



Tsavo Conservation Area Management Plan 2008- 2018





This management plan was developed through a participatory planning process involving a cross section of Tsavo Conservation Area stakeholders, under the coordination of a Core Planning Team comprising representatives from Tsavo East, Tsavo West, and Chyulu Hills National Parks and KWS Headquarters.

Co-financing for the planning process was provided by the David Sheldrick Wildlife Trust

Planning resource base information collection, technical assistance and facilitation was carried out by Ian Games, M.E. Associates (Pvt) Ltd

Additional planning inputs and alignment with the KWS Protected Areas Planning Framework was carried out by the Conservation Development Centre, Nairobi.

Approval Page

The Board of Trustees and the management of the Kenya Wildlife Service have approved the implementation of this management plan for the Tsavo Conservation Area.

Dr Julius Kipng'etich
Director

Date:

Mr. David Mwiraria
Chairman, KWS BoT

Date:

Foreword

The Tsavo Conservation Area Management Plan is the second protected area plan to be produced according to KWS' new Protected Areas Planning Framework, or PAPF, and is the culmination of the first phase of developing and rolling out the new planning framework. The development of the PAPF has been part and parcel of a wider process of institutional change and renewal that has been underway in KWS in the past few years, which has transformed KWS from an organisation mired in the past to a dynamic, confident institution leading the way in the management and conservation of Kenya's remarkable and world-renowned natural resources and wildlife. This transformation has come just in time, as our nation's protected areas face mounting pressures from growing human populations on their borders and from an enormous increase in demand for tourism within the parks.

The Tsavo Conservation Area is the tourism flagship of KWS' protected areas, and generates a significant proportion of the revenues that KWS uses to finance other less visited but nonetheless conservation-critical parks and reserves, and also to underwrite the ongoing institutional transformation process. It is vital that the TCA has a strong and forward-looking management plan in place to guide the management of the area in the years to come, and to ensure that the TCA offers a first-class tourism product and visitor experience alongside the conservation of the area's outstanding wilderness characteristics and biodiversity. I am therefore especially pleased that this new management plan has been completed in time to be approved and released under the auspices of the current KWS Board of Trustees whose tenure ends in December 2007, and who have done so much to support and guide the transformation process in KWS, and to champion the protected areas planning framework which has been at the heart of the rebirth of the organisation.

KWS has come a long way in the last few years, as is demonstrated in the contents of the TCA management plan presented in the following pages. We are now on course to develop clear ecological and conservation targets for all our protected areas, and we have developed a way of prioritising the threats to these values and thereby guiding our management responses. Through the management planning process, we have begun to build a strong partnership with the tourism industry in identifying the optimal tourism product for a particular protected area, and in defining what needs to be put in place to deliver that product. We are firmly putting behind us the previous situation where KWS and the tourism industry would proceed along separate and sometimes divergent paths in a protected area, with very little communication or understanding of each others needs. Through the new PAPF-inspired community partnership programmes, we are also building a much stronger foundation for collaboration and benefit sharing with our neighbours, upon whose support the conservation of the protected areas ultimately hinges.

The TCA management plan is the latest example of the professional and systematic approach that KWS is now spearheading in the management of our protected areas, but we anticipate further advances in the New Year as we apply the PAPF in several other priority protected areas, such as the Nairobi, Mount Kenya and Aberdares National Parks. The new plans, together with the TCA and MCA plans, will be a pivotal ingredient in our ongoing march to achieve ISO 9001:2000 certification, thereby setting the seal on KWS' transformation into a world-class conservation agency, and a highly respected Kenyan parastatal.

Finally, I would like to say a special word of thanks to one of our longstanding partners in the conservation and management of the Tsavo Conservation Area, without whose steadfast support the TCA would not be what it is today – the David Sheldrick Wildlife Trust. I hope that this new management plan, which the DSWT helped to finance, is an appropriate testimonial to the fruitful partnership we have enjoyed over the years, and we look forward to joining forces with the Trust in the years to come in implementing the plan.

Dr Julius Kipng'etich
Director, KWS
December 2007

Executive Summary

This 10-year (2008-2018) management plan for the Tsavo Conservation Area (TCA) is the second KWS management plan piloting the new Protected Area Planning Framework (PAPF). The PAPF aims to ensure that all new KWS protected area management plans are developed according to a standardised process and have a similar structure. In line with the PAPF, the TCA plan has been developed in a highly participatory manner, incorporating and building on ideas from a broad cross-section of TCA stakeholders.

The plan is designed to be a highly practical management tool supporting TCA management in carrying out their duties. Towards this end, the plan sets out strategic guidance on the **goals** (the purpose statements and subsidiary objectives) towards which management is working, and a series of straightforward **prescriptions and management actions** that need to be implemented in order to achieve these aims. In addition, the TCA plan structure has been developed to be as simple as possible, and as such, easily understood by stakeholders and implemented by TCA management. At the heart of the plan is the TCA **zonation scheme** and the five **management programmes**, each of which cover an essential aspect of PA management. These five programmes are:

- ▶ **Ecological Management Programme**
- ▶ **Tourism Development and Management Programme**
- ▶ **Community Partnership and Conservation Education Programme**
- ▶ **Security Programme**
- ▶ **Protected Area Operations Programme**

Each programme contains a programme purpose statement that sets out the overall goal management is working towards, and a series of management objectives designed to achieve this purpose. Under each objective are a series of discrete management actions that will be implemented during the 10-year lifespan of this plan, and which will result in the achievement of their overarching objective. Each of the management programmes is completed by a **3-year Activity Plan**. These plans provide the vital link between the management plan's 10-year strategic outlook, and the day-to-day management operations in the TCA. Each plan breaks down the individual management actions to be completed in the first three years of the plan implementation period into a series of tangible management activities, which in turn provides the basis for annual operational planning and budgeting by TCA managers.

TCA Purpose and Values

The TCA purpose statement summarises the importance of the TCA, and provides the overall goal that TCA managers are working towards. The purpose of the TCA is defined in this plan as:

To preserve the integrity of the protected areas making up the Tsavo Conservation Area while promoting appropriate and sustainable development in the greater TCA landscape

The development of the above Purpose Statement was based on the stakeholder identification of the TCA's "Exceptional Resource Values" (ERVs), which have been divided into four

categories: Biodiversity; Scenic; Social; and Cultural. Some of the most important ERVs identified for the TCA include: the area's high number of endangered species and Kenya's largest elephant population (biodiversity); the area's diverse landscapes, scenery and wilderness characteristics (scenic); and the national and local economic benefits that the area generates (social).

TCA Zonation Scheme

The TCA zonation scheme provides a framework both for supporting the decentralisation of the area's management, and for enabling the regulation and promotion of the desired levels and type of visitor use in different parts of the TCA. In order to achieve this, the area has been divided into 6 management sectors and 7 closely corresponding visitor use zones:

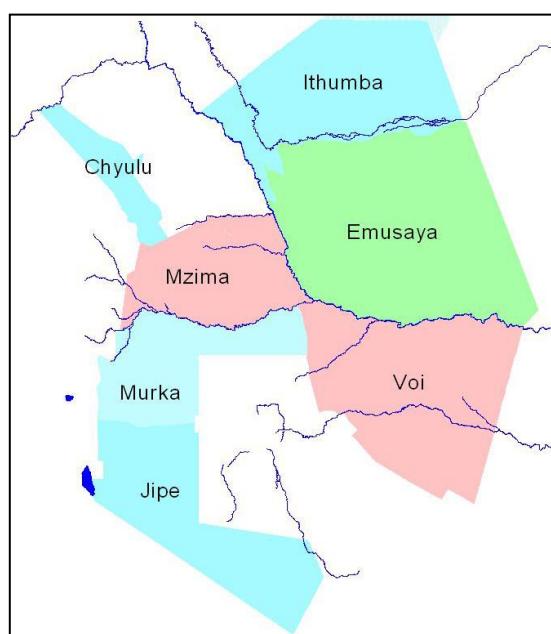
Protected Area	Management Sector	Visitor Use
Tsavo East:	Voi Sector	High Use
	Emusaya Sector	Wilderness; Low Use (strip north of road on south bank of Tiva River)
	Ithumba Sector	Low Use
Tsavo West:	Kamboyo Sector	High Use; Low Use (south of Tsavo River)
	Jipe Sector	Low Use
Chyulu Hills:	Chyulu Sector	Low Use

Management Sectors

In accordance with the KWS Sectoral Management Strategy for conservation areas, the TCA has been divided into six management sectors with the aim of increasing management presence and infrastructure development throughout the area. The Assistant Director, Tsavo Conservation Area has overall responsibility for the TCA, with the Senior Wardens TENP and TWNP, based at Voi and Kamboyo HQs respectively. Chyulu Hills NP falls under the jurisdiction of the Senior Warden, TW. Each of the six management sectors (3 in TENP, 2 in TWNP and 1 in CHNP) will be managed by a warden based at a headquarters located within the sector.

Visitor Use Zones

The visitor use zones have been developed to enable the degree and type of visitor use to be managed spatially across the TCA. The scheme (in conjunction with the Tourism Development and Management Programme) primarily aims to support a well managed, high-quality, relatively high-density vehicle-based traditional game viewing experience with minimal environmental impacts in the high use zones, while encouraging and making provisions for increased intensity and variety of visitor use in both the low and wilderness zones. To enhance the ease of implementation, the number of visitor use zones has been kept to a minimum, and all zone boundaries are aligned with easily visible physical features, such as roads or major rivers.



In line with the PAPF, the zonation scheme uses a simple modelling approach based on vehicle encounter rates to assess the quality of the visitor experience in any particular zone. This leads to the subsequent development of **Limits of Acceptable Use** (LAU) on the number of visitors per day that is desirable in each zone, which has in turn been used to establish prescriptions on the number of visitor beds that is permitted in the concerned zone.

Based on these LAU, the zonal accommodation prescriptions specify that **no new facilities are permitted in the high uses zones**, while a significant **expansion of facilities (422 new beds) is proposed in the area's low and wilderness zones**. However, even with the planned expansion, overall encounter rates in the low and wilderness zones are likely to remain low and further expansion in these zones may be appropriate in the future, contingent on an assessment of the quality of the tourism product being provided and its environmental impacts. The only likely exception to this is Murka Zone which, while designated as low use zone, is likely to develop towards a high use zone level of use during the implementation of this plan.

In addition to the expansion of visitor accommodation facilities, a wide variety of visitor activities (such as walking safaris, horseback safaris, and river rafting) are also permitted in the low and wilderness zones to further encourage and support increased visitor use of these areas. In contrast, in the high uses zones activities will remain restricted to game viewing from vehicles and short walks, and the emphasis will instead be on improving the management of the high numbers of vehicle-based visitors.

Ecological Management Programme

The Ecological Management Programme aims to ensure that “*the conservation of the TCA’s natural environment is enhanced, through improved ecological monitoring, applied research and targeted management interventions*”. In line with the PAPF, this programme used the Nature Conservancy’s Conservation Action Planning (CAP) process as a mechanism for focusing ecological management on the area’s most important ecological features (the conservation targets), and on developing management actions to either abate the key threats to these targets or to enhance their status. The nine conservation targets identified for the TCA are:

1. River & lake systems
2. Mountain forests
3. *Acacia-Commiphora* bushland and grasslands
4. Riverine habitats
5. Large carnivores
6. Elephants
7. Black rhino
8. Grevy’s zebra
9. Hirola

The first objective of the Ecological Management Programme focuses on enhancing the conservation status of the key large mammal conservation targets in the TCA (specifically Black rhino, Grevy’s zebra and elephants). The two other species-level conservation targets (hirola and large carnivores) are addressed through further research and specific studies (covered under the programme’s final objective), as well as through the monitoring activities specified in the TCA Ecological Monitoring Plan framework. The second objective addresses common issues or threats impacting on key habitats in the TCA, primarily through improving fire management, mitigating the environmental impacts of tourism developments, and combating invasive species. The third ecological management objective focuses on the conservation of key river systems and wetlands in and around the TCA (the first conservation target). As

many of the threats impacting on this target emanate from areas outside the TCA, this objective will involve a significant degree of collaboration with agencies mandated to deal with these issues in the wider ecosystem, such as water user associations and the National Environment Management Authority, NEMA. The programme's final objective focuses on strengthening the Tsavo Research Station's role in the conservation and management of the TCA, and will achieve this by improving the station's facilities, capacity and staff establishment, and the management and coordination of KWS and external research activities.

Tourism Development and Management Programme

The purpose of the Tourism Development and Management Programme is to ensure that "*the Tsavo Conservation Area's position as KWS' premier tourism destination is maintained and enhanced*". The programme aims to achieve this purpose through a two-tier approach to the development and management of tourism in the TCA: the intensive management of traditional vehicle-based tourism in the TCA's high use areas; combined with the promotion of investment in low volume, high value tourism in the TCA's low use and wilderness areas. This approach has the advantage of not only diversifying the TCA tourism product so as to appeal to different market segments, and thereby the sustainability and reliability of revenues the area currently generates from tourism, but also, by increasing visitor use of the wilderness areas, demonstrating productive economic use of these areas and thereby helping provide a deterrent to livestock grazing and bushmeat poaching.

In order to achieve these aims, the programme has three objectives that focus on: improving visitor experience in the high use zones while ensuring the environmental impacts from use are minimised (achieved through sub-objectives focusing on improving driver/guide and visitor conduct, and increasing the variety of visitor attractions and amenities on offer); expanding and diversifying tourism investment and use in the TCA's low use and wilderness areas, within the bounds of maintaining a high quality, low density wilderness based visitor experience; and strengthening existing tourism management and administration systems in order to keep pace with the escalating tourism use of the area and the increased complexity of tourism management as a result of plan implementation. A key component of this final objective is the monitoring of the quality and environmental impacts of visitor use in the TCA; this will be assessed through both qualitative methods (such as visitor surveys) and through more objective assessments using the "Tourism Benchmarks" the programme sets out.

Community Partnership and Conservation Education Programme

The purpose of the Community Partnership and Conservation Education Programme is to ensure that "*community support for the TCA's conservation and participation in conservation compatible land uses across the greater TCA landscape [is] enhanced*". Importantly, the purpose statement differentiates between the conservation of the core TCA, for which community support is vital, and the greater TCA landscape, where KWS will support the development of conservation-compatible community land uses and activities. Key in achieving this aim is ensuring that mechanisms are in place to enable KWS and TCA-adjacent communities to work together, and which is the focus of the programme's first objective. The programme's second and third objectives complement this approach by working to reduce the costs communities incur as a result of the area's conservation (primarily through mitigating human-wildlife conflict) and enhancing the direct benefits that communities receive (both through employment and KWS social projects), thereby improving KWS-community relations and increasing overall community support for the area's conservation. The fourth objective aims to reduce the impacts of TCA-adjacent communities on the ecological integrity of the area, and at the same time improve community economic wellbeing, through supporting conservations-

compatible community initiatives and sustainable natural resource enterprises. The programme's fifth and final objective focuses on conservation education, and aims to improve both visitor and community understanding and awareness, and thereby appreciation and support for, the conservation of the TCA, as well as Kenya's wider network of protected areas and the work of KWS.

Security Programme

Despite recent successes in combating commercial poaching in the area, security remains an issue of paramount importance in the TCA, especially as the focus of illegal activities has now shifted to indiscriminate bushmeat poaching and extensive livestock grazing. The TCA Security Programme therefore aims to make certain that "*the safety of the TCA's natural resources, staff, visitors and assets is ensured, through the delivery of efficient, effective and adequate security services*". In order to achieve this aim, three management objectives have been developed. These objectives focus on: strengthening natural resource protection operations, especially in the more remote parts of the TCA (through improvements in security facilities and infrastructure, as well as improvements in rhino and elephant security operations); enhancing the effectiveness of security operations in the TCA by improving data management, the use of information provided by informants, and relations with other key stakeholders (such as the administration police, judiciary, and Tanzanian authorities); and finally, by enhancing the security of people and property across the entire area. This final objective involves specific activities focusing on enhancing visitor security, and measures to improve the security of KWS staff carrying out their duties.

Protected Area Operations Programme

The plan's management programmes set out an ambitious series of management objectives and actions and, if this plan is to be successful, PA operations also need to be strengthened in order to ensure that management operations are supporting the plan's implementation, and providing a conducive and supportive working environment for TCA staff. The aim of the Protected Area Operations Programme is therefore to ensure that "*protected area operations efficiently and effectively support the achievement of the TCA's purpose and the delivery of other TCA management programmes*". In order to achieve this aim, the programme has three management objectives. The first of these objectives focuses on formalising and strengthening collaborations between KWS and other key stakeholders. This includes internal stakeholders using "enclaves" within the TCA (such as mining companies, tourism investors, and the prison service) and external stakeholders such as county councils and district authorities. The programmes remaining two objectives focus on ensuring that there is a sufficient KWS staff establishment in the area, that are well trained and motivated to carry out their duties, and lastly, on ensuring that the necessary infrastructure is in place to support the effective management of the TCA. This final objective is split into two sub-objectives that focus on improving the management facilities themselves (such as sector headquarters, entrance gates and staff housing), and on improving transportation infrastructure throughout the area, including the internal road network and the maintenance and location of airstrips.

Plan Monitoring

The plan's final section provides a framework for monitoring the potential impacts, both positive and negative, that are anticipated from the implementation of each of the five management programmes' objectives and/or sub-objectives. The framework also includes easily measurable indicators for monitoring positive and negative impacts, and potential sources of this information.

Contents

Approval Page.....	iii
Foreword	iv
Executive Summary.....	vi
Contents	xi
Acronyms	xv
Plan Foundations	1
The Plan.....	2
Plan structure	2
Participation in planning.....	3
The TCA.....	4
Area description.....	4
TCA Purpose Statement.....	5
TCA Exceptional Resource Values	6
TCA Zonation Scheme.....	11
Introduction.....	12
TCA management sectors.....	12
Visitor Use Zones	13
Limits of Acceptable Use	14
Visitor accommodation in and around the TCA	16
Tsavo East: Zone details	18
Voi High Use Zone.....	18
Ithumba Low Use Zone.....	20
Emusaya Wilderness Zone	24
Tsavo West and Chyulu Hills: Zone details	26
Mzima High Use Zone	26
Murka Low Use Zone.....	29
Jipe Low Use Zone	31
Chyulu Low Use Zone	33
Ecological Management Programme	37
Programme Purpose.....	38
Guiding principles	38
Targeting ecological management action.....	40
Management objectives	44
Objective 1: The status of key TCA large mammal species secured and enhanced.....	44
Objective 2: Key habitats and rangeland conditions in the TCA managed and maintained	53
Objective 3: Conservation of key river systems and wetlands in and around the TCA enhanced.....	57
Objective 4: The Tsavo Research Station's role in the conservation and management of the TCA strengthened	59
Three Year Activity Plan.....	65
TCA Ecological Monitoring Framework	76
Tourism Development & Management Programme.....	83
Programme Purpose.....	84

Guiding principles	84
Management objectives.....	87
Objective 1: Visitor experience in the TCA's high use areas improved, and environmental impacts from tourism minimised.....	87
Objective 2: Tourism investment and use in the TCA's low use and wilderness areas expanded and diversified, within environmentally acceptable levels.....	95
Objective 3: TCA tourism management and administration systems strengthened	99
Three Year Activity Plan	103
Community Partnership & Conservation Education Programme.....	113
Programme Purpose.....	114
Guiding principles	114
Management objectives.....	116
Objective 1: TCA-community communication and collaboration mechanisms established and strengthened	116
Objective 2: Human-wildlife conflict incidences reduced	119
Objective 3: Community benefits from the TCA improved	123
Objective 4: Conservation-compatible community initiatives supported.....	125
Objective 5: Understanding and awareness of TCA conservation improved	127
Three Year Activity Plan	131
Security Programme	139
Programme Purpose.....	140
Guiding principles	140
Management objectives.....	141
Objective 1: Natural resource protection operations strengthened, especially in remoter parts of the TCA and the greater landscape.....	142
Objective 2: Effectiveness of natural resource protection operations improved	147
Objective 3: Security of people and property strengthened	149
Three Year Activity Plan	151
Protected Area Operations Programme.....	157
Programme Purpose.....	158
Guiding principles	158
Management objectives.....	160
Objective 1: Institutional collaborations formalised and strengthened	161
Objective 2: TCA staff are effectively and effectively carrying out their duties	164
Objective 3: Infrastructure to support TCA tourism, ranger operations and administration improved	166
Three Year Activity Plan	173
Plan Monitoring.....	179
Plan Annexes	185
Annex 1. Participation in plan development	186
Annex 2. Summary TCA staffing requirements	188
Annex 3: Proposed developments in the TCA Roads, Bridges and Supplemented Water Plan	189
Tsavo East National Park.....	189
Tsavo West National Park.....	192
Chyulu Hills National Park.....	193

Figures

Figure 1: The Tsavo Conservation Area	5
Figure 2: Major ethnic groups around the Tsavo Conservation Area	10
Figure 3: TCA management sectors	12
Figure 4: TCA visitor use zones	13
Figure 5: Comparison of vehicle encounters per hour in the Meru Conservation Area, TCA East and TCA West	16
Figure 6: Voi High Use Zone	19
Figure 7: Ithumba Low Use Zone	22
Figure 8: Emusaya Wilderness Zone	24
Figure 9: Mzima High Use Zone.....	27
Figure 10: Murka Low Use Zone	29
Figure 11: Jipe Low Use Zone	32
Figure 12: Chyulu Low Use Zone.....	34
Figure 13: Ecological Management Programme objectives tree	44
Figure 14: The Ngulia Rhino Sanctuary and extension	47
Figure 15: TCA elephant population trends	50
Figure 16: Elephant distribution in and around the TCA	51
Figure 17: Known elephant migration movements in and around the TCA	52
Figure 18: Location of supplemented water in the TCA.....	56
Figure 19: Tourism Development and Management Programme objectives tree	87
Figure 20: Community Partnership & Conservation Education Programme objectives tree	116
Figure 21: Broad patterns of land use in the greater TCA landscape.....	118
Figure 22: Known HWC hotspots in the greater TCA landscape	120
Figure 23: Existing and proposed electric fences around the TCA.....	121
Figure 24: Security Programme objectives tree	142
Figure 25: Management and security infrastructure in and around the TCA	143
Figure 26: Current de-snaring sectors covered by DSWT/KWS teams in and around the TCA.....	145
Figure 27: Number of snares recovered per year by DSWT/KWS teams in locations in and around the TCA.....	145
Figure 28: PA Operations Programme objectives tree.....	160
Figure 29: Current mining concessions in TWNP	162
Figure 30: Existing TCA entrance gates	169
Figure 31: Voi High Use Zone	189
Figure 32: Ithumba Low Use Zone	191
Figure 33: Emusaya Wilderness Zone	191
Figure 34: Mzima High Use Zone.....	192
Figure 35: Murka Low Use Zone	192
Figure 36: Jipe Low Use Zone	193
Figure 37: Chyulu Hills Low Use Zone	193

Tables

Table 1: TCA Exceptional Resource Values	7
Table 2: TCA Management Sectors and Zones.....	12
Table 3: Overview of TCA zonal activity prescriptions	14
Table 4: TCA Limits of Acceptable Use/ Visitor Experience model	15
Table 5: Overview of TCA zonal accommodation size prescriptions	17
Table 6: Overview of approved new accommodation facilities for TCA zones	17

Table 7: Voi High Use Zone: Visitor activity prescriptions	19
Table 8: Voi High Use Zone: Permitted tourism facility categories.	20
Table 9: Accommodation prescriptions and visitor use estimates for Voi High Use Zone	21
Table 10: Ithumba Low Use Zone: Visitor activity prescriptions.....	22
Table 11: Ithumba Low Use Zone: Accommodation prescriptions	23
Table 12: Accommodation prescriptions and visitor use estimates for Ithumba Low Use Zone	23
Table 13: Emusaya Wilderness Zone: Visitor activity prescriptions	25
Table 14: Emusaya Wilderness Zone: Accommodation prescriptions	25
Table 15: Accommodation prescriptions and visitor use estimates for Emusaya Wilderness Zone	26
Table 16: Mzima High Use Zone: Visitor activity prescriptions	27
Table 17: Mzima High Use Zone: Permitted tourism facility categories.	28
Table 18: Accommodation prescriptions and visitor use estimates for Mzima High Use Zone	28
Table 19: Murka Low Use Zone: Visitor activity prescriptions.....	30
Table 20: Murka Low Use Zone: Accommodation prescriptions	30
Table 21: Accommodation prescriptions and visitor use estimates for Murka Low Use Zone	31
Table 22: Jipe Low Use Zone: Visitor activity prescriptions	32
Table 23: Jipe Low Use Zone: Accommodation prescriptions	32
Table 24: Accommodation prescriptions and visitor use estimates for Jipe Low Use Zone	33
Table 25: Chyulu Low Use Zone: Visitor activity prescriptions.....	34
Table 26: Chyulu Low Use Zone: Accommodation prescriptions.....	34
Table 27: Accommodation prescriptions and visitor use estimates for Chyulu Low Use Zone	35
Table 28: TCA Conservation targets	40
Table 29: Threats to TCA conservation targets.....	43
Table 30: TCA Ecological Monitoring Plan Framework.....	76
Table 31: Existing HWC outposts and strengthening needs	122
Table 32: Improvements or upgrades needed at sector HQs and selected operational bases.....	168
Table 33: Proposed improvements to the TCA gate system.....	169
Table 34: Ecological Management Programme Monitoring Framework	180
Table 35: Tourism Development and Management Programme Monitoring Framework	181
Table 36: Community Partnership and Conservation Education Programme Monitoring Framework	182
Table 37: Security Programme Monitoring Framework.....	183
Table 38: Protected Area Operations Programme Monitoring Framework	184

Acronyms

BoT	KWS Board of Trustees
CAP	TNC's Conservation Action Planning methodology
CHNP	Chyulu Hills National Park
CPT	Core planning team
CWS	Community Wildlife Service (KWS)
DSWT	David Sheldrick Wildlife Trust
ERV	Exceptional resource value
GPS	Global Positioning System
GSU	General Service Unit
HWC	Human-wildlife conflict
KEA	Key ecological attribute (of conservation target)
KFS	Kenya Forest Service
KWS	Kenya Wildlife Service
IPZ	Intensive (rhino) protection zone
IUCN	International Union for Conservation of Nature
LAU	Limits of acceptable use
MCA	Meru Conservation Area
NEMA	National Environment Management Authority
PA	Protected area
PAC	Problem animal control
PAPF	KWS Protected Areas Planning Framework
PTC	Permanent Tented Camp
SC	Special campsite
TCA	Tsavo Conservation Area
TE, TENP	Tsavo East National Park
TNC	The Nature Conservancy
TW, TWNP	Tsavo West National Park
WWF	World Wide Fund for Nature

Plan Foundations

The Plan

This 10-year (2008-2018) management plan for the Tsavo Conservation Area (TCA) is the second management plan piloting the new KWS Protected Area Planning Framework, or PAPF (the recently completed Meru Conservation Area Management Plan was the other). The PAPF aims to ensure that all new KWS protected area management plans are developed according to a standardised process and have a similar structure. In line with the PAPF, the TCA plan has been developed in a highly participatory manner, incorporating and building on ideas from a broad cross-section of TCA stakeholders.

The TCA plan is designed to be a practical management tool supporting TCA management in carrying out their duties. In order to achieve this, the plan sets out strategic guidance on the **goals** (the purpose statements and subsidiary objectives) towards which management is working, and a series of **prescriptions and management actions** that need to be implemented in order to achieve these aims.

Wherever possible, the plan builds on previous planning initiatives that have been developed for areas within the TCA; most notably, the previous management plans for Tsavo East and Tsavo West, which spanned the period from 1993-1997, prepared by the then Planning and Research Department. More recently, the Tsavo East and West Charters were developed in 2005, which briefly outlined the goals, vision and objectives for the two areas, but were primarily focused on providing detailed job descriptions and roles and responsibilities of senior staff.

It is hoped that, supported by the application of the new KWS PAPF, and building on the experience of the previous planning initiatives, this document will be both easier to implement, respond to the key issues impacting on the area, and provide the guidance and support that TCA managers require.

Plan structure

In accordance with the PAPF, the TCA plan structure has been developed to be as simple as possible, and as such, easily understood by stakeholders and implemented. The following points summarise the plan's main sections:

- ▶ **Plan Foundations.** This chapter introduces the plan, and describes the plan's structure and stakeholder participation mechanisms. The chapter also provides an introduction to the TCA, its location, constituent protected areas, and exceptional resource values. It also sets out the TCA's overall Purpose Statement.
- ▶ **Zonation Scheme.** This section sets out areas of the TCA where different types of visitor use and tourism developments are permitted. The scheme contains detailed prescriptions on the size and number of tourism developments allowed in different parts of the TCA, and specific prescriptions on the types of visitor activity allowed in each zone. The scheme also describes the management sectors that the TCA is divided into, in order to facilitate the efficient and effective management of the area.
- ▶ **The five management programmes.** The main bulk of the plan is divided into five management programmes:

- **Ecological Management Programme**
- **Tourism Development and Management Programme**
- **Community Partnership and Conservation Education Programme**
- **Security Programme**
- **Protected Area Operations Programme**

Each programme includes a programme purpose statement, which sets out the overall goal to which management under this programme is working towards, and a set of guiding principles describing the overall management approach pursued through the programme. Each programme also contains management objectives that set out the goals that TCA management aims to achieve over the 10-year lifespan of the plan, and a set of specific management actions to achieve these goals. In order to facilitate plan implementation, wherever possible the management programmes, or in some cases specific objectives therein, have been designed to align with MCA management section(s), and/or KWS HQ departments.

Each of the management programmes are completed by the **3-year Activity Plans**. These plans break down the individual management actions to be completed in the first three years of the plan implementation period into a series of tangible management activities, and sets out the timeframe for their implementation, allocates responsibility for their completion, and the “milestones” that management aims to achieve. These activity plans are designed to provide the basis for annual operational planning by TCA managers and are a vital link between the management plan’s 10-year outlook, and day-to-day management activities in the TCA.

- ▶ The **plan monitoring** framework provides guidance to enable the assessment of the potential impacts, positive, and where appropriate negative, resulting from the implementation of each of the five management programmes. The framework sets out the desired impact of each programme’s objectives and/or sub-objectives, and any potential negative impacts that may occur. The framework also includes easily measurable and quantifiable indicators for assessing these impacts, and potential sources of the information required.

Participation in planning

To ensure the management plans produced are both realistic and appropriate, and to build wider stakeholder understanding and support for implementation, the PAPF planning process has been designed to ensure a high degree of stakeholder participation in the development of a PA management plan. This is achieved through a multi-layered approach involving a variety of mechanisms designed to ensure that all stakeholders can meaningfully contribute to the plan’s development. The three principal mechanisms used to enable this participation are: the Core Planning Team, Stakeholder Workshops, and Expert Working Groups. The roles and functions of these mechanisms are elaborated in the following paragraphs:

- ▶ The **TCA Core Planning Team** (CPT) provided overall guidance and oversight to the entire planning process and consisted of: TCA managers and researchers; KWS HQ staff; and planning facilitators. CPT members ensured that the plan’s development progressed smoothly, which included: ensuring funding was available for planning events; collecting and collating information necessary for planning; organising and facilitated planning events; and writing up planning event outputs into the final management plan. CPT members also participated in all other planning mechanisms described below.
- ▶ Two **TCA Stakeholder Workshops** were held during the plan’s development: one near the beginning and one nearer the end of the planning process. These workshops involved around 30-40 stakeholders including representatives from TCA management,

KWS HQ, the local councils, local communities, tour operators and investors, and researchers and scientists. The initial workshop identified the exceptional resources and purpose of the TCA. Stakeholders then went on to identify the key problems and issues the plan must address. The second workshop provided the opportunity for stakeholders to review, comment on, and endorse the final contents of the draft management plan.

- ▶ Four **Expert Working Groups** were formed during the plan's development, each responsible for developing one of the plan's five management programmes (the Security and PA Operations Programme was covered by one working group). Each of these working groups comprised of CPT members, and other key stakeholders and experts. Each working group refined the relevant management programme's purpose, strategy and objectives, and developed the subsidiary management actions necessary for achieving each objective.

In addition, the plan underwent substantial revision to bring it into line with the revised PAPF Manual (September 2007). This involved a number of additional internal KWS meetings, including a reconstituted Tourism Working Group and Ecological Management Working Group, and additional CPT meetings held in the TCA to realign the Community, Security, and PA Operations management programmes with the framework. Annex 1 provides a detailed list of stakeholders who participated in the TCA plan's development, and the specific events that they contributed to.

The TCA

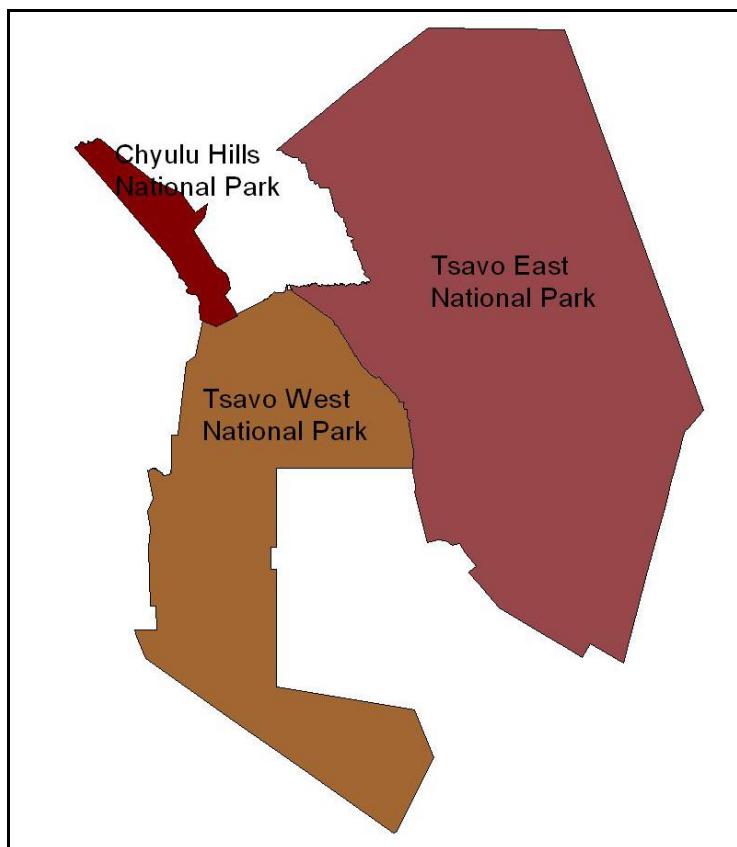
Area description

Covering over 21,000 km², the Tsavo Conservation Area is the largest protected area complex in Kenya, and covers over 4% of the entire country's land mass. The TCA consists of three national parks: **Tsavo East**, **Tsavo West** and **Chyulu Hills**. Tsavo National Park was originally established in 1948 as a single entity (legal notice number 17 of 6/4/48 and 23 of 29/9/53), but in 1949 it was separated into Tsavo West and Tsavo East for administrative purposes. The three national parks are administered from three main headquarter stations: Voi (for Tsavo East); Kamboyo (for Tsavo West); and Kithasyu (for Chyulu Hills).

Tsavo East National Park

At nearly 14,000 km², Tsavo East National Park is the largest protected area in Kenya, and is located over four districts: Kitui, Taita Taveta, Tana River, and a small portion in Makueni. The park is currently the most visited KWS protected area, attracting about 180,000 visitors per annum in recent years (the majority of whom visit as part of a package holiday and are based at the coast), and is KWS' leading revenue earner. Most visitors are attracted to the area by the high concentrations of relatively easily visible wildlife along the main rivers and water sources, and particularly the possibility of seeing all of the "Big Five" large mammal species. However, the area still retains vast tracts of wilderness that are virtually unused by visitors, especially in the northern parts of the park.

Figure 1: The Tsavo Conservation Area



Tsavo West National Park

Tsavo West National Park covers an area around 7,000 km². The park is located within Taita-Taveta district, and borders both Makueni and Kajiado districts. Although since the late 1980's the park has been less popular with visitors than its larger neighbour Tsavo East, the park has still received over 100,000 visitors per annum over recent years, many of whom are attracted by the area's high diversity of mammals (over 60 species have been recorded in the park, including all of the "Big Five"), and 400 plus species of birds that have been recorded in the area.

Chyulu Hills National Park

Located in Makueni District and covering just over 700 km², the Chyulu Hills National Park (officially an extension of Tsavo West National Park) was opened in 1983, primarily to provide protection to the area's unique habitats, and its vital role as a water catchment area. Although less suited to traditional game viewing and less visited than the other two parks in the TCA, the Chyulu Hills still have a high diversity of wildlife, including leopard, lion, buffalo, and occasionally black rhino, and the park has the potential for a variety of other activities such as walking or horseback safaris.

TCA Purpose Statement

The TCA purpose statement summaries the importance of the TCA, clarifies the reasons for its existence, and provides the overall goal that TCA managers are working towards. The Purpose Statement is divided into a primary TCA Purpose followed by a series of supplementary purposes that expand on and complement the primary purpose.

To preserve the integrity of the protected areas making up the Tsavo Conservation Area while promoting appropriate and sustainable development in the greater TCA landscape

Supplementary purposes of the TCA are:

- ▶ ***To maintain Kenya's largest intact, viable and functioning ecosystem for the future***
- ▶ ***To protect the large mammal populations which include Kenya's most important elephant population and several critically endangered species***
- ▶ ***To ensure that the water catchments that are vital for southern Kenya are not degraded***
- ▶ ***To build relationships with communities adjacent to the Conservation Area to ensure that the advantages from environmental protection benefit all groups***
- ▶ ***To contribute to the economic development of the area by encouraging appropriate and sustainable tourism***

The development of the above Purpose Statement was based on the stakeholder identification of the TCA's "Exceptional Resource Values" (ERVs). These ERVs are discussed and elaborated in the following section.

TCA Exceptional Resource Values

The TCA ERVs describe the area's key natural resources and other features that provide outstanding benefits to local, national and international stakeholders and that are especially important for maintaining the area's unique qualities, characteristics and ecology. The following sections describe the TCA ERVs, their importance to the area. These sections have been set out according to the four categories of ERV identified: Biodiversity, Scenic, Social and Cultural (see Table 1 overpage).

Biodiversity values

Kenya's largest protected area complex

Covering over 21,000 km², the TCA is the largest protected area complex in Kenya, and covers over four percent of the entire country's land mass. In addition, the TCA is bordered by the South Kitui National Reserve, covering nearly 2,000 km², and the Mkomazi Game Reserve in Tanzania at around 3,300 km², bringing the total continuous PA complex to around 26,000 km². This large area is particularly important for some migratory species within the TCA, such as elephants, which have been shown to migrate from the TCA into the Mkomazi Game Reserve, and for ensuring that the edge effects from increasing human populations are minimised.

High number of endangered species

Partly by virtue of its large size, the TCA contains a high number of endangered species. Most notable of these are the large mammals, which include elephants and black rhinos, both of which have been translocated to the area over recent years in efforts to either reduce high densities in other areas in the case of elephants, or supplement the indigenous population in the case of black rhinos. In addition, the critically endangered hirola (*Beatragus hunteri*) and endangered Grevy's zebra (*Equus grevyi*) have also been introduced into the TCA as protection was limited in their natural habitats.

Table 1: TCA Exceptional Resource Values

Category	Exceptional Resource Value
Biodiversity	► Kenya's largest protected area complex
	► High number of endangered species
	► Kenya's largest elephant population
	► Diverse habitats and inselbergs
	► Ecological transition area
Scenic	► Diverse landscapes and scenery
	► Wilderness characteristics
	► Volcanic features
Social	► Water catchments
	► National and local economic benefits
	► Scientific research
Cultural	► Ethnic and cultural diversity
	► Cultural and sacred sites of local importance
	► Rich and well-documented history

Kenya's largest elephant population

Elephants have historically been a major driving force in the ecology of the TCA, especially in Tsavo East, where they have been largely responsible for drastic changes in the vegetation in the area between Voi and Aruba, which has been converted from impenetrable *Commiphora* woodland to more open grassland habitat over the last 50 or so years. In 2005, more than 10,000 elephants were counted in and around the TCA, which makes it by far the single largest population in Kenya, and there are indications that it is expanding at a rate of 4-5% per annum.

Diverse habitats and inselbergs

The TCA has a remarkable diversity of habitats including lowland dry savannah, which covers the vast majority of the area, riverine habitats, montane vegetation, and habitat types derived from the recent volcanic activity in parts of the area. The TCA's vegetation is strongly related to soils and climate, approximately 90% of which belongs to plant communities dominated by *Commiphora* and *Acacia* species. In addition, the area also contains a number of isolated inselbergs, which vary in size from a few square kilometres to over 500 km² (e.g. the Taita Hills just beyond the TWNP boundary).

Ecological transition area

The TCA contains species from two terrestrial ecoregions (as defined by WWF). Most of the area falls into the “Northern Acacia-*Commiphora* Bushlands and Thickets Ecoregion” but a number of species from the drier “Somali Acacia-*Commiphora* Bushlands and Thickets are also found in the area. In addition, the Taita Hills also form part of the Eastern Arc Mountains, which are regarded as a conservation hotspot mainly as a result of their high plant diversity and endemism.

Scenic values

Diverse landscapes and scenery

The conservation area is exceptionally scenic, and contains a wide diversity of landscapes. The vast majority of Tsavo East is dominated by a extensive plain of archetypal bushland, bisected by a number of large rivers and associated riverine forest. A few groups of hills stand out from this plain, notably Taita, Kasigau, Sagalla and Ngulia, which provide an impressive backdrop to game viewing in the area, and enable visitors to appreciate the vastness of the TCA. Although Tsavo West is also dominated by similar bushland to Tsavo East, Lake Jipe in the south provides a contrast to the dry bushland, and the neighbouring Chyulu Hills, which contain a variety of volcanic landforms and a unique mix of montane forest and grasslands.

Wilderness characteristics

Although the TCA is one of the most visited protected areas in Kenya, the vast majority of visitors remain in the easily accessible southern part of Tsavo East and northern parts of Tsavo West. As such, much of the area retains its wilderness characteristics, and pristine environmental qualities that are becoming increasingly rare in Kenya’s network of protected areas.

Volcanic features

The TCA contains a number of volcanic features, some dating back only a few hundred years. Perhaps the largest of these is the nearly 300km-long Yatta Plateau, which begins near Thika and runs to opposite Sobo, where it turns northwards and breaks up into a cluster of lava cones and craters. Most experts believe that the plateau represents the remnants of a lava flow down a river valley. In addition, almost 400 volcanic vents have been recognised in the Chyulu Hills, and lava composition suggests that the last flows could have been less than 150 years ago.

Social values

Water catchments

The Tsavo Conservation Area is a vitally important catchment area for much of southern Kenya. Most of the Tsavo River (now the only perennial river in the area) is within the TCA, as is the Mzima Springs, which supplies several large towns with water, including Mombasa. A substantial proportion of the Athi/Galana, the largest river in Kenya, also flows through Tsavo East and forms a large part of the area’s boundary.

National and local economic benefits

Tsavo East is now KWS' most visited area, and the second most popular wildlife destination in the country (after the Masai Mara National Reserve). The entire TCA generates substantial revenues that not only support the management of the area itself, but also subsidise the management of equally important but less visited protected areas in Kenya. In 2005, around 180,000 people visited Tsavo East, and over 80,000 visited Tsavo West. This thriving industry also provides employment for a huge number of drivers, guides, tour operators, and hotel staff, many of which come from local communities living around the TCA.

Scientific research

The Tsavo Research Station was initiated in 1966 as the Tsavo Research Project, the primary focus of which was an investigation into the increasing numbers of elephants in the park and the impacts of this increase on the area's ecology. Under its umbrella, a number of smaller research projects, all aimed at adding to the primary focus of the investigation, were also initiated. The Station is still running today, and research is carried out both by KWS personnel and, by external researchers, often in collaboration with KWS. This includes long-term studies on: lion distribution and population dynamics; elephant behavioural ecology; and ongoing monitoring of rhino, both in the sanctuary in Tsavo West and in Tsavo East.

Cultural values

Ethnic and cultural diversity

As shown in Figure 2 overpage, the TCA is the meeting point of a number of diverse cultures. These include: the Masai, who are largely pastoralist and live in the areas west and south west of Tsavo West, the Kamba who inhabit the Ukambani Hills to the north east of Tsavo East and who practise both small-scale settled agriculture and livestock keeping; the Taita, who inhabit the enclave between Tsavo East and West; and the Taveta, who are now restricted to a small area north of Lake Jipe east of Tsavo West, and who mainly practice subsistence agriculture and pastoralism.

Cultural and sacred sites of local importance

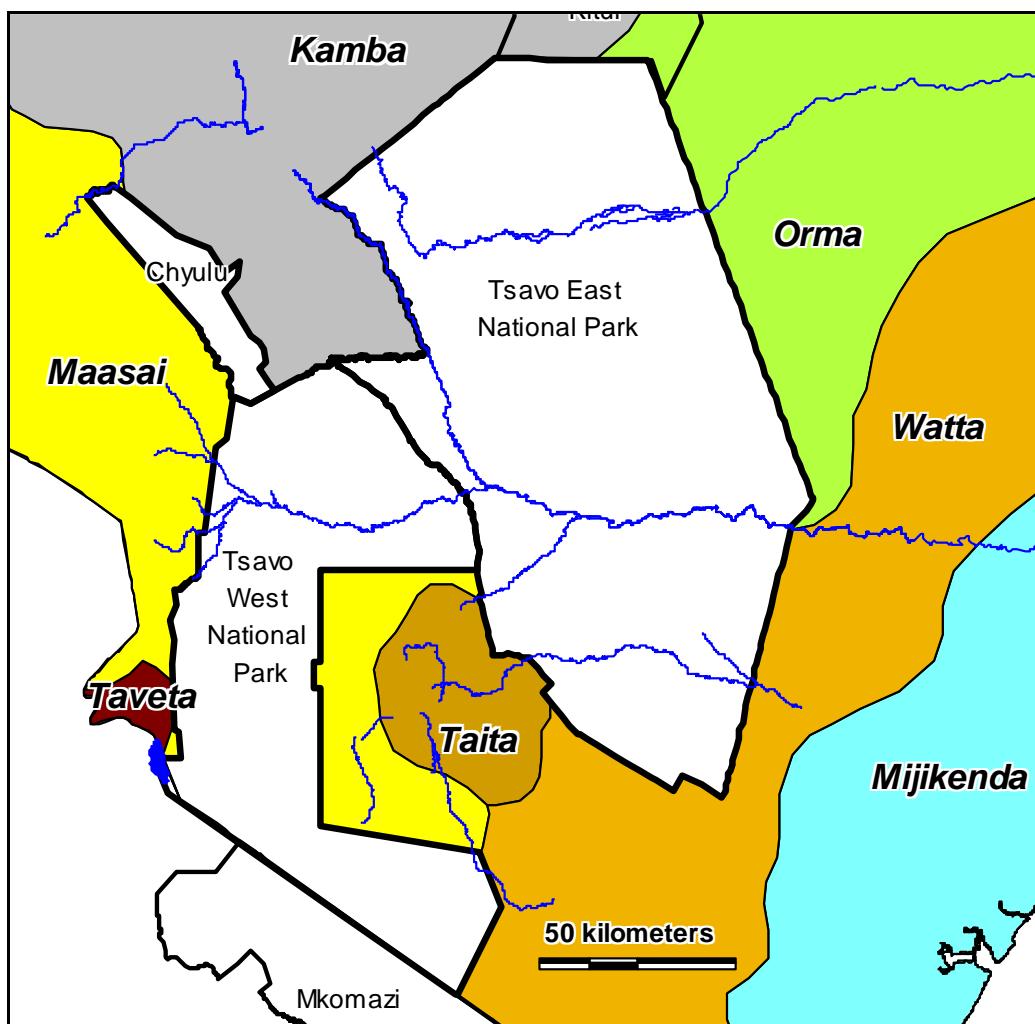
Many of the tribes above have lived in and around the TCA for centuries, and as a result a number of sites of sacred or cultural importance have developed in the area. Although many of these are not well documented, known sites include: Irima in Tsavo East, which the Taita use for rain-making medicines; the Thabangunji in Tsavo East, and Umani in Chyulu Hills, which is the site of a sacred spring for the Kamba. A number of archaeological sites also exist in the Sala and Rombo areas, and along the Tsavo River.

Rich and well-documented history

The TCA has a rich and well-documented history dating back several centuries, and the area includes a number of sites of historic importance. These include caravan routes and slaving trails, along which many of the early European explorers subsequently passed. The most used of these followed the route of the railway through Maungu, Sagalla, Tsavo and Mtito Andei. Other explorers used the Sabaki-Galana as an access route, the earliest detailed description of this being by Lugard (after whom Lugard's Falls is named). The railway itself gained notoriety when two lions stopped work for several months by killing and eating a number of workers. This notoriety has persisted through to the present and most advertising for the parks makes much of the man-eaters of Tsavo. The TCA also was the scene of con-

siderable antagonism during the early part of the First World War, and Tsavo West in particular contains a number of important battle sites.

Figure 2: Major ethnic groups around the Tsavo Conservation Area



TCA Zonation Scheme

Introduction

The TCA zonation scheme provides a framework both for supporting the decentralisation of the area's management and for enabling the regulation and promotion of the desired levels and type of visitor use in different parts of the TCA. In order to achieve this, the TCA has been divided into six management sectors and seven visitor use zones. The six management sectors and their corresponding visitor use zones are set out in Table 2 below.

Table 2: TCA Management Sectors and Zones

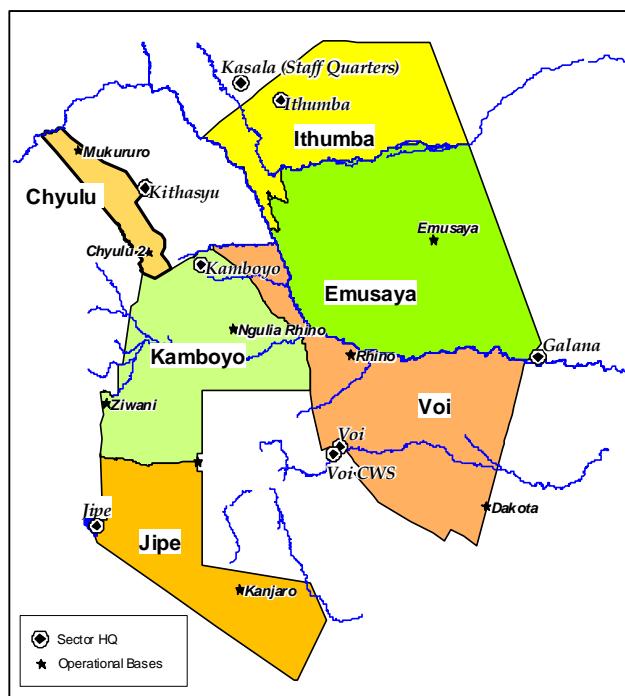
Management Sector	Headquarters	Visitor Use
TCA	Voi	--
Tsavo East: Voi	Voi	High
Emusaya	Galana	Wilderness; Low (strip north of road on south bank of Tiva River)
Ithumba	Ithumba	Low
Tsavo West: Kamboyo	Kamboyo	High: north of Tsavo River (Mzima) Low: south of Tsavo River (Murka)
Jipe	Jipe	Low
Chyulu Hills: Chyulu	Kithasyu	Low

The following section provides further details on the location of the six management sectors. Following on from this, details of each of the visitor use zones are set out in turn, including: an overview of the rationale behind their development, and details of the visitor activity and accommodation facilities prescriptions for each zone.

TCA management sectors

In accordance with the KWS Sectoral Management Strategy for conservation areas, the TCA has been divided into a number of management sectors with the aim of increasing management presence and infrastructure development throughout the area. TENP and TWNP are both managed by a Senior Warden, from the Voi and Kamboyo HQs respectively, under the overall supervision of the Assistant Director, Tsavo Conservation Area. Chyulu Hills NP falls under the jurisdiction of the Senior Warden, TW. The location of the TCA's six management sectors, HQs and operational bases are shown in Figure 3 opposite. Table 2 above provides a summary of the HQs for each sector, and the related visitor use zones.

Figure 3: TCA management sectors



Visitor Use Zones

The visitor zonation scheme has been developed to enable the degree and type of visitor use to be managed spatially across the TCA. The scheme (in conjunction with the Tourism Development and Management Programme) primarily aims to support a well managed, high-quality, relatively high-density vehicle-based traditional game viewing experience with minimal environmental impacts in the high use zones, while encouraging and making provisions for increased intensity and variety of visitor use in both the low and wilderness zones. As such, it is anticipated that the scheme will contribute to the TCA's conservation by not only securing a sustained revenue base to support the area's management (as a result of sustained levels of visitation in the two high use zones), but also, by demonstrating active use of areas of the TCA that are currently not significantly utilised for tourism but which are impacted by a number of illegal activities, help improve resource conservation across the area.

In order to achieve these aims, the TCA has been divided into seven visitor use zones, each of which have been designated as a High Use Zone, a Low Use Zone or a Wilderness Zone (see Figure 4 opposite). Wherever possible, the visitor use zones have been aligned with the TCA management sectors (discussed above). The only exceptions to this are: the division of the Kamboyo management sector into two visitor zones – Mzima High Use and Murka Low Use; and the adjustment in the boundary between the Emusaya Wilderness Zone and the Ithumba Low Use Zone, which follows the road south of the Tiva River, whereas the management sector boundary follows the river itself.

As the diagram opposite shows, South Kitui National Reserve is likely to become a low use zone once the MoU between KWS and the County Council of Mutomo is signed (see Action of the PA Operations Programme). However, although the zone is illustrated here to provide an overview of the desired visitor use patterns throughout the TCA, this zone is not described further in this scheme.

Figure 4: TCA visitor use zones

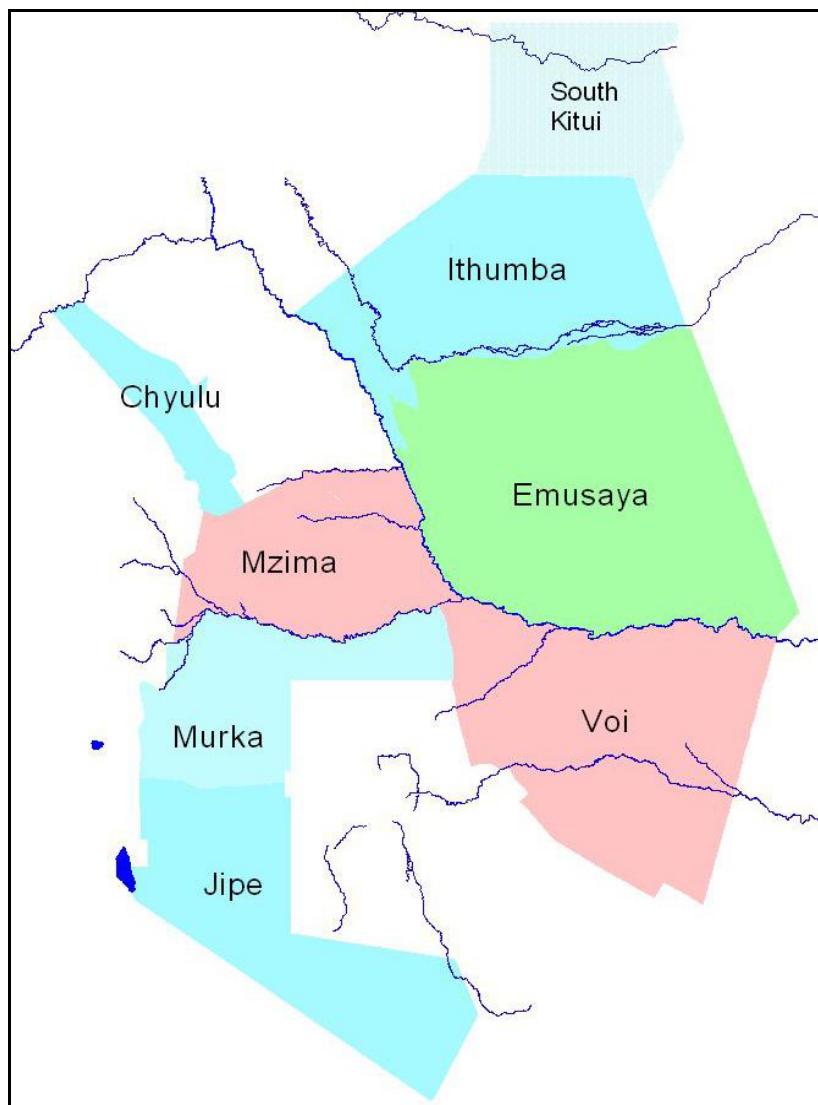


Table 3 below provide an overview of the TCA activity prescriptions for each zone category respectively.

Table 3: Overview of TCA zonal activity prescriptions

High Use	Low Use	Wilderness
<ul style="list-style-type: none"> ▶ Game drives ▶ Night game drives ▶ Short walks ▶ Sport fishing (Voi Zone) ▶ Balloon safaris (Voi Zone) 	<ul style="list-style-type: none"> ▶ Game drives ▶ Night game drives ▶ Short walks ▶ Walking safaris ▶ Boating/rafting (Lake Jipe and Tiva River) ▶ Horseback and bicycle safaris (Chyulu) ▶ Camel safaris (Ithumba) 	<ul style="list-style-type: none"> ▶ Game drives ▶ Night game drives ▶ Short walks ▶ Walking safaris ▶ Camel, horseback and bicycle safaris

Limits of Acceptable Use

The KWS Protected Areas Planning Framework uses a simple modelling approach based on vehicle encounter rates to estimate the quality of the visitor experience in any particular zone in the protected area concerned. This then leads to the development of Limits of Acceptable Use (LAU) on the number of visitors per day that is desirable in each zone, which in turn can be used to establish prescriptions on the number of visitor beds that is permitted in the zone for the 10-year duration of the management plan.

The underlying premise is that the quality of the visitor experience in any zone in the protected area is highly dependent on the number of other vehicles that a visitor will encounter during a game drive. The more encounters with other vehicles that a visitor has, the less the sense of solitude and “wildness”, which is one of the most important values sought by most visitors. The emphasis on encounters as a fundamental determinant of visitor experience is not only the case for visitors to Kenya national parks, but has been found equally important in many other protected area systems around the world.

The encounter rate can be estimated with an understanding of how many visitors are using a particular zone in any one day, how many kilometres of tourism road are available in the zone, and the average speed of a game viewing vehicle. The encounter rate will of course be influenced if particular parts of the zone are heavily favoured over others, or if vehicles congregate at particular attractions, such as carnivore sightings. However, such factors can where necessary be managed during the implementation of the management plan to improve the visitor experience. For example, rules on vehicle congestion at carnivore sightings can be introduced and enforced by visitor management patrols, and new attractions can be developed in little-used parts of a zone to encourage more even dispersal of visitors. Measures can also be introduced to slow vehicles down while game viewing, such as chicanes and speed bumps, thereby reducing encounter rates and enhancing the visitor experience.

Despite the apparent weaknesses of the encounter rate model, overall, the model provides a useful means of first, understanding visitor use patterns in the various zones of the concerned protected area, and then managing visitor use in each zone to achieve a desired type of visitor experience. The PAPF LAU model based on encounter rates has therefore been used for the TCA management plan, and for the determination of prescriptions on bed numbers for each zone as described in the following sections.

Table 4 below shows the Limits of Acceptable Use model for the seven TCA zones. The number of visitors in the zone per day is based on the accommodation available in the zone as detailed in the accommodation prescriptions for each zone (see Table 6 overpage for a summary of new facilities approved for development in each zone). Visitor use is based on available accommodation adjusted for estimated high season occupancy rates. Also included in the model are estimates of visitor usage of the zone from accommodation facilities based outside the zone – either outside the TCA, or in another neighbouring zone within the TCA. The different categories of TCA accommodation are discussed in the following section, and information on these external facilities and between-zone movements is also included in the detailed accommodation prescriptions for each zone set out in the following sections.

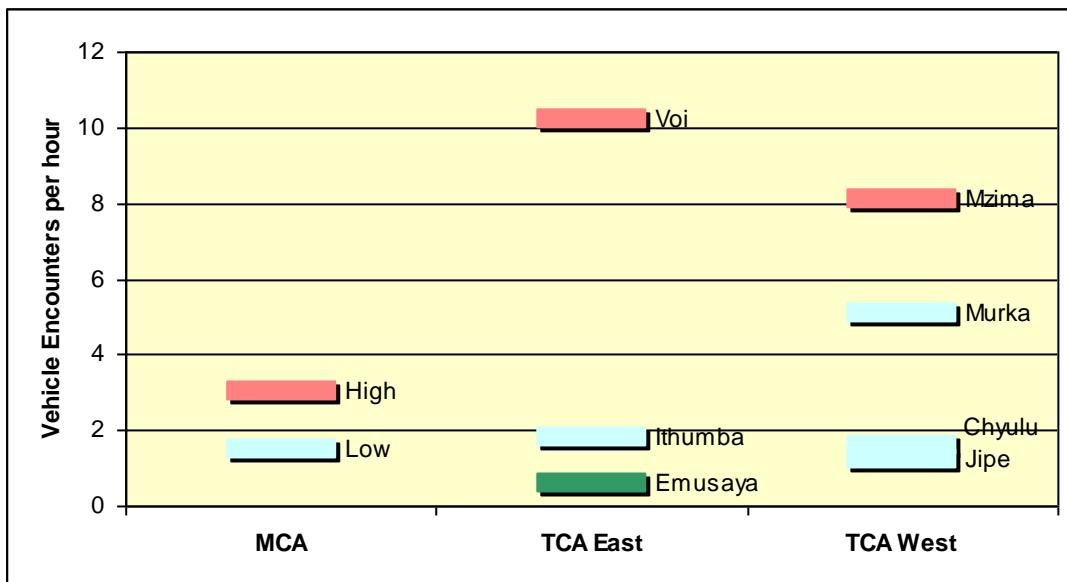
Table 4: TCA Limits of Acceptable Use/ Visitor Experience model

Parameter	HIGH USE		LOW USE				WILDERNESS	
	Voi	Mzima	Murka	Jipe	Chyulu	Ithumba		
VARIABLES	Number of visitors in zone per day	1177	523	234	65	50	71	25
	Available tourism road in zone (km)	700	400	365	480	160	350	400
	Average vehicle speed (km per hour)	30	30	30	30	20	30	30
	Average no of pax per vehicle	5	5	4	4	4	4	4
VISITOR EXPERIENCE ESTIMATES	Number of vehicles in zone per day	235	105	58	16	12	18	6
	Number of vehicles per km	0.34	0.27	0.17	0.04	0.08	0.06	0.02
	Number of vehicle encounters per hour	10.2	8.1	5.1	1.2	1.6	1.8	0.6

The model uses information on the available tourism roads in each zone provided by the TCA management. Average speed of tourist vehicles and number of visitors per vehicle are best guesses, except for the average number of passengers per vehicle for the Voi and Mzima High Use zones, which are based on available data.

Figure 5 overpage compares the vehicle encounter rates derived from the LAU models for the Meru Conservation Area (see MCA Management Plan) and the encounter rates derived in the LAU model for the TCA, East and West. The figure illustrates that the encounter rates for the low use zones are similar for the MCA and for TCA East and West, with the exception of the Murka Zone which has a significantly higher encounter rate. This reflects the plan for tourism development in this zone over the duration of this management plan, which will move the visitor usage of the zone towards a more high use pattern. Visitor usage in the two TCA high use zones – Voi and Mzima – is expected to be significantly greater than that for the MCA High Use Zone, especially for Voi Zone which is estimated to have an average vehicle encounter rate of 10 vehicles per hour during the high season. This high encounter rate places emphasis on the need for careful management of visitor use with additional tourism roads, tourism sinks, and enforcement of regulations discouraging congestion over the lifespan of this plan, as detailed in the Tourism Development & Management Programme.

Figure 5: Comparison of vehicle encounters per hour in the Meru Conservation Area, TCA East and TCA West



Visitor accommodation in and around the TCA

As described in the previous section on Limits of Acceptable Use, the amount of visitor accommodation available in and around the TCA is a fundamental factor in determining the visitor experience in the different TCA zones. An important function of this zonation scheme is to identify the tourism sites that are available in each TCA zone, and to lay down **prescriptions for these facilities over the 10-year lifespan of the management plan**. The zonation scheme recognises three main categories of accommodation facility/sites, as follows:

- ▶ Established accommodation sites/facilities inside the TCA
- ▶ Established accommodation sites/facilities outside the TCA
- ▶ Planned sites inside the TCA

These categories of accommodation are described further below.

Established sites inside the TCA

Established accommodation sites inside the TCA are those sites where there is already a developed accommodation facility or, in the case of special and public campsites, where there is already a developed site in regular use. Except for public and special campsites and KWS-managed bandas, all established sites in the TCA are leased to private sector operators, the arrangements for which are set out in the **KWS Tourism Facilities Development Procedures**. These guidelines set out the requirements for the establishment of new sites, the terms of lease agreements, and the guidelines for ongoing operation of the sites in accordance with KWS and national environmental impact requirements.

This zonation scheme identifies all established accommodation sites in the TCA zones, providing the site names as well as, where appropriate, the current operator at the site. The

ZONATION SCHEME

management planning process has not included a review of the lease arrangements between KWS and the concerned operator, and this is the subject of a management action under the Tourism Development & Management Programme. Therefore, the identification of a particular operator in connection with an accommodation site in this zonation scheme **does not imply that the lease arrangements between KWS and the operator are normalised, or that the operator has tenure at the site in question.** This aspect is subject to a separate process currently underway.

As part of the lease agreements with individual operators of established sites, the maximum number of beds permitted at the site is specified, and this is used as a basis for the determination of the concession fees in relation to the site. The permitted size of all established sites in the TCA is set out in the detailed site definition tables under the individual zonal descriptions given below. **No expansion over and above these defined bed numbers is permitted by this management plan.**

Planned sites inside the TCA

In addition to the established sites, a number of new tourism accommodation sites are approved for development in this plan in line with the Limits of Acceptable Use model detailed above. However, **no new developments are permitted in the Mzima and Voi High Use Zones**, because these zones are already regarded as over-subscribed, as discussed above. Table 5 below provides an overview of the TCA zonal accommodation size prescriptions for all new developments.

Table 5: Overview of TCA zonal accommodation size prescriptions

Accommodation type	High Use	Low Use	Wilderness
Lodge	60 beds	--	--
Ecolodge	60 beds	30 beds	30 beds
Permanent tented camp	60 beds	30 beds	30 beds
Starbeds ¹	--	10 beds	10 beds
Special campsites	12 beds	12 beds	12 beds
KWS self-help bandas	16 beds	12 beds	--
Public campsite	60 beds	30 beds	--

Table 6 below provides an overview of the prescribed new accommodation facilities for all TCA zones. For the TCA low use and wilderness zones, there may in due course be scope for additional development of accommodation facilities over and above those set out in the table, depending on an assessment of the impact of this initial phase of development. The desirability of approving additional accommodation in these zones will be assessed after the first three years of operation of this plan (see Action 2.8 of the Tourism Development & Management Programme).

Table 6: Overview of approved new accommodation facilities for TCA zones

Facility type	Voi and Mzima	Murka	Jipe	Chyulu	Ithumba	Emusaya
Ecolodge/PTC (30 beds)	NO NEW FACILITIES	3	2	3	2	1
Starbed (10 beds)		0	0	0	1	1
Special campsite (12 beds)		1	2	1	0	2
Total new beds	0	102	84	102	70	64

¹ Linked to a lodge, ecolodge or permanent tented camp.

Accommodation facilities outside the TCA

The TCA is in a unusual position compared with many other KWS protected areas in that large amounts of tourism accommodation are located outside the boundaries of the protected area, especially neighbouring Voi and Mzima High Use Zones. It seems likely that the quantity of such external accommodation will increase in coming years. On the one hand, this is a positive feature as it ensures that local communities and landowners receive direct benefits from the presence of these facilities. However, external facilities also present significant challenges for KWS and the TCA management. Most importantly, because these facilities are not on KWS land, **it is not possible to regulate their size** as can be done for the internal facilities, with consequent complications for managing the visitor experience as detailed in the Limits of Acceptable Use section above. The implication is that TCA management and KWS must if necessary use other mechanisms to influence the impact of these facilities on the TCA and its visitor experience, for example through pricing of the TCA tourism product, or through collaboration with local authorities and landowners to influence the responsible development of such facilities.

As noted above, this plan cannot prescribe bed numbers in accommodation facilities outside the TCA, and bed numbers set out in the detailed site definition tables under the individual zonal descriptions below are therefore only intended for calculating estimates of visitor numbers using the zone.

Tsavo East: Zone details

Tsavo East has been divided into three visitor use zones: Voi High Use Zone; the Ithumba Low Use Zone; and Emusaya Wilderness Zone. Each of these zones is described in more details in the following sections.

Voi High Use Zone

The Voi High Use Zone covers around 22% of the TCA, and, due to the area's high densities of wildlife, suitable habitat for game viewing and close proximity to the coast, is the TCA's most visited zone. The zone absorbs the majority of visitors to the area from the coastal centres of Mombasa (through Buchuma Gate) and Malindi (through Sala Gate). The vast majority of use in the zone is currently focused along the two rivers in the zone, and in particular the Voi River. The zone also contains most of Tsavo East's current tourism accommodation, the TCA HQ at Voi, and a number of ranger outposts. In addition to the visitor accommodation facilities within the zone, large numbers of facilities are located outside the zone, and in particular around Voi and Sala Gates. As shown in Figure 6 overpage, the northern border of the zone is defined by the Galana and then the Athi Rivers, with the zone's remaining boundaries defined by the TENP boundary.

Visitor activity prescriptions

As this zone has both high densities of wildlife, suitable game viewing habitat and is well connected with the coastal client base, it will continue to have the highest level of use in the TCA. However, in order to help maintain the quality of the game viewing experience in this already highly used area, visitor activities will be restricted to game viewing from vehicles, short walks, and sport fishing along designated lengths of Galana River. However, in addition, if feasible, balloon safaris will be permitted from the Ndara Plains in this zone between

ZONATION SCHEME

06.00 and 08.00 hours. The specific activities permitted in the Voi High Use Zone are set out in Table 7 below.

Figure 6: Voi High Use Zone

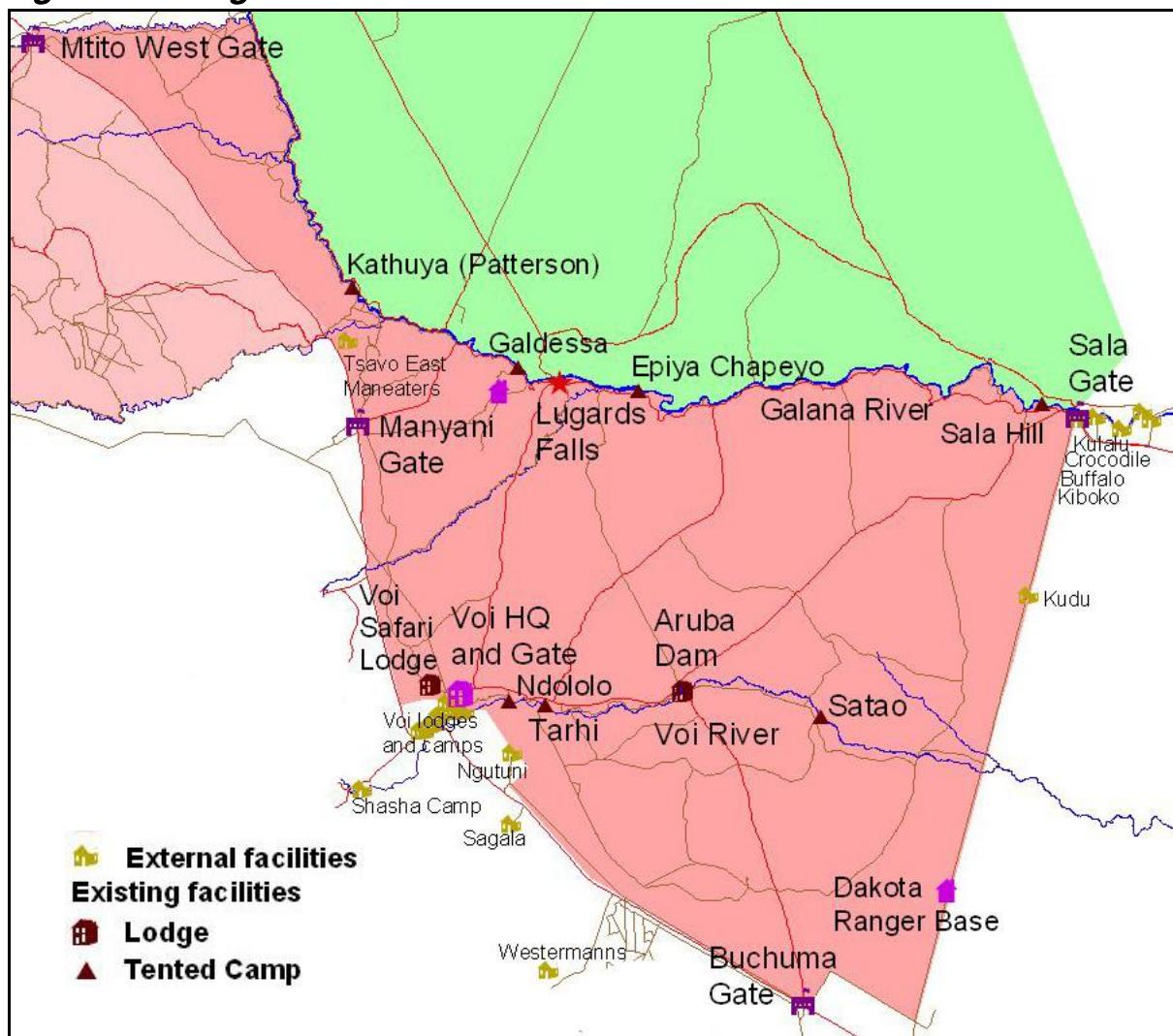


Table 7: Voi High Use Zone: Visitor activity prescriptions

- ▶ **Game drives.** On official park roads only; no off-road driving.
- ▶ **Night game drives.** Along specified routes agreed between the operator and TCA management. Red/pink filters must be placed over spotlights. Visitors must return to their accommodation by 20.30. (Park gates close at 19.00, therefore night game drives will not be available to operators based outside the PAs).
- ▶ **Short walks.** Along specified routes agreed between the operator and TCA management. No overnighting, except walks between existing permanent facilities (lodges or permanent tented camps).
- ▶ **Catch and release (sport) fishing.** Along designated lengths of Galana River agreed between the operator and TCA management. All fish caught to be released at same location. Accompanied by ranger guide.
- ▶ **Balloon safaris.** One balloon operator will be permitted to fly two balloons per day in this zone between 06.00 and 08.00 hours. If feasible, this should take place from the Ndara Plains area south of the Voi River.

Accommodation prescriptions

This zone will continue to have the highest density of tourism accommodation facilities in the TCA. This is reflected in the wide variety of accommodation types permitted in this zone (summarised in Table 8 below).

Table 8: Voi High Use Zone: Permitted tourism facility categories.

Accommodation type	Maximum size
Lodge	No new developments
Ecolodge	60 beds
Permanent tented camp	60 beds
Special campsites	12 beds
KWS self-help bandas	16 beds
Public campsite	60 beds

Bed capacity prescriptions

Table 9 overpage shows the existing accommodation facilities already established in Voi High Use Zone, as well as external accommodation facilities that are utilising the zone. The table details the number of beds installed at each facility, the estimated high season occupancy rate, and the estimated use of Voi Zone by visitors staying at each facility. This information enables the estimation of an average number of visitors using the zone per day from the facility concerned. The addition of these figures, combined with an estimate of the number of visitors entering or leaving the zone from neighbouring zones, allows a total number of visitors using the zone in the high season to be calculated (see Table 4). This figure is then used in the calculation of visitor encounter rates for the zone as detailed in the Limits of Acceptable Use section above.

As detailed in the LAU section, Voi Zone has the highest visitor encounter rate of all the TCA zones, which will necessitate careful visitor management over the lifespan of this management plan. While the visitor use of the zone is not considered to be excessive, there is no capacity for the development of new visitor accommodation in the zone over the lifespan of the management plan. **No new accommodation developments will therefore be permitted within the zone.** Existing accommodation facilities within the zone will also not be permitted to increase from their present size. In cases where existing facilities are below the maximum permissible size for the accommodation type as detailed in the Accommodation Prescriptions section above, an increase up to the maximum permitted size may be considered, provided that visitor experience indicators (see Action 3.2 of the Tourism Development & Management Programme) are considered favourable, and subject to appropriate increases in tourism road infrastructure and tourism sinks within the zone (see Sub-objective 1.2 of the Tourism Programme).

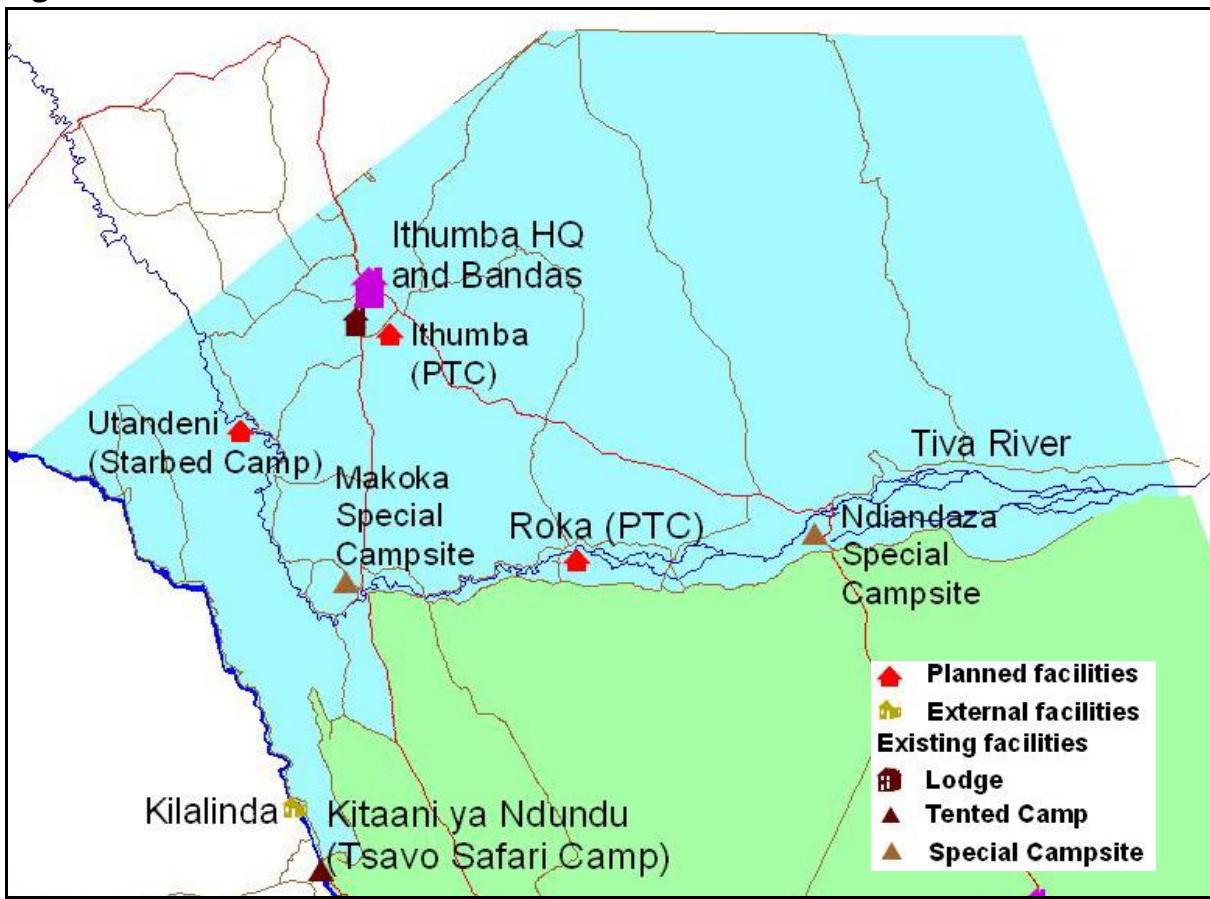
Ithumba Low Use Zone

This zone covers the northern area of Tsavo East NP and around 17% of the TCA. The zone is not currently heavily used by visitors, although it has significant tourism potential, especially if, as expected, access to the area is improved through the upgrading of the Kibwezi-Kitui Road. The zone is defined by the park boundaries to the north, east and west and by the road on the south bank of the Tiva River, which runs across the Yatta Plateau (beginning just south of Kitaani ya Ndunu (Tsavo Safari Camp), continuing north past Nthalakana (Sheldrick Blind) and past signs 120, 193, to the PA boundary in the east. At present, the

Table 9: Accommodation prescriptions and visitor use estimates for Voi High Use Zone

Status	Facility Name	Type	No. of Beds	Estimated High Season Occupancy	Use of Zone (%)	Average Number of Visitors/Day
Established Internal	Voi Safari	Lodge	106	85%	100%	90
	Aruba	Lodge	80	85%	100%	68
	Galdessa	Permanent tented camp	30	80%	100%	24
	Epiya Chapeyo	Permanent tented camp	36	60%	100%	22
	Satao	Permanent tented camp	54	90%	100%	49
	Ndololo PTC	Permanent tented camp	44	50%	100%	22
	Tarhi	Permanent tented camp	30	90%	100%	27
	Sala Hill	Permanent tented camp	30	50%	100%	15
	Kathuya (Patterson)	Permanent tented camp	60	80%	100%	48
	Voi (being developed)	KWS Bandas	24	80%	100%	19
	Kanderi	Special campsite	12	30%	100%	4
	Durusikale	Special campsite	12	30%	100%	4
	Rock Camp	Special campsite	12	30%	100%	4
	Ndololo	Public campsite	60	60%	100%	36
External	Voi Wildlife Lodge	Lodge	300	90%	100%	270
	Tsavo East Maneaters	Lodge	150	80%	50%	60
	Lion Hill	Tents and bandas	40	60%	100%	24
	Mashariki Camp	Tents	12	60%	100%	7
	Ngutuni	Lodge	120	65%	100%	78
	Sagala	Lodge	56	80%	70%	31
	Red Elephant	Lodge	45	50%	100%	23
	Royal East Gate Resort	Hotel	32	75%	100%	24
	Tsavo Lodge	Rooms and tents	24	40%	100%	10
	Silent Inn	Guest house	34	50%	100%	17
	Tsavo Park	Hotel	32	90%	100%	29
	Shasha Camp		20	50%	100%	10
	Westermanns	Camp/lodge	48	80%	50%	19
	Satao Rock	Tented camp	16	80%	30%	4
	Buffalo Camp	Tented camp	40	90%	100%	36
	Crocodile	Tents and bungaloes	72	80%	100%	58
	Lali Lodge		12	50%	50%	3
	Kiboko	Tented camp	21	90%	100%	19
	Kulalu	Tented camp	8	50%	50%	2
	Kudu				50%	0
Movements between zones	Net exit to Ithumba Zone (%)			0%	n/a	0
	Net entry from Ithumba Zone					24
Total visitors in Voi Zone per day						1,177

only permanent accommodation in the zone is the KWS bandas at Ithumba and Kitaani ya Ndundi (Tsavo Safari Camp), although (as shown in Figure 7 overpage) there are also a number of special campsites along the Tiva River. The zone will be managed from the management zone HQ at Ithumba, and in future will be mainly accessed by the entrance gate to be developed at Kasalla (see PA Operations Programme, Action 3.1.4).

Figure 7: Ithumba Low Use Zone

Visitor activity prescriptions

Although this zone does have potential for traditional vehicle-based game viewing, other activities, such as walking and rafting/boating on the Tiva River are also allowed in order to encourage visitor use in this currently under-utilised area. Table 10 below summarises the activities permitted in the Ithumba Low Use Zone.

Table 10: Ithumba Low Use Zone: Visitor activity prescriptions

- ▶ **Game drives.** On official park roads only; no off-road driving.
- ▶ **Night game drives.** Along specified routes agreed between the operator and TCA management. Red/pink filters must be placed over spotlights. Visitors must return to their accommodation by 20.30.
- ▶ **Short walks.** Along specified routes agreed between the operator and TCA management. No overnighting, except walks between existing permanent facilities (lodges or permanent tented camps). Accompanied by ranger guide.
- ▶ **Walking safaris.** Along specified routes between permanent and/or temporary camps agreed between the operator and TCA management. Accompanied by ranger guide.
- ▶ **Camel safaris.** Along specified routes between permanent and/or temporary camps agreed between the operator and TCA management. Accompanied by ranger guide.
- ▶ **Rafting/boating.** On the Tiva River.

Accommodation prescriptions

As with all low use zones in the TCA, the maximum size for visitor accommodation facilities in this zone is limited to 30 beds. This should not only help minimise the visual impacts of accommodation facilities in this zone, but also help disperse visitor use throughout the area. The specific accommodation facilities permitted in this zone are set out in Table 11 below.

Table 11: Ithumba Low Use Zone: Accommodation prescriptions

Accommodation type	Low Use
Ecolodge	30 beds
Permanent tented camp	30 beds
Starbed camps	10 beds
Special campsites	12 beds
KWS self-help bandas	12 beds

Bed capacity prescriptions

Table 12 below shows the existing and planned accommodation facilities in Ithumba Low Use Zone, as well as external tourism facilities that are utilising the zone. As previously described, the information provided in the table has been used in the calculation of visitor encounter rates for the zone as detailed in the Limits of Acceptable Use section above.

Table 12: Accommodation prescriptions and visitor use estimates for Ithumba Low Use Zone

Status	Facility Name	Type	No. of Beds	Estimated High Season Occupancy	Use of Zone (%)	Average Number of Visitors/Day
Established Internal	Kitaani ya Ndunu (Tsavo Safari Camp)	Permanent Tented Camp	72	70%	100%	50
	Ithumba	KWS Banda	6	50%	100%	3
	Makoka	Special campsite	12	20%	100%	2
	Ndiandaza	Special campsite	12	20%	100%	2
Planned Internal	Ithumba	Permanent Tented Camp	30	50%	100%	15
	Roka	Permanent Tented Camp	30	50%	100%	15
	Utanden'i	Starbed camp	10	30%	100%	3
Ex-ter-nal	Kilalinda	Lodge	12	50%	50%	3
Movements between zones	Net exit to Voi Zone (%)			25%	n/a	-24
	Net entry from Voi Zone					0
Total visitors in Ithumba Zone per day						71

The plan makes provision for the **establishment of an additional 70 beds in the zone**, made up as follows:

- ▶ 2 Permanent Tented Camps (30 beds each)
- ▶ 1 Starbed Camp (10 beds)

These additional accommodation facilities will bring the vehicle encounter rate to 1.8 vehicles per hour (see Table 4 above), which is in line with the Meru Conservation Area Low Use

Zone encounter rate. Provided that visitor experience indicators (see Action 3.2 of the Tourism Development & Management Programme) are considered favourable, and subject to appropriate increases in tourism road infrastructure and tourism sinks within the zone (see section Sub-objective 1.2 of the Tourism Programme), there may in due course be scope for further development of accommodation facilities within the zone. The feasibility of increasing accommodation facilities in the zone while maintaining an appropriate low use visitor experience will be assessed after the first three years of operation of this plan (see Action 2.8 of the Tourism Development & Management Programme).

Emusaya Wilderness Zone

This is the largest visitor use zone in the TCA, and covers around 27% of the total area. The zone boundary is defined by the Galana River in the south, the Tsavo East park boundaries to the east and west, and by the road running across the Yatta Plateau beginning just south of Kitaani ya Ndundu (Tsavo Safari Camp), continuing to the PA boundary in the east (described in more detail under the Ithumba Low Use Zone above). Currently this zone is rarely used by visitors to the area and contains no permanent visitor accommodation. Large parts of the area have relatively low densities of wildlife, and as such a wide range of alternative activities to vehicle-based game drives are permitted in this area. However, in order to maintain the wilderness-type visitor experience desired in this zone, and the safety of visitors in the area, access will be restricted to suitably-equipped professional operators and private parties accompanied by a ranger guide in four-wheel drive vehicles only. Access to other visitors will however be permitted along the road to the west of the Yatta Plateau along the Athi River to enable visitors to transit between the Voi High Use and Ithumba Low Use Zones. This zone will continue to have the lowest density of tourism accommodation facilities in the TCA.

Figure 8: Emusaya Wilderness Zone



Visitor activity prescriptions

As discussed above, in order to encourage increased visitor use and investment in this zone, which has limited potential for traditional game viewing activities, a wide variety of visitor activities will be permitted, notably walking safaris, as well as other adventure activities such as camel, horseback or bicycle safaris. Table 13 below summarises the visitor activities permitted in the Emusaya Wilderness Zone.

Table 13: Emusaya Wilderness Zone: Visitor activity prescriptions

- ▶ **Game drives.** Four-wheel drive vehicles only. On official park roads; no off-road driving.
- ▶ **Night game drives.** Four-wheel drive vehicles only. Along specified routes agreed between the operator and TCA management. Red/pink filters must be placed over spot-lights. Visitors must return to their accommodation by 20.30. (Park gates close at 19.00, therefore night game drives will not be available to operators based outside the PAs).
- ▶ **Short walks.** Along specified routes agreed between the operator and TCA management. No overnighting, except walks between existing permanent facilities (lodges or permanent tented camps). Accompanied by ranger guide.
- ▶ **Walking safaris.** Along specified routes between permanent and/or temporary camps agreed between the operator and TCA management. Accompanied by ranger guide.
- ▶ **Camel, horseback and bicycle safaris.** Along specified routes between permanent and/or temporary camps agreed between the operator and TCA management. Accompanied by ranger guide

Accommodation prescriptions

In order to help maintain the wilderness nature of the visitor experience in this zone, the types of visitor accommodation facilities permitted have been restricted (i.e. no lodges, public campsites or bandas) and, in order to help distribute visitor use evenly throughout the zone, the maximum size of any type of accommodation facility is 30 beds. Table 14 below sets out the types of accommodation facilities permitted in this zone and the maximum size allowed for each.

Table 14: Emusaya Wilderness Zone: Accommodation prescriptions

Accommodation type	Maximum size
Ecolodge	30 beds
Permanent tented camp	30 beds
Special campsites	12 beds
Starbed camps	10 beds
Temporary Fly Camps	12 beds

Bed capacity prescriptions

Table 15 overpage shows the existing and planned accommodation facilities in Emusaya Wilderness Zone. As previously described, the information provided in the table has been used in the calculation of visitor encounter rates for the zone as detailed in the Limits of Acceptable Use section above.

The plan makes provision for the **establishment of an additional 64 beds in the zone**, made up as follows:

- ▶ 1 Ecolodge or Permanent Tented Camp (30 beds)
- ▶ 1 Starbed camp (10 beds)
- ▶ 2 Special campsites (12 beds each)

Table 15: Accommodation prescriptions and visitor use estimates for Emusaya Wilderness Zone

Status	Facility Name	Type	No. of Beds	Estimated High Season Occupancy	Use of Zone (%)	Average Number of Visitors/Day
Planned Internal	Thabangunji	Ecolodge/PTC	30	50%	100%	15
	Nthalakana	Starbed camp	10	50%	100%	5
	Emusaya	Special campsite	12	20%	100%	2
	Athi	Special campsite	12	20%	100%	2
Total visitors in Emusaya Zone per day						25

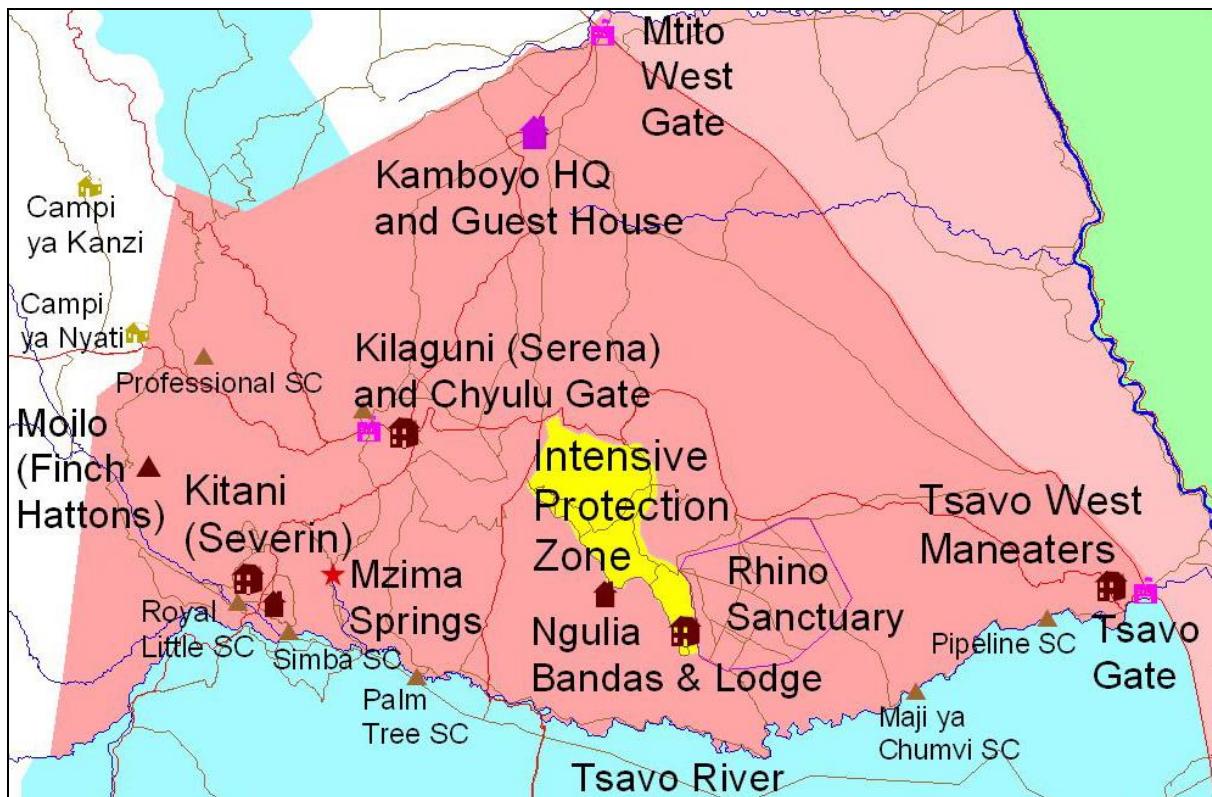
These additional accommodation facilities will bring the vehicle encounter rate in this zone to 0.6 vehicles per hour (see Table 4 above). While this figure is less relevant for a wilderness zone, where walking safaris rather than vehicle-based game viewing are likely to be the predominant visitor activity, it nonetheless confirms the exclusivity and sense of solitude that is desirable in the zone. However, provided that visitor experience indicators (see Action 3.2 of the Tourism Development & Management Programme) are considered favourable, there may in due course be scope for limited further development of accommodation facilities within the zone. The feasibility of increasing accommodation facilities in the zone while maintaining an appropriate wilderness visitor experience will be assessed after the first three years of operation of this plan (see Action 2.8 of the Tourism Development & Management Programme).

Tsavo West and Chyulu Hills: Zone details

Tsavo West National Park has been divided into three visitor use zones: the Mzima High Use Zone; and the Murka and Jipe Low Use Zones. Chyulu Hills National Park has been designated as a low use zone. Each of these zones is described in more detail in the following sections.

Mzima High Use Zone

Although covering only about 8% of the entire TCA, this zone is the most heavily used area of Tsavo West NP, and has the highest density of roads, infrastructure and tourism facilities and attractions in the park. The zone is defined by the Tsavo West park boundary to the north, east and west, and by the Tsavo River to the south. The zone includes a number of key attractions and facilities such as the visitor centre, Mzima Springs, the Ngulia Rhino Sanctuary, and the park HQ at Kamboyo. In addition, this area also contains the Black rhino Intensive Protection Zone (IPZ), which are due to be released into this area in 2008 (see Figure 9 overpage). The Mzima High Use Zone is managed from TWNP HQ at Kamboyo.

Figure 9: Mzima High Use Zone

Visitor activity prescriptions

As with the Voi High Use Zone, due to the area's already high level of use, and relatively high densities of easily visible wildlife, visitor activities in the Mzima High Use Zone are primarily restricted to vehicle-based game viewing (with short walks also permitted from permanent accommodation facilities). However, **night game drives and short walks are not permitted within the rhino sanctuary or the adjacent Intensive Protection Zone**. A summary of the activities permitted in the Mzima High Use Zone is set out in Table 16 below.

Table 16: Mzima High Use Zone: Visitor activity prescriptions

- ▶ **Game drives.** On official park roads only; no off-road driving.
- ▶ **Night game drives.** Along specified routes agreed between the operator and TCA management. Red/pink filters must be placed over spotlights. Visitors must return to their accommodation by 20.30. (Park gates close at 19.00, therefore night game drives will not be available to operators based outside the PAs). (Not permitted in the rhino sanctuary or IPZ).
- ▶ **Short walks.** Along specified routes agreed between the operator and TCA management. No overnighting, except walks between existing permanent facilities (lodges or permanent tented camps). (Not permitted in the rhino sanctuary or IPZ).

Accommodation prescriptions

This zone has and will continue to have the highest density of visitor accommodation facilities in TWNP. As such, (as shown in Table 17 overpage) all types of accommodation facilities are permitted in this zone, although there will be no further development of lodges in the area.

Table 17: Mzima High Use Zone: Permitted tourism facility categories.

Accommodation type	Maximum size
Lodge	No new developments
Ecolodge	60 beds
Permanent tented camp	60 beds
Special campsites	12 beds
KWS self-help bandas	16 beds
Public campsite	60 beds

Bed capacity prescriptions

Table 18 below shows the existing and planned accommodation facilities in Mzima High Use Zone, as well as external tourism facilities that are utilising the zone. As previously described, the information provided in the table has been used in the calculation of visitor encounter rates for the zone as detailed in the Limits of Acceptable Use section above.

Table 18: Accommodation prescriptions and visitor use estimates for Mzima High Use Zone

Status	Facility Name	Type	No. of Beds	Estimated High Season Occupancy	Use of Zone (%)	Average Number of Visitors/Day
Established Internal	Ngulia	Lodge	104	80%	100%	83
	Kilaguni (Serena)	Lodge	102	85%	100%	87
	Tsavo West Maneaters	Ecolodge	40	70%	100%	28
	Kitani 1 (Severin)	Ecolodge	60	90%	100%	54
	Moilo (Finch Hattons)	Permanent tented camp	70	75%	100%	53
	Rhino Valley	Permanent tented camp	30	75%	100%	23
	Professional	Special campsite	12	20%	100%	2
	Royal Little	Special campsite	12	20%	100%	2
	Maji ya Chumvi	Special campsite	12	20%	100%	2
	Simba	Special campsite	12	20%	100%	2
	Palm Tree	Special campsite	12	20%	100%	2
	Pipeline	Special campsite	12	20%	100%	2
	Kitani 2 (Severin)	Banda (private)	16	50%	100%	8
	Kamboyo	Guest house	8	50%	100%	4
External	Nyati Camp	Permanent tented camp	18	70%	100%	13
	Kampi ya Kanzi	Permanent tented camp	16	70%	10%	1
	Tsavo East Maneaters	Lodge	150	80%	50%	60
Movements between zones	Net exit to Murka Zone (%)			10%	n/a	-50
	Net exit to Chyulu Zone (%)			0%	n/a	0
	Net entry from Murka Zone					61
	Net entry from Chyulu Zone					12
Total visitors in Mzima Zone per day						523

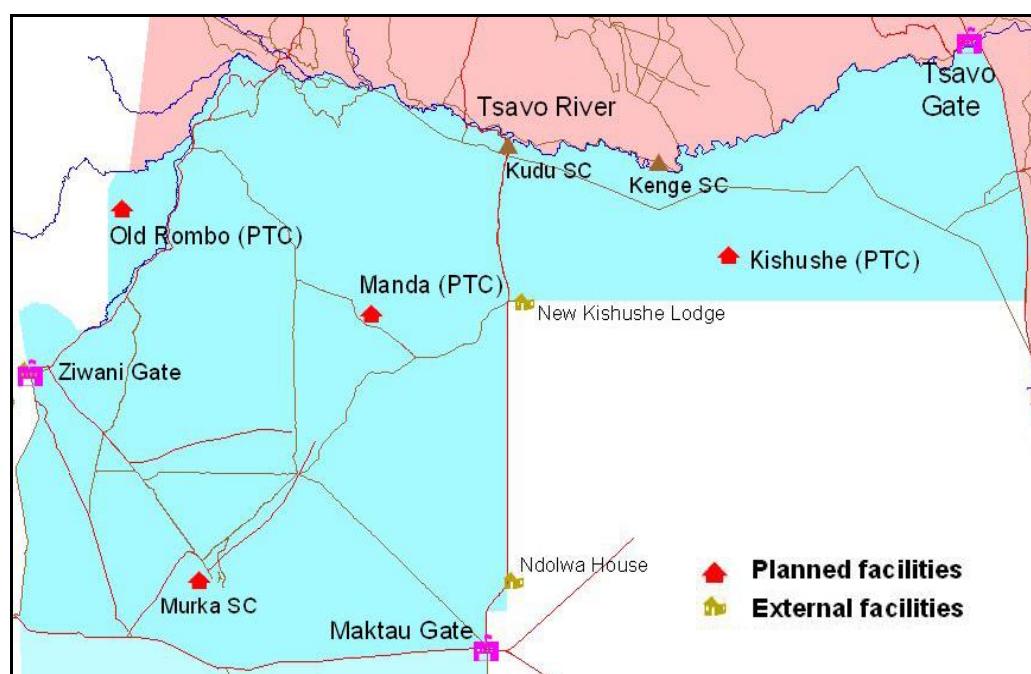
ZONATION SCHEME

As detailed in the LAU section, Mzima Zone has the second highest visitor encounter rate (8.1 vehicles per hour) of all the TCA zones. As with Voi Zone, this will necessitate careful visitor management over the lifespan of this management plan. While the visitor use of the zone is not considered to be excessive, there is no capacity for the development of new visitor accommodation in the zone over the lifespan of the management plan. **No new accommodation developments will therefore be permitted within the zone.** Existing accommodation facilities within the zone will also not be permitted to increase from their present size. In cases where existing facilities are below the maximum permissible size for the accommodation type as detailed in the Accommodation Prescriptions section above, an increase up to the maximum permitted size may be considered, provided that visitor experience indicators (see section 3.2 of the Tourism Development & Management Programme) are favourable, and subject to appropriate increases in tourism road infrastructure and tourism sinks within the zone (see Sub-objective 1.2 of the Tourism Programme).

Murka Low Use Zone

This zone covers 9% of the TCA and includes the area of TNPW south of the Tsavo River as far as the Maktau-Taveta road. Although at present this area is not heavily used by TCA visitors, it does have significant potential, due to its relatively accessible location and large areas of suitable game viewing habitat (especially in the south of the zone and along the Tsavo River). It is anticipated that use of this zone will increase significantly through the 10-year lifespan of this plan. As shown in Table 4 (Limits of Acceptable Use) above, if all the proposed visitor accommodation facilities are developed, this zone will have an encounter rate of five vehicles per hour, which is significantly higher than for other low use zones within the TCA, and which would be approaching high use zone levels. Along with the Mzima High Use Zone, this zone will be managed from the TCA HQ at Kamboyo.

Figure 10: Murka Low Use Zone



Visitor activity prescriptions

As shown in Table 19 overpage, although a low use zone, the visitor activities in this zone will continue to focus on vehicle-based game viewing, with short walks between visitor ac-

commodation facilities also permitted. This zone has the most restrictive activity prescriptions of all low use zones in the TCA, due to its relatively high suitability for traditional game viewing, and likely increases in use due to its ease of accessibility.

Table 19: Murka Low Use Zone: Visitor activity prescriptions

- | |
|---|
| <ul style="list-style-type: none"> ▶ Game drives. On official park roads only; no off-road driving. ▶ Night game drives. Along specified routes agreed between the operator and TCA management. Red/pink filters must be placed over spotlights. Visitors must return to their accommodation by 20.30. ▶ Short walks. Along specified routes agreed between the operator and TCA management. No overnighting, except walks between existing permanent facilities (lodges or permanent tented camps). Accompanied by ranger guide. |
|---|

Accommodation prescriptions

In order to maintain the ambience of low visitor use and to disperse visitors throughout the zone, the maximum size of accommodation facilities in this area has been restricted to 30 beds for ecolodges or permanent tented camps. As shown in Table 20 below, other facilities permitted in this zone are starbed camps and special campsites.

Table 20: Murka Low Use Zone: Accommodation prescriptions

Accommodation type	Low Use
Ecolodge	30 beds
Permanent tented camp	30 beds
Starbed camps	10 beds
Special campsites	12 beds

Bed capacity prescriptions

Table 21 overpage shows the existing and planned accommodation facilities in Murka Low Use Zone, as well as external tourism facilities that are utilising the zone. As previously described, the information provided in the table has been used in the calculation of visitor encounter rates for the zone as detailed in the Limits of Acceptable Use section above.

The plan makes provision for the **establishment of an additional 102 beds in the zone**, made up as follows:

- ▶ 3 Permanent Tented Camps (30 beds each)
- ▶ 1 Special Campsite (12 beds)

These additional accommodation facilities will bring the vehicle encounter rate to 5.1 vehicles per hour (see Table 4 above). This encounter rate is significantly higher than other TCA low use zones and, while the visitor experience in the zone will not equate to that in the TCA high use zones, the zone will inevitably provide less opportunities for solitude than other TCA low use zones. In order to reduce encounter rates and enhance the visitor experience in the zone, new game viewing roads will need to be created during the lifespan of this plan.

Table 21: Accommodation prescriptions and visitor use estimates for Murka Low Use Zone

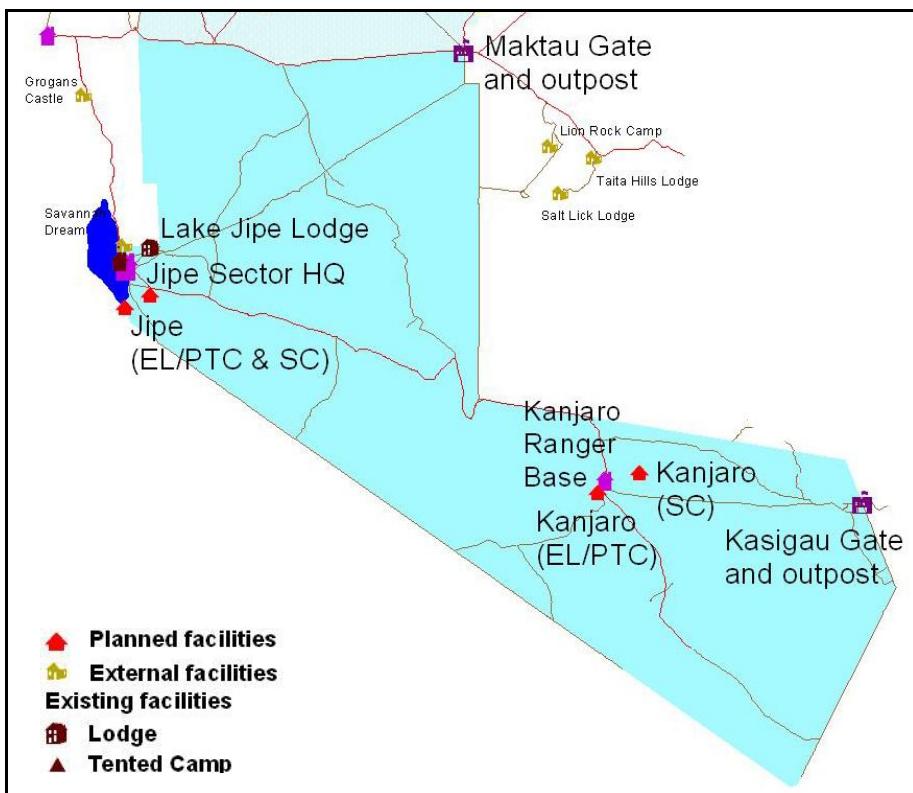
Status	Facility Name	Type	No. of Beds	Estimated High Season Occupancy	Use of Zone (%)	Average Number of Visitors/Day
Established Internal	Kudu	Special campsite	12	20%	100%	2
	Kenge	Special campsite	12	20%	100%	2
Planned Internal	Old Rombo	Tented camp/ecolodge	30	50%	100%	15
	Manda	Tented camp/ecolodge	30	50%	100%	15
	Kishushe	Tented camp/ecolodge	30	50%	100%	15
	Murka	Special campsite	12	20%	100%	2
External	Ziwani	Permanent Tented Camp	50	85%	100%	43
	New Kishushe Lodge	Ecolodge	14	50%	100%	7
	Lion Rock	Permanent Tented Camp	24	90%	20%	4
	Ndolwa House	Cottages	14	50%	100%	7
	Taita Hills	Lodge	130	80%	50%	52
	Saltlick	Lodge	200	80%	50%	80
Movements between zones	Net exit to Mzima Zone (%)			25%	n/a	-61
	Net entry from Mzima Zone					50
Total visitors in Murka Zone per day						234

Jipe Low Use Zone

This zone covers around 14% of the TCA, and the majority of TWNP. The zone begins south of the Maktau-Taveta road and continues south throughout the remainder of TWNP. Although it has a number of attractions, such as Lake Jipe, the vast majority of this zone is not currently used by visitors to the TCA. However, it is anticipated that use of the area will increase through the lifespan of this plan, and this will be supported by increasing both the number of visitor accommodation facilities in the area, and the variety of activities permitted, with the aim of either attracting visitors into the area from the zones to the north, or encouraging visitors to remain in this zone during their time in the TCA. This zone will be managed from the sector HQ at Lake Jipe.

Visitor activity prescriptions

In order to encourage increased use of this area, the majority of which is less suitable for traditional game viewing than the other zones in TWNP, an increased variety of visitor activities are permitted in this zone. This includes both walking safaris and boating/rafting on Lake Jipe. An overview of the visitor activities permitted in this zone is set out in Table 22 overpage.

Figure 11: Jipe Low Use Zone**Table 22: Jipe Low Use Zone: Visitor activity prescriptions**

- ▶ **Game drives.** On official park roads only, except as part of the pilot off-road driving scheme (see Tourism Development & Management Programme).
- ▶ **Night game drives.** Along specified routes agreed between the operator and TCA management. Red/pink filters must be placed over spotlights. Visitors must return to their accommodation by 20.30.
- ▶ **Short walks.** Along specified routes agreed between the operator and TCA management. No overnighting, except walks between existing permanent facilities (lodges or permanent tented camps). Accompanied by ranger guide.
- ▶ **Walking safaris.** Along specified routes between permanent and/or temporary camps agreed between the operator and TCA management. Accompanied by ranger guide.
- ▶ **Rafting/boating.** On Lake Jipe.

Accommodation prescriptions

In line with other TCA low use zones, and in order to maintain the impression of low visitor use and to disperse visitors throughout the zone, the maximum size of accommodation facilities in this area has been restricted to 30 beds.

Table 23: Jipe Low Use Zone: Accommodation prescriptions

Accommodation type	Low Use
Ecolodge	30 beds
Permanent tented camp	30 beds
Starbeds	10 beds
Special campsites	12 beds
KWS self-help bandas	12 beds

Bed capacity prescriptions

Table 24 below shows the existing and planned accommodation facilities in Jipe Low Use Zone, as well as external tourism facilities that are utilising the zone. As previously described, the information provided in the table has been used in the calculation of visitor encounter rates for the zone as detailed in the Limits of Acceptable Use section above.

Table 24: Accommodation prescriptions and visitor use estimates for Jipe Low Use Zone

Status	Facility Name	Type	No. of Beds	Estimated High Season Occupancy	Use of Zone (%)	Average Number of Visitors/Day
Established Internal	Jipe	Bandas	12	60%	100%	7
Planned Internal	Lake Jipe Lodge	Ecolodge	30	50%	100%	15
	Kanjaro	Tented camp/ecolodge	30	50%	100%	15
	Jipe	Tented camp/ecolodge	30	50%	100%	15
	Kanjaro	Special campsite	12	20%	100%	2
	Jipe East	Special campsite	12	20%	100%	2
External	Savannah Dream	Permanent Tented Camp	16	50%	100%	8
Total visitors in Jipe Zone per day						65

The plan makes provision for the **establishment of an additional 114 beds in the zone**, made up as follows:

- ▶ 2 Permanent Tented Camps (30 beds each)
- ▶ 1 Ecolodge (30 beds)
- ▶ 2 Special Campsites (12 beds each)

These additional accommodation facilities will bring the vehicle encounter rate to 1.2 vehicles per hour (see Table 4 above), which, despite the proposed increases in bed capacity, is still the lowest encounter rate of all three of the TCA's low use zones. This does leave scope for additional increases in bed capacity in this zone, provided that visitor experience indicators (see Action 3.2 of the Tourism Development & Management Programme) are considered favourable.

Chyulu Low Use Zone

This zone comprises all of Chyulu Hills National Park and covers 3.5% of the TCA. The zone currently has extremely low levels of visitation, and contains no permanent visitor accommodation (apart from the public campsite at Kithasyu Gate). Although the zone has relatively low wildlife densities, due to the absence of many potentially dangerous animals in the area and its open areas of montane grasslands, this zone has significant opportunities for a variety of alternative visitor activities, such as walking and horse riding, and other potential activities centred around the Leviathan cave complex at the heart of the zone. This zone will be managed from the Kithasyu HQ.

Visitor activity prescriptions

As discussed above, this zone is currently underutilised, but is well suited to a diversity of visitor activities, such as walking and horseback safaris. As such, and as illustrated in Table 25 below, a wide range of activities are permitted in this zone, many of which (such as horseback, camel, or bicycle safaris) are otherwise restricted to the Emusaya Wilderness Zone.

Accommodation prescriptions

There are currently no accommodation facilities in this zone, except the public campsite at Kithasyu Gate. Accommodation facilities will be expanded in this zone during the lifespan of this plan, and a wide variety of accommodation facilities are permitted in this area, as detailed in Table 26 below.

Figure 12: Chyulu Low Use Zone

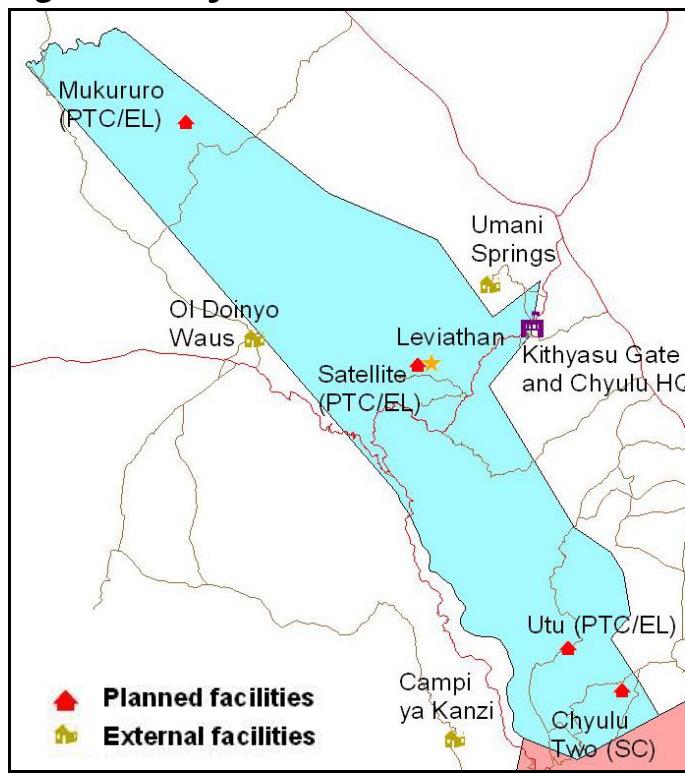


Table 25: Chyulu Low Use Zone: Visitor activity prescriptions

- ▶ **Game drives.** On official park roads only; no off-road driving.
- ▶ **Night game drives.** Along specified routes agreed between the operator and TCA management. Red/pink filters must be placed over spotlights. Visitors must return to their accommodation by 20.30. (Park gates close at 19.00, therefore night game drives will not be available to operators based outside the PAs).
- ▶ **Short walks.** Along specified routes agreed between the operator and TCA management. No overnighting, except walks between existing permanent facilities (lodges or permanent tented camps). Accompanied by ranger guide.
- ▶ **Walking safaris.** Along specified routes between permanent and/or temporary camps agreed between the operator and TCA management. Accompanied by ranger guide.
- ▶ **Horseback and bicycle safaris.** Along specified routes between permanent and/or temporary camps agreed between the operator and TCA management. Accompanied by ranger guide.

Table 26: Chyulu Low Use Zone: Accommodation prescriptions

Accommodation type	Low Use
Ecolodge	30 beds
Permanent tented camp	30 beds
Starbeds	10 beds
Special campsites	12 beds
KWS self-help bandas	12 beds
Public campsite	30 beds

Bed capacity prescriptions

Table 27 below shows the existing and planned accommodation facilities in Chyulu Low Use Zone. As previously described, the information provided in the table has been used in the calculation of visitor encounter rates for the zone as detailed in the Limits of Acceptable Use section above.

Table 27: Accommodation prescriptions and visitor use estimates for Chyulu Low Use Zone

Status	Facility Name	Type	No. of Beds	Estimated High Season Occupancy	Use of Zone (%)	Average Number of Visitors/Day
Established Internal	Kithasyu	Public campsite	30	25%	100%	8
Planned Internal	Mukururo	Tented camp/ecolodge	30	50%	100%	15
	Satellite	Tented camp/ecolodge	30	50%	100%	15
	Utu	Tented camp/ecolodge	30	50%	100%	15
	Chyulu 2	Special campsite	12	20%	100%	2
External	Umani Springs	Permanent Tented Camp	24	50%	20%	2
	OI Doinyo Waus	Lodge	20	70%	20%	3
	Kampi ya Kanzi	Permanent tented camp	16	70%	20%	2
Movements between zones	Net exit to Mzima Zone (%)			20%	n/a	-12
	Net entry from Mzima Zone					0
Total visitors in Chyulu Zone per day						50

The plan makes provision for the **establishment of an additional 102 beds in the zone**, made up as follows:

- ▶ 3 Ecolodges or Permanent Tented Camps (30 beds each)
- ▶ 1 Special Campsite (12 beds)

These additional accommodation facilities will bring the vehicle encounter rate in this zone to 1.6 vehicles per hour (see Table 4 above), which is consistent with the Meru Conservation Area Low Use Zone as well as the TCA's Ithumba and Jipe Low Use Zones. As with the Emusaya Wilderness Zone, this figure is less relevant for Chyulu Zone because of the emphasis on walking safaris and other adventure activities rather than vehicle-based game viewing. Provided that visitor experience indicators (see Action 3.2 of the Tourism Development & Management Programme) are considered favourable, there may in due course be scope for limited further development of accommodation facilities within the zone. The feasibility of increasing accommodation facilities in the zone while maintaining an appropriate low use visitor experience will be assessed after the first three years of operation of this plan (see Action 2.8 of the Tourism Development & Management Programme).

Ecological Management Programme

Programme Purpose

The conservation of the TCA's natural environment is enhanced, through improved ecological monitoring, applied research and targeted management interventions

The Tsavo Conservation Area has experienced significant change over the past 50 years, ranging from ecological changes such as the drastic decline and then gradual recovery in the area's elephant population and the rapid expansion in human population density in the greater TCA landscape, to development changes, including the major expansion in tourism infrastructure in the area, and the increase in public infrastructure in the TCA and environs, including increasing heavy traffic on the transit roads through the area, underground and overhead pipelines and power transmission cables, and mining activities. Managing human-induced changes that impact on the TCA's ecology, and balancing the competing needs of environmental conservation and human development, are perhaps the greatest challenge facing the management of the TCA over the lifespan of this management plan. The Ecological Management Programme will have a crucial role to play in spearheading the management response to change, by providing the ecological information that is needed to understand the underlying factors driving change, and by designing and coordinating the implementation of targeted and appropriate management interventions to address the most significant emerging threats to the area's exceptional resource values.

The following section sets out the guiding principles that describe key factors taken into account in the development of the Ecological Management Programme and that will influence the way the programme is implemented in achieving the Programme Purpose.

Guiding principles

The guiding principles for the Ecological Management Programme are:

- ▶ **Provision of appropriate and timely information for PA management**
- ▶ **Leadership role of the Tsavo Research Station**
- ▶ **Maintaining the balance between conservation and development**
- ▶ **Understanding and monitoring the dynamics of the ecosystem**
- ▶ **Preservation of vital ecological processes**

These guiding principles are briefly described and explained in the following paragraphs.

Provision of appropriate and timely information for PA management

As described above, the TCA is currently experiencing a wide variety of human development pressures that have potentially important consequences for the natural ecology of the area. Developing appropriate management responses to address these threats and to mitigate changes in the ecosystem depends in the first instance on the availability of information

about the nature of, and trends in, the human development pressures concerned (water extraction, pollution, land-use change, etc) as well as on how these pressures are altering ecological regimes in the TCA (water availability, fire patterns, habitat dynamics, wildlife movements, etc). A major role of the Ecological Management Programme over the lifespan of this management plan will therefore be to ensure the provision of appropriate and timely information on the changing ecology of the TCA, the factors driving change, and the appropriate management responses to influence or adapt to change.

Leadership role of the Tsavo Research Station

Although the provision of management information is a crucial function of the Tsavo Research Station and a priority of this Ecological Management Programme, the reactive provision of information is unlikely to be sufficient to ensure an adequate management response to deal with the growing and increasingly complex pressures impacting on the ecosystem. A guiding principle of the Ecological Management Programme is that over the lifespan of this management plan, the Tsavo Research Station will need to develop a stronger and more proactive leadership role in addressing the key factors influencing change in the ecosystem, including internal pressures such as expanding tourism infrastructure and visitor numbers and growing elephant populations, and external pressures such as livestock incursions and land-use changes impacting on migration routes and water catchments. The Tsavo Research Station has a vital role to play in designing and leading the management response to these emerging ecological management issues, and in coordinating the responses of other TCA management sections.

Maintaining the balance between conservation and development

A particular area where the Ecological Management Programme and the Tsavo Research Station will need to provide leadership is in understanding and maintaining an appropriate balance between the need to conserve the key ecological features of the TCA on the one hand, and the need to permit rational and appropriate development of the protected areas on the other. For example, as detailed in the Tourism Management & Development Programme, tourism in the TCA has the potential of making a significant economic contribution towards the costs of conserving and managing the extensive land area that comprises the TCA, as well as demonstrating that the TCA is being actively used for the benefit of Kenyans nationwide. However, inappropriate tourism can severely undermine the exceptional natural resources upon which the tourism industry depends, and which provide other benefits to the nation. A guiding principle for the Ecological Management Programme and for the work of the Tsavo Research Station will be to both understand the delicate balance between conservation and development in the area, as well as to design and implement management actions to maintain this balance.

Understanding and monitoring the dynamics of the ecosystem

The TCA is made up a diverse array of habitats and landscapes, ranging from moist mountain forest in the Chyulu highlands to arid grasslands and woodlands in the lowlands. Historically, fire and elephants have had a major impact on TCA ecosystem dynamics; both these factors have been heavily influenced in the past, and continue to be influenced, by man. The other major determinant in this predominantly dry ecosystem is water. Like fire and elephants, water availability in the TCA is heavily influenced by man, negatively by extraction and pollution by the growing tourism infrastructure, and positively through the creation of arti-

ficial water supplies that support greater abundance and diversity of wildlife. A guiding principle of the Ecological Management Programme is the need to carry out ongoing monitoring and targeted applied research to understand these and other key determinants of the dynamics of the TCA ecosystem, and how these factors are changing over time and with human influences. This requires an improved understanding of which changes are natural and acceptable aspects of ecosystem dynamics and which are undesirable changes driven by human impacts.

Preservation of vital ecological processes

As noted previously, the TCA is an arid, water dependent area, and the health of the ecosystem largely depends on the major river systems flowing into the TCA from the greater landscape. The catchments for these river systems are increasingly threatened by human population expansion and land-use change. Uncontrolled water extraction for commercial agriculture, coupled with catchment degradation from erosion and siltation, represent serious problems for all of the TCA's major rivers. Similarly, many of the TCA's large mammal populations, especially elephants and large carnivores, depend on dispersal areas and migration corridors well beyond the boundaries of the TCA, and these too are coming under increasing human population pressures. Growing human populations and human activities in areas surrounding the TCA represent a major threat to the viability of the essential ecological processes on which the TCA's exceptional biodiversity and diverse habitats depend. Recognising the interdependence between the TCA's ecological processes and human-induced changes in the greater landscape, a guiding principle of the Ecological Management Programme will be to implement appropriate management actions aimed at addressing land-use and other human-induced changes in the greater TCA landscape. Because of KWS' restricted mandate beyond the boundaries of the TCA, this will necessarily involve collaboration with other agencies, communities and landowners that have the mandate to address land use and development issues in these areas.

Targeting ecological management action

The following tables present the TCA conservation targets and the threats to conservation targets as identified by participants at Ecological Working Group Meeting #1 using the Nature Conservancy's Conservation Action Planning (CAP) methodology. The threat matrix presented in Table 29 was used as a basis for the identification of possible management actions, which are set out in the subsequent sections.

Table 28: TCA Conservation targets

<i>Conservation target</i>	<i>Rationale for selection</i>	<i>Important subsidiary targets</i>	<i>Key ecological attributes</i>
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ECOLOGICAL MANAGEMENT PROGRAMME

	Conservation target	Rationale for selection	Important subsidiary targets	Key ecological attributes
Systems	River & Lake systems	A vital and limited resource in the TCA, and essential for the survival of the TCA wildlife populations. Key water resources include the Tsavo, Voi, Galana, and Tiva Rivers, and Lake Jipe. Under threat from intensifying water use and conversion of catchments.	<ul style="list-style-type: none"> ▶ Fish species (<i>Tilapia jipe</i>, African lungfish) ▶ Reptiles and amphibians (e.g. Nile crocodile, African reed frog) ▶ Riverine vegetation, swamps and Lake Jipe wetlands ▶ Riverine bird species (e.g. Lake Jipe heronry, African darter) 	<ul style="list-style-type: none"> ▶ River regime (flow and level) ▶ Water quality ▶ Catchment forest ▶ Riparian habitat ▶ Fish species composition and size
Habitats/ Communities	Mountain Forests	Vital catchment forests feeding water sources in Tsavo West, including Mzima Spring. Also provide refuge for important species such as black rhino and forest hog.	<ul style="list-style-type: none"> ▶ Sandalwood ▶ Greater kudu ▶ Giant forest hog 	<ul style="list-style-type: none"> ▶ Forest canopy cover ▶ Tree species composition ▶ Forest extent and size
	Acacia-Commiphora bushland/grasslands	The predominant habitats in the TCA. A significant amount of variation has been observed in between bushland and grassland habitats, which has been attributed to a number of factors including elephants and fire. Threatened by livestock incursions, invasive species and mining.	<ul style="list-style-type: none"> ▶ Browsers: lesser kudu, Dikdik, gerenuk, eland ▶ Grazers: zebra, oryx, giraffe ▶ Birds: Raptors, ostrich ▶ Inselbergs (and cycads) 	<ul style="list-style-type: none"> ▶ Extent of bushland and grassland ▶ Ratio of woody-grass species ▶ Forage quality and quantity ▶ Surface water availability ▶ Ungulates species composition and size
	Riverine Habitats	A highly restricted but ecologically vital habitat in the TCA. Found along the area's major rivers, and provide refuge for a large number of animal species.	<ul style="list-style-type: none"> ▶ Waterbuck ▶ Birds: hammerkop (<i>Scopus umbretta</i>) and fish eagles ▶ Key plant species: <i>Acacia nilotica</i>, <i>Zygium</i> species 	<ul style="list-style-type: none"> ▶ Forest canopy cover ▶ Tree species composition ▶ Forest extent and size ▶ River regime (flow and level)
	Large Carnivores	Highly threatened, yet play an ecologically (and economically from a tourism perspective) essential role in the TCA. Wild dogs are classified as endangered by IUCN. Grouped together as they face common threats including human-wildlife conflict, poaching and closure of dispersal areas.	<ul style="list-style-type: none"> ▶ Cheetah ▶ Wild dog ▶ Lion 	<ul style="list-style-type: none"> ▶ Population size and structure ▶ Genetic diversity ▶ Habitat size and quality, and connectivity ▶ Prey species availability
Species	Elephants	Classified as vulnerable by IUCN. Current population remains well below records from late 1970's. Play a key role in maintaining TCA habitats, especially grasslands.	<ul style="list-style-type: none"> ▶ Other species that migrate or disperse outside the TCA (e.g. carnivores, see above, buffalo, eland) 	<ul style="list-style-type: none"> ▶ Population size and structure ▶ Migration/dispersal areas (sufficient habitat) ▶ Water availability

Conservation target	Rationale for selection	Important subsidiary targets	Key ecological attributes
<i>Black rhino</i>	Classified as critically endangered by IUCN. Global population declined drastically over last 30 years. TCA populations remain small, isolated and vulnerable.	--	<ul style="list-style-type: none"> ▶ Population size, recruitment and structure ▶ Genetic diversity ▶ Habitat size and quality (water and forage)
<i>Grevy's zebra</i>	Endemic to northern Kenya and southern and eastern Ethiopia; classified as endangered by IUCN. Introduced into the TCA, but current TCA population is not ecologically viable.	--	<ul style="list-style-type: none"> ▶ Population size and structure ▶ Genetic diversity ▶ Habitat size and quality
<i>Hirola</i>	Classified as critically endangered by IUCN, and is one of the world's rarest antelopes. Introduced into the TCA. Current population around 100.	--	<ul style="list-style-type: none"> ▶ Population size and structure ▶ Genetic diversity ▶ Habitat size and quality

Table 29: Threats to TCA conservation targets

Threat \ Target	River & Lake systems	Mountain Forests	Acacia-Commiphora bush/grasslands	Riverine Habitats	Elephants	Large Carnivores	Black rhino	Grevy's zebra	Hirola
Threat									
Poaching ²	Medium (Jipe)	High (logging)	High (bushmeat)		High	High	High		
Tourism infrastructure/activities ³			Medium	High	Low	Low			
Human-wildlife conflict ⁴					High	Medium			
Livestock incursion ¹			High	Medium					
Land use changes	Very High		High (outside TCA)		High	High			
Unprescribed fire	Very High	Very High	High	High					
Water abstraction	Very High								
Pollution	High								
Sand extraction	Low								
Siltation	Very High								
Charcoal burning ¹		Very High							
Sandalwood extraction ¹		Medium							
Elephants			Medium	High					
Invasive species			Medium	Medium					
Mining ¹			Medium						
Drought	High		High	High	High		High		
Disease						Medium			
Declining prey species						Medium			
Inbreeding							Medium	Medium	Medium
Over population (sanctuary)							Medium		
Extraordinary predation								High	High
Skewed sex ratios								Very High	

² Covered under PA Operations Programme

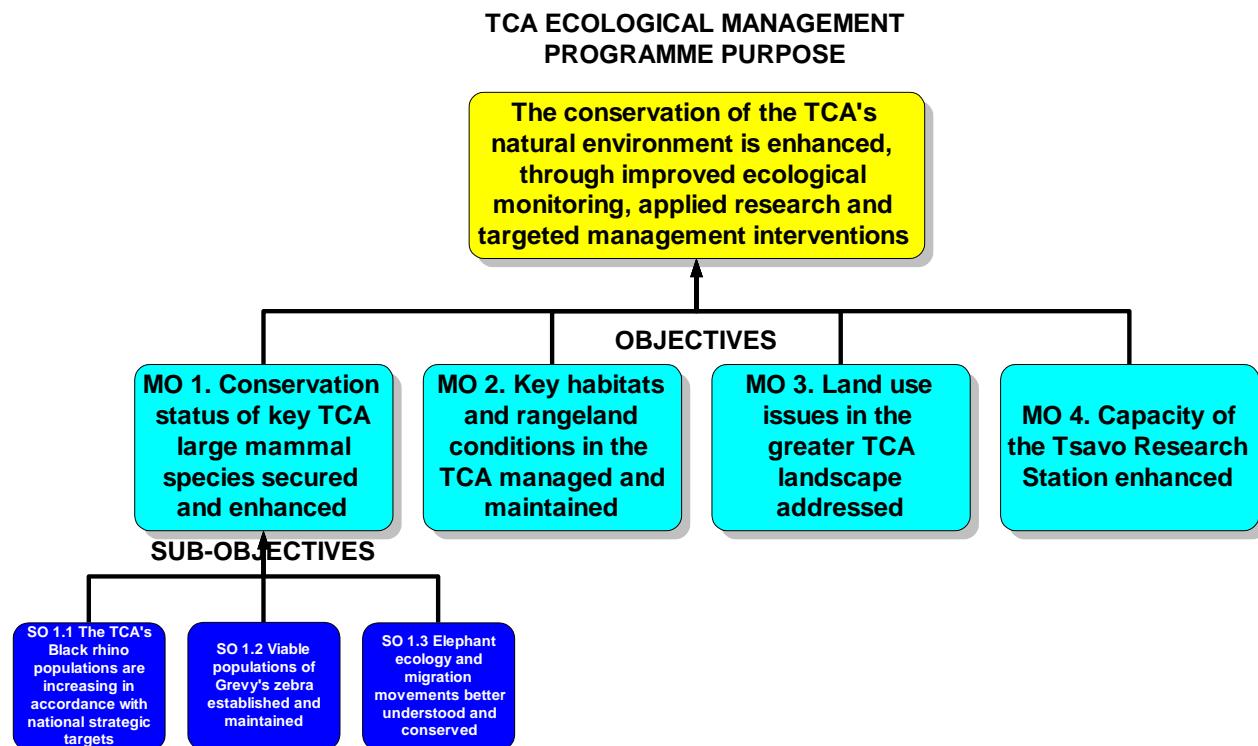
³ Covered under Tourism Management Programme and Zonation Scheme

⁴ Primarily covered under Community Partnership and Education Programme

Management objectives

Figure 13 below shows the objectives tree for the TCA Ecological Management Programme, which is based on the analysis of the TCA Conservation Targets, their Key Ecological Attributes, and the threats impacting on the targets and KEAs, as described in the previous section.

Figure 13: Ecological Management Programme objectives tree



Each of these management objectives, and their subsidiary sub-objectives and management actions are set out in the following sections.

Objective 1: The status of key TCA large mammal species secured and enhanced

The desired future state of the TCA that this objective aims to bring about is one where the species-level conservation targets are effectively managed so as to ensure their continued survival in the TCA. This objective has three sub-objectives, each of which focuses on ensuring the conservation of one of the TCA's critically endangered or vulnerable large mammal species that have been selected as conservation targets: Black rhinos, Grevy's zebra and elephants. The two other species-level conservation targets (hirola and large carnivores) are addressed through management actions under Objective 4, which sets out further research and studies to be undertaken, and through the monitoring activities specified in the TCA Ecological Monitoring Plan framework (see Table 30).

Sub-objective 1.1: The TCA's Black rhino populations are increasing in accordance with, and contributing to, national strategic targets

Black rhino (*Diceros bicornis*) suffered a catastrophic decline across Africa in the 1970s and 1980s, both in population size and range. Numbers plummeted from an estimated 65,000 in 1970 to less than 2,500 by 1992. The decline in the eastern Black rhino subspecies (*Diceros bicornis michaeli*) in East Africa was particularly severe, and in Kenya, Black rhino numbers fell from an estimated 20,000 in 1970 to under 400 animals by the 1990s. TENP was one of the most severely impacted areas, and the population underwent a massive decline from over 5,000 in the late 1960s to two individuals by 1991. In response to this situation, KWS developed a National Conservation and Management Strategy for the Black Rhino. The first and second editions of this strategy have successfully overseen a steady increase in Black rhino numbers over the last 15 or so years; the third edition of the strategy has recently been developed, and will be implemented from 2007-2011.

This sub-objective has been developed to ensure that the conservation and management of the TCA's Black rhino populations is directly contributing to the revised national strategy's goals. Although the 2007-2011 strategy retains the vision from the previous two editions of "conserving *in-situ* at least 2,000 black rhinos in natural habitat in Kenya", the updated strategy sets out a number of actions that will move Kenya into a new phase of conservation of black rhino over next few years. The strategy states that, while maintaining a minimum population growth rate of 6% per annum in established sanctuaries, the target of 2,000 Black rhinos cannot be achieved within fenced areas alone, and therefore remaining intact habitat needs to be secured and availed to accommodate the spill-over of Black rhinos from sanctuaries that have reached ecological and/or social carrying capacities.

The TCA will play a vital role in the new strategy's successful implementation, and in particular the aim of establishing a free-range population of 150 animals in Kenya. This is not only due to the current free-ranging populations in Tsavo East and Chyulu Hills, but also thanks to the lessons learnt from the reestablishment and ongoing management of the free-ranging TENP population. In addition, TWNP will also play an increasingly important role in the conservation and management of the national population, both by efforts to maintain, and if possible enhance, the current rate of population increase in the Ngulia Sanctuary, and also through the establishment of a free-ranging population in the rhino "Intensive Protection Zone" that will be developed adjacent to the existing sanctuary in TWNP.

The management actions that have developed to ensure that the TCA's Black rhino populations are increasing in accordance with, and contributing to, the national strategic targets are set out in the following paragraphs. Additional management actions regarding law enforcement are included in the Security Programme under Action 1.5.

Action 1.1.1: Enhance rhino monitoring and surveillance in Tsavo East and Chyulu NP

The reestablishment of ecologically viable and self-sustaining black rhino populations in the TCA is still at relatively early stages, and all of the area's populations remain fragile and highly susceptible to a number of potential impacts (such as poaching, disease, or intra-specific competition) that could easily undermine the success of the species in the area. As such, the monitoring and surveillance of all rhino populations, and in particular the TCA's two free-ranging populations in CHNP and TENP, is essential for informing TCA managers on the overall status and trends in these rhino populations, and as basis for the implementation of

the management actions under this sub-objective. The importance of monitoring is reflected in the Black rhino conservation and management strategy, which has the development of a “*standardised monitoring system to provide information for efficient protection, metapopulation management and programme implementation*” as one of its key strategic objectives. The strategy goes on to highlight that “*without good quality monitoring data, one cannot make informed biological management decisions and one also cannot properly assess progress towards meeting the [strategy’s] overall goal.*”

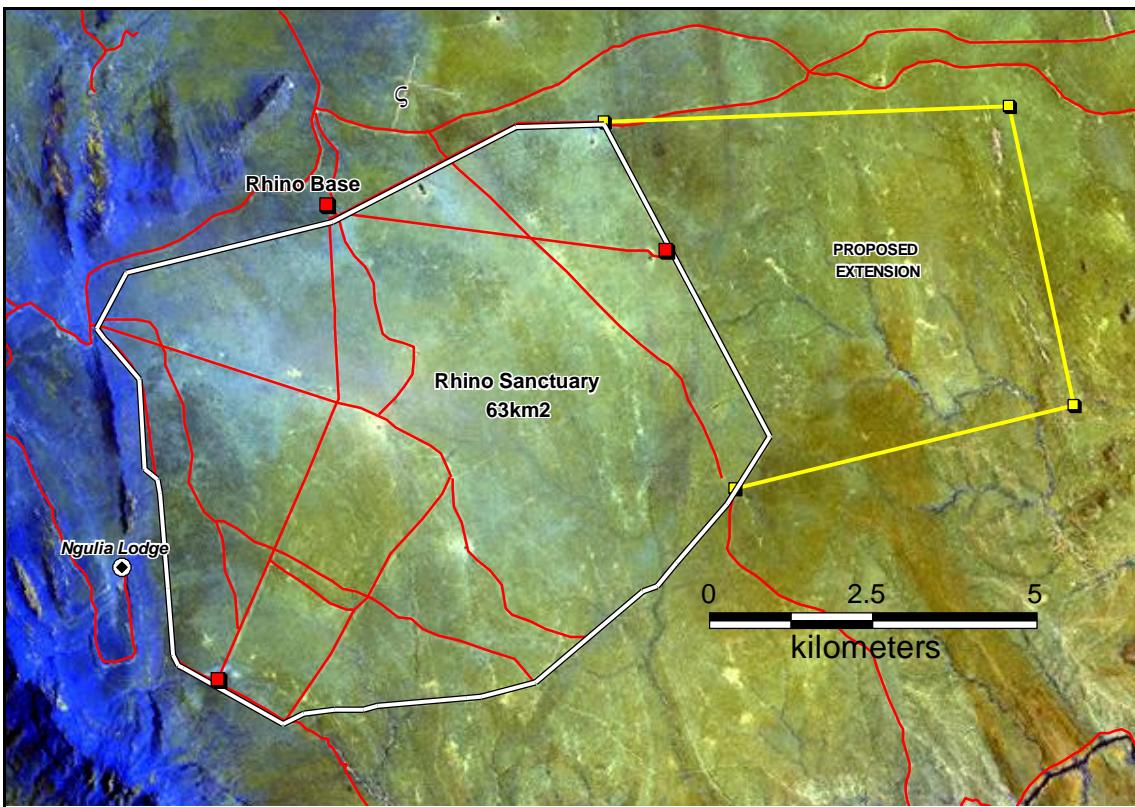
As such, in conjunction with KWS Rhino Monitoring team, and in accordance with the strategy’s guidelines and the TCA Ecological Monitoring Plan (see below), information will be regularly collected, collated and disseminated on population dynamics (including the number of rhinos and population growth rates), reproductive health (such as age at first calving and average inter-calving intervals), and health condition, as well as factors that may be affecting performance (e.g. density of browsers, rainfall, etc). The collection of this information will involve a number of key steps including: the deployment of an officer to specifically oversee security, monitoring and management of free-ranging rhino populations in the TCA, and the implementation of a standardised monitoring and reporting system, in accordance with AfRSG recommended standardised age and condition classes. To further enhance monitoring, additional indirect monitoring techniques will also be implemented in CHNP, where terrain makes direct sightings difficult, and some rhinos will be ear-notched and fitted with radio transmitters in Tsavo East. In order to ensure that the best possible use is being made of the available manpower and resources, additional training in monitoring and a review of the overall effectiveness of the rhino-monitoring unit will also be carried out.

Action 1.1.2: Improve availability and quality of rhino habitat in and around Chyulu NP

Although relatively small, the free-ranging population in CHNP is one of the two populations considered indigenous to Kenya (the other being the Masai Mara NR population), and it is therefore vitally important for the conservation of the eastern Black rhino subspecies. However, due in part to the limited availability of water within the PA, the current range of this population extends beyond the CHNP boundaries into open areas north of the Kiboko River, the Kibwezi Forest Reserve on the east, and the Amboseli Group Ranches to the west. Although the population is relatively secure within the park, both population pressures and land uses are intensifying in the dispersal areas that are currently used by rhinos, a trend that is set to continue during the implementation period of this plan. Complementary to Action 1.3.1 below, which focuses on KWS collaboration with KFS in improving conservation and management of Kibwezi Forest Reserve, activities under this action focus on improving the habitat within CHNP itself through, EIA permitting, the development water points in Mukururo. These activities will take place in conjunction with efforts to collaborate with KARI in the development of land uses that are compatible with rhino conservation on land adjacent to the CHNP.

Action 1.1.3: Complete expansion of Ngulia Rhino Sanctuary

The Ngulia Rhino Sanctuary in TWNP was established in 1984 as an area where surviving rhinos in the TCA could be protected from the intense poaching pressure the area was suffering at that time. Originally covering just 3 km², the area was extended in 1987 to 17 km², to 64 km² in 1990, and is currently being extended to around 90 km² (shown in Figure 14 over-page). This extension is in line with the national strategy of maintaining rhino numbers below the ecological carrying capacity of their habitat in order to achieve maximum population growth.

Figure 14: The Ngulia Rhino Sanctuary and extension

Action 1.1.4: Create rhino Intensive Protection Zone in Tsavo West NP

An Intensive Protection Zone (IPZ) is defined in the national Black rhino conservation strategy as a definite zone within a larger protected area where law enforcement staff are deployed at moderate to high density with the specific aim of protecting a rhino population. An IPZ is designed to enable “*natural patterns of distribution and movement*” of a rhino population, which is not constrained by fencing or other methods of confinement. As discussed above, the national target of 2,000 Black rhinos cannot be achieved within sanctuaries alone, and remaining intact habitat needs to be secured to accommodate the spill-over of Black rhinos from fenced areas that have reached ecological and/or social carrying capacities. Towards this goal, the KWS Board in 2006 approved implementation of a rhino IPZ adjacent to the existing Ngulia Sanctuary in TWNP (the approximate area is shown in Figure 9 of the Zonation Scheme).

The TWNP IPZ will be one of the first IPZs to be established in the country, and increases in both the security staff and their capacity will be needed to secure the free-ranging rhino population. The national strategy specifies that at least 10 rhinos will be translocated to the area, and that a minimum ranger strength of 40 personnel is needed to secure the area. As a first step, a digital geo-referenced map of the IPZ will be produced to define the area and as a basis for the enhancement of security operations. There will also be a need to train trackers/staff in bushcraft and necessary monitoring skills, which will involve establishing an IPZ security and monitoring training programme as part of Manyani field training curriculum. Two years after the translocation of rhinos into the area, a formal independent assessment of the zone’s success will be undertaken.

Action 1.1.5: Monitor habitat quality and populations in the sanctuary and IPZ

Both the sanctuary and, once established, the IPZ, will have relatively high densities of Black rhino. Studies in other PAs in Kenya have shown that the quality of habitat available to rhinos, and in particular the abundance of woody vegetation that is the species-preferred food source, can have a major impact on the recovery of depleted rhino populations. The availability of specific food species has been shown to be impacted not only by browsing by Black rhinos themselves, but also as a result of elephants, unprescribed fire, and even livestock grazing. In addition to the monitoring of the TCA Black rhino populations (as set out in the TCA Ecological Monitoring Plan and Action 1.1.1), specific monitoring of the vegetation is necessary within the Ngulia Sanctuary and IPZ in order to ensure that the maximum growth rates of the rhino populations are maintained, and if necessary to inform management responses to improve the habitat available. Complementary activities to this monitoring of vegetation will include the intensive full moon waterhole photographic census during the dry season to establish the exact population in the Ngulia Sanctuary, and the piloting of thermo-imaging technology to enhance security and monitoring.

Action 1.1.6: Implement community education and awareness programme for the park buffer zone community (CHNP)

As discussed above, the CHNP population is one of the two Kenyan populations considered indigenous to the country, and is therefore exceptionally important for the conservation of the eastern sub-species. In addition, animals from this population frequently use areas beyond the PA, where both human populations and land uses pressure are increasing. As such, complementary to efforts to improve the compatibility of land-use activities in these PA-adjacent areas with rhino conservation, an education and awareness campaign will be implemented in communities around CHNP to increase awareness of the importance of the rhino population to conservation, and its potential as a resource for wildlife-based tourism. This action will be carried out as a component of the wider programme of community awareness and education around the TCA implemented under Action 5.6 of the Community Partnership & Education Programme.

Sub-objective 1.2: Viable populations of Grevy's zebra established and maintained

Once distributed over large parts of northern Kenya, Somalia and Ethiopia, the current natural range of Grevy's zebra (*Equus grevyi*) is now restricted to a portion of northern Kenya, and a small section of southern Ethiopia. Recent estimates put the number of Grevy's zebra in Kenya at around 1,600-2,000 individuals (and at less than 130 in Ethiopia), which represents an approximate decline of 85% in numbers over the past three decades. In response to this drastic decline in numbers, and as only 0.5% of Grevy's zebra natural range in Kenya falls within protected areas, a number of Grevy's zebra were introduced to the TCA in the early 1960s and late 1970s in order to provide a safe refuge and as such enhance the conservation of this highly endangered species.

This sub-objective has been developed to ensure that viable populations of Grevy's zebra in the TCA are established and maintained, and are contributing to the vision set out in the National Grevy's Zebra Conservation Strategy of establishing "*viable and sustainable Grevy's zebra populations and their habitats for present and future generations*". However, the current population within the TCA PAs remains very small (stated as between 18-50 in the National Grevy's Zebra Strategy, distributed in both TENP and TWNP, although additional individuals are found on the Taita ranches), and is unlikely to be ecologically viable due to very

low population densities and highly skewed sex ratios. As such, in order to ensure that this sub-objective is achieved, and that an ecologically viable population of Grevy's zebra is established in the TCA, a number of management actions have been developed; these are elaborated in more detail in the following sections.

Action 1.2.1: Establish Grevy's zebra site committee for the TCA

In the 40 years since their initial translocation to the TCA, Grevy's zebra have widely dispersed beyond the PA boundaries, and are now found in TENP, TWNP and on a number of the Taita ranches. As such, a coordinated and landscape-level initiative is needed to consolidate and streamline the conservation of this species across the area. The first step in achieving a coordinated approach to Grevy's zebra conservation is the establishment of a site committee, including representative from TCA-adjacent areas where Grevy's zebra are found, in order to guide and oversee conservation activities in the area focusing on this species. This will involve close liaison with the KWS HQ Species Conservation and Management Department, and the subsequent development of terms of reference for the committee. Once developed, potential members will be invited to an initial stakeholder meeting to review the ToR and the purpose of the committee. KWS will then support the operationalisation of the committee thought the provision of ongoing logistical support for its bi-annual progress review meetings.

Action 1.2.2: Carry out comprehensive census of Grevy's zebra population in and around the TCA

Currently, due in part to the wide dispersal of individuals described above, accurate data on the size and composition of the Grevy's zebra population in and around the TCA is not available. This baseline information on the status and health of the TCA Grevy's zebra population needs to be established before steps can be identified and implemented to ensure the continued conservation of the species in and around the TCA. As an initial step, a ground count of all individuals with the TCA PAs and in adjacent areas will be undertaken, along with photography of each individual to enable future identification. In addition, aerial counts of Grevy's zebra will be built into routine aerial surveys to triangulate and build on the data from the ground surveys. Specific studies may also be needed to ascertain the impacts of particular diseases on the population's increase, and potentially, the extent of hybridisation between Grevy's and Burchell's zebra and possible impacts that this may have had on the genetic integrity of the TCA population.

Action 1.2.3: Investigate feasibility of relocating purebred Grevy's zebra within a fenced sanctuary in the TCA

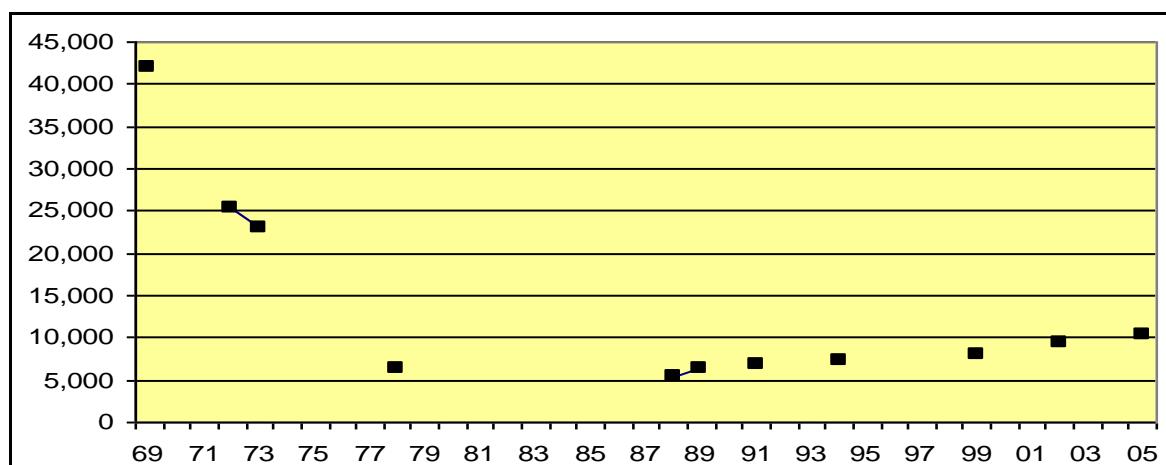
The small and widely dispersed TCA Grevy's zebra population faces a range of challenges to its viability and integrity. These include potential impacts from extraordinary predation (particularly from lions), disease (most notably anthrax which has had a large impact on the population of zebras within their natural range), and from genetic dilution from inbreeding with Burchell's zebra, often due to the highly dispersed nature of the TCA Grevy's zebra population and the inability to find a more suitable mate. The development of a fenced sanctuary into which genetically pure Grevy's zebra could be translocated to form the core of a breeding population, could go some way towards addressing many of these issues. However, the development of such a sanctuary and movement of animals would be an expensive undertaking, and may have negative ecological impacts on the greater TCA environment or the zebras themselves. As such a feasibility study on the establishment of a TCA Grevy's zebra sanctuary will be undertaken in conjunction with the with the Grevy's Zebra Task Force (in-

cluding an assessment of the potential locations and environmental impacts). If appropriate, and in line with recommendations from this study, a sanctuary will be established and Grevy's zebra moved into the area. In addition, subsequent liaison with the Grevy's Zebra Task Force about translocation of additional individuals to the sanctuary may be needed, in order to boost the sanctuary population or even out any imbalances in the age/sex structure.

Sub-objective 1.3: Elephant ecology and migration movements better understood and conserved

Elephants have been a major driving force in the conservation history of the TCA, and the dramatic fluctuations in their population numbers have had significant impacts on the appearance and ecology of the entire TCA. The most significant population trend in the recent past has been the dramatic population decline, as a result of both a severe drought (which killed off around 9,000 animals) and heavy poaching pressure, from an estimated high of just over 40,000 in the late 1960s, to about 7,000 by the early 1990s (see Figure 15 below). However, since the early 1990s, under an improved protection regime, numbers of elephants in the TCA have been steadily increasing at a rate of between four and five percent per annum and a total of 10,397 elephants were counted in and around the TCA in 2005.

Figure 15: TCA elephant population trends



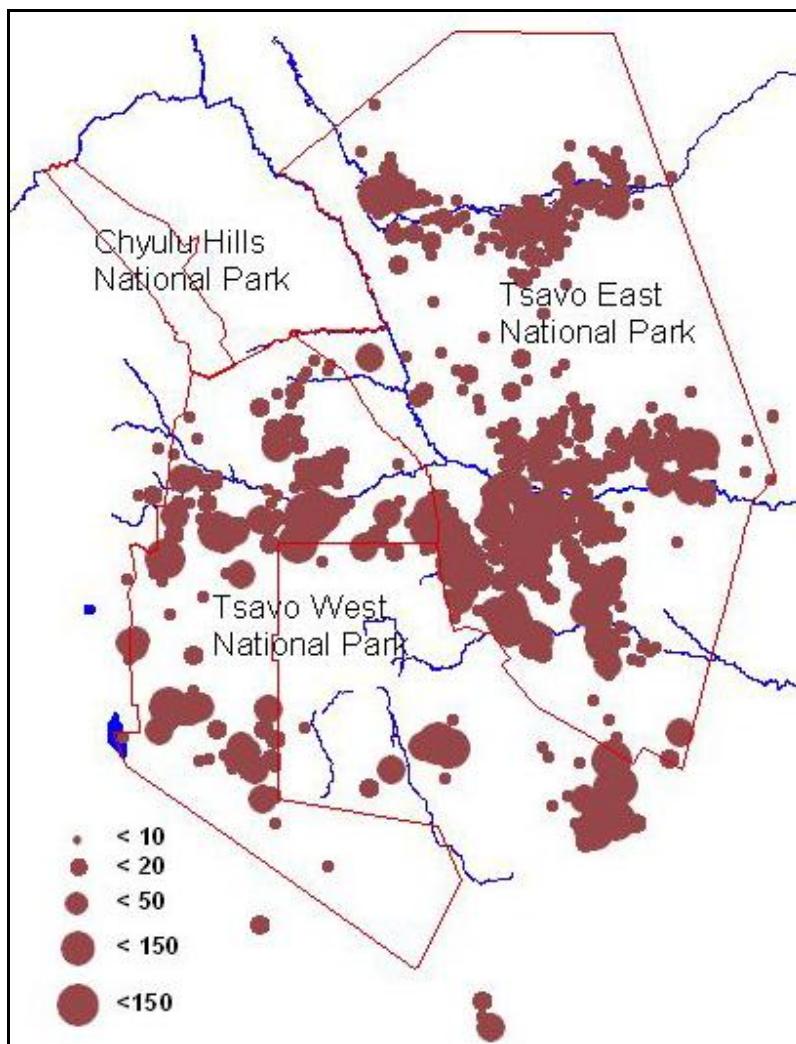
While these figures indicate a resounding recovery of this vulnerable species, concern has been expressed that the numbers may in the near future again increase to levels that may require active or more interventionist management. In addition, as shown in Figures 16 and 17 overpage, a significant proportion of the population migrates beyond the TCA boundary, and this is likely to increase if current population trends continue. If a larger population is to be sustained over the long term, management action will be needed to help ensure that these dispersal areas remain accessible to elephants from the TCA. As such, this sub-objective has been developed to help improve current understanding of the ecology and migratory movements of the TCA elephant populations, and to ensure that areas beyond the TCA's boundary remain accessible and suitable for elephants to use. The management actions that have been developed to achieve this objective are set out in the following sections.

Action 1.3.1: Collaborate with KFS in improving conservation and management of Kibwezi Forest Reserve

Although small, the Kibwezi Forest Reserve is strategically located close to the CHNP and TWNP, and as a result provides an important dispersal area for a number of species, including elephants, rhino and other large mammals. However, to date, this area has been signifi-

cantly impacted by a number of illegal activities, most notably timber extraction and bushmeat poaching, both of which disturb wildlife use of the area, and undermine its conservation value. In order to help address these issues, KWS will provide both technical and logistical support to Kenya Forest Service (KFS) operations within the Reserve. As is taking place in other areas where KWS and KFS are collaborating in the management of forest reserves, the first step in formally establishing this collaboration will be the inclusion of the Kibwezi Forest Reserve in the existing institutional-level Memorandum of Understanding between KWS and KFS. Once this step has been completed, the responsibilities outlined in this MoU will then be implemented at the field level, including the design and implementation of joint KWS-KFS security patrols in and around the Reserve.

Figure 16: Elephant distribution in and around the TCA

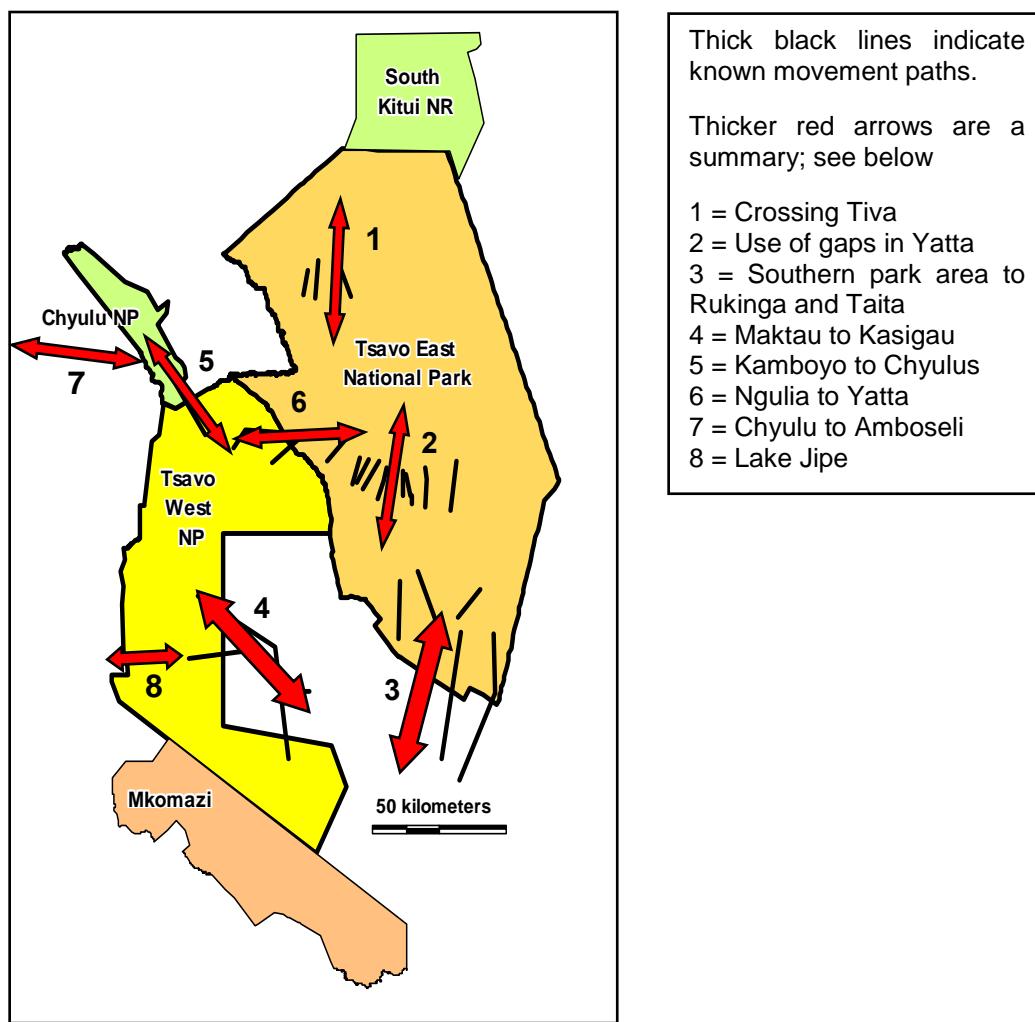


Action 1.3.2: Collaborate with greater TCA landowners in protecting key elephant migration routes and dispersal areas

As shown in Figure 17 overpage, some elephant migration patterns in and around the TCA are well known, such as those between TWNP and the Amboseli area, and between TWNP and TENP through the Taita Hills area. However, during the last one hundred years, and in particular over recent decades, these traditional migration routes have been continually curtailed by human settlements and intensifying farming practices; a situation that is particularly

severe around the Taita and Rukinga Hills areas. If, as is projected, elephant populations continue to increase at current rates, these migration routes and dispersal areas will become increasingly important, to enable the natural migrations of elephants between different parts of the TCA as well as forced movements in response to the shortages of water that periodically occur in the area, and that have been shown to have drastic impacts on the TCA's elephant populations. Therefore, although beyond the boundaries of the TCA and the immediate jurisdiction of KWS, through this management action, TCA management will take steps to help ensure that these traditional migration routes remain open and accessible to TCA elephant populations.

Figure 17: Known elephant migration movements in and around the TCA



As a first step towards achieving this aim, elephant migration routes and dispersal areas in the greater TCA landscape will be identified and mapped, in collaboration with external researchers, in order to build on the current and more general understanding illustrated in Figure 17 above. This will set the scene for the prioritisation of key migration routes and an identification of land-use trends in these areas and their likely impacts on elephant movements. Following on from this assessment, options for maintaining and/or enhancing key elephant migration routes (e.g. between TENP and TWNP through Taita ranches, and the Buchuma-Sagala Corridor) will be investigated, and activities subsequently developed, in collaboration with CWS and relevant greater TCA landowners, to help preserve the continued use of these areas by elephants. This may include, for example, MoUs will surround large land holders, covering issues such as PAC, fencing, land uses and other issues. Such an MoU is expected

to be developed and signed between KWS and Galana Ranch during the early stages of the implementation of this plan.

Action 1.3.3: Carry out applied ecological research on potential impacts and scenarios for managing increasing elephant populations in the TCA

As shown in Figure 15 above, there have been significant fluctuations in the TCA's elephant population over the last 40 years, and the current population of around 10,000 individuals remains well below the high recorded in the late 1960's of around 42,000 animals. At the time that this population high was recorded, there was an intense debate about culling of elephants in order to alleviate what was perceived to be their negative effect on the TCA's vegetation, and an offtake of 2,000 animals had been proposed by park scientists, although management was opposed to this action. These disagreements were however overtaken by events, notably a severe drought followed by intense poaching, which reduced numbers to around 10% of their former size, and the proposed cull never took place. However, recent population surveys project a doubling of the population in a little over 15 years, and concern has been expressed that the numbers may again increase to the levels that precipitated discussions on active management in the late 1960s, especially as both land use and population pressure have intensified during the intervening time period and the area's carrying capacity is likely to have been reduced as a result. It is therefore imperative that research into management scenarios regarding elephants be undertaken during the early stages of the implementation of this plan in preparation for informing management should it again become necessary to advocate one type of management approach over another.

In order to achieve this, TCA research scientists will carry out an assessment of potential alternative elephant management scenarios for the TCA (e.g. non-intervention in some and active management in other areas). This will be complemented by the design and commissioning of a study on elephant population dynamics in the TCA and likely future trends in elephant numbers and density, which will be undertaken by an external researcher, and which will inform management of the potential severity of any future problems. Complementing these activities, efforts will also be stepped up to establish the impact of the current elephant populations on the TCA's ecology. This will involve rehabilitating existing vegetation exclosures, establishing vegetation monitoring databases, based on fixed point photography in selected parts of the TCA, and acquiring 1950s photos to provide baseline data for vegetation changes that have occurred in the area. In addition, further attention will be paid to the translocation of elephants to the TCA, through the establishment of protocols to guide the future translocation of elephants to the TCA (including monitoring, research and husbandry techniques), and increasing the post translocation monitoring of individuals introduced to the area.

Objective 2: Key habitats and rangeland conditions in the TCA managed and maintained

In the last 100 years, the TCA, and especially Tsavo East, has undergone significant vegetation changes. For example, when the park was first established, the area between Voi and Aruba was dominated by thick *Commiphora* bushland; however, by the late 1960s significant areas in the park south of the Voi River had been converted to open grassland, primarily as a result of high elephant numbers in the area. Subsequently, following the drastic reduction in elephant numbers during the 1970s (discussed under sub-objective 1.3 above), bushland vegetation in these areas has once again increased. The other major cause of vegetation change in the TCA is fire, which has played a pivotal role in the opening up of large areas of

Tsavo East, especially when combined with bush removal by elephants, and as a result of the high number of fires started along the main road and railway line in the west of the park. Fires are also an annual feature in the Chyulu Hills, and there is some concern that this may be having an impact on the forest fragments on the crests of the hills. Other factors impacting on habitat and rangeland conditions in the TCA result more directly from human activities in the area and include: the establishment of supplemented water supplies; the development of tourism facilities; and the introduction of invasive species into the PAs.

The desired future state that this objective aims to achieve is one where the wildlife habitat and rangeland conditions in the TCA are optimally managed and maintained, so as to conserve the natural vegetation cycles and habitat dynamics in the TCA, while also supporting the conservation of critical and sensitive habitats in the area. In order to achieve this desired future state, seven management actions have been developed that address threats impacting on the three TCA's habitat-level conservation targets: mountain forests; *Acacia-Commiphora* bush/grasslands; and riverine habitats. In contrast to the programme's other objectives which typically focus on addressing threats to specific conservation targets, the actions under this objective address cross-cutting issues or threats impacting on all three conservation targets (e.g. fire, tourism developments and invasive species). The seven actions designed to achieve this objective are elaborated in more detail in the following sections.

Action 2.1: Raise awareness of fire risk and impacts of unprescribed fire on TCA ecology

As mentioned above, a high number of unprescribed fires enter the TCA from surrounding community lands, or originate along the main Nairobi-Mombasa highway. These unprescribed fires not only have a serious impact on the area's ecology but also reduce the effectiveness of prescribed fire as a management tool, and undermine the ability of management to assess the overall effectiveness of prescribed fire management strategies. The high incidence of these fires is due to a low awareness of the risks and impacts of unprescribed fire on the TCA's ecology among users of the main road, and, in the case of community areas, of alternative practises or measures that can be taken to reduce the risk of fires getting out of control and entering the TCA. This action therefore aims to improve overall awareness of both the risks and potential impacts of fire on the TCA's conservation. The two main target groups for this action are users of the main Nairobi-Mombasa highway, where the number and visibility of signs warning about the risks of fire will be improved, and TCA adjacent communities, where activities will focus on first enhancing understanding of fire occurrence, location and seasonality in consultation with the communities, and thereafter raising community awareness of fire prevention measures and best practices.

Action 2.2: Improve the response to unprescribed fire

An essential complement to efforts to reduce the incidence of fires in the TCA (discussed above), is improving management response and capacity to fight unprescribed fires once they have occurred within the area. This will be achieved through two main approaches pursued through the activities under this action: enhancing the identification of unprescribed fires; and building the capacity of management to respond to unprescribed fires once identified. As a precursor to the development of these approaches, fire preparedness guidelines will be developed for the TCA, in liaison with the KWS rapid response unit. These guidelines will pave the way for the enhanced detection of wildfires through the development of fire watchtowers at appropriate points in the TCA, which will be complemented by aerial reconnaissance. In addition to these activities, a TCA rapid response unit will be established to

enhance the capacity of TCA managers to respond quickly and efficiently to unprescribed fires once they have been detected.

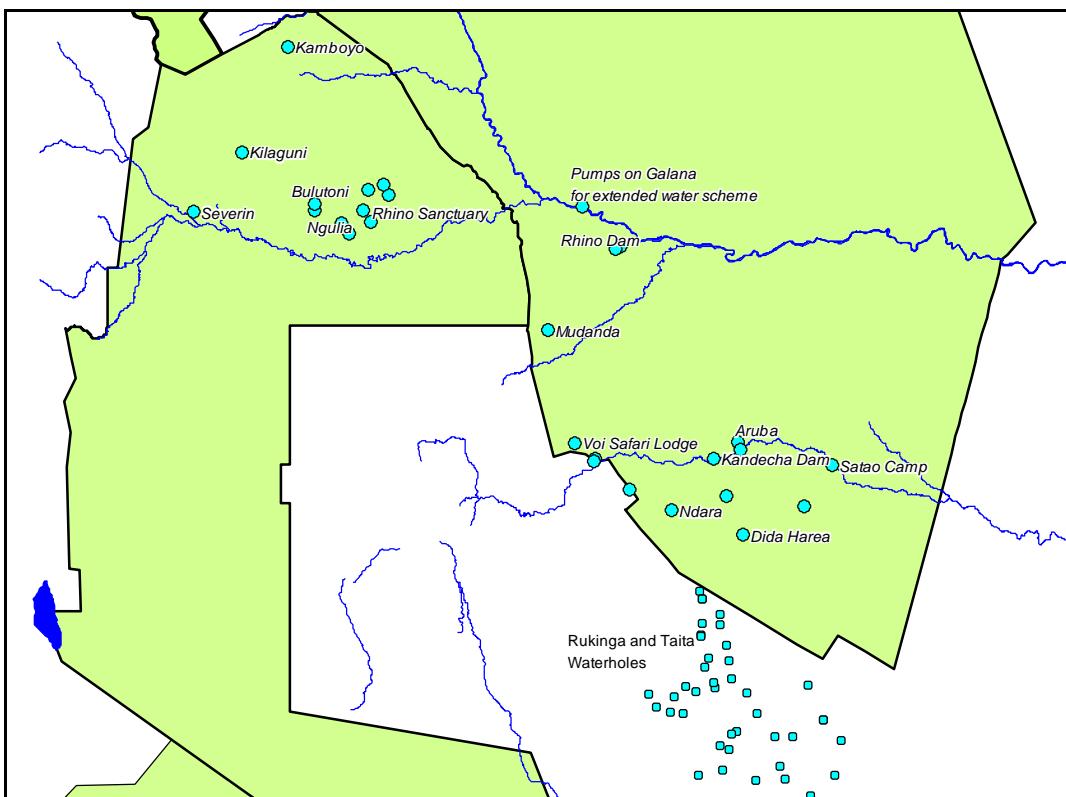
Action 2.3: Implement improved fire management measures

Fire has been a significant modifier of habitat in the TCA, especially in TENP, where fires have had an increasing impact following the removal of large areas of bushland by elephants. Most fires enter the TCA from the east (the direction of the prevailing wind), but a high number are also started along the main highway and railway line in the western parts of the TCA. Up until now, the majority of fire management in the TCA has been responding to such unprescribed fires, rather than focusing on harnessing the potential benefits of prescribed fire to the overall ecological health of the TCA and its habitats. This action therefore focuses on the development of a pilot prescribed fire management programme for the TCA, based on KWS fire policy guidelines and current best practice. The pilot programme aims to maximise the potential contribution of fire to the area's conservation, and ensure a coordinated approach to fire management across the entire TCA. Once piloted, the prescribed burning regimes will be rolled out more widely across the TCA in line with the experience of the pilot programme. Monitoring and periodic review of the programme's implementation and impacts will also be undertaken, and fire management practices subsequently adapted in line with the resulting recommendations. This will involve the reestablishment of fire plots to ascertain the impacts of the new burning regimes, and the potential use of remote sensing information, such as the Fire Early Warning System (FEWS) or MODIS, to enable the impacts of fire management methods and burning regimes to be assessed.

Action 2.4: Improve TCA wildlife watering points in response to prevailing and desired wildlife distributions

The Tsavo parks are located in a very dry area that is prone to frequent droughts, and at the peak of the dry season reliable water supplies are few and far between. In response, TCA management has developed a number of supplemented water points since the parks' creation, with the aim of improving wildlife habitat (see Figure 18 overpage). Some of these projects have been quite ambitious; however, in recent years many have suffered from neglect and some are no longer functioning. This, combined with the fact that most visitor accommodation facilities in and around the area have also established their own waterholes to attract wildlife, has resulted in the haphazard development of supplemented water across the TCA, with little or no strategic planning or knowledge of its environmental impacts, and in particular its possible effects on wildlife distribution and numbers.

This management action will therefore focus on developing this understanding, and on ensuring that the potential benefits from supplemented water are maximised, and any potential negative impacts are mitigated. An important first step in this process will be undertaking a complete inventory of supplemented water sites within the parks (building on the work done as part of the resource inventory during the development of this management plan). This assessment will be complemented by a fact-finding visit to other parks that have extensive supplemented water schemes. This will provide a foundation for the development of guidelines to ensure that all future supplemented water developments in the TCA are appropriate, and have minimal environmental impacts. Once developed, existing water sources will be assessed, and rationalised where necessary, in accordance with the new guidelines. (A specific study of the potential impacts of supplemented water in the TCA, and in particular relating to wildlife distributions, will be implemented under Action 4.4 of this programme.) In addition, TCA management will also improve collaboration with the Ministry of Water to reduce leakage along the Mzima Springs pipeline, and in particular in community areas where water is attracting elephants and increasing human-wildlife conflicts.

Figure 18: Location of supplemented water in the TCA

Action 2.5: Minimise the ecological impact of TCA tourism facilities

As discussed in more detail under the Tourism Development and Management Programme, the TCA, and especially the northern parts of TWNP and southern parts of TENP, has a relatively high density of tourism accommodation facilities, many of which are located in sensitive habitats such as riverine forests or inselbergs. Although both national and KWS regulations exist to minimise the negative environmental impact of these facilities, such as the requirement for an annual environmental audit, to date these have not always been rigorously observed, and recommended improvements have often not been implemented. As such, these facilities have sometimes had an unnecessarily large impact on the quality of the TCA's environment. This action, linked to Action 3.1 of the Tourism Programme, therefore focuses on the implementation of these regulations in order to ensure that the ecological impact from tourism facilities in the TCA is minimised. This will be achieved through a number of activities including regular inspections of TCA accommodation facilities to ensure compliance with EIAs and annual environmental audits, and working with facility managers to replace the use of ornamental exotic species around tourism facilities with indigenous species. (A study to identify appropriate indigenous ornamental plant species will be implemented under Action 4.4, see below).

Action 2.6: Eradicate and control invasive species in key TCA habitats

As mentioned under the previous action, a number of the older lodges and management facilities have exotic species growing around them, but this is not at present a major issue and generally appears to be under control. However, other areas of the TCA are more severely impacted by invasive species, this includes high incidences of *Lantana camara* along the Tiva River, *Datura stamonium* at Kanderi Swamp, *Prosopis juliflora* at Aruba, and a variety of

invasive species that occur along the Nairobi-Mombasa highway. Although these exotics are not presently having a major impact on the overall ecology of the TCA, this problem does have significant potential to develop in the future. As such, this action has been included in this plan to ensure that the potential threat of exotic species is mitigated *before* it becomes a major issue, and before it requires significant investment in time and resources to combat.

However, the distribution and abundance of key invasive species (such as *Lantana*, *Cassiam* and *Prosopis*) across the TCA is not currently well understood. Therefore, as a first step to addressing this problem, exotic species will be mapped, and then monitored, as a basis for prioritising management action to combat the spread of these species. Before implementing large-scale eradication measures, TCA management will review KWS invasive species guidelines and best practice (drawing on experience from CABI and the KWS Forest Section), followed by the design and piloting of experiments for removing/managing the most aggressive and damaging invasive species. If successful, and subject to modification based on the pilot experiments, the eradication/management programmes for particular species will then be rolled out to other priority areas as appropriate. Complementary to this approach, TCA management will also investigate options for controlling particular invasive species upstream of the TCA, including the replanting of native species in seriously degraded areas.

Objective 3: Conservation of key river systems and wetlands in and around the TCA enhanced

The vast majority of the TCA is exceptionally dry, and much of the area's wildlife is dependent on water from the rivers that flow through the area, especially during the dry season when other sources of water in the TCA dry up. These dry season water sources are not only important for many of the area's resident wildlife species, but also for the TCA's riverine forest and other habitats, such as swamps and wetlands. All of the area's major rivers (the Athi/Galana, Voi, Tiva and Tsavo) have their headwaters beyond the TCA's boundaries, and of these, the Tsavo River, which has its source on Mt. Kilimanjaro, is the only perennial river in the TCA. The other principal water source in the TCA is Lake Jipe, located in the south of TWNP, which is fed by the Lumi River.

Increasing populations and an intensification of land-use practices in the catchment areas of these rivers has resulted in increased diversion of water to support agriculture and other economic activities in areas upstream of the TCA. This has not only resulted in decreases in the quantity of water entering the TCA, especially during the critical dry season, but has also impacted on the quality of water in these rivers, primarily through increased pollution and siltation. Any further increases in the extraction of water that would otherwise have entered the TCA, or a serious reduction in the quality of water entering the area, could have serious consequences for the area's ecology, and in particular its ability to maintain high wildlife population densities.

This sub-objective has been developed to ensure that the quantity and quality of water in key rivers supplying the TCA are maintained, and that other critical wetland habitats in the area (such as Lake Jipe) are conserved. Many of the threats to the conservation of the TCA's rivers and wetlands are located well beyond the boundaries of the TCA; and addressing these threats is beyond KWS' immediate mandate. However, if left unaddressed these threats are likely to have severe and far-reaching impacts on the TCA's ecology and wildlife populations. This objective therefore sets out four management actions designed to ensure the conservation of river systems and wetlands in and around the TCA, each of which focuses on

strengthening collaboration with and supporting the work of those stakeholders in the wider TCA landscape that have the jurisdiction and wherewithal to address the emerging threats, in particular the Water User Associations and the National Environment Management Authority. The four management actions are elaborated in the following sections.

Action 3.1: Promote sustainable water use in TCA catchment areas

As discussed above, all of the TCA's major rivers have their headwaters well beyond the boundary of the TCA. Both land uses and population pressure has intensified in these areas over recent years, a trend that is set to continue during the lifespan of this plan, and this has led to increasing demands for water from rivers feeding the TCA. It is suspected that the increasing extraction of water from these rivers has already contributed to the extended dry period that has been observed in some rivers (such as the Galana). If this trend continues, the supply of water vital for the continued conservation of the area's biodiversity is likely to be significantly impacted over the next 10 years. In order to establish the current and likely future impacts of water extraction on TCA water supplies, a study will either be commissioned or undertaken by TCA researchers under this management action. The results of this study will set the stage for the identification of priority areas for TCA management to focus activities aimed at enhancing the sustainable use of water supplies. This will initially involve the installation of river flow gauges on key impacted rivers to enable ongoing monitoring of trends in water quantity, in collaboration with the relevant water resource management authorities (WRMAs). TCA management will also collaborate with the WRMAs in establishing and providing training and support to Water User Associations and in developing watershed management plans.

Action 3.2: Strengthen water quality monitoring systems on major rivers feeding the TCA

Alongside the quantity of water flowing into the TCA, the *quality* of water is also likely to become an increasingly important issue during the lifespan of this plan. The problem of water quality is likely to increase as commercial and industrial activities in urban centres and rural agricultural practices intensify upstream, and there is increased reliance on rivers flowing into the TCA for the discharge of industrial and agricultural chemicals and waste. As with issues of water quantity, these activities take place well beyond the boundary of the TCA, and as such KWS will aim to address this issue in close collaboration with the relevant authorities. As a first priority, however, TCA research staff will be equipped with water monitoring equipment to ascertain the extent of the problem, and to identify local point sources of pollution. TCA management will then liaise with NEMA on appropriate mitigation or enforcement measures that can be instigated in order to ensure that the quality of water entering the TCA continues to support its ongoing conservation.

Action 3.3: Collaborate and support reforestation programmes in catchments around TCA

One of the most serious results from the intensifying land uses and agricultural practices in the TCA's catchment areas is the high levels of deforestation that is underway. This is particularly severe in the catchment area of the Voi River in the Taita Hills, and has contributed to an increased seasonality in the river's flow and an increased sediment load the river typically carries (which in turn has contributed to the siltation of the Aruba Dam). As with many of the issues addressed under this objective, the source of these impacts is in areas well beyond the boundary of KWS PAs, and TCA management activities under this action will therefore focus on collaborating and working with KWS HQ to ensure the effective targeting of any re-

forestation programmes in TCA catchment areas to ensure that the maximum conservation benefits are derived from such interventions.

Action 3.4: Reduce the impacts of community activities on the ecological integrity of Lake Jipe

Straddling the Kenya-Tanzania border, around half of Lake Jipe's 30km² area is located within TWNP. Over the past ten years, the lake has lost about 50 percent of its water mass, primarily due to diversion of freshwater recharge from the lake's primary source, River Lumi. This, combined with siltation caused by deforestation in the water catchment area, has resulted in increases in the lake's salinity and declining water levels, both of which are negatively impacting on the lake's biodiversity. Of particular importance in this regard is the endemic fish *Oreochromis jipe*, which has experienced a serious decline in its population over recent years. The lake also supports an important heronry (located outside TWNP), is a vital breeding ground for the African darter, and is an important dry season water source for many wildlife species. In order to help ensure the continued survival of this vital water resource, NEMA has recently developed a management plan for the lake, and identified actions that need to be taken to address the environmental impacts that are increasingly threatening its survival. TCA management will collaborate with NEMA wherever possible in implementing this plan. In addition, in order to reduce the impacts of fish poaching on those parts of the Lake within TWNP, the TWNP boundary (international border) will be clearly marked with buoys so that fishermen do not accidentally stray into the protected area.

Objective 4: The Tsavo Research Station's role in the conservation and management of the TCA strengthened

The Tsavo Research Station (originally the Tsavo Research Project) was established in 1966, and at the time was primarily focused on investigating the increasing numbers of elephants in the TCA and the impacts of this increase on the area's vegetation. A great deal of scientific work was done during the early days of the station's establishment, and under its umbrella, a number of smaller research projects aimed at adding to the primary focus of the investigation were also initiated. Unfortunately, as priorities within KWS changed, and in particular during the poaching crisis of the 1970s and 1980s, the initial high level of research effort was not continued. As with other research facilities in East Africa's protected areas, current research activities are at relatively low levels and are hampered by limited funding and insufficient equipment and personnel.

With an area the size and complexity of the Tsavo Conservation Area, research and monitoring has always been of vitally importance. However, as threats to the TCA's ecological integrity continue to mount, it is now imperative that the Tsavo Research Station is not only providing the information necessary to enable managers to respond to these threats, but is itself proactively developing and coordinating the responses to emerging and intensifying ecological management issues in collaboration with other TCA management sections.

This objective has therefore been developed to help realise the future desired state where the Tsavo Research Station is playing a pivotal role in the conservation and management of the TCA, and in particular in addressing the key factors influencing change in the ecosystem, including internal pressures such as expanding tourism infrastructure and visitor numbers, or growing elephant populations, and external pressures such as land-use changes impacting

on migration routes and water catchments. In order to ensure that the Station has both the human and physical resources needed to move more firmly into this expanded role, while also strengthening the station's traditional activities of providing information to management and ecological monitoring, seven management actions have been identified. These cover a range of issues from the human resources and equipment available to the Station, to the management and activities of the TCA Veterinary Unit, and are elaborated in the following sections.

Action 4.1: Design and implement the TCA Ecological Monitoring Plan

Ecological monitoring of the TCA forms a crucial component of this Ecological Management Programme. Monitoring is vital for understanding the nature of, and trends in, ecological change underway in the TCA, the factors responsible for this change, especially human influences, and ultimately, for understanding the overall health of the TCA ecosystem. The TCA Ecological Monitoring Framework (see final section of this programme) sets out an ambitious and comprehensive framework to guide future ecological monitoring activities in the TCA, based on the conservation targets, their key ecological attributes and the priority threats to their integrity that have been identified through the TNC CAP process prescribed by the PAPF. This framework provides the basis for the development of a comprehensive TCA Ecological Monitoring Plan (EMP). The EMP will be elaborated and developed by the Tsavo Research Station as one of the first activities undertaken in the implementation of this programme, and will subsequently provide the basis for all future routine ecological monitoring in the TCA. The Tsavo Research Station will also ensure that monitoring activities are included in annual workplans, and will work together with KWS HQ to ensure appropriate budgets are approved to cover the activities stipulated.

The first step in developing the EMP will be to refine and finalise detailed **monitoring protocols**, i.e. the monitoring indicators, their information sources, and methods to be used for collecting information, based on the information already set out in the ecological monitoring framework at the end of this programme. The detailed elaboration of monitoring protocols will in turn enable the determination of human resource, equipment and any other requirements needed for undertaking the protocols. These requirements will also be included in the detailed EMP document. The establishment of monitoring protocols will also pave the way for the collection of baseline data for specific indicators, filling in any gaps where such baseline information does not already exist.

The launch of the new EMP will not occur in a vacuum, since the Tsavo Research Station is already engaged in a significant amount of ongoing ecological monitoring work, which has been underway for a number of years. The next activity will therefore be a difficult and potentially uncomfortable one – which will be to review the existing TCA ecological monitoring activities and to determine how to adjust these to focus on the new monitoring protocols that have been identified. Inevitably, this may mean abandoning some ongoing monitoring which does not make a significant contribution to the new monitoring plan, and replacing these with new monitoring activities that TCA scientists have little experience or expertise with. Although this will be a difficult transition, it is nonetheless a vitally important one to the success of ongoing ecological monitoring efforts in the TCA. The approach that has been adopted by the PAPF for the ecological management of a protected area, based on the identification of conservation targets, their key ecological attributes and threats, is a proven and internationally well tested method that enables park managers and scientists to understand the essential ecological features that represent the overall health of an ecosystem, and then to focus conservation action on these key aspects. The ecological monitoring framework presented in this management programme, which will form a basis for the future TCA EMP, is similarly based on these crucial attributes of the TCA ecosystem, and this enables scientists to focus their efforts on the **essential information requirements for monitoring TCA ecosystem health**,

rather than collecting monitoring information which, while intellectually interesting, is non-critical.

The new ecological monitoring protocols defined by the EMP will in turn require new data gathering methodologies and documentation, new equipment (e.g. PDA/GPS units) to be procured to facilitate specific information collection (already defined in the EMP), and for additional training in data collection to be provided to TCA rangers and other relevant TCA sections. Ultimately, new data management, synthesis and reporting methods and guidelines will also be needed, and these are dealt with under Action 4.3 below.

Action 4.2: Improve the Tsavo Research Station's human resources, infrastructure and equipment

The KWS Biodiversity Research and Monitoring Division Strategic Plan 2006-2011 recognises “*the increasing need for active management to compensate for the diminishing role played by natural processes*” in maintaining an area’s biodiversity. However, the ability of the Tsavo Research Station’s scientists and researchers to undertake a more proactive management approach and to take a lead role in implementing many of the management actions set out in this programme is currently severely undermined by a variety of factors. The first deficiency that needs to be addressed is the current human resource shortfalls in the TCA research section. In this regard, TCA management will liaise with KWS HQ to deploy scientists in line with the BRM Division Strategic Plan, 2006-2011. It will then be necessary to address the poor standard of TCA research infrastructure, through the rehabilitation of the Tsavo Research Station buildings at Voi, and the construction of the Tsavo West Research Sub-station (in line with the existing construction plan). The rehabilitation and development of these stations will be complemented by the provision of equipment required to meet specified ecological research needs. This will involve liaison with KWS HQ to install a VSAT Internet link and the procurement of office and field equipment to support essential operations.

Action 4.3: Improve the management, accessibility and dissemination of TCA ecological information

Several of the management actions listed in this programme, and as a result of the implementation of the TCA Ecological Monitoring Plan, will generate a significant amount of ecological information. In addition, a considerable amount of data is collected, or can be collected, by field staff in other departments, including the CWS, rangers and the tourism officers. If this information is to be used effectively, it needs to be managed, stored and synthesised effectively and efficiently, and the outputs disseminated to all relevant TCA and KWS officers in a form that is easy to digest and understand. Unless this is achieved, much of the ecological information is likely to be unused or unusable (sometimes termed “data swamp”), wasting both time and resources of the officers collecting and those analysing the data.

This action therefore provides for the establishment of a TCA ecological monitoring database designed to store information generated through the implementation of the programme and the TCA Ecological Monitoring Plan (see Action 4.1 above). The database will be developed to be as far as possible compatible with existing species databases, so that data can be easily transferred between them. At the same time, efforts will also be made to ensure that the new database is integrated with other TCA databases, such as tourism, security and CWS. The design of the new database will be complemented by the development of a reporting framework and communication protocols aimed at ensuring that database outputs are regularly available in a simple and transparent form for both researchers and other park managers. This will also involve the production of annual EMP summary reports detailing key as-

pects of TCA monitoring information, including trends in significant indicators, which will be made available to TCA management, KWS HQ and other stakeholders as appropriate.

The TCA Ecological Monitoring Plan is a significant new undertaking for the Tsavo Research Station, and considering the major human-generated impacts that the TCA is now experiencing, also a crucial one. It will therefore be important to regularly assess the performance of the EMP and the ecological monitoring database to ascertain the relevance and accessibility of the information generated, and to make necessary adjustments according to lessons learnt. This action therefore makes provision for an annual assessment of EMP performance, carried out by the Tsavo Research Station in collaboration with other TCA and KWS Biodiversity, Research & Monitoring Division staff.

Action 4.4: Improve the management and targeting of research activities in the TCA

There are a large number of ecological issues that need to be better understood in the TCA, but the Tsavo Research Station has neither the staff nor the resources to address all of them. The TCA is, however, fortunate to have a number of long-running, independent research projects, which have made substantial contributions to the existing knowledge of the area's ecology. However, although the potential contribution of external researchers to the TCA's conservation remains high, some research programmes have in the past been driven by external rather than TCA and KWS priorities, and have not conformed to national KWS research guidelines, particularly the communication protocols regarding the identification, review, approval and supervision of research activities. As a first step towards rectifying this situation, and ensuring that the management and targeting of KWS and external TCA research activities is improved, TCA management in collaboration with the KWS BRM Division will ensure that these research guidelines are disseminated and then enforced within the TCA. In addition, in order to ensure the better targeting of future research in the area, a "Research Prospectus" promoting priority TCA research needs will be developed and disseminated to appropriate potential research institutions and ecologists that may wish to collaborate with KWS in undertaking specialist studies. Subsequently, these institutions and individuals will be encouraged to launch priority applied research activities in accordance with the research prospectus and guidelines.

A preliminary list of studies that have already been identified for possible inclusion in this prospectus is shown in the box below:

A preliminary identification of specialist studies needed in the TCA:

- ▶ The impacts of public infrastructure in the TCA on the areas ecology
- ▶ The impacts of livestock incursions on the TCA's ecology (potentially both positive and negative)
- ▶ The extent and impacts of miraa and/or sandalwood harvesting in CHNP
- ▶ Potential solutions to increased human-wildlife conflicts around the TCA (in particular carnivores and elephants)
- ▶ The potential impacts of supplemented water in the TCA, in particular relating to wildlife distributions
- ▶ The extent and impacts of bushmeat poaching in and around the TCA
- ▶ A strategic environmental assessment on the effects of fencing in the TCA on wildlife, livestock and human activities, in order to guide future fencing activities
- ▶ Population dynamics and future elephants numbers, distribution and density in the TCA
- ▶ Habitat requirements and population dynamics of Fringe-eared oryx
- ▶ Population estimates and trends in Greater kudu and Giant forest hogs in CHNP
- ▶ Appropriate indigenous ornamental plant species for use in TCA lodges

Action 4.5: Conduct research to determine key factors impacting on hirola population dynamics

The hirola (*Beatragus hunteri*) is one of the world's rarest and most endangered antelopes, and is particularly important as it is the only surviving member of the genus *hunteri*. The species has however suffered a devastating decline in the last 30 years, with numbers plummeting from around 14,000 in the 1970s to an estimated 600 today. In order to help secure its conservation, a founding population of 20 hirola were released into Tsavo East NP in 1963, which by 1996 had increased to 79 individuals. In 1996, with assistance from donors, another 29 hirola were translocated into the Tsavo East population, bringing the total to around 100 animals. Although hirola were selected as one of the conservation targets for the TCA, no specific management actions were considered necessary to abate the threats identified (shown above in Table 29). However, as a species of particular conservation concern, steps are needed to improve the current understanding of hirola distribution and ecology, and the potential factors impacting on the TCA population. As a first step towards establishing this understanding, a survey will be undertaken to establish the current population size and distribution of the TCA hirola population, and ongoing hirola monitoring activities will be revised and brought into line with the TCA Ecological Monitoring Plan Framework (discussed above). Following on from the establishment of baseline ecological data and monitoring, a postgraduate study focusing on factors impacting hirola population dynamics in the TCA will be undertaken (either by KWS staff or external researchers).

Action 4.6: Institute large carnivore monitoring programme

As with hirola, large carnivores were also identified as a conservation target for the TCA, but no management actions are currently considered necessary under this programme to abate the specific threats identified in Table 29 above (measures to reduce human-wildlife conflict are included in the Community Partnership and Education Programme). However, as these species are of particular conservation and economic value, enhanced baseline information and monitoring of these species is especially important. This management action will therefore institute targeted monitoring of selected key species (including lions, wild dogs, cheetah and striped hyena) in accordance with the specifications of the TCA Ecological Monitoring Framework, including data collection on population sizes and distributions, incidence of disease, and human-carnivore conflicts. The action also makes provision for carrying out a study to quantify impacts and causes of human-lion conflicts, as well as post-release monitoring of translocated predators, in particular lions.

Action 4.7: Improve the management, operations and resources of the TCA veterinary unit

The KWS Veterinary Unit is based at the headquarters in Nairobi, and comprises some of the country's most competent wildlife veterinarians, technicians and animal capture staff. In addition, currently assisted by donor funding, a veterinarian is stationed at Voi and the duty station includes the TCA, Amboseli NP and Shimba Hills NR. The TCA veterinary unit has a number of functions including the treatment of animals injured by poaching, snares or other causes, the monitoring of diseases, and participation in translocation exercises. However, the line management of this unit has caused some confusion in recent years, as has the use of KWS or donor-supported vehicles and resources. As such, TCA management will liaise with the KWS Veterinary Unit regarding the provision of resources to ensure that non-donor funded activities (disease surveillance and research) can be implemented. In addition the facilities available to the Voi unit will also be improved through the development of a holding facility for injured/sick animals during treatment and problem animals during pre-release con-

finement, and the development of improved carnivore transport cages/ traps. The ultimate aim of this action will be to establish a fully KWS-funded mobile veterinary unit for the TCA.

Three Year Activity Plan

The following pages set out the first 3-Year Activity Plan for the Ecological Management Programme. The activity plan details the activities, responsibilities, and timeframe for the delivery of each management action over the first 3-year timeframe of this management plan. In addition, that plan sets out specific and timebound “milestones” that TCA management aims to achieve in implementing the plan.

Management Action and Activities	Persons responsible	Timeframe												Milestones		
		FY 2007-08				FY 2008-09				FY 2009-10						
		1	2	3	4	1	2	3	4	1	2	3	4			
Objective 1: The status of key TCA large mammal species secured and enhanced																
Sub-objective 1.1: The TCA's Black rhino populations are increasing in accordance with national strategic targets																
Action 1.1.1: Enhance rhino monitoring and surveillance in Tsavo East and Chyulu NP																
1.1.1.1: Deploy an officer to oversee security, monitoring and management of free ranging rhino populations in the Tsavo Conservation Area	AD-TCA, RPC, SRS-TCA				Orange									Rhino security officer deployed by June 2008		
1.1.1.2: Conduct on-site rhino monitoring training	RPC, W-Rhino				White	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	All rhino monitoring and security staff trained by June 2008 and at least 5 accredited instructors by June 2008		
1.1.1.3: Implement jointly run (KWS MPT) standardised monitoring and reporting system	W-CHNP				Orange	Orange	White	White	White	White	White	White	White	Monthly and annual status reports prepared and monitoring data stored in the Park HQS kifaru database management system by December 2007		
1.1.1.4: Implement indirect rhino monitoring method to complement the direct sighting approach in difficult terrain (CHNP)	W-CHNP, RPC	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Indirect rhino monitoring protocol prepared by Dec 2007		
1.1.1.5: Survey available watering points and assess the need for establishing artificial waterholes to improve rhino sighting in CHNP	SRS-TCA, H-EIA				Orange									Water assessment report prepared by December 2009		
1.1.1.6: Ear-notch and fit transmitters to some rhinos to enhance monitoring and security (TENP)	SRS-TCA, SVO, SW-TE, W-Rhino				White	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Ten rhinos fitted with transmitters and ear notched by Sept 2008, and monitoring reports of radio tracked rhinos prepared quarterly		

Management Action and Activities	Persons responsible	Timeframe												Milestones	
		FY 2007-08				FY 2008-09				FY 2009-10					
		1	2	3	4	1	2	3	4	1	2	3	4		
1.1.1.7: Increase number of monitoring tracks to enhance surveillance (TENP-linked to PA Ops Programme)	SW-TE, SRS-TCA													60 kms of additional tracks by June 2010	
1.1.1.8: Implement an enhanced rhino security system (TENP-linked to Security Programme)	SW-TE, W-Security, SRS-TCA													Annual reports, mapping distribution and trend of security related issues as from Dec 2008	
1.1.1.9: Review effectiveness of rhino monitoring unit	SWTE/TW, W-Security													Review report by march 2009	
Action 1.1.2: Improve availability and quality of rhino habitat in and around Chyulu NP															
1.1.2.1: Conduct an EIA for the Mukururo artificial water project	RS-TW													EIA report by March 2008	
1.1.2.2: Develop water points in Mukururo in line with EIA recommendations	W-CHNP, RS-TW, RPC													Two water points established by June 2008	
1.1.2.3: Collaborate with KARI on determining optimal conservation-friendly land-use options in CHNP buffer areas	AD-TCA, W-CHNP														
1.1.2.4: Collaborate with KARI and other agencies in promoting conservation-friendly land-uses according to a defined land-use plan	AD-TCA, W-CHNP														
Action 1.1.3: Complete extension of Ngulia Rhino Sanctuary															
1.1.3.1: Provide water to Ngulia Sanctuary from Ndawe Escarpment	SW-TW, W-Rhino													Water provided in the sanctuary by Jan 2008	
Action 1.1.4: Create rhino Intensive Protection Zone in Tsavo West NP															
1.1.4.1: Produce digital geo-referenced map of the IPZ	SRS-TCA, SW-TE/TW, RPC													Georeferenced map of IPZ with water points, and potential poachers' hideouts prepared by January 2008	
1.1.4.2: Liaise with KWS HQ concerning posting of additional ranger force to enhance IPZ security as necessary															
1.1.4.3: Train trackers/staff in bushcraft and monitoring skills for IPZ	RPC, SW-TE/TW, W-Security													10 trackers trained by Feb 2008	

ECOLOGICAL MANAGEMENT PROGRAMME

Management Action and Activities	Persons responsible	Timeframe												Milestones	
		FY 2007-08				FY 2008-09				FY 2009-10					
		1	2	3	4	1	2	3	4	1	2	3	4		
1.1.4.4: Translocate at least 10 rhinos to the IPZ	RPC, SW-TE, W-Security				■									10 rhinos translocated to the IPZ by end 2008	
1.1.4.5: Liaise with KWS Security and MFTS to establish IPZ security and monitoring training programme as part of Manyani field training curriculum	SW-TW, H-HC, RPC					■								Rhino monitoring training programme established by July 2008	
1.1.4.6 Undertake an independent assessment of IPZ after 2 years	RPC, SRS-TCA										■			First independent assessment carried out by March 2010	
Action 1.1.5: Monitor habitat quality and populations in the sanctuary and IPZ															
1.1.5.1: Undertake vegetation monitoring and assessment within the IPZ and sanctuary	SRS-TCA, H-EMU						■							Vegetation assessment report prepared by December 2008	
1.1.5.2: Undertake complete (from data capture to analysis) intensive 4-night full moon waterhole photographic census during the dry season in the sanctuary	SRS-TCA, W-Rhino	■					■				■			Census report every 1st quarter	
1.1.5.3: Pilot advanced thermo-imaging rhino monitoring technology	SW-TW, RPC, RS-TW						■							Thermal imaging set up by December 2008	
Action 1.1.6: Implement community education and awareness programme for the park buffer zone community (CHNP) (see Action 5.6 of Community Partnership & Education Programme)															
Sub-objective 1.2: Viable populations of Grevy's zebra established and maintained															
Action 1.2.1: Establish Grevy's zebra site committee for the TCA															
1.2.1.1 Liaise with Species Conservation and Management Department on establishment of a TCA Grevy's Zebra Committee	AD-TCA, SRS-TCA, H-SCP						■							A Grevy zebra site committee established and stakeholder meeting held by September 2008	
1.2.1.2: Develop ToRs and operational framework for the committee	AD-TCA, SRS-TCA, SW-TE/TW					■									
1.2.1.3: Hold stakeholder meeting to review and endorse ToRs and establish membership	AD-TCA, SRS-TCA, SW-TE/TW						■								
1.2.1.4: Operationalise the committee by providing logistical support for regular bi-annual meetings	AD-TCA, SRS-TCA, SW-TE/TW							■		■					
Action 1.2.2: Carry out comprehensive census of Grevy's zebra population in and around the TCA															

Management Action and Activities	Persons responsible	Timeframe												Milestones	
		FY 2007-08				FY 2008-09				FY 2009-10					
		1	2	3	4	1	2	3	4	1	2	3	4		
1.2.2.1: Conduct ground counts in PAs and adjoining ranches (including photography for identification of individual animals)	SRS-TCA, RS-TW													Census carried out and report on status of Grevy population ready by December 2008	
1.2.2.2: Carry out aerial counts of Grevy's Zebra as integral part of aerial patrols	SRS-TCA, RS-TW, Pilots														
1.2.2.3: Design a concept for call for a study on factors that affect population dynamics of Grevy's Zebra (including hybridisation issues)	SRS-TCA														
Action 1.2.3: Investigate feasibility of relocating purebred Grevy's zebra within a fenced sanctuary in the TCA															
1.2.3.1: Undertake disease surveillance to establish potential disease threats	SVO, SRS-TCA, RS-TW														
1.2.3.2: Undertake feasibility study for establishment of the sanctuary	SRS-TCA, RS-TW, SW-TE/TW														
1.2.3.3: In line with recommendations, develop sanctuary and introduce Grevy's zebra as appropriate	SRS-TCA, RS-TW, SW-TE/TW														
1.2.3.4: Liaise with Grevy's Zebra task force about translocation of additional individuals to the sanctuary if needed	SRS-TCA, RS-TW, SW-TE/TW														
Sub-objective 1.3: Elephant ecology and migration movements better understood and conserved															
Action 1.3.1: Collaborate with KFS in improving conservation and management of Kibwezi Forest Reserve															
1.3.1.1: Collaborate with Kenya Forest Service to include Kibwezi Forest Reserve in KWS-KFS MoU	AD-TCA, W-CHNP														Kibwezi forest included in the KWS-KFS MOU by March 2009
1.3.1.2: Implement KWS responsibilities under MoU, including the design and implementation of joint patrols together with KFS	AD-TCA, W-CHNP														
Action 1.3.2: Collaborate with greater TCA landowners in protecting key elephant migration routes and dispersal areas															
1.3.2.1: In collaboration with appropriate external researchers, map elephant migration routes and dispersal areas in the greater TCA landscape using remote sensing methodologies as appropriate															
1.3.2.2: Determine the likely impact of human population and land-use trends on elephant migration routes and dispersal areas, using satellite images and ground															

ECOLOGICAL MANAGEMENT PROGRAMME

Management Action and Activities	Persons responsible	Timeframe												Milestones	
		FY 2007-08				FY 2008-09				FY 2009-10					
		1	2	3	4	1	2	3	4	1	2	3	4		
studies as appropriate															
1.3.2.3: Investigate options for maintaining and/or enhancing elephant migration routes, e.g. between TE/TW through Taita ranches, the Buchuma-Sagala Corridor and areas to the east of TENP															
1.3.2.4: In collaboration with CWS and relevant greater TCA landowners, develop activities to preserve elephant migration routes and dispersal areas	SRS-TCA, RS-TW														
1.3.2.5: Develop and sign an MoU with Galana Ranch, including provisions for maintaining elephant migration routes and dispersal areas	AD-TCA, SRS-TCA, SW-CWS													MOU with Galana ranch signed by December 2008	
Action 1.3.3: Carry out applied ecological research on potential impacts and scenarios for managing increasing elephant populations in the TCA															
1.3.3.1: Carry out an assessment of elephant management scenarios (e.g. non-intervention in Tsavo and active management in some other areas)	SRS-TCA														
1.3.3.2: Design a concept for call for a study on elephant population dynamics in the TCA and likely future trends in elephant numbers and density															
1.3.3.3: Rehabilitate existing vegetation exclosures	SRS-TCA, RS-TW													Exclosures rehabilitated by march 2008	
1.3.3.4: Establish vegetation monitoring databases based on fixed point photography of vegetation in selected parts of the park	SRS-TCA, RS-TW													Photo stations established by Dec 2008	
1.3.3.5: Acquire 1950s photos to provide baseline data for vegetation changes that has occurred in Tsavo	SRS-TCA, RS-TW													Historical TCA photos acquired by Dec 2008	
1.3.3.6: Establish protocols for translocation of elephants to the TCA, including monitoring, research and husbandry techniques															
1.3.3.7: Carry out ongoing monitoring of elephants translocated to the TCA from other areas (e.g. Shimba Hills)															

Management Action and Activities	Persons responsible	Timeframe												Milestones		
		FY 2007-08				FY 2008-09				FY 2009-10						
		1	2	3	4	1	2	3	4	1	2	3	4			
Objective 2: Key habitats and rangeland conditions in the TCA managed and maintained																
Action 2.1: Raise awareness of fire risk and impacts of unprescribed fire on TCA ecology																
2.1.1: Improve fire warning signs on Nairobi-Mombasa highway	SRS-TCA, RS-TW													Four fire warning signs installed by December 2008		
2.1.2: Improve understanding of fire occurrence, location and seasonality (in consultation with communities)	SRS-TCA, RS-TW															
2.1.3: Carry out community awareness raising on fire prevention and impacts	SRS-TCA, RS-TW															
Action 2.2: Improve the response to unprescribed fire																
2.2.1: Develop fire preparedness guidelines in liaison with KWS Rapid Response Unit	SRS-TCA, RS-TW													Fire preparedness guidelines developed by December 2008		
2.2.2: Establish fire towers	SW-TE, SW-TW															
2.2.3: Establish TCA Rapid Response Unit	AD-TCA															
2.2.4: Carry out routine aerial reconnaissance for fires	PILOTS, SRS-TCA,															
Action 2.3: Implement improved fire management measures																
2.3.1: Develop pilot fire management programme based on KWS fire policy guidelines and current best practice	SW-TE, SW-TW, SRS-TCA, RS-TW													Fire management plan developed and pilot burning programme established by September 2008		
2.3.2: Carry out prescribed burning according to pilot programme	SW-TE, SW-TW, SRS-TCA, RS-TW															
2.3.3: Monitor impacts of pilot programme, including application of Fire Early Warning System	SRS-TCA, RS-TW															
2.3.4: Re-establish fire plots, and monitor impacts	SRS-TCA, RS-TW													Long term fire monitoring plots and monitoring protocol re-established by December 2008		
2.3.5: Adapt fire management practices based on pilot programme monitoring	SW-TE, SW-TW, SRS-TCA, RS-TW															
Action 2.4: Improve TCA wildlife watering points in response to prevailing and desired wildlife distributions																

ECOLOGICAL MANAGEMENT PROGRAMME

Management Action and Activities	Persons responsible	Timeframe												Milestones	
		FY 2007-08				FY 2008-09				FY 2009-10					
		1	2	3	4	1	2	3	4	1	2	3	4		
2.4.1: Carry out inventory of all artificial water sources in the TCA	SRS-TCA, RS-TW													Hydrological Inventory completed by December 2008	
2.4.2: Visit to other parks with extensive supplemented water programmes (Southern Africa parks, Tanzanian park, and/or Laikipia conservancies)	SRS-TCA, RS-TW														
2.4.3: Develop water source development guidelines for the TCA (Review and incorporate already existing/old guidelines/plans)	SRS-TCA, RS-TW														
2.4.4: Rationalise water sources according to water guidelines	SRS-TCA, RS-TW														
2.4.5: Collaborate with Ministry of Water to reduce leakage along Mzima Springs pipeline	AD-TCA,														
Action 2.5: Minimise the ecological impact of TCA tourism facilities (see Action 3.1 of Tourism Development & Management Programme)															
2.5.1: Carry out regular inspections of TCA accommodation facilities to ensure compliance with KWS facility management and environmental protection guidelines, EIAs and annual environmental audits	SRS-TCA, RS-TW													Protocol for inspection of facilities developed and communicated to tourist facilities by March 2008 and Inspection reports prepared quarterly	
2.5.2: Enhance enforcement of annual environmental audits and KWS facility management and environmental protection guidelines	SRS-TCA, RS-TW														
2.5.3: Work with tourism industry to reduce use of ornamental exotic species around tourism facilities	SRS-TCA, RS-TW														
Action 2.6: Eradicate and control invasive species in key TCA habitats															
2.6.1: Carry out mapping and monitoring of the distribution and abundance of key invasive species	SRS-TCA, RS-TW													Cassia species eliminated from the PAs by December 2008	
2.6.2: Review best practice and KWS invasive species guidelines (CABI, KWS Forest Section)	SRS-TCA, RS-TW														
2.6.3: Design and pilot experiments for removing/managing priority invasive species	SRS-TCA, RS-TW														
2.6.4: Roll out eradication/management programmes for particular species as appropriate	SRS-TCA, RS-TW														

Management Action and Activities	Persons responsible	Timeframe												Milestones	
		FY 2007-08				FY 2008-09				FY 2009-10					
		1	2	3	4	1	2	3	4	1	2	3	4		
2.6.5: Investigate options for controlling particular invasive species upstream of the TCA, including the replanting of native species in seriously degraded areas	SRS-TCA, RS-TW														
2.6.6: Carry out a study of potential for cross-breeding domestic and wild guinea fowl species	SRS-TCA, RS-TW									■	■	■	■		
Objective 3: Conservation of key river systems and wetlands in and around the TCA enhanced															
Action 3.1: Promote sustainable water use in TCA catchment areas															
3.1.1: Undertake or commission a study to establish the impact of water extraction on TCA water supplies in collaboration with appropriate Water Resources Management Authorities and Boards	SRS-TCA, RS-TW														
3.1.2: Collaborate with appropriate WRMAs in installing and monitoring river flow gauges on major rivers feeding the TCA															
3.1.3: Collaborate with WRMAs in establishing and providing training and support to Water User Associations and in developing watershed management plans	SRS-TCA, RS-TW														
Action 3.2: Strengthen water quality monitoring systems on major rivers feeding the TCA															
3.2.1: Acquire water quality monitoring equipment etc for TCA Research Department	SRS-TCA, RS-TW					■	■	■	■					Water monitoring equipment acquired by December 2008	
3.2.2: Identify local point sources of pollution	SRS-TCA, RS-TW					■	■	■	■						
3.2.3: Liaise with NEMA on mitigation/enforcement measures	SRS-TCA, RS-TW			■	■	■	■	■	■	■	■	■	■		
Action 3.3: Collaborate and support reforestation programmes in catchments around TCA															
3.3.1: Liaise with KWS HQ regarding reforestation programmes further from TCA	SRS-TCA, RS-TW														
Action 3.4: Reduce the impacts of community activities on the ecological integrity of Lake Jipe															
3.4.1: Place buoys to mark NP boundary on Lake Jipe	SW-TW, RS-TW				■									NP boundary marked by June 2008	
3.4.2: Collaborate with NEMA to implement Lake Jipe Management Plan	SW-TW, RS-TW			■	■	■	■	■	■	■	■	■	■		

ECOLOGICAL MANAGEMENT PROGRAMME

Management Action and Activities	Persons responsible	Timeframe												Milestones		
		FY 2007-08				FY 2008-09				FY 2009-10						
		1	2	3	4	1	2	3	4	1	2	3	4			
Objective 4: The Tsavo Research Station's role in the conservation and management of the TCA strengthened																
Action 4.1: Design and implement the TCA Ecological Monitoring Plan (EMP)																
4.1.1: Finalise monitoring indicators, information sources and collection methods based on ecological monitoring framework																
4.1.2: Determine human resource and equipment requirements for implementing EMP																
4.1.3: Review and revise existing TCA ecological monitoring activities in accordance with the new EMP																
4.1.4 Design standardised ecological data gathering forms in line with EMP information requirements																
4.1.5: Procure necessary equipment for implementing EMP (e.g. PDA/GPS units)	SRS-TCA, RS-TW															
4.1.6: Provide training in EMP data collection to TCA rangers and other relevant TCA sections	SRS-TCA, RS-TW															
Action 4.2: Improve Tsavo Research Station human resources, infrastructure and equipment																
4.2.1: Liasse with KWS HQS to deploy scientists in line with the KWS BRM Divisional strategic plan and EMP implementation requirements	SRS-TCA, AD-TCA													Two additional scientists deployed to TCA by June 2008		
4.2.2: Carry out rehabilitation of Tsavo Research Station buildings	SRS-TCA, RS-TW, AD-TCA													VSAT installed by September 2008		
4.2.3: Construct Tsavo West research sub-station according to existing construction plan	SRS-TCA, RS-TW															
4.2.4 Liasse with KWS HQ in the procurement of field equipment.	SRS-TCA, RS-TW													Field equipment procured by December 2008		
4.2.5: Liasse with KWS HQ to install VSAT Internet link	AD-TCA															
Action 4.3: Improve the management, accessibility and dissemination of TCA ecological information																

Management Action and Activities	Persons responsible	Timeframe												Milestones	
		FY 2007-08				FY 2008-09				FY 2009-10					
		1	2	3	4	1	2	3	4	1	2	3	4		
4.3.1: Establish TCA ecological monitoring database based on TCA EMP (standardise with existing species databases)	SRS-TCA, RS-TW													Design and implement a customized ecological monitoring database management system by December 2008	
4.3.2: Investigate options for integrating ecological monitoring database with other TCA databases such as tourism, security and CWS															
4.3.3: Develop a reporting framework for disseminating simple and clear summary information from the EMP annually															
4.3.4: Develop communication mechanisms for disseminating TCA EMP and research reports	SRS-TCA, RS-TW														
4.3.5: Produce annual EMP summary reports and disseminate to TCA, KWS BRM Division and relevant stakeholders															
4.3.6: Carry out annual assessment of EMP performance with other TCA and KWS BRM Division															
Action 4.4: Improve the management and targeting of research activities in the TCA															
4.4.1: Implement KWS research guidelines in the TCA, especially communication protocols	DD-BRMD, SRS-TCA, RS-TW													TCA research prospectus prepared by June 2009	
4.4.2: In collaboration with other TCA and KWS BRM Division staff, develop and disseminate research prospectus promoting priority TCA research needs	SRS-TCA, RS-TW, SVO														
4.4.3: Liaise with appropriate research institutions and ecologists to launch priority applied research activities															
Action 4.5: Conduct research to determine key factors impacting on hirola population dynamics															
4.5.1: Collect and collate information on hirola distribution	SRS-TCA													Hirola monitoring protocol developed by December 2008	
4.5.2: Revise hirola monitoring schedule to bring into line with TCA Ecological Monitoring Plan	SRS-TCA														
4.5.3: Institute a postgraduate study on factors impacting hirola population dynamics	SRS-TCA														
Action 4.6: Institute large carnivore monitoring programme															

ECOLOGICAL MANAGEMENT PROGRAMME

Management Action and Activities	Persons responsible	Timeframe												Milestones	
		FY 2007-08				FY 2008-09				FY 2009-10					
		1	2	3	4	1	2	3	4	1	2	3	4		
4.6.1: Design monitoring protocols for selected species in accordance with the TCA Ecological Monitoring Framework	SRS-TCA, RS-TW, SVO														
4.6.2: Carry out regular monitoring, including data collection on population sizes and distributions, incidence of disease, and human-carnivore conflicts	SRS-TCA, RS-TW, SVO														
4.6.3: Carry out a study to quantify impacts and causes of human-lion conflicts	SRS-TCA, RS-TW, SVO														
4.6.4: Institute post-release monitoring of translocated lions	SRS-TCA, RS-TW, SVO														
Action 4.7: Improve the management, operations and resources of the TCA veterinary unit															
4.7.1: Liaise with H-Vet to provide resources for non-donor funded activities (disease surveillance and research)	SVO, H-Vet													Holding facility constructed and functional by December 2008	
4.7.2: Build a holding facility for injured/sick animals during treatment, and problem animals during pre-release confinement	AD-TCA, SVO, SRS-TCA														
4.7.3: Construct better carnivore transport cages/ traps															
4.7.4: Establish fully KWS-funded mobile vet unit	AD-TCA, SVO, SRS-TCA, H-Vet														

TCA Ecological Monitoring Framework

The Ecological Monitoring Framework is a vital complement to the Ecological Management Programme's objectives and actions. The use of the TCA's conservation targets, their key ecological attributes (KEAs) and their threats (identified through TNC CAP methodology) as a basis for ecological monitoring not only provides a mechanism for assessing the overall health of the TCA ecosystem, but also, by ensuring a direct link between the components of the ecosystem that are being monitored and the programme's objectives and actions, a basis for assessing the effectiveness of this programme's implementation.

The left-hand column of Table 30 below sets out the KEAs of each of the conservation targets, as well as the priority threats for monitoring (i.e. those with a high threat ranking). Where a KEA and a corresponding threat are so closely linked that independent monitoring is not worthwhile (e.g. KEA: water quality; threat: pollution and siltation), they have been combined together in a single row. This framework will need further elaboration into a comprehensive TCA Ecological Monitoring Plan which will provide a comprehensive basis for future ecological monitoring activities in the TCA, and to ensure that monitoring activities are in due course adequately incorporated into annual workplans and budgets (discussed above under Action 4.1)

Table 30: TCA Ecological Monitoring Plan Framework

Key Ecological Attribute/ Threat	Indicator of change	Method of measurement	Collection frequency	Data source	Responsibility	Data currently collected?
Conservation Target: River & Lake systems						
KEA: River regime (flow and pattern) <u>Threat:</u> Water abstraction	Volume of water flowing	Flow rate and depth per cross section of rivers and streams, Gauge readings	monthly	TCA Research	TCA Research	Yes but limited
KEA: Water quality <u>Threat:</u> Pollution and siltation	Water quality	Laboratory analysis	quarterly	TCA Research, Ext Researchers	TCA Research	No
KEA: Catchment forest and riparian habitat <u>Threat:</u> Land use changes	Forest Extent	Analysis of satellite imagery, Aerial photographs	Every three years	TCA Research	TCA Research	No
<u>Threat:</u> Fire	Fire Scars	Aerial and ground observations	Ad hoc, annually	Patrols	TCA Research	Partially

ECOLOGICAL MANAGEMENT PROGRAMME

Key Ecological Attribute/ Threat	Indicator of change	Method of measurement	Collection frequency	Data source	Responsibility	Data currently collected?
KEA: Fish species composition and size	species composition and abundance	Catch effort	Quarterly, monthly	Fisheries, KWS	TCA Research	Some
Threat: Poaching (Lake Jipe)	Number of arrest per patrol effort	Arrests per Patrol effort	Daily	KWS, WPU	WPU, Research	Partially
Conservation Target: Mountain Forests						
KEA: Forest canopy cover	Canopy cover	Satellite imagery, Aerial photos, ground observation	Every Five years	KFS, NASA,	TCA Research/ Consultants, Ext. Researcher	No
KEA: Tree species composition	Species composition	Quadrats and transects	Every Five Years	KFS, Ext. Researchers, TCA Research	TCA Research In Collaboration with other Interested institutions	No
KEA: Forest extent and size	Forest extent, Vegetation clearing	Satelite imagery	Every Five Years	KFS, Ext. Researchers, TCA Research,	TCA Research In Collaboration with other Interested institutions	No
Threat: Fire	Fire Scars	Aerial and ground observations	Ad hoc, annually	Patrols	TCA Research, Patrols	Partially
Threat: Poaching (bushmeat, sandalwood and tress for charcoal)	Snare densities, Arrests, Kiln sites	Security reports Aerial survey Transects in forests Transport route monitoring	Daily	Security patrols	TCA Research	Partial
Conservation Target: Acacia-Commiphora bushland and grasslands						
KEA: Extent of bushland and grassland	Size of bush cover and grass cover	Analysis of Satellite imagery	Every Three Years	TCA Research, Ext researchers	TCA research	No
Threat: Ratio of woody-grass species	Bush encroachment/ disappearance	Change Detection on Satellite imagery	Every Three Years	TCA Research, Ext researchers	TCA research	No
KEA: Forage quality and quantity	Plant species composition Changes	Transects and quadrats	Every Three Years	TCA Research, Ext researchers	TCA research	No

Key Ecological Attribute/ Threat	Indicator of change	Method of measurement	Collection frequency	Data source	Responsibility	Data currently collected?
<u>KEA:</u> Ungulate species composition and size <u>Threat:</u> Bushmeat poaching	<ul style="list-style-type: none"> Population and age-sex structure of various ungulate species Density of snare/traps Arrests Injured animals and carcasses 	Water hole counts, Aerial counts, ground counts Patrol reports	Daily, Monthly, Seasonally	WPU DSWT, Intelligence, Research, CWS, Public	KWS Research	Some
<u>Threat:</u> Fire	Area burnt; number of fire outbreaks	Aerial Mapping and photography, satellite images, ground observations	Based on occurrence, Annually	KWS, Public	KWS Research	Some data collected but inconsistent
<u>Threat:</u> Invasive species	Abundance of invasive plants, sightings	Extend of coverage, Sampling transects to establish dominance	Annually	TCA research	TCA research	Yes but not adequately
<u>KEA:</u> Surface water availability	Water hole persistence and location	GPs, Size and Photographs, persistence, water presence	monthly	TCA Research	TCA Research	Yes on a limited Scale
<u>Threat:</u> Drought	Rainfall	Rain gauges	Daily, monthly	TCA Research, Community ranches, Dept. Of Met. Patrol bases	TCA Research, Dept of Met.	Yes
<u>Threat:</u> Livestock incursions	Number of Livestock, Extent of Incursion	Aerial Counts, Ground estimates, Arrests	Daily	WPU,CWS, Ext- Researchers, Patrols, Aerial Censuses	TCA Research	Some data is collected
Conservation Target: Riverine Habitats						
<u>KEA:</u> Riverine forest canopy cover	Canopy cover	Satellite imagery, Aerial photos, ground observation	Every Five years	KFS, NASA,	TCA Research/ Consultants, Ext. Researcher	No
<u>KEA:</u> Tree species composition	Species composition	Quadrats and transects	Every Five Years	KFS, Ext. Researchers, TCA Research	TCA Research In Collaboration with other Interested institutions	No

ECOLOGICAL MANAGEMENT PROGRAMME

Key Ecological Attribute/ Threat	Indicator of change	Method of measurement	Collection frequency	Data source	Responsibility	Data currently collected?
KEA: Forest extent and size	Forest extent, Vegetation clearing	Satelite imagery	Every Five Years	KFS, Ext. Researchers, TCA Research,	TCA Research In Collaboration with other Interested institutions	No
KEA: River regime (flow and level)	Volume of water flowing	Flow rate and depth per cross section of rivers and streams, Gauge readings	monthly	TCA Research	TCA Research	Yes but limited
Threat: Tourism infrastructure	Number of infrastructures, litter, off-road tracks in riverine habitats	observations	Quarterly	Tourism, TCA Research	Tourism, TCA Research	Partial
Threat: Fire	Area burnt; number of fire outbreaks	Aerial Mapping and photography, satellite images, ground observations	Based on occurrence, Annually	KWS, Public	KWS Research	Some data collected but inconsistent
Threat: Invasive species	Abundance of invasive plants, sightings	Extend of coverage, Sampling transects to establish dominance	Annually	TCA research	TCA research	Yes but not adequately
Threat: Drought	Rainfall	Rain gauges	Daily, monthly	TCA Research, Community ranches, Dept. Of Met. Patrol bases	TCA Research, Dept of Met.	Yes
Threat: Livestock incursion	Number of Livestock, Extent of Incursion	Aerial Counts, Ground estimates, Arrests	Daily	WPU,CWS, Ext- Researchers, Patrols, Aerial Censuses	TCA Research	Some data is collected
Conservation Target: Large Carnivores						
KEA: Population size and structure of key species	Population and age-sex structure	Specific counts, transects, aerial surveys, Road surveys	Monthly ground counts and When possible, every three years for aerial counts	TCA, research, Ext researcher,	TCA Research	Partially
KEA: Genetic diversity	Genetic Diversity	DNA testing	Ad hoc	Ext Researches	TCA in collaboration with Ext. researcher	For a few species

Key Ecological Attribute/ Threat	Indicator of change	Method of measurement	Collection frequency	Data source	Responsibility	Data currently collected?
<u>KEA:</u> Habitat size and quality, and connectivity <u>Threat:</u> Land use changes	Disturbance/Fragmentation of corridors and dispersal areas	Analysis of satellite imagery, change detection	Every Three Years	TCA Research, Ext researchers	TCA research	No
<u>Threat:</u> Human-wildlife conflicts	Number of reported Incidents	Reports (CWS)	Ongoing	CWS	TCA research	Good data has been collected
<u>KEA:</u> Prey species availability	Population and age-sex structure	Specific counts, transects, aerial surveys, Road surveys	Monthly ground counts and When possible, every three years for aerial counts	TCA, research, Ext researcher,	TCA Research	Partially
<u>Threat:</u> Disease	Incidence	Regular attendance	Ongoing	TCA Vet and external researchers	TCA vet and TCA research.	Some data already collected
<u>Threat:</u> Poaching	Carcasses Number of arrest	Patrols, aerial survey, security reports	Daily,	TCA security and external researchers	TCA research in collaboration with external researchers.	Good data already collected.
Conservation Target: Elephant						
<u>KEA:</u> Migration routes/ dispersal areas <u>Threat:</u> Land use changes	Movement Land use changes	Tracking collared species individual identification PAC reports Analysis of satellite imagery	Ongoing Every 5 years	TCA research and external researchers. NASA	TCA research Consultant.	Limited data for collared species Extensive PAC data
<u>KEA:</u> Population size, recruitment and structure	Numbers, recruitment rates, age structure, sex structure, habitat health. Mortality	Road transects Aerial counts Habitat survey	Ongoing. Monthly Every after 3 years Biannualy.	External researchers MIKE TCA research KWS- species TCA research	TCA in collaboration with external researchers KWS coordination.	Consistent data has been collected. For exclosures data not consistent (exclosures not maintained)
<u>Threat:</u> Human-wildlife conflicts	Incidents	Reports (CWS)	Ongoing	CWS	TCA research	Good data has been collected

ECOLOGICAL MANAGEMENT PROGRAMME

Key Ecological Attribute/ Threat	Indicator of change	Method of measurement	Collection frequency	Data source	Responsibility	Data currently collected?
Threat: Water availability (drought)	Elephant distribution Rainfall	Distribution maps Elephant concentration on water sources. Rain gauges	Quarterly	TCA research	TCA research	No.
Threat: Poaching	Carcasses Number of arrest	Patrols, aerial survey, MIKE, security reports	Daily, every 3 years	TCA security KWS – species	TCA research	Good data already collected.
Conservation Target: Black rhino						
KEA: Population size, recruitment and structure Threat: Poaching	Numbers, sex and age structures, mortality	Night census, individual identification, carcasses	Daily	Rhino teams ATGSA	Rhino programme coordinator	Yes
KEA: Habitat size and quality Threat: Drought	Plant species composition Changes	Transects and quadrats	Every Three Years	TCA Research, Ext researchers	TCA research	partially
KEA: Genetic diversity Threat: Inbreeding	Genetic Diversity	DNA testing	Ad hoc	Ext Researches	TCA in collaboration with Ext. researcher	No
Conservation Target: Grevy's zebra						
KEA: Habitat size and quality Threat: Insufficient habitat	Plant species composition Changes Habitat change	Transects and quadrats Comparison studies	annually	TCA Research, Ext researchers	TCA research	No
KEA: Population size, recruitment rates, age structure, sex structure, Mortality	Numbers, recruitment rates, age structure, sex structure, Mortality	Individual recognition using photographs Total ground counts Aerial counts	Annually After 3 years	TCA research KWS- species	TCA in collaboration with external researchers KWS coordination.	None
Threat: Skewed sex ratios	Male female ration	individual recognition	monthly	TCA research and external researchers	TCA research	Partial
Threat: Extraordinary predation	Population size, mortality cases	Routine monitoring Scat analysis key predator species	Monthly , adhoc	TCA research and external researchers	TCA research	None

Key Ecological Attribute/ Threat	Indicator of change	Method of measurement	Collection frequency	Data source	Responsibility	Data currently collected?
<u>KEA:</u> Genetic diversity and variability <u>Threat:</u> Inbreeding	Genetic Diversity	DNA testing	Ad hoc	Ext Researches	TCA in collaboration with Ext. researcher	No
<u>Threat:</u> hybridization	Hybrid numbers	Individual recognition	Annually	TCA research and external researchers	TCA research	No
Conservation Target: Hirola						
<u>KEA:</u> Population size, recruitment rates, age structure, sex structure, Mortality	Numbers, recruitment rates, age structure, sex structure, Mortality	ground counts Population ecology studies	Annually Quarterly	TCA research External researchers	TCA in collaboration with external researchers	One report available but not consistent.
<u>Threat:</u> Extraordinary predation	Population size, mortality cases	Routine monitoring Scat analysis key predator species	Monthly , adhoc	TCA research and external researchers	TCA research	None
<u>KEA:</u> Habitat size and quality	Plant species composition Changes Habitat change	Transects and quadrats Comparison studies	annually	TCA Research, Ext researchers	TCA research	No
<u>KEA:</u> Genetic diversity <u>Threat:</u> Inbreeding	Genetic Diversity	DNA testing	Ad hoc	Ext Researches	TCA in collaboration with Ext. researcher	No

Tourism Development & Management Programme

Programme Purpose

The Tsavo Conservation Area's position as KWS' premier tourism destination is maintained and enhanced

In recent years, the Tsavo Conservation Area has experienced a rapid increase in tourism, much of which is generated by the Kenyan coastal resorts, where there is a large pool of tourists seeking alternative activities to their beach holidays. The large volume of visitors to the TCA has meant that the area now generates the lion's share of KWS' revenues, and with the recent revisions of entry and concession fees, these revenues are likely to increase significantly in future.

Despite this success story, the management and development of the TCA's tourism product poses significant challenges as well as opportunities in the year's ahead. The large numbers of visitors flooding into the TCA's tourism high use areas threaten the Tsavo natural environment as well as the quality of the visitor experience, and this requires careful and proactive management. On the other hand, large expanses of Tsavo are still largely unused for tourism, yet they offer a potentially unique visitor experience based on the increasingly rare and sought after qualities of wilderness and solitude. The future development of these areas poses major challenges in terms of tourism investment and infrastructure, but also significant opportunities to diversify and enhance the TCA tourism product and strengthen the conservation of these areas.

Through its management objectives and actions, the TCA Tourism Development and Management Programme sets out an ambitious plan for improving the quality and diversity of the TCA tourism product over the lifespan of the management plan, based on a set of guiding principles as detailed in the following section. One of the central pillars of the programme is the adoption of a zoning scheme for the TCA as set out elsewhere in this management plan, which will enable and facilitate alternative tourism products based on different levels and types of visitor use, and that in sum will ensure that the TCA continues to fulfil its position as KWS' premier tourism destination and revenue earner for the foreseeable future.

Guiding principles

The guiding principles describe key factors taken into account in the development of the Tourism Development & Management Programme and that influence the way the programme is implemented in achieving the above programme purpose. The guiding principles are:

- ▶ **Developing the TCA tourism product so as to appeal to different market segments by providing a variety of distinctive visitor experiences that capitalise on the area's diversity of habitats and landscapes**
- ▶ **Providing a high quality and low environmental impact visitor experience in the TCA's high use areas through intensive tourism management**
- ▶ **Promoting investment in low volume, high value tourism in the TCA's low use and wilderness areas to strongly support resource conservation efforts.**

These guiding principles are briefly described and explained in the following paragraphs.

Developing the TCA tourism product to appeal to different market segments

The TCA is a landscape of contrasts – contrasting habitats and scenery, but also contrasting patterns of visitor use, ranging from very intensive use in the riverine habitats along the major rivers in the Voi and Mzima zones, to practically non-existent use in the remoter and less accessible parts of the area. As mentioned above, the TCA is responsible for generating a large proportion of KWS' revenues, but the vast majority of these revenues presently rely on high volume, low value tourism in the high use areas, and come at a relatively high environmental price. At the other end of the spectrum, the wilderness areas are being gradually degraded by livestock incursions and bushmeat poaching, have not been a priority for KWS in terms of security and road infrastructure, and in future are likely to come under growing political pressure for land excisions because of their lack of economic productivity.

Economically, it makes sense for KWS to pursue a different approach to tourism development in the TCA in the future, which does not rely on having all the tourism eggs in one basket, with all its inherent dangers, but rather diversifies the TCA tourism product so as to appeal to different market segments. This will ensure that KWS is able to withstand fluctuations in the tourism industry, for example as a result of global security scares or oil price hikes, which traditionally impact the high volume, low value market first. It will also ensure that KWS takes maximum advantage of the increasing value placed on wilderness and solitude, as opportunities for this experience elsewhere in Kenya and around the world diminish.

Environmentally, diversification of the TCA tourism product and an increased emphasis on high value, low volume tourism in the wilderness and low use areas also makes sense. While maintaining or enhancing revenues, this will enable KWS to reduce the environmental impacts brought about by mass tourism by dispersing use to other areas, and focussing more on value rather than volume. By increasing visitor use of the wilderness areas, this will demonstrate economic use and productivity of these areas thereby deterring both short-term pressures for livestock grazing and bushmeat poaching, as well as longer-term pressures for degazetttement.

An important guiding principle of this Tourism Development & Management Programme is therefore to develop the TCA tourism product so that it appeals to different market segments. The ultimate end result of this approach will be a more stable and viable tourism product that continues to generate high revenues, but with lower environmental impacts and greater conservation returns.

Providing a high quality, low environmental impact visitor experience in the TCA's high use areas

The TCA is renowned and marketed as an area where it is possible to see the “Big Five” large mammals during a short stay. Elephants and big cats are key species for tourism, and sightings of rhino are virtually guaranteed in the Ngulia Rhino Sanctuary in Tsavo West. Much of this tourism is concentrated in the prime wildlife areas near water sources (rivers such as the Galana, Tsavo and Voi, and other springs and pans) and areas that contain sensitive habitats. In many of these key areas, the TCA is beginning to show many of the symptoms of tourism congestion and overuse as is experienced in high-density game viewing parks elsewhere in Kenya, such as the Masai Mara. This includes traffic congestion at carnivore sightings, vegetation damage from off-road driving, over-speeding on main road arteries, and litter. All these by-products of a prospering tourism industry also in the longer term

threaten to undermine both the quality of the visitor experience and therefore the desirability of Tsavo as a destination, and the natural environment on which the tourism product ultimately depends.

Compounding the problem of high visitor numbers is the rapidly expanding amount of visitor accommodation in the Tsavo area. The number of accommodation facilities and bed numbers within the TCA high-use areas themselves are currently not at an unacceptably high level, but in recent years there has been an uncoordinated proliferation of tourist beds in areas adjacent to these high-use areas, and especially around the southern portion of Tsavo East (the Voi High Use Zone). This area has around 400 beds inside the park but at least 1,100 beds near its boundaries – and the vast majority of these visitors are using the TCA. In reality, and for planning purposes, this means that the Voi zone has 1,500 beds, with more to come (see the Zonation Scheme for details). This high number of visitors is further exacerbated by a poor game viewing road network in both the high use areas of Tsavo East and West, and the small number of tourism sinks (picnic sites, short walks and other attractions) that encourage visitors to get out of their cars and off the roads.

There seems little immediate prospect of changing the nature of the tourism product in the TCA high use areas from its present high volume, low value approach. This is because many Tsavo visitors are on safari as an added feature to an otherwise beach-based holiday, and are likely to be unwilling to spend a large amount of additional money for a more high value, exclusive safari. In addition, a large section of Kenya's tourism industry relies on the current tourism product offered by the TCA, especially the coastal operators, and it will not be easy for them to change the nature of the tourism experience they provide. As explained previously, there are also advantages to KWS in offering multiple tourism products in the TCA. High volume, low value tourism therefore is likely to continue to play an important role in the TCA's high use areas in the future, and the challenge is to manage that tourism product in order to provide an optimal visitor experience with low environmental impacts. This will require intensive management of vehicle-based tourism in the high use zones, which is the second major guiding principle of this programme.

Promoting investment in low volume, high value tourism in the TCA's low use and wilderness areas

Besides the high use areas with their emphasis on traditional vehicle-based game viewing, the Tsavo parks are also home to an asset that is rapidly increasing in value - wilderness. Large parts of the TCA presently have little infrastructure or tourism development. This is partially due to past management strategies, but also to the fact that these areas are not conducive to traditional types of tourism centred on viewing wildlife from vehicles. Unfortunately, many of these areas are also not currently well protected by KWS, and illegal use by livestock and poaching for the bushmeat trade is widespread. The future development of tourism in these wilderness areas provides an opportunity for KWS to on the one hand diversify the TCA tourism product away from traditional game viewing in the high use areas, thereby increasing the resilience of the overall TCA tourism product, and on the other to improve the conservation of the wilderness areas, by greatly increased presence and improved revenues for their management and security.

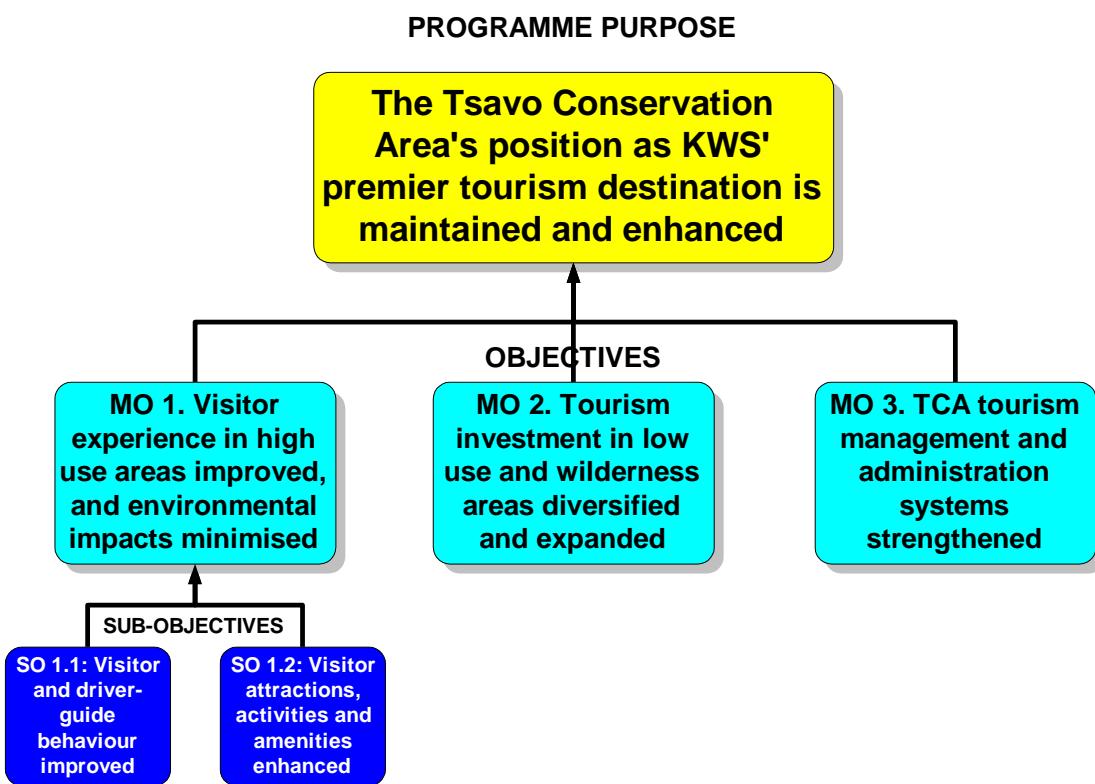
The TCA's wilderness and low use areas lend themselves to a different model of tourism which is geared towards exclusivity, luxury and an alternative array of activities that do not rely on high concentrations of wildlife, and are not on offer in high use game viewing areas. While this product may very well be combined with a more traditional game viewing experience in a safari package, it is a quite distinct product, which is normally provided by different tourism operators with different skill sets. The third and final guiding principle for this programme will be the promotion of new investment in such low, volume, high value tourism

products in the TCA's wilderness and low use areas. Since the essential quality that is being sought after in this product is the sense of exclusivity and solitude, an important consideration in the programme and in the plan's zonation scheme will be to keep these new developments at low levels that are commensurate both with maintaining the wilderness ecological values as well as with the desired visitor experience.

Management objectives

Figure 19 below shows the overall objectives tree for the TCA Tourism Development and Management Programme.

Figure 19: Tourism Development and Management Programme objectives tree



Each of these management objectives, and their subsidiary management actions are set out in the following sections.

Objective 1: Visitor experience in the TCA's high use areas improved, and environmental impacts from tourism minimised

The vast majority of tourism use in the TCA is currently concentrated in the area south of the Galana River in Tsavo East and north of the Tsavo River in Tsavo West. As shown in the TCA Zonation Scheme, both these areas have been designated as high use zones (termed Voi and Mzima respectively) and currently contain almost all tourist accommodation, facili-

ties, attractions and infrastructure in the TCA. Although the high levels of use in these areas, primarily due to their easily accessible location within a few hours drive from the coast and from Nairobi, does generate significant income for the TCA and for KWS as a whole, concerns have been raised that the high levels and patterns of visitor use in these areas is undermining the overall quality of the visitor experience, and may also be impacting negatively on the TCA's wildlife and vegetation.

This objective has therefore been developed to help realise the desired future state where visitors to the TCA are enjoying a high density, and yet well-managed and high quality wildlife viewing experience in the TCA high use areas, with minimal impacts on the area's environment and wildlife. Alongside the prescriptions in the Zonation Scheme, which both restrict the development of new visitor accommodation facilities and the variety of visitor activities permitted in these areas, this desired future state will be realised through three main thrusts: improving awareness and adherence to game-viewing rules and regulations, developing alternative visitor attractions (to help reduce traffic levels on game viewing tracks and provide a more diverse experience), and through the development of new, and improvement of existing, game viewing circuits. The first two of these thrusts (awareness of and adherence to rules and regulations, and the development of alternative visitor attractions) will be implemented through the two sub-objectives under this objective, which are elaborated in the following sections. The development and improvement of game viewing circuits is elaborated under Action 3.2.1 of the Protected Area Operations Programme.

Sub-objective 1.1: Visitor and driver-guide behaviour and adherence to TCA rules improved

Although extensive, the TCA does not have the extremely high densities of easily visible wildlife that are associated with other popular protected areas (such as the Masai Mara National Reserve or Amboseli National Park), and which many of the less discerning visitors to the TCA have come to expect. As such, large concentrations of vehicles have been known to congregate around wildlife sightings, and in particular sightings of large predators, which both undermines the quality of the visitor viewing experience and may result in stress and disturbance to the animals themselves. This situation is often compounded by unqualified or inexperienced drivers and guides, who may be unaware of, or may disregard, viewing regulations, and by visitors who may also be unaware of the potential impacts of their actions. The situation is further aggravated due to the limited network of game viewing tracks in the TCA's high use zones, which both increases the concentration of vehicles around wildlife visible from official roads, and encourages the creation of illegal "off-road" tracks, which have had a significant impact on vegetation in parts of the TCA, and in particular in certain areas of Tsavo East.

This sub-objective has therefore been developed in an effort to improve the conduct of visitors and driver guides in the TCA, and thereby contribute to a high quality visitor experience and minimise the negative impacts of visitor use on the TCA's ecology. Recognising that existing strong visitor preferences for sightings of large charismatic mammals, and in particular large predators, are unlikely to change, this sub-objective will mainly focus on improving the clarity of and visitor/guide awareness of regulations and on strengthening the policing of these regulations. Alongside this, TCA management will also take steps to build on current efforts to enhance the standards and environmental awareness of the driver/guides that utilise the TCA. Four management actions have been developed to realise this sub-objective, and these are elaborated below.

Action 1.1.1: Revise and disseminate TCA visitor regulations

The regulation of activities and behaviour inside national parks is addressed in Section 16 of the Wildlife Conservation and Management Act (1989), which specifies rules regarding: entry times, speed limits, disturbance of wildlife, and littering. In the TCA, these regulations have been distilled into a more easily understandable and accessible set of rules and guidelines called "The Tsavo Code", as well as complementary guidelines regarding off-road driving and behaviour in the vicinity of big cats. Nevertheless, most of these regulations are routinely flouted by many professional guides and drivers, and this is a major factor contributing to the poor quality of the overall visitor experience in the TCA, especially in the high-use areas, as well as impacting on the TCA's environment. Ignorance and ignoring of the TCA's rules and regulations is particularly acute in the TCA due to the short stay, low budget nature of tourism in the TCA's high use zones, which often relies on the use of inexperienced drivers and guides who may be unaware of or unfamiliar with the regulations, and of visitors who do not know what type of behaviour is acceptable in the area. This situation is compounded as some of the regulations are currently not as clear as they could be (e.g. the minimum distance to be maintained from animals), and some key aspects of visitor behaviour that need regulating (such as the number of vehicles permitted around an animal sighting) are not specified.

A vital first step in helping to improve adherence to the TCA rules and regulations, and as a result to improve the overall quality of the visitor experience while minimising environmental disturbance from visitor use, is to ensure that all such regulations are clear, concise, consistent and easily understandable by users of the area. In order to achieve this, TCA management will first conduct a review of Tsavo Code and other existing TCA visitor regulations, and, as necessary, consolidate, amend and include additional rules, in order to ensure that all regulations are clear and comprehensive. This is likely to include, for example, the establishment of limits for the number of vehicles permitted at animal sightings, setting the time allowed and minimum distance to be maintained from wildlife, and the development of any additional regulations required for carnivore sightings. Once consolidated, these regulations will then be printed and made available at key points determined by TCA managers, such as entrance gates and/or visitor accommodation facilities in and around the area.

Action 1.1.2: Increase Ticket Inspection Units in Voi and Mzima High Use Zones

A vital complement to the improvement of visitor regulations discussed under the action above is strengthening the mechanisms to ensure adherence to these regulations. Enforcement is especially difficult in a large and highly used area such as the TCA, and this is further compounded by the short time that many visitors spend in the area, which increases the pressure on guides and drivers to meet visitor expectations, and as a result the likelihood that some regulations, particularly those regarding the maximum number of vehicles around carnivores and off-road driving, will be disregarded. In order to address this issue, a limited number of Ticket Inspection Units (TIUs) are currently deployed in the TCA's high use zones. However, at present levels, their presence is not sufficient to effectively deter illegal activities in the area, and the vast majority of offences currently go unrecorded and unpunished. Therefore, in order to improve adherence to TCA regulations, TCA management will liaise with the KWS HQ Security Department in the deployment of additional TIUs to improve adherence to TCA visitor regulations, as well as ensuring that all visitors' tickets are in order.

Action 1.1.3: Develop video(s) to raise awareness of the TCA's ERVs and visitor rules and regulations

In addition to the dissemination of TCA rules and regulations through leaflets or posters at entry gates and other points around the TCA (discussed under Action 1.1.1), other traditionally underutilised media have the potential to play an important role in improving visitor appreciation of the conservation importance of the TCA, and to enhance their understanding of the park rules and regulations. In particular, concise, professionally prepared videos are especially suitable for this role, as they can provide visitors with an easily digestible and targeted overview of key information on the TCA, and can also be easily integrated into the typical safari schedule (for example, they can be shown after dinner at lodges or camps, and/or at visitor centres near TCA entry points). This action caters for the production of a suitable high standard video for this purpose.

The production of the video will involve the initial preparation of a synopsis of the proposed video, and subsequent discussions between TCA management and KWS Tourism, Publicity and Education Departments to agree on the modalities of video production. It will be important that production is entrusted to a professional filmmaker, so as to ensure that the video is of a suitably high quality both for its intended visitor audience as well as to encourage its uptake by key tourism stakeholders. In this regard, a detailed brief for the production project will be prepared, leading to a tender process, followed by the selection of an appropriate production company. Once the video has been produced to an acceptable standard and in accordance with the brief, TCA management will liaise with lodges and camps in and around the area to ensure that the video is used to its maximum impact.

Action 1.1.4: Promote high standards of TCA professional drivers and guides

The current standard of driver-guiding in the TCA is generally poor. This is primarily due to the use of inexperienced and unqualified drivers and guides by many coastal-based operators, which not only undermines the overall experience of many visitors to the area, but has also contributed to negative impacts on the area's environment, through for example, increased off-road driving or crowding around animal sightings. The tourism section of KWS has recently instigated a number of measures to address these problems, including the development of a driver/guide database that is currently being compiled and is now in the pilot phase. The recording of inappropriate behaviour and rule breaking by drivers and guides will be one of the central functions of this database. Also under consideration is the possibility of incorporating a points system where, once a guide reaches a certain level, more punitive actions will be taken (such as temporary or permanent banning from the TCA, and/or other KWS areas). The driver/guide database has the potential to be an important mechanism for influencing the behaviour of drivers and guides in the TCA, and its further piloting and completion will be a high priority under this management plan.

In addition to the database, TCA management and KWS HQ will also continue to provide ongoing support for the periodic training of drivers and guides designed to improve their overall awareness of the area's values, its rules and regulations, and the rationale behind their creation and enforcement. This will be complemented by annual events to acknowledge individual drivers/guides, as well as those companies with the best drivers operating in the TCA. On a longer term basis, and in an effort to improve the overall standard and accountability of drivers using the area, TCA management will also begin steps to ensure that all professional drivers and guides operating in the area belong to a recognised tourism association. This will involve agreeing a schedule for the implementation of this new requirement, raising awareness amongst operators of this schedule and the forthcoming changes to TCA rules and eventually, to enforcing this new requirement in line with the established schedule.

Sub-objective 1.2: Visitor attractions, activities and amenities in high use areas enhanced

As discussed in the TCA Zonation Scheme, a major factor impacting on the quality of the visitor experience is the number of other vehicles that a visitor is likely to encounter during a game drive. The scheme explains that the more encounters with other vehicles that a visitor has on a game drive, the less the visitors' sense of solitude and "wildness" (which is one of the most important values sought by the majority of PA visitors), and the lower the overall quality of the visitor experience. One way of reducing game drive encounters is to provide alternative attractions and activities that encourage visitors and driver/guides to get off the roads. An increased variety of visitor attractions, activities and amenities in the TCA high use areas will also improve the overall quality of the TCA tourism product, by providing high quality and appealing alternative attractions to wildlife viewing.

The TCA, and in particular both high use zones, are fortunate to have a variety of natural and historic attractions, many of which, such as Mzima Springs, Mudanda Rock, and Lugards Falls, are already visited by a significant number of visitors. However, many potential attractions or "**tourism sinks**" remain under or undeveloped, and other opportunities for diversifying the visitor experience, such as the development of short walks and nature trails, remain untapped. As such, this sub-objective has been developed to bring about the desired future state where visitors to the TCA are enjoying a wide diversity of visitor attractions, activities and amenities in the TCA's high use areas, and thereby benefiting from reduced vehicle encounters during game drives. This approach complements other strategies pursued through this management plan that are designed to reduce the overall visitor encounter rate in the TCA high use areas (such as increasing the length of game-viewing roads and slowing down the speed of traffic on roads).

In order to achieve this sub-objective, a number of management actions have been developed that focus on a range of issues, including the improvement of existing tourism sinks, the development of new sinks and other activities, and enhancing the provision of KWS staff to support these activities where necessary. These management actions are elaborated below.

Action 1.2.1: Upgrade and improve existing tourism sinks and facilities

As discussed above, the TCA is fortunate to have a relatively high number of existing tourism sinks, many of which are already visited by large numbers of visitors on a daily basis. However, while visitors' use of such sinks does enhance the overall experience in the TCA, current high levels of use have in some cases begun to impact on the environment around these attractions, or increased the need for new or upgraded visitor facilities/amenities, such as toilets and washrooms. This management action aims to address this issue and to ensure that existing tourism sinks meet appropriate visitor use and environmental impact standards. This will involve the initial definition of visitor use and environmental impact criteria for developing and managing tourism sinks, followed by an assessment of the existing tourism sinks in accordance with these criteria. Following the assessment, appropriate measures will then be taken to bring the management of existing sinks into line with the established visitor use and environmental standards. In some cases, further studies may be needed on visitor use and impact at the most popular visitor attractions, including developing scenarios for efficient management. The most urgent of these is Mzima Springs (which is dealt with separately under Action 1.2.8 below), however other studies at Shaitani, Chaimu, and the Kisula caves may also be desirable. In addition to these more general activities, specific improvements have also been identified as part of the management plan development process. These include: the construction of washrooms at Mudanda, Kandecha, Aruba and Lugards Falls; the

development of viewing points along Galana River, Irima and Ithumba hills, picnic sites at Kithasyo and Mukururo; and improving the access road to Roaring Rock viewing point.

Action 1.2.2: Develop new tourism sinks and facilities

Tourism use of the TCAs high use areas is expected to increase over the 10-year timeframe of this plan, and the development of new tourism sinks and facilities to augment the existing ones will therefore be important to ensure that the quality and diversity of the TCA tourism experience is maintained and where possible enhanced. As a first step, TCA management will carry out an assessment in conjunction with tourism industry stakeholders of the optimal requirements and the potential locations of new tourism sinks and visitor facilities. This could consider, for example, potential improvements to the existing network of picnic sites, additional viewpoints, and/or new interpretive stops or information points. These proposals will then be reviewed by TCA management, and, if approved, the new sinks and facilities developed according to development criteria formulated under Action 1.2.1.

Action 1.2.3: Improve wildlife viewing circuits

Most of the TCA road network was established at a time when there was very little tourism in the TCA, and when the area's management was more focused on enabling effective access to all parts of the PAs. As a result, many TCA roads, in particular in TENP, are not well placed or optimally designed to support wildlife viewing, or to encourage the dispersal of visitor use. Too few roads, which are often located in sub-optimal wildlife viewing areas, has impacted on the quality of the visitor experience, led to congestion and, where the roads are wide and straight, to over-speeding. All of these factors are likely to have an increasingly severe impact as visitor use intensifies in the area over the next 10 years. It is therefore vital that the road network, especially in the TCA high use zones, is improved to establish a network of wildlife viewing circuits that takes optimal advantage of available wildlife concentrations and habitats, disperses visitors more evenly throughout the TCA high use areas, reduces traffic speed by meandering rather than simply taking the shortest route between A and B, and minimises environmental impacts. This will involve an initial identification of key visitor congestion areas as well as currently under-utilised wildlife viewing opportunities, which will be carried out in collaboration with key tourism industry stakeholders. Once this assessment has been completed, and the recommendations reviewed and subjected to EIA, TCA management will proceed with the design and construction of new wildlife viewing circuits in accordance with these recommendations, complemented by the road planning that has already been set out in the TCA Roads, Bridges and Supplemented Water Plan (see PA Operations Programme Action 3.2.1 for details).

Action 1.2.4: Establish interpretive nature trails and short walks

Alongside the establishment of new tourism sinks and the improvement of existing sinks (detailed under Actions 1.2.1 and 1.2.2 above), the development of nature trails and short walks can also contribute to enhancing the TCA visitor experience. These trails provide visitors with an opportunity to get out of their vehicles, thereby broadening the focus of a visit to the TCA from purely wildlife viewing, while at the same time reducing vehicle encounter rates on the area's roads. Under this management action, new trails will be developed at some existing and already popular tourism attractions, such as Ithumba Hill, Mudanda Rock, and Lugards Falls, which will make visitors stops at these sites more rewarding and encourage them to remain longer. In addition, new paths will be developed and interpretation signage improved at key World War I historical sites in TWNP, many which are currently underdeveloped and hardly visited. Specific sites of botanical interest will also be identified in TENP and, where

appropriate, interpretation signage and parking areas provided to encourage visitor use. TCA management will also engage with lodge and camp operators and managers in the area to raise awareness of the opportunities and benefits of developing short walks/nature trails in the vicinity of their facilities, and provide support for the development of new trails as necessary.

Action 1.2.5: Develop TENP visitor interpretation centre and displays at key TCA entry points

Informing and educating protected area visitors about the PAs' biodiversity values ensures that visitors get the most out of their visit, and provides a much-needed alternative activity to game viewing. Interpretation facilities also provide an opportunity for PA managers to communicate directly with visitors, for example to raise awareness of PA rules and regulations. The TCA is fortunate in having a recently developed and well-equipped visitor centre to fulfil this role in TWNP, but while the more heavily visited TENP has an education hostel at Voi, it does not have a visitor interpretation centre. In order to ensure that the vast majority of visitors to the TCA have the opportunity to access visitor interpretation facilities, this action focuses on the development of a visitor interpretation centre in TENP (possibly linked to upgrading the Voi education hostel – see Action 5.2 of the Community Programme), as well as complementary visitor interpretation displays at key TCA entry points. The first step in establishing the new facilities will be the development of a design proposal for a new TENP visitor interpretation centre and complementary TCA entry point displays, which will be developed by TCA management together with the KWS HQ Tourism & Education Departments. Once the proposal has been finalised and approved, a tender process will be undertaken based on the proposal, to identify and secure the services of an appropriate firm to undertake the construction of the new centre and entry point displays, and their outfitting with appropriate interpretation exhibits. TCA management will oversee construction of the new facilities, including liaising with the contractors concerning the design of interpretive exhibits and materials, and will deploy staff to manage the facilities and for visitor public relations once the facilities are operational.

Action 1.2.6: Develop the “Maneaters” visitor centre and museum

At the turn of the 20th Century, the Tsavo area gained notoriety when two lions stopped work for several months on the construction of the new Kenya-Uganda Railway by killing and eating a number of railway construction workers. Before they were eventually shot, nearly 140 workers were killed by the maneaters in less than a year, many of the victims being dragged from their tents at night. This notoriety has persisted through to the present day, and most advertising of the TCA makes much of the “Maneaters of Tsavo” story, and the events have been the focus of a number of popular books and two movies. However, to date, the TCA has not itself capitalised on the full potential of this unique historical aspect of the area, and the potential remains to develop additional visitor attractions associated with the events and locations of this story. This management action has therefore been developed to take fuller advantage of this aspect of the area's history. In collaboration with the National Museums of Kenya (NMK) and KWS HQ Tourism Department, TCA management will develop a design proposal for a new visitor interpretation centre and museum focusing on the “Maneaters of Tsavo”. As with the previous action, this design concept will then be distributed to appropriate firms, and a tendering process carried out. Once this has been completed, TCA management will then oversee the construction of the new interpretation centre and museum, in collaboration with NMK.

Action 1.2.7: Establish/strengthen the centralised system for providing ranger escorts for walking and night drive activities

The development of the new visitor activities set out in the TCA Zonation Scheme and in this Programme (such as night drives, short walks and nature trails) will require additional support/escorting services from KWS rangers to ensure that visitors can safely undertake these activities within the TCA. To enable efficient administration and delivery of these escort services and to promote uptake of the new activities by operators and visitors to the area, a centralised system for ranger escorts will be established in both TWNP and TENP. Besides a booking system, this may also involve the establishment of a central location(s) for collecting ranger escorts, linked to specific areas for undertaking night drives and short walks. The action will involve defining the ranger guide/escort requisition process and requirements, in consultation with key tourism stakeholders, which, once finalised, will then be disseminated to visitors and operators in the TCA. The centralised system will then be piloted, and its operation and ease of use subsequently reviewed (also in collaboration with tourism stakeholders), and then revised and improved as necessary in accordance with the recommendations of the review process.

Action 1.2.8: Upgrade and expand the Mzima Springs visitor facilities

Located in the heart of TWNP, Mzima is probably East Africa's most well-known spring, and a major tourism attraction of the TCA. The spring creates a green oasis, which provides a strikingly beautiful contrast to the surrounding semi-arid land. It is a rich habitat for hippos, crocodiles, and birds, and a source of water for many other animals in the TWNP. As a tourism site, its popularity is increasing year on year, and visitor records show that 74,255 tourists visited in 2006, and 69,881 between January and September 2007. It is expected that by end of 2007, approximately 100,000 tourists will have visited the spring. However, this high visitation rate, coupled with the large number of wild animals (especially elephants, hippos and antelope) that also use the spring is placing significant pressure on the area's habitat, and presents a major challenge to the management of the area. Habitat deterioration due to intense over use has already been noted in some areas. For example, soil erosion on the eastern bank is evident, which is causing silt to flow into the spring thereby creating conducive conditions for the opportunistic invasive, the water lettuce (*Pistia stratiotes*).

This situation necessitates the redesign and redevelopment of tourism infrastructure around the spring, in order to better present its natural beauty, improve the interpretation of natural features for visitor enjoyment, enhance visitor management, and, most importantly, to preserve the integrity of the habitat. For example, the current underwater viewing tank is now very old and dilapidated, and there are proposals for installing an underwater viewing walkway similar to those that have been introduced in some modern aquariums. To this end, a planning team consisting of KWS staff from various sections (wetlands, planning and EIA, research and park management) has already been established and has produced a concept report setting out preliminary proposals for the redevelopment of Mzima Springs. This report includes details of the current facilities and proposals for improvement to these facilities, and an outline of the implementation steps needed. These steps begin with an initial presentation of the preliminary report and workplan to the KWS E-com, followed by a study tour by the planning team to similar facilities in other countries (such as the Chicago Museum and Aquarium). Following on from this study tour, a more detailed design proposal for the redevelopment of the Mzima Springs visitor facilities (incorporating outcomes of study tour and consultants with different expertise to develop detailed designs) will be prepared, and subject to available funds, a tendering process incorporating the design concept then carried out. Environmental considerations permitting, the development will then get underway, and TCA

management will oversee the construction of new visitor facilities and ensure that they are in line with the specifications.

Objective 2: Tourism investment and use in the TCA's low use and wilderness areas expanded and diversified, within environmentally acceptable levels

Despite significant potential, the vast majority of the TCA (i.e. north of the Galana River in Tsavo East, south of the Tsavo River in Tsavo West, and all of Chyulu Hills National Park) remains almost entirely unused by visitors, and has very few permanent visitor accommodation facilities. This is due to a number of factors, including traditional difficulties in access to these areas, in particular crossing rivers during the wet seasons, less favourable game viewing conditions and wildlife populations when compared to the high use zones, and lingering concerns about security in some of the more remote areas. At the same time, these underutilised areas are severely impacted by illegal activities, such as livestock grazing, bushmeat poaching, and the extraction of other natural resources (such as sandalwood from the Chyulu Hills). Experience in other PAs has shown that increased visitor use, and accompanying management presence, clearly demonstrates use of the area, and thus helps reduce the occurrence of many illegal activities that would otherwise occur. Tourism use also helps to raise the profile and economic importance of these often overlooked areas, and thereby encourages both the institutional, political and financial support essential for their continued conservation.

This objective has therefore been developed to realise the desired future state where tourism investment and visitor use is increased across the TCA's low and wilderness zones. Recognising that investment in these more logically difficult areas of the TCA is less attractive to potential investors than in the high use zones, as well as the potential contributions that such investment could make to the TCA's conservation, a proactive approach to developing investment in these parts of the TCA will be pursued through the implementation of the management actions under this objective. This will involve a number of steps such as the development of a prospectus detailing potential sites, and familiarisation tours for potential investors. Investment and use will be further encouraged in these zones through the designation of additional special campsites to encourage high end, low density mobile tourism that is particularly appropriate for these areas, and through the development of appropriate "adventure activities" that are not permitted in the more heavily used areas of the TCA, such as walking safaris, camel or horseback safaris, and river rafting.

Wilderness is one of the TCA's most characteristic attributes, and the wilderness experience is likely to become increasingly valued and valuable as tourism pressures on other wildlife areas in Kenya intensifies. While efforts are made under this objective to expand visitor use of the TCA's wilderness areas, which as explained previously is vital for the future conservation of these areas, this needs to be tempered by efforts to maintain the very wilderness characteristics that visitors value. The management plan achieves this by setting clear limits on tourism development in the TCA's wilderness areas, and by maintaining low visitor densities and encounter rates, as detailed in the TCA's zonation scheme.

The eight activities that have been developed to achieve this objective are elaborated in more detail in the following sections.

Action 2.1: Carry out first round of tourism investment promotion

Despite the significant increases in bed capacities in the low use and wilderness zones that is permitted in the TCA Zonation Scheme, and the more exclusive nature of the tourism product that will be promoted in these zones, potential investors face a number of challenges in developing successful operations in these areas. Investment in previously little known tourism areas comes with greater financial risks compared with investment in high use visitor areas, such as the TCA's Voi or Mzima zones. In addition, there are greater logistical and supply costs when operating smaller facilities in remote areas. For these and other reasons, it is realistic to assume that investors will not be scrambling to set up new facilities and operations in these currently underutilised areas, and that KWS Headquarters and TCA management will need to take proactive steps to promote and support private sector investment in these areas.

Following on from a confirmation of the proposed accommodation facility sites included in the TCA Zonation Scheme, these steps will focus on the development and dissemination of a tourism prospectus detailing available investment opportunities, including the potential of each site, the visitor activities that could be developed in conjunction with the accommodation facility, any financial incentives offered to investors, and other relevant details. This prospectus will be launched together with a familiarisation tour for potential investors, designed to showcase the areas or specific sites that are included in the prospectus. The distribution of the prospectus and familiarisation tour will be closely followed by the issuing of a call for Expressions of Interest in developing facilities in the TCA low use and wilderness zones, which will invite proposals from potentially interested investors, and clearly set out the investment guidelines and the information that potential investors must provide (including proposed site or sites, type of facility, outline of proposed developments, and any planned visitor activities). Based on these initial proposals a number of investors will be shortlisted and invited to submit a more detailed elaboration of their proposed developments, in accordance with the "Proposal Requirements, Content and Format" guidelines provided in the KWS Facilities Development Procedures. Once this has been completed, the remaining steps outlined in the Facilities Development Procedures will continue to be followed, including the need to complete a detailed EIA and obtain NEMA certification before beginning construction.

Action 2.2: Improve access and wildlife viewing roads

One of the major challenges facing potential investors in the TCA's low use and wilderness zones is the difficulty of access to these areas, both as a result of poor, or poorly positioned, roads, and insufficient commercial operation standard airstrips. This is primarily because the vast majority of the road network and transportation infrastructure in the TCA was designed at a time when there was very little tourism in the area, and the major focus of TCA management was improving administration and supporting security operations, rather than enhancing visitor use or game viewing. This was particularly the case in the TCA's more remote areas, where security has traditionally been much more of a priority, and as a result nearly all the roads in these areas are not well designed for visitor use, and do little to enhance the already difficult wildlife viewing. If tourism investment and use of these areas is to be encouraged, it is therefore essential that both access roads and wildlife viewing circuits are improved. This will initially involve identifying the specific access and wildlife viewing requirements associated with the new tourism facilities (discussed under Action 2.1 above), followed by the design and construction of new access roads, game viewing circuits and river crossings in accordance with these specific requirements, as well as with the general framework provided by the TCA Roads, Bridges and Supplemented Water Plan (see PA Ops Programme Action 3.2.1 for details).

Action 2.3: Establish new special campsites in the Low Use and Wilderness Zones

Currently, the vast majority of the TCA's special campsites are located within or adjacent to the area's high use zones, and there are currently very few special campsites in the remoter parts of the area. Yet special campsites provide a much-sought-after (especially by high-end tourists) opportunity for visitors to overnight at a scenic and exclusive location within a national park. As has been noted elsewhere in this management plan, such opportunities for exclusivity and solitude are now becoming increasingly rare in Kenya's parks. Therefore, in order to capitalise on this potential, and to provide a relatively rapid method for increasing visitor use in the TCA low use and wilderness zones, a number of new special campsites will be established in these areas during the lifespan of this plan. All new developments will be in line with the specifications set out in the TCA Zonation Scheme, and will include: two sites in the Emusaya Wilderness Zone; one site in the Murka Low Use Zone; two sites in the Jipe Low Use Zone; and one site in the Chyulu Low Use Zone. Once the sites included in the zonation scheme have been verified and exact locations specified, the sites can then be cleared and made ready for use, and any new access roads developed. These sites will then be incorporated into the existing TCA special campsite booking system.

Action 2.4: Design and establish adventure activity concessions

Despite their size, most of the TCA's low use and wilderness zones, with some exceptions such as along the Tiva River in the Ithumba Low Use Zone, are not well suited for traditional game viewing from vehicles. This is due to a number of factors, some of which, such as limited game viewing circuits, can be resolved by TCA managers (see Action 2.2 above). Others, however, such as the low wildlife densities and dense bushland habitat, are much more difficult to address. However, these same areas do have the potential to support a wide variety of adventure-based activities, many of which are not available in other PAs, and that would enable these currently underutilised areas to take advantage of growing niche markets that focus on such activities. Potential adventure activities that could be established in the TCA include: walking safaris (which have proved popular in many other PAs); boating on Lake Jipe or rafting on the Tiva River; horseback and bicycle safaris in CHNP; and the possibility of camel safaris in the Emusaya Wilderness Zone (details of activities permitted in each zone are provided in the Zone Detail section of the TCA Zonation Scheme).

However, any development of new adventure activities in the TCA needs to be regulated by clear guidelines, and the roles, responsibilities and liabilities of KWS and any private sector investors need to be clearly established from the outset. As such, an essential first step in establishing these activities is a review and clarification, in conjunction with KWS HQ Tourism Section, of the legislative, policy, liability and insurance aspects of the development of adventure activities in KWS PAs. Once this has been completed, TCA management will then proceed to develop a proposal outlining potential adventure activities that could be developed within the area, including possible sites, any specific logistical and administrative support needs, and the possibilities for local community involvement in the development or operation of such activities (such as the provision of camels and handlers for camel safaris). The proposal would also detail the accommodation possibilities linked to the new adventure activity, such as use of special campsites established under Action 2.3 or the development of a new permanent facility according to Action 2.1 above. Once KWS HQ has endorsed these ideas, an Expressions of Interest document for launching adventure activity concessions can then be developed, incorporating the initial proposal and any other feedback received, and then disseminated to potentially interested operators. KWS tendering procedures will then be followed, successful operators selected, and pilot schemes for specific adventure activities developed and then initiated. Once underway, TCA management will continue to monitor

scheme performance and the environmental impacts of any activities developed, periodically solicit feedback from operators regarding any additional management support needed, and subsequently make any adjustments as necessary and appropriate.

Action 2.5: Establish pilot off-road driving scheme in Jipe Low Use Zone

Due to its remoteness, low densities of easily visible wildlife, and poor habitat for game viewing, the Jipe Low Use Zone remains one of the least utilised areas within the TCA. Even the Lake Jipe area with its high scenic values and concentrations of wildlife during the dry season is rarely used by visitors outside of the peak season. Therefore, as an added incentive to encourage visitation and use of this zone, off road driving will be permitted on a pilot basis within certain parts this zone, by operators approved by TCA management. The first stage in the development of the pilot off-road driving scheme will be the identification of suitable areas, which can be clearly marked or are easily discernable on the ground, where off road driving is permitted. Once these areas have been designated, guidelines for off-road driving in these areas will then be developed, and agreed with approved operators. The pilot off-road driving scheme will then be implemented, and the pilot areas periodically assessed for any negative environmental impacts, and guidelines or areas designated subsequently adapted as necessary.

Action 2.6: Develop the Kisula Cave complex as a major visitor attraction

Although the CHNP is currently not highly visited and has relatively low wildlife densities compared with some other parts of the TCA, it does have significant potential for a number of other visitor activities, such as walking or horseback safaris (discussed under Action 2.5 above). The park also has several other visitor attractions, perhaps the most spectacular of which is the Kisula Cave complex. This complex includes extensive lava flows that have created some spectacular craters and hills, and includes what is currently considered to be the second longest lava cave in the world. However, despite the important potential that this attraction has to not only diversify the overall TCA visitor experience and encourage increased use of the currently underutilised CHNP, the cave complex and associated features do not currently feature on most visitors' itineraries. This is mainly due to poor road access and minimal facilities and interpretation materials for visitors. This management action will improve the existing amenities at the cave complex itself, such as washrooms and cave climbing ladders to ease visitor access within the caves. These developments will be complemented by the upgrading of the Kithasyo-Kisula Road, with the aim of improving overall visitor access to the site.

Action 2.7: Develop key archaeological sites in TENP for tourism

There is a long history of human settlement in and around the TCA, evidence of which can be seen in ancient cave paintings located in the Ithumba area, and along the Yatta Plateau. Similar paintings have proved very popular with visitors to many other protected areas (such as the Serengeti National Park), and the TCA archaeological sites have similarly proved popular with the limited number of visitors that are currently aware of their existence and location. These sites are also well placed to attract visitors to currently underused parts of the TCA, and their promotion will add an extra dimension to the TCA visitor experience. However, the sites are also especially sensitive to increased visitation, and their development and promotion as an attraction must therefore be carried out with caution, and in accordance with international best environmental practice. In order to ensure that this is achieved, TCA management will liaise with the National Museums of Kenya regarding visitation rules, and the requirements for interpretive displays and other simple environmentally-sensitive visitor facil-

ties at key sites. Once these have been established, and an EIA undertaken, these displays and facilities will then be constructed and established in accordance with the recommendations received.

Action 2.8: Carry out second round of tourism investment opportunities in TCA as appropriate

The previous actions under this objective are likely to result in a significant increase in tourism investment and use in the TCA's low use and wilderness zones. However, bearing in mind the 10-year time horizon of this plan, and other efforts to disperse tourism use throughout the area, it is likely that there will be significant potential and untapped opportunities for additional tourism investment in the TCA once these actions have been successfully implemented. Therefore, after the first three years of plan implementation, an assessment will be undertaken by a KWS HQ and a TCA management team of the feasibility and desirability of further tourism development in all TCA zones based on the current visitor experience and environmental impacts, prevailing economic conditions, and any other relevant factors. This may also entail the modification of Limits of Acceptable Use and bed capacity prescriptions for one or more zones set out in the TCA Zonation Scheme. Based on the results of this assessment, and the experiences and lessons learnt from the first round of investment, potential new sites for visitor facilities will be identified as appropriate, and a new investment prospectus prepared in a similar manner to that described under Action 2.1 above. Once completed, the prospectus will be disseminated, a call for Expressions of Interest issued, and the tendering process and subsequent development process carried out according to KWS Facilities Development Procedures.

Objective 3: TCA tourism management and administration systems strengthened

The previous two objectives describe the efforts that will be made over the lifespan of this management plan to improve the quality of the visitor experience in the TCA's high use zones, and to increase tourism investment and visitor use in the low use and wilderness areas. These anticipated increases in the scale and complexity of the TCA tourism product will need to be matched by a strengthening of the TCA's tourism management and administration systems. Objective 3 has therefore been developed to ensure that the management of tourism in the TCA is strengthened, so that KWS is able to provide the desired tourism product with minimal impacts on the area's natural environment, and can also meet its obligations to the TCA's tourism investors. In order to achieve this objective, four management actions have been developed; these are elaborated in more detail below.

Action 3.1: Implement measures to ensure that all accommodation facilities comply with facility development, management and environmental protection requirements

The historical lack of a TCA management plan, coupled with inadequate policy guidelines from KWS HQ and a constant turnover of senior TCA managers, has meant that there has been no coherent and rational strategy applied to the development of tourism accommodation facilities in the TCA. As a result, many facilities have developed gradually and opportunistically from campsites into tented camps, and, in some cases, eventually into lodges. Several of these facilities have inappropriate and seemingly arbitrary lease provisions, and in some instances, no leases at all.

Now that KWS has put in place comprehensive lease provisions and tourism facility development guidelines, there is a requirement that all TCA accommodation facilities are brought into line with the new arrangements. For example, where existing facilities are located in sensitive habitats, such as riverine forest, they now need to be relocated. This process of ensuring compliance with the relevant guidelines and regulations is already underway. For example, TCA management has recently relocated some camps, and moved others away from rivers beyond critical habitats. New and standardised leases are also in the process of being negotiated with all the TCA camps and lodges. However, at the time of writing this management plan, many facilities in the TCA have either not yet signed new leases with KWS, or are otherwise in contravention of KWS guidelines. An important management action under this objective will therefore be to ensure that all remaining non-compliant accommodation facilities are brought into line with KWS lease provisions and facility development guidelines. To achieve this, TCA management will continue to liaise with operators of existing non-compliant facilities in order to regularise their status.

A longer term issue for ensuring that TCA accommodation facilities have minimal impact on the TCA environment is that there are currently no consolidated KWS-wide guidelines for tourism facility management and environmental impact mitigation. For example, the recently revised and updated KWS facilities development procedures only cover the initial selection and development of tourism sites and facilities, not their ongoing operation. There are no KWS-wide guidelines, for example, with regard the establishment of artificial waterholes, the use of floodlights at night, the use of saltlicks to attract wildlife, and the planting of exotic species in tourism facility gardens. While the number of tourism facilities remained relatively low, this did not represent a major impact on a protected areas' environment, but with the rapid increase in the density of tourism facilities in recent years, especially in the high use areas, the absence of these guidelines is now a major cause for concern, and the impacts in terms of changes in animal movements from artificial waterholes and saltlicks, spread of invasive species from lodge gardens, and light pollution at night are now clearly seen in several KWS PA.

Once TCA lodges are brought into compliance with KWS facilities development procedures and have signed their new and standardised leases, an important priority will therefore be the development of KWS-wide guidelines on facility management and environmental protection that can subsequently be piloted in the TCA. Once the guidelines have been developed, possibly as an extension of the existing facilities development procedures, the compliance of existing facilities with the revised requirements will be assessed, after which TCA management will work with facility operators to resolve any cases of non-compliance with the new guidelines. This may involve removing, relocating or modifying saltlicks or artificial waterholes, removing certain exotic species from lodge gardens and replacing them with non-invasives or indigenous species, and adjusting or removing artificial light sources, all according to the eventual regulations that are put into place. TCA management will continue to carry out annual inspections of TCA tourism facilities to ensure continuing compliance with the new KWS facilities management and environmental impact guidelines, as well as with national environmental impact requirements. (This action will be implemented in conjunction with Action 2.6 of the Ecological Management Programme.)

Action 3.2: Carry out regular monitoring of visitor satisfaction and tourism use

The successful implementation of this programme, and in particular the delivery of an enhanced visitor experience in the TCA's two high use zones, will depend on the availability of accurate and up-to-date information on the quality of the TCA's visitor experience, and the patterns and trends in tourism use in the area. Perhaps the most important potential source

of information on the quality of the visitor experience is from monitoring the satisfaction that visitors themselves express with their visit to the TCA, as opposed to what the PA managers instinctively believe is the visitor experience being provided. TCA management has already taken some significant steps towards tapping this valuable source of feedback on the TCA visitor experience through the implementation of periodic TCA visitor satisfaction surveys, and this will be continued under this action with their frequency stepped up to a quarterly basis.

The other major source of information on patterns and trends in tourism use in the TCA is the KWS Safari Card system, the improved version of which is due to be implemented in the TCA in the near future. This system will enable the collection of detailed information on the levels of visitation, length of stay, type of visitor etc. If collated and analysed regularly, this information can provide TCA management with a valuable and timely snapshot of the TCA tourism product, enabling management to assess the effectiveness of tourism management actions implemented through this programme, and informing any management adjustments that may be necessary. TCA management will therefore ensure that this information is routinely collected at the TCA level, and consolidated into periodic summary reports on the TCA tourism product.

Action 3.3: Improve communication and collaboration with TCA tourism stakeholders

Tourism investors and operators are major stakeholders in the TCA, and their concerns and advice need to be regularly solicited in order to successfully realise the area's tourism potential, and to implement a number of the actions set out in this programme. This group of stakeholders is also particularly well placed to advise TCA management on key issues that may be impacting on current tourism activities and operations in the area, or that may be discouraging the development of new activities or investments. TCA management will therefore implement two key mechanisms to improve collaboration and information exchange between themselves and the area's tourism stakeholders. The first and most regular of these will be quarterly meetings, chaired by the TCA Senior Warden, between management and selected tourism investors and facility managers in the TCA. These meetings will address emerging tourism issues in the area, and catalyze and monitor the implementation of the management actions set out under this programme. In addition, a wider TCA tourism stakeholders meeting will be held on an annual basis. This will involve a greater number and a wide selection of tourism stakeholders, and will aim to improve general awareness of management successes and challenges during the previous year, to inform stakeholders of anticipated works over the next 12 months, and enable them to provide feedback on key issues that they feel TCA management should also be addressing.

Action 3.4: Enhance marketing and awareness of the TCA and its attractions

As many of the actions detailed in this programme demonstrate, the TCA is fortunate to have a wide variety of unique tourism attractions, a rich history, and opportunities for several adventure-based visitor activities in addition to traditional wildlife viewing, all of which can add a unique flavour to a visit to the TCA. However, during the lifespan of this plan, it is highly likely that the majority of tourism operators and investors will continue to focus their marketing of the TCA on the "Big Five", and other large charismatic mammals that are the main reason that most current visitors come to the area. In order to complement this marketing approach, and to support the development of the diversity of alternative visitor attractions and activities set out in this programme, KWS will carry out national-level advertising focusing especially on the newly-developed visitor attractions and activities in the TCA. This will involve the utilisation of tourism, wildlife and travel media, and the KWS website, in order to raise general

awareness of these new opportunities in the domestic as well as international market. Also in this regard, the Tsavo Parks were established on 1st April 1948, and they will have their 60th Anniversary in 2008, a major milestone not only for the TCA itself, but also for the Kenya Wildlife Service. KWS HQ and TCA management will capitalise on and celebrate this important “Diamond Jubilee” by preparing for and holding suitable public events and commemorative workshops within the TCA. These events are likely to boost KWS’ image and reputation nationally as well as internationally, and will help ensure on-going support for the TCA’s conservation well into the future.

Three Year Activity Plan

The following pages set out the first 3-Year Activity Plan for the Tourism Development & Management Programme. The activity plan details the activities, responsibilities, timeframe and extraordinary resource requirements necessary for the delivery of each management action over the first 3-year timeframe of this management plan. In addition, that plan sets out specific and timebound "milestones" that TCA management aims to achieve in implementing the plan.

Management Action and Activities	Persons responsible	Timeframe												Milestones		
		FY 2007-08				FY 2008-09				FY 2009-10						
		1	2	3	4	1	2	3	4	1	2	3	4			
Objective 1: Visitor experience in the TCA's high use areas improved, and environmental impacts from tourism minimised																
Sub-objective 1.1: Visitor and driver-guide behaviour and adherence to TCA rules improved																
Action 1.1.1: Revise and disseminate TCA visitor regulations																
1.1.1.1: Carry out a review of Tsavo Code and other existing TCA visitor regulations and determine need for consolidation, amendment and additional regulations														Revised TCA Code prepared and distributed by June 2009		
1.1.1.2: Establish limits for number of vehicles permitted at animal sightings, time allowed and distance to be maintained	WT, SRS															
1.1.1.3: Define any additional regulations required for carnivore sightings	WT, SRS															
1.1.1.4: Determine appropriate printing method and organise printing of regulations as required																
1.1.1.5: Determine optimal dissemination methods and distribute regulations accordingly																
Action 1.1.2: Increase Ticket Inspection Units in Voi and Mzima High Use Zones																
1.1.2.1 Liaise with the Security Department in the deployment of additional TIUs	WT, W-security													At least 2 additional TIUs deployed to TCA by December 2008		

Management Action and Activities	Persons responsible	Timeframe												Milestones	
		FY 2007-08				FY 2008-09				FY 2009-10					
		1	2	3	4	1	2	3	4	1	2	3	4		
Action 1.1.3: Develop video(s) to raise awareness of the TCA's ERVs and visitor rules and regulations															
1.1.3.1 Prepare a video synopsis (script)	WT, WE													TCA video produced by December 2009	
1.1.3.2 Liasise with KWS Tourism, Publicity and Education Departments to establish appropriate method for producing video	WT, WE, AD-EDU														
1.1.3.3 Develop video production project brief for distribution to appropriate production firms and carry out tender process															
1.1.3.4 Liasise with selected production company in producing video															
1.1.3.5 Liasise with lodges and camps in making arrangements for optimal video use for visitor awareness raising															
Action 1.1.4: Promote high standards of TCA professional drivers and guides															
1.1.4.1 Continue developing and strengthening the TCA driver-guide database as a mechanism for monitoring and enforcing high standards of driver-guide behaviour														At least 75% of tour operators entering TCA registered with tourist associations by June 2010	
1.1.4.2: Carry out regular driver-guide training	SW-TE, SW-TW, WT														
1.1.4.3: Hold annual events to acknowledge good drivers/guides in the TCA	SW-TE, SW-TW, WT														
1.1.4.4: Liasise with key TCA tour operators to raise awareness and secure support for the need for all TCA operators to be registered with recognised tourism associations	SW-TE, SW-TW, WT														
1.1.4.5: Develop and enforce requirement for all drivers/guides operating in the TCA to belong to a recognised tourism association	SW-TE, SW-TW, WT														
1.1.4.6: Liasise with KATO, KTF and Ministry of Tourism and Wildlife to enhance and enforce requirements for licensing tour operators	KWS Director, KWS Tourism Department														

Management Action and Activities	Persons responsible	Timeframe												Milestones		
		FY 2007-08				FY 2008-09				FY 2009-10						
		1	2	3	4	1	2	3	4	1	2	3	4			
Sub-objective 1.2: Visitor attractions, activities and amenities in high use areas enhanced																
Action 1.2.1: Upgrade and improve existing tourism sinks and facilities																
1.2.1.1: Establish criteria for developing and managing tourism sinks and facilities, including measures for environmental impact mitigation and enhancement of visitor experience														Upgrading of existing tourism sinks carried out by December 2008		
1.2.1.2: Assess compliance of existing tourism sinks with criteria, and implement measures to mitigate environmental impacts and enhance visitor experience																
1.2.1.4: Construct washrooms at Mudanda, Kandechha, Aruba and Lugards Falls	WT, WS															
1.2.1.5: Develop viewing points along Galana River, Irima and Ithumba hills	WT, WS															
1.2.1.6: Develop picnic sites at Kithasyo and Mukururo	WT, WS															
1.2.1.7: Develop access road to Roaring Rock viewing point	WT, WS															
Action 1.2.2: Develop new tourism sinks and facilities																
1.2.2.1: Carry out assessment in conjunction with tourism industry stakeholders of optimal requirements and locations of new tourism sinks and facilities																
1.2.2.2: Develop new tourism sinks and facilities according to development criteria and site assessment																
Action 1.2.3: Improve wildlife viewing circuits																
1.2.3.1: Identify key congestion areas and wildlife viewing opportunities in collaboration with key tourism industry stakeholders														Kisula cave complex facilities and Kithasyo-Kisula road upgraded by May 2009		
1.2.3.2: Design and construct new wildlife viewing circuits in accordance with TCA Roads, Bridges and Supplemented Water Plan (see PA Ops Programme Action 3.2.1)																

Management Action and Activities	Persons responsible	Timeframe												Milestones	
		FY 2007-08				FY 2008-09				FY 2009-10					
		1	2	3	4	1	2	3	4	1	2	3	4		
Action 1.2.4: Establish interpretive nature trails and short walks															
1.2.4.1: Develop trails at Ithumba Hill, Mudanda Rock, and Lugards Falls	WT, WS													3 new nature trails developed and interpretation enhanced by December 2008	
1.2.4.2: Clear paths and improve signage at key WW1 sites	WT, WS														
1.2.4.3: Identify and where appropriate provide interpretation and parking areas at sites of botanical interest	WT, WS														
1.2.4.4: Raise awareness and provide support for the development/improvement of nature walks at TCA lodges	WT, WS														
Action 1.2.5: Develop TENP visitor interpretation centre and displays at key TCA entry points															
1.2.5.1: Develop design proposal for new TENP interpretive centre and TCA entry point displays in conjunction with KWS HQ Tourism & Education Departments														Staff deployed at entrance points to offer interpretive services by end FY 09-10	
1.2.5.2: Distribute design concept to appropriate firms and carry out tender process															
1.2.5.3: Oversee construction of new interpretation centre and entry point displays															
1.2.5.4: Deploy staff to offer interpretive services at key entry points	AD-TCA, H-HC														
Action 1.2.6: Develop the "Maneaters" visitor interpretation centre and museum															
1.2.6.1: Develop design proposal for the new interpretation centre and museum in collaboration with the National Museums of Kenya and KWS HQ Tourism Department	WT, SRS, WE														
1.2.6.2: Distribute design concept to appropriate firms and carry out tender process															
1.2.6.3: Oversee construction of new interpretation centre and museum in collaboration with NMK															

Management Action and Activities	Persons responsible	Timeframe												Milestones	
		FY 2007-08				FY 2008-09				FY 2009-10					
		1	2	3	4	1	2	3	4	1	2	3	4		
Action 1.2.7: Establish/strengthen the centralised system for providing ranger escorts for walking and night drive activities															
1.2.7.1: Define the ranger guide/escort requisition process and requirements in consultation with key tourism stakeholders, and disseminate to clients	SW-TE, SW-TW, WT													Procedures for requisition of ranger guide/escort prepared and availed at key tourist facilities by June 2008	
1.2.7.2: Establish pilot ranger guide/escort requisition process															
1.2.7.3: Review operation and ease of use of process in collaboration with tourism stakeholders, and revise as necessary															
Action 1.2.8: Upgrade and expand the Mzima Springs visitor facilities															
1.2.7.1: Carry out a study tour of similar facilities in other countries (facilitated by a suitable conservation and development centre)	SW-TW, SRS													Detailed design proposal for development of Mzima springs prepared by October 2008	
1.2.8.2: Develop a design proposal on re-development of Mzima Springs visitor facilities incorporating outcomes of study tour	SW-TW, SRS														
1.2.8.3: Carry out tendering process incorporating design concept	SW-TW, SRS														
1.2.8.4: Oversee construction of new visitor facilities	SW-TW, SRS, H-IDM														
Objective 2: Tourism investment and use in the TCA's low use and wilderness areas expanded and diversified, within environmentally acceptable levels															
Action 2.1: Carry out first round of tourism investment promotion															
2.1.1: Carry out tourism site identification field visit	SW-TE, SW-, WT BDM, MM													Bidding for tourist facilities carried out by September 2008	
2.1.2: Develop and disseminate tourism prospectus detailing available opportunities	SW-TE, SW-, WT BDM, MM														
2.1.3: Make management plan available on TCA and KWS websites	SW-TE, SW-, WT BDM, MM														

Management Action and Activities	Persons responsible	Timeframe												Milestones	
		FY 2007-08				FY 2008-09				FY 2009-10					
		1	2	3	4	1	2	3	4	1	2	3	4		
2.1.4: Carry out familiarisation tour for potential investors	SW-TE, SW-, WT BDM, MM														
2.1.5: Issue EOI advertising investment opportunities and providing investment guidelines	SW-TE, SW-, WT BDM, MM														
Action 2.2: Improve access and wildlife viewing roads															
2.2.1 Identify requirements for enhancing access and wildlife viewing roads for new tourism facilities															
2.2.2 Design and construct new access and wildlife viewing roads in accordance with TCA Roads, Bridges and Supplemented Water Plan (see PA Ops Programme Action 3.2.1)															
Action 2.3: Establish new special campsites in the Low Use and Wilderness Zones															
2.3.1: Identify suitable sites for establishment of special campsites	SW-TE, SW-TW, WT													At least 5 new special campsites established by December 2008	
2.3.2: Develop special campsites and access roads to the camp sites	SW-TE, SW-TW, WT														
Action 2.4: Design and establish adventure activity concessions															
2.4.1: Clarify the legislative, policy, liability and insurance aspects of adventure activities in KWS PAs	AD-TCA, HLS													Sites for adventure activities identified by June 2009	
2.4.2: Develop proposal for potential adventure activities, including possible sites, logistical and administrative support needs, and possibilities for local community involvement	SW-TE, SW-TW, WT														
2.4.3: Develop and disseminate Expressions of Interest document for launching adventure activity concessions incorporating proposal	BDM, SW-TE, SW-TW, WT														
2.4.4: Develop pilot schemes according to KWS tendering procedures	BDM, SW-TE, SW-TW, WT														

Management Action and Activities	Persons responsible	Timeframe												Milestones	
		FY 2007-08				FY 2008-09				FY 2009-10					
		1	2	3	4	1	2	3	4	1	2	3	4		
2.4.5: Monitor scheme performance and environmental impact and make appropriate adjustments	BDM, SW-TE, SW-TW, WT, SRS-TCA														
Action 2.5: Establish pilot off-road driving scheme in Jipe Low Use Zone															
2.4.1: Designate areas within Jipe Zone for pilot off-road driving scheme															
2.4.2: Establish guidelines for off-road driving in pilot area and agree with approved operators															
2.4.3: Implement pilot scheme and assess environmental impacts															
Action 1.6: Develop the Kisula Cave complex as a major visitor attraction															
1.6.1: Construct climbing ladders in the cave and provide washrooms	W-CHNP, WS													Kisula cave complex facilities and Kithasyo-Kisula road upgraded by December 2008	
1.6.2: Upgrade Kithasyo-Kisula Road	W-CHNP, WS														
Action 1.7: Develop key archaeological sites in Tsavo East for tourism															
1.7.1: Establish requirement for interpretive displays and other simple visitor facilities cave painting sites in conjunction with NMK, including the requirement for EIA of visitor use															
1.7.2: Develop visitor displays and construct facilities in accordance with proposal and EIA															
Action 2.8: Carry out second round of tourism investment development in TCA as appropriate															
2.8.1: Carry out an assessment of the feasibility/desirability of further tourism development in all TCA zones															
2.8.2: Identify new sites where appropriate, and prepare investment prospectus															
2.8.3 Disseminate prospectus, issue EOI and carry out tendering process according to Facilities Development Procedures															

Management Action and Activities	Persons responsible	Timeframe												Milestones		
		FY 2007-08				FY 2008-09				FY 2009-10						
		1	2	3	4	1	2	3	4	1	2	3	4			
Objective 3: TCA tourism management and administration systems strengthened																
Action 3.1: Implement measures to ensure that all accommodation facilities comply with facility development, management and environmental protection requirements																
3.1.1: Liaise with operators of existing facilities that do not comply with KWS Tourism Facilities Development Procedures to regularise their status														Annual inspections/ environmental audits of tourist facilities in the TCA carried out		
3.1.2: Develop KWS-wide facility management and environmental protection guidelines	BDM, H-EIA, SRS-TCA															
3.1.3: Carry out an assessment of compliance of existing facilities with national guidelines and any TCA-specific requirements																
3.1.4: Liaise with facility operators to rectify cases of non-compliance, and enforce as necessary																
3.1.5: Carry out annual inspections of TCA tourism facilities to ensure continuing compliance with KWS guidelines and national environmental impact requirements	SRS-TCA, WT															
Action 3.2: Carry out regular monitoring of visitor satisfaction and tourism use																
3.2.1: Carry out quarterly TCA visitor satisfaction surveys	SRS-TCA, WT															
3.2.2: Collate and analyse visitor use information from the KWS Safari Card system	SRS-TCA, WT															
Action 3.3: Improve communication and collaboration with TCA tourism stakeholders																
3.3.1: Hold quarterly TCA tourism investors and facility managers meetings	AD-TCA, SW-TE, SW-TW,													TCA tourism investors meeting held quarterly		
3.3.2: Convene annual TCA tourism stakeholders meeting	AD-TCA, SW-TE, SW-TW,															

Management Action and Activities	Persons responsible	Timeframe												Milestones	
		FY 2007-08				FY 2008-09				FY 2009-10					
		1	2	3	4	1	2	3	4	1	2	3	4		
Action 3.4: Enhance marketing and awareness raising of the TCA and its attractions															
3.4.1: Prepare and hold Tsavo 60th anniversary celebrations and activities	AD-TCA, SW-TE, SW-TW,													60th anniversary celebrations for Tsavo East held by December 2008	
3.4.2: Carry out national-level advertising of existing and new TCA attractions through tourism, wildlife and travel media, and the KWS website	AD-TCA, SW-TE, SW-TW,														
3.4.3: Undertake focused local-level advertising to raise awareness of seasonal wildlife movements and other special attractions	AD-TCA, SW-TE, SW-TW,														

Community Partnership & Conservation Education Programme

Programme Purpose

Community support for the TCA's conservation and participation in conservation-compatible land uses across the greater TCA landscape enhanced

The vast majority of community members living around the TCA directly depend on natural resources to meet their livelihood needs. As populations have increased, and land use practices and livelihood strategies have intensified and diversified, human activities in the greater landscape have increasingly impacted on the conservation of the TCA protected areas. These activities include, for example, the conversion of once suitable wildlife habitat to permanent agriculture, and the use of water that would have entered the TCA to irrigate crops. At the same time, the impacts of the TCA on these neighbouring communities have also increased, primarily through damage to crops or livestock from animals that have dispersed from the protected areas. These reciprocal impacts appear set to continue to escalate during the lifespan of this plan, especially if both human and wildlife populations (in particular elephants) continue to increase.

In response to this situation, the Community Partnership & Conservation Education Programme will implement a comprehensive set of activities aimed at mitigating the negative impacts of the increasingly interconnected relationships between the TCA and the communities that live around it, and capitalising on opportunities where both conservation goals and community livelihood needs and aspirations can be reconciled. As set out in the purpose statement above, the programme purpose focuses on enhancing both community support and participation in the TCA's conservation. Importantly, the purpose statement differentiates between the conservation of the core TCA, for which community support is vital, and the greater TCA landscape, where KWS will support the development of conservation-compatible community land uses and activities.

Guiding principles

The guiding principles describe key factors that have influenced the development of the Community Partnership & Conservation Education Programme and that impact the way the programme is implemented in achieving the above programme purpose. These guiding principles are:

- ▶ **Developing open and constructive relations between KWS and communities in the greater TCA landscape**
- ▶ **Building community support for the conservation of the TCA by ensuring that the TCA has a positive impact on the lives of adjacent communities**
- ▶ **Reducing long-term threats to the TCA by promoting conservation-based and conservation-friendly land uses in the greater TCA landscape**

These guiding principles are briefly described and explained in the following paragraphs.

Developing open and constructive relations between KWS and communities

As community livelihood activities taking place around the TCA increasingly impact on and are impacted by the area's conservation, good relations between TCA managers and communities are essential to ensure that both parties can raise issues of mutual concern before they escalate into serious problems, and can work together when livelihood and conservation goals align. Experience from other protected areas has shown that, while law enforcement is an effective way of combating illegal activities within a PA, the development of good relations with surrounding communities is an essential complement to this approach, and can, if carried out effectively, result in a reduced need for law enforcement activities in the first instance. It is therefore vital that TCA managers proactively engage the neighbouring communities, to ensure that TCA-community interactions do not simply focus on damage mitigation and conflict resolution, and that KWS' interests are not seen as being restricted to dealing with problems that impact on the management of the protected area, rather than addressing the concerns raised by communities themselves, or capitalising on potential synergies between community and KWS activities. As such, the first guiding principle of this management programme is that KWS will strive towards developing open and constructive relations between TCA managers and neighbouring communities, in order to strengthen KWS-community collaborations and increase communities' support and contribution to the TCA's conservation.

Building community support for the TCA's conservation

TCA-adjacent communities have historically borne many of the costs associated with the area's conservation, through reduced access to previously utilised natural resources, loss of crops, livestock and even human life as a result of wildlife dispersing from the area, and restrictions on access to areas of cultural importance. In addition, many of the benefits resulting from the area's utilisation, especially from tourism, have mainly benefited KWS or tourism businesses based in urban centres, or even abroad. This situation, combined with a lack of community awareness of the national and global importance of the TCA and the exceptional biodiversity it contains, has negatively impacted on community support for the area's continued existence and KWS management activities, and has even led to resentment towards TCA in some communities. This in turn has exacerbated the community-related problems that TCA managers have to deal with, increasing both the complexity and costs of the TCA's management. As such, alongside efforts to develop open and constructive relations with neighbouring communities (discussed above), a major thrust of this programme will be to rectify this situation and improve overall community support for the TCA's conservation through efforts to reduce the costs they incur as a result of its conservation, increase direct benefits from the area, and improve their awareness and appreciation of the area's importance.

Promoting conservation-friendly and sustainable land-use practices in the greater TCA landscape

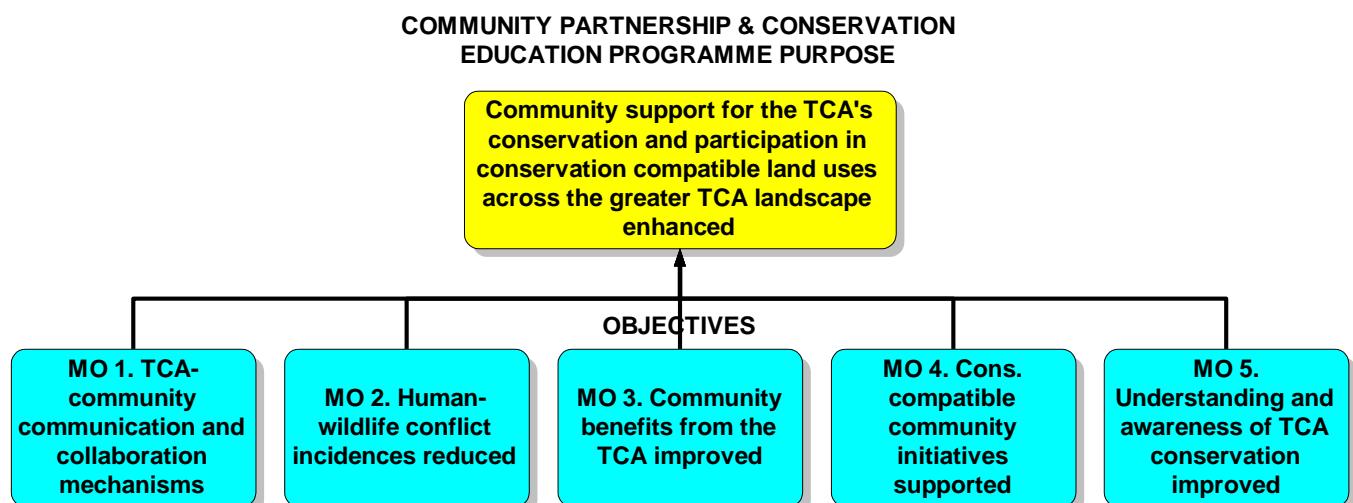
In common with the rest of Kenya, populations around the TCA have increased dramatically since the parks' creation almost 60 years ago. As a result of these increases in population, combined with the intensification and diversification of land-use practices around the area over the same period, the ecology and conservation of the TCA is increasingly impacted by activities that take place beyond its borders. These impacts include fire, water abstraction and pollution, and habitat fragmentation and loss of migratory corridors, all of which are set to intensify during the lifespan of this management plan. However, in contrast to many other

PAs in Kenya, primarily due to relatively high populations of wildlife and suitable game-viewing habitat around the TCA, there is significant potential for the development of conservation-friendly land-use practices in these areas (as is demonstrated by the existence of a number of community wildlife conservancies and other wildlife-based enterprises in the area). As such, due to the high potential contribution that appropriate activities can make both to the conservation of the TCA and to the incomes of TCA adjacent communities, through this programme, KWS will wherever possible strive to promote and strengthen conservation-friendly and sustainable land-use practices in the greater TCA landscape.

Management objectives

Figure 20 below shows the overall objectives tree for the TCA Community Partnership & Conservation Education Programme.

Figure 20: Community Partnership & Conservation Education Programme objectives tree



Each of these management objectives, and their subsidiary management actions are set out in the following sections.

Objective 1: TCA-community communication and collaboration mechanisms established and strengthened

The TCA is surrounded by a wide diversity of different communities and land uses, including, amongst others, smallholder agriculture, pastoralism, commercial plantations and wildlife conservancies. Nevertheless, the TCA is fortunate that there are also a number of community-based organisations and individual large-scale landowners that TCA management can potentially engage with. The support and collaboration of these key stakeholders is vital for the continued conservation of the TCA and the exceptional biodiversity it contains. However, in the past, KWS has mainly engaged with these stakeholders on an informal basis, thereby leaving the collaboration vulnerable to changes in both personnel and KWS organisational

priorities. In addition, there are also important wildlife areas around the TCA where representative organisations or institutions that KWS can engage with are either absent or weak.

The desired future state that this objective aims to achieve is therefore one where robust and sustainable communication and collaboration mechanisms are in place in key wildlife areas around the TCA, which are enabling TCA-adjacent communities, other large-scale landowners, and TCA managers to efficiently and effectively work together. These communication and collaboration mechanisms are essential not only for supporting the development of supportive and constructive relationships between these groups, but also for enabling both KWS and these key stakeholders to raise issues of mutual concern before they escalate into serious problems, and to work together in achieving common goals. Several of the management actions under this objective focus on formalising and strengthening existing collaborations between KWS and these key TCA-adjacent stakeholders, and on supporting the establishment of representative community organisations where they do not already exist. These and the other management actions that have been developed to achieve this objective are elaborated in more detail in the following sections.

Action 1.1: Strengthen and support activities of Taita-Taveta Wildlife Forum

The Taita-Taveta Wildlife Forum (TTWF) was established in 2001 through a merger of three existing organisations that were operational in Taita-Taveta District at the time (the Taita-Taveta Landowners Association, the Taita-Taveta Wildlife Association, and the Tsavo Conservation Trust). The forum was created to promote conservation, management and appropriate development practices in the Taita-Taveta area, while also aiming to ensure that conservation efforts take into consideration all aspects of human development. Its membership currently includes representatives from ranches, sanctuaries, sisal estates, hoteliers, tour operators and nature-based CBOs that operate in the Taita-Taveta District. A number of the TTWF's strategic objectives align well with the goals of the KWS Community Wildlife Service, and the objectives of this programme. These include: creating awareness and promoting environmental education; assisting and advising the communities on the initiation of nature-based enterprises; and the development and implementation of appropriate natural resources management tools and technologies. The TTWF has supported the TCA's conservation in a number of ways; perhaps the best example of this is the mobilisation of ranches, mainly in the Kasigau area, to establish protocols for controlled grazing in order to reverse land degradation and restore the game corridor between the TENP and TWNP.



However, although KWS is already on the TTWF Board of Directors, additional inputs by TCA management are needed to ensure that TTWF and KWS activities in the greater TCA landscape complement and are compatible with each other, and to strengthen the operational capacity of the forum so as to enhance the sustainable management of natural resources in the Taita-Taveta area. These inputs include the formalisation of the working relationship between the TTWF and KWS through the development of an MoU, and the provision of ongoing support and training of TTWF members in order to improve the services it offers to the communities in the Taita-Taveta District. It has been recommended that initial training of TTWF members should focus on resource mobilisation, community development, wildlife sanctuary management, and project management.

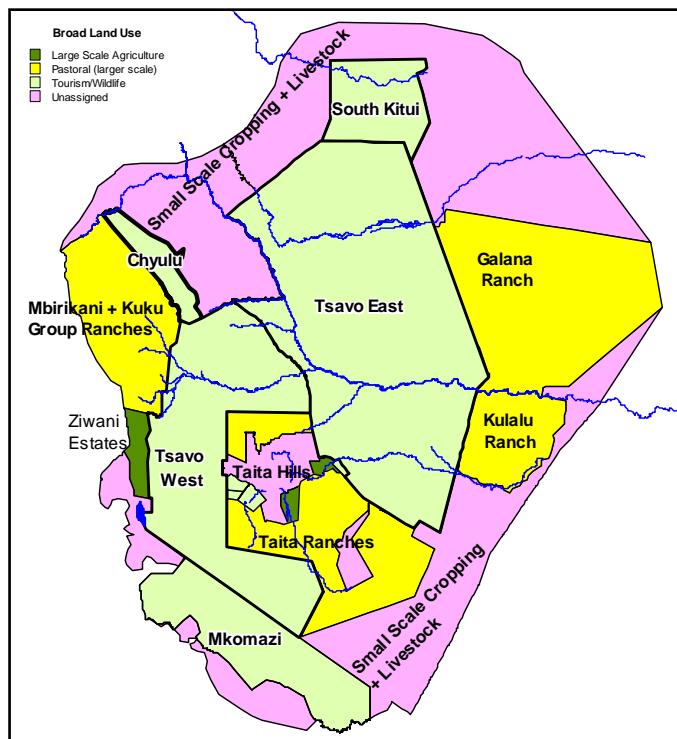
Action 1.2: Promote and support the establishment of Kibwezi-Kitui Wildlife Forum

The Kibwezi-Kitui area to the west and north of the TCA is an important area for wildlife dispersal. However, unlike Taita-Taveta, this part of the greater TCA landscape currently has no umbrella body that can coordinate the activities of KWS and the conservation NGOs/CBOs that operate in the area. In response to this situation, which is likely to increasingly impact on the effectiveness of conservation activities in the Kibwezi-Kitui area over the implementation period of this plan, TCA management will promote and support the establishment of the Kibwezi-Kitui Wildlife Forum (KKWF). The KKWF will aim to address and coordinate responses to emerging conservation issues in the Kibwezi-Kitui area, and will fulfil a similar role to the Taita-Taveta Wildlife Forum described under the previous action. The creation of this forum will begin with the initial identification and mobilisation of key stakeholders that could potentially be involved in the KKWF, and the subsequent provision of technical support for developing the KKWF Memorandum and Articles of Association (based on the articles of the TTWF and other similar forums), and for the subsequent registration process. Once the forum has been legally established, KWS will continue to provide technical and other support for establishing and enhancing KKWF operations and stakeholder participation protocols and mechanisms.

Action 1.3: Strengthen collaboration on wildlife conservation and utilization between KWS and Galana and Kululu Ranches

Figure 21 below shows the broad patterns of land-use in the greater TCA landscape. The figure illustrates that the TCA is bordered by several large landholdings, the largest of which are the Galana and Kululu Ranches to the east of TENP. These are both former cattle ranches that are now mainly involved in tourism and conservation activities.

Figure 21: Broad patterns of land use in the greater TCA landscape



These ranches are very important dispersal areas for TCA wildlife (Galana Ranch alone covers 647,484 ha). They also have a significant potential for further tourism development, and have both indicated that in the future they may establish conservancies to capitalise on the areas' tourism opportunities. To ensure that there is maximum benefit and complementarity between the proposed developments in these TCA-adjacent areas and ongoing KWS activities, TCA management is in the process of developing an MoU with both of these ranches. This MoU will be finalised as a high priority under this management plan, and once completed, KWS' responsibilities under the MoU (such as security, management or administration) will be implemented through this management action.

Action 1.5: Collaborate with local non-governmental organisations

There are a large number of non-governmental organisations that are active in the greater TCA landscape. However, their objectives, resources and operations do not always align well with each other, or with those of the TCA management. This situation has led to conflicts of interest and duplication between NGOs, or between NGOs and KWS, which has resulted in the sub-optimal use of resources and staff time by all the organisations involved. In addition, although a number of the NGOs operating in and around the area are well known (such as AWF, EAWLS, and DSWT) current knowledge of all NGOs operational in the greater TCA landscape remains incomplete, which is increasing the risk of conflicting objectives and duplicating activities being pursued by these organisations. As a first step towards improving collaboration with and between these organisations, TCA management will conduct an inventory of all NGOs and CBOs operating in and around the area, their activities and their relevance to wildlife conservation. Once this has been completed, regular meetings will be scheduled, chaired by the CWS Warden, between KWS and NGO representatives to ensure that TCA management is updated on and can assist the coordination of activities around the area. In addition, representatives from TCA management will continue to attend District Monitoring and Evaluation Committee meetings to ensure that they are kept abreast of any new developments.

Action 1.6: Nominate honorary wardens for gazettement by the KWS Director

The Wildlife Act (CAP 376) provides for the appointment of honorary wardens to further strengthen wildlife conservation and management, especially outside the protected area network. An honorary warden exercises the same powers as a KWS warden, and can be used to facilitate problem animal control and other conservation activities, such as attending community meetings and acting as intermediaries between TCA and the local communities. In order to strengthen the relationship between communities around the TCA and the area's management, TCA management will therefore identify appropriate persons of integrity who have a passion for and understanding of conservation and management issues, and recommend them to the Director KWS for gazettement as honorary wardens.

Objective 2: Human-wildlife conflict incidences reduced

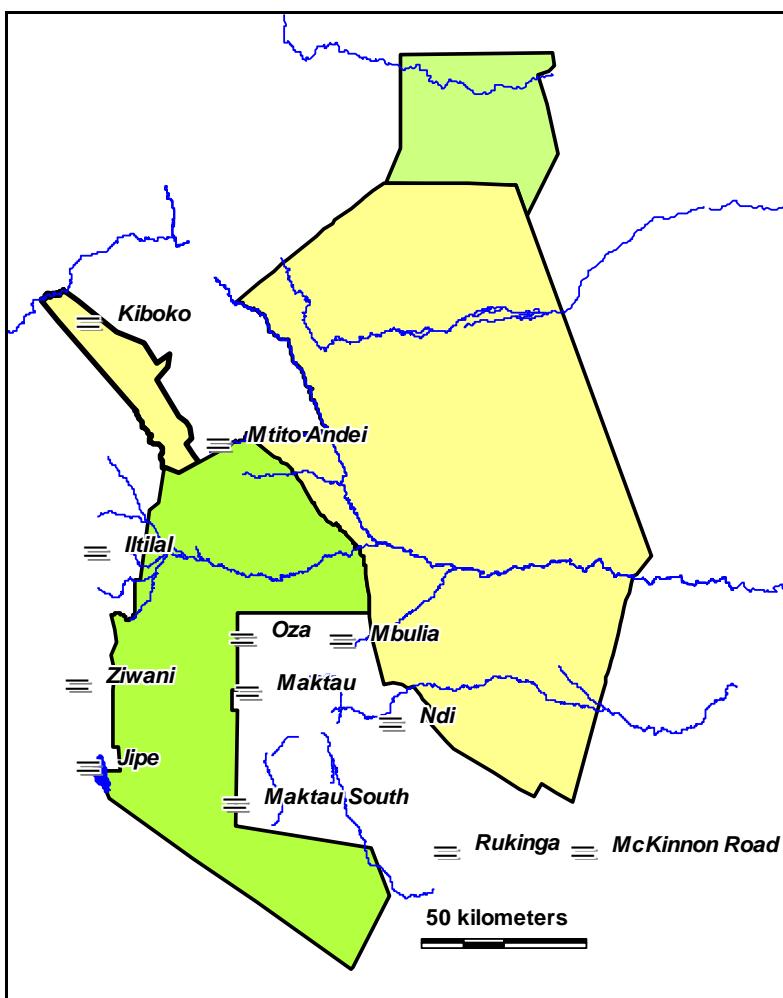
Conflict between people and wildlife on the periphery of the TCA is an ongoing problem. As human populations around the TCA continue to increase, settlements expand and land use intensifies, there is certain to be a corresponding increase in human-wildlife conflict (HWC) incidences in coming years. This situation is likely to be further exacerbated if the TCA's elephant populations, one of the main species responsible for HWC, continue to increase at cur-

rent rates (c. 5% annum). This objective has therefore been developed to bring about the desired future state where HWC incidences around the TCA are minimised, in order to both reduce the negative impacts resulting from the TCA's conservation on adjacent communities, and to improve overall TCA-community relations. In order to achieve this objective, a number of management actions have been developed both to prevent HWC (e.g. through additional fences along the TCA boundary and improvements in CWS infrastructure) as well as to alleviate the impacts of HWC incidences once they have occurred (through, for example, facilitating compensation claims). These actions are set out in more detail below.

Action 2.1: Develop a HWC GIS-based database and identify HWC hotspots

As illustrated in Figure 22 below, much is already known about human-wildlife conflict around the TCA, and the available HWC information is certain to increase during the implementation of this plan. However, this information is not currently stored or organised in a format that enables easy analysis of the nature, spatial distribution and trends in HWC around the TCA. To address this issue, and facilitate monitoring of HWC cases, a computerised GIS-based database for recording and mapping the location, type and severity of HWC incidences around the TCA will be developed under this management action.

Figure 22: Known HWC hotspots in the greater TCA landscape



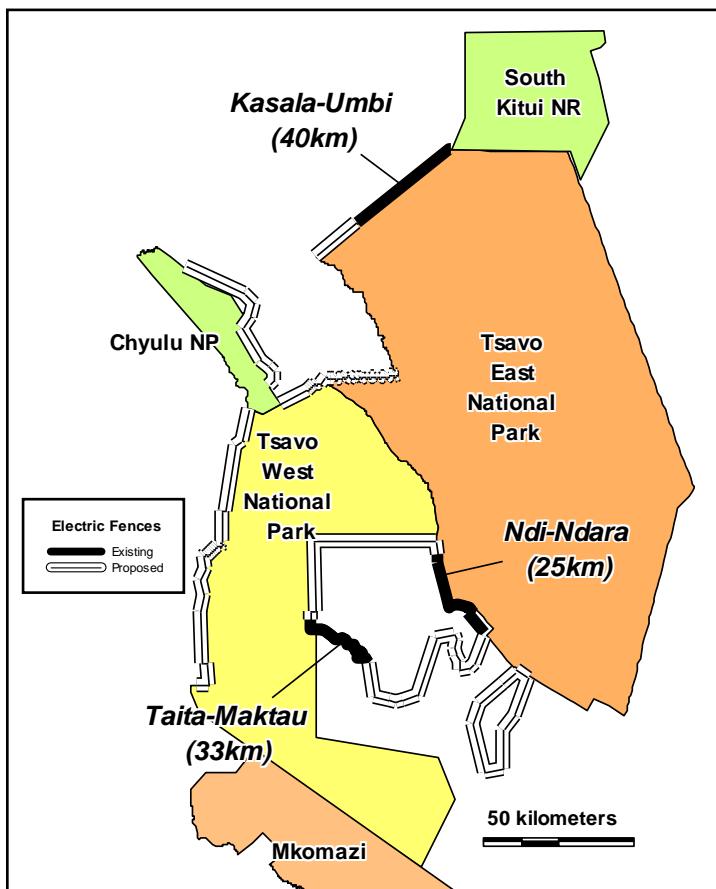
The new database will enable TCA management to pinpoint priority HWC hotspots around the TCA where mitigation methods should be focussed. This information will in turn be used to support planning and implementation of several of the management actions set out under

this objective. Once the equipment needed to implement the system has been identified (in consultation with the TCA Research Section) and acquired, CWS staff will be trained in its operation, and in data collection and management, and HWC hotspots will then be subsequently mapped out using GIS. In addition, and to complement this approach, the HWC hotspots identified will be confirmed and amended through a participatory process involving extensive consultations with the local communities around the TCA. The identification of HWC hotspots will inform the selection of priority areas for constructing wildlife barriers (see Action 2.2 below), and the establishment of new HWC outposts (carried out under Action 2.3).

Action 2.2: Construct and maintain wildlife barriers in key areas around the TCA

KWS has used a variety of wildlife barriers, such as electric fences, ditches and walls, to mitigate HWCs around many PAs in the country. However, electric fences have proved to be the most effective barrier in containing large herbivores, such as elephants, and it is for this reason that this approach has been selected to mitigate HWC around the TCA. Initial analysis of the incidence of conflicts between people and wildlife indicates that there are fewer problems where fences have been erected. However, it does appear that elephants soon find a way around the ends of the fences, which has led to increased incidences in these areas. In the Sagalla area, this is also thought to have been a significant factor in the deaths of elephants along the main road and railway.

Figure 23: Existing and proposed electric fences around the TCA



There are currently almost 120 km of elephant-proof electric fences around the TCA. Funding is presently being secured for another 52 km, and plans are also at various stages of

completion for at least another 450 km (see Figure 23 above). In addition, there are also indications that many communities and ranches adjacent to the TCA would like to see parts of their areas fenced in to the TCA (e.g. Mbulia, Kishushe and Oza), which would support these communities' ability to develop wildlife-based tourism initiatives. However, this would require clear agreements between KWS and the landowners (for example regarding security, permitted activities, response to HWC, and level of tourism development), and would necessitate the development of an MoU between the parties to ensure that the area fenced-in is enhancing, or at least compatible with, the management and conservation of the TCA.

As shown Figure 23 above, the extent of existing and proposed fences along the TCA's borders clearly has the potential to significantly impact on several major ecological factors in and around the TCA. These factors include the influence that these fences are likely to have on wildlife movements and dispersal patterns, on the availability of grazing land and, potentially, on the intensification of human-wildlife conflict in some areas that are not presently impacted by HWC. It is therefore imperative that, as a precursor to the expansion of fencing around the TCA, an evaluation of the effectiveness and impacts (both environmental and socio-economic) of the existing fences is undertaken as soon as possible. Once this has been completed, and in conjunction with the findings of the Fencing Strategic Environmental Assessment carried out under Action 4.4 of Ecology Programme, the TCA research section in collaboration with other TCA and KWS-HQ departments will develop a position paper on the construction of new fences around the TCA, including addressing the issue of whether community areas and private land parcels should be fenced into the TCA, and if so, under what circumstances and conditions this may occur. If appropriate, TCA management will then establish MoUs between KWS and communities/private landowners on construction of fences, and proceed with their construction according to the position paper recommendations, and any complementary stakeholder consultations.

In addition, under this management action the TCA management will also promote and support the planting of live fences (e.g. using Mauritius thorn) around individual land parcels in particularly HWC-prone areas.

Action 2.3: Construct new and strengthen existing CWS outposts

One reason attributed for the poor relations between local communities and TCA management, and for the severity of some HWC incidences around the area, are delays in responding to human-wildlife conflicts. Although the TCA does have a high number of CWS outposts that have been developed to help address this situation, they are not always well equipped, are often understaffed, and are lacking in some key HWC areas. This situation, combined with the large areas that staff have to cover, and the often limited or poor transportation infrastructure, is currently undermining the ability of TCA management to respond effectively to HWC in some areas. In response, a number of new CWS outposts will be developed during the lifespan of this plan, including as appropriate new outposts at Kasigau, Kidong, Elerai, Mtito, Kishushe, Challa Ziwani, Kasala and Kone, and any other priority HWC hotspots identified under Action 2.1 above. To complement this approach, a mobile PAC unit base will be established at Kiboko Station, staffed by five rangers and an NCO, with responsibility for the Kilinget, Mashulu, Makali and Emali areas. In addition, a number of measures will be implemented to strengthen existing HWC outposts, as set out in Table 31 below.

Table 31: Existing HWC outposts and strengthening needs

CWS Outpost	Strengthening needs
Njukini	Currently has only two staff, additional staff needed
Rombo	Outpost needs to be strengthened (staff and equipment)
Itlal	Outpost needs a new vehicle (existing motorbike is unserviceable)
Mtito	Needs to be de-linked from Kamboyo and relocated to Mtito staff quarters to

CWS Outpost	Strengthening needs
	make it accessible to the community
Olkikinget	Outpost in place but abandoned due to lack of staff, new staff needed
Mutomo	Additional staff needed, and outpost needs upgrading
Yatta BII	Needs relocation to the southern area where it will be managed from Ol Donyo Sabuk (discussions underway)
Bura	Outpost which needs additional personnel and equipment
Voi	Additional equipment and staff needed, including an officer
Kinango	Has one NCO and two rangers, requires two more rangers and a vehicle

Action 2.4: Investigate and apply new problem animal control techniques

In addition to the erection of wildlife barriers (described above under Action 2.2) a wide variety of problem animal control techniques have been developed and tested, with varying success, across Kenya and in a number of other African counties. Much of this work has focused on the prevention of damage by elephants, and is therefore of particular relevance to the TCA. These techniques include a diversity of often complementary techniques, including the use of banger sticks to scare away animals, applying pepper mixed with grease to ropes or fences, and/or the inter-planting of chilli peppers with other crops to discourage elephants from eating them. To make the best use of these new techniques and to capitalise on the lessons learnt elsewhere in Kenya and Africa, CWS staff will liaise with the TCA research section to identify and assess potential new PAC techniques, including wildlife scaring methods, which could be effective around the TCA. Once potential methods have been identified, and a study visit undertaken to see them in action, necessary equipment or resources will be acquired, and pilot trials carried out in appropriate communities. Finally, building on the success and lessons learned from these pilot trials, communities will be equipped and then trained on the implementation of the most successful PAC techniques.

Action 2.5: Provide support to enhance compensation claim process

Adequate and timely compensation for wildlife damage can go a long way to improving the relationship between KWS and TCA-adjacent communities. Although historically there have been delays in the processing of compensation claims, these have been now been reduced, and the District Compensation Committee meets once per month and processes all claims received. However, in order to further expedite this process, the Senior Warden CWS will actively follow up on outstanding claims by liaising with KWS Headquarters to hasten their processing. In addition, awareness will be raised amongst TCA staff on how to process compensation claims, as some staff are not conversant with the requirements for compensation, and this has led in the past to incorrect information being given to members of the public.

Objective 3: Community benefits from the TCA improved

PA-adjacent communities frequently bear a disproportional share of the costs associated with conserving the protected area, compared with the benefits the PA generates. These costs include human-wildlife conflict, as discussed above, as well as other opportunity costs incurred where areas traditionally used for livelihood or cultural activities are no longer available to the communities concerned. This traditional imbalance between community costs and benefits has often resulted in resentment and poor relations between PA managers and PA-adjacent communities, which in turn has frequently led to increased conflicts and complexities in the management of these areas, and has in some instances impacted on the conser-

vation of the key values the area was created to protect. Consequently, this objective has been developed in order to address the community cost-benefit imbalance, and to realise the desired future state where TCA-adjacent communities are gaining direct benefits from the TCA's existence, and as a result, their support for the area's continued conservation is enhanced.

Three management actions have been developed to achieve this objective. The first two actions focus on implementing and enhancing support to ongoing KWS community development projects in key areas around the TCA, and enhancing employment opportunities for local community members (and in particular formalising the employment of casual workers from around the TCA). The final management action under this objective aims to develop a mechanism to enable community members to benefit from regulated access to a number of culturally important sites within the TCA that are currently off-limits. All three of these management actions are elaborated in more detail below.

Action 3.1: Implement and support new and ongoing community development projects

TCA management has a long history of assisting communities by funding community projects. This not only helps KWS to fulfil its corporate social responsibility, but also increases community support for TCA management and the ongoing conservation of the area. These projects have included the building of schools and dispensaries, the development of water projects, and support for beekeeping, Jatropha tree nurseries, and aloe farming. However, a number of community development projects have failed in the past, often as a result of poor community participation and engagement, either because projects were not well aligned with community needs, or because community members lacked the skills necessary for their successful implementation.

To address this situation, and improve the targeting of new community projects that KWS could potentially support, the TCA CWS will periodically carry out Participatory Rural Appraisals together with community representatives from target communities to identify appropriate projects that have strong community support, as well as the capacity-building needs for their successful implementation. Once appropriate projects have been identified and agreed with the target communities, the CWS will provide additional support and training to community members in developing project proposals, which can then be submitted for funding. The CWS will also continue to provide ongoing material, technical and other support to ensure the successful implementation of the funded projects, as well to any existing community development projects as required.

Action 3.2: Enhance employment opportunities for local community members

The employment of members of TCA-adjacent communities in various tasks necessary for the successful management of the TCA is one of the most direct ways to improve the linkages between the conservation of the area and community well-being. Currently, almost all the fence technicians on two of the TCA fences (Ndi-Ndara and Taita-Maktau) are labourers drawn from the local communities. However, they are currently employed on a casual basis and lack job security. To further enhance relationships with surrounding communities, TCA management will liaise with KWS HQ to ensure that these and other casual workers already engaged within the TCA are wherever possible employed as permanent employees, and, as such, enjoy the improved security and benefits associated with this type of employment. In addition, as and when necessary for specific tasks in the TCA, casual employees will continue to be sourced from the local communities.

Action 3.3: Develop a mechanism to enable regulated access to cultural sites

A number of sites of cultural importance are known to exist within the TCA including: Shimo la Shetani near the Tiva River, Irima Hill, Thabangunji in the southern part of TENP, and Umani in CHNP. However, due to entry restrictions since the creation of the TCA, these sites are for the most part no longer visited by members of the local communities that traditionally used them for a variety of purposes. This situation has contributed to community resentment of the TCA's existence, and has on occasion undermined efforts of TCA management to develop open and constructive relations with these communities. However, this situation can be easily addressed, without any negative impacts on the security or integrity of the TCA's natural resources, by allowing community members regulated access to these sites. As a first step towards achieving this, all sites of cultural importance in the TCA will be identified and documented by TCA management, working in close collaboration with local community representatives. Once this step has been completed, and the sites that community members would like access to identified, TCA management and community members will continue to work together to develop the modalities, including the rules and regulations, that will govern community visits to these sites. After these modalities have been agreed, community visits will be facilitated on a pilot basis, and rules and regulations subsequently adjusted as necessary according to these experiences and any lessons learnt.

Objective 4: Conservation-compatible community initiatives supported

The vast majority of community members living around the TCA directly depend on the use of natural resources to fulfil their livelihood needs. Historically this has not had a major impact on the conservation and ecology of the TCA, but more recently, as populations have increased and land use practices intensified, this situation has changed, and community activities are increasingly impacting on the area's ecology. As discussed under the Ecological Management Programme, this is particularly important regarding the extraction of water (most often for agriculture) that would otherwise have flowed into the TCA, and the closure of wildlife dispersal areas or migratory corridors beyond the TCA's boundaries through the conversion of once suitable wildlife habitat to permanent agriculture.

However, as a number of successful community initiatives around the TCA have already demonstrated, large areas around the TCA have significant potential for the development of conservation-compatible land uses and enterprises, and a number of community conservancies have already been established. This objective has therefore been developed to strengthen existing community land-use initiatives, and support the establishment of new initiatives, in order to bring about the desired future state where TCA-adjacent communities are practising both sustainable and conservation compatible land-uses in key areas around the TCA, and as a result enhance the overall conservation and ecological integrity of the area. Three actions have been developed to achieve this objective that focus on building the capacity of existing community conservancies, supporting the establishment of new conservancies, and encouraging the development of other conservation-compatible wildlife utilisation enterprises. These actions are elaborated below.

Action 4.1: Build capacity of and support existing community wildlife conservancies

Several wildlife conservancies have already been established in areas around the TCA. These include the Lumo Community Sanctuary; the Taita Hills Sanctuary (which is privately owned); and Rukinga Wildlife Works (currently a ranch in the process of converting to a conservancy). The development of these conservancies has a twofold benefit for the conservation of the TCA, in that they not only ensure that large parcels of land remain compatible with wildlife conservation, but also provide much-needed revenue to local communities, which increases community support for wildlife conservation. Therefore, in order to help ensure the continued viability and sustainability of these initiatives, KWS will provide both technical and logistical support to strengthen the capacity and operations of existing community conservancies.

TCA management has already made progress toward implementing this action. For example, through the Manyani Field Training School, KWS has provided basic paramilitary drill training to a number of conservancy game scouts. To date, 12 game scouts from Taita Hills Sanctuary have attended this training, as have a number of scouts from the Lumo Conservancy, and this initiative will be continued and rolled out to additional conservancies under this management action. In addition, TCA management will work with KWS-HQ BDM to ensure that TCA-adjacent wildlife conservancies are incorporated in TCA marketing and promotional materials (see Activity 3.4.2 of Tourism Programme), and are also included in any TCA-level tourism marketing activities (see Activity 3.4.3 of Tourism Programme). KWS will also provide logistical support to conservancies by providing plant and other support for the development of game viewing tracks in these areas, and for enhancing the quality of conservancy game viewing by constructing water pans at key points.

Action 4.2: Support establishment of new community wildlife conservancies around the TCA

As explained in the previous action, the development of community conservancies, while not a straightforward task, has proved to be one of the most effective ways of ensuring that communities derive benefits from the wildlife on their lands, and that these areas remain available for wildlife to disperse from and to the TCA. Although significant progress has already been made in establishing community conservancies around the TCA, there remains considerable untapped potential for their development, especially in those community areas that are fortunate to have good wildlife populations, suitable game-viewing habitat, and good connections with existing transportation infrastructure. In this regard, the following ranches or organisations have been identified as having the potential, or are in the process of, establishing wildlife conservancies:

- ▶ Taita Discovery Centre
- ▶ Yatta B II Ranch
- ▶ Galana Ranch
- ▶ Kulalu Ranch
- ▶ Saghasika Ranch
- ▶ Kishushe-Mburia Ranch
- ▶ Rombo Ranch
- ▶ Kasigau Ranch

In order to capitalise on the potential contributions that the establishment of these conservancies could make to the conservation of the TCA and the livelihoods of the communities in the greater TCA landscape, under this action TCA management will continue to provide sup-

port for conservancy establishment. This will involve a number of key steps, beginning with the identification of priority target communities and/or suitable areas for promoting the establishment of conservancies, coupled with the raising of awareness of their potential within the relevant communities. This will be followed by the mapping of potential conservancies in collaboration with relevant authorities (e.g. county councils, or locations in the case of the Taita ranches), and the subsequent drafting and registration of conservancy documents. Once this has been completed, TCA management will provide initial support to the conservancies in setting up and then building the capacity of conservancy management committees, and then finally assisting the established management committees in the development of conservancy land use and management plans.

Action 4.3: Support wildlife utilisation enterprises around the TCA

A variety of wildlife utilisation enterprises are already taking place around the TCA. These enterprises, if appropriately developed and managed, have the potential to play a supportive role in securing wildlife dispersal areas beyond the TCA's boundary, and in enhancing and diversifying local communities' incomes. This management action aims to promote the uptake of appropriate new wildlife enterprises, and the strengthening of existing successful enterprises. As a first step, a comprehensive inventory of existing wildlife utilisation enterprises around the TCA will be carried out, since little is currently known about their extent, location, success, or their impacts (positive or negative) on the conservation of the TCA. Based on this assessment, activities will be designed aimed at promoting successful enterprises, through the provision of technical and material support. One wildlife utilisation enterprise that has proved a particular success around the TCA is guinea fowl farming, and TCA management will continue to provide support to guinea fowl farming activities. The active support and participation of the TCA Security Section Support in this initiative will be sought, to avoid past confusion where guinea fowl keepers have sometimes been arrested as poachers. Other ongoing or potential wildlife utilisation enterprises that TCA management will investigate the possibility of supporting include reptile farming (as is currently practised at Voo in Mutomo District), and the farming of plant species, such as Aloe and Jatropha.

Objective 5: Understanding and awareness of TCA conservation improved

Environmental education is a crucial strategy for enhancing community understanding of, and thereby appreciation and support for, the conservation of the TCA, as well as Kenya's wider protected area network. This is recognised in the KWS Conservation and Education Strategy 2006-2011, which has the development and strengthening of conservation education and awareness-raising programmes as one of its major objectives. As such, and in line with this strategy, this objective has been developed to realise the desired future state where the existence of the TCA is valued and supported by local communities as well as TCA visitors, who are aware of the global conservation importance of the TCA and the exceptional biodiversity it contains. In order to achieve this objective, a number of management actions have been developed that focus on enhancing and expanding the TCA's educational facilities, and improving linkages and relations with school environmental education and conservation awareness-raising activities. These actions are elaborated in more detail below.

Action 5.1: Strengthen TCA education staff establishment and capacity

Although performing a vital supporting role in the conservation and management of the TCA, the effectiveness of the area's Education Department is currently hampered due to insuffi-

cient staff. This, combined with the fact that some members of staff have not received adequate training, is currently preventing officers from carrying out their assigned duties effectively. In order to address this issue, TCA education staff will be strengthened in accordance with the TCA staffing report which is due to be compiled under Action 2.1 of the PA Operations Programme, complemented by a training needs assessment carried out in conjunction with Action 2.2 of that programme. Once the additional staff are in place, and the training needs of all department members have been established and prioritised, training of all education staff will then commence in accordance with the needs defined.

Action 5.2: Upgrade Tsavo East Education Centre

The Tsavo East Conservation Education Centre was established in 1972 to help improve awareness of the importance of wildlife conservation and natural resources. The centre currently has five staff, and serves members of the Wildlife Clubs of Kenya, students from all levels of educational institutions, and other organised groups from the general public. However, the centre's facilities, equipment and interpretation materials have become very dated over the last 35 years, and now need upgrading in order to cater for the increasing number of educational and other groups that use the centre every year. Currently the centre only has accommodation facilities for students, and teachers accompanying the groups often have to seek separate accommodation outside the TENP and apart from their groups. This situation is clearly undesirable, and initial improvements to the centre will therefore focus on the construction of self-contained accommodation facilities for teachers or other staff that are accompanying groups. The centre's main hall will also be improved through the replacement of the existing furniture, which is currently in a poor state of repair. In addition, up-to-date interpretive and education materials, including display panels and other new interpretation aides, will be designed and acquired to improve the overall appeal of the centre and its ability to fulfil its objectives. This upgrade may be combined with the development of a new Visitor Interpretation Centre in TENP detailed under Action 1.2.5 of the Tourism Programme.

Action 5.3: Develop education facilities in conjunction with Tsavo West Visitor Interpretation Centre

The Tsavo West Visitor Interpretation Centre was opened in 2001, and is strategically located in the high use zone in TWNP, where it currently serves visitors to the area through the provision of basic information about the TCA, and the selling of guide books, maps of the area, and simple refreshments. These interpretation facilities could potentially also be utilised by educational parties, however unlike TENP, Tsavo West has no hostel facilities for accommodating school and other educational parties overnight. This management action addresses this shortfall through the development of hostel accommodation and other related facilities (kitchen, ablutions and classrooms) neighbouring the TW Interpretation Centre, thereby expanding the role of the centre to provide education services to school parties as well as interpretation services to tourists. In addition to accommodation facilities, up-to-date interpretive and education materials will also be developed and/or acquired to support the reorientation of the centre's role (carried out in conjunction with Action 5.2 above).

Action 5.4: Establish Ithumba Education Centre

The Ithumba Low Use Zone to the north of TENP is abutted by high density human population and intensive land use. Human pressures on TENP in this area are already significant, and these are likely to intensify over the lifespan of this management plan as road access to areas to the north of the zone is improved. However, the zone does not presently have an education centre or similar facility, and while TENP education staff based at Voi have at-

tempted to extend their services to cover the zone, due to access and logistical difficulties this has not to date been realistic. Therefore, through this action, a new education centre will be established in the Ithumba zone to encourage school and other educational parties to visit the zone, and to raise community awareness and understanding of the importance of the TCA. The development of the centre will involve the initial identification of a suitable site for the centre (possibly at Kasala Gate, where the sector headquarters are due to be relocated), followed by the design and subsequent construction of the centre, and of any associated accommodation facilities needed for students and staff. Once this is complete, the centre will be suitably equipped, and provided with up-to-date interpretive and education materials (the production of which will ideally take place in conjunction with Action 5.2 and 5.3 above).

Action 5.5: Provide support to school environmental education and conservation awareness raising activities

Environmental education of children is a major function of the TCA Education Department, which is currently achieved by enhancing and supporting environmental education in schools around the TCA. In order to build on the past successes that have been achieved in this area, the Education Department will initiate a number of new activities to enhance this approach during the lifespan of this plan. These new initiatives will be implemented through two major approaches: the implementation of the "*nature school concept*", which involves identifying a school, and supporting its environmental projects that relate to the conservation challenges in the area; and the establishment of new wildlife clubs in key schools, or supporting the ongoing activities of existing clubs, through, for example, giving conservation talks and showing conservation videos at the clubs. To complement these activities, TCA management will also reintroduce sponsored tours of the TCA by local school children, which has proved successful in the past (this activity will necessitate the replacement of the existing buses, which is dealt with under Action 3.2.4 of the PA Operations Programme). Finally, all conservation education programmes will be subject to periodic monitoring to assess their impact on the attitudes of pupils in the target schools, and will subsequently be adapted according to the results of these assessments.

Action 5.6: Carry out adult education and awareness programmes around TCA, especially in key HWC areas

Although adult education and awareness programmes have the potential to improve understanding and support for an area's conservation, and to build relations between KWS and PA-adjacent communities, due to a number of factors, such as poor infrastructure and limited manpower and equipment, it is impossible for TCA management to comprehensively implement these programmes in all TCA-adjacent communities. Therefore, an essential first step in the implementation of the adult education and awareness programmes around the TCA will involve the identification of key HWC areas (using information developed through Action 2.1 above) and other conservation pressure points, such as the Sagalla-Buchuma Corridor, where adult education programmes are most urgently needed and will have maximum potential benefit for the TCA's conservation. Once these target areas have been identified, appropriate education and awareness activities will be planned out to address the specific needs and issues impacting on the communities' resident in each area. Appropriate equipment will then be acquired, and education and awareness materials produced, to support the successful implementation of these activities, which will then be rolled out according to the programme developed for each community.

Action 5.7: Raise general awareness of the TCA conservation importance and values

The media, including radio, television and newspapers, can play an important role in conveying conservation education messages to TCA adjacent communities, and beyond. In order to take advantage of these mechanisms for improving awareness and understanding of the TCA's conservation, and the wider work of KWS nationwide, TCA CWS staff will collaborate with local media in promoting wildlife conservation, through, for example, using the radio stations that have been established in Voi and Mtito Andei. CWS staff will also participate in appropriate local and national environmental awareness events aimed at raising awareness about the TCA and its exceptional resource values. A number of special events, such as wild-runs, cycling in the wild, and other competitions, will also be held in 2008 to commemorate the 60th anniversary of the TCA's establishment (see Action 3.4 of the Tourism Programme). In addition, the CWS will also involve the TCA security department in a number of these awareness activities, and keep them informed of other activities discussed throughout this programme, to ensure that they are aware of the various projects being undertaken by CWS in partnership with TCA adjacent communities.

Three Year Activity Plan

The following pages set out the first 3-Year Activity Plan for the Community Partnership and Conservation Education Programme. The activity plan details the activities, responsibilities, and timeframe for the delivery of each management action over the first 3-year timeframe of this management plan. In addition, that plan sets out specific and timebound “milestones” that TCA management aims to achieve in implementing the plan.

Management Action and Activities	Persons responsible	Timeframe												Milestones		
		FY 2007-08				FY 2008-09				FY 2009-10						
		1	2	3	4	1	2	3	4	1	2	3	4			
Objective 1: TCA-community communication and collaboration mechanisms established and strengthened																
Action 1.1: Strengthen and support activities of Taita Taveta Wildlife Forum																
1.1.1: Develop an MoU between KWS and TTWF	SW- CWS, TTWF Co-ordinator													KWS-TTWF MoU signed by December 2008		
1.1.2: Provide ongoing support for TTWF activities including provision of technical advice	SW- CWS, TTWF Co-ordinator															
1.1.3: Provide training and capacity building for TTWF members	SW- CWS, TTWF Co-ordinator															
Action 1.2: Promote and support the establishment of Kibwezi-Kitui Wildlife Forum																
1.2.1: Identify and mobilize stakeholders	SW-CWS													Kibwezi-Kitui wildlife forum established by December 2008		
1.2.2: Provide support for developing Memorandum and Articles of Association for the new Forum, based on Taita-Taveta WF articles and other similar forums																
1.2.3 Support registration process																
1.2.4 Provide technical and other support for establishing K-K WF operations and stakeholder participation mechanisms																
Action 1.3: Strengthen collaboration between KWS and Galana and Kulalu Ranches (see Action 1.3.2 of Ecology Programme)																
1.3.1: Develop MoU with Galana and Kulalu Ranches in collaboration with research section	SW-CWS, SW -T/E, HLS													KWS-Galana MoU signed by December 2008		
1.3.2: Implement KWS responsibilities under MoU																
Action 1.4: Establish and strengthen Community Consultative Committees																

Management Action and Activities	Persons responsible	Timeframe										Milestones	
		FY 2007-08				FY 2008-09				FY 2009-10			
		1	2	3	4	1	2	3	4	1	2	3	4
1.4.1 Hold discussions with community leaders and decision makers concerning role and procedure for establishing four CCCs around TCA													4 new Community Consultative Committees formed by December 2008
1.4.2 Develop simple action plan for establishing or strengthening CCCs and agree with community leaders and decision makers													
1.4.3 Provide technical support, training and other support for establishing CCCs, including governance systems and project development and management													
1.4.4 Participate in CCC meetings and promote linkages between the community forums and wider community	SW-CWS												
1.4.5: Enter into partnership with consultative committees in existing sanctuaries	SW-CWS, SRS-TCA												
Action 1.5: Collaborate with local non-governmental organisations													
1.5.1: Identify all active conservation based NGOs and CBOs operating in greater TCA landscape	SW-CWS, CWO												NGO/CBO workshop held by December 2008
1.5.2: Establish a forum for discussing conservation issues with NGOs and CBOs	AD-TCA, SW-CWS,												
1.5.3: Participate in district level meetings concerning NGO activities	SW-CWS, CWO												
Action 1.6: Nominate honorary wardens for gazetttement by the KWS Director													
1.6.1: Identify and recommend suitable persons for nomination	SW-CWS, CWO												10 Honorary Wardens nominated by December 2009
1.6.2: Gazette honorary wardens	SW-CWS, AD-TCA, Director												
Objective 2: Human-wildlife conflict incidences reduced													
Action 2.1: Develop a HWC GIS-based database and identify HWC hotspots													
2.1.1 Collaborate with research section on establishing GIS system for mapping hotspot records using existing or new equipment as appropriate													TCA HWC hotspots map developed by July 2008

COMMUNITY PARTNERSHIP & CONSERVATION EDUCATION PROGRAMME

Management Action and Activities	Persons responsible	Timeframe												Milestones	
		FY 2007-08				FY 2008-09				FY 2009-10					
		1	2	3	4	1	2	3	4	1	2	3	4		
2.1.2: Purchase GIS-adapted PDAs for field recording of HWC incidences	SW-CWS														
2.1.3 Train CWS HWC staff on operating PDAs and data management	SW-CWS, H-HC														
2.1.4: Map out HWC hotspots on GIS system using PDA-generated records	SW-CWS, SRS														
2.1.5 Hold community meetings to confirm HWC hotspots based on information collected															
2.1.6 Produce annual human wildlife conflict reports															
Action 2.2: Construct and maintain wildlife barriers in key areas around the TCA															
2.2.1 Carry out evaluation of existing TCA fences including environmental and socio-economic impacts															
2.2.2 In conjunction with TCA research section and other TCA and KWS-HQ departments, develop a proposal on the construction of new fences around the TCA including: proposed fence alignment, construction scheduling and pros and cons of including and excluding community areas and private land parcels															
2.2.3 Carry out Strategic Env. Assessment of fencing proposals (see Action 4.4 of Ecology Programme), including consultations with community groups and private land owners															
2.2.4: Establish MoUs between KWS and communities/private landowners on construction of fences where appropriate	SRS, H-LS, SW-CWS,														
2.2.5: Construct fences according to position paper recommendations and subsequent stakeholder consultations and agreements	AD-TCA, SW-CWS, CWO														
2.2.6: Promote planting of live fences around individual land parcels in human-wildlife prone areas	SW-CWS, CWO, SRS														
Action 2.3: Construct new and strengthen existing CWS outposts															
2.3.1: Establish a mobile PAC unit base at Kiboko	SW-CWS, W- CHNP,													One PAC mobile unit	
2.3.2: Establish new patrol outposts at Kasigau, Kidong, Ele-rai, Mtito, Kishushe, Kasala and Kone	AD-TCA, SW-CWS, CWOs													and 7 new outposts es-tablished by July 2010	

Management Action and Activities	Persons responsible	Timeframe										Milestones	
		FY 2007-08				FY 2008-09				FY 2009-10			
		1	2	3	4	1	2	3	4	1	2	3	4
2.3.3: Strengthen existing outposts	AD-TCA, SW-CWS, CWOs												
Action 2.4: Investigate and apply new problem animal control techniques													5 training workshops conducted by July 2010
2.4.1: Liaise with research section to identify and assess new PAC techniques, including wildlife scaring methods	CWOs, SRS, SW-CWS												
2.4.2: Undertake study visit to other sites using PAC techniques, especially for elephants	CWOs, SRS, SW-CWS												
2.4.2: Obtain PAC equipment as necessary and carry out pilot trials in appropriate communities													
2.4.3: Equip and train communities on selected PAC techniques following successful piloting	SRS, CWOs												
Action 2.5: Provide support to enhance compensation claim process													All TCA officers, NCOs and CWS staff trained by July 2010
2.5.1: Create awareness among TCA staff on the compensation process	SW-CWS, CWOs												
2.5.2: Liaise with claimants and KWS headquarters in processing of claims	SW-CWS, CWOs												
Objective 3: Community benefits from the TCA improved													
Action 3.1: Implement and support new and ongoing community development projects													
3.1.1: Carry out Participatory Rural Appraisal (PRA) in collaboration with community representatives (wildlife forums/CCCs) to identify new projects	SW-CWS, SW-TE/TW, CWOs												One PRA conducted every quarter
3.1.2: Provide support and training to community representatives (wildlife forums/CCCs) in developing project proposals	SW-CWS, CWOs, CBOS												
3.1.3: Provide material, technical and other support to implement funded projects	SW-CWS, CWOs, CBOS												
3.1.4: Support visits to existing successful projects and highlight lessons learnt in project management	SW-CWS, CWOs, CBOS												

COMMUNITY PARTNERSHIP & CONSERVATION EDUCATION PROGRAMME

Management Action and Activities	Persons responsible	Timeframe								Milestones	
		FY 2007-08				FY 2008-09					
		1	2	3	4	1	2	3	4		
Action 3.2: Enhance employment opportunities for local community members											
3.2.1: Liaise with KWS headquarters to formalise temporary employee contracts on a permanent basis, including fence attendants	AD-TCA, H-HC										3 casuals employed for every 20KM fence
3.2.2: Carry out in-service training for fence attendants	SW-CWS, SW-TE/TW, H-IDM										
Action 3.3: Develop a mechanism to enable regulated access to cultural sites											
3.3.1: Identify and document key cultural sites within TCA in collaboration with community representatives (wildlife forums/CCCs)	SW-CWS, SW-TE/TW										Regulations on access to cultural sites developed by December 2008
3.3.2: Develop rules and regulations to control access to cultural sites in consultation with community representatives (wildlife forums/CCCs)	SW-CWS, SW-TE/TW										
3.3.3: Collaborate with community representatives to facilitate access to sites and adjust rules and regulations according to lessons learnt	SW-CWS, SW-TE/TW										
Objective 4: Conservation-compatible community initiatives supported											
Action 4.1: Build capacity of and support existing community wildlife conservancies											
4.1.1: Provide training to community game scouts	SW-CWS, CC										50km of game viewing tracks established in wildlife conservancies annually
4.1.1: Work with KWS-HQ BDM to incorporate TCA-adjacent wildlife conservancies in TCA marketing and promotional materials (see Activity 3.4.2 of Tourism Programme)	SW-CWS, SW-TE/TW, H-BDM										
4.1.2: Incorporate advertising of TCA-adjacent conservancies in TCA-level tourism marketing activities (see Activity 3.4.3 of Tourism Programme)											
4.1.3: Provide plant and other support for developing game viewing tracks in wildlife conservancies	SW-CWS, SW-TE/TW, WS										
4.1.4: Construct water pans in wildlife dispersal areas	SW-CWS, SW-TE/TW, WS										

Management Action and Activities	Persons responsible	Timeframe								Milestones	
		FY 2007-08				FY 2008-09					
		1	2	3	4	1	2	3	4		
Action 4.2: Support establishment of new community wildlife conservancies around the TCA											
4.2.1: Identify suitable areas and mobilize the communities	SW-CWS, SRS-TCA, CWOs					■	■	■	■	One conservancy established annually	
4.2.2: Identify and map potential conservancies in collaboration with relevant county councils	SW-CWS, SRS-TCA, CWOs					■	■	■	■		
4.2.3: Collaborate with relevant county councils in establishing and endorsing conservancy registration documents	SW-CWS, SRS-TCA, CWOs					■	■	■	■		
4.2.4: Provide support to communities in setting up and building capacity of conservancy management committees	SW-CWS, SRS-TCA, CWOs					■	■	■	■		
4.2.5 Assist management committee in developing conservancy management plans	SW-CWS, SRS-TCA, CWOs					■	■	■	■		
Action 4.3: Support wildlife utilization enterprises in greater TCA landscape											
4.3.1: Carry out inventory and needs assessment for existing and potential wildlife utilization enterprises in greater TCA landscape	SW-CWS, SRS-TCA, CWOs		■	■	■	■	■	■	■	20 guinea fowl farms established per year	
4.3.2: Support guinea fowl farming	SW-CWS, SRS-TCA, CWOs		■	■	■	■	■	■	■		
4.3.3: Provide ongoing support to other viable wildlife utilization enterprises	SW-CWS, SRS-TCA, CWOs		■	■	■	■	■	■	■		
Objective 5: Community understanding and awareness of TCA conservation improved											
Action 5.1: Strengthen TCA education staff establishment and capacity											
5.1.1: Strengthen TCA education staff according to TCA staffing report (see Action 2.1 of Park Operations Programme)	AD-TCA, SW-TE, SW-TW					■	■	■	■	Key TCA education staff trained by July 2010	
5.1.2: Carry out a training needs assessment (see Action 2.2 of Park Operations Programme)	WE					■	■	■	■		
5.1.3: Train education staff according to needs assessment	AD-Edu, AD-TCA, WE					■	■	■	■		

COMMUNITY PARTNERSHIP & CONSERVATION EDUCATION PROGRAMME

Management Action and Activities	Persons responsible	Timeframe								Milestones	
		FY 2007-08				FY 2008-09					
		1	2	3	4	1	2	3	4		
Action 5.2: Upgrade Tsavo East Education Centre											
5.2.1: Build self-contained accommodation for teachers/staff accompanying educational groups	AD- Edu, AD-TCA, WE									Education Centre upgraded by December 2008	
5.2.2: Upgrade and provide adequate equipment	AD- Edu, AD-TCA, WE										
5.2.3: Develop and obtain up-to-date interpretive and education materials	AD- Edu, AD-TCA, WE										
Action 5.3: Develop education facilities in conjunction with Tsavo West Visitor Interpretation Centre											
5.3.1: Construct student hostels	AD- Edu, AD-TCA, SW-TW, WE									Interpretive material developed by September 2008	
5.3.2: Furnish and equip hostels	AD- Edu, AD-TCA, SW-TW, WE										
5.3.3: Develop and obtain up-to-date interpretive and education materials	AD- Edu, AD-TCA, WE										
Action 5.4: Establish Ithumba Education Centre											
5.4.1: Identify a suitable site for the education centre	W-Ithumba, AD-Edu, SW-T/E, WE, WS									Interpretive material developed by Sept. 2008	
5.4.2: Design and construct the education centre	SW-TE, W-Ithumba-T/E, AD-Edu, WE										
5.4.3: Equip the education centre	SW-TE, W-Ithumba-T/E, AD-Edu, WE										
5.4.4: Develop and obtain up-to-date interpretive and education materials	SW-TE, W-Ithumba-T/E, AD-Edu, WE										
Action 5.5: Provide support to school environmental education and conservation awareness activities											
5.5.1: Monitor performance of conservation education programmes in schools adjacent to the TCA	WE									One nature school established per year	
5.5.2: Promote and support establishment of Wildlife Clubs	WE										
5.5.3: Implement the nature school concept	AD- Edu, AD-TCA, WE										
5.5.4: Re-introduce sponsored park tours in the TCA	SW-TE/TW, WE										

Management Action and Activities	Persons responsible	Timeframe								Milestones	
		FY 2007-08				FY 2008-09					
		1	2	3	4	1	2	3	4		
Action 5.6: Carry out adult education and awareness programmes around TCA, especially in key HWC areas											
5.6.1: Identify key HWC areas and TCA conservation pressure points using the HWC database (see Action 2.1) and community consultations as appropriate	SW-CWS, WE-TW, WE-TE, W-CHNP					■	■				
5.6.2 Plan out appropriate education and awareness activities for each target area according to need	SW-CWS, WE-TW, WE-TE, W-CHNP					■	■				
5.6.3 Produce or acquire education and awareness materials, and equipment to support outreach activities	SW-CWS, WE-TW, WE-TE, W-CHNP					■	■				
5.6.4 Carry out awareness and education activities	SW-CWS, WE-TW, WE-TE, W-CHNP							■	■	■	
Action 5.7: Raise general awareness of the TCA conservation importance and values											
5.7.1: Organize annual conservation awareness events and activities	AD- TCA, SW-TE/TW, SW-CWS, CWOs, WE			■	■	■	■	■	■	Two conservation awareness events organised per year	
5.7.2: Participate in local and international exhibition and trade fairs	AD- TCA, SW-TE/TW, SW-CWS, CWOs, WE			■	■	■	■	■	■		
5.7.3: Collaborate with local media in promoting wildlife conservation	AD- TCA, SW-TE/TW, SW-CWS, CWOs, WE			■	■	■	■	■	■		
5.7.4: Involve Security Department in community awareness programmes	AD- TCA, SW-TE/TW, SW-CWS, CWOs, WE, W-Security			■	■	■	■	■	■		

Security Programme

Programme Purpose

The safety of the TCA's natural resources, staff, visitors and assets is ensured, through the delivery of efficient, effective and adequate security services

The size, remoteness and limited infrastructure in much of the TCA presents significant challenges to ensuring that the area is maintained as a safe and secure environment for the area's natural resources, KWS staff and assets, and visitors to the area. The security challenge has been further complicated in recent years as the focus of illegal resource use has gradually shifted from predominantly commercial poaching of high value species (primarily elephant and rhino) to high levels of bushmeat poaching and extensive livestock grazing throughout much of the area, particularly in the more remote and underutilised northern parts of TENP, southern parts of TWNP and in CHNP.

Through its management objectives and actions, the TCA Security Programme sets out the measures that management will take in response to these changing and escalating threats, in order to achieve the programme purpose set out above. The key guiding principles that have been taken into account during the programme's development, and that will guide its implementation, are set out in the following section.

Guiding principles

The guiding principles describe key factors taken into account in the development of the Security Programme and that influence the way the programme is implemented in achieving the above programme purpose. The guiding principles are:

- ▶ **Expanding security coverage to the entire TCA, in order to enhance visitor use and the ecological integrity of the more remote and difficult to access parts of the TCA**
- ▶ **Collaborating with key stakeholders who are able to enhance and/or improve the efficiency and effectiveness of TCA security operations**
- ▶ **Focusing on emerging and escalating threats to natural resources, while ensuring that traditional threats remain abated**

These guiding principles are briefly described and explained in the following paragraphs.

Expanding security coverage to the entire TCA

Despite the significant and ongoing investments that KWS has made in the human and financial resources dedicated to improving the safety of the TCA's natural resources, visitors and staff, these efforts have so far only prevented certain illegal activities (in particular livestock grazing and illegal extraction of natural resources) in a relatively small part of the TCA, with the rest of the area still being significantly impacted at certain times of the year. Without a significant enhancement in security and the reduction in illegal activities throughout the TCA, wildlife populations and natural habitats in these areas will continue to be impacted, and tourism investment and use will be unlikely to expand from the current high use zones in the south of TENP and north of TWNP. A high priority of this management programme, and

its first guiding principle, is therefore that security and management presence will over the lifespan of this management plan be intensified and extended across the entire TCA, and in particular in the more remote and difficult to access parts of the area.

Collaborating with key stakeholders

With an area the size and complexity of the TCA, bringing about improvements in the overall efficiency and targeting of security operations and enabling an expansion of security coverage cannot be achieved simply by increasing investment in the TCA's security forces and infrastructure. Rather, TCA management needs the support and active collaboration of other relevant law enforcement agencies in the wider landscape, including the police, judiciary, local government, and concerned institutions in neighbouring countries, in particular the Tanzanian wildlife authorities. While such mutually beneficial collaborations in security matters have always been part and parcel of security operations in the TCA, these arrangements are becoming increasingly crucial to successful law enforcement and intelligence operations as human populations, and conflict situations, around the TCA increase. As a result, the need to further strengthen collaborations with key law enforcement and government agencies in the wider TCA landscape, who are able to support the TCA security forces' efforts to protect natural resources, KWS staff and visitors, is an important guiding principle for this TCA Security Programme.

Focusing on emerging and escalating threats to natural resources

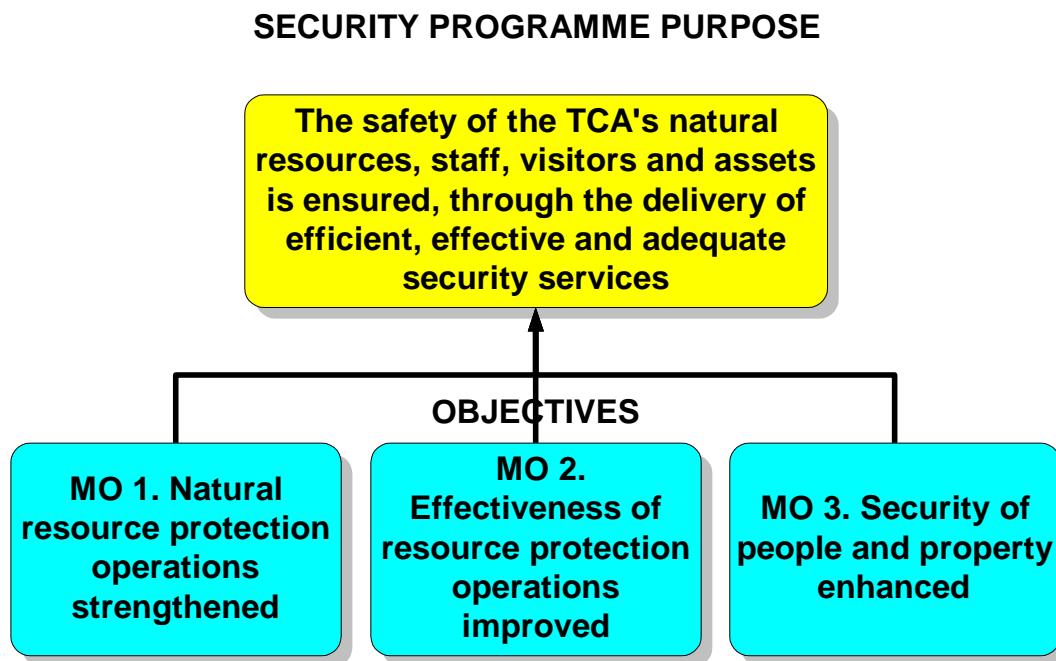
In recent years, indiscriminate bushmeat poaching has increased drastically in parts of the TCA, and has in particular impacted on the area's small mammal populations. It has been estimated that thousands of these animals are being lost on a monthly basis to this trade, and the methods used have evolved from more traditional snaring and poisoned arrows to the use of lamps and horns at night. Livestock incursions into many parts of the TCA have also intensified, especially during the dry season, which is impacting on several of the TCA's habitats, especially the savannah bushlands and grasslands. It is estimated that at present only around 30% of the national parks can be considered free of cattle in any given year, and there is evidence of extensive use of the parks' grazing resources by commercial livestock owners. There are also emerging threats to the TCA's commercially important exceptional resources such as sandalwood, which has recently come under intense pressure in CHNP.

The TCA has historically experienced heavy poaching pressure on its two main large mammal species of high commercial value - elephants and rhinos – and over the years major achievements have been made in combating this threat. While maintaining vigilance with regard these two species, there is now a need for TCA management to intensify the response to the various emerging and escalating threats to the TCA's natural resources as detailed above, which may require alternative strategies to those already being pursued, as well as an adjustment in the geographical targeting of security efforts. A key guiding principle of this programme is therefore that, while ensuring that the currently low level of threats to elephants and rhinos is maintained, TCA management will remain responsive to changing situation and threats to the area's natural resources, and will ensure that emerging and escalating threats to natural resources are appropriately addressed.

Management objectives

Figure 24 below shows the overall objectives tree for the TCA Security Programme.

Figure 24: Security Programme objectives tree



Each of these management objectives, and their subsidiary management actions are set out in the following sections.

Objective 1: Natural resource protection operations strengthened, especially in remoter parts of the TCA and the greater landscape

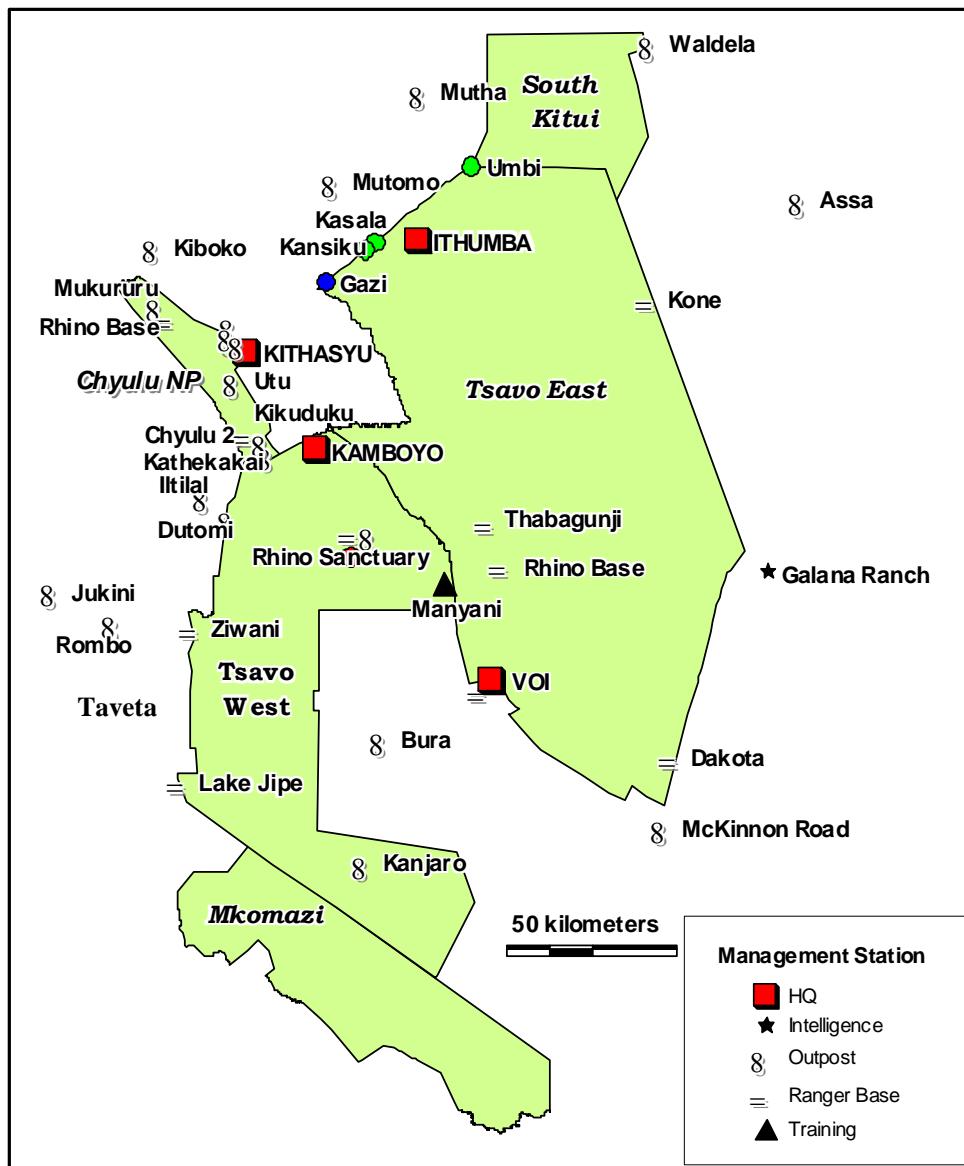
Covering almost four percent of Kenya, the TCA is the nation's most expansive protected area complex, and this presents significant challenges for natural resource protection operations. Despite the area's large ranger force and a major financial investment by KWS, it has proved difficult to maintain adequate resource protection operations across the area, especially in the remoter parts such as the northern parts of TENP and southern parts of TWNP. In these areas, security operations are often hampered by inadequate infrastructure, equipment and difficulty of access, and as a result, illegal activities such as livestock grazing and bushmeat poaching are still widespread.

If, as set out in the Tourism Development and Management Programme, visitor use of the remoter parts of the TCA is to be increased over the lifespan of this management plan, concurrent efforts also need to be made to enhance resource protection operations and to combat the reoccurring human incursions in these areas. In addition to the decentralised sectoral management of the area (see PA Operations Programme), which aims to increase management presence and infrastructure development across the TCA, this objective has been developed to strengthen the TCA's resource protection operations, especially in the remoter parts of the TCA as well as in key areas of the greater landscape beyond the TCA's borders. The actions needed to achieve this objective are elaborated below.

Action 1.1: Establish new security operations bases and improve existing ones

As shown in Figure 25 below, security operations in the TCA are already supported by a significant number of outposts and ranger bases. However, much of this infrastructure is located in or around the area's high use zones, and has not to date been sufficient to prevent some illegal activities (notably livestock grazing and bushmeat poaching) that are seriously impacting the more remote parts of the TCA.

Figure 25: Management and security infrastructure in and around the TCA



Further exacerbating this situation is the fact that a number of the existing security bases and outposts are currently in a poor state of repair, and need upgrading if they are to effectively support the proposed expansion of security operations set out in this management programme. In order to address these issues, the initial activities under this action will focus on the establishment of a number of new security bases at strategic locations in and around the TCA. This will require the identification and mapping by TCA management of the most appropriate locations for the new bases. Once the plans and budgets for developing the new facilities have been approved by KWS HQ, the patrol bases will then be constructed at the

identified sites, suitably equipped, and adequate personnel subsequently deployed to enable their effective operation. In addition, TCA management will liaise with the civil works office to identify the repairs and improvements required at existing bases and outposts, and then, funds permitting, implement these improvements as appropriate.

1.2: Strengthen the capacity of security patrol teams

Currently, many TCA security staff lack basic training in important field skills such as the use of data collection tools, and also lack some essential field equipment, including binoculars, night vision goggles and GPS, and in some cases, 4WD vehicles. As a first step towards addressing these issues, a training needs assessment of security staff will be carried out (in conjunction with Action 2.2 of the Park Operations Programme), and priority training subsequently initiated in accordance with the assessment's recommendations. This training will also include the use of GIS or other spatial data collection tools, which will support the establishment and continued use of the new security database that will be developed through Action 2.1 of this programme (see below). In addition, and in order to enhance the mobility of security patrols, TCA management will liaise with KWS HQ regarding the provision of additional heavy-duty 4WD vehicles to support ground patrols.

Action 1.3: Intensify ground and aerial patrols

The main illegal activities currently taking place within the TCA include honey harvesting, timber extraction, livestock grazing, and bushmeat poaching, all of which are particular severe in the remoter parts of the TCA, including Ithumba, Emusaya, Dakota and Maungu in TENP, and the Jipe area of TWNP. In order to combat this situation, aerial and ground patrols will be expanded and intensified to both deter and detect illegal activities over the entire TCA, in particular the more remote parts. This will involve the initial strengthening of the TCA staff establishment through the deployment of resident pilots in TENP and TWNP (combined with the development of regular flight schedules to improve aerial coverage), and the deployment of additional personnel to highly impacted parts of the area (in line with the TCA staffing report - see Action 2.1 of the PA Operations Programme). Regular foot and vehicle patrols will also continue to be carried out across the TCA, and relevant data collected and incorporated in the new security database (developed under Action 2.1 below). In addition, the northern parts of TENP currently lack adequate security patrol roads, and many of those that do exist are in very poor condition. Potential new security roads will therefore be identified, along with any existing roads that need upgrading, and subsequently incorporated as appropriate into the improvements scheduled under Action 3.2.1 of the PA Operations Programme.

Action 1.4: Establish TCA de-snaring teams

The snaring of wild animals, which was once practiced only at a subsistence level, is now a commercial business in many parts of the TCA and is seriously impacting on a number of wildlife species. To date, the vast majority of de-snaring activities in and around the TCA have taken place in close collaboration with the DSWT, which currently operates six well-equipped de-snaring teams that have been removing snares in areas adjacent to the TCA boundary, and at times within the TCA itself (see Figure 26 overpage). Figure 27 overpage shows that this operation has been highly successful, with the number of snares recovered annually since operations began having substantially reduced.

Figure 26: Current de-snaring sectors covered by DSWT/KWS teams in and around the TCA

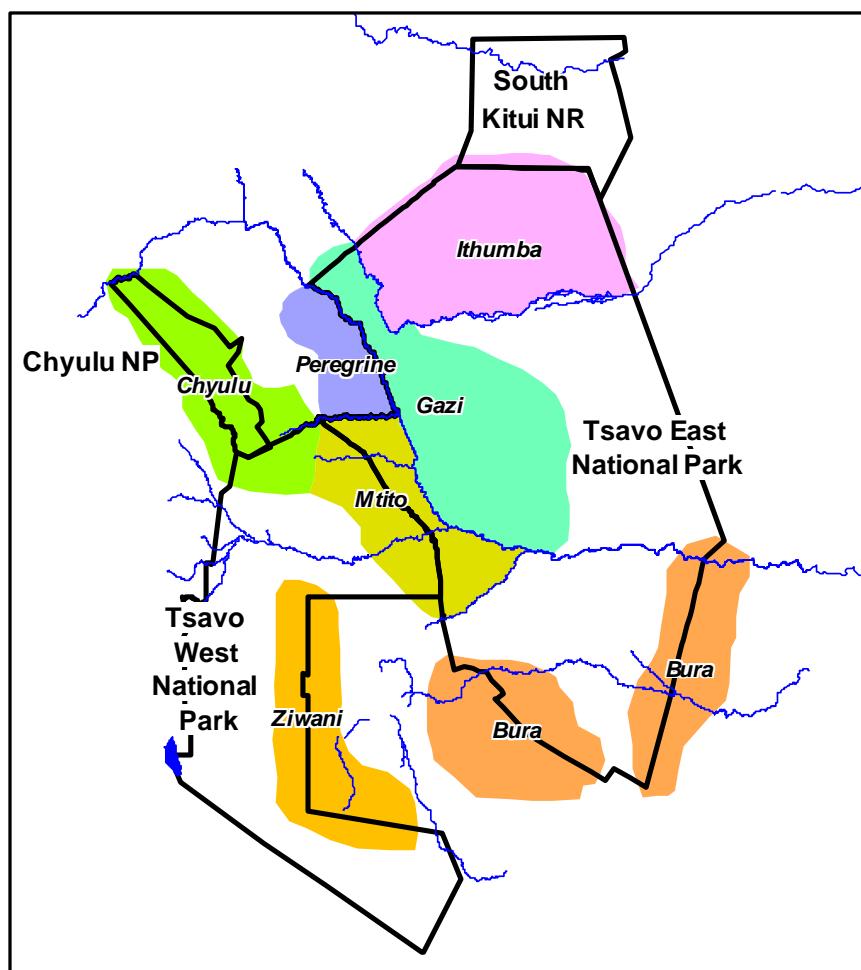
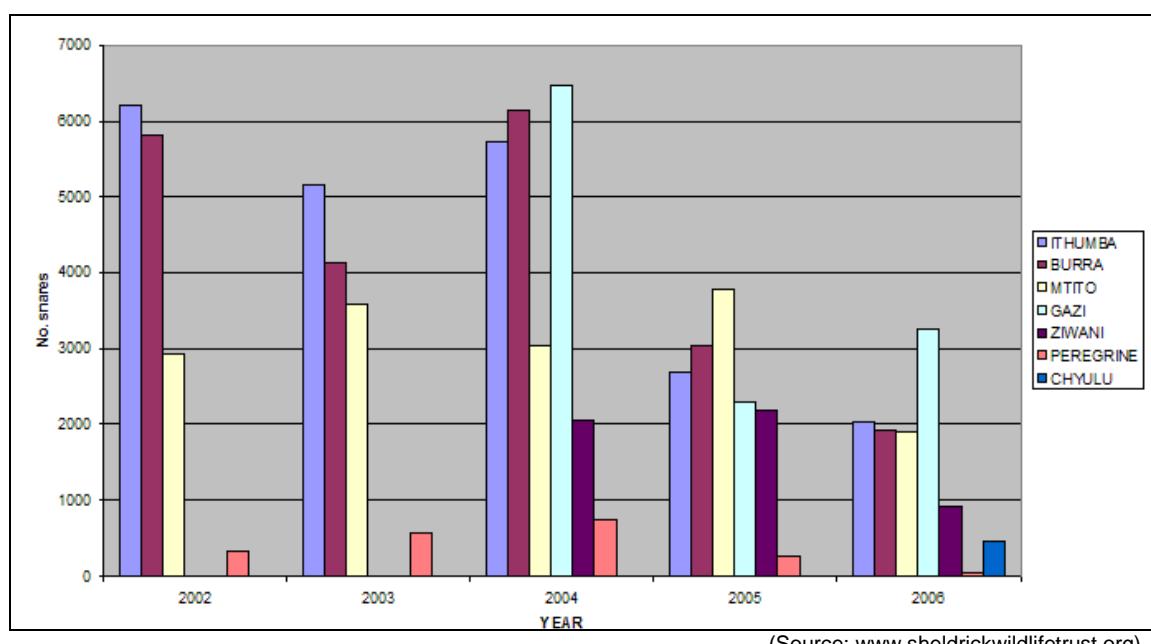


Figure 27: Number of snares recovered per year by DSWT/KWS teams in locations in and around the TCA



In order to further strengthen the TCA management's response to the snaring problem, KWS will establish its own de-snaring teams that will complement and support the existing DSWT-led operations. The establishment of the KWS-led teams will involve the initial development of a scheme outlining how the new de-snaring operations will be integrated with ongoing work, including the designation of new de-snaring sectors. Once the scheme has been developed, appropriate camping gear, field equipment and clothing will be procured for the new de-snaring teams, and additional staff recruited to conduct de-snaring patrols under the supervision of TCA security staff. In addition, TCA management will continue to collaborate with and provide necessary support for the DSWT operations, and any other de-snaring teams operating in the greater TCA landscape (for example, by the Tsavo-Amboseli Game Scouts Association, Taita Ranches or other wildlife conservancies).

Action 1.5: Implement enhanced rhino security systems

In line with the recently developed Black Rhino National Conservation and Management Strategy (discussed in more detail under Sub-objective 1.1 of the Ecology Programme) existing rhino security operations will be enhanced over the next few years throughout the TCA. These improvements will build on current successes in the area (such as the reduction in poaching incidences to one or two per year), and respond to new management approaches that will be adopted under the new national strategy, most notably the development of a rhino "Intensive Protection Zone" (IPZ) in TWNP. The first step in enhancing the TCA's rhino security systems will be the deployment of additional staff. This will include an officer charged with overseeing and coordinating rhino security activities across all three of the TCA's PAs, and, with specific regard to TWNP, the posting of additional rangers to the IPZ to ensure the release of free-ranging rhinos is supported by sufficient security personnel. With regard to TENP, the Rhino Monitoring Team (RMT) currently has only one vehicle to cover all six patrol blocks, and the RMT's six sections are also ill equipped with surveillance tools such as binoculars, GPS and night vision goggles. Therefore, in order to improve the efficiency of the TENP security operations, each of the patrol blocks will be sub-divided into smaller manageable units, and each of the RMT's six sections provided with essential observation and tracking equipment. In addition, TCA management will liaise with KWS HQ regarding the possibility of increasing the number of vehicles available for rhino security. Finally, reports on all rhino security operations across the TCA will be compiled on an annual basis by the new TCA rhino security coordination officer, at which time the effectiveness of the TCA rhino security system will also be evaluated and adapted as necessary.

Action 1.6: Enhance coordination of the MIKE programme operations

The CITES Monitoring the Illegal Killing of Elephants (MIKE) Programme, which has been operational in the TCA for some time, measures levels and trends in the illegal hunting of elephants, and helps to identify the factors causing or associated with such changes. However, this programme is not currently being used to its maximum potential in the TCA, and relatively little is known about the MIKE programme by TCA managers, which has resulted in the database falling into disuse. In addition, although the MIKE monitoring data forms developed by KWS HQ are available, they are quite complex and are often not completed to the standards required. In order to address these issues, TCA management will reactivate the MIKE database, and, in collaboration with KWS HQ, reformulate the data collection systems to enhance their ease of use. In order to ensure that the best possible use is made of the information collected, TCA security staff will also be trained in data collection and in the recording of information according to MIKE standards.

Objective 2: Effectiveness of natural resource protection operations improved

Besides the practical and logistical difficulties of operating in remote and hard-to-access parts of the TCA addressed under the previous objective, the effectiveness of natural resource protection operations is also undermined by a number of other recurring problems. These include problems encountered in generating and managing intelligence information to detect and respond to illegal activities, as well as in prosecuting offenders once apprehended, often due to insufficient collaboration with other law enforcement agencies and a lack of awareness in the judiciary of the impacts of illegal activities on TCA natural resources. This objective has therefore been developed in order to maximise the effectiveness of TCA resource protection operations, and to ensure that the best possible use is made of the manpower and other resources that are assigned to resource protection. This will involve a number of actions designed to improve intelligence information gathering and handling, and to enhance collaboration with other law enforcement agencies. These actions are set out in more detail below.

Action 2.1: Establish a TCA security database

All information currently gathered by the TCA security teams is sent to KWS HQ where it is included in the central database that covers all KWS security operations. There is currently no TCA-level security database, although such a database has the potential to be an important tool for monitoring security operations in and around the TCA, and for assessing and adapting them to improve their effectiveness. For example, the database could be used to support planning of security operations and patrols, and to help identify the optimal location of any new security outposts or other infrastructure that may be needed. Therefore, to make best use of the security information that is already being collected, this management action will develop a comprehensive TCA-level security database to address the specific information needs of TCA's managers. Key elements of this database are likely to include details on the patrols carried out each month (such as patrol route, observations made, and action taken where illegal activities are encountered), details on arrested individuals and any prosecutions, and intelligence information on wildlife-related illegal activities. Ideally the database will also incorporate a Geographic Information System (GIS) to facilitate the display and output of information in the form of maps.

Action 2.2: Increase the number of intelligence sub-CLICS

A good intelligence network is vital for obtaining advance warning of activities that may pose a threat to security in and around the TCA. The KWS Intelligence Unit (CLIC), whose network covers the entire country, is responsible for carrying out surveillance and monitoring of poachers and other lawbreakers in and around protected areas, and for collecting, analysing and collating security related information. To facilitate their operations, the Intelligence Unit has established a number of intelligence outposts, known as sub-CLICS, around the TCA. However, the existing sub-CLICS are insufficient to cover the entire TCA, and as a result TCA intelligence officers are overstretched and unable to provide adequate intelligence information to support ongoing TCA security operations. Under this management action, the number of sub-CLICS will be increased in order to improve intelligence gathering operations around the TCA. Four priority areas have been identified where new sub-CLICS are needed: Chyulu, Kuranzé, Waldena and Baba Wangia. As a first step in establishing the new outposts, TCA management will liaise with the KWS Civil Works section to determine construction and materials requirements, and, subject to available resources, will oversee the con-

struction works. Once established, additional intelligence staff will be deployed to the new sub-CLICS, with responsibility among others for the recruitment of new community informers (in conjunction with Action 2.5 below).

Action 2.3: Collaborate with police and judiciary in enhancing prosecution rates for wildlife offences

Each year, TCA management expends considerable financial and human resources in an effort to curb illegal activities taking place within the parks. While many arrests are made, these often do not lead to an eventual conviction of the perpetrators, or if they do, the penalty is often inadequate. The explanation can be attributed on the one hand to failures on KWS part, and on the other to failures on the side of the judiciary. For example, poor drafting of charge sheets by KWS staff has in the past frequently led to dismissal of cases on the grounds of improper charges. In addition, a lack of awareness amongst the magistrates of both wildlife law and the impacts that wildlife offences have on the TCA's wildlife populations often leads to the dismissal of cases, or minimal penalties. In some instances, poachers have been released with a verbal warning after they declare that they were poaching due to poverty.

Through this management action, TCA management will step up current collaboration with the police and judiciary, primarily to improve prosecution rates and general understanding of the impacts of wildlife offences on the area's ecology. This will involve initial liaison between TCA management and the local police to train TCA staff in the drafting of charge sheets and court procedures. In addition, TCA management will also take steps to sensitise members of the judiciary on the seriousness of wildlife offences in the TCA, through, for example, supporting tours of the area for magistrates with the aim of raising their awareness of the extent and impacts of illegal activities within the TCA (as has recently been successfully implemented at Makindu). Finally, in order to further enhance collaboration with other law enforcement agencies in the Greater TCA, the security section will continue to participate in all relevant district security meetings.

Action 2.4: Conduct joint operations with Tanzanian wildlife authorities

The TCA is bordered to the south by Mkomazi Game Reserve (proposed national park) in Tanzania, which lies adjacent to the southern boundary of TWNP along the Kenya-Tanzania border. The Reserve represents a substantial extension to the TCA PA complex, which will become increasingly important if, as is likely, other wildlife dispersal areas around the TCA are reduced over the years ahead. In order to enhance natural resource security, and to address other issues of mutual concern, TCA management has been holding regular cross-border meetings with their Tanzanian counterparts, and conducting joint or simultaneous security operations. TCA management will continue with both of these initiatives during the implementation period of this management plan, as well as other activities aimed at maintaining and improving this important cross-border partnership, and at strengthening wildlife security in the Kenya-Tanzania border region.

Action 2.5: Liaise with local communities in enhancing security operations

In areas where a good relationship already exists between KWS and the local community, the Intelligence Unit sometimes receives advance information from the community about impending wildlife crimes. However, many community members are often afraid to pass on such information, due to fear of being recognised by poachers or by other members of the community who may view them as traitors. There is a clear opportunity to enhance intelli-

gence gathering in such a way that the identity of those who volunteer information remains secure. The additional intelligence information generated as a result will enable the TCA security section to better combat bushmeat poaching and other illegal activities currently taking place within the area.

This management action aims to address this issue, as well as to improve relations and linkages with communities with the aim of enhancing security operations. In this regard, TCA management will hold periodic barazas/forums in local communities with the aim of raising awareness of the need for intelligence information from community members. In addition, local administration and community leaders will also be incorporated into security operations, and potential informants from local communities will be identified and trained. A system will also be implemented to reward informants for reliable information leading to apprehending offenders.

Objective 3: Security of people and property strengthened

The vastness of the TCA and its proximity to several relatively insecure parts of Kenya presents KWS with special challenges in ensuring the safety of its staff, visitors, property and revenue. The ability of TCA staff to safely carry out their duties across the entire area will have a direct impact on the effective and efficient implementation of the other management programmes detailed in this management plan. In addition, and of particular importance, is the safety of visitors to the TCA. Even isolated security incidences can generate significant negative publicity, and have the potential to have far-reaching impacts on tourism and tourism revenues. This issue is particularly important in the more remote areas of the TCA, where KWS needs to provide investors and visitors with high levels of security in order to encourage tourism use of these less popular areas. As such, this objective has been developed to bring about the desired future state where a high level of security is maintained for KWS staff and visitors throughout the TCA, as well as for KWS and investor property. Three actions have been developed to achieve this objective, elaborated below.

Action 3.1: Improve provision of KWS rangers to support TCA management operations and security

Currently, only the park gates and park headquarters are provided with security rangers, and this has left a number of TCA facilities unguarded and at risk from vandalism or theft. In order to address this situation, and to deter any illegal activities potentially directed towards KWS properties, under this action the number of security rangers will be increased at key facilities, including research labs, education offices and centres, and the TENP workshop. In addition, at present there are only two rangers attached to the TENP research centre, who also double up as research assistants. This number is insufficient to ensure that all researchers are adequately accompanied by security staff; a situation that is particularly dangerous when scientists are operating for long periods away from their vehicles. In response, the number of rangers available to TCA researchers will also be increased to numbers sufficient to ensure that they can safely undertake their duties. Finally, there has been a general increase in the demand by other TCA management sectors for the provision of rangers for security purposes. These demands are likely to increase as the variety of activities and initiatives underway in the TCA increases over the lifespan of this plan. As a result, it is essential that there is effective liaison between the Warden Security and other management sections regarding the provision of rangers. As such, all section heads will in future forward their security requirements in advance to the Coy Commander to enable him to schedule staff accordingly.

Action 3.2: Enhance security of cash collection and transit

Ensuring the security of cash collection and transit is a specialised task that is ideally carried out by dedicated staff that are trained to deal with the potential risks involved. Although TCA security staff have traditionally carried out this function, it is not an effective and efficient use of their time, which is much better spent on visitor and natural resource security activities. The implications of one major loss of revenue while in transit are also potentially very severe for KWS, and it is now considered more cost effective that these functions are in future outsourced to a specialised cash transportation firm, such as Wells Fargo or Securicor (as has already been implemented at KWS Headquarters and a number of other PAs around the country). Under this management action, TCA management will liaise with KWS HQ Finance Department with regard to outsourcing cash collection and transportation services. Furthermore, although KWS has now deployed trained customer care staff to all major TCA entry points, constant security is still needed at these strategic locations, and a 24-hour security presence will continue to be maintained at all revenue collection gates.

Action 3.3: Enhance security for TCA visitors

Although there has not been a serious visitor security incident in the TCA for a number of years, there have been minor incidences around the area, and visitor security remains an important management issue. Unless visitor security can be guaranteed across the entire TCA, tourism investment and use will be unlikely to expand beyond the area's high use zones, and if security incidences do occur, even the use of these areas may significantly decline. Therefore, in order to ensure that the current good record of visitor security in the TCA is maintained, a number of proactive measures will be taken under this management action by TCA management. These include liaising with the tourism police to ensure law and order is maintained at all tourist facilities in the TCA, and supporting the provision of services that they offer to tourism facilities both in and around the area. Additional security rangers will also be posted at tourism facilities and along major tourism roads during the tourism high seasons.

An effective and reliable communication link between tour operators and TCA management is also essential for the maintenance of a high state of security throughout the area. TCA management has already gone some way to achieving this aim by providing tourist facilities in TENP with cellphone numbers for the AD, SW and Tourism Officer. In order to further strengthen communication mechanisms, a common radio frequency will be established between tour operators, tourist facilities and TCA security staff to enable a rapid response to any issues that arise. To supplement this, a 24-hour hotline number will also be established to ensure that communication is possible at all times. Finally, as incidences elsewhere in Kenya have illustrated, terrorism poses a serious and ongoing threat to the tourism industry in Kenya. Therefore, in order to enhance management response and prevent terrorism attacks in the TCA, security teams will be trained in terrorism and disaster preparedness, in collaboration with the tourism police and relevant disaster management committees in the coastal region.

Three Year Activity Plan

The following pages set out the first 3-Year Activity Plan for the Security Programme. The activity plan details the activities, responsibilities, timeframe and extraordinary resource requirements necessary for the delivery of each management action over the first 3-year timeframe of this management plan. In addition, that plan sets out specific and timebound "milestones" that TCA management aims to achieve in implementing the plan.

Management Action and Activities	Persons responsible	Timeframe								Milestones		
		FY 2007-08		FY 2008-09		FY 2009-10						
		1	2	3	4	1	2	3	4			
Objective 1: Resource protection operations strengthened, especially in remoter parts of the TCA and the greater landscape												
Action 1.1: Establish new security operations bases and improve existing ones												
1.1.1: Identify and map strategic locations for new patrol bases	SW-TW/TE, W-CHNP, W-Security				█					A report on potential patrol base sites prepared by June 2008		
1.1.2: Construct patrol bases at identified sites												
1.1.3: Deploy personnel to the new patrol bases												
1.1.4: Liaise with the civil works office and identify the works/repairs required				█								
1.1.5: Implement the works as per Activity 1.1.4					█							
Action 1.2: Strengthen the capacity of security patrol teams												
1.2.1: Carry out a training needs assessment (see Action 2.2 of Park Operations Programme)	W-Security, WS AD-TCA, HROs, H-HC				█					Appropriate technology procured by July 2008		
1.2.2: Identified new security roads and existing roads for improvement												
1.2.3: Implement in situ and ex situ training according to training needs assessment					█	█	█					
1.2.4: Procure and equip the patrol teams with appropriate technology, e.g. PDAs with GPS, night vision goggles, laser range finders, telescopic sights.						█						
1.2.5: Liaise with KWS HQ for provision of heavy duty 4x4 vehicles to enhance ground patrols												

Management Action and Activities	Persons responsible	Timeframe								Milestones	
		FY 2007-08				FY 2008-09					
		1	2	3	4	1	2	3	4		
Action 1.3: Intensify ground and aerial patrols											
1.3.1: Deploy resident pilots in TE/TW	AD-TCA, H-AIRWING				■					Livestock incursion in PAs reduced by 40% by December 2009	
1.3.2: Enhance personnel strength in affected areas according to TCA staffing report (see Action 2.1 of Park Operations Programme)	AD-TCA, H-HC				■	■					
1.3.3: Develop flight schedules for effective aerial coverage	PILOTS TE/TW				■						
1.3.4: Carry out regular foot and vehicle patrols in the hot spot areas	SW-TE/TW, W-security										
Action 1.4: Establish TCA de-snaring teams											
1.4.1: Develop a scheme for effective de-snaring operations including establishment of de-snaring sectors	SW-TW/TE, W-security					■				TCA de-snaring teams established by December 2008	
1.4.2: Employ casual labour to conduct de-snaring patrols						■					
1.4.3: Procure camping gear and attire for de-snaring teams											
Action 1.5: Implement enhanced rhino security systems											
1.5.1: Deploy an officer to oversee TCA rhino security system	SW-TE/TW, W-Security, RPC				■					Rhino security equipment procured and in use by September 2008	
1.5.2: Liaise with KWS HQ concerning posting of additional ranger force to enhance TWNP IPZ security as necessary					■	■					
1.5.3: Equip the rhino team with sufficient surveillance tools/personnel					■	■					
1.5.4: Liaise with KWS HQ regarding possibilities of increasing the number of vehicles for rhino monitoring to three					■	■					
1.5.5: Sub-divide the rhino blocks into smaller manageable units						■					
1.5.6: Produce annual reports on rhino security operations						■			■	Annual reports, mapping distribution and trend of security	

SECURITY PROGRAMME

Management Action and Activities	Persons responsible	Timeframe								Milestones	
		FY 2007-08				FY 2008-09					
		1	2	3	4	1	2	3	4		
1.5.7: Review rhino security system and strategy annually and implement recommendations										related issues as from December 2008	
Action 1.6: Enhance coordination of the MIKE programme operations											
1.6.1: Reactivate the MIKE database										MIKE Programme operationalised by September 2008	
1.6.2: Formulate data collection systems	SRS-TCA, W-Security										
1.6.3: Ensure quality data collection and proper recording through training of rangers											
Objective 2: Effectiveness of natural resource protection operations enhanced											
Action 2.1: Establish TCA security database											
2.1.1: Design a GIS-based security database	W-Security, W-CLIC, W-Inv									Security database management system established by September 2008	
2.1.2: Establish a database office											
2.1.3: Procure a computer and accessories											
2.1.4: Train security personnel in database management and data collection											
Action 2.2: Increase the number of intelligence sub-CLICs											
2.2.1: Identify strategic sites for establishment of sub-CLICs	AD-TCA, SW-TE, SW-TW, W- CLIC									Additional informers recruited by December 2008	
2.2.2: Liaise with the civil works office to establish resource requirements for construction of sub-CLICs											
2.2.3: Construct sub-CLICs											
2.2.4: Recruit additional informers for effective coverage											
Action 2.3: Collaborate with police and judiciary in enhancing prosecution rates for wildlife offences											
2.3.1: Liaise with local police to train TCA rangers in drafting of charge sheets and court procedures	W-Security, W-CLIC, W-Inv									TCA participates in all district level security meetings	
2.3.2: Liaise with the police and judiciary for successful prosecution of arrested herdsmen											
2.3.3: Attend all district security meetings											

Management Action and Activities	Persons responsible	Timeframe												Milestones	
		FY 2007-08				FY 2008-09				FY 2009-10					
		1	2	3	4	1	2	3	4	1	2	3	4		
Action 2.4: Conduct joint/simultaneous operations with Tanzanian wildlife authorities															
2.4.1: Enhance cross-border collaboration by attending transboundary PA meetings	AD-TCA, SW-TW, W-Security, W-CLIC													Bi-annual cross-border meetings held and two cross-border operations conducted annually	
2.4.2: Plan and execute joint /synchronised cross-border operations															
Action 2.5: Liaise with local communities in enhancing security operations														Two barazas attended by TCA security officers annually	
2.5.1: Hold awareness barazas/forums with the local communities with a view to win their support	W-Security, SW-CWS														
2.5.2: Incorporate local administration and leaders in security operations	W-CLIC														
2.5.3: Identify and train informants from the local community															
2.5.4: Reward informants for reliable information leading to arrests/contact															
Objective 3: Security of people and property strengthened															
Action 3.1: Improve provision of KWS rangers to support TCA management operations and security														Ranger escort provided whenever required	
3.1.1: Increase number of sentries at KWS facilities	W-Security														
3.1.2: Provide armed escorts for researchers															
3.1.3: Liaise between Warden Security and other management sections on provision of rangers															
Action 3.2: Enhance security of cash collection and transit														24 hour security provided at all revenue collection gates	
3.2.1: Maintain 24 hour security at revenue collection gates	W-Security														
3.2.2: Outsource transportation of cash															
Action 3.3: Enhance security for TCA visitors														Radio communication with tourist facilities established by December 2008	
3.3.1: Liaise with tourism police to increase visitor safety	SW-TE/TW, W-security														
3.3.2: Increase tourism security patrols during high seasons	SW-TE/TW, W-security														

SECURITY PROGRAMME

Management Action and Activities	Persons responsible	Timeframe												Milestones	
		FY 2007-08				FY 2008-09				FY 2009-10					
		1	2	3	4	1	2	3	4	1	2	3	4		
3.3.3: Establish a communication link with tour operators	SW-TE/TW, W-security														
3.3.4: Establish radio communication with facilities that are not covered by mobile telephone networks	SW-TE/TW, W-security														
3.3.5: Establish a 24-hour hotline number for visitors and tour operators	SW-TE/TW, W-security														
3.3.6: Train security teams on terrorism and disaster preparedness	SW-TE/TW, W-security														

Protected Area Operations Programme

Programme Purpose

Protected area operations efficiently and effectively support the achievement of the TCA's purpose and the delivery of other TCA management programmes

Each of this management plan's five programmes sets out an ambitious set of goals that TCA management will be working towards achieving over the 10-year implementation period of this plan. This includes a number of key approaches, including: the expansion of tourism in remote areas and its regulation and management in currently highly used parts of the TCA; improving the efficiency, coverage and effectiveness of security operations; measures to improve relations with TCA adjacent communities and to improve their economic wellbeing; and steps to ensure that threats to the TCA's exceptional biodiversity are mitigated. All of this will take place in an increasingly complex socio-economic environment, as populations around the area continue to grow, tourism use is likely to continue increasing, and distant land uses, such as water extraction or deforestation in TCA catchment areas, intensify and increasingly impact on the ecological integrity of the area.

The implementation of this ambitious agenda is not straightforward, even in an area far less logistically challenging and expansive than the TCA. If this plan is to be successful, PA operations also need to be greatly strengthened in order to ensure that they are supporting the entirety of the plan's implementation, and providing a conducive and supportive working environment for TCA staff working under difficult conditions. This programme therefore focuses on addressing this through a number of objectives that have been developed in order to achieve the purpose set out above. These objectives include measures to enhance and formalise institutional collaboration between KWS and key stakeholders, measures to improve the motivation and capacity of TCA staff, and measures to improve the quality of management facilities and infrastructure that is essential for supporting TCA management in carrying out their duties.

Guiding principles

The guiding principles describe key factors taken into account in the development of the PA Operations Programme and that influence the way the programme is implemented in achieving the above programme purpose. The guiding principles are:

- ▶ **Strengthening partnerships with key stakeholders to ensure strong cooperation in achieving conservation and sustainable livelihood aims**
- ▶ **Investment in management systems and technology to support the management of the TCA at a world class standard**
- ▶ **Investment in people to ensure that TCA staff are well motivated and trained to carry out their duties**
- ▶ **Improving access to TCA entry points, and road networks within the TCA, to support the effective management of the area, and in particular the conservation of exceptional resource values and the delivery of the desired tourism product**

These guiding principles are briefly described and explained in the following paragraphs.

Strengthening partnerships with key stakeholders

A reoccurring theme throughout this plan is the establishment, or further development, of partnerships, cooperation and collaboration with stakeholders. This is also a major feature of the KWS Strategic Plan (2005 – 2010), where the fourth of the five strategic objectives is to “*Improve KWS’s linkages, recognition, and relationships with Stakeholders*”. This is especially important in the TCA where, due to its large size, thriving tourism industry, importance as a centre of ecological research, and the diversity of communities living around the area, there are an especially high number of stakeholders both impacting on and impacted by the conservation and management of the area. In addition, the TCA situation is further complicated by a number of internal stakeholders using various “enclaves” within the area (such as mining companies, tourism investors, and the prison service). Accordingly, and complementary to other efforts to improve KWS-stakeholder relations implemented throughout this plan, a major guiding principle of this programme is the establishment, strengthening and clarification of partnerships and cooperation with key stakeholders both inside and outside the TCA.

Investment in management systems and technology

The management of any protected area is highly dependent on the quality of the systems that are put in place to support PA operations. Due to a number of factors, such as the historical necessity to focus on anti-poaching operations and low levels of visitation to the area, many of which have now ameliorated, there are significant opportunities in the TCA for enhancing the area’s management through the implementation of new, or the improvement of existing, management and administrative systems. These opportunities cover a wide variety of issues, including the improvement of data management (for example through the establishment of security and human-wildlife conflict databases), and focusing the collection of information to inform adaptive management of the area. Technology has also advanced rapidly in recent years and many of these innovations have the potential to greatly enhance the management of the TCA. This includes, for example the provision of Internet access and email to all park headquarters, and the implementation of the new safari card system. Ecological and security management of the area can also benefit from new technological advances such as night vision equipment and portable GPS and data collection devices. As such, a key principle guiding the implementation of this programme is the focus on investment in management systems and technology that will support the management of the TCA at a world class standard.

Investment in people

An essential complement to investment in management systems and technology is investment in the people who are there to operate them, and who carry out the daily operations necessary for the effective management of the TCA. This is also a major feature under Objective 3 of the KWS Strategic Plan (2005 – 2010), which focuses on building institutional capacity through training and the improvement of staff incentives and rewards. In a difficult and isolated environment such as the TCA, such incentives, accompanied by the provision of essential facilities and amenities (such as education for staff children and recreational facilities) have an important role to play in maintaining staff morale, and as a result in enhancing their ability to carry out their assigned duties. Therefore, and in line with the KWS Strategic Plan, investment in TCA staff will be one of the key principles pursued throughout this programme.

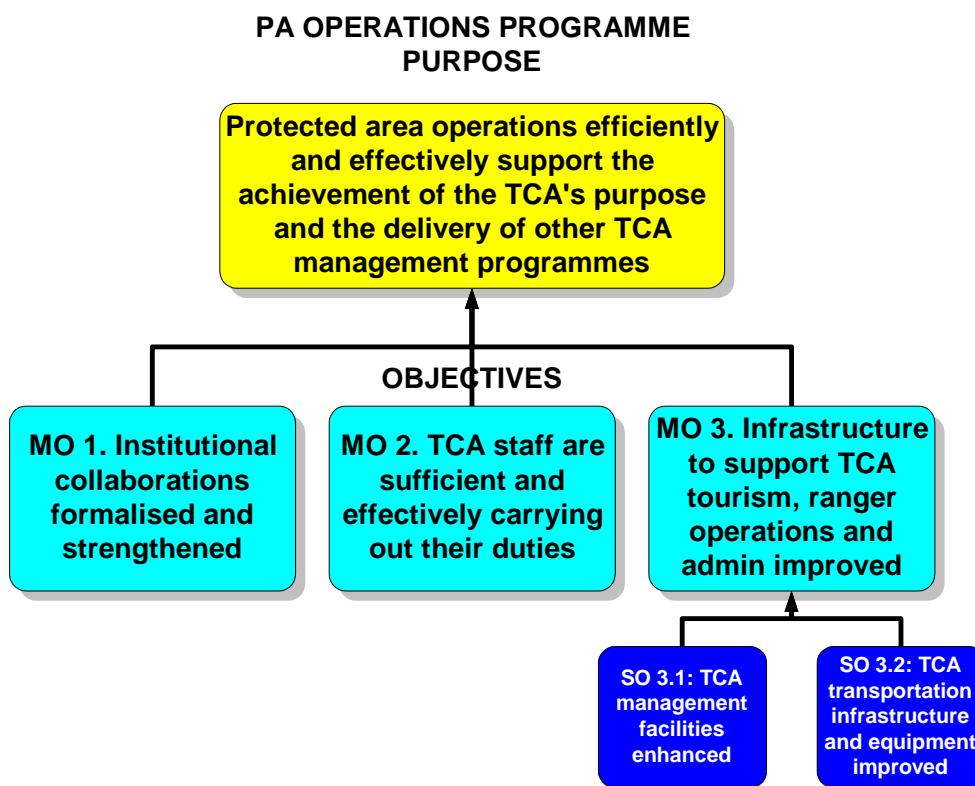
Improving access to the TCA and internal transportation infrastructure

In common with many protected areas in Kenya, the quality and location of roads within the TCA has become a major issue in recent years, especially during the wet season. A well-planned and quality road network within the TCA is essential if management is to be able to operate effectively, especially with regard to security operations, and if tourism investment and use is to be expanded from the current highly used and easily accessible areas. Of particular importance in this regard are crossings of key TCA rivers (many of which can currently only be traversed when water levels are low) and, due to the area's size, the maintenance of a strategically-located network of airstrips within the area. In addition, there is significant potential to enhance the road network in currently underutilised parts of the TCA (such as the northern part of TENP), and strengthening the road linkages with other protected areas, such as Amboseli National Park and Shimba Hills National Reserve. Lastly, there is an urgent need for the development of additional, carefully planned game and scenic viewing circuits in the TCA's high use areas, to relieve pressure on the existing roads in these areas that were often not designed for high visitor numbers, thereby improving the TCA visitor experience and mitigating environmental impacts of tourism. As such, a key principle guiding the implementation of this programme is that, wherever possible and appropriate, TCA management will strive to improve both access within and to the TCA.

Management objectives

Figure 28 below shows the overall objectives tree for the TCA PA Operations Programme.

Figure 28: PA Operations Programme objectives tree



Objective 1: Institutional collaborations formalised and strengthened

The TCA exists in a complex institutional environment and, if the management objectives for the area are to be successfully and efficiently achieved, there are a variety of institutions with which TCA management needs to either establish or strengthen existing relations and collaborations. These include a range of internal stakeholders, such as hotel and tour operators, stakeholders using enclaves inside the PAs (for example mining companies and the railway/road reserve authorities at Manyani), as well as a number of other stakeholders, including the six county councils that have jurisdiction over parts of the greater TCA landscape. In addition, if the management of South Kitui National Reserve is to be eventually integrated into the TCA, collaboration with the County Council of Mutomo needs to be formalised through the development of an MoU, and a management plan for the national reserve subsequently developed. As such, this objective has been developed to bring about the desired future state where KWS has constructive and supportive relations with key institutions impacting on and impacted by the management and conservation of the TCA. In order to achieve this aim, six management actions have been developed, which are elaborated in more detail below. Collaboration with TCA tourism industry stakeholders is dealt with separately under the Tourism Development & Management Programme.

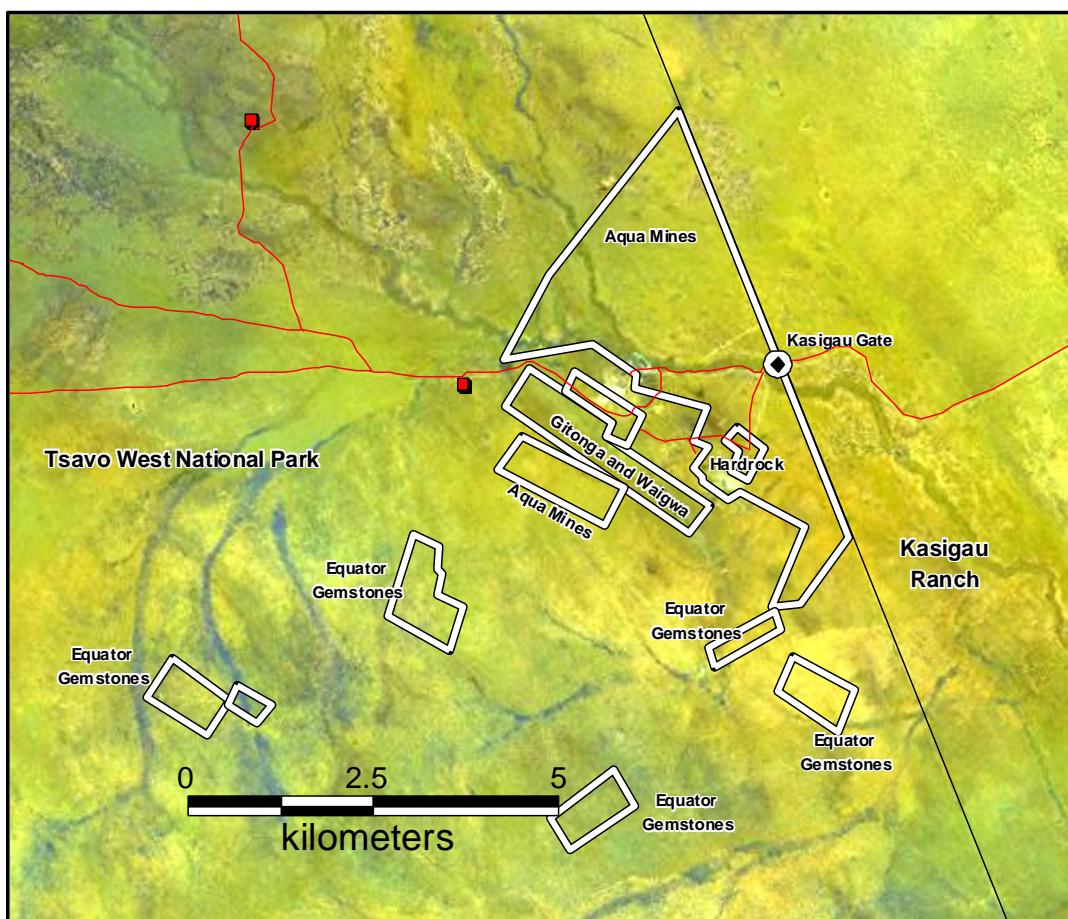
Action 1.1: Develop mechanisms to regulate activities and infrastructure in TCA enclaves

Due to historic circumstances, a number of “enclaves” exist within the TCA protected areas over which KWS has limited or no jurisdiction. These include a wide variety of areas, such as a road and railway reserve, mining concessions, and particular parts of the TCA that have a separate title deed. However, developments and activities in a number of these enclaves are now beginning to impact on the area’s ecological integrity or on the quality of the TCA tourism product. Developments of particular concern include the Maneaters Lodge development near the Tsavo Bridge, which KWS lacks the legal powers to control, and settlements at Manyani in the road and railway reserve, which are now developing into a small town. This reserve has also been settled by pastoralists between Ndi and McKinnon Road, who often utilise grazing and water inside TENP. In addition, a number of mining concessions have been developed in the Kasigau area of TWNP (see Figure 29 overpage). Unfortunately, many of these concessions are along the Mwatate River, which is one of the few sources of water available to wildlife in this very dry part of the TCA. This situation is further complicated as some of the concession holders have sub-leased their concessions to small-scale miners, which has made monitoring of mining activities difficult.

Although KWS does not have the legal rights to control activities in these and other enclaves within the TCA, it is able, through negotiation and awareness raising, to influence many ongoing activities and developments in these areas with the aim of ensuring that their impact on the TCA is minimised. To this end, one of the first steps TCA management will take is the initiation of formal, regular communication with managers of public infrastructure found within the TCA (including those responsible for power lines, oil and water pipelines, and roads and railways). On a broader level, TCA management will carry out a study on the legal status of land within, and access roads to, TCA enclaves, which will include recommendations for improving the regulation of activities taking place within these areas. This study will be implemented simultaneously with a review of the existing mining leases in the TCA, which will inform TCA management of any measures that can be taken to exert greater control over the activities taking place within the concessions, or to help mitigate their impact on the area’s environment and tourism product. In addition, TCA management will also liaise with the Ts-

vo railway and road reserve competent authority with regard to controlling the expansion of settlements at Manyani and at Tsavo Bridge (Maneaters).

Figure 29: Current mining concessions in TWNP



Action 1.2: Develop MoU with the County Council of Mutomo to integrate South Kitui National Reserve into the TCA

The South Kitui National Reserve (SKNR), located directly to the north of TENP, has the potential, if properly managed and administered, to provide an important extension of the TCA PA complex and to make a valuable contribution to the livelihoods of the communities under the jurisdiction of the County Council of Mutomo (CCM). However, at present the reserve is seriously impacted by a number of illegal activities, including logging, bushmeat poaching and livestock grazing, all of which need to be reduced, and security improved, if the area is to maximise both its conservation and tourism potential. As a first step towards achieving this goal, collaboration between KWS and the CCM will be strengthened through the development of an MoU that sets out the agreements and responsibilities of each party with regard to the SKNR's management. This agreement will address the key issues impacting on the collaborative management of the area, including, for example, the provision of security, infrastructure development, visitor traversing rights, and revenue sharing from any future tourism developments or visitation.

Action 1.3: Support development of a management plan for SKNR

Following on from the establishment of formal collaboration between KWS and CCM (through the MoU developed under the previous action), a management plan will be developed for the SKNR. Although addressing all aspects of reserve management, this plan will particularly focus on tourism development, including the establishment of prescriptions on the size, number and type of tourism accommodation facilities permitted in the area. These tourism prescriptions are essential to not only ensure that developments within the SKNR are compatible with those in the neighbouring Ithumba Low Use Zone, but also to demonstrate to the recently-established CMM the potential value of the SKNR for tourism, and as a result increase support for the area's conservation. The first stage in the development of the management plan will be a resource base inventory of the SKNR, including the identification of potential sites for tourism development. Once this has been completed, and in order to ensure that the plan developed is appropriate and up to the standards required, TCA management will continue to collaborate with representatives from CCM and provide ongoing support throughout the plan's development.

Action 1.4: Collaborate with the County Council of Mtito Andei to determine the future of Ngai Ndethya National Reserve

Since an announcement was made of its intended de-gazettlement some years ago, the Ngai Ndethya National Reserve has been severely encroached by settlement and farming activities. However, although the reserve has never been formally de-gazetted, following agreements with the County Council of Mtito Andei, some of the land immediately adjacent to the Mtito and Athi Rivers has been used for private residences and low-key nature-based enterprises. Alongside seeking a clarification of the reserve's status, TCA management will liaise with the County Council of Mtito Andei regarding the creation of a two kilometre buffer area that prohibits cultivation along the Mtito and Athi Rivers (between the Mtito junction and the northern boundary of the Ngai Ndethya National Reserve) in order to ensure that this area remains available and accessible to wildlife dispersing from the TCA.

Action 1.5: Participate in all District Development Committees and District Environment Committees and other relevant district level committees

Although covering an extremely large geographic area, the TCA is still heavily influenced by activities and developments that take place in the areas that surround it. However, linkages between TCA Management and the four districts⁵ that have jurisdiction over parts of the area have on occasion been inadequate, which may have weakened support for TCA management activities in and around the PAs. It is therefore important that KWS collaboration with district authorities be enhanced, both to help maximise the benefits from the TCA to the surrounding areas and district activities, and to ensure that other issues of mutual concern are addressed (such as security, community issues, or any proposed developments). TCA management will therefore participate in all District Development Committees and District Environment Committees, and other relevant district level committees as appropriate.

Action 1.6: Produce a booklet outlining all TCA rules and regulations

There are a broad range of policies, guidelines, rules and regulations that govern management and other activities taking place within the TCA. In addition, a number of new rules

⁵ Kitui, Taita Taveta, Tana River, and Makueni

and regulations will be developed under this management plan covering a variety of issues, such as specific visitor activities, operation of accommodation facilities, protocols for independent scientific researchers, etc. However, at present the existing rules and regulations are not currently available in a single consolidated document, and in some cases broader national level guidelines or policies may need refining to better fit the TCA context. Accordingly, under this action TCA management will undertake a review of all TCA guidelines, rules and regulations, and any relevant KWS or national policies, which will then be refined and incorporated into a consolidated booklet that is available as a reference for both managers and users of the area. This booklet will incorporate a number of outputs from actions under other programmes in this plan, including Actions 1.1.1 and 3.1 of the Tourism Programme (covering game-viewing regulations and accommodation facility operation) and Actions 2.4 and 4.4 of the Ecology Programme (covering regulations on the development of artificial water sources and rules for external researchers).

Objective 2: TCA staff are effectively and effectively carrying out their duties

Although the TCA's relative isolation and wilderness characteristics are a key attraction for many visitors to the area, as a place of work it can be a difficult environment that presents many challenges for the area's staff. The provision of adequate welfare and recreational facilities, good housing and working conditions, and suitable schooling for children can make significant contributions to enhancing staff morale, and to improving staff motivation to carry out assigned duties. In addition, although the parks in the TCA currently have over 600 staff, additional staff will be needed to ensure the successful implementation of this plan, and that existing staff are not overburdened with excessive workloads. As such, this objective has been formulated to help ensure that TCA staff are well motivated, well trained and sufficient in number to effectively carry out their duties. In order to achieve this objective, a number of management actions have been developed that focus on addressing shortfalls in the TCA staff establishment and identifying training needs of current staff, and improving a variety of staff facilities and amenities in the TCA. These actions are set out in more detail below.

Action 2.1: Enhance TCA human resource capacity

Currently the TCA has over 600 staff split between the three national parks, the vast majority of which are security personnel. However, this number is currently insufficient to ensure the effective management of the entire area, and in particular to prevent illegal activities in the more remote parts of the TCA. Furthermore, the implementation of the management actions set out in this management plan, combined with the rolling out of KWS Sectoral Management Strategy for Conservation Areas across the TCA (described in more detail under the Zonation Scheme), will substantially increase the number of staff needed in the area over the next 10-years. Therefore, to help address any current and likely future deficiencies in human resources, TCA management will carry out an assessment of TCA optimum staffing levels, and prepare recommendations on the additional staff needed for the area. These recommendations will then be submitted to KWS HQ Human Resources, and potential strategies for addressing priority TCA human resource needs discussed. (A provisional assessment carried out during the development of this management plan is presented in Annex 2.)

In addition, the provision of sufficient and relevant training is also vital for improving the capacity of personnel deployed to the TCA. This is not only important for improving their overall ability to carry out their assigned duties, but also for improving staff morale and opportunities for career advancement. In order to address this issue, a training needs assessment will

therefore also be carried out across all TCA sections, and areas where additional training is most needed and will add maximum value to the area's management identified. Once this has been completed priority *in situ* and *ex situ* training will then be carried out according to the assessment's recommendations.

Action 2.2: Construct and rehabilitate staff houses

The main staff accommodation facilities in the TCA are currently located in the three park HQs at Voi, Kamboyo, and Kithasyu. Although, the recently concluded park branding saw many staff houses at TCA park headquarters rehabilitated, and some fitted with electricity, the overall number of staff houses in the TCA remains insufficient, and most staff, especially the lower cadres, have to share houses. In addition, many of the houses that do exist are in a poor state of repair, and many have asbestos roofing that needs to be replaced with appropriate non-toxic roofing materials. This situation, which is already impacting staff morale, will become increasingly severe if the increases in staff establishment determined under Action 2.1 are implemented and more staff are deployed to the area. In response, TCA management will undertake an assessment of the construction and rehabilitation needs for staff housing for all three of the area's PAs. Once this has been determined, construction will then proceed in accordance with the needs defined, overseen by the Works Superintendent. Preliminary recommendations on addition houses needed at new sector HQs and operations bases are included in Table 32 under Action 3.1.3 below.

Action 2.3: Improve schooling facilities for TCA staff

TCA staff currently face serious difficulties in organising adequate schooling for their children. This is primarily due to the remoteness of some of the TCA bases, which in some cases, such as Ithumba, can be up to 25 km from the nearest school. This situation is clearly far from ideal and through this action, TCA management will implement measures to improve the educational opportunities for TCA staff families. An immediate priority will be the establishment of boarding school facilities for TCA staff, especially for those located at remote stations. Two ways of addressing this need are proposed. Firstly, an existing day primarily school will be identified that is suitable for upgrading to a boarding school that TCA staff children, and potentially other children from remote community areas, can attend. If a suitable school is identified, TCA management will then provide support for the construction of dormitory facilities. Alternatively, and subject to available resources, TCA management will investigate the option of constructing a new boarding school in a strategic location around the TCA. Both options will require extensive consultation and collaboration with the relevant district education authority to ensure that once established, such facilities are appropriately maintained and adequately staffed. In addition, wherever possible, TCA management will provide support to existing schools that TCA staff children are using, through, for example, the provision of text books or supporting teachers' salaries.

Action 2.4: Improve canteen facilities at key TCA administration centres

TCA management has already taken steps to improve staff facilities and amenities at the three TCA park headquarters and at some operational bases, by establishing canteens and equipping them with basic recreational facilities such as satellite TV and pool tables. This approach has had positive impacts on staff morale, and will therefore be extended to a number of other administrative centres throughout the area. In addition, to ensure that discipline and alertness is maintained at all times, especially with the uniformed cadre, standing orders and a code of conduct will be developed that will be applicable to all canteens. These orders

will also support the management of the canteens by making provisions to ensure that they are well maintained, and that lending systems are not abused.

Action 2.5: Establish sports fields at HQs and operation bases

KWS has recognised sports as an important recreational activity for boosting staff morale, and has introduced sports competitions between the seven regional Wildlife Conservation Areas. Within the TCA, participation in these activities has helped to enhance teamwork and to relieve stress, particularly for staff based in the more remote parts of TCA. Therefore, suitable sites for sport fields will be identified and subsequently developed at operational bases, and park/sector HQs across the TCA.

Action 2.6: Establish a reward system for staff

A system for recognising and rewarding staff that show exceptional and outstanding performance can go a long way towards boosting morale and enhancing innovation and creativity. Although there is already a KWS-wide system, this has not been overly effective in the TCA, and under this management action a tailor-made reward scheme will be established to better fit the TCA context. This will involve the initial development of criteria for selecting outstanding TCA staff, and establishing appropriate rewards. Following on from the establishment of these criteria, annual ceremonies will be held where the staff selected are recognised and rewarded accordingly.

Action 2.7: Strengthen internal collaboration between TCA protected area managers

The interconnected nature of the three PAs that make up the conservation area, particularly with regard to security, ecological and tourism issues, necessitates a high degree of collaboration between the managers responsible for each park. The need for collaboration will further increase during the implementation period of this management plan, which includes a number of actions that will be simultaneously implemented across two or more of the TCA PAs. Regular meetings will therefore be held, chaired by the AD-TCA, between the three parks' senior management to ensure that management plan implementation is proceeding in a coordinated and coherent manner, and to address other issues of mutual concern.

Objective 3: Infrastructure to support TCA tourism, ranger operations and administration improved

Management of the TCA has traditionally focused on the high use areas in TENP and TWNP, and as a result the vast majority of the PA management infrastructure and facilities are located in these areas. However, even in these priority areas, park headquarters and staff accommodation has not kept pace with technological developments (particularly regarding Internet and email access) or with increases in staff numbers. In addition, especially in the more remote areas of the TCA, transportation infrastructure and equipment have often been in a poor condition or lacking, which has contributed to the difficulties associated with managing these areas effectively and has hampered the development of tourism. As such, in addition to the sectoral approach to management being implemented in the TCA which will

help distribute management resources more equitably throughout the area, this objective has been developed to bring about the desired future state where TCA staff are supported by sufficient and well maintained infrastructure, equipment and management facilities. In order to achieve this objective two sub-objectives have been formulated that focus on enhancing TCA management facilities and improving transportation equipment and infrastructure. These sub-objectives and their subsidiary management actions are elaborated in more detail in the following sections.

Sub-objective 3.1: TCA management facilities enhanced

Sufficient, well-maintained and modern management facilities and systems are an important ingredient in enabling effective and efficient PA operations. For the TCA, this not only includes the park headquarters at Voi, Kamboyo and Kithasyu, but also, and increasingly, a number of other facilities such as sector headquarters and community-wildlife service posts amongst others. In addition, and of particular importance in this regard, are the systems and infrastructure required for the effective processing and management of visitors, including entrance gates and the new safari card system. However, due in part to the long history of management in the area, dating back 60 years, many of the existing management facilities are now old and outdated, and in some cases are in serious need of upgrading and repair. This sub-objective has therefore been developed to ensure that these issues are addressed and that TCA management facilities are sufficient and of adequate standard to ensure that managers and staff can carry out their duties effectively. Seven management actions have been formulated, described below.

Action 3.1.1: Upgrade existing TENP, TWNP and CHNP headquarters

Despite the recent brandings that have taken place in TENP and TWNP, which resulted in significant improvements in facilities and infrastructure, all three of the TCA parks' headquarters remain in need of further upgrading. Of these, TENP HQ at Voi has already been significantly upgraded, and only additional office space is needed (along with addition houses for senior staff, which is dealt with under Action 2.2 above). However, both the TWNP and CHNP HQs need to be connected to reliable electricity and water supplies, and also require new offices and additional staff housing (also covered under Action 2.2 above). In addition, the mechanical workshops at TENP and TWNP HQs are also in need of upgrading, along with the TCA telecommunication workshop at Voi. In order to bring about these improvements, area management will first identify the specific needs of each park HQ, and then proceed to develop a construction timeframe, bill of works and budget, in collaboration with KWS civil works specialists. If appropriate, a tender process for carrying out the improvements will then be undertaken, and the most appropriate company selected. The Senior Wardens from each park will oversee the works and ensure that they proceed in line with the specifications and to the standards required, with assistance from the Works Superintendent.

Action 3.1.2: Construct TCA headquarters at the Voi Community Wildlife Service station

The TCA headquarters is currently housed in cramped offices with inadequate facilities at the TENP HQ at Voi. In order to improve the overall administration and management of the area, the TCA HQ will in future be moved to new premises alongside the Voi CWS Station. As per Action 3.1.1 above, this will involve initial liaison with KWS HQ and civil works specialists to develop office designs and architectural plans, and the subsequent preparation of a construction timeframe, bill of works and accompanying budget. A tender process for the construction of the new conservation area HQ will then be carried out, and the most suitable

company selected. The AD-TCA will then oversee construction, and ensure it proceeds in line with the agreed specifications.

Action 3.1.3: Construct or enhance TCA sector sub-headquarters and operational bases

The implementation of the KWS Sectoral Management Strategy for Conservation Areas in the TCA will increase management presence and infrastructure development across the entire area, and will involve the decentralisation of the area's management to six management sectors, each administered from a sector HQ (described in more detail under the Zonation Scheme). This decentralisation of the area's management will however involve a significant expansion in the management infrastructure needed in each sector, most notably through the construction or upgrading of facilities that can serve as sector HQs, and increasing or upgrading the number of operational bases. Table 32 below, presents a summary of the improvements or upgrades needed at sector HQs and selected operational bases.

Table 32: Improvements or upgrades needed at sector HQs and selected operational bases

Sector HQs/operational bases	Identified improvements/upgrades needed
Ithumba Sector HQ	Rehabilitation needed, including re-roofing
Emusaya Sector HQ	To be established at Galana/Sala, including a borehole, new ranger units, staff canteen, and office facilities
Jipe Sector HQ	Upgrade needed, including water supply, office facilities and staff houses
Kasigau Operational Base	Upgrade needed, including four new ranger houses and improved water supply
Dakota Operational Base	Upgrade needed, including 15 new ranger units, and a new borehole
Rhino Operational Base	Upgrade needed, including 15 new ranger units
Emusaya Operational Base	To be moved from Thabagunji to Sangayaya, new uniports and a borehole needed
Ziwani Operational Base	Upgrade needed, including a new borehole and four new ranger houses
Kanjaro Operational Base	Upgrade needed, specifically a borehole or other water supply

As the details in the table show, a significant amount of additional infrastructure is needed in the TCA if the sectoral management strategy is to be implemented effectively. The priorities in this regard include the upgrading and completion of the Ithumba and Jipe Sector HQs, and the development of a new sector HQ for the Emusaya area. As described under the actions above, this will involve the initial identification of the works needed, and the subsequent development of architectural plans, bill of works, and budgets, which will be followed by a tendering process for the new developments and upgrades (in line with the process described under Action 3.1.2 above). Once the tendering process is completed the park or sector warden, as appropriate, will oversee construction.

Action 3.1.4: Redesign and improve the gate system

As shown in Figure 30 overpage, there are twelve official entrance gates to the TCA. However, there are certain parts of the area, such as CHNP and the Ithumba area of TENP, which are not well served by the existing gates and where administrative centres currently have to fulfil this role. In addition, a number of other gates to the area are not standard KWS design, or are not aligned with the TCA boundary. As a result, and in order to rectify these

issues, a number of improvements will be carried out to the TCA gate system over the implementation period of this plan. Initially this will involve moving the Voi Gate to the boundary of the park, establishing a gate to serve the new Maneaters Lodge, and remodelling the main Mtito Gate so as it is compatible with the existing information centre and shop. Following on from these initial improvements, TCA management will identify other priority gates that need developing or upgrading, and liaise with KWS HQ regarding gate designs and the development of a construction timeframe, bill of works and budget. Once completed, a tendering process will be carried out, and the construction programme subsequently initiated. An initial summary of the steps needed to improve the TCA gate system is set out below in Table 33.

Figure 30: Existing TCA entrance gates

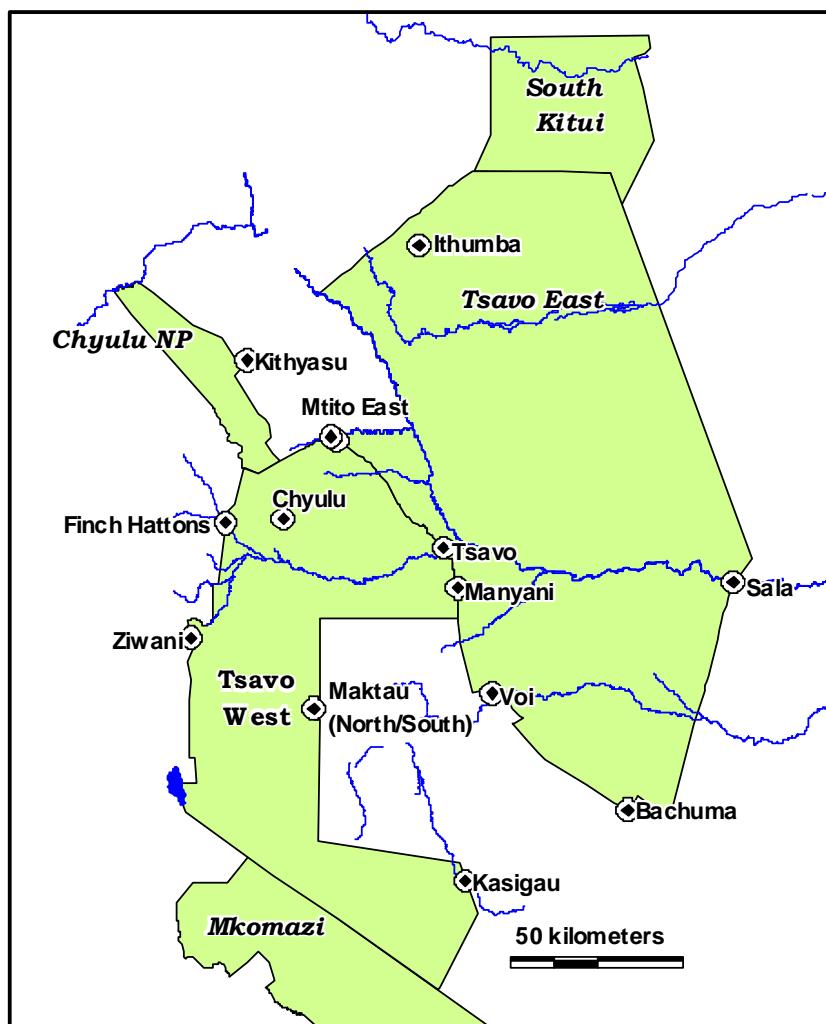


Table 33: Proposed improvements to the TCA gate system

- | | |
|-------------------------------------|---------------------------------|
| ► Move Voi Gate to boundary of TENP | ► Establish Kikunduku Gate |
| ► Establish Maneaters Gate to TENP | ► Establish Manyani Prison Gate |
| ► Remodel Mtito Andei Gate | ► Establish Kasalla Gate |
| ► Redevelop Jipe and Chyulu Gates | ► Upgrade Kasigau Gate |
| ► Establish Kithasyu Gate | ► Upgrade Salla Gate |
| ► Establish Utu Gate | |

Action 3.1.5: Demarcate the TCA boundaries

The high level of illegal activities that are currently taking place within the TCA can, in some areas, be partly attributed to unclear or unmarked boundaries between the TCA and adjacent community land; as is the case along the western boundary of Chyulu Hills NP and other parts of Tsavo West. Arresting local residents for unintentional illegal activities within the TCA has on occasion undermined KWS' efforts to form positive relations and collaborations with local community members, and has increased conflicts and misunderstandings between TCA management and the communities that live around the area. To eliminate this ambiguity, and help reduce illegal activities in the TCA, the area's boundary will be demarcated, cleared and marked where appropriate so that local residents can be in no doubt when they are entering the protected area.

Action 3.1.6: Implement new safari card system

KWS is in the process of developing a new revenue management system called the "safari card". The new system is designed to reduce revenue leakages through fraud, enhance the ease of revenue collection and management, and provide accurate and timely information for visitor management. If properly implemented and managed, the new system not only has the potential to streamline and improve revenue collection over the entire TCA, but can also provide a substantial amount of reliable and accurate information on tourism use patterns, which can then be used to inform the adaptive management of the area. As a first step in supporting the implementation of this system in the TCA, area management will liaise with the ICT Department to ensure that the new system is installed at all points of entry (including any new gates developed under Action 3.1.4 above). Once this is complete, all relevant officers will be trained in the new system's operation to ensure that the system is operating effectively at all entrance gates and that the visitor information generated is contributing to the TCA's management.

Action 3.1.7: Procure other critical management equipment

Alongside the construction and upgrading of the various management facilities necessary for the effective management of the TCA (as set out in the previous actions), additional specific equipment is needed to enable management to make best use of the existing, and any new or improved facilities. Potentially the most important equipment in this regard is the installation of VSAT Internet connections. Currently only the office of the AD-TCA has an Internet connection, and under this management action, this will be extended to all major administrative centres across the area. In addition, both generators to ensure that electricity supply is not interrupted and fire fighting equipment to ensure staff are ready to deal with any incidents that may occur, will be provided to all PA and Sector HQs.

Sub-objective 3.2: TCA transportation infrastructure and equipment improved

In addition to management facilities, another key ingredient for ensuring effective and efficient PA operations is reliable and sufficient transportation infrastructure and equipment. This issue is of particular concern in the TCA, where the area's unique geography, and in particular the rivers that bisect the area, make access to parts of the area extremely difficult or impossible for significant parts of the year, especially during and after heavy rains. As such, this sub-objective has been developed to ensure that TCA management is suitably equipped and supported by adequate and appropriate transportation infrastructure. In order to achieve this

objective, four management actions have been developed that focus on improving specific roads and river crossings in the area, improving road links to the TCA, developing additional airstrips, and procuring vital plant and transportation equipment. These actions are elaborated in more detail below.

Action 3.2.1: Implement TCA Roads, Bridges and Supplemented Water Plan

Most of the TCA road network was established at a time when there was very little tourism in the area, and when management was primarily focused on security operations rather than tourism use. As a result, many of the TCA's roads are not well placed or optimally designed to support wildlife viewing, or to encourage the dispersal of visitor use within the area. In addition, visitor use in the area's low use and wilderness zones is further undermined by a lack of permanent river crossings, which can make accessing these areas extremely difficult. In response to this issue, TCA management have developed a preliminary Roads, Bridges and Supplemented Water Plan, which sets out the location of new roads needed to reconcile the existing road network, proposes the location of bridges to be developed over the area's major rivers, and identifies locations for new supplemented water sources. These proposed developments are illustrated in detail in Figures 31-37 in Annex 3, and set out an ambitious plan for road development in the TCA, with particular focus on the area's low use and wilderness zones. Of particular importance in this regard are the proposed developments of bridges across the Gallana, Athi, Tiva, and Tsavo Rivers.

In addition to the development and improvement of roads as set out in the Roads, Bridges and Supplemented Water Plan, which is designed to primarily support the expansion of tourism and security operations, the road from Voi to TENP HQ will also be carpeted up to the park gate. Although involving a substantial initial capital cost, it is anticipated that this expenditure will be recovered relatively quickly, as, due to its heavy use as the main point of entry into the TCA, this road currently requires grading about once per month and costs over three million shillings to maintain per year. **No roads within the TCA itself will be carpeted**, as this is incompatible with the visitor experience that KWS is striving to develop and maintain in the TCA, and will increase traffic and traffic speeds through the parks, thereby endangering wildlife and sensitive habitats alike. This is particularly important with regard to the road from Sala Gate to Manyani Gate, which passes through the TENP's prime wildlife and tourism area.

Action 3.2.2: Enhance road links between TCA and surrounding areas

One of the major factors currently undermining the dispersal of visitor use over the entire TCA, and the efficiency of security operations around the area, is the limited road links connecting the area's entrance points with external centres and transportation hubs. At present the vast majority of visitors enter the TCA from gates located along the main Nairobi-Mombasa highway, and the Sala Gate in TENP, which is well connected to Malindi. This creates a concentration of visitors around these entrance points, and leaves much of the TCA unused by the majority of visitors to the area.

Through this management action, TCA management will implement measures to improve road access to the TCA, with a particular focus on enhancing access to the area's low use and wilderness zones. This will involve the initial rehabilitation of the Mbirikani to Chyulu II road, as set out in the TCA Roads, Bridges and Supplemented Water Plan (see Figure 37 Annex 3), which will both improve linkages between the Chyulu and Amboseli National Parks and enhance security operations combating livestock encroachment in this area. In addition, TCA management will also liaise with the Ministry of Public Works regarding the development of roads linking southern TWNP to the coast, with the aim of developing a circuit linking

TWNP and Shimba Hills National Reserve, and concerning the development of the existing track connecting Mwingi National Reserve to South Kitui National Reserve, therefore eventually establishing a circuit connecting the Meru Conservation Area to the TCA, and eventually the coast.

Action 3.2.3: Maintain and construct airstrips in strategic locations

The TCA is currently well served by airstrips, with at least 54 located in and around the protected areas. However, not all of these are currently operational or in a good state of repair, and additional or upgraded airstrips are needed in some parts of the area to ensure effective security coverage and to enhance visitor use. In this regard, the Voi airstrip, which is well located in the heart of the TCA close to both TCA and TENP HQs, will be carpeted to ensure that it can accommodate anticipated increases in use during the lifespan of this management plan. New airstrips will also be developed at Mzima Springs and at Kithasyo, with the aim of enhancing the management and development of tourism in these areas.

Action 3.2.4: Procure transportation and plant equipment

The size of the TCA often necessitates a significant amount of staff travel within the area, which places a heavy burden on the vehicles available. In most cases, priority allocation is given to security staff, especially if there is an ongoing operation, and in the past this has severely handicapped the operations of other TCA sections, in particular finance and administration. In addition, there are currently only two buses in the TCA, which are intended to provide transport for staff and to support education activities, such as tours of the area for local school children. This number is insufficient and has led to the cancellation of field trips for organised groups, which has undermined one of the primary functions of the Education Division. In order to address these issues, TCA management will liaise with KWS regarding the provision of two vehicles to support finance and administration offices and five new buses (three in TENP: two shuttles for education purposes, and one for administration purposes; and two in TWNP: one for education purposes and the other for administration).

The other major equipment shortage hampering the effectiveness of TCA management is heavy plant needed to develop and maintain the road network and other essential services. Currently the TCA has to rely on KWS HQ for the provision of some essential heavy plant, which has the potential of seriously delaying work. For example, because KWS has only one low-loader for transporting tracked bulldozers and mechanical shovels, which currently serves all the protected areas in the country, it can take weeks before the loader is available, grounding road works in the meanwhile. The TCA also has to share an exhauster with other parks, although it can sometimes be needed as often as twice per week. In addition, a variety of other new or replacement equipment is needed as much of the existing equipment dates from the early 1990s, and is no longer fully functional. As such, TCA management will also take steps to procure a wheel shovel, tippers and graders during the plan implementation period, to ensure that road upgrades can continue according to schedule and without unavoidable interruption.

Three Year Activity Plan

The following pages set out the first 3-Year Activity Plan for the Protected Area Operations Programme. The activity plan details the activities, responsibilities, and timeframe for the delivery of each management action over the first 3-year timeframe of this management plan. In addition, that plan sets out specific and timebound “milestones” that TCA management aims to achieve in implementing the plan.

Management Action and Activities	Persons responsible	Timeframe												Milestones		
		FY 2007-08				FY 2008-09				FY 2009-10						
		1	2	3	4	1	2	3	4	1	2	3	4			
Objective 1: Institutional collaborations formalised and strengthened																
Action 1.1: Develop mechanisms to regulate activities and infrastructure in TCA enclaves																
1.1.1: Establish regular communication mechanism with managers of public infrastructure within the TCA														Legal status of TCA enclaves and mining activities established by June 2008		
1.1.1.1: Carry out study on the legal status of land and access roads in TCA enclaves, including recommendations for improving regulation of activities	AD-TCA, H-Lands, SW-TE, SW-TW															
1.1.2: Review existing mining leases	AD-TCA, H-Lands, SW-TE, SW-TW															
1.1.3: Implement measures to enhance regulation of human activities in TCA enclaves, including mining, based on legal study recommendations																
1.1.4: Liaise with railways and road reserve competent authority in controlling the expansion of settlements at Manyani and Tsavo River (Maneaters)	AD-TCA, H-Lands															
Action 1.2: Develop MoU with the County Council of Mutomo to integrate South Kitui National Reserve into the TCA																
1.2.1: Organise consultative meetings on SKNR	SW-TE, W-Ithumba													MoU KWS-CCM signed by September 2009		
1.2.2: Develop draft MoU based on similar MoUs with other county councils, e.g. Isiolo and Mwingi CCs in the Meru CA	SW-TE, W-Ithumba															

Management Action and Activities	Persons responsible	Timeframe								Milestones	
		FY 2007-08				FY 2008-09					
		1	2	3	4	1	2	3	4		
1.2.3: Negotiate provisions of MoU and commitments of the signing parties with CCM leaders	SW-TE, W-Ithumba							■	■		
1.2.4: Holding MoU signing ceremony	Director KWS, AD-TCA, SW-TE, W-Ithumba								■		
Action 1.3: Support development of a management plan for SKNR											
1.3.1: Carry out a resource inventory of SKNR	SRS-TCA, SW-TE,						■	■			
1.3.2: Identify tourism development sites in SKNR	WT, SRS-TCA						■				
1.3.3: Collaborate with Mutomo County Council in the development of a management plan for SKNR	SRS-TCA, SW-TE,						■	■	■	■	
Action 1.4: Collaborate with Mtito Andei County Council to determine the future of Ngai Ndethya National Reserve											
1.4.1: Organise consultative meetings with MCC on the future of NNNR	SW-TE				■	■	■	■			
Action 1.5: Participate in all District Development Committees and District Environment Committees and other relevant district level committees											
1.5.1: Attend all District administration meetings	SW-CWS, W-security			■	■	■	■	■	■		
Action 1.6: Produce a booklet outlining all TCA rules and regulations											
1.6.1: Collect and review all TCA rules and regulations (e.g. game viewing regulations, accommodation facility operating procedures, research protocol, artificial water source development)											
1.6.2: Review all KWS and national policies and identify relevant sections for inclusion in the new booklet											
1.6.3: Identify potential inconsistencies or changes needed in KWS policy or TCA regulations and liaise with AD-TCA or KWS HQ regarding revision, as appropriate											
1.6.4: Consolidate all rules and regulations, along with relevant policy statements into the booklet											
1.6.5: Liaise with KWS HQ regarding printing/production of new booklet											
Objective 2: TCA staff are effectively and efficiently carrying out their duties											

PA OPERATIONS PROGRAMME

Management Action and Activities	Persons responsible	Timeframe								Milestones			
		FY 2007-08				FY 2008-09							
		1	2	3	4	1	2	3	4	1	2	3	4
Action 2.1: Enhance TCA human resource capacity												Optimum staffing report prepared by June 2008.	
2.1.1: Carry out an assessment of TCA optimum staffing levels and prepare recommendations	AD-TCA, SW-TE, SW-TW, KWS HQ HR												
2.1.2: Liasse with KWS HQ Human Resources to seek ways of addressing TCA priority HR needs	AD-TCA, SW-TE, SW-TW, KWS HQ HR											Training needs assessment report prepared by December 2008	
2.1.3: Carry out a training needs assessment study for the TCA	AD-TCA, SW-TE, SW-TW, KWS HQ HR												
2.1.4: Carry out in situ and ex situ training according to study recommendations	AD-TCA, SW-TE, SW-TW, KWS HQ HR												
Action 2.2: Construct and rehabilitate staff houses												Staff houses rehabilitated by June 2010	
2.2.1: Assess construction and rehabilitation needs for the entire TCA	WS, H-IDM												
2.2.2: Construct new houses and rehabilitate existing ones as per recommendations from Activity 2.3.1	WS, H-IDM												
Action 2.3: Improve schooling facilities for TCA staff													
2.3.1: Identify a day primary school at TCA that can be upgraded to a boarding school	WE												
2.3.2: Support existing schools so that TCA staff can attend	AD-TCA, WE												
2.3.3: Construct a new boarding school within TCA	AD-TCA, WE												
Action 2.4: Improve canteen facilities at key TCA administration centres												Staff canteens established at key administration centres by June 2010	
2.4.1: Develop construction timeframe, bill of works and budget for new canteen construction and refurbishment in collaboration with the civil works office.	SW-TE, SW-TW, W-CHNP												
2.4.2: Construct canteens at Ithumba, Sangayaya, Rhino base, Voi, CWS, Jipe, Kanjaro, Ziwaya, Rhino sanctuary, Kamboyo, Chyulu II, Mukururo, and Kithasyo	SW-TE, SW-TW, W-CHNP												
2.4.3: Develop standing orders for canteens	W-Security												
Action 2.5: Establish sports fields at HQs and operation bases												New Sports fields established by	

Management Action and Activities	Persons responsible	Timeframe												Milestones	
		FY 2007-08				FY 2008-09				FY 2009-10					
		1	2	3	4	1	2	3	4	1	2	3	4		
2.5.1: Identify suitable sites for sport fields	SW-TE, SW-TW			■										December 2008	
2.5.2: Clear the sport fields and provide essential facilities	SW-TE, SW-TW				■	■	■								
Action 2.6: Establish a reward system for staff														A reward mechanism established by June 2010	
2.6.1: Develop criteria for rewarding staff at the TCA level	SW-TE, SW-TW										■				
2.6.2: Select outstanding staff annually and reward them													■		
Action 2.7: Strengthen collaboration between TCA protected area managers															
2.7.1: Hold regular meetings of senior TCA managers	AD-TCA				■	■	■	■	■	■	■	■	■		
Objective 3: Infrastructure to support TCA tourism, ranger operations and administration improved															
Sub-objective 3.1: TCA management facilities enhanced															
Action 3.1.1: Upgrade existing TENP, TWNP and CHNP headquarters												Upgrading of Voi and Kamboyo HQs completed by June 2010			
3.1.1.1: Develop construction timeframe, bill of works and budget in collaboration with the civil works office.	SW-TE, SW-TW, W-CHNP				■	■									
3.1.1.2: Develop tender documents as appropriate and undertake tender process in collaboration with KWS HQ	SW-TE, SW-TW, W-CHNP					■	■								
3.1.1.3: Supply electricity to houses at TWNP and CHNP headquarters	SW-TE, SW-TW, CW-Suprt							■	■						
3.1.1.4: Construct new office accommodation at TENP, TWNP and CHNP headquarters	SW-TE, SW-TW, CW-Suprt									■	■				
3.1.1.5: Construct new staff houses at Voi and Ithumba headquarters and Dakota operational base	SW-TE, SW-TW, CW-Suprt									■	■	■			
Action 3.1.2: Construct TCA headquarters at the Voi Community Wildlife Service station												TCA headquarters constructed by December 2009			
3.1.2.1: Liaise with KWS HQ and the civil works office. to develop office designs and architectural plans	AD-TCA				■	■									
3.1.2.2: Develop construction timeframe, bill of works and budget in collaboration with the civil works office.	AD-TCA					■	■								
3.1.2.3: Liaise with KWS HQ for allocation of funds for construction of the headquarters	AD-TCA							■	■						
3.1.2.4: Develop tender documents and undertake tender process in collaboration with KWS HQ	AD-TCA							■	■						

PA OPERATIONS PROGRAMME

Management Action and Activities	Persons responsible	Timeframe												Milestones	
		FY 2007-08				FY 2008-09				FY 2009-10					
		1	2	3	4	1	2	3	4	1	2	3	4		
3.1.2.5: Supervise construction work	AD-TCA									■	■	■			
Action 3.1.3: Construct or enhance TCA sector sub-headquarters and operational bases														Sector sub-headquarters constructed by December 2009	
3.1.3.1: Develop architectural plans, bill of works, budgets, tender documents etc for new works linked to Action 3.1.2						■	■	■	■						
3.1.3.2: Supervise construction of new Emusaya sector sub-headquarters	SW-TE, WS									■	■	■			
3.1.3.3: Construct Sub-headquarters in Jipe and Ithumba sectors	SW-TW, WS									■	■	■			
Action 3.1.4: Redesign and improve the gate system														Voi gate relocated and Maneaters Gate constructed by December 2008	
3.1.4.1: Establish Maneaters Gate to Tsavo East	SW-TE, WS					■	■								
3.1.4.2: Move Voi Gate to boundary of TENP	SW-TE, WS						■	■							
3.1.4.3: Remodel Mtito Andei Gate	SW-TW, WS														
3.1.4.4: Liaise with KWS HQ and the civil works office. to develop gate designs and architectural plans	SW-TW, SW-TE, W-CHNP, WS			■	■										
3.1.4.5: Develop gate construction timeframe, bill of works and budget in collaboration with the civil works office.	SW-TW, SW-TE, W-CHNP, WS				■	■									
3.1.4.6: Liaise with KWS HQ for allocation of funds for construction of priority gates	SW-TW, SW-TE, W-CHNP, WS					■	■								
3.1.4.7: Develop tender documents and undertake tender process in collaboration with KWS HQ	SW-TW, SW-TE, W-CHNP, WS						■	■							
3.1.4.8: Supervise gate construction programme	SW-TW, SW-TE, W-CHNP, WS								■	■	■	■			
Action 3.1.5: Demarcate the TCA boundaries														Boundaries surveyed and demarcated by December 2009	
3.1.5.1: Collaborate with KWS HQ Lands Section to survey and demarcate PA boundaries	AD-TCA, SW-TW, SW-TE, W-CHNP								■	■	■	■			
Action 3.1.6: Implement new Safari Card system														TCA staff trained in use of the safari card system by June 2008	
3.1.6.1: Liaise with ICT department to ensure the new Safari Card system is installed in all gates	SW-TE, SW-TW				■	■									
3.1.6.2: Train all officers in TCA in the operation of Safari Card system	SW-TE, SW-TW, H-ICT					■	■								
Action 3.1.7: Provide other critical management equipment														Generators provide to all TCA centres by June 2009	
3.1.7.1: Liaise with ICT to fast-track installation of V-Sat	SW-TE, SW-TW					■									

Management Action and Activities	Persons responsible	Timeframe								Milestones	
		FY 2007-08				FY 2008-09					
		1	2	3	4	1	2	3	4		
3.1.7.2: Provide generators to all TCA centres	SW-TE, SW-TW										
3.1.7.3: Provide fire-fighting equipment to all TCA centres	SW-TE, SW-TW										
Sub-objective 3.2: TCA transportation infrastructure and equipment improved											
Action 3.2.1: Implement TCA Roads, Bridges and Supplemented Water Plan											
3.2.1.1: Develop additional game viewing roads (see Action 1.2.3 of Tourism Programme)	WT, SW-TE, SW-TW, CW-Suprt									Game viewing tracks constructed in the triangle area by December 2008	
3.2.1.2: Tarmac the 6 Km Voi - T/E HQ road	SW-TE, WS										
3.2.1.3: Construct a bridge across Tsavo River	SW-TE/TW, WS										
3.2.1.4: Upgrade Kitani and Iltital River crossings	SW-TW, WS										
3.2.1.5: Upgrade Mukururo road (45 Km)	W-CHNP, WS										
3.2.1.6: Develop 2 waterholes at Mukururo	W-CHNP, WS										
3.2.1.7: Complete the Kithasyo community water project	W-CHNP, WS										
Action 3.2.2: Enhance road links between TCA and surrounding areas											
3.2.2.1: Rehabilitate Mbirikani to Chyulu II road	SW-TW, WS										
3.2.2.2: Liaise with Ministry of Public Works to develop a road from South Coast through Kinango to southern Tsavo West and from Mwingi to South Kitui National Reserve	AD-TCA										
Action 3.2.3: Maintain and construct airstrips in strategic locations											
3.2.3.1: Tarmac Voi Airstrip	SW-TE, WS									Voi airstrip tarred by December 2008	
3.2.3.2: Develop Mzima Springs airstrip	SW-TW, WS										
3.2.3.3: Upgrade Kithasyo airstrip	W-CHNP, WS										
Action 3.2.4: Procure transportation and plant equipment											
3.2.4.1: Provide transport for finance and administration offices	SW-TE, SW-TW									At least two new buses procured by June 2010	
3.2.4.2: Replace existing buses with 5 new ones	AD-TCA, H-IDM										
3.2.4.3: Provide adequate and sufficient vehicles and plants: low-loader and exhauster, wheel shovel	AD-TCA, H-IDM										
3.2.4.4: Replace existing road maintenance equipment – tippers and graders	AD-TCA, H-IDM										

Plan Monitoring

Monitoring the impacts of plan implementation is a key aspect of the ultimate success of the plan and for informing adaptive management of the TCA. The plan monitoring framework set out in the following tables has been designed to provide guidance for the assessment of the potential impacts resulting from the implementation of each of the five management programmes. The framework sets out the desired positive impact of each programme's objectives and/or sub-objectives, as well as any potential negative impacts that may possibly occur. The framework also includes easily measurable and quantifiable indicators for assessing these impacts, and potential sources of the information needed.

Table 34: Ecological Management Programme Monitoring Framework

Objective or Sub-Objective	Potential Impacts (Positive and Negative)	Verifiable Indicator	Sources and means of verification
Sub-objective 1.1: The TCA's Black rhino populations are increasing in accordance with national strategic targets	The TCA Black rhino populations are increasing at target rates	Population size and recruitment rates	Population counts (c.f. TCA Ecological Monitoring Plan)
Sub-objective 1.2: Viable populations of Grevy's zebra in the TCA established and maintained	The TCA Grevy's zebra population is increasing	Population size and recruitment rates	Population counts (c.f. TCA Ecological Monitoring Plan)
Sub-objective 1.3: Elephant ecology and migration movements better understood and conserved	Elephants are able to continue moving between the TCA and dispersal areas	Elephant movement patterns	Elephant migration routes and dispersal areas map (c.f. Ecology Programme Activity 1.3.2.1)
Objective 2: Key habitats and rangeland conditions in the TCA managed and maintained	Fire is making a positive contribution to the conservation of the TCA's key habitats	Incidence and extent of wild or un-prescribed fires in the TCA	Fire monitoring reports (c.f. Ecology Programme Activity 2.3.3)
	The TCA's vegetation is restored to its natural species composition	Extent/occurrence of invasive species in key habitats	Monitoring reports (c.f. Ecology Programme Activity 2.7.1)
Objective 3: Conservation of key river systems and wetlands in and around the TCA enhanced	The TCA is supplied with sufficient, unpolluted water	Water quantity and quality	Water monitoring reports (TCA Ecological Monitoring Plan)
Objective 4: The Tsavo Research Station's role in the conservation and management of the TCA strengthened	TRS staff are playing a significant role in conservation threat abatement activities	Staff performance against 3-Year Activity Plan milestones	Annual reports/operational plans
	Trends in the overall health of the TCA's ecosystem understood	Implementation of TCA Ecological Monitoring Plan	Implementation milestones of Ecological Management Programme Action 4.1

Table 35: Tourism Development and Management Programme Monitoring Framework

Objective or Sub-Objective	Potential Impacts (Positive and Negative)	Verifiable Indicator	Sources and means of verification
Sub-objective 1.1: Visitor and driver-guide behaviour and adherence to TCA rules improved	Reduced crowding at wildlife viewing hotspots	Number of vehicles at carnivore sightings	TIU records, and/or spot checks by TCA staff
	Reduced impacts of visitor use on the TCA habitats	Number of vehicles warned for off-road driving	TIU records
	Improved quality of professional driver/guides	Percentage of professional driver guides with a recognised qualification	TCA driver/guide database (c.f. Tourism Programme Action 1.1.4)
Sub-objective 1.2: Visitor attractions, activities and amenities in high use areas enhanced	Enhanced visitor experience through diversification of attractions/activities	Number of visitors using tourism sinks and/or taking short walks	Visitor surveys (c.f. Tourism Programme Action 3.2)
	Pollution/litter/habitat degradation at tourism sinks	Evidence of pollution or litter at key tourism sinks	Targeted inspections by TCA staff
	Increased risk to visitor safety at tourism sinks and on short walks	Safety incidences	Tourism and/or security department records
Objective 2: Tourism investment and use in the TCA's low use and wilderness areas expanded and diversified, within environmentally acceptable levels	Increased use of the low use and wilderness zones	Concession holder bednights and special campsite usage	Concession holder records and campsite booking system
	Increased risk to visitor safety in more remote areas	Safety incidences in low or wilderness zones	Tourism department records
	Wilderness characteristics in TCA low use and wilderness zones reduced	TCA visitor and investor satisfaction	Visitor surveys and investor feedback (c.f. Tourism Programme Actions 3.2 and 3.3)
Objective 3: TCA tourism management and administration systems strengthened	Improved collaboration between TCA management and tourism investors and operators	Number of meetings and participation at tourism stakeholder and TCA management meetings	Minutes of quarterly TCA management – tourism stakeholder meetings (c.f. Tourism Programme Action 3.3)
	Reduced environmental and visual impacts of TCA tourism facilities	Compliance with national and KWS environmental regulations	Targeted inspections by TCA staff (c.f. Tourism Programme Action 3.2)

Table 36: Community Partnership and Conservation Education Programme Monitoring Framework

Objective	Potential Impacts (Positive and Negative)	Verifiable Indicator	Sources and means of verification
Objective 1: TCA-community communication and collaboration mechanisms established and strengthened	Improved relationships between TCA management and community organisations	TCA management participation in CCCs or wildlife forum meetings	TCA CWS records
Objective 2: Human-wildlife conflict incidences reduced	Reduced costs from wildlife incurred by TCA-adjacent communities	Incidences of HWC around the TCA	HWC database (c.f. Community Programme Action 2.1)
Objective 3: Community benefits from the TCA improved	Increased community support for TCA conservation	Community attitudes and opinions of the TCA and KWS	Participatory Rural Appraisals (c.f. Community Programme Action 3.1)
	Permission to use cultural sites within the TCA used as a pretext for illegal activities	Number of local residents arrested for illegal activities around cultural sites	Security section database (c.f. Security Programme Action 2.1)
Objective 4: Conservation-compatible community initiatives supported	Reduced conversion of wildlife dispersal areas to conservation incompatible land uses	Area (ha) covered by established community wildlife conservancies	CWS records
	Increased importance of wildlife conservation to local community members	Community member income from wildlife related commercial activities	Participatory Rural Appraisals (c.f. Community Programme Action 3.1)
	Benefits exacerbate inequalities in surrounding communities	Number of households benefiting from conservancy establishment	Conservancy and/or TCA CWS records
Objective 5: Understanding and awareness of TCA conservation improved	Improved understanding of TCA's conservation importance	Number of nature schools established	CWS records
		Participation in KWS sponsored tours	
	Increased of and respect for TCA rules and regulations	Number of local residents arrested for illegal activities in the TCA	Security section records (c.f. Security Programme Action 2.1)

PLAN MONITORING

Table 37: Security Programme Monitoring Framework

Objective	Potential Impacts (Positive and Negative)	Verifiable Indicator	Sources and means of verification
Objective 1: Natural resource protection operations strengthened, especially in remoter parts of the TCA and the greater landscape	Reduced impacts of bushmeat poaching in the TCA	Number of snares collected per effort (DWST and KWS operations)	DWST records and TCA security database (c.f. Security Programme Action 2.1)
	Reduced impacts of livestock incursions in the TCA	Size, frequency and distribution of livestock incursions	Aerial surveys/ ground patrols
	Commercial poaching is maintained at current low levels	Number of rhinos/elephants killed per year	TCA Security Section and CITIES MIKE records
Objective 2: Effectiveness of natural resource protection operations improved	Strengthened deterrent to committing wildlife crime in the TCA	Arrest to prosecution ratio of offenders caught in the TCA	TCA security database (c.f. Security Programme Action 2.1)
	Better targeting of TCA security operations through enhanced intelligence	Rewards given for intelligence leading to arrests or contacts	TCA security database (c.f. Security Programme Action 2.1)
Objective 3: Security of people and property strengthened	Visitor security is maintained in and around the TCA	Number of security incidences in and around the TCA	TCA Security Section incident reports

Table 38: Protected Area Operations Programme Monitoring Framework

Objective or Sub-objective	Potential Impacts (Positive and Negative)	Verifiable Indicator	Sources and means of verification
Objective 1: Institutional collaborations formalised and strengthened	Increased support for TCA management operations in and around the area	TCA management participation in district level committees	Annual reports/operational plans and meeting minutes
	Increased management collaboration between KWS and County Council of Mutomo	Implementation of responsibilities outlined in KWS-CCM MoU	Annual reports/operational plans
Objective 2: TCA staff are sufficient and effectively carrying out their duties	Improved efficiency of TCA staff in completing their assigned duties	Staff performance against 3-Year Activity Plan milestones	Annual reports/operational plans
	Increased morale of TCA staff	Number of poor morale related incidences	Incident records/annual reports
Sub-objective 3.1: TCA management facilities enhanced	Improved management efficiency	Staff performance against 3-Year Activity Plan milestones	Annual reports/operational plans
	Decentralisation of management to the sector level	Number of functioning sector HQs, and new/upgraded operational bases	Annual reports/operational plans
Sub-objective 3.2: TCA transportation infrastructure and equipment improved	Increased visitor use of low use and wilderness zones	Percentage of visitors entering TCA through gates in low use and wilderness zones	Safari card records (c.f. Protected Area Operations Programme Action 3.1.6)
	Improved response to security and HWC incidences	Number of security and HWC incidents responded to	Security and HWC databases (c.f. Security Programme Action 2.1 and Community Programme Action 2.1)

Plan Annexes

Annex 1. Participation in plan development

Name	Position and Organisation	Workshop		Working Groups				Consult
		#1	#2	Ecolo-gy	Tour-ism	Com-munity	Sec / PA Ops	
Abdalla, Abdulaziz	Pollmans			X	X			
Abdi	Kone		X					
Allen, Iain	Tropical Ice				X			
Andanje, Dr. Samuel	Senior Research Scientist TCA	X	X	X	X	X	X	
Balali, Abdi	Orma Community	X						
Bengo, Wycliffe	T. Tech-TCA						X	
Bergermann, Lori	Amara Conservation		X					
Berhe, Adhan	Rhino Warden		X					
Bonaya, Shukri, W.	KWS D/Warden		X					
Carr-Hartley, Robert	Sanganai Ltd, Director			X				
Cheptei, Julius K.	KWS Tsavo East N. Park	X	X		X		X	
Cherogony, Dr. Maurice	ADC Galana Ranch		X					
Dadacha, Joseph	KWS Tsavo East, Warden Tourism	X			X		X	
Dodi, Abdi	KWS -TE, Intelligence Officer						X	
Dodson, Rob	Wildlife Works	X	X	X				
Duale, Adan	R/ Ass T/ East						X	
Earnshaw, Allan	KWS BoT; Ker & Downey Safaris				X			X
Erupe, Josephat N.	KWS – TE Northern Sector, Warden		X					
Gachago, Salome	KWS Bus. Development		X					X
Games, Dr. Ian	Facilitator	X	X	X	X	X		
Gaturu, Ndung'u	Taita Discovery Centre, Coordinator	X				X		
Gichohi, Joseph	KWS Tourism Warden, Tsavo East		X		X			
Githecha, Francis K.	KWS - TW, Workshop Manager		X					
Godana, Abdub, O.	ADC Galana Ranch		X					
Jenga, James	Accounts- T/East							X
Juma, Anderson	KTDC, Business Development Officer				X			
Juma, Joy	Fauna and Flora International		X					
Jumases, Joseph	County Council, Taita Taveta, Chairman				X	X		
Kamau, Francis	KWS – Database Planner		X					
Kariuki, Apollo	KWS – Biodiversity Planning		X	X	X	X	X	
Kariuki, John	KWS Tsavo West, Research Scientist	X	X	X	X	X	X	
Kasiki, Samuel, Dr	KWS			X				
Kavi, Joseph	Warden-AWI							X
Kenana, Lekishon	SRS-TCA							X
Ketch, Richrad	Save the Rhino Int., TCA Coordinator		X					X
Kilango, Javan	KWS, Fence Technician							X
Kimitei, Kenneth	KWS - ARS		X					
Kimutai, David	KWS – Research Scientist		X					
King, Dennis	Tsavo Predator conservation	X	X	X	X			
Kirkland, Mike	Kenya Tourism Federation, Coast Rep.				X			
Kirui, Johnathon	KWS AD Tsavo Conservation Area		X		X		X	
Kurgat, Jeremaih	KWS - Tsavo West, Warden Tourism				X		X	
Lamprey, Dr Richard	Fauna and Flora International		X					

ANNEXES

Name	Position and Organisation	Workshop		Working Groups				Consult
		#1	#2	Ecolo-gy	Tour-ism	Com-munity	Sec / PA Ops	
Lesilau, Francis	KWS Tsavo East/ Langata Special Ops	X		X				
Litoroh, Moses	KWS Research and Biodiversity		X	X				
Lokitela, Peter	KWS Tsavo East	X	X					
MacLennan, Seamus	Kilimanjaro Lion Conservation		X	X				
Manegene, Stephen	KWS HQ	X					X	
Masarie, Willaim	Mbirikani Group Ranch	X						
Mbivu, Johnathon	KTB	X						
Mbogo, Nyaga	KATO		X					
Mbugua, Paul	KWS AD Tsavo Conservation Area	X		X				
McKnight, Barbara	Tsavo Elephant Research	X	X	X				
Mlamba, John	TTWF, Tourism Liaison Officer					X		
Mogire, Evans	A/A-Tsavo East							X
Mombo, Donald	Taita Taveta W. Forum, Coordinator	X		X			X	
Mtongolo, Magdalene	LUMO CWS		X					
Mulwa, Alex	KTB	X						
Muremi, Peter	KWS Rep. Northern Area Tsavo East				X			X
Muriithi, Michael	KATO/KTF, Administration	X	X		X			
Muriuki, David	KWS – W/Manager, Tsavo East		X					X
Muruki, Peter	KWS Sn. Supt. Telecomms				X			
Musioko, M.J.	KWS Warden Chyulu Hills				X			
Musyoka, P.M.	KWS - CWS, Warden				X			X
Mutero, Wycliffe	KWS – Head GIS		X					
Mutua, Jane	Ag. HCO-Tsavo East							X
Mwaita, Francis	KWS – H.CP		X					
Mwakamba, Elipida	County Council Taita Taveta, Deputy	X			X	X		
Mwakio, Donart	Taita Hills W. Sanctuary	X	X					
Mwakio, Philip	KWS – AD Coast		X					
Mwakioini, Kisaka	Range Management Dept, Range Officer							X
Mwandoe, Nyambu	Lumo Sanctuary	X						
Mwangombe, James	EAWS – Wundanyi/ TTWF Cordinator		X	X	X			
Mwanyumba, Dawson	EAWS, Project Assistant						X	
Mwasho, Constance	KWS, Community Warden, Taveta		X				X	
Ndeereh, David	SVO-TCA							X
Nderitu, Peter	KWS – Warden		X					
Ndoro, Joseph	KWS – T Supt		X					
Ndwiga, Grace	Wildlife Works, Programme Coordinator	X					X	
Njingira, Mary	KWS – A/Warden		X					
Nutter, Lionel	D.Sheldrick W. Trust, Coordinator	X					X	
Nyagol, Naaman	Procurement Assist.							X
Nyangena, Kenneth	Ngutuni, General Manager						X	
Nyibule, Ojuang	KWS - TW Warden							X
Nzisa, Martha	KWS - HQ, Research Assistant	X			X			
Nzomo, Jones	Accountant- T/ East							X
Nzomo, Jones, M	KWS - Accountant		X					
Ochieng, Keneth	KWS - TE, Pilot							X
Ochola, Vitalis	KWS – TE, Company Commander		X					X
Okita, Ben	Rhino co-ordinator		X					
Otieno, Jacob O.	KWS - TW, Civil works Officer		X					X
Oyugi, David	KWS Tsavo East, Warden Tourism				X			
Oyugi, David	Tourism T/ East							X

Name	Position and Organisation	Workshop		Working Groups				Consult
		#1	#2	Ecolo-gy	Tour-ism	Com-munity	Sec / PA Ops	
Perrio, James K.	KWS Tsavo, Senior Warden, CWS	x			x	x		
Pinta-Wollman, Noa	Tsavo East Research	x		x				
Ramme, Tina M.	Lion Conservation Fund/KWS	x	x	x				
Rauni, Munene	KWS – Warden Chyulu		x					
Robertson, James	Ker and Downey Safaris							x
Salim, Zainabu	KWS TE, Warden Education		x	x	x	x	x	
Salim, Zainabu	W-Education-Tsavo East							x
Sangawe, A. D.	KWS - TW, Company Commander		x					x
Siku, Hesbon	Dept. Phys. Planning – DPP/A		x					
Simba, B. Onyango	KWS- Warden Chyulu Hills	x			x		x	
Tekla, Kiyeng	KWS- RGR		x					
Thondu, Moses	KWS -TE, Warden		x					
Tokro, George	KWS - HQ, GIS Cartographer				x			
Too, James	KWS - TE, Investigation		x					
Towett, Sammy	KWS HQ Tourism	x	x		x			
Trevor, Simon	African Environment Film Foundation	x	x			x		
Tunoi, Alex	KTB – Ass. Marketing Manager		x					
Tuye, Umuro	KWS – Human Resource TE							x
Wandera, Antony	KWS – Rhino Program, Asst. Res. Sci-ent.							x
Wanuthia, Samuel	KWS – Assistant Warden		x					x
Woodley, Daniel	KWS Tsavo West Senior Warden	x	x	x	x		x	

Annex 2. Summary TCA staffing requirements

Category	Current	Required	Difference
Area Management (AD Office)	7	7	0
Voi Management and Administration	42	99	57
Ithumba Management and Administration	0	4	4
TCA Telecommunications	4	9	5
Voi Research	10	26	16
Civil Works	24	83	59
Human Resources	4	4	0
Tourism	25	54	29
Community Wildlife Service	32	68	36
Security – WPU and CLIC	113	172	59
TOTAL TSAVO EAST	261	526	265
Kamboyo Administration (excluding casuals)	27	29	2
Research	3	7	4
Civil Works	19	39	20
Human Resources	3	6	3
Air Wing	2	3	1
Tourism	43	86	43

Category	Current	Required	Difference
Community Wildlife Service	26	41	15
Security – WPU and CLIC	79	160	81
TOTAL TSAVO WEST	202	371	169
Kithyasu Management and Administration	9	9	0
Tourism	0	19	19
Security – WPU and CLIC	28	89	61
TOTAL CHYULU	37	117	80
GRAND TOTAL	500	1014	514

Annex 3: Proposed developments in the TCA Roads, Bridges and Supplemented Water Plan

Tsavo East National Park

Figure 31: Voi High Use Zone

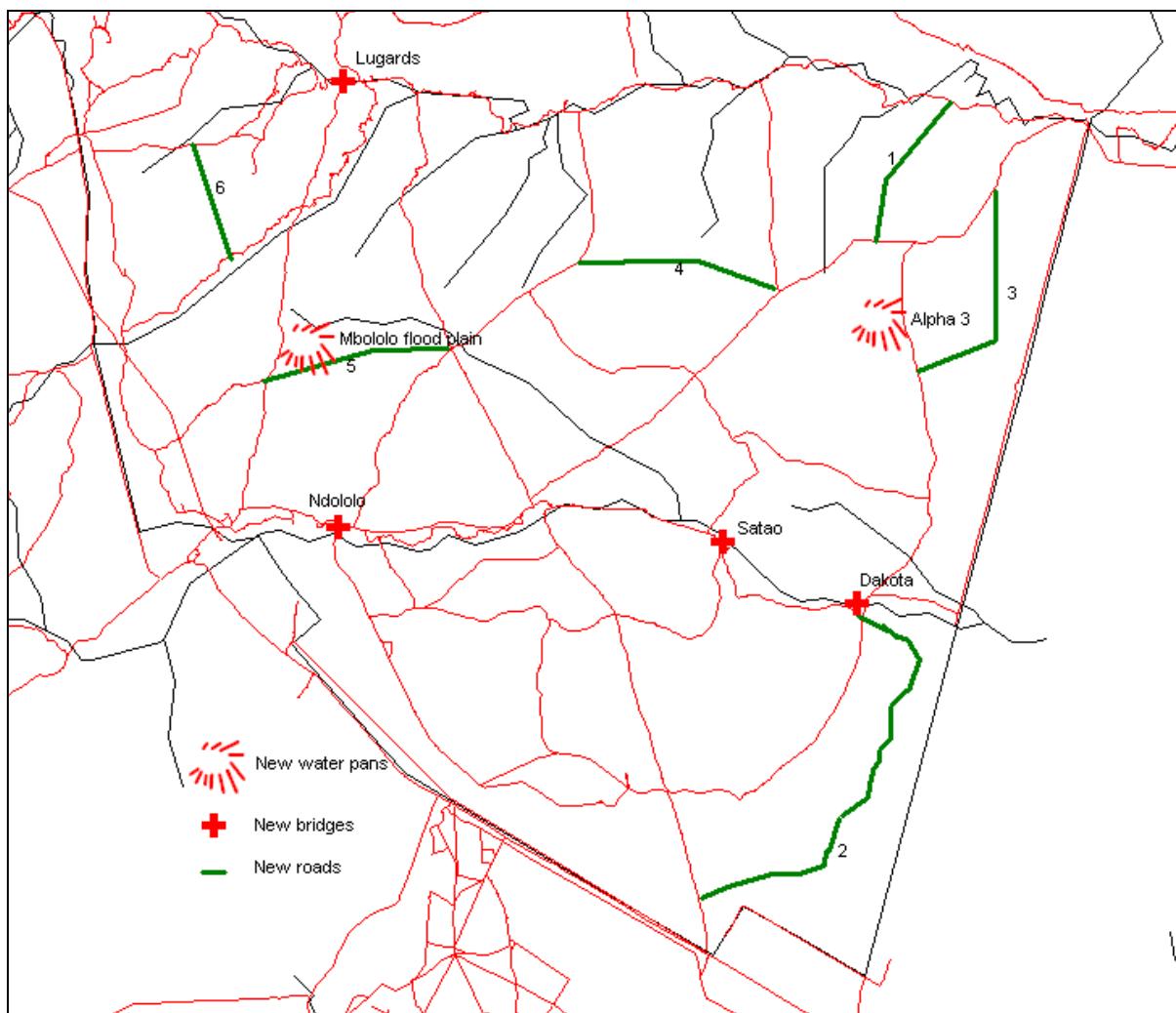


Figure 32: Ithumba Low Use Zone

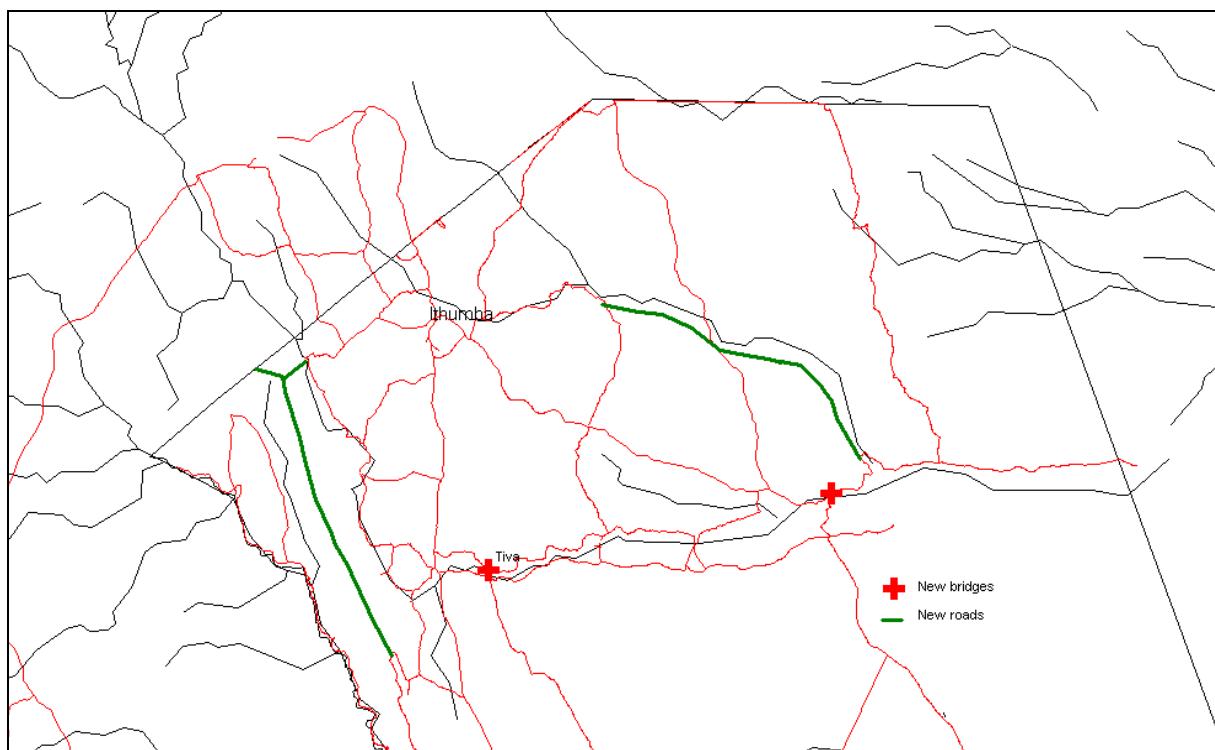
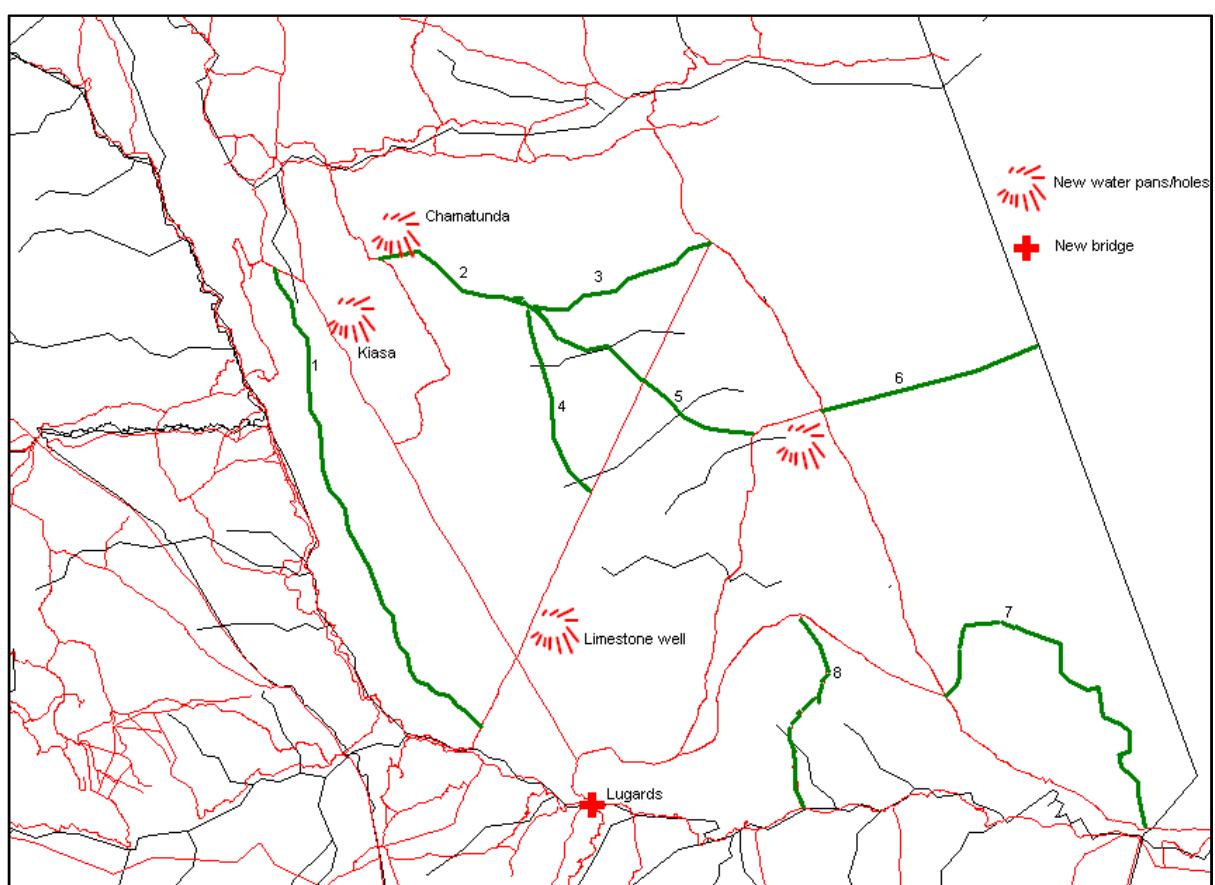


Figure 33: Emusaya Wilderness Zone



Tsavo West National Park

Figure 34: Mzima High Use Zone

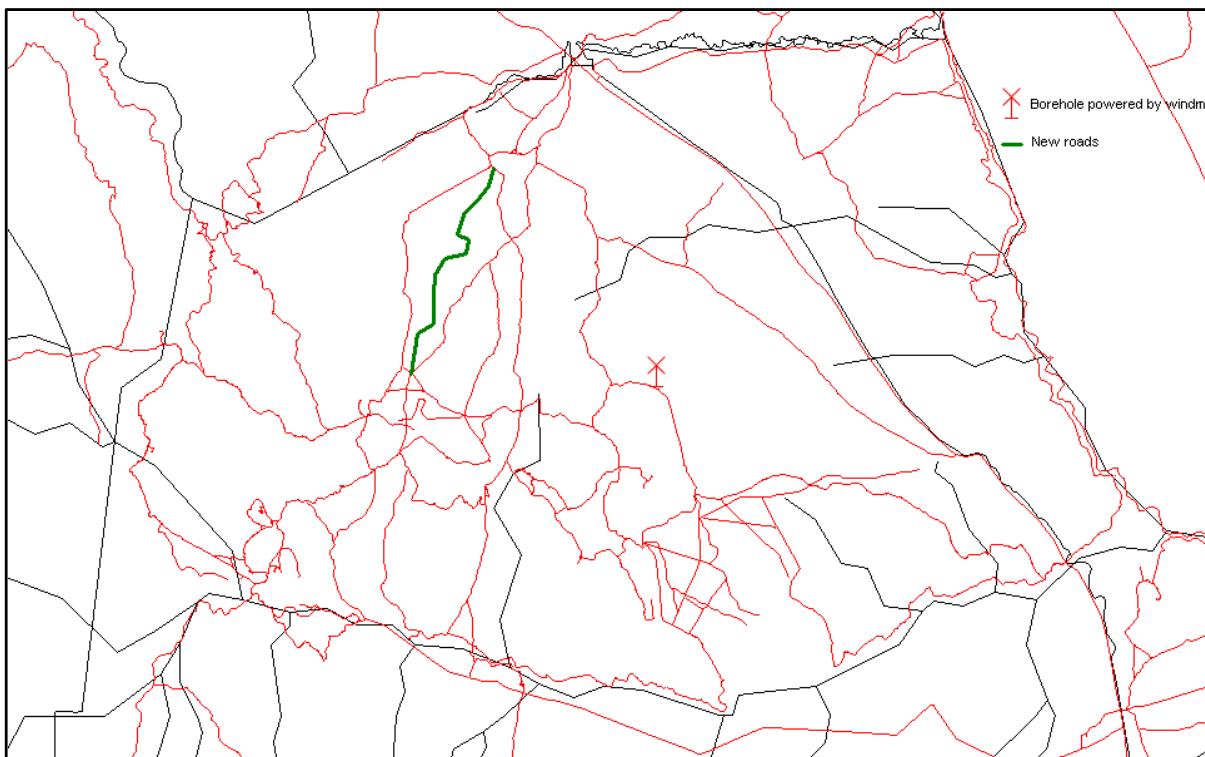


Figure 35: Murka Low Use Zone

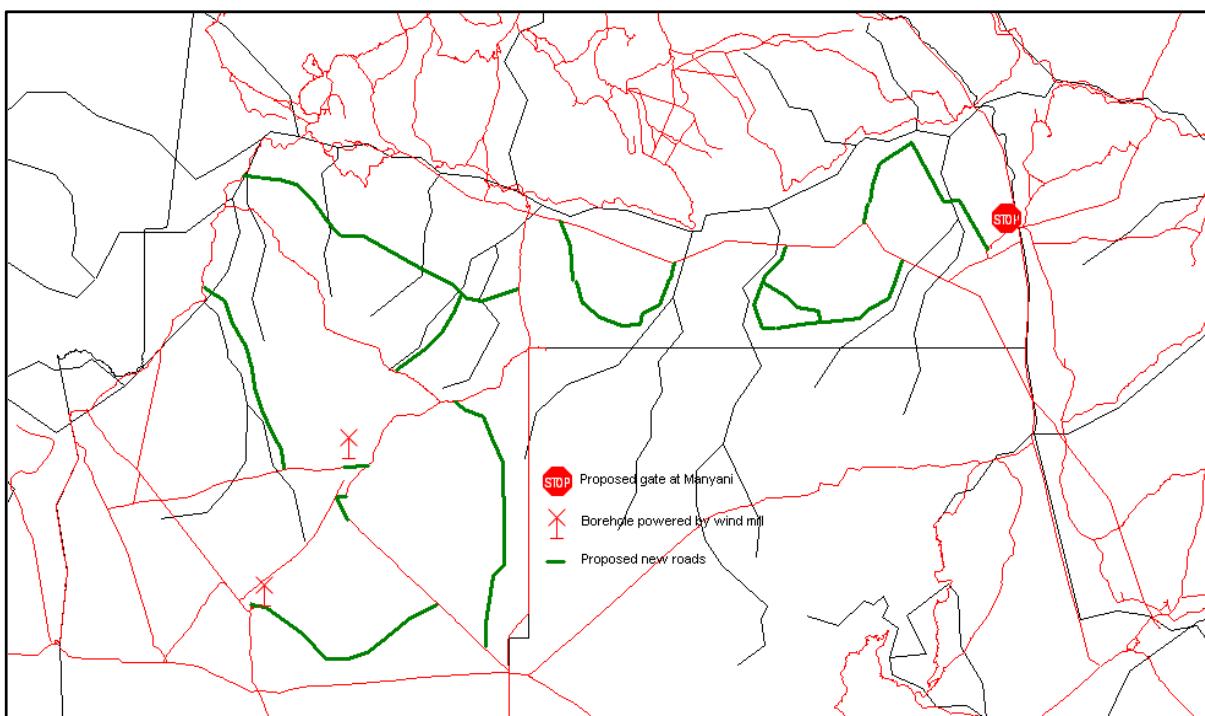
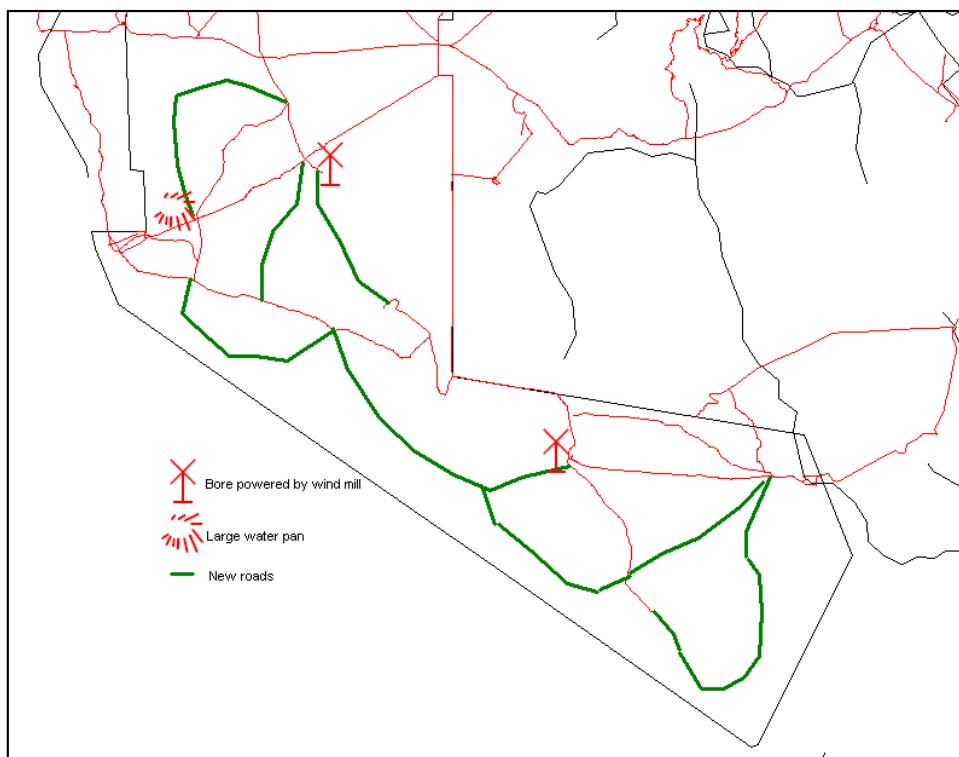


Figure 36: Jipe Low Use Zone



Chyulu Hills National Park

Figure 37: Chyulu Hills Low Use Zone

