



Greater Mapungubwe

Transfrontier Conservation Area



Collaborative Policy and Planning Framework for the Management of Elephants, 2011-2020



Greater Mapungubwe Transfrontier Conservation Area

"a world-renowned Transfrontier Conservation Area linking the Mapungubwe cultural landscape as well as the ecosystems of the Limpopo and Shashe Valleys across the international borders between Botswana, South Africa and Zimbabwe"

Collaborative Policy and Planning Framework for the Management of Elephants

2011-2020

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TABLE OF CONTENTS

ACKNOWLEDGEMENTS	i
APPROVALS	ii
TABLE OF CONTENTS	iii
LIST OF FIGURES	iv
LIST OF MAPS	iv
LIST OF TABLES	v
ABBREVIATIONS/ACRONYMS	v
EXECUTIVE SUMMARY	vii
1 INTRODUCTION	1
2 BACKGROUND	2
2.1 HISTORICAL SIGNIFICANCE	3
2.2 BIOPHYSICAL FEATURES.....	3
2.2.1 Climate.....	3
2.2.2 Geology and Geomorphology.....	3
2.2.3 Soils.....	4
2.2.4 Topography.....	4
2.2.5 Hydrology.....	4
2.2.6 Vegetation.....	4
2.2.7 Large Mammals.....	4
2.3 SOCIO-ECONOMIC CONDITIONS.....	6
2.3.1 Tenure Arrangements and Land Use.....	6
2.3.1.1 Agriculture	7
2.3.1.2 Mining and Energy Production	7
2.3.1.3 Tourism.....	7
3 LEGAL AND INSTITUTIONAL FRAMEWORK	9
3.1 WILDLIFE POLICIES AND LAWS	9
3.2 GOVERNANCE.....	9
3.3 CONSERVATION AREAS	11
3.4 TFCA STAKEHOLDERS.....	11
4 CONSERVATION STATUS OF ELEPHANT	12
4.1 SOUTHERN AFRICA.....	12
4.2 BOTSWANA	12
4.3 SOUTH AFRICA.....	13
4.3.1 Elephant Management Plan: Mapungubwe National Park.....	14
4.3.2 Transboundary Management of Elephants.....	15
4.4 ZIMBABWE	15
4.5 GREATER MAPUNGUBWE TFCA	16
5 KEY ELEPHANT CONSERVATION ISSUES	17
5.1 ELEPHANT NUMBERS, DISTRIBUTION, RANGE, TRENDS AND MORTALITY	17
5.1.1 The Tuli Elephants.....	17
5.1.2 Demographics.....	17
5.1.3 Mortality.....	17
5.2 ELEPHANT CONSERVATION AND MANAGEMENT.....	19
5.2.1 Persistence of Specific Vegetation Communities.....	19
5.2.2 Plant Species whose Persistence is of Special Concern.....	19
5.2.3 Trampling Effects	19
5.2.4 Persistence of Specific Vegetation Types due to too little Use by Elephant	19

5.3	HUMAN ELEPHANT CONFLICT	20
5.3.1	<i>Causality and Possible Solutions</i>	20
5.4	BENEFITS OF ELEPHANT CONSERVATION	21
5.5	VETERINARY DISEASE CONTROL CONSIDERATIONS	22
6	POLICY AND PLANNING FRAMEWORK STRATEGY	23
6.1	VISION	23
6.2	MISSION	23
6.3	GOAL	23
6.4	ACTION PLAN	23
6.4.1	<i>Assumptions</i>	24
6.4.1.1	Goal Level	24
6.4.1.2	Objectives Level	24
7	IMPLEMENTATION PROCEDURES	29
7.1	INSTITUTIONAL AND ORGANISATIONAL ARRANGEMENTS	29
7.2	IMPLEMENTATION SET UP	29
7.3	ACTION PLAN, MANAGEMENT CALENDARS AND WORK PROGRAMMES	29
	REFERENCES	30
	APPENDICES	32
	APPENDIX 1: SUMMARY OF APPLICABLE LEGAL INSTRUMENTS	32
	APPENDIX 2A: PASSIVE METHODS FOR MANAGING ELEPHANTS	34
	APPENDIX 2B: ACTIVE METHODS FOR MANAGING ELEPHANT	35
	APPENDIX 3: CALCULATION OF HUNTING QUOTAS	36
	APPENDIX 4: SUPPLEMENTARY MAPS	37
	APPENDIX 5: LOGICAL FRAMEWORK ANALYSIS	40

LIST OF FIGURES

Figure 1: Institutional Arrangements	29
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LIST OF MAPS

Map 1: Land Use	8
Map 2: Proclamation Status	11
Map 3: Elephant Distribution in GMTFCA 2000-2010	18
Map 4: Elephant Census, August 2010	37
Map 5: Elephant Census - Count Distributions, Land Tenure	37
Map 6: Elephant Census – Kernel Probabilities, Land Cover	38
Map 7: Elephant Census – Kernel Probabilities, Land Tenure	38
Map 8: GMTFCA Development Phase 1	39
Map 9: GMTFCA Development Phase 2	39

LIST OF TABLES

Table 1: Provisional list of large mammals known to occur in the GMTFCA	5
Table 2: Comparisons of the Legal Basis for the Management of Elephant Populations in Botswana, South Africa and Zimbabwe	10
Table 3: Administrative and Governance Structures for Conservation Areas in the GMTFCA	11
Table 4: Results of the Six Aerial Total Counts of the Central Limpopo Valley Elephant Population	18
Table 5: Human elephant conflict issues	20
Table 6: Issues facing the benefits of elephant conservation	21
Table 7: GMTFCA Elephant Management Action Plan 2011-2020	25
Table 8: Country-based Legal Instruments	33
Table 9: Passive Methods for Managing Elephant	34
Table 10: Active Methods for Managing Elephant	35
Table 11: Approximate Relationship between Population Structure and Size/age Relationship of Ivory from Zimbabwe Data	36

ABBREVIATIONS/ACRONYMS

AA	Appropriate Authority
bTB	bovine Tuberculosis
Bw	Botswana
CAMPFIRE	Community Areas Programme for Indigenous Resources
CBNRM	Community Based Natural Resource Management
CCA	Community Conservation Area
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CRUAT	Community Resource Use Assessment Technology
DEA	Department of Environment Affairs
DNP&WLM	Department of National Parks and Wild Life Management
DSS	Decision Support System
DWNP	Department of Wildlife and National Parks (Botswana)
FAO	Food and Agriculture Organisation
FMD	Foot and Mouth Disease
GMTFCA	Greater Mapungubwe Transfrontier Conservation Area
GR	Game Reserve
HEC	Human Elephant Conflict
ICS	International Conservation Services
IDP	Integrated Development Plan
IUCN	International Union for the Conservation of Nature
JMP	Joint Management Plan
JV	Joint Venture
KNP	Kruger National Park
LE	Law Enforcement

LFA	Logical Framework Analysis
LNP	Limpopo National Park
MoU	Memorandum of Understanding
MPNP	Mapungubwe National Park
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NOTUGRE	Northern Tuli Game Reserve
NP	National Park
NR	Nature Reserve
NRMP	Natural Resource Management Programme
PA	Protected Area
PAC	Problem Animal Control
PCP	Private-Community Partnership
PPCP	Public-Private-Community Partnership
PPF	Peace Parks Foundation
PWMA	Parks and Wildlife Management Authority (Zimbabwe)
RDC	Rural District Council
SA	South Africa
SADC	Southern African Development Community
SANParks	South African National Parks
SME	Small Medium Enterprise
TFCA	Transfrontier Conservation Area
TPC	Thresholds of Potential Concerns
TTC	Trilateral Technical Committee
UNESCO	United Nations Education, Scientific and Cultural Organisation
WCP	Wildlife Conservation Policy
WHS	World Heritage Site
WMA	Wildlife Management Area
Zw	Zimbabwe

EXECUTIVE SUMMARY

In the late 1990s a proposal for a Transfrontier Conservation Area (TFCA) comprising the confluence of the Limpopo and Shashe Rivers straddling Botswana, South Africa and Zimbabwe area led to the formal establishment of the Greater Mapungubwe Transfrontier Conservation Area (GMTFCA). The TFCA has a spectacular diversity of plant and animal life, scenic landscapes, paleontological and archaeological remains, and a rich Iron Age cultural heritage combining to make the area one of great societal and scientific value.

The GMTFCA is characterised by sparse populations of people, and limited infrastructural support. The nature of land use and ownership is unusually diverse and includes contractual partners, private and communal land owners, land claimants, private tourism operations, game farms, and commercial and subsistence farmers. In all three participating countries there are both existing and proposed formally proclaimed protected areas as well as community and private sector conservation areas enjoying varying forms of conservation or protection status.

Recent developments in nature-based tourism include ecotourism and safari hunting with Mapungubwe as a cultural hub. The likely regional benefits arising from the TFCA has much economic promise with development plans providing details of these aspirations. If this can be achieved, the socio-economy of the region will be transformed from what is a partly subsidised and subsistence agricultural economy to one based on more sustainable nature-based tourism.

Several areas could potentially become part of the TFCA formally proclaimed protected area network subject to the relevant legislation of the partner country within which the area is located and in accordance with the development planning process of the TFCA itself. Presently the core TFCA area is 257,298 ha with the potential to double to 563,823 ha. The legal frameworks in Botswana, South Africa and Zimbabwe for elephant conservation are not markedly dissimilar and provide the basis for developing a policy and planning framework for elephant management in the TFCA. However, advances in conceptualising this framework for improved management decisions and their implementation can still be made.

Over 30 years ago, elephant in northern Tuli were estimated to number about 1,200 animals and since 2000, six total counts have yielded an average of 1,224 elephant in the TFCA, an apparently relatively stable population of which more than 50% occur in the Northern Tuli Game Reserve, in Botswana. Elsewhere elephant occupy the confluence of the Shashe-Limpopo Rivers, including Venetia and Mapungubwe National Park in South Africa. In Zimbabwe, largish but isolated groups occur on Sentinel and Nottingham Ranches with only few elephant in Tuli Circle. The absence or infrequent occurrence of elephant in the Zimbabwean communal lands is notable, although sporadic appearances of crop raiding elephant are reported.

Present indications suggest levels of protection and tenure in relation to land use rather than land cover or vegetation determines this distribution and the existing elephant range. Further development of the TFCA will provide additional elephant range as reflected in the goals and objectives of this strategic framework, as well as providing for desired management actions.

A collaborative policy and planning framework for the management of elephant in the GMTFCA envisages the presence of elephant as integrated drivers of ecosystem integrity, benefiting all stakeholders and enhancing the livelihoods of people, thereby contributing to the social, cultural, ecological and economic development of the Transfrontier Conservation Area.

In addressing identified issues of conservation, protection and ecological management, including veterinary disease control, together with human elephant conflict and livelihood improvements of local people, the strategic goal is to maintain and adaptively manage variable elephant use of cultural and biological landscapes, enhance rural livelihoods and improve wildlife benefits, whilst reducing conflict and engaging stakeholders through effective communication.

Five objectives will achieve the above: Elephant populations will be conserved and protected; elephant impacts will be managed and populations sustainably used across the TFCA landscape in collaboration with local stakeholders; and human elephant conflict will be reduced through spatial planning, mitigation measures and increased benefits. Accompanying each of these objectives is a set of strategies and actions.

1 INTRODUCTION¹

In the late 1990s a transfrontier conservation initiative was suggested for the area situated at the confluence of the Limpopo and Shashe Rivers straddling Botswana, South Africa and Zimbabwe. This led to the formal establishment of the Greater Mapungubwe Transfrontier Conservation Area (GMTFCA) in June 2006 through a Memorandum of Understanding (MoU) signed by the Governments of the three partner countries.

The GMTFCA represents the western extremity of the southern African lowveld, extending from the contact zone between Mozambique, South Africa and Zimbabwe, along the Limpopo Valley. Initially the Transfrontier Conservation Area (TFCA) was known as the Limpopo/Shashe TFCA but was renamed in 2009 after a proposal submitted by the Trilateral Technical Committee (TTC) met with approval by a Ministerial Committee of the three countries. The TFCA is now known as the Greater Mapungubwe TFCA, with Mapungubwe meaning "The place of the many jackals".

The TTC with supporting Working Groups was created in terms of the MoU to fulfill the coordination function between the countries until a Treaty is signed and a joint management structure formalised. Since the signing of the MoU, a vast amount of deliberation and discussion has taken place within the partner countries regarding the areas to be incorporated as part of the core and buffer area of the TFCA. This includes communal land, private land and State land components.

The TFCA Integrated Development Plan (IDP - GMTFCA TTC. 2010) provides context for the GMTFCA and provides a structured description of the study area -the place and its people - and the plan for managing and developing the TFCA. The aim of the IDP for the Greater Mapungubwe TFCA is to provide clear guidelines for attaining the objectives of the TFCA by addressing the various aspects related to the governance of the TFCA, which include institutional arrangements, joint planning, integrated management and development, policy harmonisation, the sustaining of landscape dynamics, and sustainable financing of TFCA related activities.

This document, the Collaborative Policy and Planning Framework for the Management of Elephants in the Greater Mapungubwe Transfrontier Conservation Area 2011-2020, contributes to a number of identified needs in the TTC's Conservation Working Group's Action Plan which includes combining all specific management plans into one overall Joint Management Plan (JMP). The JMP, in integrating country-specific species, heritage, legislative, policy and management plans, will take into account elephant policy and management needs to which this planning framework specifically contributes. The Planning Framework presented here has built on and benefited from preliminary working documents (GMTFCA WD 2010a, b) and two participatory planning workshops and meetings (GMTFCA 2010c, d).



¹ The Introduction and Background sections draw on GMTFCA TTC. 2010. Greater Mapungubwe Transfrontier Conservation Area Integrated Development Plan, February 2010. vii + 126pp

2 BACKGROUND

The GMTFCA is centred on the confluence of the Limpopo and Shashe rivers that straddle the international boundaries of Botswana, South Africa and Zimbabwe. The area has a diversity of plant and animal life, scenic geological features, paleontological and archaeological findings including fossilized dinosaur remains and dinosaur footprints, golden ornaments and other decorative artefacts, San rock paintings and engravings as well as the rich cultural heritage associated with the Iron Age Settlements of around 1200 AD. These attributes combine to make the Limpopo-Shashe confluence area an ideal site for establishing a Transfrontier Conservation Area of great societal and scientific value.

The proposal for creating a National Park on the South African side was resurrected in 1967 in recognition of the value of archaeological sites around Mapungubwe hill. This proposal received support from leading institutions associated with the conservation of nature and archaeological sites, resulting in the proclamation of the 8,746 ha Vhembe Nature Reserve, comprising one state-owned and two privately-owned farms. This initiative was compromised by an intensive irrigation scheme developed on the privately-owned properties. The idea of establishing the Dongola National Park was revisited again in 1994. This attempt culminated in the 1995 agreement signed by the Premier of the Northern Province and the South African Minister of Environmental Affairs and Tourism, proposing the establishment of a National Park at the confluence of the Limpopo and Shashe rivers. South African National Parks (SANParks), assisted by the Peace Parks Foundation (PPF), has since 1998 been involved in land purchases to consolidate the core area of the Mapungubwe National Park (MPNP).

Whilst South Africa was engaged in protracted negotiations to create a conservation area around the confluence of the Limpopo and Shashe rivers, the situation in Botswana had been pro-conservation for some considerable time previously. In the late 1960s and early 1970s, a group of 21 farm owners who between them owned 33 farms with a total area of 64,000 ha, removed fences separating their properties to jointly farm game. The property owners also created a Land Owners Association called the Northern Tuli Game Reserve (NOTUGRE). The reasons the property owners engaged in game ranching is that much of NOTUGRE lies in an area designated as a cattle free zone because of the prevalence of Foot and Mouth Disease (FMD).

The situation in Zimbabwe is somewhat different where main land use practices involve livestock rearing, cattle and game ranching, safari hunting and small irrigation schemes. The potential TFCA sites in Zimbabwe include one state protected area, Tuli Circle Safari Area, three commercial estates, Sentinel, Nottingham and River Ranches and communal wards in Maramani, Machachuta and Masera Communal Lands. The Tuli Circle Safari Area (55,000 ha), established in 1963, is presently used for trophy-based safari hunting, whereas the commercial estates of Sentinel Ranch (32,000 ha) and Nottingham Estate (25,000 ha) are primarily used for game ranching and safari hunting, all with annual hunting quotas allocated by the Zimbabwe Parks and Wildlife Management Authority (PWMA). Small portions of these properties are being used for irrigation and commercial cattle ranching. The communal lands of Maramani, Machachuta, and Masera are inhabited by over 5,000 people who keep cattle, sheep, goats and donkeys. Wildlife in the communal lands is presently limited except for elephants and predators like lions and hyenas that occasionally venture into these communal areas, causing damage to property in the process.

The social, political and economic climate in Southern Africa is in an ideal state for establishing Transfrontier Conservation Areas and this conforms to the spirit of regional protocols and international treaties such as Southern African Development Community (SADC), African Renaissance, Convention on Biological Diversity, the Millennium African Recovery Programme, and indeed a Regional Elephant Conservation and Management Strategy. Although the current designations of the proposed TFCA are tied to specific areas in all three countries, the potential for extending the TFCA to include other areas is relatively high.

2.1 HISTORICAL SIGNIFICANCE

Great Mapungubwe was home to the Mapungubwe people who inhabited the Limpopo River Valley between 900AD and 1300AD. At that time Mapungubwe had developed into the largest kingdom on the subcontinent with a highly sophisticated civilisation. These peoples traded with Arabia, Egypt, India and China. The famous Golden Rhino was a symbol of the power of the King and the civilisation which existed at Mapungubwe.

The cultural resources of the Limpopo-Shashe basin are generally associated with Iron Age settlements of around 1200AD. The similarity of ivory objects, pottery remains and imported glass beads excavated at different sites spread across the modern international borders of Botswana, South Africa and Zimbabwe, attests to the cultural affinity of the people that lived in the Limpopo-Shashe basin during the Iron Age. GMTFCA is thus generally regarded as an important cultural TFCA. Visitors are attracted to the area not only to see the magnificent sandstone formations, the wide variety of trees - notably the enormous baobab - and game and birdlife, but also to experience a kinship with past generations.

Although not yet extensively researched, a variety of dinosaur remains have been located in South Africa and Zimbabwe (Nottingham Estate, Sentinel Ranch and the Maramani Communal Land). Inextricably linked to the region is the British South Africa Company pioneer history, and its associations with the Tuli Circle, as well as the history of conservation within the Limpopo Valley. Other colonial and Boer War history is represented at Rhodesdrift and Poachers Corner. More recent military history is illustrated in the extensive border fences erected by the apartheid government of South Africa.

A transfrontier conservation area was already identified in the early 1900s when the first farms were proclaimed in South Africa on the Limpopo River just east of the present site of Mapungubwe. Then referred to as the Dongola Botanical Reserve, it was proposed at the time that the Reserve should eventually straddle international borders to ensure that the flora and fauna in the three countries were protected and secured.

The present day significance of the TFCA extends past flora and fauna. The selection of the Limpopo-Shashe area is based on the rich biodiversity of the area, its scenic beauty and the cultural importance of the archaeological treasures of Mapungubwe. The area supports populations of big game, including the famous

Tuli elephant, all major predators, and offers potential for the development of a viable, consumptive and non-consumptive tourism industry. Now also a World Heritage Site (WHS), listed as such by UNESCO in July 2003, Mapungubwe is a major visitor attraction in the area.

2.2 BIOPHYSICAL FEATURES

2.2.1 *Climate*

An extremely low and variable summer rainfall between November-April ranges from 65–88mm annually, whilst winter rainfall is either absent or insignificant at 0–4mm. Extended periods of below average rainfall are not infrequent. Evaporation from free water surfaces exceeds 2,500 mm per year, with summer temperatures rising to 45°C (mean range 30–34°C). The winters are generally warm to mild (mean range 23–26°C), although frost may occur infrequently.

2.2.2 *Geology and Geomorphology*

The GMTFCA landscape comprises a varied geology including extremely old Achaean rocks, metamorphics of intermediate age, karoo sandstone and conglomerate uplands that are about 200 million years old, and recent alluvium and sands. All three major geological rock types are thus present in the TFCA - Igneous rocks in the northern section (mainly Basalt), Sedimentary in the middle (Siliciclastic rock or Sandstone) and Metamorphic rocks in the southern section (primarily Granulites interspersed by Granite Gneiss). The main geological feature is the Siliciclastic Rock or Sandstone belt and ridges running from east to west across the study area and which is also the source of coal and diamonds in the region. Plant and animal fossils are also found in the area.

2.2.3 Soils

A variety of soils are present, with large areas characterised by sandy, lime-rich Calcimorphic soils, generally deeper than 750mm, reflective of the underlying geology. Soils generally have low agricultural potential, with irrigated alluvium tending to become sodic and /or saline. The dominant soil types of the TFCA are weakly developed Leptosols (or lithosols) found in the north of the study area. Luvisols occur along the Limpopo and Shashe river valleys and Cambisols to the south, interspersed with Arenosols and Regosols.

Leptosols are well drained, shallow to moderately deep, ranging from friable, rocky, stony and gravelly to fine loamy and clayey soils. The heavier clayey Luvisols are deposited by flood water and are characterised by a rich organic and nutrient content. These soils are fertile and porous yet very high in moisture retention. Cambisols are well drained, very deep brown coarse loamy soils.

Arenosols, commonly known as Kalahari sands, extend at least 1m deep with high sand and low nutrient content. These soils are porous and thus have low water retention capability. Also weakly developed, Regosols are moderately well drained, very deep, brown to very pale brown, friable, fine loamy to clayey soils, often imperfectly drained.

2.2.4 Topography

Variation in altitude within the TFCA ranges from ~389 to ~1,000m asl with the highest areas lying to the north and south and lower areas along the middle section comprising the Limpopo and Shashe river valleys. Besides the steeper slopes found along these river valleys, the study area is relatively flat to undulating with most of the area not exceeding slopes of two degrees.

2.2.5 Hydrology

The primary rivers of the study area are the Limpopo and Shashe. Secondary rivers in Botswana are the Motloutse, Bojale (Matali), and Lower Limpopo; in South Africa the Kolopi, Mapedu, Upper Sand and Magalakwena, and in Zimbabwe the Pazhi and Mutshilashokwe. The confluence of the seasonally-flowing Shashe and Limpopo rivers is a dominant hydrological feature, as is the large ephemeral Kolohe/Maloutswa wetland upstream of the confluence.

2.2.6 Vegetation

The vegetation of the TFCA can be broadly categorised into woodland and shrubland. In the south a belt of Mopane (*Colophospermum mopane*) Woodland dominates, with a large area including *Jubernardia globiflora-Brachystegia glaucescens* to the east between the Limpopo and Umzingwani Rivers. *Guibourtia conjugata*-mixed Woodland is found on the Basalt to the north and tall Riparian Woodland and *Acacia/Hyphaene* Shrubland along the river valleys – a unique feature of the GMTFCA. Alien plant threats are generally low but need to be monitored.

2.2.7 Large Mammals

Most large mammals common to southern Africa (Smithers 1983) occur in the GMTFCA. Movement of wildlife between the three countries causes fluctuation in numbers, both within and between countries. It is anticipated that through the establishment of the TFCA more effective management of wildlife can be attained, especially elephant and predators leading to an improved conservation status.

Large mammals presently known to occur in the GMTFCA are listed in Table 1. Indices of abundance are provided but a more critical assessment of status and distribution is still needed. No comprehensive inventories of small mammals, birds reptiles, snakes, lizards, frogs and insects have been undertaken for the TFCA, apart from earlier published lists either by country or regionally, e.g. Smithers, Roberts, Broadly, Fitzsimmons, Passmore and Carruthers, Skaife, and other more recent updates and publications.

Table 1: Provisional list of large mammals known to occur in the GMTFCA

Common name	Scientific name	Abundance
Vervet monkey	<i>Cercopithecus pygerythrus</i>	Common
Baboon	<i>Papio ursinus</i>	Common
Spotted hyaena	<i>Crocuta crocuta</i>	Rare
Brown hyaena	<i>Hyaena brunnea</i>	Rare
Cheetah	<i>Acinonyx jubatus</i>	Rare
Leopard	<i>Panthera pardus</i>	Common
Lion	<i>Panthera leo</i>	Rare
Caracal	<i>Felis caracal</i>	Numerous
Wild dog	<i>Lycaon pictus</i>	Rare
Honey badger	<i>Mellivora capensis</i>	Numerous
Civet	<i>Viverra civetta</i>	Numerous
Aardvark (Antbear)	<i>Orycteropus afer</i>	Common
Elephant ²	<i>Loxodonta africana</i>	Common
White rhino	<i>Ceratotherium simum</i>	Rare
Zebra	<i>Equus burchelli</i>	Common
Bushpig	<i>Potamochoerus porcus</i>	Common
Warthog	<i>Phacochoerus aethiopicus</i>	Common
Giraffe	<i>Giraffa camelopardalis</i>	Common
Buffalo	<i>Syncerus caffer</i>	Rare
Bushbuck	<i>Tragelaphus scriptus</i>	Common
Kudu	<i>Tragelaphus strepsiceros</i>	Common
Eland	<i>Tragelaphus oryx</i>	Common
Common duiker	<i>Sylvicapra grimmia</i>	Common
Waterbuck	<i>Kobus ellipsiprymnus</i>	Common
Gemsbok	<i>Oryx gazella</i>	Common
Blue wildebeest	<i>Connochaetes taurinus</i>	Common
Red Hartebeest	<i>Alcelaphus caama</i>	Rare
Impala	<i>Aepyceros melampus</i>	Common
Klipspringer	<i>Oreotragus oreotragus</i>	Common
Porcupine	<i>Hystrix africaeaustralis</i>	Numerous

Source: GMTFCA TTC. 2010. Greater Mapungubwe Transfrontier Conservation Area Integrated Development Plan

² The status, abundance and distribution of elephants in the GMTFCA are discussed in detail in subsequent sections of this document

2.3 SOCIO-ECONOMIC CONDITIONS

The area within which the GMTFCA is located, is characterised by sparse populations of people, and long distances for infrastructural lines of support. The nature of land use and ownership within the core area of the TFCA and the buffer is unusually diverse and includes TFCA contractual partners, private and communal land owners, land claimants, private tourism operations, game farms, commercial and subsistence farmers.

Recent developments in nature-based tourism include ecotourism and safari hunting with Mapungubwe as a cultural hub. The likely regional benefits of the GMTFCA have much economic promise. Plans such as the 2002 Development Bank of Southern Africa-funded *Mapungubwe Tourism Initiative Conceptual Tourism Destination Plan* provides details of these aspirations. If this can be achieved, the socio-economy of the region will be transformed from what is a partly subsidised and subsistence agricultural economy to one based on more sustainable nature-based tourism.

This process is already underway, and MPNP itself has attracted an encouraging level of tourism since being opened to the public in 2004. Within Botswana NOTUGRE has proven that wildlife tourism has the potential to sustain regional growth and development and has been successful in securing investment resulting in significant regional economic benefit. Numerous lodges have been established either as commercial or private entities within a jointly managed conservation area and this conservation initiative serves as an example of what transboundary conservation can achieve, albeit wholly within Botswana at present.

Zimbabwe's component of the GMTFCA is characterised by a broad spectrum of land use options including cattle and game ranching, hunting, irrigation and mining as well as rain-fed subsistence agriculture and settlement. Large areas utilise wildlife and other natural resources either consumptively or non-consumptively as the major land use. Where viable and feasible, irrigation farming dominates.

Threats existing within the GMTFCA arise as a result of conflicting land use practices such as large-scale irrigation and mining competing with wildlife and tourism for riparian habitat.

2.3.1 *Tenure Arrangements and Land Use*

Pre-colonial land-use included usage of different landscape positions in the Earlier Stone Age (river terraces), Middle Stone Age (thallus slopes) and Later Stone Age (caves) by hunter-gatherers, and within the last 2,000 years by Khoi herders. Early Bantu-speaking farmers kept livestock and grew crops on lower-lying ground with better soils, while hilltops were favoured by the elite and were considered important for rain-making.

White farmers in the 20th century tended to occupy land near the river for irrigation, or farm in the areas away from the river with cattle and/or game-based ventures on the extensive semi-arid range. Military, mining and conservation land usage has added to the mix over the past century. Much of the area along the Limpopo has a history of agriculture in the last few decades, with much riparian woodland having been cleared for this purpose. Groundwater supplies are generally poor except along fault lines, and irrigation withdrawals along the Limpopo are large relative to surface water supplies.

Tenure within the GMTFCA includes State land, private land and communal land. Land uses within the GMTFCA focus mainly on conservation and tourism. Where mining and commercial agriculture are practiced, these have existing or potential impacts on the area, but where mitigation options are possible. Importantly, the employment opportunities offered by these enterprises should not be overlooked as alternative livelihoods to unsustainable subsistence agriculture (refer Map 1).

Built-up and cultivated land thus occur mainly along watercourses in the TFCA, predominantly the Limpopo and Shashe Rivers, with opencast mining taking place at Venetia (diamonds), River Ranch and Nottingham Estate (diamonds and coal). Degraded woodland areas are generally associated with farmsteads and agricultural activities. Artificial water bodies refer to the many farm dams including the large dam on the Mutishilashokwe River. Remaining wetlands are associated with the various river courses. The larger TFCA is, however, woodland intermixed with tree and shrubland with thickets and gallery forest along the riparian areas.

Veterinary fences occur along the western boundary of NOTUGRE, as well as around portions of the MPNP. Some game fences exist within Sentinel Ranch and Nottingham Estate, but not accepted as veterinary

control measures. Veterinary fences for disease control, especially FMD and bovine Tuberculosis (bTB) are likely to be extremely important but will need to be considered more strategically for the needs of livestock, cattle, wildlife and people than hitherto (Ferguson and Hanks 2010, Taylor 2010).

2.3.1.1 *Agriculture*

Within a region dominated by wildlife and tourism, a limited amount of labour intensive agriculture takes place along the Limpopo, targeting the alluvial deposits. Despite the high impacts of these farms, visually and environmentally, these farms currently employ high numbers of local people to service the citrus, vegetable and other crop industries. Most of these agricultural developments are dependent on the provision of electricity to the region since both the pumping of water and irrigation is reliant on the electricity grids for viability. Regional price increases regarding electricity could severely impact on operations. Due to extremely harsh environmental conditions, limited livestock farming is practiced in the core area, occurring mainly in the communal areas of Botswana and Zimbabwe.

2.3.1.2 *Mining and Energy Production*

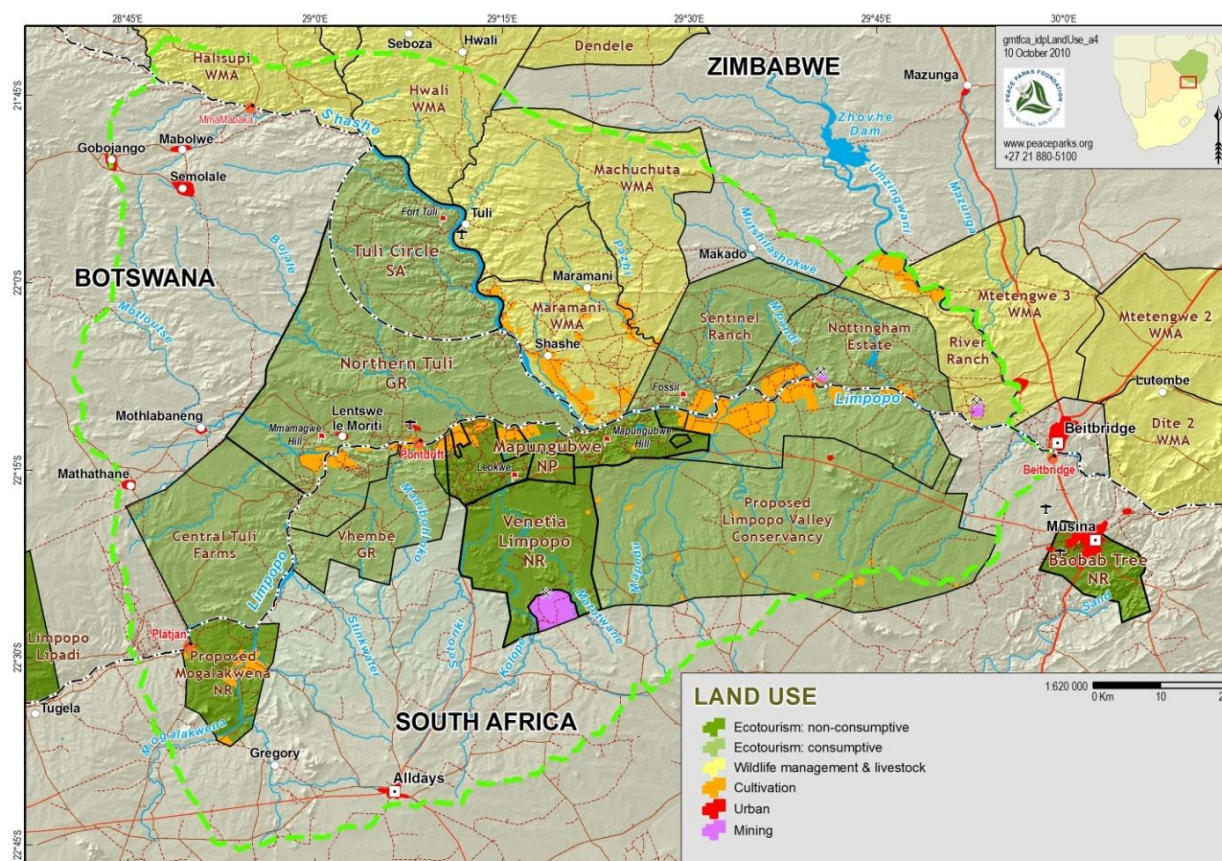
Two diamond mines occur within the area – Venetia and River Ranch – while a small coal mine is located on Nottingham Ranch. Despite opposition from numerous stakeholders, plans are being developed to establish additional open cast coal mines as well as a power station in the Limpopo Valley. The perceived threat that such industrialisation will have on the TFCA, notably its character, and planned movement corridors as well as on the Mapungubwe WHS need to be weighed against the benefits appropriately planned rural industrialisation can provide to a growing rural population practicing unsustainable agriculture. Prospecting is also being undertaken throughout large portions of the area.

2.3.1.3 *Tourism*

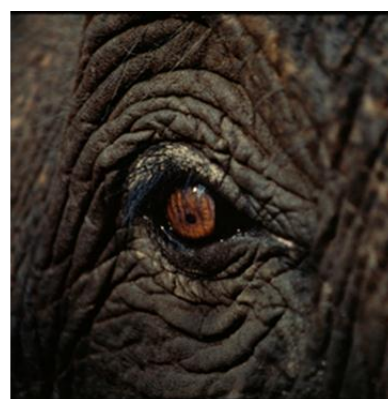
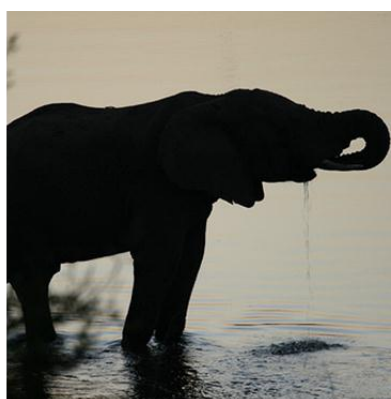
The TFCA is easily accessible by road from all major centres in Botswana, South Africa and Zimbabwe and well maintained gravel roads provide access to most parts of the TFCA with a myriad of smaller tracks and 4x4 routes providing access to remote areas. The Limpopo Valley Airfield in southern NOTUGRE is an international airfield on a scheduled route between Johannesburg and Kasane. Numerous other private airstrips and aerodromes are however found in and around the TFCA.

In Botswana, individual property owners are engaged in non-consumptive uses of wildlife, in particular, photographic tourism. At present there are three up-market lodges and a number of tented safari camps catering for close to 30,000 visitors a year. The lodges have excellent conference facilities and a combined capacity of over 100 beds, whereas the self-catering safari camps have a capacity of over 70 beds. NOTUGRE also has associated tourist facilities and infrastructure in the form of game viewing routes (i.e. bicycle, horseback and 4WD vehicle trails), waterholes and airstrips. These facilities have a combined labour force of 400 employees, 90% of whom are Botswana who, along with their families, benefit from Pula 7 million (± US\$ 1.4 million) revenue derived from NOTUGRE each year.

Although the TFCA offers a wide assortment of accommodation and related infrastructure, most of these are situated in the NOTUGRE area and MPNP. Few amenities are available in the Zimbabwe component. Approximately 500 tourist beds are presently available in the TFCA of which most are high spend facilities.



Map 1: Land Use



3 LEGAL AND INSTITUTIONAL FRAMEWORK

3.1 WILDLIFE POLICIES AND LAWS

An interpretation of relevant wildlife policies and laws that govern the management of wildlife, particularly elephants, in the three GMTFCA partner countries, Botswana, South Africa and Zimbabwe is provided in GMTFCA 2010a. It summarises contemporary and emerging global and regional issues, outlines global conventions and treaties, and examines southern African regional policies and strategies, particularly those of SADC, with more detailed policy and legal frameworks presented for each country (Appendix 1). This enables comparisons of the legal basis by which each country manages its elephant populations (Table 2).

The legal frameworks for doing so in Botswana, South Africa and Zimbabwe are not markedly dissimilar. It would appear, however, that advances in conceptualising this framework for improving management decisions and implementing these can still be made. The legal framework summarised here (Appendix 1 and Table 2) and described in GMTFCA 2010a, together with options for regional collaboration provide the basis for addressing these issues in developing a policy and planning framework for the management of elephants in the GMTFCA.

3.2 GOVERNANCE

Governance occurs at three levels or tiers and includes Government administrative structures at provincial and district³ levels, sub-district community structures^{4,5} and private sector corporate and individual holdings.

In Zimbabwe, the Rural District Councils (RDC) Act serves to provide for the declaration of districts and the establishment of rural district councils; to confer and impose functions upon rural district councils and provide for the administration of their areas. In the context of the GMTFCA and its elephant management conservation plan, there are two such RDCs in the TFCA area and both these councils are appropriate authorities for wildlife management in their respective jurisdictions in terms of the Parks and Wild Life Act. They are also in the position to use the provisions of the Communal Lands Act (1982) [CAP 20:04] to establish Game Areas in the Communal Lands they serve. In 1988 Muzarabani RDC used this provision to declare the Mavuradonha Wilderness Area in the Zambezi escarpment a Game Area⁶.

³ In Zimbabwe, PWMA, formerly DNP&WLM is the legally mandated authority responsible for wildlife resources in the country. The 1975 Parks and Wild Life Act decentralized state authority, conferring Appropriate Authority status upon land owners and/or occupiers, giving them de facto responsibility for wildlife and making them the beneficiaries of sound wildlife conservation and use. After 1980, similar rights were extended to communal farmers through an amendment to the Act in 1982, which delegated Appropriate Authority (AA) to Rural District Councils (RDCs), primarily for the implementation of CAMPFIRE. In practical terms AA represents the decentralization of authority and control over wildlife only to RDCs (Murombedzi 2001). This decentralised responsibility recognised that long-term success depended on further devolution to sub-district levels, even to a community level institution. The absence of any legal persona below the level of RDC, however, obliged DNP&WLM to decentralise administrative authority and legal rights to wildlife to RDCs, but on condition that rights and benefits were to be further devolved to what were termed "producer communities". This latter condition is partially realised through sub-district Natural Resource Committees, often referred to as Ward Wildlife Committees (WWC).

⁴ In Zimbabwe, Provinces are made up of Districts comprised of Wards. Wards in turn comprise a number of Villages. These spatially and physically defined groupings also reflect the lower level administrative structures of the country, namely WADCOs (Ward Development Committees) and VIDCOs (Village Development Committees).

⁵ Murphree (2005) defines "decentralization" as the delegation of responsibility and limited authority to subordinate or dispersed units of hierarchical jurisdiction, which have a primary accountability upward to their superiors in the hierarchy, and "devolution" as involving the creation of relatively autonomous realms of authority, responsibility and entitlement, with a primary accountability to their own constituencies.

⁶ This example is cited for the benefit of Beitbridge and Gwanda RDCs in Zimbabwe in the context of the GM TFCA and the categorisation of "WMA" (or CCA) in certain communal lands in the IDP.

Table 2: Comparisons of the Legal Basis for the Management of Elephant Populations in Botswana, South Africa and Zimbabwe

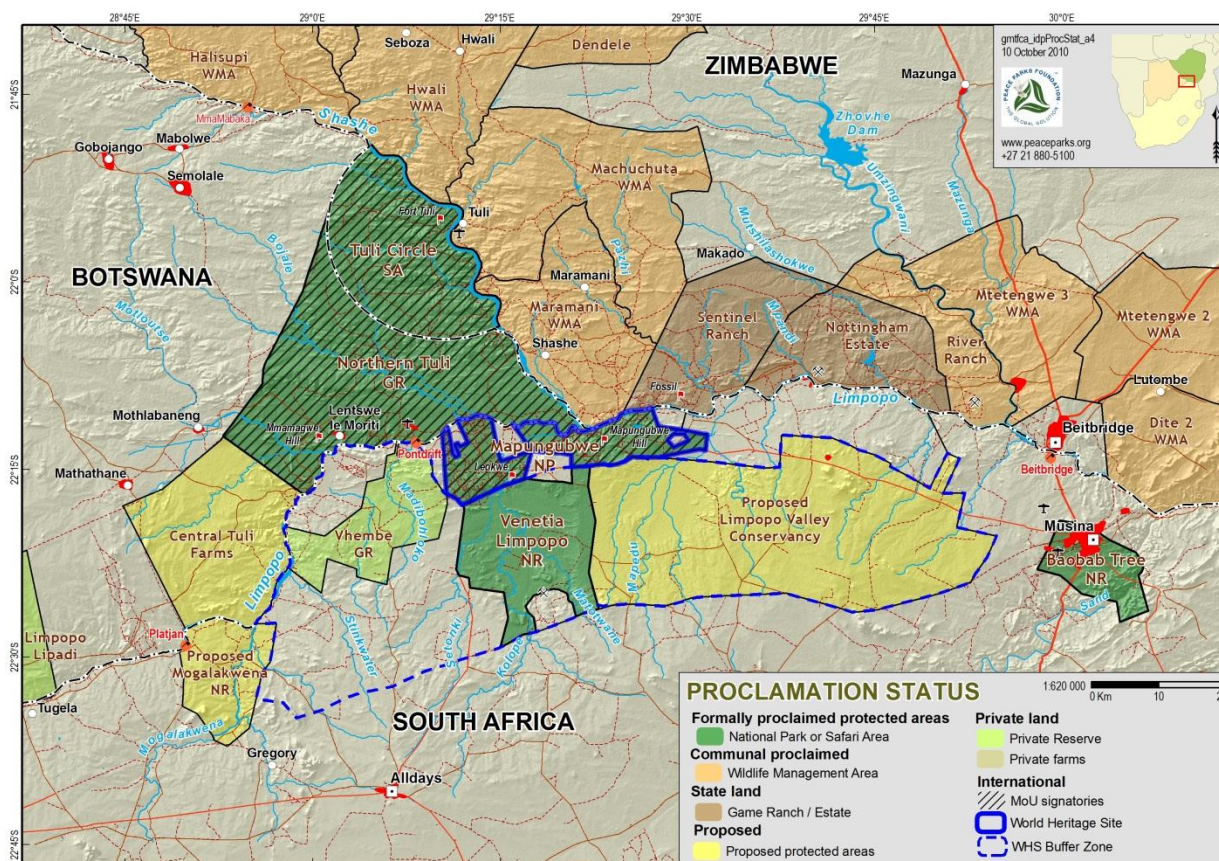
Country	Elephant population size	Roman-Dutch law: wildlife is res nullius	Responsibility application and administration	Legal status of elephant	Legal utilisation	Decision making process	Management objectives & plans	Elephant-human interactions
Botswana	Very large >150,000	Yes but de facto ownership and controls claimed by state	Single Ministry and government wildlife agency - DWNP	Partially protected Can be destroyed in self defence	Yes – Convention on International Trade in Endangered Species of Flora and Fauna (CITES) approved trade in ivory; trophy hunting	Representative democracy, i.e. Parliament	Economic, social and ecological; latter laissez faire but mechanistic in intent; plans not implemented timeously & being updated	Urban: Anti-killing lobby exists Rural: Elephant populations not contained within PAs; Severe HEC
South Africa	Small < 20,000	Yes, but ownership established through control & fences; inconsistencies identified in context of customary, constitutional & international law	Single Ministry but multiple agencies: National level Department of Environment Affairs (DEA) & SANParks plus 9 provincial authorities each with own acts &/or ordinances	Protected	Yes – CITES approved trade in ivory; trophy hunting?	Legally mandated public participation	Economic, social and ecological; Process driven; Area specific plans being implemented	Urban: Growing animal rights movements Rural: Elephant populations well contained within protected areas in SA; Slight HEC
Zimbabwe	Large ~100,000	Yes but de facto ownership and controls claimed by state	Single Ministry and parastatal wildlife agency - PWMA	Not protected Can be destroyed in self defence	Yes – CITES approved trade in ivory; trophy hunting	Representative democracy, i.e. Parliament	Economic, social and ecological; country-wide management approach; not being well applied presently	Urban: concerned public Rural: Elephant populations mostly not contained within PAs; Severe HEC
GMTFCA	Very small ~ 1,400	Res nullius but land owner, i.e. State, is overall custodian	The State whose land the elephant is on, through its own legal and administrative mechanisms	Protected?	TFCA Elephant Conservation Policy and Management Plan			

3.3 CONSERVATION AREAS

Within the TFCA there are both existing and proposed formally proclaimed protected areas as well as community and private sector conservation areas enjoying varying forms of protection status such as Game or Nature Reserve, Conservancy and Community Conservation Area (CAMPFIRE areas in Zimbabwe or Wildlife Management Area (WMA) as described in the IDP) and Wildlife Management Area, e.g. as in Botswana (Map 2 & Table 3). Several other potential areas could become part of the TFCA formally proclaimed protected area network subject to the relevant legislation of the partner country within which the area is located and in accordance with the development planning process of the TFCA itself.

3.4 TFCA STAKEHOLDERS

Stakeholders in the GMTFCA include State Governments, in particular each country's wildlife agencies(s), private sector partners including corporates and individuals, with both wildlife and non-wildlife interests, and community conservation entities (Table 3). There is need to ensure all stakeholders are aware of and informed about the GMTFCA and the existing and potential opportunities it offers, socially, economically and ecologically.



Map 2: Proclamation Status

Table 3: Administrative and Governance Structures for Conservation Areas in the GMTFCA

Country	Province	District	State Land	Communal Land	Private Sector
Botswana	Central	Bobonong			NOTUGRE Central Tuli Farm Bock
South Africa	Limpopo	Capricorn Vhembe Waterberg	Mapungubwe NP	Vhembe GR Mogalakwena NR	Venetia Limpopo NR Limpopo Valley Conservancy
Zimbabwe	Matabeleland South	Beitbridge Gwanda	Tuli Safari Area	Maramani Machuchuta Masera Halisupi	Nottingham Sentinel River

4 CONSERVATION STATUS OF ELEPHANT

4.1 SOUTHERN AFRICA

Presently some of the more important wildlife and environmental management decisions having to be made in southern African protected and other conservation areas revolve around elephants. Questions of too many elephants, growing human-elephant conflict, scientific controversy and differing value systems underpin the longer-term management of elephants in the region (Cumming and Jones 2005). The elephant range states, acknowledging this situation, have developed a collaborative regional elephant conservation and management strategy (SADC 2007), comprising a set of principles and values, accompanying objectives and activities together with a toolbox of elephant management options and interventions.

This strategy was developed by the African Wildlife Consultative Forum following on a SADC workshop held in May 2005 at Victoria Falls in Zimbabwe at which seven of the eight southern African elephant range states participated. The exception was Angola. The strategy is designed to guide the conservation and management of elephants in the southern African region and is informed by the need to develop a framework for the region to manage a transboundary elephant population; to address common challenges in managing a growing elephant population; and to address issues of trade.

The strategy was adopted by Ministers responsible for wildlife management within SADC in April 2007 prior to the 14th Conference of Parties to the CITES which was held in The Hague in June 2007.

4.2 BOTSWANA

Botswana presently supports the largest national elephant population in the world, standing at around 150,000 animals. This population also represents approximately half of southern Africa's elephants. These animals form part of a continuous population that stretches from Namibia through to Zimbabwe. Elephants are found in northern Botswana from the Makgadikgadi National Park northwards to the border with Namibia, and from the Zimbabwe border westwards to the Okavango Delta.

Importantly only 20-30% of this population occurs in the PA network, with the remainder outside of the PAs. Outside of formally protected areas, elephant-human interactions are leading to increasing conflict and constraining the ability of elephants to disperse. In PAs themselves, there is scientific controversy around elephant-associated habitat change and biodiversity loss, and whether this is "good" or "bad" for conservation (Cumming and Jones 2005).

In the context of the GMTFCA, there is a population of ~1,200 elephants centred on the Tuli Block (NOTUGRE) in the east (Selier 2008) which constitutes the source population for the GMTFCA. Although <1% of Botswana's overall population, it is nevertheless an extremely important population for the GMTFCA.

In international border areas, the approach will be to allow free movement of elephants back and forth as shared resources. Where TFCAs are established, Botswana will encourage the harmonisation of elephant conservation strategies between participating countries. The importance of cooperation between neighbouring countries in the management of elephants is emphasised. Cooperation is needed between all of these countries particularly if the approach of developing elephant movement corridors is followed and if adequate measures are to be taken regarding the mitigation of human-elephant conflict. Harmonising regional elephant conservation management objectives are especially important.

The following principles guide the management of Botswana's elephants (Cumming and Jones 2005):

- Management shall be precautionary. If there is a possibility of a problem arising, and even though the system may be poorly understood, it is better to carry out a management activity than risk the consequences of a worsening problem.
- In selecting management options, the one that presents the least risk (minimum regret) will be selected.
- Management activities shall be process-based and adaptive, designed so that they can be continually adjusted in response to the results of previous activities.

- Only feasible, practical, economic and aesthetically acceptable management options shall be adopted.

Four primary objectives have been identified in the draft policy for managing elephants in Botswana:

- 1) Reduce human-elephant conflicts to acceptable levels;
- 2) Prevent, reduce or reverse unacceptable elephant-induced environmental changes;
- 3) Maximise the benefits from sustainable utilisation of elephants;
- 4) Protect elephants through law enforcement.

In addition to the four primary objectives, other supporting objectives include: (a) meeting international obligations on elephant conservation; (b) monitoring and management; improving public awareness of the management needs; and (c) research and monitoring to enable DWNP to manage elephants effectively. The draft national policy acknowledges that issues and options for elephant management are different for different areas in the country. Therefore different management strategies are required for different areas.

Strategies recommended for different areas in Botswana largely reflect the four management objectives outlined above:

- 1) 1 Areas to be elephant free zones
- 2) 2. Areas where conflict will be reduced
- 3) 3. Areas where benefits will be maximised through utilisation
- 4) 4. Minimal management (optimising tourism) in National Parks and Game Reserve
- 5) 5. Areas where benefits will be maximised and conflict reduced
- 6) 6. Areas where benefits will be maximised and environmental impacts reduced.

Elephants in the citizen hunting area in Central District will be removed to create an "elephant free zone"⁷. In community leasehold areas the aim will be to maximize benefits. This will be achieved through a combination of safari hunting and non-consumptive tourism. In agricultural and in communal leasehold areas where human-elephant conflict is high, multiple protective measures will be put in place. In areas where elephant-vegetation impacts reach unacceptable levels, the draft policy states that elephant population removal might become necessary. In Protected Areas, the emphasis will be on optimising tourism with elephants as a major attraction.

These strategies and objectives are confined to northern and central Botswana and no management prescriptions are provided for the Tuli area of interest to the GMTFCA. However, the importance of cooperation between neighbouring countries in the management of elephants is emphasised. Harmonising regional conservation management objectives, particularly for elephant management are especially important.

This overview of Botswana's draft elephant management policy and plan emphasises a precautionary approach to a large growing elephant population. It is utilisation oriented, e.g. marketing ivory, with active management mostly centred on Problem Animal Control (PAC) and trophy hunting. Human Elephant Conflict (HEC) is growing in Central District, with compensation being paid by DWNP. It has been noted that the zonation for NOTUGRE possibly needs to change, having been imposed largely from an administrative aspect. Management strategies differ across the country.

4.3 SOUTH AFRICA

The total number of elephants in South Africa is now in the region of 20,000, distributed in more than 80, mostly small isolated populations. Nearly all of these populations are expanding and many are already facing problems of overpopulation. Since 1995 the Kruger National Park population of ~ 8,000 elephants had nearly doubled to 13,000 elephants by 2004. Elephants from Botswana and Zimbabwe have moved into the newly established MPNP and the associated game reserves along the Limpopo River.

⁷ The implications of this for elephants in NOTUGRE needs to be further examined

The National Norms and Standards for the Management of Elephants in South Africa were developed in terms of section 9 of the National Environmental Biodiversity Act and came into effect on 1 May 2008. The purpose of the National Norms and Standards for the Management of Elephants in South Africa is to ensure that elephants are managed in a way that ensures the long-term survival of elephants within the ecosystem in which they occur or may occur in the future, to promote broader biodiversity and socio-economic goals that are socially, economically and ecologically sustainable and enables the achievement of specific management objectives of protected areas. The norms and standards apply to all protected areas and private land on which elephants occur and require the preparation of elephant management plans, which may be incorporated into either:

- 1) A management plan as contemplated in Chapter 4 of the National Environmental Management: Protected Areas Act; or
- 2) A biodiversity management plan that has been developed in accordance with section 43 of the National Environmental Management Biodiversity Act.

4.3.1 *Elephant Management Plan: Mapungubwe National Park*

MPNP is of cultural significance, has important biological assets and values and is embedded in an international transboundary landscape of various land uses and stakeholder interests.

The plan describes the strategic context of elephant management within SANParks as well as key linkages to the vital attributes and management objectives of MPNP. Elephants may impact these attributes affecting achievement of objectives supporting the desired state of this National Park.

Five key elephant management objectives have been developed for this park, with 59 associated management actions to address these:

Objective 1: Maintaining the cultural sense of place

SANParks wish to maintain the cultural sense of place through mimicking the effect of cultural human landscape use on elephant spatial use, primarily by excluding elephants temporarily from culturally important sites.

Objective 2: Managing impact, damage and human interactions

Manage elephant impact and human interactions through inducing spatial and temporal variation in elephant use of landscapes by restoring the spatial limitations of the landscape. This requires minimizing the number of man-made water points and dams, consolidating land and removing fences, as well as expanding land through acquisition, contracts and agreements where appropriate.

Objective 3: Managing stakeholder and affected parties

Aligning the Elephant Management Plan with co-management and contractual agreements and, where appropriate, revisiting existing and establishing new agreements with stakeholders and affected parties where appropriate.

Objective 4: Managing trans-frontier needs and policies

Align SANParks' and the Greater Mapungubwe Trans Frontier Conservation

Area Elephant Management Policies through appropriate bilateral approaches.

Objective 5: Evaluating, informing and revising management

Expanding understanding through focused research, namely to evaluate, inform and revise elephant management through collaborative research agreements. This provides for the critical evaluation, both internally and externally, of SANParks' achievements against the intentions articulated in the Mapungubwe Elephant Management Plan.

4.3.2 *Transboundary Management of Elephants*

There are three elephant populations that lie on international borders and where transboundary management issues arise; (i) Kruger National Park (KNP) which now adjoins the Limpopo National Park (LNP) in Mozambique and Gonarezhou National Park and communal land across the Limpopo River in Zimbabwe; (ii) Maputo National Reserve in Mozambique through the Futi corridor to Tembe Game Reserve in South Africa and (iii) across the central Limpopo river and valley linking Mapungubwe National Park and adjacent conservation areas with those in Tuli, Botswana and state, communal and private conservation areas in Zimbabwe.

Parts of the fence between KNP and LNP have been lowered and elephants have been translocated into the LNP from Kruger. So far only limited dispersal from

KNP in Mozambique has occurred. In the case of Mapungubwe there has been a rapid influx of elephants from Botswana, where elephant densities are high, and possibly from Zimbabwe. The influx has raised concern about elephant impacts on woodlands in what is primarily a World Heritage Site and cultural park.

4.4 ZIMBABWE

The number of elephants in Zimbabwe was estimated at ~ 89,000 in 2001 (Dunham and Mackie 2002) when the last country-wide aerial census was completed. The present population probably exceeds 100,000 elephants. There are four large, separate elephant populations in Zimbabwe, namely in North-West Matabeleland, the Sebungwe to the south of Lake Kariba, the mid Zambezi valley and Gonarezhou in the south east of the country.

Several smaller, currently isolated populations totaling ~1,000 animals are found in conservancies in the south-east Lowveld and in the Shashe-Limpopo area, i.e. the GMTFCA that is shared with Botswana and South Africa. In 2001 a total of 92 elephants were recorded in the Shashe river area, Tuli Circle Safari Area, Maramani Communal Land, and on Sentinel and Nottingham Ranches. Elephants reportedly moved to Sentinel and Nottingham from Botswana during 1991-1992 (Dunham and Mackie 2002 quoting Selier 2001).

A Policy and Plan for Elephant Management in Zimbabwe (1997) was developed and adopted by the Ministry of Environment and Tourism in 1997 and, although not fully implemented, it is still in force.

The document identified a number of issues associated with the conservation and management of elephant in Zimbabwe. Amongst these was the listing of all elephant populations on CITES Appendix I against the wishes of southern Africa elephant range states, the high and increasing elephant numbers in Zimbabwe, their potential impacts on biodiversity and the problem of increasing human-elephant conflicts in the face of diminished returns, and hence conservation incentives, for rural communities.

The ten point policy statement is as follows:

The Government recognises that elephants comprise an important component of Zimbabwe's wildlife and cultural heritage, and wishes to conserve elephants at levels which promote the goals of biodiversity conservation while ensuring their sustainable use and their contribution to national development through the following:

- 1) Maintaining at least four demographically and genetically viable populations.
- 2) Maintaining numbers and densities below levels which will not compromise biodiversity.
- 3) Maintaining or increasing elephant range at or above the 1996 level.
- 4) Maintaining continuity in research and monitoring necessary for the conservation and management of elephants.
- 5) Establishing sustainable funding programmes and building and maintaining necessary human resources (staffing levels and capacity) and strengthening elephant management capacity.
- 6) Strengthening partnerships and stakeholder programmes to facilitate the equitable distribution of the costs and benefits of elephant management and conservation.
- 7) Minimising human/elephant conflicts
- 8) Improving public awareness of elephant management and conservation issues and the value of elephants with activities targeted for domestic, regional and international audiences.

- 9) Ensuring effective trade control measures and enforcement.
- 10) Liaising with other elephant range states in the region.

The management plan reiterates the policy goal and is followed by ten objectives and associated management actions to give effect to the policy.

4.5 GREATER MAPUNGUBWE TFCA

Although elephants are known to have occurred in the Central Limpopo Valley in the 1800s, they were probably hunted out to the extent that they had virtually disappeared from the area by the 1900s. Elephants re-appeared again in the area in the early 1940s and by the 1970s a sizeable population utilized a range comprising the Northern Tuli Farms and tribal land to the west of these farms in Botswana, the Tuli Circle and the eastern bank of the Shashe River in Zimbabwe and the south bank of the Limpopo River in South Africa. The increase in human activity in the area, in particular the fencing of livestock and agricultural farms resulted in the majority of elephants being confined to the Northern Tuli Farms and the Tuli Circle Safari Area.

Reports of a significant increase in elephant numbers in the area and their associated impacts became common in the mid-1970s. It is also believed that about 120 elephants moved onto Sentinel Ranch in the 1990s and have since been resident on the ranch. At about the same period a smaller number of elephants moved into the Platjaan area of South Africa and became residents there. Small groups are still found in the Mathathane area of Botswana and are frequently seen following the construction of the Letsibogo Dam. In addition to this free ranging but fragmented elephant population, a small group of elephants numbering ~120 animals have been introduced into the Venetia Limpopo Nature Reserve (34,000 ha) in South Africa, owned by De Beers Consolidated Mining Company. The results of a simultaneous dry season aerial count of elephants of the three countries carried out in 2000 indicated that there were approximately 1,260 elephants in the total area of up to 16,000 km².

The elephant populations of the three countries are listed in Appendix II of the CITES, which allows the three countries to trade in ivory, hides, curios and live specimens subject to control mechanisms prescribed by the Conference of Parties to CITES.

Besides being a flagship species in the region, elephants in the Central Limpopo Valley constitute a common and shared natural resource. The policies and strategies used by the three countries should therefore be harmonized and consolidated to facilitate their conservation and sustainable use to which the three countries subscribe.



5 KEY ELEPHANT CONSERVATION ISSUES

5.1 ELEPHANT NUMBERS, DISTRIBUTION, RANGE, TRENDS AND MORTALITY

5.1.1 *The Tuli Elephants⁸*

In 1976 elephants in northern Tuli were estimated to number ~1,200 animals and since 2000, six aerial total counts (Table 4) have yielded a mean of 1,224 elephants (range 1,080-1,294) in the TFCA of which >50% occur mostly in the NOTUGRE. Mean density over the 6 counts is 0.41 elephants per km² (Selier 2010b).

Most elephants occur in northern Tuli in Botswana. Extending along the Shashe and Limpopo rivers, NOTUGRE and the Central Tuli Farms, elephants “funnel” into the confluence of the two rivers, and into Venetia and Mapungubwe NP in South Africa. In Zimbabwe, largish but isolated groups occur on Sentinel and Nottingham with few elephants seen in Tuli Circle. The absence or infrequent occurrence of elephants in the Zimbabwean communal lands is notable, although sporadic appearances of crop raiding elephant are reported.

Map 3 illustrates the distribution of these elephants (also refer Appendix 4, Maps 4-7). Present indications suggest levels of protection and tenure in relation to land use rather than land cover or vegetation determines this distribution and the existing elephant range. This equates largely with the extent of the Phase I core TFCA area of 257,298 ha or 2,573 km² (Appendix 4, Map 8). Given further development of the TFCA, an additional 306,525 ha are envisaged bringing the total TFCA area within the planning domain to some 563,823 ha or 5,638 km² (Appendix 4 Map 9). This will provide needed additional elephant range as reflected in the goals and objectives of this strategic framework, as well as providing for desired management actions.

5.1.2 *Demographics*

Demographically the GMTFCA population arising from Tuli, is slow growing at <2% annually with a relatively low reproductive rate (calving interval of 4.3 years, n = 50 known females with age at first calving approximately 13-15 years). This is also evident in the population census data where, apart from one “low” count in June 2007, overall population size has remained relatively stable at ~1,200 animals over the past decade. Selier (2010a, b) recognises four and possibly as many as seven, sub groups within this population (refer Table 4).

5.1.3 *Mortality*

Annual mortality is estimated at a minimum 5% which is on the high side, with natural mortality correlated with rainfall. Together with the reproductive parameters, these statistics confirm the low growth rate and the empirical observation that the population has increased very little in over 30 years, if at all. Water distribution and its seasonality is an important factor in the behavioural ecology of elephants in Tuli and indeed the entire GMTFCA.

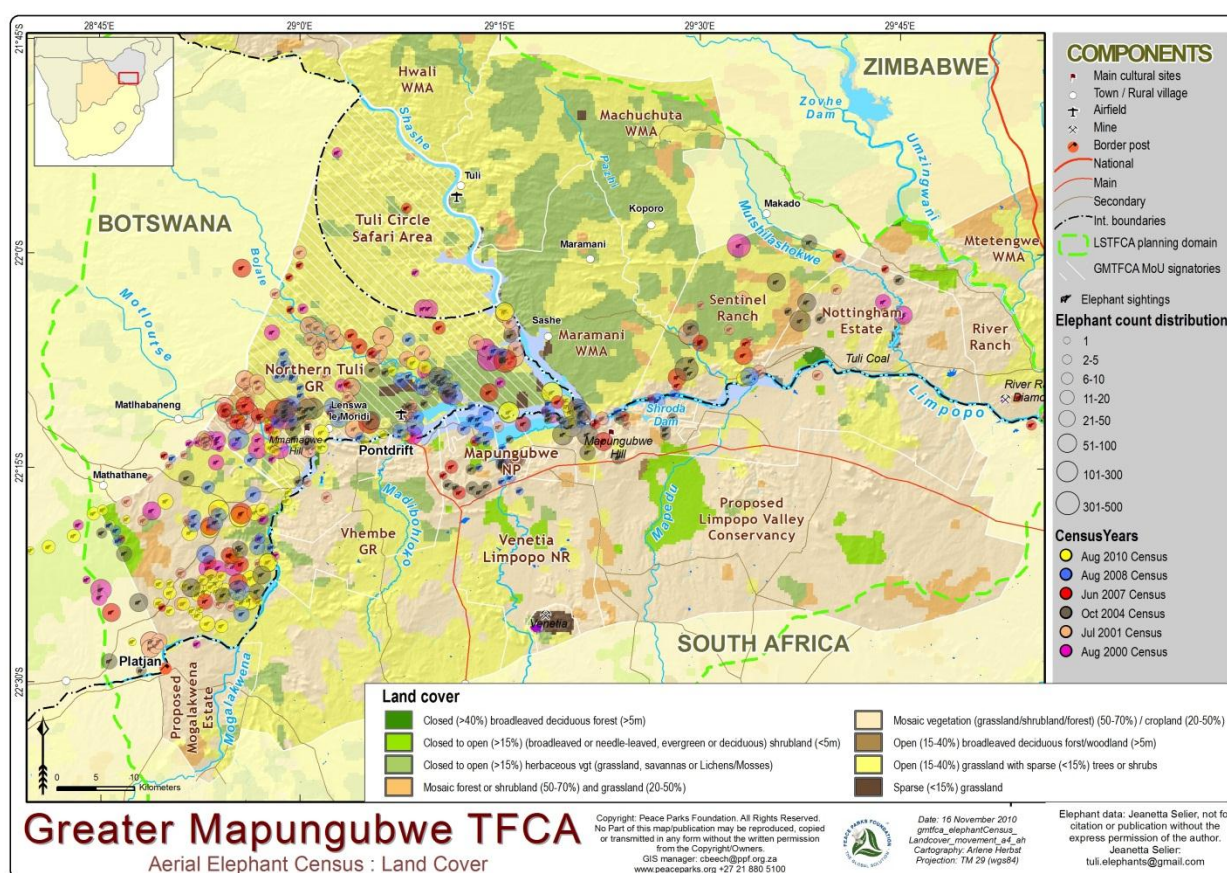


⁸ Information on elephants in Tuli and the larger GMTFCA, including numbers and distribution draws on data from Selier (2008, 2010a & b)

Table 4: Results of the Six Aerial Total Counts of the Central Limpopo Valley Elephant Population

Sub-population	Counts					
	Aug 00	Jul 01	Oct 04	Jun 07	Aug 08	Sep 10
NTGR-MPNP-TSA	574	892	298	721	562	743
BDMRF	373	288	522	244	636	190
SNRC	170	104	270	115	31	34
LDNS	145	10	150	0	0	0
TOTAL	1262	1294	1240	1080	1229	1237

NTGR – Northern Tuli Game Reserve; MPNP – Mapungubwe National Park; TSA – Tuli Safari Area; BDMRF – Baines Drift-Motloutse River Farms; SNRC – Sentinel-Nottingham-River Ranch Complex; LDNS – Letsibogo Dam-Northern Shashe Area. Data from Selier (2010b).



Map 3: Elephant Distribution in GMTFCA 2000-2010

Data from Six Total Aerial Counts (Selier 2010)

5.2 ELEPHANT CONSERVATION AND MANAGEMENT

5.2.1 *Persistence of Specific Vegetation Communities*

Elephants require three key resources - water, food and shade. How much time elephants spend in an area is dependent on the availability of these resources in any particular area. In the Mapungubwe system water is most likely the most critical resource. By altering the distribution or availability of these resources through, for example the opening and closing of water troughs and dams or fencing, the distribution and use of space by the elephants will change. This in turn will lead to a change in the intensity of usage of particular parts of the range.

The three mechanisms through which elephant utilization will lead to tree mortality are through ring barking, felling and uprooting of an individual. When the intensity of debarking, tree felling or uprooting is too high, the affected trees will die. Where there is insufficient recruitment of the impacted species the vegetation type may ultimately be lost. The strength of this process differs between male and female elephants with males most likely having the stronger effect.

Elephant, water and other herbivores are the three drivers that can result in changes in the structure and composition of vegetation communities (in this instance Riparian Gallery Forests and Woodlands, Riparian Palm Forests, Sandstone Communities, Wetlands). These three drivers act synergistically.

There are several factors that lead to a decrease in ground water levels. This can result in an increase in tree mortality and, consequently lead to a change in a vegetation community.

A change in the resource availability and distribution in an area, i.e. plants, water, can lead to a change in the densities of other herbivores in the area and an increase (or decrease) in the intensity of use. This will lead to a change in a vegetation community.

5.2.2 *Plant Species whose Persistence is of Special Concern*

These are: *Scleocarya birrea* (marula), *Adansonia digitata* (baobab), *Xanthocercis zambesiaca* (mashatu), *Adenia spinosa* (spiny greenstem), *Sterculia rogersii* (star-chestnut), *Berchemia zeyheri* (red ivory), *Spirostachys africana* (tamboti) *Albizia armara* (bitter albizzia), *Albizia anthelmintica* (worm-cure albizzia), and *Albizia brevifolia* (rock albizzia)).

The same model as in 5.2.1 applies. Elephants prefer specific tree species. If the accessibility of these tree species is altered through, for example, the provision of additional water, specific individuals will be selected more often. Equally the removal of water and use of fencing may protect individuals of a given species.

5.2.3 *Trampling Effects*

Intensive use of an area by elephants may impact exposed archaeological artefacts.

5.2.4 *Persistence of Specific Vegetation Types due to too little Use by Elephant*

Examples in Mapungubwe include wetland edges that are invaded by woody vegetation and degraded wetlands that are being invaded by woody vegetation. Maloutswa Vlei on Mapungubwe is an example.

5.3 HUMAN ELEPHANT CONFLICT

The primary symptoms of human elephant conflict manifest themselves under 5 main groupings (Table 5), namely:

- Crop raiding;
- Fence destruction;
- Damage to infrastructure;
- Poaching; and
- Poor cross-border communication.

The first three reflect the impacts of elephants on people, their livelihoods and infrastructure; poaching is an indirect consequence of problem elephant, impacting on elephants (and other wildlife) but is related to poverty and adverse socio-economic conditions. Lack of communication, coordination and collaboration is an internal feature of HEC common to many countries, and becomes exacerbated when the problem involves two or more countries with cross border elephant populations as occurs in the GMTFCA.

5.3.1 Causality and Possible Solutions

Underlying causality is important to dealing with HEC. Invariably, mitigation measures address symptoms only. Apart from environmental factors such as climatic variability, the use of corridors in an integrated land use planning and zonation framework, can assist in dealing with possible elephant range expansion and movement.

Poverty is inevitably at the root of community problems in agriculturally marginal rural areas, of which conflicts with elephants is only a part. Food security can be achieved through better planning, the development of commercial and community-based irrigation schemes and improved natural resource governance.

Thereafter the application of mitigation measures (traditional and modern methods) to deal with HEC should be strongly farmer-based, provided s/he is provided with the tools and training to do so. Compensation (cash) can be fraught with difficulties, especially in dealing with crop damage, and is best placed in the hands of local institutions rather than bureaucratically managed.

Table 5: Human elephant conflict issues

<i>Symptoms 1</i>	<i>Symptoms 2</i>	<i>Causes</i>	<i>Solutions</i>
1. Crop raiding	• Loss of livelihoods • Poverty • Human injury &/or loss of life	• Climatic variability; drought; • Migration (elephant movement) • Expansion of elephant range	Proper allocation of land use; proper spatial planning and participatory land use planning & zonation; alignment of fences
2. Fence destruction	Disease outbreak	Lack of integrated (veterinary, conservation, tourism, community) land use planning Expansion of human population and settlement Lack of enforcement of land use planning Lack of resources (tools) to protect crops & livestock No compensation No benefits – material or other	• Irrigation schemes; fenced and protected to ensure food security • Fence monitoring and maintenance • Animal health (vaccinations, prophylactics – anthrax, rabies, FMD, etc. • Enforcement of land use; alternative livelihood options • Provision of elephant migration (movement) corridors
3. Damage to infrastructure; stock and human water points; granaries			

<i>Symptoms 1</i>	<i>Symptoms 2</i>	<i>Causes</i>	<i>Solutions</i>
			• Provide mitigation tools for HWC, e.g. chili deterrents • Provide compensation • Benefits from elephant utilisation returned to communities; Education and awareness (including of elephant behaviour)
4. Poaching		• Poverty – subsistence poaching • Lack of compensation • Commercially driven poaching	Protection and law enforcement; education and awareness, benefits; explore compensation options and implement; community enforcement institutions
5. Cross border tensions Lack of cross border collaboration, coordination and planning	Lack of, or confused policies and management actions, e.g. hunting quotas; PAC	No harmonised policies, legislation rules and regulations	Develop &/or adapt appropriate TFCA policies, legislation rules and regulations strategies and actions

5.4 BENEFITS OF ELEPHANT CONSERVATION

Key issues focus on the use of elephants through hunting and PAC, financial and economic beneficiation at local and national levels, and partnerships between stakeholders (Table 6). There is also overlap in relation to spatial planning for hunting and ecotourism as well as non-wildlife based activities, including commercial and subsistence agriculture and settlements.

Table 6: Issues facing the benefits of elephant conservation

<i>Issue</i>	<i>Possible solution</i>
1. Consumptive utilisation: • Over use of quotas: • No clear TFCA management of hunting quota • Need to confine hunting to trophy hunting only • No management quota for other uses • No or unclear PAC quota • Take into account genetic considerations (tusk size and tusklessness)	• Agreed total quota (hunting, management & PAC) between countries, set at <0.75% of estimated population size for up to 3 years, adaptively managed annually, perhaps on a rotational basis between countries • Monitor hunting mortalities, i.e. trophy quality, age, sex, location • Establish need for management quota vis a vis PAC quota • Establish criteria for PAC offtakes and monitor
2. Spatial planning: • No clear zonation for hunting and non-consumptive use within the TFCA • Relate to other spatial needs (settlement, dryland and irrigable cropping, wildlands and wildlife etc.)	Integrated spatial planning undertaken in a participatory manner with all stakeholders and plan agreed to, signed off by TTC and implemented
3. Need for partnerships	Viable and meaningful partnerships between communities, ranch and game reserve owners and TFCA (state) agencies, i.e. Public-Private-Community Partnerships (PPCPs)
4. Financial and economic benefits at local and national levels (regional?): • Benefits not reaching target groups • No wildlife-related commercial activities at local	• Equitable distribution of benefits • Apply "producer community" concepts • Benefits to those who bear the costs of living with wildlife • Develop wildlife-based SMEs e.g. Chili production,

<i>Issue</i>	<i>Possible solution</i>
level	tanneries, worked ivory curios, hives, meat butcheries • Explore alternative livelihood options • Tourism related employment opportunities
5. No "accommodation" of elephants under current land use systems	Possible expansion of TFCA through elephant growth, range expansion
6. Lack of financial resources for management, monitoring and research	Establish a TFCA Trust Fund
7. Poor public relations	Improve PR, awareness, education
8. No clear idea of market demands	Undertake research on tourism within TFCAs
9. No clear monetary policy within TFCA	Base currency on USD in all 3 countries within TFCA

5.5 VETERINARY DISEASE CONTROL CONSIDERATIONS

Animal health, both wild and domestic, is prone to disease (anthrax, FMD, bTB and rabies by way of examples) and will need to be incorporated into elephant management planning, although elephants *per se* are not generally considered transmitters of such diseases. There are however important implications for fences in dealing with disease as well as mitigating HEC.

Although there has been no direct input into the elephant management planning framework to date, it was deemed important to highlight a set of veterinary matters for the consideration of the Veterinary Working Group. These are provided in point form below:

- 1) Reconstruction of landscapes implies "fences down", i.e. fence where only absolutely essential and needed.
- 2) Fences can be erected but can also be taken down as circumstances dictate.
- 3) Fences can contribute to social disruptions.
- 4) Border fences can perform both a security and disease control function.
- 5) The present FMD & bTB border fence can be removed and relocated to the southern MPNP boundary.
- 6) The motivation to maintain fences (costs and manpower) is declining in some countries.
- 7) What is the intended veterinary status of GMTFCA?
- 8) Consider other forms of barriers and alternative forms of fencing.
- 9) Encourage commodity based trade and/or compartmentalisation.
- 10) Elephants potentially pose a threat to the maintenance of disease control fences so need to align fences more strategically and minimise impact (can also protect human investments if possible).
- 11) Design, align and place fences for specific purposes.
- 12) What is the health status of livestock at the livestock/wildlife interface?
- 13) What levels and types of monitoring and surveillance are required?
- 14) Buffalo is a key economic species for the TFCA. How can an expanding population be accommodated disease-wise?
- 15) Avoid where possible area based (fences) approaches to disease control in preference to product-based controls.

Recent work in the context of TFCAs (e.g. Ferguson and Hanks 2010, Thomson 2008) emphasise the importance of many of the above points in the future use of fences in relation to disease control and broader conservation issues.

6 POLICY AND PLANNING FRAMEWORK STRATEGY

POLICY AND PLANNING FRAMEWORK STRATEGY 2011-2020

Analysis of the above sets of issues and options provide the basis for formulating a strategy and action plan for a policy and planning framework for the management of elephants in the GMTFCA. This is accompanied by a logical framework incorporating the needed set of sub-strategies and actions or activities. Targets, their indicators, means of verification and assumptions are established at the Goal and Objectives level.

6.1 VISION

The vision for management of elephant within GMTFCA is-

"Elephants are present as integrated drivers of ecosystem integrity that benefits all stakeholders and enhances livelihoods of people."

6.2 MISSION

The mission and long term objective for elephant management is-

"Elephants contribute to the social, cultural, ecological and economic development of the Greater Mapungubwe Transfrontier Conservation Area."

6.3 GOAL

The goal for elephant management within GMTFCA is-

"To maintain and adaptively manage variable elephant use of cultural and biological landscapes, enhancing livelihoods and benefits, reducing conflict and engaging stakeholders through effective communication."

Goal Targets include:

- 1) Persistence of elephants, cultural and biological landscapes across the TFCA ensured;
- 2) Human-elephant conflict minimized; and
- 3) Wildlife conservation-related net benefits to local communities optimised.

6.4 ACTION PLAN

The elephant conservation and management Action Plan for 2011-2020 is set out in Table 7 and is structured around the following 5 objectives for which targets, strategies and actions are listed:

- 1) Elephant Populations Conserved;
- 2) Elephant Populations Protected ;
- 3) Elephant Impacts Managed;
- 4) Elephant Populations Sustainably Managed; and
- 5) Human Elephant Conflict Reduced.

In support of the Action Plan a Logical Framework Analysis (LFA) is attached as Appendix 5.

6.4.1 Assumptions

6.4.1.1 Goal Level

The achievement of the Action Plan at goal level is subject to the following suppositions:

- Wildlife and Tourism sectors recognised in the region and amongst the three GMTFCA countries as important economic activities and contributors to growth and development;
- All sectors of society recognise and understand full (direct & indirect utility, existence and future) value of elephants;
- Elephants and their habitats are accepted politically, socially and economically;
- Elephants contribute to economic growth and development; and
- Costs of local communities living with elephants offset by the benefits elephants bring.

6.4.1.2 Objectives Level

The achievement of the Action Plan at objective level is subject to the following suppositions:

- Expertise, knowledge, skills and equipment together with funds available to undertake aerial surveys;
- GMTFCA Governments commitment to meet costs of field protection and law enforcement, i.e. ~USD\$100-200/km²;
- GMTFCA Governments commitment to combating organised national and international wildlife crime;
- Expertise, knowledge, skills and equipment together with budgeted funds available to administer and/or undertake management activities;
- Communities willing to participate and collaborate; and
- Need for communications strategy and information flow recognised by all stakeholders.



Table 7: GMTFCA Elephant Management Action Plan 2011–2020

Objective	Target	Strategy	Action
1. Elephant populations conserved	Target 1.1 Establish and monitor elephant numbers, distribution and trend	Determine elephant numbers, distribution and trend	1.1.1 Conduct regular standardised systematic and coordinated aerial surveys and census to monitor elephant populations across the GMTFCA 1.2.1 Negotiate for additional land through acquisition, contracts and agreement 1.2.2 Explore possible public private partnerships 1.2.3 Move TFCA Development Phasing from Phase I through Phase 2.1–2.10 ⁹
	Target 1.2 Expand land available to elephant	Land made available for elephant	2.1.1 Establish a legal framework within which collaborative law enforcement relating to elephant management in the TFCA can be practiced 2.1.2 Set up an anti-poaching task force team for the TFCA 2.1.3 Strengthen collaborative law enforcement capacity and procedures for the TFCA, together with appropriate monitoring protocols, e.g. MIKE, MOMS, MIST
2. Elephant populations protected	Target 2.1 Collaborative TFCA law enforcement policy for the protection of elephant put in place	Law enforcement policy and practice in place	2.2.1 Harmonise compliance with international treaties, e.g. SADC Law Enforcement Protocol
	Target 2.2 Ensure legal compliance and consistency in the application of international treaties relating to elephant	Legal compliance and consistency ensured	
3. Elephant impacts managed ¹⁰	Target 3.1 Manage elephant impact through inducing spatial and temporal variation in elephant use of landscapes by restoring the spatial limitations of the landscape	Water manipulation	3.1.1 Identify and map all natural and artificial water points within the TFCA 3.1.2 Identify role of existing water points on elephant population dynamics, e.g. distribution, behaviour 3.1.3 Monitor and evaluate use of artificial and natural water supplies 3.1.4 Monitor and evaluate minimising and manipulating the number and distribution of artificial and natural water supplies 3.2.1 Determine presence/absence of fences and purpose of such fences e.g. agricultural protection: habitat protection, disease control, exclusion of livestock 3.2.2 Exclude undesirable access and designate appropriate access/transit routes e.g. for donkey carts and human movement 3.2.3 Identify, establish and monitor elephant movement
	Target 3.2 Ensure that the consequences of historical management actions and associated lag effects thereof, as well as legal constraints, are minimized by proposing short to medium term actions and evaluating risks to other objectives through for example,	Spatial use of elephant habitat increased	

⁹ This will double the extent of GM TFCA from 2,573 km² to 5,638 km²
¹⁰ A full set options and interventions for managing elephants are given in Appendices 2a and 2b

Objective	Target	Strategy	Action
4. Elephant populations sustainably managed in collaboration with local stakeholders across the TFCA	managing elephant numbers, excluding elephant and establishing botanical reserves		corridors across the TFCA, ensuring local stakeholder participation and support 3.2.4 See also Target 1.2 Land available for elephants
	Target 3.3 Evaluate, inform and revise transboundary management of elephant ecological effects through collaborative monitoring and research agreements	Thresholds of potential concerns identified	3.3.1 Identify, develop and formulate Thresholds of Potential Concerns (TPCs) 3.3.2 Include habitat modification; loss of species of special concern; upper and lower limits of elephant population size with respect to population and genetic viability and elephant impacts 3.3.3 Identify existing and potential sources/sink configurations for the elephant population 3.3.4 Determine vegetation and plant species protection needs and ensure TPCs not exceeded, e.g. through establishment of botanical reserves 3.3.5 Identify and establish adequate protection of cultural, historical and ecological sites within the TFCA 3.3.6 Design, implement, monitor and evaluate water and fence management permutations in relation to identified TPCs across the TFCA
	Target 4.1 Regular and adequate information flow across the TFCA in place	Information flows	4.1.1 Acquisition and exchange of information from the three TFCA wildlife management authorities (Botswana (Bw) DWNP, SANParks & Zw PWMA and other TFCA stakeholders) to manage elephant effectively, especially offtake and other mortality data (Hunting, PAC, poaching & natural mortalities) 4.1.2 Monitor incidence of tusklessness and develop offtake strategies as part of PAC and hunting to reduce excessive tusklessness if deemed appropriate
	Target 4.2 TFCA PAC strategy and action plan in place	Problem Animal Control	4.2.1 Collaboratively develop PAC Policy and strategy based on vertically integrated (VI) Decision Support System (DSS) linked to National HWC Policies and HWC mitigation measures across the three TFCA countries¹¹ 4.2.2 Develop and implement standardised PAC protocols (reports, response & monitoring) across the TFCA, based on national HEC policies 4.2.3 Set indicative PAC offtake "quotas" and avoid where possible valuable trophy elephant males 4.2.4 Clarify criteria and regularise shooting of PAC elephant, responding to problem animals effectively and timeously

¹¹ See IUCN SSC African Elephant Specialist Group: HEC Working Group: Decision Support Systems and Vertically Integrated Model for Human Elephant Conflict

Objective	Target	Strategy	Action
5. Human elephant conflict reduced through spatial planning, mitigation and increased benefits	Target 4.3 Hunting of trophy elephant based on sustainable offtakes, effectively monitored and regulated across the TFCA	Trophy hunting	4.3.1 Regularise quota setting and allocation in relation to equitable and sustainable offtakes across the TFCA and adjacent areas using collaborative and participatory adaptively managed quota setting methodologies, avoiding excessive mis-allocations 4.3.2 Regularise quota setting and allocation in relation to equitable and sustainable offtakes across the TFCA and adjacent areas using collaborative and participatory adaptively managed quota setting methodologies, avoiding excessive mis-allocations¹² 4.3.3 Harmonise data collection, monitoring and evaluation of hunting across the TFCA
	Target 5.1 Invest and participate in improved spatial planning and zonation in relation to land use at local level (State, private sector, communities)	Spatial planning and land zonation	5.1.1 Identify practicable and workable land use boundaries and zones with land owners/occupiers 5.1.2 Develop and implement participatory community-based land use and zonation planning incorporating corridors, using for e.g. CRUAT (Community Resource Use Assessment Technology) 5.1.2 Ensure zonation adequately caters for agriculture (irrigation, grazing and settlement including communities adjacent to and not part of the TFCA 5.1.3 Explore options for fencing human settlements with development of a water supply model on site in consultation with affected communities 5.1.4 Identify and establish demarcated elephant and wild life corridors within and between countries where appropriate and where necessary (see also Objs.1 & 3) 5.1.5 See also 5.3 strategies and actions below
	Target 5.2 Integrate diversity of land uses ensuring compatibility with wildlife conservation and other NR uses, into the TFCA	Integration of diverse land uses	5.2.1 Define and map (location, surface area) of possibly inimical major land uses (mining, agriculture, including large scale irrigation and cattle production requiring area based disease control fences, energy generating sites, supply and delivery routes) areas in Bw, SA and Zw, determining & recording details of each in relation to potential conflicts with elephant conservation
	Target 5.3 Reduction of human-elephant conflicts to acceptable levels	Human-elephant conflict reduction	5.3.1 Identify the key drivers of HEC 5.3.2 Identify problem areas and establish priorities 5.3.3 Coordinate conflict management

¹² See Appendix 3

Objective	Target	Strategy	Action
			5.3.4 Identify and map areas not conducive to human elephant coexistence 5.3.5 Define land use boundaries that effectively contains or restricts elephant, e.g. electrified elephant proof game fence 5.3.6 Mitigate conflict through maintained elephant proof barriers, e.g. fences, and the protection of crops 5.3.7 Develop transboundary guidelines to deal with HEC using a Vertical Integration Model (see also Objective 4.2) 5.3.8 Involve local communities in conflict management, e.g. apply use of Food and Agriculture Organisation (FAO) regional HEC toolbox of mitigation measures 5.3.9 Evaluate critically the efficacy of compensation schemes (assessment methodologies, forms of compensation, and institutions required for implementation)
	Target 5.4 Improved and sustained return of material benefits to elephant-affected local communities	Livelihood benefits	5.4.1 Determine the economic value of elephants within the GMTFCA and its most cost-effective allocation, including incentive schemes that target specific animals, i.e. elephant, through utilisation 5.4.2 Determine the best locally-appropriate models for beneficiation of rural communities from elephant, e.g. NR-based SMEs &/or JVs, PPCPs PCPs (use experience of Bw NRMP and Zw CAMPFIRE) 5.4.3 Maximize irrigation potential through development and rehabilitation of existing schemes to reduce pressure on available resources 5.4.4 Market the GMTFCA as a cultural landscape 5.4.5 Generate tangible benefits from elephant conservation and utilisation 5.4.6 Establish mechanisms to ensure that local communities benefit directly as well as indirectly from wildlife generally and elephant in particular 5.4.7 Inform recipient communities about the source of benefits directly as well as indirectly 5.4.8 Use the presence of elephant to stimulate tourism development to generate employment and other benefits to local communities 5.4.9 Promote tangible benefits to establish community-based conservation activities

7 IMPLEMENTATION PROCEDURES

Some of the issues raised in this Planning Framework are not specific to elephant conservation but relevant to the overall functioning of the GMTFCA, and will need to be dealt with in ensuring elephants and their habitats are conserved and sustainably used. A number of these are addressed under the various components of the IDP as well as by the Joint Working Groups. In this regard the Planning Framework presented here should constitute a part of the JMP for Elephants.

7.1 INSTITUTIONAL AND ORGANISATIONAL ARRANGEMENTS

These are already prescribed through the TFCA TTC, the Joint Conservation Working Group and its constituent individual country Working Groups, coordinated by the International Coordinator

7.2 IMPLEMENTATION SET UP

These groupings are responsible for the overall TFCA JMP for which there are a number of subsidiary plans, such as the Predator Plan and now the Elephant Plan. Consequently implementation of the GMTFCA Elephant Conservation Policy and Management Plan is envisaged as follows:

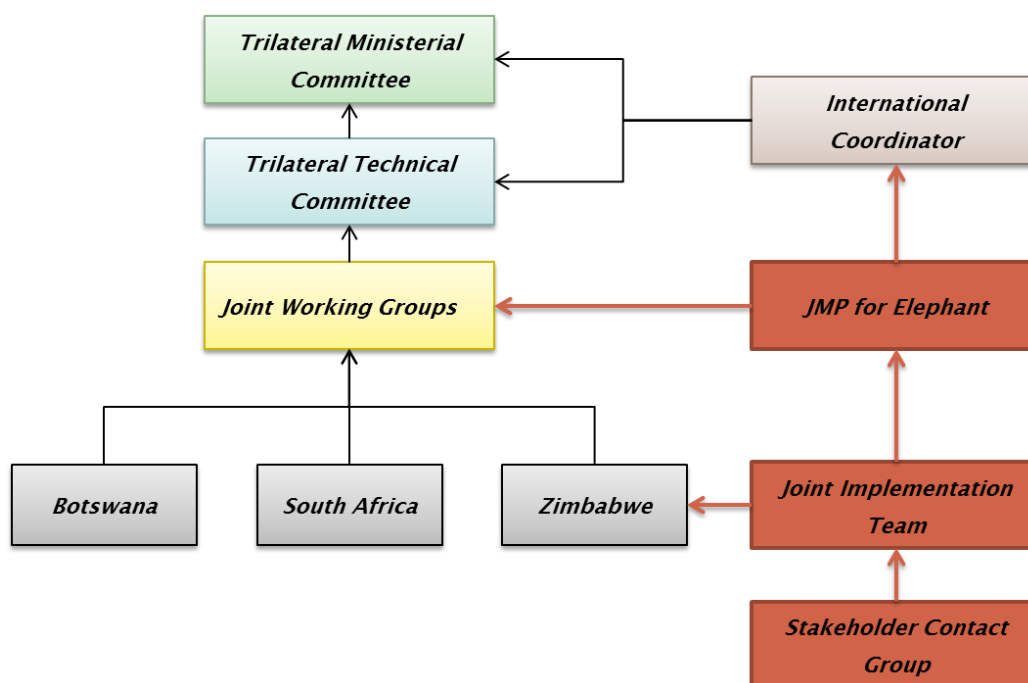


Figure 1: Institutional Arrangements

7.3 ACTION PLAN, MANAGEMENT CALENDARS AND WORK PROGRAMMES

Using this Planning Framework, in particular the LFA, time frames, milestones, responsibilities and budgets for specific components (Strategies and Actions) of this strategy will need to be detailed in the Joint Management Plan for Elephants by the Joint Implementation Team and the Stakeholder Contact Group.

The LFA presently provides the Intervention Logic throughout, but Indicators and Sources (or means) of Verification are established only at Goal Level and above. Setting these at the Objectives Level and below, together with the establishment of time frames, milestones, responsibilities and budgets, will require the input of a critical mass of key technical specialists from the three TFCA countries at a meeting or workshop designed specifically for this purpose. This will allow the development of realistic work programmes and calendars for the implementation of the elephant strategy and action plan.

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APPENDICES

APPENDIX 1: SUMMARY OF APPLICABLE LEGAL INSTRUMENTS

Below is a summary of legal instruments applicable to environmental, wildlife and elephant conservation and management in southern Africa.

International

Agenda 21 (UN 1992); WSSD (UN 2002); IUCN Convention on Biodiversity 1992; Bonn Convention on Migratory Species of Wildlife Animals 183

UN Convention to Combat Desertification; UN Convention on International Trade in Endangered Species of Wildlife Fauna and Flora (CITES) 1975

World Cultural and Natural Heritage Convention 1972 (along with UNESCO and the World Heritage Commission guidelines)

Ramsar Convention on Wetlands 1971; 1997 Watercourses Convention

Commitment to MEAs: UN CITES; UNCCD; UNFCCC; CBD;

Africa

African (Banjul) Charter on Human and People's Rights

2001 New Partnership for Africa's Development (NEPAD) 1968 African Nature Convention

Revised 2003 African Convention on the Conservation of Nature and Natural Resources

1991 Treaty establishing the African Economic Community

Regional

1992 Treaty of the Southern African Development Community; RISDP – FANR – ELM; Forestry & Wildlife – CBNRM; TFCAs

2003 (Revised) Protocol on Shared Watercourses

1999 SADC Protocol on Wildlife Conservation and Law Enforcement; 2002 Protocol on Forestry

Southern Africa Regional Elephant Conservation and Management Strategy (2005) & Addis Abba Principles [CITES-CBD]

Commitment to regional cooperation, SANParks, Limpopo Province and DEAT (signed 1996)

Memorandum of Understanding, Botswana, South Africa, Zimbabwe: NOTUGRE, Mapungubwe National Park, Tuli Circle and South Africa, 2006

Draft Treaty, July 2009 Commitment to regional cooperation, SANParks, Limpopo Province and DEAT (signed 1996); Draft Treaty, July 2009

Country PRSPs; National Environmental Policies and Acts and Biodiversity and Species Conservation Strategies and Action Plans

GMTFCA

Table 8 sets out the legal instruments pertaining to the partner countries.

Table 8: Country-based Legal Instruments

Policy	Legal Instruments	Subsidiary policies / legislation / regulations	Management Planning	Comments
Botswana				
1986 Wildlife Conservation Policy (WCP) 1990 Tourism Policy Final report of the Review of the Wildlife Policy & Act	Wildlife Conservation and National Parks Act (No. 28 of 1992) National Water Act, 1998 (Act No. 36 of 1998) National Monuments and Relics Act Environmental Impact Assessment Act, 2005 (Act No. 6 of 2005)	Game ranching policy under WCP Draft national policy and strategy for the conservation and management of elephant in prep. (2005) Other species conservation strategies and plans	1991 Draft Elephant Management Plan Review of 1991 Plan Undertaken (~2005)	Timeframes between Policy and Act and between specific reviews, draft plans and implementation too long 1986 Policy focused on conservation outside of core PAs while 1992 Act combines the two Parastatal or independent Board has been considered.
South Africa				
	National Environmental Management Act, 1998 (Act No. 107 of 1998) [NEMA] Protected Areas Act, 2005 (Act No. 57 of 2003) Biodiversity Act, 2004 (Act No. 10 of 2004) World Heritage Convention Act, 1999 (Act No. 49 of 1999) South African Heritage Resources Act, 1999 (Act No. 25 of 1999)	National Norms and Standards for the Management of Elephant (2007) Threatened and Protected Species Regulations (2007) A Framework for Development and Implementing Management Plans for South African national Parks, 2008 Agreement for the Establishment of the Vhembe/Dongola National Park, 1996	Specific area elephant management plans, e.g. Elephant Management Plan: Mapungubwe National Park 2009-2019	Strong links with NEMA legislation and biodiversity Formal public participation in the development of management plans for protected areas and the conservation of biodiversity. Elephant management activities, e.g. culling, contraception, require public participation, scrutiny and approval minister before implementation National: DEA, SANParks, 9 Provincial agencies
Zimbabwe				
1992 Wildlife Policy covering PAs and other areas, wildlife uses (trade, capture & movement)	Parks & Wildlife Act (1975) Amended 1996, 1999, 2001 Forest Act with amendments (rev1996) Environmental Management Act (2002) Water Act Communal Lands Act (1982) with amendments Rural District Councils Act (rev1996) Communal Land Forest Produce Act of 1928	Protected Species of Animals and Plants in Zimbabwe Policy and Plan for Elephant Management 1997 Other species conservation strategies and plans, e.g. Rhino, Lion, Ostrich	Policy and Plan for Elephant Management 1997	The Parks & Wildlife Act confers resource use rights and responsibilities (Appropriate Authority) on landowners and occupiers of the land which enables them to manage and derive full benefit from wildlife on their land. In the case of the Communal Lands, appropriate authority is vested in the Rural District Councils. For Forestry land it is vested in the Forestry Commission Dept. National Parks & Wild Life Management became a Statutory Authority in 2003 (Parks & Wildlife Management Authority) with Board appointed by Minister

APPENDIX 2A: PASSIVE METHODS FOR MANAGING ELEPHANTS

The following table sets out passive management options &/or interventions available for managing elephants, after Cumming and Jones 2006.

Table 9: Passive Methods for Managing Elephant

<i>Method</i>	<i>Applicability</i>	<i>Advantages</i>	<i>Disadvantages/ Risks</i>	<i>Capacity issues</i>
1. No action	Self-regulating, unconstrained populations, e.g. very arid areas, very large landscapes	- Low direct costs - Not controversial and ethically acceptable - Costs of potential long term environmental costs need to be examined	- Loss of woodlands and associated species if population is growing rapidly and exponentially - Population reaches an unmanageable size	- Resources to protect expanding populations lacking in much of the region - Resources to monitor & assess ecological and other impacts are often lacking
2. Enlarge range	- Limited applicability except TFCAs - Requires unoccupied areas or areas of low human density - Expansion into settled areas will require high incentives and benefits to residents and responsibility for management	- Avoids lethal options - Ethically acceptable to most stakeholders - Conserves other species	- Increase in human-elephant conflict - May not reduce pressure on habitats in source areas - Cost of living with elephants become too high and landholders change their preferences - Associated sustainable use (SU) options may be opposed by animal rights and humane groups	- Capacity of agency and community levels to contain Human/Elephant conflicts - Capacity to realize full benefits from elephant products is a sustainable use option.
3. Fencing	- To protect selected habitats - Contain/protect elephants in developed landscapes	Techniques readily available	- Costs of erection and maintenance can be prohibitive - Breakout and spread of diseases - In rural settings in protection homes and fields has seldom been sustainable	Human capacity and financial resources for maintenance
4. Manipulating water supplies	Limited to areas where artificial supplies have been provided	- Non-lethal - Targets elephant impacts rather than numbers	- May cause stress in drought years - Management strategies for elephants may have adverse knock –on effects on other species	Few protected areas have the resources to maintain an effective artificial water supply programme let alone establish a reliable, long term manipulation programme

APPENDIX 2B: ACTIVE METHODS FOR MANAGING ELEPHANT

The following table sets out active management options &/or interventions available for managing elephants, after Cumming and Jones 2006.

Table 10: Active Methods for Managing Elephant

<i>Method</i>	<i>Applicability</i>	<i>Advantages</i>	<i>Disadvantages/ Risks</i>	<i>Capacity issues</i>
1. Contraception	- Small confined populations - Not considered an appropriate tool in most southern African countries	- Non-lethal - Favoured by animal rights and welfare activists	- Long delay before population declines - Has to be maintained over a long period - Long terms effects on behaviour and social organisation uncertain - Not favoured by neighbouring communities	- Only South Africa (?) presently has the technical capacity to implement it - High recurrent cost with no return other than containing elephant population growth
2. Translocation	- Appropriate for restocking areas - Very limited applicability in cases of over-population	- Family group can be moved and so retain social cohesion in translocated animals - Can be used to re-stock areas with low populations	- Very high cost - Few areas left into which to move animals - Animals can return to original site	Few (2-3?) teams available to carry out this type of operation on a large scale
3. Driving/disturbing	Limited to moving herds short distances across a barrier that can be re-erected to prevent return of herds.	- Non-lethal - A means of rapidly moving herds out of selected areas	Limited to areas of suitable terrain	Very people in the region with experience in this technique
4. Culling /cropping	Technically feasible for any population where populations need to be reduced	- Rapid and effective means of reducing population size - Cost covered by recovery and sale of products - Can include local communities in direct benefits	- Opposed by some groups (e.g. animal rights activists and public opinion in many developed countries) - Maintains population in eruptive phase - Results in temporary disturbance of social and other behaviour	Few experienced people left in the region after a gap of more than 15 years for ground culling and 10 years for aerial, drug assisted, culling

APPENDIX 3: CALCULATION OF HUNTING QUOTAS

Assuming the conditions for sustainable trophy hunting are in place, "offtake" quotas should be determined on a scientific basis, using participatory methods including involved stakeholders (Taylor 2001, WWF 1997, WWF-SARPO 2000) and set in conjunction with monitoring of trophy size as well as regular monitoring of population size, hunting effort and illegal hunting. Should the first two for these parameters decrease significantly, or the latter two increase, quotas should be decreased.

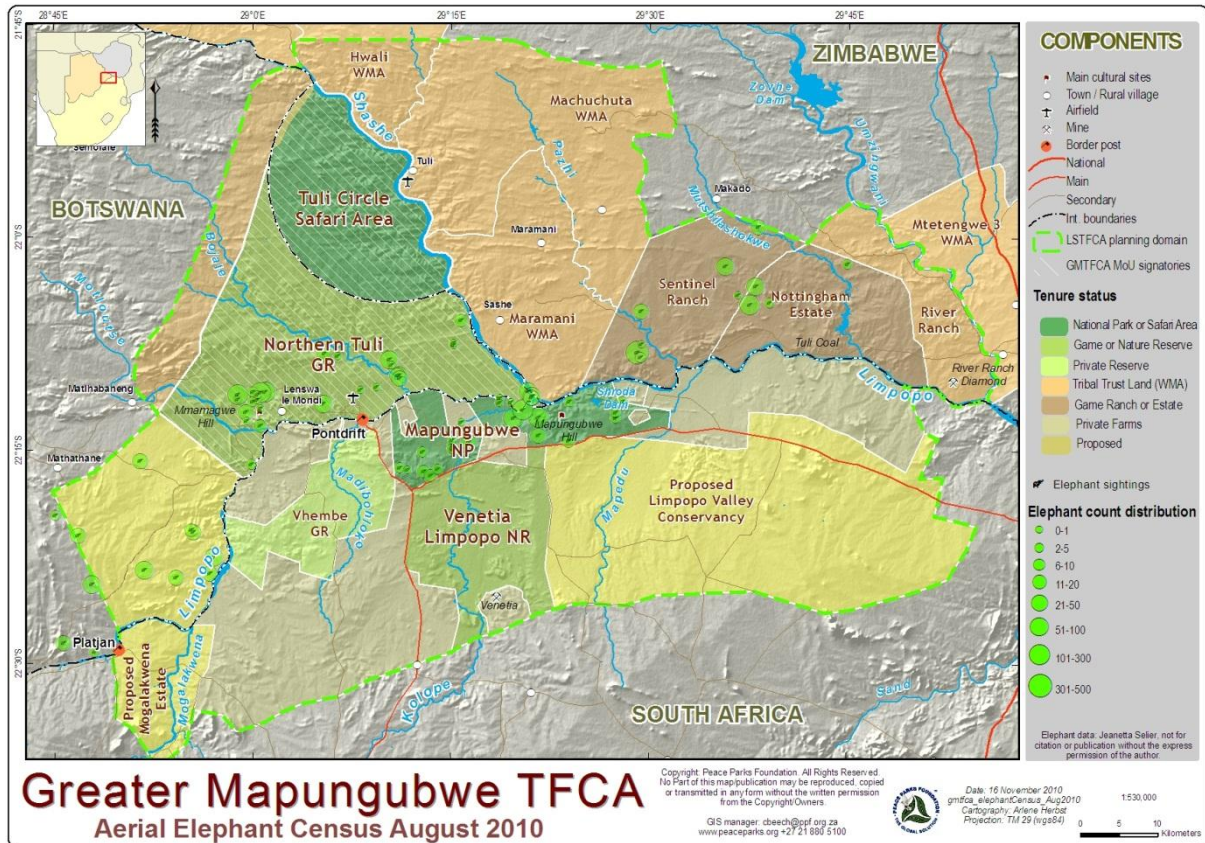
It is necessary to decide whether a big number of small trophies or a few large trophies are required annually. The table below provides a guideline for trophy quotas.

Table 11: Approximate Relationship between Population Structure and Size/age Relationship of Ivory from Zimbabwe Data

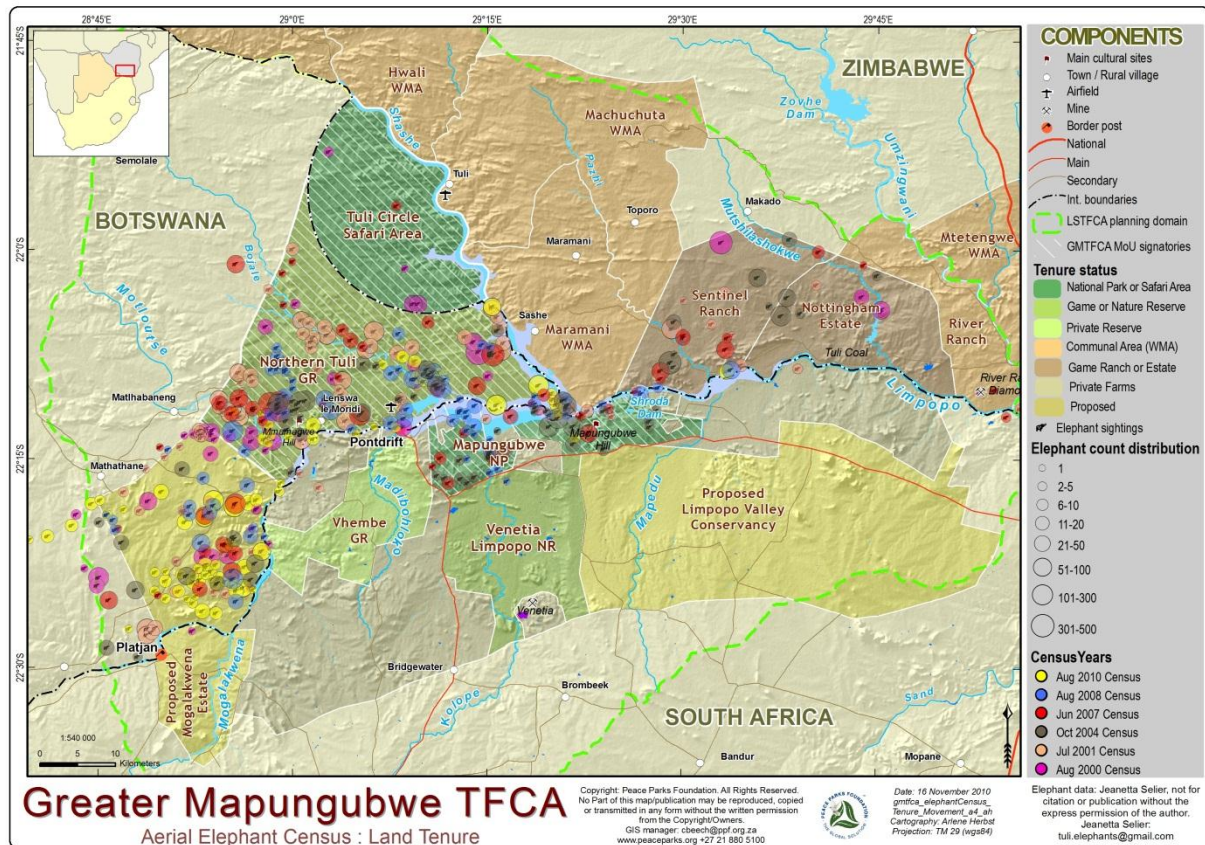
<i>Median Trophy Age</i>	<i>% Population Killed</i>	<i>Trophy Size kg/side</i>	<i>Min. Pop. Size for Offtake of 1 Ele/Annum</i>
30	0.68%	20	147
35	0.49%	26	204
40	0.37%	33	270
45	0.27%	40	370
50	0.21%	49	476
55	0.16%	56	625

Source: (G.C.Craig, pers.comm., Craig & Gibson, 1993)

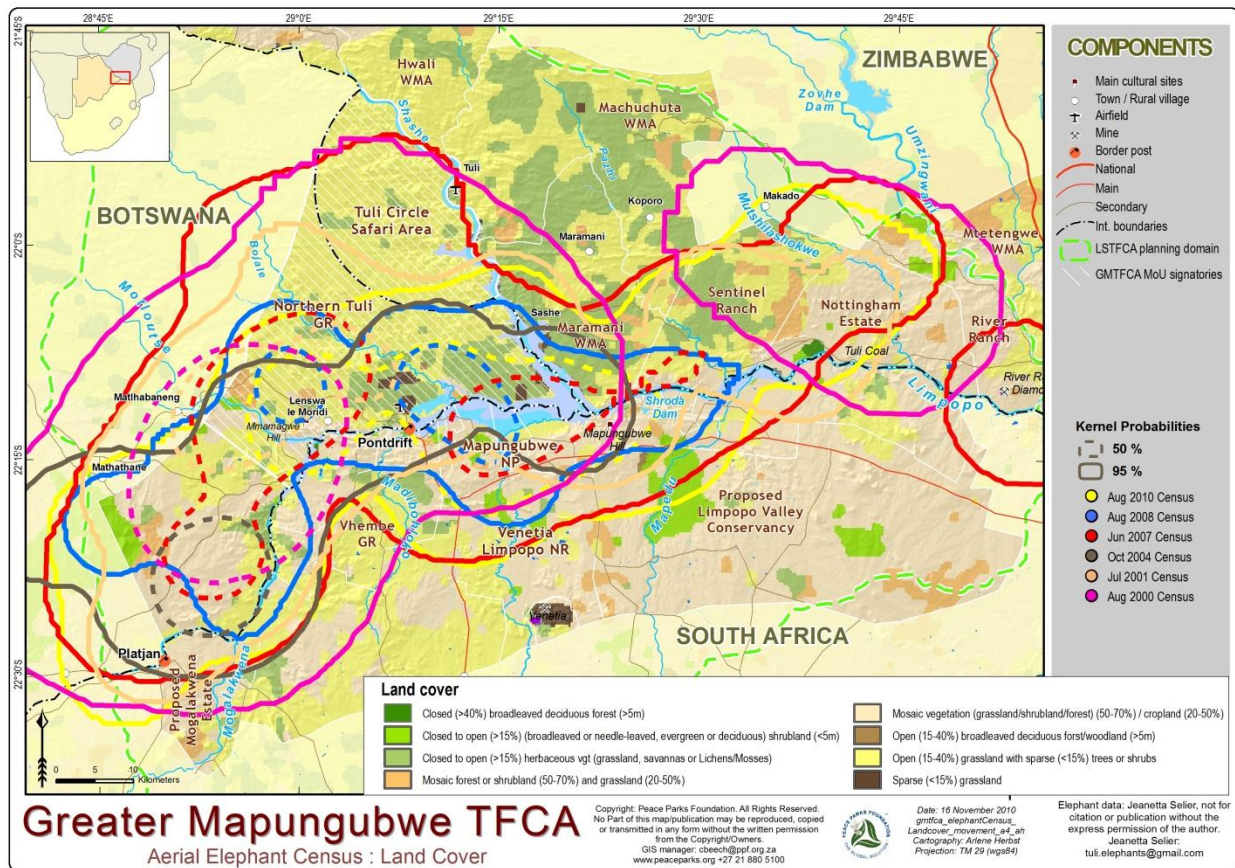
APPENDIX 4: SUPPLEMENTARY MAPS



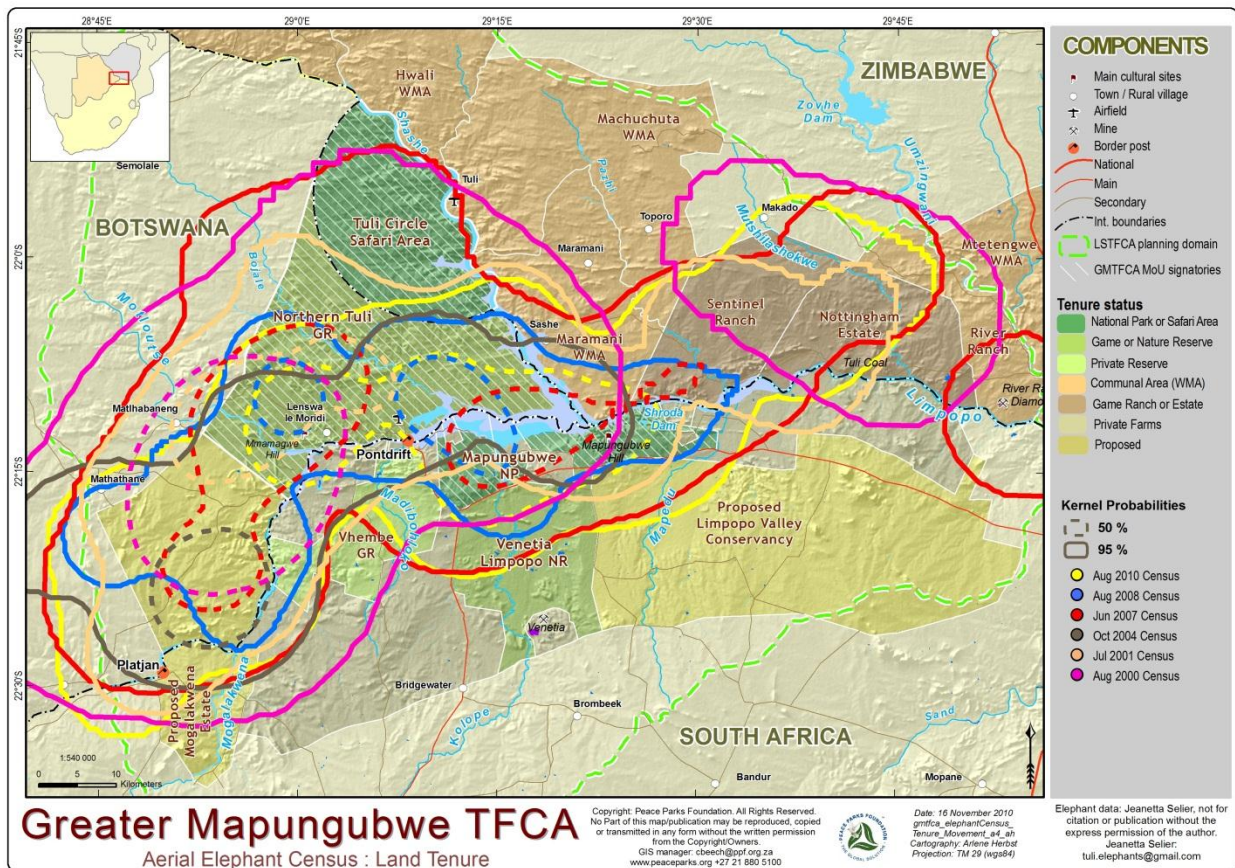
Map 4: Elephant Census, August 2010



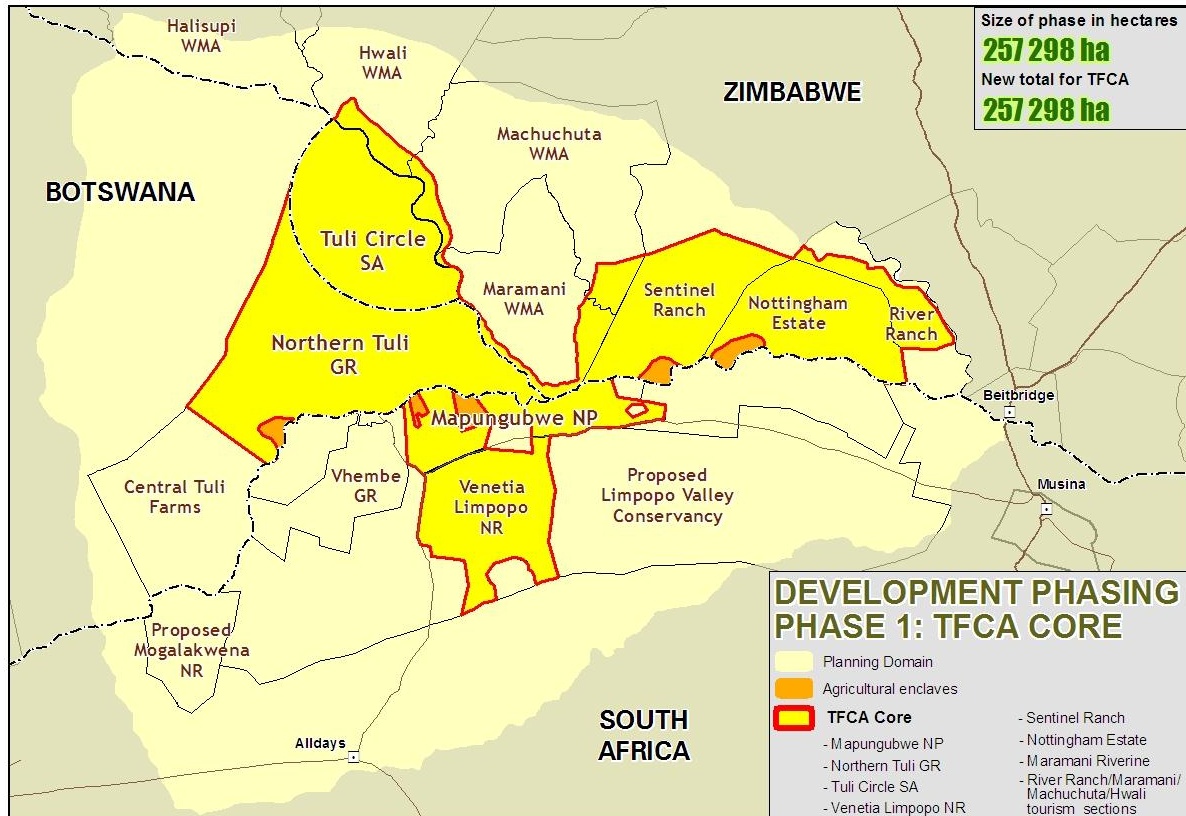
Map 5: Elephant Census - Count Distributions, Land Tenure



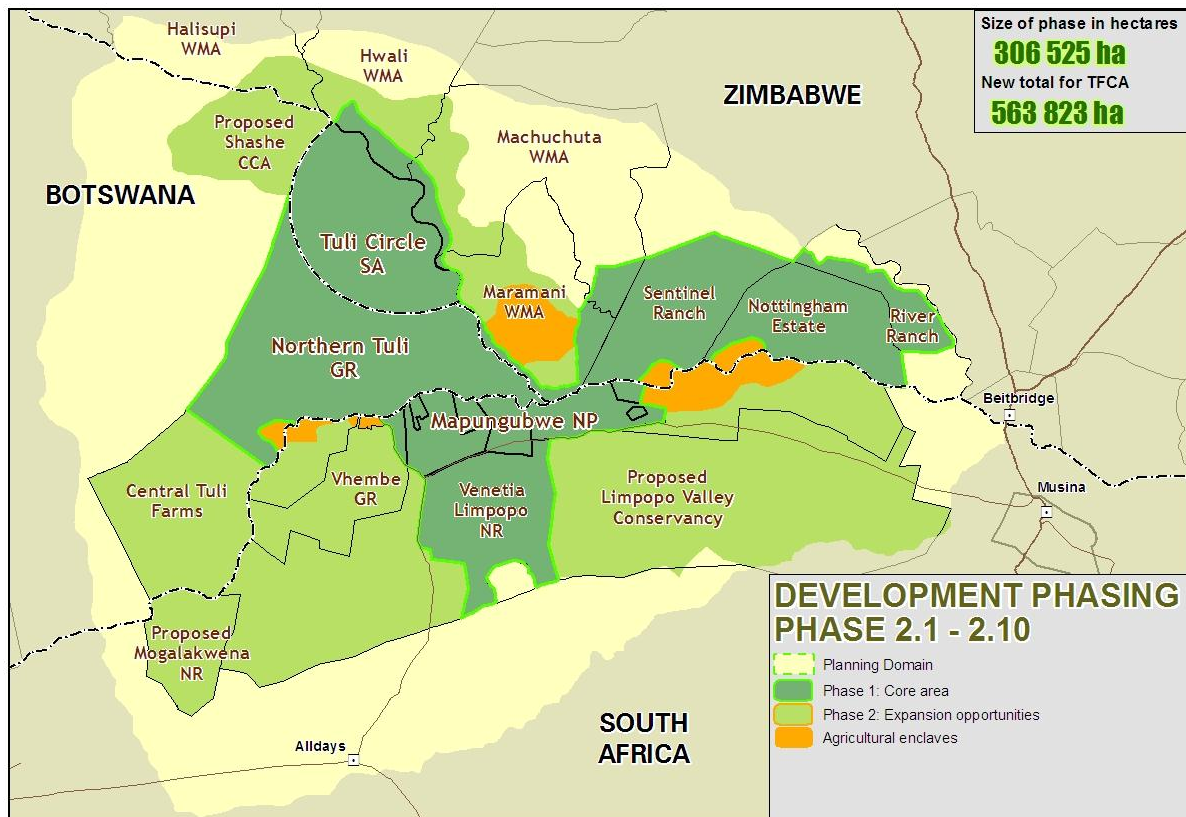
Map 6: Elephant Census – Kernel Probabilities, Land Cover



Map 7: Elephant Census – Kernel Probabilities, Land Tenure



Map 8: GMTFCA Development Phase 1



Map 9: GMTFCA Development Phase 2

APPENDIX 5: LOGICAL FRAMEWORK ANALYSIS

	<i>Intervention Logic</i>	<i>Objectively Verifiable Indicators</i>	<i>Sources of Verification</i>	<i>Assumptions</i>
Vision	Elephants are present as integrated drivers of ecosystem integrity	that benefits all stakeholders and enhances livelihoods of people		
Long term Objective [Mission]	Elephants contribute to the social, cultural, ecological and economic development of the Greater Mapungubwe Transfrontier Conservation Area	Contribution of elephants to regional and national economies of the three GMTFCA countries increases from Y% to Z% over 10 years from 2011 to 2020	Economic indicators and statistics for SADC, Botswana, South Africa and Zimbabwe	Wildlife and Tourism sectors recognised in the region and amongst the three GMTFCA countries as important economic activities and contributors to growth and development
Goal and Goal targets	To maintain and adaptively manage variable elephant use of cultural and biological landscapes, enhancing livelihoods and benefits, reducing conflict and engaging stakeholders through effective communication. 1) The persistence of elephants, cultural and biological landscapes across the TFCA ensured 2) Human-elephant conflict minimised 3) Wildlife conservation-related net benefits to local communities optimised	• By 2015, the present numbers, distribution and connectivity of the elephant population within the GMTFCA is secure and maintained, if not increasing • By 2015, human elephant conflict incidents will be reduced by 75% from Y to X incidents annually in serious HEC hotspot areas across the TFCA landscape through conservation, spatial planning and other mitigation measures, providing space and protection for people, cultural and ecological values and elephants • By 2015, improved incentives and benefits to local people living with elephants will be reflected in 50% or more of wildlife hunting and tourism revenues accruing directly and timeously to those most severely affected communities as identified annually by analyses of conflict areas	• Aerial survey reports • Elephant tracking studies • PAC data analysis • Land use planning and zonation plans • Corridor establishment and maintenance data and reports • HEC mitigation data and reports at TFCA and country levels • Annual community revenue disbursement records	• All sectors of society recognise and understand full (direct & indirect utility, existence and future) value of elephants • Elephants and their habitats are accepted politically, socially and economically • Elephants contribute to economic growth and development • Costs of local communities living with elephants offset by the benefits elephants bring

	<i>Intervention Logic</i>	<i>Objectively Verifiable Indicators</i>	<i>Sources of Verification</i>	<i>Assumptions</i>
OBJECTIVE 1	1. Elephant populations conserved <u>Targets</u> 1.1 Establish and monitor elephant numbers, distribution and trend 1.2 Expand land available to elephants			Expertise, knowledge, skills and equipment together with funds available to undertake aerial surveys
Strategy & Actions	Determine elephant numbers, distribution and trend 1.1.1 Conduct regular standardised systematic and coordinated aerial surveys and census to monitor elephant populations across the TFCA			
	Land made available for elephants 1.2.1 Negotiate for additional land through acquisition, contracts and agreement 1.2.2 Explore possible public private partnerships 1.2.3 Move TFCA Development Phasing from Phase I through Phase 2.1-2.10			
OBJECTIVE 2	2. Elephant populations protected <u>Targets</u> 2.1 Collaborative TFCA law enforcement policy and practice for the protection of elephant in place 2.2 Ensure legal compliance and consistency in the application of international treaties relating to elephant			- GMTFCA Governments commitment to meet costs of field protection and law enforcement, i.e. ~USD\$100-200/km² - GMTFCA Governments commitment to combating organised national and international wildlife crime
Strategy & Actions	Law enforcement policy and practice in place 2.1.1 Establish a legal framework within which collaborative law enforcement relating to elephant management in the TFCA can be practiced 2.1.2 Set up an anti-poaching task force team for the TFCA 2.1.3 Strengthen collaborative law enforcement capacity and procedures for the TFCA, together with appropriate monitoring protocols, e.g. MIKE, MOMS, MIST			

	<i>Intervention Logic</i>	<i>Objectively Verifiable Indicators</i>	<i>Sources of Verification</i>	<i>Assumptions</i>
	Legal compliance and consistency ensured 2.2.1 Harmonise compliance with international treaties, e.g. SADC Law Enforcement Protocol			
OBJECTIVE 3	3. Elephant impacts managed <u>Targets</u> 3.1 Manage elephant impact through inducing spatial and temporal variation in elephant use of landscapes by restoring the spatial limitations of the landscape 3.2 Ensure that the consequences of historical management actions and associated lag effects thereof, as well as legal constraints, are minimized by proposing short to medium term actions and evaluating risks to other objectives through for example, managing elephant numbers, excluding elephants and establishing botanical reserves 3.3 To evaluate, inform and revise transboundary management of elephant ecological effects through collaborative monitoring and research agreements			Expertise, knowledge, skills and equipment together with budgeted funds available to administer and/or undertake management activities
	Water manipulation 3.1.1 Identify and map all natural and artificial water points within the TFCA 3.1.2 Identify role of existing water points on elephant population dynamics, e.g. distribution, behaviour 3.1.3 Monitor and evaluate use of artificial and natural water supplies 3.1.4 Monitor and evaluate minimising and manipulating the number and distribution of artificial and natural water supplies			
Strategy & Actions	Spatial use of elephant habitat increased 3.2.1 Determine presence/absence of fences and purpose of such fences e.g. agricultural protection; habitat protection, disease control, exclusion of livestock 3.2.2 Exclude undesirable access and designate appropriate access/transit routes e.g. for donkey carts and human movement 3.2.3 Identify, establish and monitor elephant movement corridors across the TFCA, ensuring local stakeholder			

	<i>Intervention Logic</i>	<i>Objectively Verifiable Indicators</i>	<i>Sources of Verification</i>	<i>Assumptions</i>
	participation and support 3.2.4 See also Target 1.2 Land available for elephants Thresholds of potential concerns identified 3.3.1 Identify, develop and formulate TPCs 3.3.2 Include habitat modification; loss of species of special concern; upper and lower limits of elephant population size with respect to population and genetic viability and elephant impacts 3.3.3 Identify existing and potential sources/sink configurations for the elephant population 3.3.4 Determine vegetation and plant species protection needs and ensure TPCs not exceeded, e.g. through establishment of botanical reserves 3.3.5 Identify and establish adequate protection of cultural, historical and ecological sites within the TFCA 3.3.6 Design, implement, monitor and evaluate water and fence management permutations in relation to identified TPCs across the TFCA			
OBJECTIVE 4	4. Elephant populations sustainably managed in collaboration with local stakeholders across the TFCA <u>Targets</u> 4.1 Regular and adequate information flow across the TFCA in place 4.2 TFCA PAC strategy and action plan in place 4.3 Hunting of trophy elephants based on sustainable offtakes, effectively monitored and regulated across the TFCA			- Communities and other stakeholders willing to participate and collaborate - Need for communications strategy and information flow recognised by all stakeholders
Strategy & Actions	Information flows 4.1.1 Acquisition and exchange of information from the 3 TFCA wildlife management authorities (Bw DWNP, SANParks & Zw PWMA and other TFCA stakeholders) to manage elephants effectively, especially offtake and other mortality data (Hunting, PAC, poaching & natural mortalities) 4.1.2 Monitor incidence of tuskeness and develop offtake strategies as part of PAC and hunting to reduce excessive			

<i>Intervention Logic</i>		<i>Objectively Verifiable Indicators</i>	<i>Sources of Verification</i>	<i>Assumptions</i>
	tusklessness if deemed appropriate			
	Problem Animal Control 4.2.1 Collaboratively develop PAC strategy based on vertically integrated DSS linked to National HWC Policies and HWC mitigation measures across the 3 TFCA countries 4.2.2 Develop and implement standardised PAC protocols (reports, response & monitoring) across the TFCA , based on national HEC policies 4.2.3 Set indicative PAC offtake "quotas" and avoid where possible valuable trophy elephant males 4.2.4 Clarify criteria and regularise shooting of PAC elephant, responding to problem animals effectively and timeously			
	Trophy hunting 4.3.1 Develop and implement TFCA Trophy Hunting Policy 4.3.2 Regularise quota setting and allocation in relation to equitable and sustainable offtakes across the TFCA and adjacent areas using collaborative and participatory adaptively managed quota setting methodologies, avoiding excessive mis-allocations 4.3.3 Harmonise data collection, monitoring and evaluation of hunting across the TFCA			
	5. Human elephant conflict reduced through mitigation, spatial planning and increased benefits <u>Targets</u> 5.1 Invest and participate in improved spatial planning and zonation in relation to land use at local level (State, private sector, communities) 5.2 Integrate diversity of land uses ensuring compatibility with wildlife conservation and other NR uses, into the TFCA 5.3 Reduction of human-elephant conflicts to acceptable levels 5.4 Improved and sustained return of material benefits to elephant-affected local communities			
OBJECTIVE 5				
Strategy & Actions	Spatial planning and land zonation			

<i>Intervention Logic</i>	<i>Objectively Verifiable Indicators</i>	<i>Sources of Verification</i>	<i>Assumptions</i>
5.1.1 - Identify practicable and workable land use boundaries and zones with land owners/occupiers 5.1.2 Develop and implement participatory community-based land use and zonation planning incorporating corridors, using for e.g. CRUAT 5.1.2 Ensure zonation adequately caters for agriculture (irrigation, grazing and settlement including communities adjacent to and not part of the TFCA 5.1.3 Explore options for fencing human settlements with development of a water supply model on site in consultation with affected communities 5.1.4 Identify and establish demarcated elephant and wild life corridors within and between countries where appropriate and where necessary (see also Objs.1 & 3) 5.1.5 See also 5.3 strategies and actions below			
Integration of diverse land uses 5.2.1 Define and map (location, surface area) of possibly inimical major land uses (mining, agriculture, including large scale irrigation and cattle production requiring area based disease control fences, energy generating sites, supply and delivery routes) areas in Bw, SA & Zw, determining & recording details of each in relation to potential conflicts with elephant conservation			
Human-elephant conflict reduction 5.3.1 Identify the key drivers of HEC 5.3.2 Identify problem areas and establish priorities 5.3.3 Coordinate conflict management 5.3.4 Identify and map areas not conducive to human elephant coexistence 5.3.5 Define land use boundaries that effectively contains or restricts elephant, e.g. electrified elephant proof game fence 5.3.6 Mitigate conflict through maintained elephant proof barriers (fences) and the protection of crops 5.3.7 Develop transboundary guidelines to deal with HEC using a Vertical Integration Model (see also Objective 4.2)			

<i>Intervention Logic</i>	<i>Objectively Verifiable Indicators</i>	<i>Sources of Verification</i>	<i>Assumptions</i>
5.3.8 Involve local communities in conflict management, e.g. apply use of FAO regional HEC toolbox of mitigation measures 5.3.9 Evaluate critically the efficacy of compensation schemes (assessment methodologies, forms of compensation, and institutions required for implementation)			
Livelihood benefits 5.4.1 Determine the economic value of elephants within the GMTFCA and its most cost-effective allocation, including incentive schemes that target specific animals, i.e. elephants, though utilisation 5.4.2 Determine the best locally-appropriate models for beneficiation of rural communities from elephant, e.g. NR-based SMEs &/or JVs, PPCPs, PCPs (Use experience of Bw NRM and Zw CAMPFIRE) 5.4.3 Maximize irrigation potential through development and rehabilitation of existing schemes to reduce pressure on available resources 5.4.4 Market the TFCA as a cultural landscape 5.4.5 Generate tangible benefits from elephant conservation and utilisation 5.4.6 Establish mechanisms to ensure that local communities benefit directly as well as indirectly from wildlife generally and elephants in particular 5.4.7 Inform recipient communities about the source of benefits directly as well as indirectly 5.4.8 Use the presence of elephants to stimulate tourism development to generate employment and other benefits to local communities 5.4.9 Promote tangible benefits to establish community-based conservation activities			