholders	Database system developed and in place Protocols developed and being effectively used through training programmes as needed Number of HEC incidence reports	
	1.2 Increase data collection coverage to at least 98% of HEC area identified in this document.	2012 and ongoing	WD, TAWIRI, TANAPA, relevant stakeholders	Number of HEC incidence reports Priority conflict areas covered	
	1.3 Establish levels of HEC incidences.	2012 and ongoing	WD, TAWIRI, TANAPA, relevant stakeholders	Annual report	
	1.4 Conduct cost-benefit analyses of elephant-friendly crops through pilot studies and promote viable solutions.	End 2012	TAWIRI, WD, relevant stakeholders, research and conservation organisations	Report on cost-benefit analyses produced and used for promoting viable solutions through exchange visits etc.	
	1.5 Enhance involvement of local game scout associations, agricultural officers and village leaders in the detection and reporting of problem animal incidents	2011 onwards	WD, TAWIRI, TANAPA, relevant stakeholders	Increase in reporting of problem animal incidences	
	1.6 Analyse data and generate standardised reports on a timely basis.	Ongoing	WD, TAWIRI, TANAPA, relevant stakeholders	Number of reports produced and disseminated on time	
	1.7 Incorporate results of data analyses into the coordination and decision-making framework of TANAPA, TAWIRI, WD and stakeholders at local level.	2011 and ongoing	WD, TAWIRI, TANAPA, relevant stakeholders	Minutes of meetings documenting management decisions	
2. Enhance capacity of WD, TANAPA, & TAWIRI in HEC resolution and mitigation by 2012.	2.1 Develop and implement HEC training program (including conflict resolution, community engagement and PAC).	By end of 2011	WD, TANAPA & TAWIRI	Number of staff trained Number of PAC incidents successfully carried out Decline in number of HEC incidences	
	2.2 Assess and recruit experienced personnel in HEC issues and mitigation.	By end of 2011	WD, TANAPA & TAWIRI	Assessment report produced and circulated to KWS HR Proportion of desired qualified personnel recruited	

	Activity	Timeframe	Responsible	Indicator
	2.3 Acquire necessary additional resources such as equipment for HEC mitigation.	Ongoing	WD, TANAPA & TAWIRI	Resources deployed
	2.4 Develop and implement plan to manage HEC, integrating both local communities and other stakeholders in participatory planning.	By 2012	WD, TANAPA & TAWIRI	Comprehensive plan produced and implemented
	2.5 Disseminate training module handbook	By 2012	TAWIRI, WD, DCs, NGOs (development & conservation)	Training module handbook
	2.6 Exchange visits to successful projects	By 2012	TAWIRI, WD, DCs, NGOs (development & conservation)	Exportation of experience from successful areas
	2.7 Enhance capacity (financial, technical, human etc.)	Ongoing	WD	
Objective 2: Expand the use of HEC mitigation methods/techniques in affected areas by 50% (from baseline established through Objective 1).				
1. Improve protection for crops and property on the boundaries of elephant distribution range	1.1 Trial deterrents (disturbance methods, watch towers, fires, chilli fences, beehive fences, innovative technologies) to determine potential effectiveness in different sites.	Ongoing	TAWIRI, WD, TANAPA, landowners and communities, research organisations	Results published and disseminated Number of exchange visits
	1.2. Build the institutional and technical capacity of communities to use available and tested elephant deterrents.	Ongoing	WD, TAWIRI, TNRF, TANAPA, Local Government, NGOs	Number of Conflict Resolution Committees established and functioning Number of community members trained and involved in HEC mitigation
	1.3. Improve awareness in affected communities about elephant conservation and HEC.	Ongoing	WD, TANAPA, TAWIRI, NGOs	Number of awareness programs Number of people reached
	1.4. Trial innovative technologies such as satellite tracking, geo-fencing, camera trapping, etc. in the control of potential problem animals as part of research and monitoring.	2010 onwards	TAWIRI, WD, TANAPA, NGOS	Number of trials with costs-benefit analyses
Objective 3. Promote development and implementation of participatory LUP in elephant ranges, taking into account elephant movement patterns.				
1. Promote and maintain compatible land use in areas of existing or potential HEC.	1.1. Identify land-use types that exist in areas of HEC, determine those that are currently not compatible and recommend appropriate land use types.	Ongoing	WD, TANAPA, NCAA, DCs, TAWIRI, local communities	Approved land use plans in place. Number of WMAs in place. Reduction in HEC incidents.
	1.2. Facilitate and support establishment of WMAs and compatible LUPs.	Ongoing	WD, TANAPA, NCAA, DCs, TAWIRI, local communities, NGOs, Ministry of Lands	WMAs and LUPs

Goal	Activity	Timeframe	Responsible	Indicators
	1.3. Sensitise local communities, politicians, DCC.	End 2011	WD, NGOs, DCs, NCAA, TANAPA and local communities	Number of meetings held, minutes documented and circulated
	1.4. Use District Commissioners for village-level, cross-sectoral planning.	Ongoing	DCs, WD, relevant stakeholders	Number of meetings held, minutes documented and circulated
	1.5. Ensure new developments in elephant distribution range (including fences, structures, etc.) undergo EIAs and that existing developments undergo an environmental audit.	Ongoing	NEMC, WD, TANAPA, DCs, TAWIRI, Ministry of Lands	Proportion of new developments based on EIAs Proportion of existing developments with audits undertaken
2. Secure corridors in areas of existing or potential HEC by 2016.	2.1 Integrate HEC and other elephant distribution data into the planning process for creating corridors and buffer zones as part of habitat maintenance program.	Ongoing	TAWIRI, TANAPA, Wildlife Division, NCA, Local NGOs, District Councils	Corridor and buffer zone plans based on HEC and other elephant distribution data where available/relevant
Objective 4. Formulate HEC and PAC regulations as per the new Wildlife Conservation Act No. 5 of 2009.				
1. HEC and PAC regulations added to the Wildlife Conservation Act No.5 of 2009.	1.1. Prepare preferred regulations		NGOs, WD	
	1.2. Analyse needs and lobby for appropriate regulations		NGOs, WD, National HEC Forums	
	1.3. Put regulations in place to operationalise the Wildlife Act.	By Dec. 2010	WD	Regulations in Place and working
Objective 5. Promote cross-sector and scaled integration of HEC mitigation strategies.				
1. Develop and support forums related to HEC	1.1. Support the newly created (2009) National HEC forum		WD, TANAPA, NCAA, TNRF, TAWIRI, NGOs	
	1.2. Create a district-level HEC forum		WD, TANAPA, NCAA, TNRF, TAWIRI, NGOs	

2.2 Strategic Objective 2: Elephant Corridors

Objectives

1. Identify and assess wildlife corridors.
2. Sensitise and consult with stakeholders.
3. Secure appropriate corridors by 2015.
4. Use monitoring data for effective planning and management of elephant corridors.
5. Facilitate effective and sustained systems for monitoring elephant corridors nationally.

Background

For a detailed introduction to elephant corridors see Section 1.4 above.

The 2009 report (Jones *et al* 2009) "Wildlife Corridors in Tanzania" concluded that:

"the vast majority of the documented corridors in the country are in poor condition, and many critically so. This means that they may have less than five years remaining (up to the year 2013) before they disappear, judging on current rates of habitat change. Most corridors are being destroyed by rapid agricultural expansion, increased bushmeat trade, and the building of roads. Unless action is taken in specific areas to manage these activities in a way that considers both human and wildlife needs, human-wildlife conflict will increase and Tanzania's protected areas will become ecologically isolated islands, leading to inevitable decline of animal and plant populations. This will have serious economic and environmental implications for the next generation of Tanzanians. Unfortunately, the opportunities for establishing, maintaining or managing corridors between protected areas are rapidly diminishing."

Among the five corridors cited as in 'extreme' condition in 2009 (likely to disappear within 2 years, see Table 2) the Udzungwa-Selous (Nyanganje and Ruipa) corridors were indeed found to be blocked during a recent re-survey in 2010; no elephants were recorded along these routes during the last two years. This loss of connectivity between elephant populations is predicted to recur in all the other remaining elephant corridors around the country unless urgent actions are taken, hence the prominence of corridors in this Management Plan. The Udzungwa-Selous corridors may still be restored, and if this can be achieved, elephants, known to be long-lived and remember migration routes for many years, will likely resume usage of these routes. Thus this Plan aims to restore lost corridors, as well as to increase protection for identified corridors that are still in use.

The Government of Tanzania recognizes that, for elephants and many other species, the restoration and protection of corridors represents a serious and urgent challenge that is vital to the Vision, Mission and Goal of this Plan. The new Wildlife Conservation Act 2009, section 21(1-3), presents for the first time a new law specifically aimed at conserving Tanzania's wildlife corridors:

> ### (b) Protection of Wildlife Corridor, Dispersal Area, Buffer Zones and Migratory Routes
>
> 21.—(1) The Minister may, in consultation with relevant local authorities and by Order in the *Gazette*, designate wildlife corridors, dispersal areas, buffer zones and migratory routes.
>
> (2) The Minister may, after consultation with the relevant local authorities, prescribe for regulations in the Gazette to govern the management of designated wildlife corridors, dispersal areas, buffer zones and migratory routes.
>
> (3) Regulations made by the Minister under subsection (2) of this section shall declare rights of communities that are compatible with conservation.

Marginal note: Designation of wildlife corridors, dispersal areas, buffer zones and migratory routes

Regulations for implementing this section of the Act are currently being drawn up and will soon be published.

Objective 1: Identify and assess wildlife corridors				
Target	**Action**	**Timeline**	**Actor**	**Indicator**
1. Ascertain and assess priority corridors	1.1 Conduct rapid assessment of corridors 1.2 Literature review 1.3 Interviews 1.4 Trails, dung, feedings signs, etc 1.5 Usage / Current land use 1.6 Species 1.7 Mapping extent of corridors 1.8 Assessing/mapping 1.9 Human activities 1.10 Workshop on priority areas where criteria are developed then each area is assessed	1.5 years	WD, TAWIRI, TANAPA, land use commission, District Authorities	Report # identified and assessed corridor Priority list with urgency ranks
Objective 2: Sensitise and Consult with stakeholders				
1. Consult and sensitize stakeholders on priority corridors	1.1. Conduct meeting with relevant stakeholders	Ongoing	TAWIRI, WD, TANAPA	# of meeting conducted # of proceedings
	1.2. Education & awareness campaign	Ongoing	TAWIRI,WD, TANAPA, NCAA, NGOs, DC	Behavioral change/attitude/practices # of corridors secured
	1.3 To recognize and establish "Elephant Day" nationally	Annually	MRT	Elephant Day celebrated on 22 September yearly
Objective 3: Secure appropriate corridors by 2015				
1. Use current knowledge to identify potential corridors	1.1 Survey and collate information into accessible format/report 1.2 Develop a comprehensive spatial plan for corridors using current knowledge	By 2011	WCS, TAWIRI, other NGOs	Complete plan

Objective	Action	Timeframe	Responsible	Indicator/Output
2. Prioritize areas based on a set of criteria and assess feasibility	2.1 Workshop on priorities areas where criteria are developed then each area is assessed	2011	WCS, TAWIRI, WD, TANAPA	Priority list with urgency
3. Establish compatible and non compatible activities within corridors (linked to monitoring and evaluation)	3.1 Workshop to identify compatible and non compatibles	2011	TAWIRI, WD, NEMC, communities	Set of guidelines for the management of corridors
4. Adopt and secure critical corridors	4.1 Awareness and sensitization and consultation with relevant communities	Most threatened within 2 years (2012)	WD and TAWIRI, TANAPA, relevant authorities and stakeholders	Legal status secured
	4.2 Submission to the minister and Approval		WD and Minister	
5. Improve adoptions of additional corridors	5.1 Awareness and sensitization and consultation with relevant communities	2013	WD and TAWIRI, TANAPA, relevant authorities and stakeholders	Legal status secured
	5.2 Submission to the minister and Approval		WD and Minister	
6. Revive lost corridors	6.1 Awareness and sensitization and consultation with relevant communities	2015	WD, TAWIRI, TANAPA, Communities, relevant authorities and stakeholders	Legal status secured
	6.2 Submission to the minister and Approval		WD and Minister	
7. Explore new corridor areas	7.1 Identify possible areas for surveys 7.2 Conduct surveys in selected areas	Ongoing	TAWIRI, WCS, NGOs, researchers, etc	Full area coverage of country assessed covering time
8. Ensure that the corridors get incorporated into the land use plan	8.1 Support villages to develop land use plans (consultative process)	Ongoing as adopted	District authorities The ministry MNRT Ministry of Lands Communities	Integrated land use plan taking corridors into account

Strategy	Activity	Timeframe	Actors	Indicators
9. Sensitize and educate the public about the need for elephant corridors	9.1 Work with schools, stakeholders and communities, and general public	Ongoing	WD, stakeholders, private sector, NGOs, TANAPA, DCs, academic institutions, forestry	Understanding and compliance. Number of illegal incidents reduced.
10. Monitor and evaluate corridor integrity	10.1 Identify corridors for monitoring 10.2 Develop methodology 10.3 Implement 10.4 Report		TAWIRI, TANAPA, WD, local authorities	Feedback regarding compliance
11. Monitor implementation	11.1 Conduct joint law enforcement activities	Ongoing	WD, DC, Local communities, private sectors, AAs	# patrols conducted Size of area covered # illegal activities # of prosecuted cases
12. Develop village by-laws to support land use plans	12.1 Ensure appropriate by-laws are in place. No HEC consolation for individuals who not compliant with by-laws	Ongoing	Local authorities	
Objective 4: Use monitoring data for effective planning and management of elephant corridors.				
1. Organize corridor data in a user-friendly manner for planners and policy makers	1.1. Develop and test a data template that is usable for all stakeholders.	Ongoing	TAWIRI, Researchers Institution, WD, TANAPA, NCAA	Database available and accessible to users
Objective 5: Facilitate effective and sustained systems for monitoring elephant corridors nationally				
1. Develop effective and sustained systems for monitoring elephant corridors nationally	1.1. Establish specific link among law enforcement, research and monitoring & database	Ongoing	Communities, Researchers	Corridors secured Database established
	1.2. Re-enforce local communities capacity in the conservation of elephant corridors	Ongoing	TANAPA ,WD, NCAA, NGOs, DC, private sectors	Improved effectiveness of elephant corridor conservation

2.3 Strategic Objective 3: Law Enforcement

Objectives

1. Integrated, effective, proactive and efficient elephant security mechanisms for Tanzania.

2. Strengthen regional and international cooperation regarding elephant security (including improving border controls).

3. Security capacity within Tanzania (financial, technology, human resources, and information management) is appropriately resourced.

4. Develop and implement preventative/proactive strategies.

5. Monitor and evaluate reporting of law enforcement activities.

6. Strengthen inter-agencies cooperation and awareness to ensure due process in prosecution procedures.

7. Strengthen implementation of MIKE and reporting to ETIS.

8. Review plan implementation as well as plan effectiveness (management effectiveness).

Background

Tanzania has one of the finest records of conservation policy and action in the world, supported by a strong legal framework. The Government of Tanzania continues to gazette new protected areas, which now cover nearly 25% of the country's land area. Wildlife conservation laws date back to 1891 when provisions were enacted to protect certain species, including elephants, were implemented by regulating the off-take, hunting methods, and trade in wildlife.

National Wildlife Laws and Management Authorities

The wildlife of Tanzania is protected under several Acts of Parliament that provide authority for all aspects of wildlife management, including law enforcement.

The Wildlife Conservation Act 2009 (replacing the Wildlife Conservation Act of 1974), provides the legal framework for the operation of the Wildlife Division, including the appointment of the Director and the establishment of Game Reserves, Game Controlled Areas, Wildlife Management Areas and other protected areas such as wildlife corridors (excluding national parks). It also provides for the establishment of a Wildlife Authority addressing the management of wildlife outside the National Parks or Ngorongoro Conservation Area, and with responsibility for international obligations relating to wildlife conservation. The Wildlife Protection Unit is given paramilitary status in this Act, with the task of wildlife protection against unlawful utilization. The Act covers the consumptive and non-consumptive use of wildlife, the courses of action possible in cases of human-wildlife conflict, and the conditions for wildlife ranching. The remit of the Tanzania Wildlife Protection Fund to facilitate and support conservation is also defined.

The National Parks Act (CAP 282 RE 2002) establishes the legal authority for the creation and management of national parks, giving powers to the Director General to enable maintenance and security of national parks, and the responsibility for the protection of their wildlife.

The Ngorongoro Conservation Act (CAP 284 RE 2002) provides the legal instrument for the existence of the multiple land-use in Ngorongoro Conservation Area and its management Authority under the direction of the Conservator, and also provides powers for its maintenance and security.

The Tanzania Wildlife Research Institute (TAWIRI, CAP 260 RE.2002), gives powers to the Director General who is responsible for research related to wildlife, and providing this information to the

Wildlife Authorities. It is also the CITES Scientific Authority for Tanzania.

International and Regional Legal Instruments

Tanzania has ratified and is implementing the following international treaties and agreements related to wildlife law enforcement:

- CITES - the Convention on International Trade in Endangered Species of Wild Fauna and Flora. Tanzania officially became a CITES Member in 1980. In 1997, the Convention of Parties (COP) passed Resolution 10.10 on establishing two elephant monitoring programmes: Monitoring the Illegal Killing of Elephants[1] (MIKE) and Elephant Trade Information System[2] (ETIS); Tanzania began implementation of these programmes in 2002.

- Lusaka Agreement on Cooperative Enforcement Operation Directed at Illegal Trade in Wild Fauna and Flora (signed in Lusaka, 1996).

- Southern African Development Community (SADC) Protocol on Wildlife Conservation and Law Enforcement (ratified in 2000)

Wildlife Law Enforcement in Tanzania

Each of the wildlife institutions has a special law enforcement unit. The Wildlife Division's Anti Poaching Unit (APU), was first established by an Act of Parliament in 1978. It is administered within the WD, with powers vested in the Director of Wildlife. APU staff are deployed in eight zones countrywide (*Northern*: Arusha, *Central*: Manyoni, *Southern*: Songea, *Southern Highlands*: Iringa, *Western*: Tabora, *Lake Zone*: Mwanza, *Eastern*: Dar es Salaam and *Serengeti*: Bunda). TANAPA has established Anti-Poaching departments in each of the National Parks. All WD, NCAA and TANAPA anti-poaching units have the power of search and arrest, and carry firearms.

Law Enforcement in Relation to Elephants conservation

The principal law enforcement challenge for wildlife managers in relation to elephants is the demand for ivory. When demand for ivory was high in the 1980s, the population of the African elephant across the continent was halved, from approximately 1,300,000 in 1979 to 600,000 in 1988 as a result of poaching (UNEP/GEMS 1988). In Tanzania, the elephant population was halved from 110,000 to 55,000 during this period (UNEP/GEMS 1988).

Growing international awareness of the unsustainable attrition of the African Elephant population led to the placement of the species on CITES Appendix 1 in 1989, effectively banning the sale of ivory and other elephant products with instant effect. Coupled with effective anti-poaching operations, such as *Operation Uhai* in Tanzania, where the Army and Police Forces collaborated with the Wildlife Department to bring poaching under control, this led to an almost complete cessation of the international ivory trade. This has allowed the elephant population in Africa, and Tanzania especially, to recover to today's level.

Recent Law Enforcement Efforts

Unfortunately in recent years there has been growing evidence that the illegal killing of elephants and the smuggling of ivory is on the increase. In 2009 there were 32 seizures of illegal ivory in Tanzania (WD, TANAPA & TRAFFIC), and four incidents involving shipments of ivory from Tanzania occurred outside the country, with a total weight of 13,066 kg (6,232 kg in Vietnam, March 2009; 3,346 kg in Philippines, April 2009; 1,483 kg in the Philippines, April 2009; 2005 kg in Vietnam, August 2009;

---

1 See www.cites.org/eng/prog/mike/index.shtml

2 See www.cites.org/eng/cop/15/doc/index.shtml

Midala 2010).

To address this increase in poaching, two special operations involving Wildlife Division forces and the Police were mounted in 2009 to curb the increase in illegal killing of elephants in Tanzania:

- *Operation Kipepeo* (Operation butterfly in Selous ecosystem): 70 poachers arrested
- *Operation Costa* (multinational, coordinated by Interpol): 22 poachers arrested

Additionally, the Wildlife Conservation Foundation of Tanzania (WCFT) has instituted a rewards scheme in southern Tanzania, printing and distributing more than 3,000 posters. This has led to the arrest of nine poachers who were caught in possession of twelve pieces of ivory weighing 85.7 kgs, 25 kg of elephant meat, and two weapons. Eight informers have been paid a total of 8,600,000/ TZS (USD$ 6,615).

In 2009 two inter-agency workshops on wildlife law enforcement were held in Dar es Salaam and Arusha to foster cooperation between agencies and formulate a strategy to combat illegal killing. A number of strategies were discussed, with the ultimate goal of zero poaching of elephants.

Target	Action	Timeline	Actors	Indicators
Objective 1: Integrated, effective, proactive and efficient elephant security mechanisms for Tanzania				
1. Improve coordination among various management authorities	1.1 Check that the policies are same or different and try to harmonize; policy defines regulations and these need to be aligned and consistent 1.2 Review and harmonize the Wildlife Management Act, NCAA and TANAPA acts 1.3 Jurisdiction issues need to be addressed to ensure cooperation and efficiency 1.4 Ensure clarity in the interpretation of the law amongst all stake holders 1.5 Develop a standardized set of operational procedures (include definitions of types of operations) with prevention versus reactive strategies 1.6 Powers of operation 1.7 Information sharing	Dec 2011	WD, TANAPA, NCAA, Customs authority, Port authority, private sector, relevant stakeholders	• A mechanism that enables environment for cooperative collaboration • A manual for standard operational procedures understood , accepted and adopted by all relevant authorities and stakeholders
2. Develop partnerships with stakeholders and private sector to facilitate joint operations and effective law enforcement strategies	2.1 Develop and implement enabling policy to optimally and fairly utilize private stakeholders in law enforcement 2.2 Develop an agreed set of standards and training requirements for law enforcement activities that is consistent across all sectors	2011	MNRT, private sector, relevant stakeholders	• Constructive and beneficial relationships between authorities and private stake holders • Enhanced law enforcement capacity
3. Improve law enforcement area coverage	3.1 Assess current coverage 3.2 Develop and adopt strategies to improve coverage	Ongoing	WD, TANAPA, NCAA, WMA	70% area coverage in time and space of identified range
4. Establish and strengthen cross-border cooperation with respect to law enforcement	4.1 Assess what is in place 4.2 Identify needs and opportunities 4.3 Identify stake holders 4.4 Develop relationships and mechanisms 4.5 Synchronized anti-poaching patrols 4.6 Patrols planned for each cross border 4.7 Respond to all cross boundary related hot pursuits through joint patrols	Ongoing	WD, TANAPA, NCAA, and Wildlife authorities in respective countries	• Close cooperation undertaken successfully (number of interactions successful compared to number of approaches) • 100% of planned activities achieved • Number of cross-border incidence responded to versus number response • Synchronized patrols

				Increased effort leading to a reduction of incidents through time
5. Monitor implementation	5.1 Ensure efficiency and adaptive management of LE ops, coverage and patrols	Ongoing	Authorities and private stakeholders	Increased effort leading to a reduction of incidents through time

Objective 2. Strengthening regional and international cooperation regarding elephant security

1.Strengthen relationships and cooperation at regional and international levels	1.1 Identify key partners (e.g. Interpol, neighbours, recipient countries (those importing illegal material) and develop protocols and agreements to facilitate close relations 1.2 Implement	2011 for initial ID and protocols, thereafter ongoing	Ministry of Home Affairs (PF), Ministry of Foreign Affairs	• Reduced incidents of illegal ivory trade incidents related to Tanzania • Reduced elephant-related illegal incidents within TZ
2.Establish information sharing systems	2.1 Literature review on relevant themes (best practice on law enforcement) 2.2 Understand what information is available 2.3 Contact relevant counties and institutions to facilitate information exchange	First assess Dec 2011, thereafter ongoing	Ministry of Home Affairs (PF), Ministry of Foreign Affairs, TANAPA, WD,TAWIRI, forensic investigations, relevant stakeholders	Up-to-date and current technologies and strategies implemented

Objective 3: An appropriately resourced security capacity within Tanzania (financial, technology, human resources, info. management)

Financial

1.Secure government support that recognizes security as a top priority for elephant management	1.1 Sensitize and rationalize the need for appropriate funding with Government 1.2 Ensure security is given priority in government-level budgeting process	2011	MNRT, WD, TANAPA, NCAA, private sector, Ministry of Home Affairs	Appropriate allocation of resources for security from government

Objective/Target	Activities	Date	Responsible parties	Indicators
2. Develop appropriate funding mechanism models that ensure credibility and capacity for all relevant sectors involved in law enforcement	2.1 Conduct participatory review of needs and priorities, assess current practices and explore alternative models (e.g. Retention schemes, Specialized Fund) 2.2 Ratify and approve new models and allocate appropriate resources 2.3 Appropriate allocation of resources to all components of law enforcement subject to annual audits 2.4 Secure funding for border/entry/exit controls, intelligence, and to improve overall operational capacity	2011	MNRT, private sector, partners (e.g. tourism sector)	• Appropriate allocation of resources for all LE Functions • Law enforcement units pass annual audit

Training and human resources

Objective/Target	Activities	Date	Responsible parties	Indicators
3.Secure appropriate human resource capacity (people and training)	3.1 Identify training needs (tactical, data recording, crime scene, law and penalties, SOPS etc) 3.2 Identify trainers and develop courses 3.3 Identify human resource requirements across all sectors 3.4 Secure capacity requirements 3.5 Deploy	2011 2011 2011 2013 2014	MNRT, WD, TANAPA, NCAA, Private sector, Educational institutions	Effective LE capacity to support the implementation of the plan
4.Improve the curriculums at relevant training institutions	4.1 Use participatory approach to assessing and and updating current curriculums	2013	MNRT, WD, TANAPA, NCAA, Private sector, Education institutions	Graduates equipped with a solid understanding of wildlife laws and their implementation
5.Train and educate in all sectors on SOPS, (see target 1)	5.1 Identify all staff and stakeholders requiring the training (including judiciary) 5.2 Train trainers 5.3 Develop a training schedule with targets 5.4 Implement	2011 2012 ongoing	WD, TANAPA, NCAA, private sector, relevant stakeholders Ministry of Defense, Ministry of Home Affairs	• Competent coordinated and cooperative law enforcement activities • Reduced number of illegal incidents

Objective	No.	Activity	Timeframe	Responsible	Expected outcome
6. Develop capacity among law enforcement staff	6.1	Identify training needs and develop appropriate training program	Plan and schedule in place by 2012 Thereafter ongoing	MNRT/WD/TANAPA/NCAA/ Private sector	Compliance and capacity to effectively conduct duties
	6.2	Provide refresher courses for current Law enforcement staff and further on the job training			
7. Train and create awareness for prosecutors on wildlife laws and penalties	7.1	Arrange independent workshops to create awareness within judiciary regarding wildlife laws	Ongoing	WD, TANAPA, NCAA	Improved number of prosecutions for wildlife related issues
8. Improve database training	8.1	Develop training course	2011	WD, TANAPA, NCAA	Competent data base management (accuracy, accessibility, reporting)
	8.2	Identify key individuals for responsibility	2012		
	8.3	Implement appropriate training	Ongoing		
9. Provide training on data collection at crime scenes to ensure strong cases for prosecution	9.1	Develop course based on best practices	Ongoing	WD, TANAPA, NCAA	Improved prosecution rates in relation to evidence presented (strong well-presented cases)
10. Adopt technical expertise training to support technical tools (see below)	10.1	Identify training needs and develop training modules and schedule	Needs 2011 Training modules done by 2012	MNRT, WD, TANAPA, NCAA, Private sector	• Improved technical expertise capacity • Technical expertise includes: use of GPS/GIS, etc.

Technical

Objective	No.	Activity	Timeframe	Responsible	Expected outcome
11. Implement effective forensic tools	11.1	Centre of excellence in forensic investigations	2012	MNRT, TAWIRI	• Certified wildlife forensic laboratory • Improved case prosecutions based on forensic evidence • Improved credibility of court evidence
	11.2	Develop and equip lab			
	11.3	Certification for TZ laboratories for wildlife investigations so that results are accepted in a court of law.			

12. Improve availability of equipment for Law Enforcement	12.1 Identify tactical requirements in accordance with best practice and SOP's requirements (GPS, radios, communications, weapons, tents , camping equipment, metal detectors, x-ray equipment, transportation: ground and air (micro-light in all areas – cheap to run and quiet) 12.2 Assess current capacity on ground to determine gaps 12.3 Secure equipment and distribute appropriately to areas of need	Assessment Dec 2011 Equipment: basic needs by 2012 Optimal 2013 thereafter ongoing	MNRT, WD, NCAA, TANAPA, private sector	• Appropriately equipped law enforcement capacity across the whole country • Increased number of patrols • Improved area coverage
13. Investigate tools to deal with evidence and scene of crime	13.1 Identify requirements and secure necessary tools	2012	MNRT, WD, NCAA, TANAPA, private sector	Strong evidence for prosecution of cases
14. Assess the use of sniffer and tracker dog units in PA's	14.1 Identify lead organisation for this program 14.2 Identify and prioritize needs according to strategic requirements (airports, bush boarders, sea ports) 14.3 Provide training for units 14.4 Amend law to make allowance for dogs in PAs	Assessment 2011 Training to start 2012 Implementation 2013	MNRT, WD, NCAA, TANAPA, Ministry of Home Affairs, private sector, police	• Improved arrests at areas where implemented • Number of successful resolutions versus number of cases attempted
Objective 4. Development and implementation of Preventative/Proactive strategies to deter illegal activity with regard to elephants				
1. Gather Intelligence information	1.1 Review legislation pertaining to undercover work 1.2 Improve informer networks 1.3 Use the WMA's to gather information 1.4 Compare and assess policies across the relevant authorities on informer rewards and harmonize to develop a consistent mechanism (policy and procedure) for incentives for informers, improve turn-over time for rewards (reward is post success), must address confidentiality of information 1.5 Protection of the investigators and informers	2012 Ongoing Ongoing June 2012 Ongoing	WD, TANAPA, NCAA, Ministry of Home Affairs, WMA	Legislation reviewed and systems of gathering information through informers strengthened

Strategy	No.	Activity	Timeframe	Responsible	Indicator
2.Adopt best practice preventative strategies	2.1 2.2 2.3	Share and review information regarding tactical strategies for the prevention of illegal activities, investigation procedures, bring in experts if required Decide on appropriate strategies Implement strategies	Ongoing	WD, TANAPA, NCAA, WMA	Increased information sharing between stakeholders

Objective 5: Monitoring and evaluation and reporting of Law Enforcement activities

Strategy	No.	Activity	Timeframe	Responsible	Indicator
3.Implement national and international databases (MIST)	3.1 3.2 3.3 3.4	Develop databases Identify key information requirements Train appropriate personnel Provide regular reporting and reviews	2011	WD, TANAPA, NCAA, WMA, TAWIRI, Conservation NGO's	• Relevant national and international reporting compliance • Improved LE efficiency/planning
5.Develop protocol for monitoring of Law enforcement efforts (incidents and case outcomes)	5.1 5.2 5.3	Identify law enforcement monitoring needs Develop law enforcement monitoring protocols Train appropriate personnel	2011	WD, TANAPA, NCAA, TAWIRI	Protocols developed and system operational

Objective 6. Need to strengthen inter-agency cooperation and awareness to ensure due process in prosecution procedures

Strategy	No.	Activity	Timeframe	Responsible	Indicator
1.Ensure appropriate training at college-level on wildlife laws for officers and judiciary	1.1	Approach colleges and ensure that wildlife acts are profiled within the curriculum	Ongoing	WD, education institutions	Improved understanding within the judiciary regarding wildlife acts
2.Improve commitment and awareness of judiciary with respect to wildlife laws and penalties	2.1 2.2	Conduct workshops to improve awareness Work with magistrates at all levels	Ongoing	WD, TANAPA, NCAA, Customs authority, Port authority	Improved number of prosecutions for wildlife related issues
3. Increase powers of prosecution for wildlife officers	3.1	Review law to increase powers of prosecution	Ongoing	WD, TANAPA, NCAA, MNRT	Efficient handling of wildlife related cases
4. Ensure cases are strong with appropriate evidence	4.1 4.2	Ensure comprehensive investigations are conducted Ensure appropriate arrest processes are followed	Ongoing	WD, TANAPA, NCAA, Customs authority, Port authority private sector	Improved number of prosecutions for wildlife related issues

Target	No.	Activity	Timeframe	Responsible	Expected outcome
5. Case Follow up	5.1	Develop standardized protocol for recording and reporting information	2012	WD, TANAPA, NCAA, Public prosecutors office??	• Accurate "complete" database with all cases and outcomes • Efficient reporting to assist in identifying issues gaps threats and successes
	5.2	Incorporate new protocols into central database			
	5.3	Follow up on all wildlife related cases, record outcomes and penalties where relevant			
6. Review and implement appropriate penalties	6.1	Review current penalties and enhance penalties where appropriate	2011	WD, TANAPA, NCAA, Judiciary, MNRT	Illegal wildlife related activity reduced
	6.2	Create awareness of current penalties among judiciary and public	Ongoing (awareness)		

Objective 7. Strengthen implementation of MIKE and Reporting to ETIS

Target	No.	Activity	Timeframe	Responsible	Expected outcome
1. Conduct and implement a training needs assessment	1.1	Identify gaps in current training levels	2011	WD, TANAPA, NCAA, TAWIRI, ETIS and MIKE secretariat	Personnel trained to appropriate level
	1.2	Provide additional training where required			
2. Compliance with reporting	2.1	Data from MIKE sites entered into database and submitted to MIKE authority	Ongoing	WD, TANAPA, NCAA, Customs authority, Port authority, MIKE, ETIS	Submission of accurate information within the required time lines
	2.2	Data on illegal trade collected from relevant authorities by WD and submitted to ETIS authority.			
3. Ensure continuity and appropriate overlap among personnel	3.1	Sensitize Directors of wildlife management institutions to the need for staff continuity	Ongoing	WD, TANAPA, NCAA	Consistent capacity in data collection and reporting
	3.2	Ensure appropriate hand over period and in-house training			
4. Improve communication at MIKE sites	1.1	Ensure local internet structures service MIKE centers	2012	WD, TANAPA, NCAA	Effective communications at all sites

5.Improve IT technology for collecting data (through mobile phones linked to database)	5.1	Explore and test systems for data collection and transfer	2012		• Improved coverage for data collection • Coverage of all areas defined as MIKE sites
6.Assess and add possible additional MIKE sites (once data collection and reporting is satisfactory for established sites)	6.1	Identify and approve new MIKE sites	2011	WD, TANAPA, NCAA, TAWIRI, Researchers	New MIKE sites added for identified areas
Objective 8. Strengthening and Improved border controls (integrated approaches)					
1.Improve training across all authorities	1,1 / 1.2 / 1.3	Identify training needs / Develop new training module based on best practices / Implement and train personnel	2011	Ministry of Home Affairs, Ministry of Defence, ??WD	Secure borders
2. Improve security using new technology and cooperation and improve collaboration between Wildlife Offices and other authorities operating at exit points	2.1 / 2.2	Explore range of new technologies available and adopt where appropriate / Hold regular meetings between relevant authorities	Assessment 2011 / Ongoing	Ministry of Home Affairs, Ministry of Defence, WD	Reduction in illegal trade
Objective 9 Review plan implementation as well as plan effectiveness (management effectiveness)					
1.Assessment of the plan implementation and progress against targets	1.1	Workshop with actors to review progress	2x/year 1st year, thereafter annually	All actors	% targets implemented
2.Review effectiveness of plan outcomes	2.1	Success in relation to objectives		All actors	Reduction in the number of elephant related illegal incidents

2.4 Strategic Objective 4: Benefits and Sustainable Utilization

Objective

Economic benefits from elephants are shared equitably for their sustainable conservation.

Background

Few, if any, of the protected areas in Tanzania are 'closed systems', which means that wildlife regularly disperse outside the boundaries of protected areas in search of food and water. The costs of coexisting with wildlife (such as loss of crops, cattle and infrastructure to wildlife) therefore often fall disproportionately on local communities living in close proximity to protected areas. If wildlife is more costly than beneficial to communities, then communities have little incentive to protect the wildlife, which are readily displaced and eventually disappear. A recent extensive review of case studies of HEC in Africa and Asia (WWF 2008) found that where local communities have no way of benefiting from wildlife or from the ecosystems in which they live, there is an extremely low tolerance of wildlife and wildlife-related losses, even when the actual economic losses are low. In such scenarios, any long-term benefits that can be generated from the presence and utilization of wildlife will be lost. Reducing the costs and ensuring a more equitable distribution of benefits from wildlife is therefore essential for securing local support to conservation, which in turn is a key determinant for existence of wildlife outside protected areas (Leader-Williams & Hutton 2005; Walpole & Thouless 2005; Osei-Owusu & Bakker 2008).

This was acknowledged in Tanzania's Wildlife Policy of 1998 (revised in 2007), which stated its goal for allowing "*... rural communities and private land holders to manage wildlife on their land for their own benefit*" and *"devolving management responsibility of the settled and unsettled areas outside PAs [protected areas] to rural people and the private sector."*

Wildlife Management Areas

One of Tanzania's responses to the imperative of returning benefits from wildlife to local communities, and to develop community-based natural resource management (CBNRM), has been the establishment of Wildlife Management Areas (WMAs). The framework for WMAs was set out in Tanzania's Wildlife Policy of 1998 (revised in 2007), while legislation authorising the formal establishment of WMAs came in the Wildlife Management Areas Regulations (2002).

Wildlife Management Areas in Tanzania are established on village lands that are outside protected areas (although often strategically established within corridors and wildlife dispersal areas), and are used by communities for conservation and benefit sharing in conjunction with the Wildlife Division (Kweka 2010). Although local communities run the WMAs as a business venture, 50% of hunting revenue is retained by the Wildlife Division, which also sets quotas and tariffs for any hunting in the WMA (Wildlife Division 2003).

The facilitation of WMAs commenced in 2003, with 12 of 16 original proposals achieving AA status (Authorised Association), with a further 12 in process. These have so far brought a further 23,700 km^2 of Tanzania's land area into its conservation network (Kweka 2010). To date, six out of the 10 WMAs with user-rights have entered into business agreements worth over USD $3.5 million with the private sector, although only a small proportion of this has been made available to communities so far, and over USD $ 1.7 million has been allocated to nine WMAs and several districts in which hunting took place between 2005-2008. In addition, the establishment of WMAs has increased capacity for protected area management through the training of village game scouts and managers of the WMAs (Kweka 2010).

Although in general the policy of establishing WMAs has demonstrated their economic, social and

conservation viability through appropriate conservation business ventures, there are challenges that still need to be addressed. Investment in training and capacity development needs to be increased as there is often inadequate human capacity with relevant skills to manage the CBO and AA. The ability of the community to hold the CBO management accountable and ensure transparent decision-making processes is also often an issue. Above all there is a need to increase communities' access to economic benefits from wildlife utilization as at present most WMAs have low capacity to generate income for socio-economic development (Kweka 2010, Nelson *et al* 2006).

Wildlife Use

In Tanzania 'wildlife use' is currently defined as *consumptive* and *non-consumptive*, with both forms providing substantial revenue to the country. *Consumptive use* includes all forms of wildlife hunting, including by Tanzanian residents as well as by tourists, while *non-consumptive use* occurs in the form of leisure and photographic tourism, principally within the National Parks and some Game Reserves. Hunting of elephants is permitted only to trophy hunters on payment of a license fee ranging from $7,500 to $25,000, depending upon the tusk size of the animal shot and the type of weapon used. The minimum tusk size for a trophy animal is 15kg for both males and females. Since 2007 the national annual export quota arranged through CITES is currently 200 trophy-hunted male elephants (400 tusks) per year, although off-take has been less than 50% of the quota since 2007 (CITES 2010). Elephant trophy hunting occurs in Game Reserves, Game Controlled Areas, and Wildlife Management Areas where designated hunting blocks exist.

The recorded annual legal off-take of elephants in Tanzania is approximately 0.7% of the population; even allowing for higher than expected natural mortality, all legal off-take falls within the expected rate of increase of the population (3-5%) and is thus considered to be sustainable (CITES 2010). Causes of elephant mortality in Tanzania are sport hunting (less than 100 individuals per year), problem animal control (average 287 animals per year), natural mortality (231 per year recorded, though this is probably an underestimate due to the difficulty of finding many carcasses) and illegal killing (CITES 2010).

In 2009 an application from the Government of Tanzania was made to CITES (CITES 2009) for approval to sell part of the Government stockpile of ivory to raise funds for elephant conservation, and to permit the sale of other elephant products (such as skins) and live elephants. This proposal was not passed at the Fifteenth Conference of the Parties ("CITES COP15") at Doha, Qatar, and thus the sale of Tanzanian ivory stockpiles and other elephant products remains prohibited.

Objective: Economic benefits from elephants are shared equitably for their sustainable conservation.

Target	Action	Timeline	Actor	Indicators
1. Increase economic benefits from elephants in all regions with elephants	1.1 Facilitate establishment and functioning of more WMAs	Ongoing	WD, NGOs, DC, TANAPA, NCAA	# of functioning WMAs
	1.2 Facilitate development of conservation-based income generated business on less developed areas	Ongoing	Private sectors, WD, Communities, TANAPA	# of operations, size of revenue
	1.3 Improve marketing strategies for elephants in the whole country	Ongoing	Private sector, WD, Communities, TANAPA, WD	# of investments, infrastructure development
	1.4 Train communities in business skills using a 'WMA promotion unit'	Ongoing	WD, NGOs, Private sectors	Development changes noticed
2. Ensure revenue are equitably shared and well managed	2.1 Raise awareness on law regulations and mechanisms that govern benefit sharing amongst all stakeholders	Ongoing	WD	# of meetings Change in practice
	2.2 Provide revenue collection, training in financial management, institutional building and managing	Ongoing	WD, NGOs	# of people trained # of training programs
	2.3 Ensure compliance with regulations and mechanisms governing revenue management within WMAs	Ongoing	WD, DC, Investors	
3. Raise education and awareness at the value of elephants to all levels of the economy	3.1 Conduct cost benefit analysis on elephant in the economy at community, district and national level	End of 2011	WD, TANAPA, NCAA, TAWIRI, TRA, Private Sector, WMA, Tourism, Bureau of statistics Division, NGOs	Report
	3.2 Develop an integrated education programs for radio and TV	Ongoing	WD, TANAPA, NCAA	
	3.3 Develop and disseminate education materials	Ongoing	AA, TANAPA, NCAA, WD	
	3.4 Conduct exchange visits for best practicing models	Ongoing	AA, TANAPA, NCAA, NGOs	# of visits
	3.5 Promote school visits to wildlife areas	Ongoing	MoE, WD, TANAPA, NGOs, Malihai Club, WCST	# of visits
	3.6 Conduct awareness seminars for politicians, religious institutions and policy makers	Annually	WD, TANAPA, FBD	# of seminars

2.5 Strategic Objective 5: Ivory Stockpile and Management System

Objective

To have a secure chain of custody program of ivory in the Country

Background

Tanzania adheres to international standards of managing ivory stocks and has adopted a computerized ivory management system that was devised by TRAFFIC International. In accordance with CITES Resolution Conf. 10.10 (Rev. CoP 15 b) all whole tusks in the stockpile have been individually marked with punch dye and allocated a unique serial number in indelible ink (MNRT-TZ 2010). The marks are correlated with the register (database) entry showing area of origin and source. Smaller pieces (less than 1 kg or 20 cm in length) are weighed together in bags. Ivory of unknown origin or coming from outside Tanzania is kept separate from the Tanzania stockpile. According to the Wildlife Conservation Act 2009, it is obligatory for the public to surrender any ivory found to the Government.

There are three sources of ivory submitted to the Government of Tanzania: natural mortality, problem animal control and confiscation following law enforcement. Once obtained, ivory is taken to the nearest Wildlife Division field station for registration, which includes weighing and permanently marking by punching in station registration numbers that consist of two or three initial letters / serial number / two last digits of year of collection. Furthermore, other details of the ivory are recorded in the Official Register of Trophies, as according to the Wildlife Conservation Act. Registered ivory is subsequently stored temporarily at the field station before being transferred to the ivory strong-room in Dar es Salaam.

Registered ivory is thereafter transported whilst accompanied with government documents, including an "Ivory Consignment Note" and other documents, together with an armed security guard. Once the ivory is received by the Strongroom Officer, a delivery note is issued (the delivering officer remains with the original copy). The procedure for receiving ivory into the strongroom involves (MNRT-TZ 2010).

a) Re-measuring weight and length of every tusk or piece of ivory.

b) Marking every ivory (or pieces of the same) with a "National Serial Number" using a permanent marker pen denoting country code/year of registration/serial number and weight. This conforms to the designed "Ivory Database" that was agreed between TRAFFIC International (Eastern and Southern Africa) and the Wildlife Division in 2006 in accordance with CITES Resolution Conf. 10.10 (Rev. CoP14).

c) Details of every piece of ivory is recorded in the Official Register of Trophies as per the Wildlife Conservation Act 2009.

d) The same details are entered into the computer database specifically designed for ivory stocks.

e) Ivory is thereafter placed in shelf racks that are arranged according to their location of origin and weight.

Since 1989 when the African Elephant was included in CITES Appendix I, ivory from natural mortality and management operations, such as seizures and problem animal control, started to accumulate such that in September 2009 the stockpile was 89.85 tonnes (MNRT-TZ 2010). The main stockpile is secured in a strongroom at the Wildlife Division Headquarters in Dar es Salaam. Two smaller stocks are kept by Tanzania National Park and Ngorongoro Conservation Area, The three strongrooms are protected and entry must be authorized by the respective Chief Executive Officer. The ivory stockpile is occasionally audited by internal and external auditors.

Target	Action	Time	Actors	Indicator
1.Standardize documentation system from sources to strong rooms (WD,TANAPA & NCAA)	1.1 Harmonize and improve the existing documents (WCA & CITES forms)	2011	WD, TANAPA, NCAA, TRAFFIC, MIKE & Universities	Proper documents in place
	1.2 Training staff involved in documentation and handling of ivory	2011	As above and other stakeholders	Number of staff trained
	1.3 Ensure documents made available to relevant stations	Ongoing	WD, TANAPA & NCAA	Relevant document available
	1.4 Develop a standard operating procedure for document handling *(have a backup, who keeps what and where)*	2011		Standardized data backup in place
2.Secure transport system of ivory from source to main strong rooms	2.1 Use a standard courier transport system from within relevant authorities or outsourced	Ongoing	WD, TANAPA, NCAA, Police	Standardized transport system in place
3. Ensure proper storage and security of ivory piles	3.1 Have an in- and off-register for personnel in the warehouse	2010	WD, TANAPA & NCAA	
	3.2 Proper documentation in the strong room	2011	WD, TANAPA & NCAA	
	3.3 Proper identification & photographs and scribing important mark on the ivory	Ongoing	WD, TANAPA & NCAA	
	3.4 Proper security system for the strong room (camera, fire proof, security guards, fire detectors)	Ongoing	WD, TANAPA & NCAA, NGOs	
	3.5 Systematic storage according to sources and causes	Ongoing	WD, TANAPA & NCAA	
4.Standardize system of dealing with contraband	4.1 Separate contraband from other sources of ivory	Ongoing	WD, TANAPA & NCAA	
	4.2 Create museum of contraband for education and tourism purposes	Ongoing	WD, TANAPA & NCAA	
	4.3 Raise awareness among other law enforcement organs (custom, police, judiciary etc)	Ongoing	WD, TANAPA & NCAA	
5.Dispose ivory collected from legal sources and other sources (PAC, natural death)	5.1 Implementation of management plan as above	2013	As above	Stockpile disposed

2.6 Strategic Objective 6: Research and Monitoring

Objective

Strengthen and expand monitoring and priority research to provide information for adaptive management, protection of elephants and critical habitats.

Background

Research and monitoring of elephants is an essential part of elephant management, helping inform decision-making and providing necessary feedback on the impact of management actions and human disturbance. The Tanzania Wildlife Research Institute (TAWIRI) is the body that oversees and coordinates these activities in Tanzania. The TAWIRI unit, Conservation Information Monitoring Unit (CIMU), is dedicated to monitoring wildlife populations across Tanzania (primarily through aerial censuses). The unit, formerly called the Tanzania Wildlife Conservation Monitoring (TWCM), was established in the 1980s in response to the heavy poaching that was experienced in the country in 1970s and 1980s, and initial surveys focussed on the Selous and Serengeti ecosystems. Countrywide elephant population monitoring began in 1986, and surveys are now carried out every 3-5 years in each major ecosystem. Surveys of other areas are also carried out periodically at the request of the wildlife authorities. The results of the surveys are used to generate information that provides a comprehensive summary of the status of elephants in Tanzania, and this information is published in CIMU reports as well as in documents such as the IUCN African Elephant Database reports.

Some monitoring of wildlife populations (including elephants) is carried out by National Park ecologists in different Parks, often using Park rangers to gather information while out on patrol. However there is no systematic procedure for this type of data collection across Parks, nor presently a central deposit/database for the information. The MIST (Management Information System Technology) system is currently being trialled in Tanzania (see Section 2.9), and may be adopted more broadly by the various Wildlife Agencies in the country.

Considerable research has been undertaken in Tanzania by independent scientists working through TAWIRI, starting with the seminal study on elephant social behaviour carried out in Lake Manyara National Park in the late 1960s (Douglas-Hamilton 1972). There are currently active elephant research projects in seven sites across the country; these are listed below together with the key focus areas of the studies.

- Mikumi NP (demography, HEC, genetics)
- Sadaani NP (movement patterns)
- Selous GR, eastern (HEC)
- Serengeti NP (demography, genetics, ecology, HEC)
- Tarangire NP (demography, genetics, behaviour, HEC, corridors)
- Udzungwa Mountains NP (abundance, demography, HEC, corridors)
- West Kilimanjaro/Lake Natron (movement patterns, HEC)

TAWIRI has a library with the majority of publications and reports on elephants pertaining to Tanzania, though as yet there is no central database specifically for elephant information.

As protected areas in Tanzania become increasingly isolated there will be a growing need for additional research on the impact of changing patterns of habitat use within ecosystems and how this is affected by water availability. To counteract the loss of migration corridors, more research will also be needed on the efficacy and sustainability of wildlife-related benefit sharing projects with local communities living close to protected areas, particularly Wildlife Management Areas.

Objective: Strengthen and expand monitoring and priority research to provide information for adaptive management, protection of elephants and critical habitats.

Targets	Actions	Timeline	Actors	Indicators
1. Organise, coordinate, and prioritise various research on elephant populations with regards to habitat change, water availability, reduced range, and climate change	1.1. Conduct elephant distribution and habitat use studies 1.2. Assess impact of climate change on elephant behaviour and biology 1.3. Identify and prioritise key areas of elephant research topics 1.4. Assess water availability and usability in the elephant range	2015	TAWIRI, other research and higher learning institutions, researchers	Publication, reports in place
2. Establish effective and sustained systems for monitoring elephants status inside and outside PAs	2.1. Standardize aerial survey methodology to ensure repeatability and counting of carcasses 2.2 Conduct aerial survey every 3 years 2.3. Conduct ground surveys 2.4. Identify and assess elephant population beyond the current censused zone/range 2.5. Harmonise cross-border elephant surveys and monitoring 2.6. Conduct elephant demographic studies	Ongoing	TAWIRI, Wildlife Management Authorities, other research and higher learning institutions, hunting companies, researchers	Reports, publications
3. Explore effective and sustained anti-poaching surveillance	3.1. Standardise and conduct ranger/scout-based monitoring inside and outside PAs 3.2. Collect information on ivory movement to inform control of illegal trade 3.3. Assess effectiveness of anti-poaching operations in protecting elephant populations 3.4. Train rangers/scouts on new anti-poaching techniques	Ongoing	TAWIRI, Wildlife Management Authorities, other research and higher learning institutions, researchers	Reports, publications, number of rangers trained
4. Generate information on elephant movement and gene flow, habitat use and HEC in key areas to support LUP	4.1. Identify and prioritise key elephant habitat areas outside PAs (corridors, dispersal areas, mineral and watering hole sites) 4.2. Initiate and support long-term research and monitoring on elephant movements 4.3. Initiate research and monitoring on elephant home range, habitat preference, spatial and temporal patterns of crop-raiding 4.4. Initiate and support long-term research and monitoring on elephant movements and gene flow, using collaring, tissue and gene banks, and population genetics 4.5 Professional hunters and private stakeholders to help with data collection. 4.6 Integrate above into LUP	2015	TAWIRI, Wildlife Management Authorities, other research and higher learning Institutions, District and Local Government, researchers, professional hunters, private stakeholders	Reports, publications

5. Assessment of effectiveness of benefit sharing on elephant conservation	5.1. Assess community institutional setup to manage income accrued from conservation 5.2 Assess acceptability and sustainability of sources of benefits to communities 5.3 Assess community attitude towards elephant conservation 5.4 Conduct research to determine sustainable utilisation 5.5 Conduct research on cost/benefits of elephant conservation to communities	2012	TAWIRI, Wildlife Management Authorities, other research and higher learning Institutions, District and Local Government, WMAs, researchers	Reports, publications
6. Formulate policies and elephant management plan based on data from research	6.1. Develop centralised, user-friendly database on elephant research and monitoring 6.2. Disseminate information on elephant research and monitoring 6.3. Promote use of research and monitoring database for elephant conservation	Ongoing	TAWIRI, Wildlife Management Authorities, other research and higher learning Institutions, researchers, politicians	Database in place, reports

2.7 Strategic Objective 7: Elephant Health and Welfare

Objective

Elephant health and welfare matters addressed to better inform management of the species.

Background

Wildlife Veterinary Services in Tanzania

Systematic monitoring of diseases in wildlife is a relatively new phenomenon in Tanzania. In 1992 a TANAPA/TAWIRI disease investigation project was established in Serengeti National Park. Prior to that, disease investigation was done on *ad hoc* basis and was conducted by state veterinarians. By 1996 two wildlife veterinary units were in place for TANAPA and TAWIRI respectively, and another in the NCAA. The wildlife sector currently has about 10 veterinarians who are fully engaged on wildlife disease surveillance and other veterinary interventions. This is insufficient to meet the needs of the whole country and the capacity of veterinary units needs to be increased at all levels, particularly in the Wildlife Division. The techniques used for disease monitoring by the wildlife authority veterinary units include both passive (opportunistic sampling of animals) and active surveillance (systematic disease investigation) of ecological/indigenous diseases, introduced/exotic diseases, as well as emerging diseases. Currently there is no active surveillance of diseases in the elephant population in Tanzania.

African Elephant pathology and injuries

The pathology of the African elephant in the wild is poorly known. Major pathogens that have been reported to be, or potentially to be, of concern in African elephants include: *Mycobacterium tuberculosis, Mycobacterium bovis, Bacillus anthracis* (anthrax)*, Picorna* virus (an encephalomyocarditis transmitted by rodents), and *Endotheliotropic* herpes. However, there have been either few or limited studies on the epidemiology and pathogenicity of these diseases, and the sensitivity of tests for diagnosis of such pathogens and diseases in elephants is poor. Anthrax is endemic in Tarangire and Manyara National Parks and there are on average one or two elephant fatalities each year from the disease in the ecosystem; however, this is not enough to affect the high population growth rate. When anthrax is suspected as the cause of death in elephants, the carcass is tested, and, if positive, is then burned to prevent spread of the disease. More work is needed to determine the impact of disease on elephant conservation and its potential impacts, particularly on smaller, isolated populations.

Injuries to elephants sometimes require veterinary treatment, often at considerable trouble and expense. The most common of these are wounds caused by snares. Set for other wildlife targets, they can cause devastating injuries to the legs and trunks of elephants that get caught in them.

Elephant welfare

Elephant welfare has been considered by the African Elephant Specialist Group of the IUCN Species Survival Commission, especially regarding the translocation of elephants for *in situ* conservation, for which detailed guidelines have been produced (Dublin & Niskanen 2003) and in relation to the keeping of elephants in captivity. In a statement issued in 1998 (AfESG 1998), the Group recognised that while there were some benefits for education, research and training in the maintenance of captive African elephants, there was no conservation benefit for the species and that there are welfare issues for captive individuals that facilities must address.

The African Elephant Specialist Group has also issued a statement (AfESG 2003) on the removal of African Elephants for captive use:

Believing there to be no direct benefit for in situ conservation of African elephants, the African Elephant Specialist Group of the IUCN Species Survival Commission does not endorse the removal of African Elephants from the wild for any captive use.

No elephants have been trans-located for management purposes in Tanzania to date, and there are currently no plans to do so, though it may be an option in future years. Similarly there is currently no systematic capture of wild elephants for captivity, with past capture events authorised by Presidential Decree.

Objective: Elephant health and welfare matters addressed to better inform management of the species.

Target	Action	Timeline	Actors	Indicator
1. Monitor elephant health	1.1 Conduct bodily and disease surveillance 1.2 Establish causes of mortality other than illegal or legal off-take 1.3 Rescue and treat trapped (snared) and injured elephants	Ongoing	Wildlife management authorities, DVOs, VIC, NGOs, research institutions	Reports, publications
2. Strengthen and establish veterinary unit throughout wildlife management authorities	2.1 Assess current usage and efficacy of existing veterinary units (e.g. Mikumi, Serengeti) 2.2 Establish vet unit in the WD to look after the Game Reserves 2.3 Build capacity of the vet unit throughout the vet authority	Ongoing	Wildlife management authorities, NGOs	Vet unit in place at WD
3. Support and conduct elephant health research	3.1 Conduct survey of zoonoses, emerging diseases, transboundary diseases and their epidemiology 3.2 Assess elephant reproduction health and trends of tusklessness 3.3 Maintain elephant tissue bank for genetic analysis 3.4 Adopt, modify and enforce IUCN elephant capture and translocation guidelines	Ongoing	Wildlife management authorities, research institutions, VICs, NGOs	Reports, tissue data bank established, guidelines on capture and translocation followed

2.8 Strategic Objective 8: Cross-border Cooperation

Objective

Effective cross-border collaboration to ensure security of elephants and their habitats in key trans-boundary areas is promoted and established.

Background

As a highly mobile species, African elephants do not recognize political boundaries. Populations are often shared between countries across Africa, requiring close cooperation and harmonisation between the governments and wildlife authorities of neighbouring countries in order to meet shared aims in relation to elephant conservation and management. Tanzania shares elephant populations with four neighbouring countries: Kenya, Mozambique, Rwanda and (possibly) Zambia.

Table 3. Cross-border elephant populations with Tanzania

Tanzania and...	Cross-border elephant populations		
Kenya	Serengeti NP-Masai Mara Reserve	Loliondo GCA-Amboseli ecosystem-West Kilimanjaro/ Kilimanjaro NP	Mkomazi NP-Tsavo West NP
Mozambique	Selous-Niassa Corridor (West and East Corridors)		
Rwanda	Burigi GR-Akagera NP		
Zambia	Katavi NP-NE Zambia (?)[1]		

[1]Unconfirmed report of recent elephant movements (see Table 2)

Tanzania has ratified and is implementing the following international treaties and agreements related to wildlife law enforcement:

- **CITES - Convention on International Trade in Endangered Species of Wild Fauna and Flora.** Tanzania officially become CITES Member in 1980. In 1997 COP passed Resolution 10.10 on establishing Elephant monitoring programmes (MIKE & ETIS). Tanzania started to implement these in 2002.

- **Lusaka Agreement on Cooperative Enforcement Operation Directed at Illegal Trade in Wild Fauna and Flora** (signed in Lusaka, 1996). Coordinated by the inter-governmental Lusaka Agreement Task Force, this treaty is aimed at promoting cooperation in the investigation and reduction of wildlife crime In Africa. Neighbouring signatories are Kenya, Uganda, Zambia.

- **SADC Protocol on Wildlife Conservation and Law Enforcement** (ratified in 2000), promoting cooperation between range states with shared populations and collaboration in law enforcement efforts. Signatories are all countries in southern Africa, including the neighbouring countries of Mozambique, Zambia and the Democratic Republic of the Congo, plus some Indian Ocean states.

- **CMS Convention on the Conservation of Migratory Species of Wild Animals.** An intergovernmental treaty of UNDP that aims to conserve migratory species throughout their range. Tanzania became a signatory in 1999. Other neighbouring signatories are Kenya, Uganda, Mozambique and Rwanda.

No regional agreement or treaty on monitoring wildlife crime currently exists between Tanzania and the neighbouring countries of Rwanda and Burundi. There is a need for a review of gaps in the current

international and bilateral agreements for issues relating to elephant conservation so that deficiencies can be addressed.

In addition to these international treaties there are some examples of less formal cooperation between wildlife authorities and local administrations in neighbouring East African countries. Recently there have been joint wildlife aerial surveys conducted by TAWIRI and KWS in the Amboseli-West Kilimanjaro and Magadi-Lake Natron cross-border areas, which is the first time the entire ecosystem has been censused in one cross-boundary survey (KWS/TAWIRI 2010); such joint monitoring efforts are extremely useful and should be strongly encouraged. Another example is the East Africa Cross Borders Biodiversity Project (CBBP) that ran from 1998-2003, and aimed to reduce the loss of forest and wetland biodiversity in four cross-border sites of national and global significance (Conservation Development Centre 2007). The project helped communities and local district authorities work in partnership with wildlife and environmental agencies on both sides of borders. Although elephant conservation was not a direct remit of this project, it addressed conservation issues in areas of elephant habitat shared by Tanzania with neighbouring countries, including the grassland ecosystem shared between Rakai District (Uganda) and Bukoba District (Tanzania); the dry forest shared by Monduli District (Tanzania) and Kajiado District (Kenya); and the montane forests occurring in Same District (Tanzania) and Taita-Taveta District (Kenya). Such projects demonstrate the feasibility of cross-border cooperation for conservation purposes.

There is a particular need to consolidate land use planning when international borders bisect the range of an elephant population. Tanzania for instance has moved to protect the elephant corridor on its side of the border linking Kilimanjaro National Park (Tanzania) with Amboseli National Park (Kenya). However unless appropriate land and habitat protection measures are also implemented on the Kenyan side of the border, the corridor may not be viable in the long term. Similarly law enforcement implementation measures need to be coordinated to ensure that borders are not used to facilitate illegal activity. This emphasises the need for increased interaction and cooperation between Tanzania's wildlife agencies and those of its neighbours.

Objective: Effective cross-border collaboration to ensure security of elephants and their habitats in key trans-boundary areas is promoted and established.

Target	Actions	Actors	Timeline	Indicators
1.Put in place clear institutional framework that supports consultative collaborations for securing cross-border elephant populations and habitat	1.1. Assess implementation of existing agreements (e.g. Lusaka Agreement for Tanzania/Kenya and general MoU for Tanzania/Mozambique).	Gov't Tanzania, Gov't Kenya, Gov't Mozambique	2011	Assessment report and recommendations completed
	1.2. Identify areas where additional institutional agreements are needed for collaboration (for security, habitat, HEC, utilization, research & monitoring).	WD, TAWIRI	2011	Report completed
	1.3. Formulate the necessary agreements and advocate for their joint ratification.	WD and NGOs	2012	Number of agreements
	1.4. Harmonize elephant utilization (consumptive / non-consumptive) across borders.	Gov't Tanzania, Gov't Kenya, Gov't Mozambique, Gov't Rwanda, Gov't Zambia	Ongoing	
2. Ensure effective security for elephant populations in trans-boundary areas	2.1. Ensure collaboration to effectively curtail/ control illegal ivory trade.	Gov't Tanzania, Gov't Kenya, WD, TANAPA, KWS	Ongoing	Agreement in place
	2.2. Support joint anti-poaching operations where necessary.	WD, TANAPA, KWS, Mozambican Wildlife Authority, others	Ongoing	Number of joint operations
	2.3. Ensure cross-border networking using a compatible communications infrastructure.	WD, TANAPA, KWS, Mozambican Wildlife Authority	Ongoing	Type and number of communications facilities in place
	2.4. Put legal provisions in place to allow effective prosecution of poaching and illegal ivory trade cases.		Ongoing	Number of effective prosecutions completed
	2.5. Ensure effective intelligence sharing between wildlife authorities across borders.	WD, TANAPA, KWS, Mozambican Wildlife Authority	Ongoing	# of meetings between transboundary wildlife authorities # of reports

3. Secure connectivity and ecological viability of habitat across borders	3.1. Promote conservation-appropriate land use planning in transboundary areas to secure corridors.	Land Use Commission, MNRT, WD, TANAPA	Ongoing	Effective land use plans
	3.2. Promote the legal protection of vital wildlife corridors, dispersal areas, buffer zones and migratory zones.	Land Use Commission, MNRT, WD, TANAPA, WMAs	Ongoing	Gazetted WMAs Gazetted corridors
4. Enhance HEC mitigation in transboundary areas.	4.1. Collaborate to promote relevant, integrated HEC mitigation methods in transboundary areas.	National HEC Forum, NGOs, Land Use Commission, MNRT, WD, TANAPA, WMAs	Ongoing	# of HEC incidents # of PAC incidents # of mitigation trainings
5. Harmonize Research & monitoring activities in trans-boundary areas.	5.1. Share information on research activities and findings in transboundary areas.	TAWIRI, Researchers	Ongoing	# of reports/manuals
	5.2. Undertake joint surveys in key transboundary ranges.	TAWIRI, WD, Gov't Kenya, KWS, Gov't Mozambique, Gov't Rwanda	Ongoing	# of joint surveys

2.9 Strategic Objective 9: Elephant Information Management

Objective

To provide an integrated system of data and information management on matters relating to the African Elephant population of Tanzania.

Background

Although abundant information on Tanzania's elephant population exists, it is not always available to wildlife managers in a standardized, easily accessible format. With four different wildlife authorities it is important that all information be collected and submitted in a consistent format to a central database. Lacking a central data repository, managers are unable to clearly understand how their area of operation is influenced by events in other parts of the ecosystem, or in other parts of the country. The need for information covers both the basic facts of elephant biology, population and demographic trends, and data required for effective management and law enforcement. This includes information on all causes of mortality (natural deaths, hunting statistics, problem animal control and illegal killing) as well as details of human-elephant conflict in each district.

The capacity for data-sharing between authorities and institutions needs to be enhanced so that information gathered by one source can be submitted to and utilised by others with minimal delay or need for further processing. The need for an improved, integrated monitoring system is highlighted, for example, by differences in PIKE levels reported at MIKE sites by different authorities (e.g. in the Ruaha/Rungwa ecosystem), making it difficult to assess the current situation in that ecosystem.

There is also a great need for a reliable, regular information flow concerning the incidence of human-elephant conflict, using standardized data collection methods in each district and under all authorities. Without such information it is difficult to make effective decisions on matters such as mitigation and land-use planning. Easy access to this information by all stakeholders is important.

The adoption of a centralised information management system called Management Information System Technology (MIST) has been highly advocated following its successful adoption by the Uganda Wildlife Authority (UWA). This system allows a wide variety of data to be sent from the field to a central database, where it is processed and the relevant information made available to users in a concise and useful format. Users and suppliers of data in protected areas then have access to the central database by digital data transfer, enabling rangers and PA managers to communicate data quickly and efficiently. MIST can greatly improve decision-making and planning by providing ready access to up-to-date information (Schmidt & Sallee 2002; UWA 2010). A trial system of MIST has been implemented in Tanzania and is in the process of being expanded.

Regular aerial monitoring of the main elephant populations in Tanzania already occurs through the Conservation and Information Monitoring Unit (CIMU), based at TAWIRI. Additional valuable information can be gathered to supplement the count figures by carrying out Rapid Demographic Assessments (RDAs) of elephant populations to provide information on population structure and dynamics and obtain a clearer picture of their current status.

While access to research and monitoring information is critical to wildlife managers, there is also a strong demand for such data to be made publicly available. This was a consistent theme at the 2009 Zonal workshops where many stakeholders felt they had little knowledge of the status of elephant conservation across the country due to a lack of information.

Objective: To provide an integrated system of data and information management on matters relating to the African Elephant population of Tanzania.

Target	Action	Timeline	Actors	Indicator
1. Create, strengthen and expand data bases on elephant HEC and corridors	1.1. Hire GIS/data base consultants/experts to develop appropriate elephant database system for HEC and corridors	2011	WD, TAWIRI, NGOs	HEC and corridors databases established
	1.2. Formalise reporting system between the data collectors and data base managers	2011	IUCN, DISTRICTS, WD, TAWIRI, NGOs	Data base managers receiving data with elephants in country at agreed intervals
	1.3. Develop standardized data collection protocols for migration corridors	2011	TAWIRI, NGOs	Protocols developed
	1.4. Adopt IUCN HEC data collection protocols countrywide	2011	WD, DISTRICTS, TANAPA, NCAA, NGOs	All districts using same HEC form to collect data
	1.5. Train database management personnel within wildlife authorities	Ongoing	WD, TAWIRI, NGOs, consultants	Trained personnel in place
	1.6. Workshops to train data collector supervisor for every district (TOT)	2011	IUCN, NGOs, WD, DISTRICTS, TAWIRI	Data collection supervisors trained in districts having elephants
2. Create, strengthen and expand databases on elephant numbers, demography and distribution	2.1. Expand numbers and distribution data base at TAWIRI to include demography data	2011	TAWIRI, NGOs	Database established at TAWIRI to process demography data
	2.2. Adopt standardized protocols for carcass data recording in all aerial census	2010	TAWIRI	Carcass counts included in all census reports
	2.3. Develop standardized protocol for rapid demographic assessment	2010	TAWIRI	Protocol developed
3. Create, strengthen and expand data bases on elephant poaching and illegal trade	3.1. Expand MIST database to cover all range in Tanzania	2011	Wildlife Authorities, MIKE and NGO`S	MIST being implemented effectively in all TZ

Objective	Activity	Year	Responsible	Indicator
	3.2. Build adequate capacity to implement and manage MIST	2011	Wildlife Authorities and NGO'S	Capacity in place across wildlife Authorities to utilize MIST
	3.3. Adopt MIST Database that includes illegal trade elephant products	2011	Wildlife Authorities and NGO'S	Database in place
	3.4. Train Database management personnel in Wildlife Authorities	2011	Wildlife Authorities & NGO's	Database manager trained
	3.5. Workshop to train data collectors in illegal trade in all districts and relevant authority countrywide	2011	Wildlife Authorities & NGO's	Workshop proceedings produced
	3.6. Develop user friendly format for data collection for illegal trade	2011	Wildlife Authorities, District Authorities, Police, Customs, Interpol, Judiciary TRAFFIC, WD, NGO's	Data collection sheet produced
4. Create, strengthen and expand databases on *elephant utilization*	4.1 Hire Database consultant /expert to develop utilization Database entirely compatible with MIST	2011	WD, TAWIRI, Hunting Companies	Database in place
	4.2 Train Database management personnel in Wildlife Authorities	2011	WD, TAWIRI	Database Manager trained
5. Improve information sharing on elephant issues	5.1 Develop a website with all publicly available information on elephant in Tanzania including Database outputs	2011	TAWIRI, WD	Website online
	5.2 To build up capacity for communication officer	2011	WD, TAWIRI & NGO's	Officer trained in website management
	5.3 Produce bi-annual summary reports from all Databases	Ongoing	TAWIRI, WD, TRAFFIC, MIKE & NGO's	Reports, published and circulated

References

AfESG (1998) Statement and resolutions on the role of captive facilities in *in situ* African Elephant conservation. Available at < http://www.african-elephant.rg/tools/pdfs/pos_captiv_en.pdf> (accessed 10 August 2010).

AfESG (2003) Statement from the African Elephant Specialist Group of the IUCN Species Survival Commission on the removal of African Elephants for captive use. Available at < http://www.african-elephant.org/tools/pdfs/pos_capvuse_en.pdf> (accessed 10 August 2010).

Blanc J.J., Barnes R.F.W., Craig G.C., Dublin H.T., Thouless C.R., Douglas-Hamilton I. & Hart J.A. (2007) *African Elephant Status Report 2007: an update from the African Elephant Database.* Occasional Paper Series of the IUCN Species Survival Commission, No. 33. IUCN/SSC African Elephant Specialist Group. IUCN, Gland, Switzerland. vi + 276 pp.

CITES (2010) Report of the Panel of Experts on the African elephant on its review of the proposals of the United Republic of Tanzania and Zambia to transfer their populations of African elephant from Appendix I to Appendix II. CoP 15 Doc. 68 (Annex 6a).

CITES CoP15 Doc. 44.2 (Rev. 1).

Conservation Development Centre (2007). GEF Impact Evaluation. Case Study: Reducing Biodiversity Loss at Cross-border sites in East Africa Project. Impact Evaluation Information Document 9. Available at: www.thegef.org/gef/sites/thegef.org/files/documents/Impact_Eval_Infodoc9.pdf (accessed 26 August 2010).

Douglas-Hamilton I. (1972) *On the ecology and behaviour of the African elephant: the elephants of Manyara*. PhD thesis, Oxford University, Oxford, UK.

Dublin, H. T. and Niskanen, L. S. (eds.) (2003) The African Elephant Specialist Group in collaboration with the Re-introduction and Veterinary Specialist Groups 2003. IUCN/SSC AfESG. Guidelines for the in situ Translocation of African elephant for Conservation Purposes. IUCN, Gland, Switzerland and Cambridge, UK. X+54p.

Dunham K.M. (1988) Demographic changes in the Zambezi Valley elephants (*Loxodonta africana*). *Journal of Zoology* 215, 382-388.

Foley C. A. H., Pettorelli N. & Foley L. (2008) Severe drought and calf survival in elephants. *Biology Letters* 4, 541–544.

Foley C.A.H. & Faust L.J. (2010) Rapid population growth in an elephant *Loxodonta africana* population recovering from poaching in Tarangire National Park, Tanzania. *Oryx* 44(2), 205-212.

Gough, K.F. & Kerley, G.I.H. (2006) Demography and population dynamics in the elephants Loxodonta africana of Addo Elephant National Park, South Africa: is there evidence of density de- pendent regulation? Oryx, 40, 434–441.

Hoare, R. (2007) Case Study, 'Vertically integrated' human-elephant conflict management system in Tanzania: background and next steps. Extracted in part from final report of the IUCN/SSC African Elephant Specialist Group to WWF International.

Jachmann H. (2001) *Estimating abundance of African wildlife: an aid to adaptive management.* Kluwer Academic Publishers, Dordrecht, The Netherlands.

Jachmann H. (2002) Comparison of aerial counts with ground counts for large African herbivores. *Journal of Applied Ecology* 39, 841–852.

Jones T., Caro T. & Davenport T.R.B. (2009) Wildlife Corridors in Tanzania. Tanzania Wildlife Research Institute. 60pp.

Khaemba W.M., Stein A., Rasch D., De Leeuw J. & Georgiadis N. (2001) Empirically simulated study to compare and validate sampling methods. *African Journal of Ecology* 39, 374-382.

Kikoti A. (2009) Phd thesis. http://www.awf.org/content/solution/detail/3705 knowledge in African elephants. *Science* 292, 491–494.

Kweka, D. (2010) Establishing Wildlife Management Areas: impacts of CBNRM on biodiversity and communities in Tanzania. Tanzania Elephant Management Plan Workshop Report 25-28 May 2010; 51-53. TAWIRI, Arusha.

KWS/TAWIRI (2010) Aerial Census: Amboseli-West Kilimanjaro and Magadi-Natron Cross Border Landscape, Wet Season, March 2010.

Lamarque, F., Anderson, J., Chardonnet, P., Fergusson, R., Lagrange, M., Osei-Owusu, Y., Bakker, L., Belemsobgo, U., Beytell, B., Boulet, H., Soto, B. and Tabi Tako-Eta, P. (2008) Human-wildlife conflict in Africa: An overview of causes, consequences and management strategies. Summary. International Foundation for the Conservation of Wildlife & Food and Agriculture Organization of the United Nations

Laws R. (1969) The Tsavo Elephant Project. *Journal of Reproductive Fertility* 6, 495-531.

Laws R., Parker I. & Johnstone R. (1975) *Elephants and Their Habitats.* Clarendon Press, Oxford, UK.

Leader-Williams, N. & Hutton, J. (2005) Does extractive use provide opportunities to offset conflicts between people and wildlife? In: R., Woodroffe, S.J., Thirgood & A., Rabinowitz (eds) People and Wildlife: Conflict or Coexistence? Cambridge University Press, Cambridge, UK. pp.140–161.

Lindeque M. (1991) Age structure of the elephant population in the Etosha National Park, Namibia.

Lindeque, P. M. and Turnbull, P. C. (1994) Ecology and epidemiology of anthrax in the Etosha National Park, Namibia. J Vet Res. 61:71-83.

Malima, C., Hoare, R.E., and Blanc, J.J. (2005) Systematic recording of human-elephant conflict: a case study in south-eastern Tanzania. Pachyderm 38:29-38.

McComb K., Moss C., Durant S.M., Baker L. & Sayialel S. (2001) Matriarchs as repositories of social

McKnight B. (2000) Changes in elephant demography, reproduction and group structure in Tsavo East National Park (1966-1994). *Pachyderm* 29.

Midala, B. (2010) Law Enforcement and Wildlife Conservation in Tanzania. Presentation at the Tanzania Elephant Management Plan, final workshop, Arusha, Tanzania, May 25-28, 2010.

MIKE (2010) CITES CoP15 Doc. 44.2: http://www.cites.org/eng/cop/15/doc/index.shtml

MNRT (2007) The Wildlife Policy of Tanzania. Revised in March 2007

MNRT-Tz (2010) Consideration of proposals for amendment of Appendices I and II. Submitted to the 15th meeting of the Conference of Parties, Doha (Qatar), 13-25 March 2010 CoP15 Prop.4 (Rev.1) pp. 1-19. Available at <http://www.cites.org/eng/cop/15/prop/E-15-Prop-04.pdf> (accessed 24 August 2010).

Moss C. (2001) The demography of an African elephant (*Loxodonta africana*) population in Amboseli, Kenya. *Journal of Zoology* 255, 145–156

Nelson, F., Sulle, E., and Ndoipo, P. (eds). (2006). Wildlife Management Areas (WMAs) in Tanzania: a status report and interim evaluation. Tanzania Natural Resource Forum.

Norton-Griffiths M. (1978) *Counting Animals.* Handbooks on techniques currently used in African wildlife ecology, No.1. (Ed. J.J.Grimsdell). AWLF, Nairobi.

Osei-Owusu, Y. & Bakker, L. (Eds)(2008) Human-Wildlife Conflict. Elephant. Technical Manual. Food and Agriculture Organization of the United Nations.

Parker G.E., Osborn, F.V., Hoare R.E. and Niskanen, L.S. (eds.) (2007) Human-Elephant Conflict Mitigation: A Training Course for Community-Based Approaches in Africa. Participant's Manual. Elephant Pepper Development Trust, Livingstone, Zambia and IUCN/SSC AfESG, Nairobi, Kenya.

Poole J. (1989) *The effects of poaching on the age structure and social and reproductive patterns of selected East African elephant populations*. Final Report. African Wildlife Foundation, Nairobi, Kenya.

Poole J., Slotow R., van Dyke G., Page B. & Klocke A. (2000) Older bull elephants control young males. *Nature* 408, 425-426.

Rodgers W.A. & Lobo J.D. (1976) *Elephant Control and Legal Ivory Exploitation: 1920-1976*. Tanzania Notes and Records no. 84 & 85.

Schmitt, K, and Sallee, K. (2002) Information and knowledge in nature conservation. Available at: <http://www.uwa.or.ug/Mist.pdf> (accessed 25 August 2010).

Siege L. & Baldus R.D. (2000) From Decline to Recovery: The Elephants of the Selous. Tanzania Wildlife Discussion paper No. 27. Wildlife Division, Dar es Salaam.

Svancara L.K. (2002) The inherent aggravation of aggregation: an example with elk aerial survey data. *Journal of Wildlife Management* 66, 773-784.

TAWIRI (2006) – Elephant Population Estimate in Tanzania, Dry Season, 2006. Tanzania Wildlife Research Institute.

TAWIRI (2009) Elephant Population Estimate in Tanzania, Dry Season, 2009. Tanzania Wildlife Research Institute.

UNEP (2008) Fact Sheet: Selous Game Reserve, Tanzania.

UNEP/GEMS (1988) The African Elephant. United Nations Environment Programme, Nairobi, Kenya.

United Republic of Tanzania (2009) The Wildlife Conservation Act, 2008. Bill Supplement No 2. January 2, 2009.

UWA Uganda Wildlife Authority (2010) Information system. Available at <http://www.uwa.or.ug/IS.htm> (accessed 25 August 2010)

Walpole, M.J. & Thouless, C.R. (2005) Increasing the value of wildlife through non-consumptive use? Deconstructing the myth of ecotourism and community-based tourism in the tropics. In: R., Woodroffe, S.J., Thirgood & A., Rabinowitz. (eds), People and Wildlife: Conflict or Coexistence? Cambridge University Press, Cambridge, UK. pp122–139.

Wasser S.K., Clark B. & Laurie C. (2009) The Ivory Trail. Scientific American, 68-78.

WCS (2009) Human Elephant Conflict Mitigation in Tanzania. Wildlife Conservation Society, Tanzania Programme.

Wildlife Division (2001) The 2001 National Elephant Management Plan, Department of Wildlife, Dar es Salaam.

Wildlife Division (2003) Guidelines for the Designation and Management of WPAs. Dar es Salaam.

Wittemyer G. (2001) The elephant population of Samburu and Buffalo Springs National Reserves, Kenya. *African Journal of Ecology* 39, 328–337.

Wittemyer G., Getz W.M., Vollrath F. & Douglas-Hamilton I. (2007) Social dominance, seasonal movements, and spatial segregation in African elephants: a contribution to conservation behaviour. *Behavioural Ecology and Sociobiology* 61, 1919–1931.

WWF (2008) Common Ground: Solutions for reducing the human, economic and conservation costs of human wildlife conflict. Electronic document accessed 16/4/09: www.panda.org

APPENDIX I

Methods and Results
Demographic Surveys (2009-10) of the
Six Major Tanzanian Elephant Populations

The current status and trends of six of the largest seven Tanzanian elephant populations (excluding Moyowosi-Kigosi) were assessed, on the basis of all available reliable information. In particular, data on demography and population structure, trends in abundance, and levels of illegal killing were considered for each population. A full summary and interpretation of the data are presented in the main text, Section 1.

Methods used in the demographic surveys

Demography and behaviour

A Rapid Demographic Survey (RDA) method was designed, and refined in the field during training in Tarangire NP in May 2009. The field team travelled to each site for two to four weeks (with the exception of Tarangire NP, where elephants can be very rapidly surveyed). TEMP researchers were fully trained in ageing and sexing elephants on the well-known Tarangire northern sub-population, and their accuracy and inter-observer consistency tested until it had reached a satisfactory level (>90% accuracy and consistency of assigning known-age elephants to age class). The primary aims of the survey were to record age, sex, group size and flight behaviour of as many different elephants in the population as possible. Selection of survey areas followed local advice at the time of the fieldwork on where elephants were concentrated, or most likely to be encountered. To ensure that no individual elephants were recorded more than once, a different area was usually surveyed each day, with a minimum of 10km between survey areas. All recorded individuals were geo-referenced using a GPS, and whenever possible, portrait photos (and/or identification notes) were taken. These data were checked later to ensure that no double-counting had occurred.

To carry out precise ageing of individual elephants the observers must approach the elephants to within 20-50m (depending on terrain), requiring off-road driving and an understanding of elephant behaviour. Flight distance from the vehicle and other notes on behaviour were also recorded as potential indicators of levels of stress that the population are experiencing. Numbers of tusks of each individual, and any wounds caused by snares, spears or bullets, were also noted.

All individuals were sexed and assigned to the following age classes (in years):

I.	0-0.99	II.	1-1.99	III.	2-2.99	IV.	3-3.99
V.	4-4.99	VI.	5-9.99	VII.	10-14.99	VIII.	15-19.99
IX.	20-24.99	X.	25-39.99	XI.	40+		

There is a body of literature analysing African Elephant demography at a range of sites, from relatively undisturbed 'normal' populations to populations with a known history of heavy poaching. These studies were reviewed and have been referred to throughout the demographic assessments of the Tanzanian populations. Certain key demographic statistics or parameters are useful for assessing trends in the population, and the extent of past and current anthropogenic disturbance (Poole, 1989; Moss, 2001; McKnight, 2000; Wittemyer, 2001; Foley & Faust, 2010), and these are highlighted for each population wherever relevant. These parameters can be particularly useful for interpretation when compared across populations (Poole, 1989; Lindeque, 1991), which was done for the six Tanzanian populations.

The key parameters considered are as follows.

Demographic parameters

➤ **General population structure:** In a normal, undisturbed population, or a population recovering well from disturbance, a bar chart depicting number of individuals in each age class shows a general downwards gradient from left to right (i.e. young to old). Arguably the best example of this is from Amboseli, Kenya in 1996 (shown in Figure 1a), when the population was known to have been unaffected by heavy poaching or any sport hunting for a minimum of 25 years (Moss, 2001). This population structure compares well with Tanzania's Tarangire population, as recorded in this study (Figure 1b). The Tarangire population has also been undisturbed by hunting or significant poaching since at least 1994 (Foley & Faust, 2010).

Figure 1. Population age structure of elephant populations in (a) Amboseli, 1996 (from Moss, 2001) and (b) Tarangire, 2009 (this study).

Legend (a): Males, solid bars; females, open bars. Age classes: OA=0-5; OB=5-10; 1A=10-15; 1B=15-20; 2=20-25; 3=25-35; 4=35-50; 5=50-65
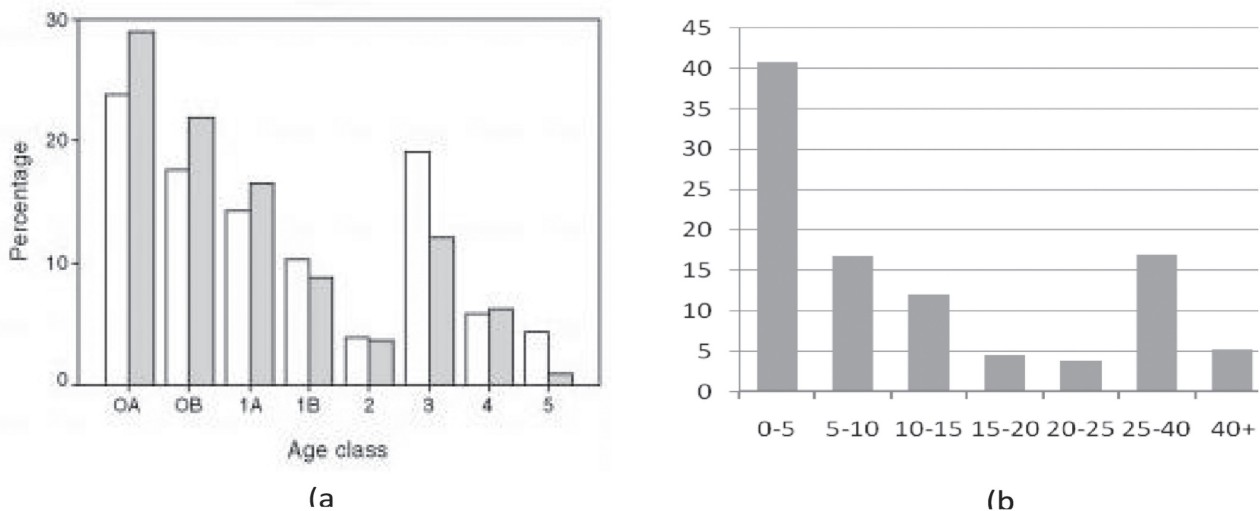
Examples of this undisturbed age structure have also been documented from Tsavo East, Kenya (Laws, 1969); Tsavo West, Kenya and Lake Manyara, Tanzania (Douglas-Hamilton, 1972); North Bunyoro, Uganda (Laws *et al.*, 1975); and Etosha, Namibia (Lindeque, 1991).

➤ **Calf to mother ratio:** a higher ratio indicates a faster growing population. In this assessment, 'calves' are defined as elephants under 5 years old, and 'mothers' are defined as all females over 10 years old (Douglas-Hamilton, 1972; Dunham, 1988; Moss, 2001; Foley & Faust, 2010).

➤ **'Breeding adult' sex ratios:** expressed as the ratio of breeding age males to breeding age females. Breeding adult females are all females over 10 years old; breeding adult males are all males over 25 years old (Poole, 1989; McKnight, 2000). These age classes, representing the breeding proportion of the population, were selected because of their importance to rates of growth or decline in the population. A higher ratio indicates a healthy breeding population. The ratio usually declines as a result of either illegal killing or excessive sport hunting, because in both cases adult males are often selectively killed first (Rodgers & Lobo, 1976). A caveat to this interpretation is that the rapid assessment method does not exclude the possibility of study area biases, i.e. that areas of high concentrations of cow-calf groups may be sampled more intensively than 'bull areas' (Wittemyer *et al.*, 2007) which man not be evident in the results.

➤ **Proportion of older individuals in the adult population:** older individuals are known to play an important role in elephant society (Poole *et al.*, 2000; McComb *et al.*, 2001; Foley *et al.*,

2008). Presence of these more mature individuals is expressed here as the percentage of adults (individuals over 10 years old) which have reached 40 years or older. Because older individuals, especially bulls, are usually killed first by hunters, this proportion can be indicative of significant legal or illegal hunting pressure either currently or in the recent past. Proportions among (i) males only, and (ii) including both sexes, are highlighted because from some populations the sample size of older males is very low.

Behavioural parameters

➢ **Flight behaviour:** the proportion of groups or individuals encountered that fled before the car had approached to a given distance (30m) is used as a rough indicator of the level of stress that a population is experiencing.

Other parameters

➢ **Tusklessness:** proportion of tuskless individuals in each population is shown for comparison with the other parameters above.

Each of these parameters may provide some insight, but assessment of populations is more powerful when several relevant parameters are considered together, which is the approach adopted here.

Interpreting aerial survey information

Demographic results were compared with recent aerial census trends for each population (see Introduction, 1.3). Aerial censuses are one of the most effective ways of monitoring the abundance of elephant populations over large non-forested areas (Jachmann, 2001, 2002). However, all methods of counting animals in the wild have their inherent flaws leading to problems with accuracy and/or precision, and aerial census is no exception (Norton-Griffiths, 1978; Khaemba et al., 2001; Svancara, 2002). Systematic Reconnaissance Flights (SRF's) count animals in a portion of the area under consideration and extrapolate those figures to obtain numbers for the entire ecosystem and any clumping of animals can therefore lead to very large confidence intervals (Norton-Griffiths, 1978). It is therefore reasonable to expect some variation in the accuracy of results from counts as a result of variation in elephant distributions as well as size of the area surveyed, habitat types and visibility. Nevertheless, analysing a series of counts of the same site using comparable methodology over time allows for an assessment of trends in the population. In Tanzania, most of the major elephant populations have been fairly regularly surveyed over the last 20-30 years (Blanc *et al*., 2007). The majority of populations are counted using SRF's, though the Tarangire and Serengeti populations, which cover smaller areas, are counted using total counts, which are generally more accurate and have no confidence intervals.

Interpreting data on illegal killing

There is no central database from which to extract data on illegal killing at present, however summary data from the four Tanzanian MIKE (Monitoring of the Illegal Killing of Elephants) sites – Selous, Ruaha-Rungwa, Katavi and Tarangire - were taken from the latest MIKE (2010) report, and supplemented wherever possible by available information from the PA managers. *In situ* observations of elephant behaviour, which can indicate levels of stress on a population, were also noted.

Comparative Results from the Demographic Surveys

The six major Tanzanian elephant populations assessed in this report are detailed in Table 1, with locations plotted on a map (Figure 2).

Table 1. Six major elephant populations included in this demographic survey, with survey dates, known elephant range (protected areas and other areas) and areas actually surveyed in 2009-2010.

| Name of Population Dates of survey | Known range of population | | Areas demographically surveyed in 2009/2010 |
	National Parks and Game Reserves (NP, GR)	Other areas (GCA, WMA, FR, corridor areas, etc)	
Tarangire 26-29 May 2009	Tarangire NP Lake Manyara NP	Simanjiro plains Manyara Ranch Kwakuchinja corridor	Tarangire NP (northern and central sub-populations + Silale swamp)
Serengeti 17 February - 1 March 2009	Serengeti NP Maswa GR Grumeti GR Ikorongo GR Ngorongoro CA	Loliondo GCA	Serengeti NP Ikorongo GR Maswa GR (only 1 elephant recorded) Grumeti GR (no elephants recorded)
Ruaha-Rungwa 8-16 June 2009 and 8-15 Sept 2009	Ruaha NP Rungwa GR Kizigo GR Muhezi GR	Itigi thickets Lunda WMA Corridor areas towards Udzungwa Mountains NP, Swaga Swaga GR, Rukwa GR	Ruaha NP Rungwa GR Muhezi GR Kizigo GR (no elephants recorded)
Selous ecosystem[1] 18 July-12 August, 2009	Selous GR Mikumi NP	Kilombero GCA Several WMAs adjacent to boundaries of Selous GR and Mikumi NP	Selous GR: (i) Matambwe photographic tourism block (ii) Kipungira hunting tourism block
Katavi-Rukwa 5-17 October, 2009	Katavi NP Rukwa GR Lukwati GR Uwanda GR	Rukwa FR Corridors to Mahale NP and Rungwa GR	Katavi NP (north: west of Park HQ and central: near Ikuu ranger post)
Ugalla 19-28 October and 1-11 November 2009	Ugalla River GR		Ugalla River GR (along Ugalla River, from western to eastern boundary)

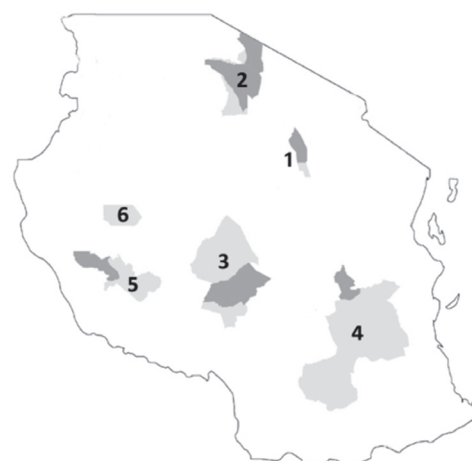[1]Excluded Selous-Niassa Corridor and Selous-Masasi Corridor.

Figure 2. The six Tanzanian elephant ranges demographically surveyed 2009-2010

1. Tarangire
2. Serengeti
3. Ruaha-Rungwa
4. Selous
5. Katavi-Rukwa
6. Ugalla

Legend:
National Parks = dark gray
Game Reserves = light gray (refer to Table 1 above).

A comparative summary of all demographic parameters across the six surveyed populations is shown in Table 2.

Table 2. Summary of basic demographic and behavioural results for all six populations (2009-10).

Site	*n* all individuals (CC-groups)[a]	Median CC-group[a] size	Calf: mother ratio[b]	Breeding adults[c] sex ratio male:female	% adult females[d] >40	% adult bulls[e] >40	% elephants fleeing[f]	Snare wounds[g]
Tarangire	443 (42)	9.2	1.36	0.20	14.3	7.3	2.9	0
Serengeti	365 (24)	12[h]	1.42	0.19	6.9	3.3	7.8	6
Ruaha-Rungwa	461 (39)	8	1.02	0.15	4.6	4.3	11.4	0
NP	*329 (30)*	*8*	*1.20*	*0.12*	*4.0*	*3.2*	*4*	*0*
GRs	*132 (9)*	*10*	*0.67*	*0.21*	*5.8*	*6.7*	*30*	*0*
Selous	347 (46)	6	0.85	0.05	2.0	2.1	19.7	0
Tourism	*214 (27)*	*6*	*0.83*	*0.07*	*2.2*	*2.8*	*16.7*	*0*
Hunting	*133 (19)*	*6*	*0.88*	*0.02*	*1.7*	*0*	*25*	*0*
Katavi	413 (34)	9.5	0.81	0.10	4.2	0	24.1	0
Ugalla	153 (8)	19[h]	0.48	0.01	1.3	0	66.7	0

***Notes for interpretation of Table 2 and Figures 3-7:**

[a] CC-groups = cow-calf groups, the most cohesive social unit of elephant society. Defined here as any group containing one or more adult females. Males over 10 years old were not included in the group size.

[b] Calves are defined as elephants under 5 years old; mothers are defined as all females over 10 years old (after Moss, 2001).

[c,d] Breeding age females are over 10 years old; breeding age males are over 25 years old (Poole, 1989)

[e] Expressed as percentage of all males over 10 years old (when most males have become largely independent) rather than as proportion of breeding age males because the latter gave small sample sizes, especially in the Selous ecosystem, Katavi-Rukwa and Ugalla populations.

[f] Expressed as percentage of elephant groups or individuals included in demographic analysis which had a flight distance greater than 30m, excluding animals unaware of the field vehicle's presence. This is given as a crude indicator of the shyness and levels of stress of the population.

[g] Total number of elephants observed during survey with wounds to trunk or legs apparently resulting from a snare.

[h] Effects of rainy season: Serengeti (Feb 2010) and Ugalla (Oct-Nov 2009) populations were surveyed during the rainy season. In Serengeti, cow-calf groups were observed aggregating, therefore median cc-group size is not a measure of cohesive social unit. The same may be true in Ugalla, although aggregations may also be a response to hunting pressure. All other populations were surveyed during the dry season of 2009.

Figure 3. Calf to Mother[b] ratio, compared across the six surveyed populations.
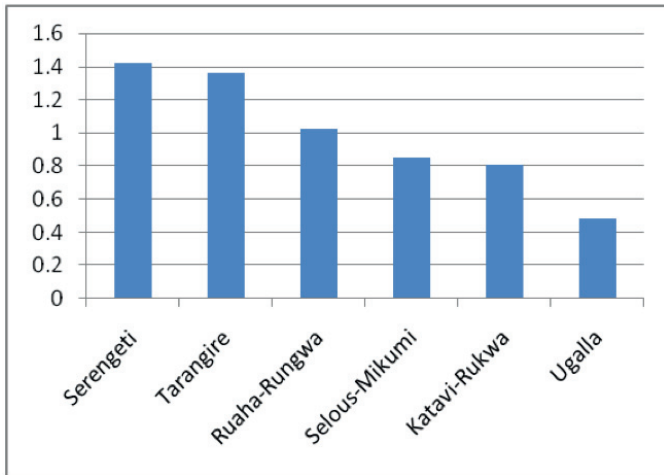
Figure 4. Sex ratio of breeding age elephants[c] (% for each class), compared across the six pop'ns.
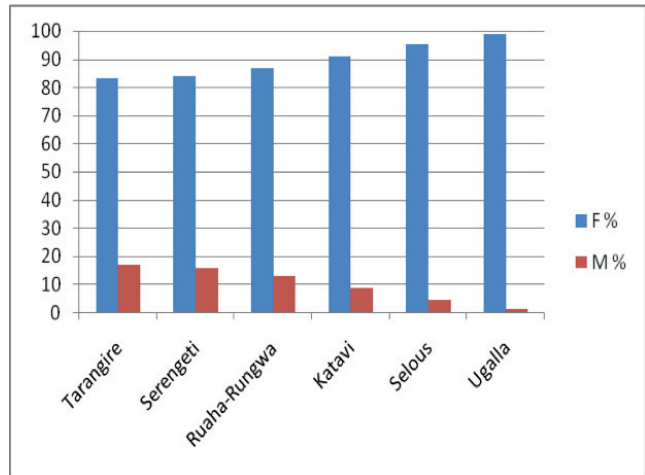
Figure 5. Percentage of adult elephants > 40 years old in the population, compared across the six populations.
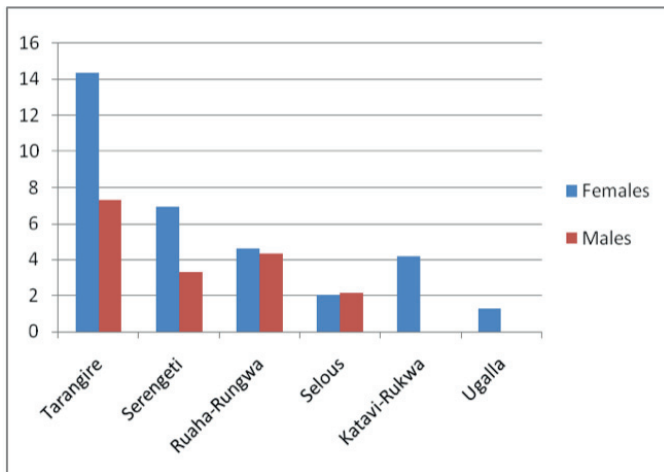
Figure 6. Elephants fleeing[f] (% of groups encountered), compared across the six surveyed populations.
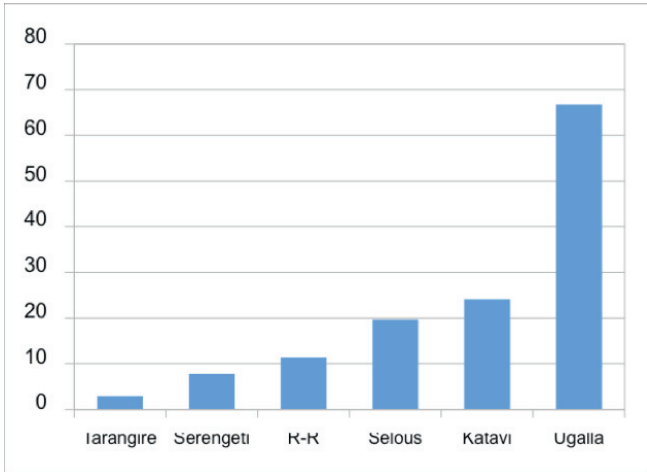
Figure 7. Tusklessness (% of total population), excluding infants < 2 years old, compared across the six populations.
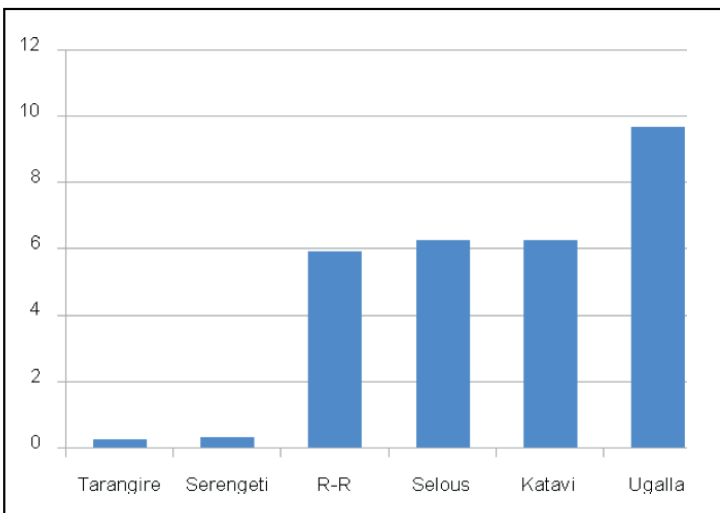
Figure 8. Population age structures for each of the six surveyed populations.
Legend: 0-5A = 0-5 years, 5-10A = 5-10 years, etc. (males and females combined)

Tarangire

Selous

Serengeti

Katavi

Ruaha-Rungwa

Ugalla
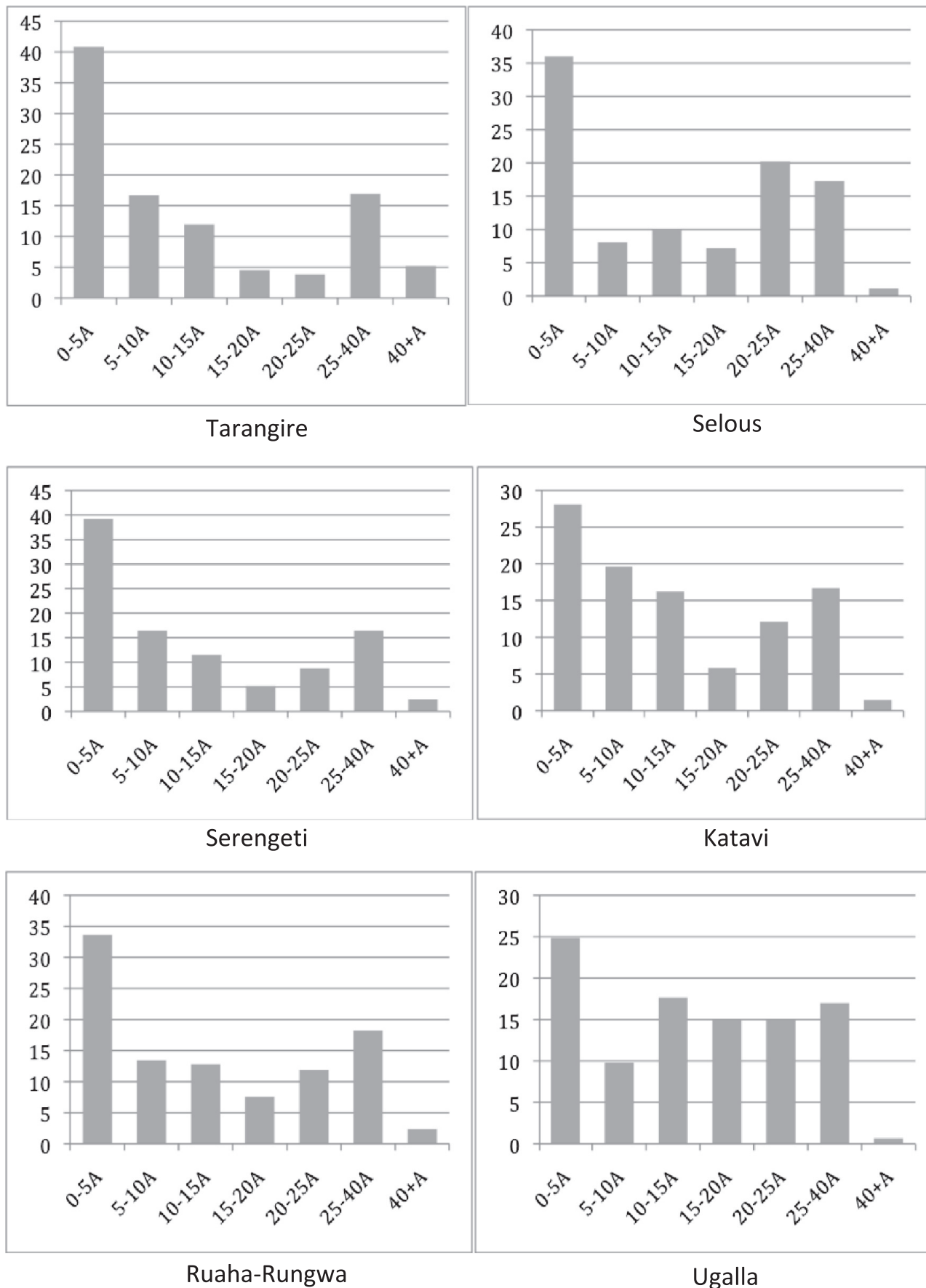
Data on Illegal Killing of Elephants: MIKE, PIKE and other sources

Tanzania has submitted poaching data to the CITES[1] Africa-wide Monitoring of Illegal Killing of Elephants[2] (MIKE) programme for each of the four selected Tanzanian MIKE sites (Katavi, Ruaha, Selous, Tarangire), dating back to 2003. MIKE uses a ratio called PIKE (Proportion of Illegally Killed Elephants) to evaluate trends in poaching at each site. PIKE is calculated as the number of illegally killed elephants found, divided by the total number of carcasses found (including natural mortality and legal killing). Figure 9 and Table 3 below show the results for Tanzania, taken from the most recent MIKE (2010) report:
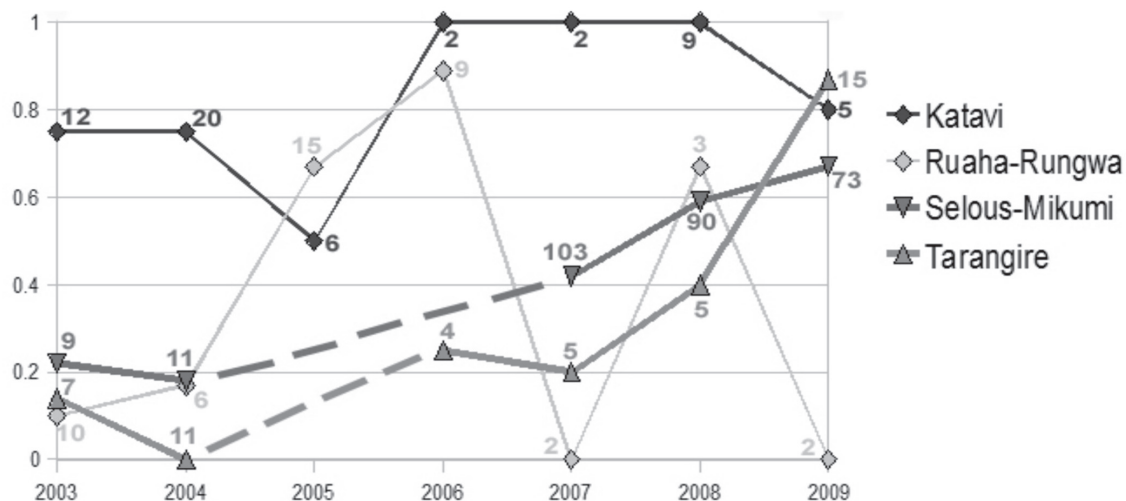

Figure 9. PIKE levels at the four Tanzanian MIKE sites for 2003-2009, with sample size (number of carcasses reported) indicated for each data point.

Table 3. PIKE levels at the four Tanzanian MIKE sites for 2003-2009, with sample size (number of carcasses reported) for each year.

Population	Year	2003	2004	2005	2006	2007	2008	2009
Tarangire	PIKE	0.14	0	-	0.25	0.2	0.4	0.87
	Total carcasses reported	7	11	-	4	5	5	15
Ruaha-Rungwa	PIKE	0.1	0.17	0.67	0.89	0	0.67	0
	Total carcasses reported	10	6	15	9	2	3	2
Selous-Mikumi	PIKE	0.22	0.18	-	-	0.42	0.59	0.67
	Total carcasses reported	9	11	-	-	103	90	73
Katavi	PIKE	0.75	0.75	0.5	1	1	1	0.8
	Total carcasses reported	12	20	6	2	2	9	5

Source: CITES CoP15 Doc. 44.2 (Rev. 1). PIKE = Proportion of Illegally Killed Elephants.

---

1 Convention on International Trade of Endangered Species

2 See www.cites.org/eng/prog/mike/index.shtml

PIKE data Interpretation

For a PIKE value to give a true reflection of the proportion of elephants being killed illegally, it requires that a reasonable sample size of carcasses is reported from a site annually – although the exact minimum number of carcasses required per year is open to debate. Natural mortality would generally be regarded as 1-4% in a stable elephant population (Gough & Kerley 2006, Foley & Faust 2010, CITES CoP15 Doc. 44.2 (Rev. 1).). Where reporting of carcasses is low, PIKE values are of less value in detecting trends in illegal killing. If the number of carcasses recorded is low in proportion to the expected natural mortality, a higher search effort coupled with improved reporting protocols is required, as for instance in the Ruaha-Rungwa and Katavi MIKE sites. Significant changes in PIKE over time, together with significant rises in reporting of carcasses, may in some cases serve as a useful early warning system for rises in illegal killing in an area, even when sample sizes are low.

Additional reports of illegal killing obtained during the demographic surveys

Ruaha National Park

Table 4. Summary of illegal elephant killing within Ruaha National Park, 2005-2009.

Year	Total elephants killed	Total tusks confiscated	Total elephant poachers captured	Total resulting court cases
2005/2006	9	14	5	5
2006/2007	4	5	12	4
2007/2008	14	25	8	4
2008/2009	11	4	11	6
Totals	**38**	**48**	**36**	**19**

Source: Ruaha NP Protection Department, Park HQ, Msembe, June 2009

Table 5. Summary of illegal firearms seized in Ruaha National Park, 2005-2009.

Year	Automatic rifle	S.A.R.	Muzzle loader	Shotgun
2005/2006	3	0	46	0
2006/2007	0	0	30	1
2007/2008	9	0	54	6
2008/2009	4	0	69	6
Totals	**16**	**0**	**199**	**13**

Source: Ruaha NP Protection Department, Park HQ, Msembe, June 2009

Selous Game Reserve

Joint Wildlife Division-Selous Rhino Project aerial observations and foot patrols (Table 6), noted a more than threefold increase in elephant carcasses detected between 2007 and 2008. During this period these monitoring activities (which ceased in early 2009) had the positive effect of allowing Selous Game Scouts to double their rate of follow-up on poaching incidents, and to improve success by calling on aerial support in anti-poaching activities.

Table 6. Encounter rates with elephant carcasses during joint Wildlife Division-Selous Rhino Project monitoring and anti-poaching activities.

Carcass category	Aerial observations per 10 flying hours (no. of hours)		
	Nov-Dec 2006 (26.7)	Jan-Dec 2007 (219.9)	Jan-Dec 2008 (166.6)
Fresh/recently dead	0.4	0.9	3.2
Old carcass	0	0	0.1

Ugalla Game Reserve

Ugalla GR scouts conduct anti-poaching ground patrols together with scouts from the Friedkin Conservation Fund (FCF), and supported by an FCF microlight aircraft. They reported an increase in elephant poaching in Ugalla GR during 2008-9, and are increasingly detecting carcasses and arresting and deterring elephant poachers. Table 7 is a summary of recent WD-FCF anti-poaching data submitted to the Wildlife Division central database through the Tabora Headquarters of the Ugalla GR. Note that resources and effort increased during 2006 and 2007, and that the total number of carcasses found in 2009 includes results of an intensive microlight survey, and may include some carcasses more than a year old.

Table 7. Number of elephant carcasses newly found in Ugalla River GR during 2006-2009 by joint WD-FCF anti-poaching teams.

	2006	2007	2008	2009
Elephant carcasses found	15	27	41	78

APPENDIX II

Input to the Tanzania Elephant Management Plan 2010-15 from Participatory Zonal/Regional Workshops

SUMMARY OF MAJOR TOPICS OF DISCUSSION AND PARTICIPANTS' VIEWS IN THE ZONAL WORKSHOPS

The information in this appendix summarises the perceptions of relevant participant stakeholders at the four zonal workshops, and do not necessarily reflect the views of the Government of Tanzania. For further information on these meetings, please refer to the workshop proceedings, on the TAWIRI website: URL here.

1. Elephant Conservation Trends in Tanzania

Participants to the planning workshops examined the key factors and events that have influenced elephant management for the past twenty years. The analysis falls into the following categories:

Economic / Financial / Trade Trends

The worldwide credit crunch of 2008 was perceived as being positive in that it reduced both the price and demand for ivory, but negative in that less money was available for conservation. Inflation and generally poor funding of local authorities also negatively impacted elephant conservation efforts. Income retention schemes were seen to be beneficial to elephant conservation, while the sale of ivory by Southern African nations was believed to have negative consequences for other populations.

Ecological / Climatic / Health and Disease trends

Several environmental trends, including climate change leading to droughts, the blockage and shrinkage of corridors and other non-protected areas and an increasing human population were all seen to be causes of increasing human-elephant conflict (HEC). An increasing elephant population is also considered to be a cause of greater numbers of HEC incidents, but this is to some extent offset by the economic return generated by increased numbers of tourists keen to see elephants.

Social, Cultural and Religious Trends

It was felt that in a situation where human lifestyles and cultures are changing rapidly there is a probability that more HEC would result, while the breakdown of traditions meant that in some areas it was now acceptable to eat elephant meat. The placing of natural resources under protection and thus out of reach of village communities meant that less value was placed on them and increased killing of elephants might result.

Political Conflicts

Wars and unrest in other parts of the region were perceived as having two effects on elephant conservation, firstly the more ready availability of weaponry and secondly the opening of routes to illegal markets for elephant products. At home, unfulfilled promises for improved livelihoods offered by politicians at election times were perceived to inspire the illegal killing of elephants as a form of revenge.

Political and Legislative Trends

Various pieces of legislation (including the Wildlife Conservation Act of 2009, Wildlife Management Areas Regulations (2005), the Wildlife Policy of Tanzania (2007), Land Act 1999) were seen as being of benefit to the conservation of elephants in Tanzania, especially through the increased emphasis on self-determination by communities in areas of wildlife management and benefit sharing. The Village Land Act, however, was seen as having negative consequences as it enabled village leaders to sign investment deals in corridor areas.

Institutional Trends

The establishment of Wildlife Management Areas and Land Trusts were perceived as beneficial to elephant conservation, and the development of the East African Community was expected to increase international cooperation, reinforcing such treaties as CITES. Decentralization of wildlife management from the Wildlife Division to local authorities was seen as detrimental, as the local bodies lacked sufficient resources. Unemployment from the closure of factories etc was considered to be a cause of laid-off workers resorting to poaching, logging and settlement in potential conservation areas, while privatization of NARCO Ranches was likely to lead to the loss of corridors through fencing. Another cause for concern was the proliferation of NGOs and CBOs providing conflicting information and promoting misunderstandings, though they had the benefit of providing additional funds for conservation.

Technological

Several recent technological developments were viewed as providing benefits for conservation, especially in terms of rapid communication of data (internet, mobile phones, GPS technology) and the development of forensic methods for monitoring the trade in elephant products. Conversely, advances in weaponry were potentially detrimental, while improving access to protected areas made life easier for both poachers and anti-poaching units.

2. Problems facing the conservation of African Elephants in Tanzania

Identifying problems is one of the most important steps in the planning process because it provides the focus for the rest of the planning effort. Identification of the problems facing conservation of elephants in Tanzania was done at the Zonal Workshops by examining the existing situation in terms of concerns or issues. Below is a summary of key issues from the four workshops:

Poaching

Illegal hunting of elephants has created an undue burden on elephant populations causing a localized decline in numbers. Poaching is exacerbated by the availability of sophisticated weapons, corruption and weak penalties against culprits. Lack of anti-poaching capacity has also contributed to this problem.

Human-elephant conflict

Incidences of human-elephant conflicts are on the increase. Most of these conflicts result from raiding of crops and loss of human life. These conflicts have resulted in retaliatory killing of elephants. Failure by the government to pay a compensation fee to the affected people in a timely manner has also escalated the conflicts between elephants and people. Water scarcity and inadequate sharing of benefits accrued from wildlife were also reported to contribute to the conflict.

Habitat loss/shrinkage, blockage of elephant corridors

Due to the increase in the human population, there is a corresponding expansion of human activities including: encroachment into elephant habitats, increasing settlement in migratory routes, shifting cultivation, over-grazing and wildfires. All these activities have led to either loss or shrinkage of elephant habitats. Encroachment and unplanned settlement for both agriculture and livestock-keeping in these areas has contributed to environmental degradation of habitats and obstruction of migratory routes. The resulting shrinkage of corridors has led to changes in migration routes and elephant numbers.. Human-wildlife conflict has also increased due to land use incompatibility. Major contributory factors were reported to be due to a lack of appropriate land use plans and, where these plans exist, a lack of enforcement of the relevant by-laws and the absence of sustainable strategies to implement them.

Lack of benefits from conservation and protection of elephants

Local communities surrounding many protected areas still claim not to benefit sufficiently from elephant conservation, despite several development programmes and investments related directly to conservation. However, the main critical issues regarding benefit sharing were reported to revolve around the type and equitable distribution of benefits.

Illegal trade in ivory

Increasing outlets and markets for elephant products have contributed to an increase in illegal trade in ivory. Porous borders, unethical and corrupt leaders and staff in various sectors / institutions have contributed to increases in illegal trading in ivory and its products.

Inadequate capacity of district councils to implement policies, enforce laws and regulations

Local Governments are perceived to have limited capacity to protect elephants due to the limited resources available to enable them to recruit, equip and train staff. It is also felt that decentralization has been a key contributor to this problem.

Conflicting policies, laws / institutions and regulations / weak / outdated laws

The current laws relating to the utilisation and protection of natural resources were reported to be very weak. Weaknesses in existing legislation result in inadequate protection of the elephant. Also weak laws do not support the existing Wildlife Policy and other natural resources and environmental policies. The laws also do not provide for sufficiently deterrent penalties. Conflicting policies and legislative environments have caused the establishment of a multitude of wildlife management and conservation institutions e.g. Tanzania National Parks, Ngorongoro Conservation Area Authority, Wildlife Division / Game Reserves, Local Government / Wildlife Management Areas. All of these institutions work to conserve and manage wildlife, including elephant populations, because elephants move between and within their areas of jurisdiction. However the roles and management jurisdiction, visions, human and financial capacities of each are different. These differences create management gaps or conflicts, which contribute to blockage of corridors and illegal hunting of elephants.

Inadequate stakeholder coordination in conservation and protection

There has been a tendency for wildlife authorities to work with people already within the conservation sector. However, it is now increasingly becoming evident that there is a need to involve stakeholders far beyond the conservation sector if the elephant is to be adequately protected.

Inadequate integration of indigenous knowledge in conservation

There is much indigenous conservation knowledge embodied within local communities, however this has not been used due to their limited involvement and participation in the planning processes.

Lack of or inadequate conservation education amongst communities

There is a need to increase technical conservation skills and knowledge within communities. In order to ensure effective and efficient protection of the African Elephant, communities may require training in appropriate wildlife conservation and management skills.

Climate change

Drought has caused a severe scarcity of water, and consequently elephants and people are competing for the remaining few sources. This competition has led to an escalation of conflict between people and elephants.

Poor communication infrastructure / facilities

There are few designated roads allowing access for management into many protected areas and into dispersal areas/corridors outside protected areas. Those few roads that exist are often in appalling

condition. This lack of infrastructure makes protection of elephants logistically difficult.

Corruption

It is felt that due to deteriorating moral behaviour among leaders and public workers many corrupt practices are currently associated with elephant products.

Poverty

Poverty of many inhabitants of rural communties, and a lack of access to alternative livelihoods, increases the likelihood of people resorting to trade in elephant products.

Lack of a single source of reliable elephant data

For effective conservation and protection of the African Elephant management and policy decisions should be guided by reliable data. Currently, wildlife censuses are carried out by TAWIRI and the data is subsequently stored in a database. However, this data is not readily available to stakeholders other than the government and management authorities. This forces other stakeholders to search for the data from other sources resulting in much conflicting information and hence conflicting decisions. Elephant research also need to be coordinated by one authority to avoid duplication and ensure that there is standardization of the information collected.

Failure to implement cross border conservation agreements

Elephants do not recognize political borders and hence there is a need to abide by agreements made between neighbouring countries to ensure free movement of elephants.

Political interference

Workshop participants felt that politicians almost always stood on the side of local communities, even when the positions adopted would almost certainly adversely affect elephant conservation.

Restricted values of wildlife perceived by some stakeholders

Some elephant management and conservation stakeholders perceive that elephants have limited economic value in the eyes of the public. Restrictive valuation of elephants guides management decisions which create conceptual conflicts amongst stakeholders and the incorrect formulation of wildlife management policies. Elephants have social / tourism values, cultural / spiritual values, ecological values, as well as economic value. Management policies, regimes and decisions must reflect all these values to best avoid conflicts.

3. Current Elephant Conservation Values and Issues

Throughout history, elephants have played an important role in ecology and human economies, religion and culture. The immense size, strength, and stature of this largest living land animal have intrigued Tanzanians of many cultures for hundreds of years. The following values were identified as significant within the Regional Workshops.

- Cultural significance to some ethnic groups
- Ivory as a commodity - it was generally felt by stakeholders that the population dynamics of elephants in Tanzania have always been hugely influenced by the value of ivory.
- Keystone species in the ecology of the Tanzanian landscape.
- Intrinsic biological values.
- A source of meat.
- A source of revenue from tourism.: wildlife-viewing tourism is worth more than $150 million a year to the Tanzanian economy. Elephant hunting also makes a substantial contribution to the economy.

4. Ivory Stockpile Issues

These planning workshops came at a moment when Tanzania was just denied the opportunity to sell its 90 ton stockpile of ivory by CITES in the CoP 15 in Doha. It was therefore deemed necessary for the Elephant Management Plan to consider strategies to manage ivory stockpiles. Participants to these workshops responded to three questions related to this issue.

1. What are the causes of ivory stockpiling?

Participants identified the following as sources of ivory to the government stockpile: the killing of problem animals officially and unofficially in retaliation for HEC; natural mortality; and poaching. Factors causing the stockpile to increase were identified as: a lack of use for ivory; restrictions imposed by international conventions (CITES) on the disposal of ivory.

2. What are the implications of ivory stockpiling?

Partiicpants identified high costs to the storage and security of ivory; lost opportunities for earning foreign currency needed to support conservation law enforcement; poor international relations; risks of deterioration of ivory in storage; risks from fire and theft; risks from corruption by storekeepers; the need for a review of elephant management policies.

3. Options to eliminate, minimize or offset the implications of stockpiling and address causes of stockpiling?

Participants identified the following options to address the issues of stockpiling: Reinforce / strengthen law enforcement; establish a special court for wildlife cases; fight corruption, ensure the existence of ethical personnel at all levels - TRA, airports, ports, courts; Motivate VGS and Game rangers and reduce HEC; increase stakeholder involvement in aspects of elephant management; improve on correct data storage and retrieval nationwide; establish zonal national museums and distribute ivory to these museums; conform to standards established by international treaties, but examine the relevance of CITES to Tanzania; pursue the option of the sale of ivory through downlisting elephant from CITES Appendix I to Appendix II.

5. Elephant Conservation Policies, Strategies and Actions

Participants to the workshops examined the future of elephant management in Tanzania, guided by elephant population trends and current issues. The exercise culminated in the development of policy statements, strategies and proposed actions as detailed below.

Policy 1: Tanzania will maintain numbers of elephants to meet specific geographical site needs and consistent with limits of acceptable adverse effects on their habitats and human livelihoods.

Strategy: Elephant Number Management.

Actions: Develop land use plans; develop and operationalize a central database; undertake elephant counts every 3 years; assess levels of habitat damage and levels of damage caused by elephants on human livelihoods; develop indicators of acceptable levels of elephant damage; develop appropriate elephant number control mechanisms; develop indicators of acceptable habitat change limits; research and document all resources used by elephants in all ecological regions.

Policy 2: Tanzania will continue to avert illegal acts which cause the ivory stockpile to grow and strive to dispose her pile through CITES instruments.

Strategy: Ivory Stockpile Management.

Actions: Ensure security of ivory piles; adequately equip and strengthen law enforcement teams; establish zonal museums; involve stakeholders in combating poaching; establish a data base; Improve

security at borders, ports, airports, bus and train stations; lobby CITES to allow disposal of legally obtained ivory; ensure good governance within the sector; control problem elephants using non lethal methods.

Policy 3: Tanzania will endeavour to fight the illegal trade in elephant ivory and support sustainable trade through CITES.

Strategy: Elephant ivory trading.

Actions: Undertake cost-benefit analysis of ivory trade; adequately equip and strengthen law enforcement and intelligence units; involve other relevant institutions in guarding against illegal trade of elephant products; enhance cross border cooperation in the fight against ivory trade; improve security on ports, airports, bus and train stations; develop and operationalize an information sharing network for illegal trade of trophies; advocate for inclusion in the law of more severe deterrents against culprits involved in illegal trade of ivory; abide by CITES regulations when trading ivory and ivory products; boost political will.

Policy 4: Tanzania will endeavour to promote community involvement and benefits through participatory elephant management approaches.

Strategy: Community benefits and involvement.

Actions: Put in place transparent and equitable mechanisms for sharing elephant conservation benefits with communities; support establishment and proper functioning of WMAs and CBOs; ensure involvement of stakeholders bordering areas with elephant; establish an elephant conservation education programme / outreach programmes; establish networks/forums for information sharing and participation amongst communities.

Policy 5: Tanzania will endeavor to mitigate human- elephant conflicts using appropriate and sustainable means.

Strategy: Human-elephant conflicts.

Actions: Conduct campaigns to move people out of problem areas; research and map all problem areas; put in place a system to make assessment of elephant damage; ensure prompt disbursement of consolation payments to affected people; improve the capacity of district councils to control problem animals; prepare and implement land use plans / identify and protect corridors / establish and maintain buffer zones in open areas; control settlements in conservation and surrounding areas; educate communities on the value of elephants and how to coexist with them; educate communities on how to avoid conflicts with elephants e.g. hard fencing, growing of crops not favoured by elephants, use of chilli oil fences, etc; translocation; establish and support relevant conservation enterprises / community development projects.

Policy 6: Tanzania will work with the international community in ways that promote sustainable conservation of her elephants.

Strategy: International relations.

Actions: Continue to support and ratify relevant and beneficial conventions/agreements; strategize conservation policies within EAC and SADC; promote attendance at international conferences; establish and operationalize cooperation programmes in scientific research and protection with international institutions/organizations; cooperate with neighbouring countries in the protection of elephants; continue with efforts to raise funds for the protection of the elephant from various international supporters and stakeholders.

Policy 7: Tanzania will endeavour to put in place the best and most relevant mechanisms to protect her elephants.

Strategy: Elephant protection and law enforcement.

Actions: Recruit, motivate and equip more staff; strengthen anti-poaching and intelligence units; improve communication infrastructure – roads, telephone, etc; develop an elephant policy;; harmonize sector policies and laws such those of agriculture, livestock conflicting with elephant conservation; research and adapt indigenous elephant conservation knowledge and practices; increase capacity of teams involved in protecting elephants; increase anti- poaching patrols; establish a special court for illegal offtake cases; involve various players e.g. TPDF, police, and communities in combating poaching; improve security at all border exit points; strengthen village natural resources committees / VGS; ensure proper record keeping of all elephant deaths.

Policy 8: Tanzania will endeavour to ensure that elephants are utilized in the most efficient, effective, optimal and equitable means.

Strategy: Elephant utilization.

Actions: Set realistic hunting quotas; monitor, assess and document utilization of elephants and their products; improve the tourist hunting and photography industry; establish different zones for different uses – hunting, photographic, conservation, etc; research and document consumption of elephant meat from PAC and tourist hunting; cooperate with the international community to ensure the proper utilization of elephants and its products.

Policy 9: Tanzania will endeavor to enhance understanding and appreciation of Elephant values by her citizens.

Strategy: Elephant conservation education and awareness.

Actions: Radio and TV programmes, leaflets, posters, cinemas, etc; establish a national elephant day; awareness meetings; reward communities which support elephant conservation initiatives; enhance outreach programmes both in villages and schools; share benefits from elephants equitably; support establishment of WMAs and CBOs (which provide benefits directly to communities); initiate and support Mali Hai clubs in schools and communities; establish and support drama groups for elephant conservation education; establish and support relevant conservation enterprises/community development projects.

Policy 10: Tanzania will endeavour to continue with participatory plans and processes providing for holistic environmental protection and sustenance of her ecological systems through a landscape system approach.

Strategy: Landscape system.

Actions: Effective land use planning; put in place by-laws to ensure land use plans are implemented; identify and protect corridors / designate elephant wildlife corridors and buffer zones; improve education and awareness of communities about landscape ecosystem management; conduct research on the status of landscape ecosystem; undertake habitat restoration in landscape ecosystem; initiate participatory programmes on ecological rehabilitation in landscape ecosystems.

Policy 11: Tanzania will strive to ensure that elephant welfare is safeguarded.

Strategy: Elephant welfare strategy

Actions: Through the adoption of the action points presented above.

6. Roles of Stakeholders in Elephant Conservation

For the implementation of the new elephant management plan to yield its desired goal, it is crucial that all key players, including those not represented at the workshops, are engaged. Participants to these planning workshops were used to identify individuals, institutions, groups, parties or states

with interests in elephant conservation (both negative and positive). This analysis of stakeholders will help identity who and how to involve stakeholders at different stages of the implementation of the plan through the understanding of the degree of influence they have, the role they can play and their weaknesses which may affect elephant conservation efforts.

The notes below summarize the stakeholders identified at the four workshops, and their perceived pluses and negatives to elephant conservation.

Stakeholder: TANAPA

Protection of natural resources within national parks, but pays less attention to areas outside the national parks; supports wildlife research; advocates and supports community involvement, but has poor relations with conservation stakeholders; sustainable utilization; assists in problem animal control; provides conservation education

Stakeholder: Wildlife Division

Overseer of wildlife conservation; conservation and protection of natural resources; controls utilization, but consumptive utilization is poorly managed; develops and implements policies, laws and regulations; has inadequate working facilities/equipment, low human resources and financial resources to manage wildlife; corruption is perceived to be a problem.

Stakeholder: Ngorongoro Conservation Area Authority

Protects natural resources with the NCA, but pays less attention to areas outside the Conservation Area; conducts research in the conservation area.

Stakeholder: TAWIRI

Supervises wildlife research; custodian of wildlife data, but provides limited dissemination of research findings; provides educational and professional advice; inadequately financed.

Stakeholder: Training institutions

Provides training in wildlife conservation; conducts research, but research is principally academic; provides educational and professional advice; contributes to workforce, but their graduates are perceived to dislike wilderness based jobs; inadequately financed.

Stakeholder: Wildlife Management Areas

Provides protection and conservation of village lands; controls utilization/sustainable utilization, though there is perceived to be inequitable sharing of benefits accrued from wildlife; identification of poachers; implements land use plans; benefits from conservation efforts; protects corridors / buffer zones; they are ill equipped, have low capacity, poor infrastructure, and are affected by illiteracy and poverty.

Stakeholder: NGOs / CBOs

Supports elephant conservation (financially, awareness, capacity building, sensitization), but this is often conditional support and they contribute to a dependency syndrome; carry out research and make data available; support community economic development projects; mediate conflicts; support conservation projects e.g. establishment of WMAs and conservation education programmes.

Stakeholder: Investors (tour companies, hotel associations, etc)

Protection and conservation of wildlife; conducts anti-poaching patrols; supports community economic development projects; provides conservation education programmes, though these are sometimes considered inadequate; provides employment opportunities; provides visitor statistics; contributes to foreign currency earning, but some are perceived as corrupt; seen as bureaucratic and believed to concentrate investments in small areas.

Stakeholder: Poachers

lllegal harvesting.

Stakeholder: Local Government

Management of wildlife outside core protected areas; anti-poaching patrols; control human elephant conflict; develops and implements conservation by laws; provides different statistics; provides conservation education; seen to be ill-equipped (facilities, finance, etc) and corruption is reported as a problem.

Stakeholder: Communities

Eliminate / mitigates effects of HEC; benefits from conservation, though there may be resistance to setting aside areas for conservation; identifies corridors; provides informers to identify poachers, though may also harbour poachers; protects elephants; though there may be competition for resources (water), and habitat destruction and corridor obstruction; ill-equipped.

Stakeholder: Media

Educates / sensitizes the public on matters of elephant conservation, but may give misleading information.

Stakeholder: Intergovernmental organizations

Provides support for conservation, but targets their support at higher political? levels.

Stakeholder: Forest and Bee-keeping Division

Protects habitat and undertakes research, but has inadequate facilities/capacity.

Stakeholder: Division of Environment

Environment protection

Stakeholder: Ministry of Lands

Surveys, demarcates and provides deeds of ownership

Stakeholder: Religious institutions

Raises awareness and increases sensitization to environmental issues, but are faith-dependent.

Stakeholder: Ranch owners

Habitat protection / corridor protection, though fencing can be a problem; patrols; water provision; reduces disease transmission; owners may have limited knowledge of conservation, or inadequate capacity to manage big ranches

Stakeholder: Ports Authority

Certifies exports, but may have limited knowledge of elephant products; corruption is a potential problem.

Stakeholder: Politicians / Parliament

Protects the interests of the people, but may be against relocation of people from conservation areas; can sensitize communities to protect elephants; provides development of laws and policies; technical interference seen as a negative.

Stakeholder: Tanzania Police Force and INTERPOL

Provides security for Property; provides protection of humans; seizes trophies; safeguards against sabotage; provides law enforcement; provides custody of exhibits; prosecutes criminals but may be

responsible for the premature release of suspects.

Stakeholder: Immigration

Controls illegal immigrants; may have limited knowledge of elephant products, corruption a problem

Stakeholder: Neighbouring countries

Provides exchange of intelligence information; collaborates in research

Stakeholder: Refugees

Contributes to Environmental destruction; contributes to killing of elephants; contributes to killing of game rangers, village game scouts; increases settlement and blockage of corridors; increases ownership of sophisicated firearms.

Stakeholder: Foreign diplomats in Tanzania

Can convince their governments to support elephant conservation; may export ivory from country under diplomatic cover.

Stakeholder: Tanzania Wildlife Protection Fund (TWPF)

Supports conservation.

Stakeholder: Tanzania Peoples Defence Force (TPDF)

Rescue operations of people affected by elephants; translocation of elephants; provides law enforcement; protects against cross boundary insurgencies; protects wildlife on military training lands, but elephant habitat may be used for army exercises.

Stakeholder: Prisons

Reformation of criminals, mostly elephant poachers

Stakeholder: Judiciary

Interprets relevant laws and makes judgements; may release criminals / poachers, or give non-deterrent penalties.

Stakeholder: Lusaka Agreement Task Force (LATF)

Controls illegal cross boundary trade in ivory; shares information with partners across political boundaries on illegal trade of ivory

6. Elephant Conservation Indicators

To be able to tell if the plan is achieving its goal, there must be some way to measure the achievements. Measurements will include a systematic process of monitoring the achievements of the plan, collecting and analyzing performance information to track progress toward planned results, using performance information and evaluation to influence decision- making and resource allocation; and communicating results achieved, or not attained, to advance learning.

Meassuments are also expected to involve many players. It was felt important for participants at the workshops to generate some ideas on possible indicators which will be used to measure the performance of the proposed plan.

The notes below summarize the indicators from the four workshops.

Elephant Driver Indicators

Human attitudes and values; behaviour of humans and elephants; market of elephant products / values; amount of encroachment into elephant habitat; elephant distribution and movements.

Elephant Pressure Indicators

Number of elephants killed per year/month/day; area of habitat shrinkage per year; rate of habitat destruction; amount of damage caused by elephants per day / week / month; poaching incidences per day / week / month; number of poachers arrested per day / week / month; number of trophies seized per day / week / month; number of weapons / snares confiscated per day / week / month; elephant mortality rate; elephant birth rate.

Elephant State Indicators

Size of suitable habitat; amount of elephant damage; number of elephants; habitat condition; incidences of diseases in elephants; current migration patterns; age structure; sex ratio; genetic variation / biodiversity.

Elephant Impact Indicators

Elephant health; level of conflict with people; ecosystem health; socio-economic and financial impacts; change in biological diversity; other ecological impacts.

Elephant -Societal Response Indicators

Policies; legislation; conventions / treaties; institutions; law enforcement equipment.

Conclusion

A high degree of convergence of ideas was evident at the four workshops, an indication that problems facing elephant management in Tanzania are common throughout the country and call for similar strategies. Key issues are those related to HEC, effects on livelihoods and benefit sharing. Although all issues need attention, there was a feeling from many workshop participants that these three are critical if the elephant is to survive. Key also to the success of the plan is the involvement of other players in its implementation.

Appendix III
Final workshop participant's list

No	NAME	TITLE	INSTITUTION	COUNTRY
1.	Keith Roberts	General Manager	Friedkin Conservation Fund	TANZANIA
2.	Julius Kimani	Assistant Director	KWS	KENYA
3.	Eliab Orio	Safari Operator	TAWICO/Tembo Foundation	TANZANIA
4.	Joe Anderson		PAMS (Ecological Institutions)	TANZANIA
5	Sebogo Lamine	AEPC	WWF Int.	KENYA
6.	George Jambiya	Senior Lecturer (Dr.)	UDSM	TANZANIA
7.	Cyprian Malima	Project Executant	WWF – TCO	TANZANIA
8.	Alfredi Kikoti	Research Scientist (Dr.)	Kili–Saadani Elephant Research Project	TANZANIA
9.	Malcolm Ryem	Ecologist	Hotel Association of Tanzania	TANZANIA
10	Richard Hoare	Senior Researcher (Dr.)	TAWIRI	TANZANIA
11.	Edison Nuwamanya	Sub regional Support Officer East Africa	CITES Mike Programme	UGANDA
12.	Trevor Jones	Consultant	WCS	TANZANIA
13.	Moses Litoroh	Elephant Program Coordinator	KWS	KENYA
14.	Diane Skinner	Programme Officer	IUCN	KENYA
15.	Charles Foley	Assistant Country Director (Dr.)	WCS	TANZANIA
16.	Tim Davenport	Country Director (Dr.)	WCS	TANZANIA
17.	Simon Metcalfe	Consultant	CAMPFIRE	ZIMBABWE
18.	Wayne Lotter	International Team Leader	Selous – Niassa Corridor Project	TANZANIA
19.	Midala, B.M.C. M.	Asst. Director	WD – MNRT	TANZANIA
20.	Thomas Joachim	Game Officer	Vice President Office	TANZANIA
21.	Fredrick F. M. Mwombeki	Zonal Antipoaching Commander	WD	TANZANIA
22.	Donald G. Mpanduji	Associate Professor	SUA	TANZANIA
23.	Pascal Mrina	Zonal Commander	WD	TANZANIA
24.	Mutayoba B.M.	Professor	SUA	TANZANIA
25.	Peter A. Ottaru	PGO – Manager Moyowosi/Kigosi Game Reserve	WD	TANZANIA
26.	Faustine I. Masalu	Zonal Antipoaching Commander – Eastern	WD	TANZANIA
27.	Songorwa, A.N	Professor	Head of Wildlife Department-SUA	TANZANIA
28.	Hassan Nkusa	Zonal Antipoaching Commander	WD	TANZANIA

29.	Elias Bahati Muzee	Zonal Antipoaching Commander - Mwanza	WD	TANZANIA
30.	Lowaeli.S. Damalu	Game Officer (Operations and MIKE)	WD	TANZANIA
31.	S. A. Okudo	Principal Game Officer	WD	TANZANIA
32.	Honori Maliti	Research Officer	TAWIRI	TANZANIA
33.	Mushi Hillary	ACO II	NCAA	TANZANIA
34.	Inyasi A. Lejora	Manager-Ecological Monitoring Department	TANAPA	TANZANIA
35.	John Mbwiliza	Project Manager	WD – Selous Game Reserve	TANZANIA
36.	Oscar J. Lipiki	Acting Antipoaching Commander	WD	TANZANIA
37.	Qambemeda M. Nyanghura	Game Officer	WD	TANZANIA
38.	Jafari R. Kideghesho	Senior Lecturer (Dr.)	SUA	TANZANIA
39.	Flora Magige	Lecturer (Dr.)	UDSM	TANZANIA
40.	Demetrius Kweka	Program Technical Assistant, M &E	WWF	TANZANIA
41.	Mary G. Simbeye	Principal Agr. Officer	Ministry of Agriculture, Food security and Cooperatives	TANZANIA
42.	Kennedy A. Hincha	DNRO	Mbarali District Council	TANZANIA
43.	William S. Mwakilema	Acting Chief Park Warden (Ruaha)	TANAPA	TANZANIA
44.	Adolf B. Matungwa	Zonal Coordinator	NEMC	TANZANIA
45.	Monica A. Kagya	Assistant Director -Research, Training and Statistics	FBD – MNRT	TANZANIA
46.	Metson R. Mwakanyamale	Zonal Antipoaching Commander	WD	TANZANIA
47.	Berthold J. Mlolere	Zonal Antipoaching Commander	WD	TANZANIA
48.	Ngomelo K.A.S.	Project Director	Selous Niassa Wildlife Protection Corrodor	TANZANIA
49.	Stephen Kihaule	DNRO	Mtwara District Council	TANZANIA
50.	Papilon Mkome	EMO	NEMC	TANZANIA
51.	Kiyungi M. Kiyungi	DNRO	Namtumbo District Council	TANZANIA
52.	Thadeous Binamungu	SPO	AWF	TANZANIA
53.	Lazaro J. Mangewa	Asst. Lecturer	MWEKA	TANZANIA

54.	Mhagama M. X.	ADDR	Ministry of Lands	TANZANIA
55.	Florence D. Mwalle	DNROistrict Lands, Natural Resource & Environmental Officer	Urambo District council	TANZANIA
56.	Sunday P. Songwe	Budget Officer	Tanzania Police Force	TANZANIA
57.	Valency Mutakyamirwa	Economist	Ministry of Home Affairs	TANZANIA
58.	James Wakibara	Principal Ecologist (Dr.)	TANAPA	TANZANIA
59.	Fredrick M. E. Mofulu	Park Ecologist	TANAPA	TANZANIA
60.	Maurus J. Msuha	Senior Research Officer (Dr.)	TAWIRI	TANZANIA
61.	Charles S. Gwera	Principle Game Warden	WD – APU	TANZANIA
62.	Paul Baran	Field Officer	WCS	TANZANIA
63.	Alexander Loiruk Lobora	Senior Research Officer and TEMP Project Manager	TAWIRI	TANZANIA
64	Rose Kicheleri	Tutorial Assisant	SUA	TANZANIA
65.	Rose Mosha	TCP - Coordinator	TAWIRI	TANZANIA
66.	Abdallah Mgonja	DGO – Chunya	Chunya District Council	TANZANIA
67.	Sue van Remsburg	Representative	Singita Grumeti Fund	TANZANIA
68.	Gerald Bigurube	Program Officer	FZS	TANZANIA
69	Enock Chengullah	Wildlife Program Officer	TNRF	TANZANIA

ADDENDUM

Suggestions for funding the implementation of the

Tanzania Elephant Management Plan

A plenary discussion was held on the funding requirements needed to successfully implement the Tanzania Elephant Management Plan. It was agreed that funding for all the strategies would require a considerable mobilization of resources, and it was noted that the government alone may not be able to fund each and every component. The next stage would therefore require prioritization and division of responsibilities among the key stakeholders. The following suggestions for funding the Plan were made:

- An immediate action is for a Steering Committee (SC) to develop an economic plan that details the value of elephants to the Tanzanian economy and which shows clearly the short and long term benefits of the Tanzania Elephant Management Plan.

- The Management Plan will have to be budgeted for, following up on the commitments made in the Permanent Secretary's speech at the opening of the meeting and ensuring that there is an adequate and appropriate allocation of funds for elephant management.

- Other actors/stakeholders (including researchers, research organizations and Conservation NGOs) may need to focus and select various aspects of the Plan. Some of these will have the resources or the ability to mobilize resources required for implementation of these components.

- Tanzania should continue to convince CITES to be allowed to sell its ivory stockpile with a commitment of using the accrued revenue to fund the Plan.

- The private sector should be consulted and requested to fund some components of the Plan.

- A fundraising event for international partners should be set up and the Tanzania Elephant Management Plan should be used to prepare an Elephant Fund roundtable.

- The document should be used to raise funds, for example, from the African Elephant Fund.

- In order to be able to attract funds, regular reviews of the implementation of the Plan is essential in order to check on achievements as well as accountability of resources used.

- Seed money should be requested from the Plan's key stakeholders - WD, TANAPA, NCAA and Conservation NGOs – that will be used to hire consultants to market and raise funds for the Plan.

- TAWIRI was identified as the agency that will take the lead in identifying the funding gaps and writing proposals for grants.

- The position of WD Elephant Programme Officer has not been filled for several years. It is important for the DW to ensure that a capable and enthusiastic person is appointed to fill the position.

Tanzania Elephant Management Plan

2010-2015