

National Elephant Conservation and Management Plan 2021/2022-2030/2031



Ministry of Environment, Forestry and Tourism
Directorate of Scientific Services
Directorate of Wildlife and National Parks



Republic of Namibia





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Republic of Namibia

Ministry of Environment, Forestry and Tourism

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Ministry of Environment, Forestry and Tourism

Directorate of Scientific Services and Directorate of Wildlife and National Parks

Troskie Building, Corner of Kenneth David Kaunda

and Robert Mugabe Avenue

P/Bag 13306, Windhoek

Tel: +264-(0)61-2842111

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FOREWORD

The conservation and management of elephants in Namibia is a high priority for the Ministry of Environment, Forestry and Tourism. Elephants as the largest land mammal alive today face enormous challenges throughout their distribution range in Africa. Not only are elephants and people competing for the same resources such as water, land, space outside the protected areas, but even inside the protected areas, illegal killing for their ivory has become a significant threat.

Notwithstanding these problems, elephant conservation in Namibia has been amongst our greatest successes as a nation. While elephants have drastically declined in numbers and their habitat has been severely fragmented in other countries, we have seen a consistent increase in elephant numbers over more than 30 years and we now have more than three times as many elephants than at Independence in 1990. Elephant distribution range has expanded, and elephants seem to be in the process of recolonizing their former range in areas that we have not expected this to happen in our lifetimes. Namibia is indeed unique in that elephants occur over wide gradients of rainfall, vegetation types, land use and human density from the hyper-arid northern Namib Desert in the Kunene and Erongo Regions in the west through to the highest rainfall woodlands and riverine areas in the north-east in the Kavango West and East Regions and the Zambezi Region.

Elephant conservation and management cannot happen without involving the people that live closest to them. While elephants are part of our African heritage and are revered by many communities, they also exact a significant toll on rural communities. In different regions, elephants' impact on water installations, infrastructure, gardens, livestock and crop farming, they are thus threatening the livelihood security of many communities and individual small farmers. Elephants also impact commercial livestock farmers and it is quite extraordinary and highly commendable that commercial farmers have been as tolerant as they have been and increasingly adapted their farming practices towards co-existence with elephants, although some conflicts remain.

In Namibia, perhaps more so than in other elephant range countries, elephants are not confined to protected areas and share the land with rural communities. Elephant conservation has to be a win-win situation for people to tolerate elephants in the long term. The Namibian Government has accordingly established a range of incentives for people to co-exist with elephants, based on the intrinsic value of elephants. These range from affirming rights over wildlife resources through our community-based natural resource management programme with 86 rural communities now taking part in it through registered communal conservancies, promotion and facilitation of tourism investments in rural areas, conservation hunting and traditional use of elephants as a source of food. The most important incentive namely the value that can be generated from trade in ivory is currently severely compromised by the actions of animal rights groups who have influenced decisions at the Convention on International Trade in Endangered Species (CITES) that undermine Namibia's conservation programmes. For how long this is going to be the case is unclear, but our tolerance is being severely tested. Namibia has major stockpiles of valuable wildlife products including ivory which it can produce sustainably and regulate properly, and which if traded internationally could support our elephant conservation and management for decades to come. We favour a collective approach on the regulation of international trade but ultimately, we have to act in the interests of conservation and the rural people that are so important in determining the fate of elephants in the long term. Elephants are part of the natural resources of Namibia over which we have full sovereignty and there is a limit to how much external interference we will accept in the use of this resource.

I want to commend the officials, past and present, of the Ministry of Environment, Forestry and Tourism for the outstanding work that they have done for elephant conservation. I also want to commend the rural communities in our communal conservancies who have set aside much of their land for wildlife, as well as our freehold landowners and conservation partners for their significant contributions to wildlife conservation.



PREFACE

This elephant conservation and management plan will for the next ten years guide the Ministry of Environment, Forestry and Tourism in its conservation management of the elephant population of Namibia. This plan is based on extensive consultation with all key stakeholders, and their rich input is much appreciated. The Directorate of Scientific Services in cooperation with the Directorate of Parks and Wildlife Management coordinated this process, and their work is commended.

The elephant conservation and management plan for 2020/2021-2030/2031 provides a comprehensive review of the recent history of the elephant population and its management and all of the core issues and challenges that we as a Ministry and our conservation partners including rural communities that take part in our community-based natural resource management programme have to face to sustain the elephant population amidst many challenges. Not least of which is the risk of climate change which is expected to have a severe impact on Namibia and its natural resources and the people dependent on these resources. In this regard, it is critically important to maintain and strengthen landscape connectivity and prevent the fragmentation of elephant habitat and the obstruction of their movements.

After many years of absence of illegal killing of elephants, Namibia saw a flare-up in illegal killing of elephants in 2014, but the Ministry of Environment, Forestry and Tourism in collaboration with other law enforcement agencies notably the Namibian Defence Force, the Namibian Police and the judiciary were able to reduce the incidence of illegal killing and cross-border trafficking of elephant products to the current low level. At no stage did these illegal practices pose a significant threat to the status of elephants in Namibia. However, the effort to combat illegal killing and trafficking of elephants (and rhinoceros) has consumed much of the Ministry's resources. I want to thank the development and conservation partners of the Ministry who have contributed so much to this effort.

Namibia takes part in major international conservation initiatives, including transfrontier conservation. The core of our elephant population forms part of the larger Kavango Zambezi Transfrontier Conservation Area elephant population and we are proud to present this elephant conservation and management plan as our contribution to cross-border collaboration in the conservation of shared elephant populations.

This National Elephant Conservation and Management Plan departs from our previous species conservation plans by including regional action plans in recognition that challenges and opportunities vary from region to region. The Ministry will, in addition to establishing Park Advisory Committees that will consist of all key stakeholders, also establish regional elephant management structures that will oversee the implementation of the regional action plans. These regional elephant management structures will create a platform for all stakeholders to decide on priorities jointly and to coordinate interventions.

The Ministry of Environment, Forestry and Tourism would like to thank all its staff members, partners and stakeholders who participated in developing this management plan, specifically the GOPA consultancy firm that was appointed to help implement the NamParks IV Project which is co-funded by the Government of the Republic of Namibia and the German Government through KfW, who facilitated the compilation of this plan by the Agra ProVision consultancy team.


Teofilus Nghitila
EXECUTIVE DIRECTOR
Office of the
EXECUTIVE DIRECTOR
REPUBLIC OF NAMIBIA
24 MAY 2021

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Abbreviations and Acronyms

ARMS	Age-Related Measuring System
Ca.	Circa, approximately
CBNRM	Community-based natural resource management
CCFN	Community Conservation Fund of Namibia
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
Coninfo	Conservancy information (database)
DNRRS	Department of Natural Resources and Regional Services
DoF	Directorate of Forestry
DSS	Directorate of Scientific Services
DWNP	Directorate of Wildlife and National Parks
EHRA	Elephant Human Relations Aid
EIA	Environmental Impact Assessment
EMR	Elephant Management Region
EMU	Elephant Management Unit
GCF	Green Climate Fund
GEF	Global Environment Facility
GPTF	Game Products Trust Fund
GPS	Global Positioning System
HEC	Human-Elephant Conflict
HWC	Human-Wildlife Conflict
HWCSRS	Human Wildlife Conflict Self Reliance Scheme
IRDNC	Integrated Rural Development and Nature Conservation
KA	Kyaramacan Association
KAZA, KAZA TFCA	Kavango Zambezi Transfrontier Conservation Area
KCR	Kavango Cattle Ranch
KEWG	KAZA Elephant Working Group
M	Molar
MAWLR	Ministry of Agriculture, Water and Land Reform
MET	Ministry of Environment and Tourism
MEFT	Ministry of Environment, Forestry and Tourism
MoF	Ministry of Finance
NACSO	Namibian Association of CBNRM Support Organizations
NamPol	Namibian Police
NDT	Namibia Development Trust
NEC	National Elephant Coordinator
NGO or NGOs	Non-Governmental Organization/s
NIDA	Namibia Industrial Development Agency
NNDF	Nyae Nyae Development Foundation
NNF	Namibia Nature Foundation
NP	National Park
n.s.	Not statistically significant
NUST	Namibia University of Science and Technology
PAC	Problem Animal Control
PES	Payment for Ecosystem Services
PH	Professional Hunter
RA	Roads Authority
SADC	Southern African Development Community
SEA	Strategic Environmental Assessment
SMART	Spatial Monitoring and Reporting Tool
SOP	Standard Operating Procedure
SRT	Save the Rhino Trust
WC	Wildlife Credits
WSS	Division Wildlife Support Services, Directorate of Wildlife and National Parks
WWF	World Wildlife Fund

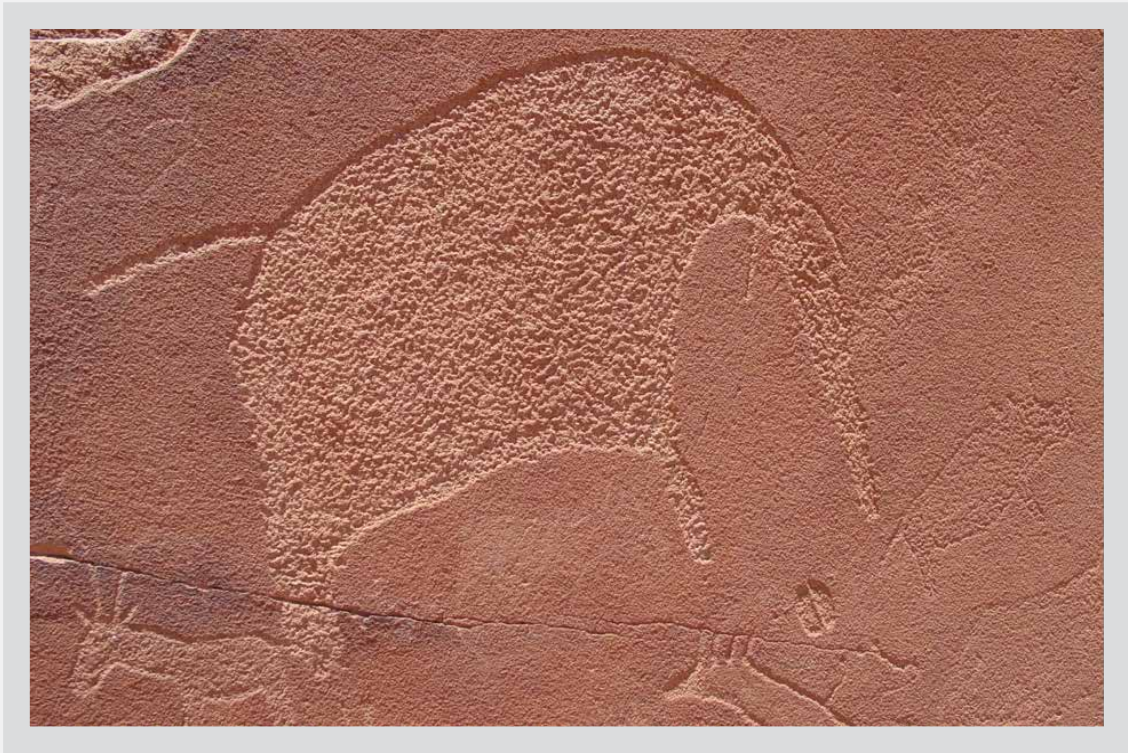


Figure 1 Famous elephant engraving at Twyfelfontein, in the Twyfelfontein World Heritage Site, north-western Namibia (photo: P. Tarr)

GLOSSARY

<i>Et al.</i>	Et alia or “and others”
Ibidem or idem	From the same source
Overview document	Overview of elephant conservation and management in Namibia, MEFT 2020

This National elephant conservation and management plan must be read in conjunction with the Overview of elephant conservation and management in Namibia, hereafter referred to as the Overview document.

1.1 Purpose of the management plan

There are several reasons for the compilation and publication of this management plan. First, the plan describes the objectives, principles and strategies for the conservation and management of elephants in Namibia so that all interventions can be planned, focused and co-ordinated according to agreed principles. As an official document issued by the Ministry of Environment, Forestry and Tourism (MEFT), the management plan is secondly a statement of commitment that binds its personnel to manage elephants according to provisions of this plan. Thirdly, the plan obliges the wide variety of people and organisations (Organs of State¹, conservancies, NGOs, private sector, the public at large) who are involved with elephant conservation and management or have the means of impacting elephant conservation and management to ensure that all their activities are congruent and compliant with provisions of this plan.

Finally, implementation of the principles provided in this plan will reduce the need for reactive or unplanned responses to unexpected events. Indeed, the management plan should provide guidance over the next ten years and may only be changed with the approval of senior management in the MEFT.

1.2 Vision and strategic objectives

The overarching Mission of the Ministry of Environment, Forestry and Tourism is *“To promote biodiversity conservation in the Namibian environment through the sustainable utilization of natural resources and tourism development for the maximum social and economic benefit of its citizens”*.

From this mission statement of MEFT the following vision and strategic objectives were derived for the conservation and management of elephants in Namibia:

1.2.1 Vision

Namibia will manage its elephants to:

- protect the maximum number of elephants which is consistent with the conservation of biological diversity and the wishes of those primary stakeholders who have elephants on their land,
- realize their full potential as a component of wildlife-based land use for the benefit of the Namibia and its people,
- maintain as contiguous and interconnected a population as possible across Namibia and southern Africa that is able to respond to climate change, but not to manage the population intentionally for further increase.

¹ Offices, Ministries, Agencies, Regional Councils, Local Authorities, Traditional Authorities, State-owned companies established by statute

1.2.2 Strategic objectives

MEFT will strive:

1. To secure and increase landscape connectivity
2. To protect elephants from illegal killing
3. To prevent long-term negative and possibly irreversible impacts by elephants on other components of biodiversity and ecosystem processes and functioning
4. To effectively mitigate human-elephant conflict and to create conditions under which elephants are a benefit to people
5. To mitigate the effects of severe drought and climate change on the small populations of elephant in the arid and hyper-arid parts of the Kunene Region

1.2.3 Enabling objectives

In order to achieve the strategic objectives, the following seven enabling objectives must be realized:

1. To effectively coordinate the implementation of this plan
2. To establish appropriate action plans and co-management arrangements
3. To maintain liaison with all primary stakeholders and primarily those people with elephants on their land
4. To ensure that monitoring and data management systems are effective as the basis for adaptive management
5. To foster partnerships with the public (communal conservancies, communal and commercial farmers, NGOs and the private sector) on elephant conservation and management
6. To provide information to the public on elephant behaviour, conflict avoidance and mitigation
7. To secure sustainable and reliable financing of elephant conservation and management in Namibia for MEFT, conservancies, freehold landowners and conservation NGOs
8. To develop and maintain the skills set and skilled personnel within MEFT necessary for the implementation of all aspects of this plan

1.3 Conservation threats and management outcomes

Based on the consultations and inputs received as part of the development of this plan, the most important short to medium term (up to 10 years) threats and management challenges regarding elephants in Namibia were identified. Essential conservation and management outcomes that need to be addressed and must be achieved in the timespan of this management plan are shown below.

Greatest threats and management challenges regarding elephants in Namibia	Essential conservation and management outcomes for elephants in Namibia
Strategic Objective: To secure and increase landscape connectivity	
Loss of landscape connectivity	• Elephant movement corridors are functioning (as the highest priority for the long-term conservation of elephants in Namibia and the KAZA TFCA) • The removal of the southern boundary fence of Bwabwata NP has been negotiated with Botswana • The opening of the fence between Khaudum NP and Ngamiland, Botswana has been negotiated • Important elephant movement corridors have been mapped, demarcated and are managed to ensure access by elephants • MEFT actively participates in land use planning and ensures compliance with the Environmental Management Act (Act 7 of 2007) and the Protected Areas and Wildlife Management Act (once promulgated) to minimize impacts on landscape connectivity • MAWLR, regional land boards and traditional authorities recognize the importance of preventing settlement, agricultural projects, artificial water provisioning and the granting of land rights over core wildlife areas and movement corridors • Communal conservancies have realigned their conservancy zonation to enhance landscape connectivity • With support from METF, communal conservancies are taking action against unlawful settlement in core wildlife areas and movement corridors • Critically important elephant movement corridors have been declared as Landscapes of Special Conservation Importance • A programme for Payment for Ecosystem Services and Wildlife Credits has been developed to safeguard important elephant movement corridors
Strategic Objective: To protect elephants from illegal killing	
Ongoing illegal killing of elephants	• Illegal killing of elephants has been reduced and managed throughout the distribution range of elephants • Small and vulnerable sub-populations or groups are not impacted by illegal (retaliatory) killing • Security plans have been drafted and are kept updated for all protected areas and surrounding land in the elephant distribution range, and are implemented

Greatest threats and management challenges regarding elephants in Namibia	Essential conservation and management outcomes for elephants in Namibia
Strategic Objective: To prevent long-term negative and possibly irreversible impacts by elephants on other components of biodiversity and ecosystem processes and functioning	
Loss of other species and habitats	• Further thinning of the riparian forests of the Kavango and Kwando Rivers has been prevented through improved fire management and the restoration of elephant movements between Botswana and Namibia to reduce the cumulative impact of fire and elephants on the riparian forests • The impact of high-density elephant populations on other species such as bushbuck, tsessebe, baobab and the riparian tree species has been evaluated • Iconic specimens of large trees in Etosha NP and baobabs in the north-eastern parks and Nyae Nyae Conservancy are protected • Vegetation structure and composition in all areas with high elephant densities are monitored
Build-up of unsustainably high elephant densities	• Landscape connectivity has been improved, allowing elephant populations to move in response to rainfall, water and food availability, fire and other disturbance • Artificial water provisioning has been reduced in specific areas and artificial waterpoints are rotated in protected areas with elephants • The fire management strategy for Namibia's protected areas is effectively implemented to reduce large scale late dry season fires in protected areas to prevent localized overconcentration of elephants in unburnt areas • Disturbance and deterrence from unplanned human settlement in Bwabwata NP and road traffic through Bwabwata NP and Mudumu NP have been reduced to prevent localized overconcentration of elephants in undisturbed areas • Illegal killing of elephants has been minimized to prevent localized overconcentration of elephants in safe areas • Cooperation agreements have been established with protected area neighbours to allow the free movements of elephants where possible • Other ways of reducing overconcentration of elephants (lethal removal, translocation) are used as means of last resort
Strategic Objective: To effectively mitigate human-elephant conflict and to create conditions under which elephants are a benefit to people	
Intolerance of elephants amongst human communities in the elephant distribution range	• Effective implementation of the Revised National Policy on Human Wildlife Conflict Management 2018-2027 • Offset mechanisms for economic losses caused by elephant impacts in conservancies are reviewed, improved and supported • Rural communities and commercial farmers have been trained in mitigating elephant conflicts and understanding elephant behaviour

Greatest threats and management challenges regarding elephants in Namibia	Essential conservation and management outcomes for elephants in Namibia
	• Elephant Management Units have been identified and are managed according to unit-specific management plans • Park entrance revenues are dedicated by Treasury and MEFT to mitigating human-elephant (and other wildlife) conflict, in line with the existing Cabinet approval and recommendations of the Second Land Conference • MEFT has increased engagement with rural communities in areas of elephant range expansion and provided information to the public on proven means of supporting co-existence with elephants • MEFT and conservation partners have assisted conservancies to convert all essential waterpoint infrastructure used by elephants to solar water supply systems to reduce conflicts over the consumption of water by elephants from diesel-powered pumps
Inadequate incentives for co-existence of humans and elephants	• Sustainable utilization of elephants for economic and cultural purposes is practiced • A programme for Payment for Ecosystem Services and Wildlife Credits has been developed in collaboration with other partners to safeguard important elephant movement corridors • Ongoing public recognition is given of the contributions of rural and agricultural communities living with elephants • MEFT actively supports programmes and encourages partnerships with others to strengthen rural livelihoods and to reduce dependency on a narrow range of economic activities and to equitably grow the wildlife economy • Cultural use of elephants, elephant meat and ivory is supported and facilitated • Rural communities are fully involved as equal partners in decision-making concerning elephants and their management in recognition that co-management of elephants by Government and affected rural communities is needed, also in recognition of the rights of indigenous people and rural communities to determine how they use their natural resources • Communal conservancies are supported to establish and maintain productive populations of other valuable species, including by translocation or reintroduction • Local management structures have been established to mitigate elephant impacts and improve co-existence with elephants on commercial farmland • The KAZA TFCA framework for elephant conservation and management is supported and implemented in collaboration with the other KAZA TFCA Partner States • The African Elephant Action Plan is supported and implemented in collaboration with the other Elephant Range States

Greatest threats and management challenges regarding elephants in Namibia	Essential conservation and management outcomes for elephants in Namibia
	- MEFT is able to sustain the conservation and management of elephants and create economic benefits to rural communities from the proceeds of its accumulated stocks of elephant products - Economic use of elephants and elephant products is optimized
Retaliatory killing of elephants may be increasing	- Conservancy programmes of community game guards patrolling, and monitoring human-elephant conflict situations are supported and strengthened - Protection measures against elephants have been implemented at all key boreholes in the North West and clusters of crop fields and community gardens - MEFT has made available to the public and other bodies an effective design and layout for protecting water installations against elephants - MEFT provides information to the public on proven means of supporting co-existence with elephants and mitigating elephant conflicts
Problem elephant control is ineffective	- Problem elephant control is done efficiently and speedily - Clear protocols are developed to fast-track decision-making on problem elephant control
Elephant hunting	Measures are taken to monitor elephant populations and the impacts of hunting, and hunting is managed adaptively
Strategic Objective: To mitigate the effects of severe drought and climate change on the small populations of elephant in the arid and hyper-arid parts of the Kunene Region	
Decline of elephants in the Hoanib-Ombonde and Hoarusib River catchments to non-viable levels due to severe drought and climate change and increased conflicts with people	- Functional programmes and partnerships have been developed with communal conservancies and NGOs to strengthen the monitoring of the Hoanib-Ombonde and Hoarusib elephants, increased surveillance, deterrence and law enforcement, mitigate human-elephant conflicts in the catchments and prevent obstruction of important movement routes - Establishment of a community-based protected area such as a Landscape of Special Conservation Importance in the Ombonde River catchment as well as the Palmwag, Etendeka and Hobatere tourism concession areas to mitigate the threats of severe droughts and climate change
Decline of elephants in the Uniab, Huab and Ugab River catchments and elsewhere in the northern highlands part of the Kunene Region to non-viable levels	- Enhanced monitoring of population trends and mitigation of human-elephant conflicts in the Uniab, Huab and Ugab River catchments and in the northern highlands part of the Kunene Region - Restoration of wetlands and downstream water flows in the Huab and Ugab River catchments has been done

1.4 Enablers

The following enabling objectives are pivotal to address these threats and achieve the desired outcomes.

Enablers	
Objectives	Essential outcomes
To effectively coordinate the implementation of this plan	• An elephant management body has been established in MEFT to oversee the implementation of this plan • An elephant coordinator has been appointed • DPWM and DSS understand their respective responsibilities to implement this plan and have integrated such responsibilities in their annual workplans
To establish regionally appropriate action plans and co-management arrangements	• Regional action plans have been established for elephant conservation and management • Local management structures have been established to mitigate elephant impacts and improve co-existence with elephants on commercial farmland • Participatory management of elephants has been established for all high frequency human-elephant conflict areas through area-specific elephant management units and structures representing all primary stakeholders
To maintain liaison with all primary stakeholders and primarily those people with elephants on their land	• The public consultation process initiated for this management plan is continued through periodic opinion surveys • Feedback is given to primary stakeholders on the implementation of this plan
To ensure that monitoring and data management systems are effective	• Important information is predictably and reliably collected and managed in continuously updated and integrated data management systems • Elephant management decisions are evidence-based
To foster partnerships with the public (communal conservancies, communal and commercial farmers, NGOs and the private sector) on elephant conservation and management	• Cooperation and partnerships have been strengthened between MEFT and communal conservancies, communal and commercial farmers, NGOs and the private sector on elephant conservation and management
To provide information to the public on elephant behaviour, conflict avoidance and mitigation	• Information has been provided to the public on elephant behaviour, conflict avoidance and mitigation to prevent the loss of human life and injury and to reduce negative impacts by elephants on livelihoods
To secure reliable financing of elephant conservation and management in Namibia for MEFT, conservancies, freehold landowners and conservation NGOs	• MEFT, conservancies and freehold farmers with elephants on their land are able to generate funding for elephant conservation and management from a diverse range of income streams to implement this plan

CHAPTER 2: Management strategy

The management strategy presented here is derived from the conservation and management objectives in Chapter 1 and inputs received through the public consultation process for this plan (captured in Chapter 2 of the Overview document) and focuses on the most important short to medium term threats and management challenges regarding elephants in Namibia and the outcomes that are required. This chapter elaborates what to do and how to do it to achieve those desired outcomes.

The overarching setting for this elephant conservation and management plan is Article 95 (l) of the Namibian Constitution: *maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilisation of living natural resources in a sustainable basis for the benefit of all Namibians, both present and future; ...*

Previous elephant management plans or draft elephant management plans in Namibia, Kilian & /Uiseb (2015) and Cumming (2016) were taken into account as well as the Strategic Planning Framework for the Conservation and Management of Elephants in the Kavango Zambezi Transfrontier Conservation Area of 2019, the Southern Africa Regional Elephant Conservation and Management Strategy of 2005, and the African Elephant Action Plan of 2010. Management plans for elephants in neighbouring and SADC countries were also consulted², noting that each country has a different approach necessitated by its particular challenges. This elephant conservation and management plan is intended to be the principal vehicle for Namibia's implementation of the Strategic Planning Framework for the Conservation and Management of Elephants in the Kavango Zambezi Transfrontier Conservation Area of 2019.

Further, research reports and publications on management options and their scientific underpinnings and successful or unsuccessful application previously in Namibia or elsewhere in southern Africa were also consulted³.

Importantly, the Protected Areas and Wildlife Management Bill, which is expected to replace current wildlife conservation legislation, in Section 3 contains principles of conservation. These will become mandatory when the Bill is enacted and should therefore be applied to this elephant conservation and management plan. Such application is shown in Table 1.

Table 1 Principles of conservation in Section 3 of the Protected Areas and Wildlife Management Bill and their application to elephant conservation and management

Principles of conservation in Section 3 of the Protected Areas and Wildlife Management Bill	Application to elephant conservation and management
The maintenance and restoration of biological diversity and integrity, including genetic diversity	• maintain viable elephant populations throughout their distribution range in Namibia • enable range expansion by elephants to vacant parts of their historical distribution range

2 Elephant management plans or draft management plans were only available for Botswana (draft), Mozambique, Zambia (draft), Zimbabwe and Kruger NP in South Africa.

3 Cumming & Jones (2005) provide a useful summary of management options.

Principles of conservation in Section 3 of the Protected Areas and Wildlife Management Bill	Application to elephant conservation and management
	• prevent the introduction of elephants of a different genetic composition or type into the wild elephant population of Namibia (and since genetic variation amongst elephants in Namibia has not been adequately studied, on a precautionary basis prevent any introduction of elephants from outside Namibia unless from a contiguous population, or, the introduction of elephants from e.g. north-eastern Namibia to the extreme north-western population) • consider the role elephants play in the maintenance and restoration of the integrity of the overall biodiversity in the areas where they occur, thus also their beneficial or detrimental impacts on such biodiversity and prevent detrimental impacts
The maintenance and restoration of essential ecological processes, integrity, and life support systems	• take measures to maintain and restore important ecological processes that elephants require and are part of, of which movements and dispersal in response to variability in climate change, temporal variation in rainfall, surface water, food plants, fire, disease and disturbance, is the most under threat
The promotion of sustainable use of wildlife populations, while preventing detrimental impact on biodiversity, ecosystem integrity and essential ecological processes	• enable the sustainable use of elephants in support of protected area management and community-based natural resource management in line with existing national policies and in a way that would not detrimentally impact e.g. elephant population age and sex structures
The provision of incentives by the State for land right holders to adopt land uses that promote the conservation of indigenous biological resources and the maintenance and, where appropriate, rehabilitation of ecosystems	• maintain and/or strengthen current incentive frameworks for land right holders – both communal and private – to maintain and adopt conservation-friendly land uses that include elephants and the access to such land by elephants • address issues of human elephant conflict • diversify economic value of elephants
The equitable access to benefits from the use of indigenous biological resources, including wildlife utilization	• ensure that the people who have the greatest ability to affect the conservation and management of elephants benefit from elephants to the greatest extent possible
The equitable access to benefits from the use of indigenous biological resources, including wildlife utilization	• recognize that elephants are an important part of the biological resources of Namibia that can be used sustainably to support conservation management, incentivize conservation-based land-use and support economic development, especially development in rural areas • support the current national policy principle that the people that live with elephants and are detrimentally impacted by them should benefit from them through legal forms of utilization such as conservation hunting

Principles of conservation in Section 3 of the Protected Areas and Wildlife Management Bill	Application to elephant conservation and management
	• support customary use of elephants such as the manufacturing and use of omakipa and providing access to the raw material required for that (i.e. elephant tusks) as well as elephant meat for traditional festivals and subsistence • recognize that equitable access to the elephant resource implies that beneficiaries have the right to be consulted in decision-making concerning access to that resource • recognize that indigenous people have vested rights over the management of their natural resources, including elephants
The vesting of ownership of wildlife in the State, unless otherwise provided for in this Act	• elephants in general are owned by the State but can be owned by parties other than the State through provisions in this Bill
The devolving of authority over the use of wildlife to the appropriate level of society that ensure sustainable use of wildlife and effective conservation of biodiversity and ecosystems	• this is a policy principle that authority over the use of wildlife should be devolved to the appropriate level of society which METF has recognized to be communal conservancies and freehold landowners. Through this Bill, people, in recognition that the people that live with wildlife and have the greatest ability to displace such wildlife and/or are detrimentally impacted by them, should have the authority over the use of such wildlife
The sharing of responsibilities of management of shared resources between the State, communities, and private landowners	• this is a further policy principle that underlines that elephant conservation is everyone's business, i.e. a broad societal responsibility, and that an enabling environment is needed for those holding such responsibilities to work together

Importantly, sustainable use of renewable wildlife resources, adaptive management and metapopulation management are in addition three important general conservation management approaches that METF supports, and these are also reflected in this strategy.

The management strategy is structured around the greatest threats and management challenges regarding elephants in Namibia as outlined in Section 1.3. which are covered in detail in the Overview document and summarized in the following sections.

2.1 Landscape connectivity

Maintaining and improving landscape connectivity is one of the greatest conservation challenges today. Changes in land use and settlement patterns threaten to permanently fragment elephant habitat and cause the division of the elephant population of Namibia and neighbouring countries into isolated sub-populations that are more vulnerable to variation in rainfall and other factors and are more prone to overutilization of their available and more limited resources.

Securing landscape connectivity is also absolutely essential to mitigate the effects of serious droughts and climate change in general, given that Namibia is one of the most vulnerable countries in the world to climate change and is widely believed to already be affected by it. The Namib Desert biome of Namibia, including the northern Namib Desert part of the Kunene and Erongo Regions as well as the escarpment zone that lies to the east of the Namib Desert biome, is likely to be the most severely affected part of Namibia. These arid to hyper-arid areas form the edge of the distribution range of elephants and the limits to what elephants can tolerate.

The limiting factors that operate in these areas such as sparse surface water supplies, erratic rainfall and low primary production, which account for the low elephant densities, large home ranges, high juvenile mortality and uneven age structures, are predicted to become more severe as the result of climate change. The elephants occupying these areas are already under pressure from competition for resources with people and livestock and the increasing human-elephant conflicts that ensue from that. As seen in Chapter 1 of the Review document, the north-western elephant populations have persisted and recovered from a very low population size only four to five decades ago, because of their great mobility and familiarity with the location of distant water sources which amount to a collective cultural knowledge of their habitat and natural resources.

Other elephant populations are also vulnerable to the loss of landscape connectivity. The Etosha NP population is currently the least threatened of all the elephants in Namibia, but the most important threat to this population is undoubtedly its increasing isolation and the disruption of connectivity with the surrounding landscapes and other elephant populations. Etosha NP has in the past served as an important drought refuge for elephants from further west, a role that will increase in importance with climate change. Further, the Etosha elephant population is the source of elephants for the northern conservancies and the viability of these conservancies will be eroded if elephant dispersal into these areas can no longer take place. This may lead to further changes in land use in this part of Namibia on the border of Etosha NP and escalate human-elephant conflicts. Importantly, climate change effects may aggravate the loss of connectivity in several ways. Shrader *et al.* (2010) predict that elephants in enclosed areas such as Etosha NP will be the first elephant populations to be impacted by climate change.

Several studies of elephant movements in Angola, Botswana, Namibia and Zambia have shown the severe extent of the compartmentalization of the western KAZA TFCA elephant population, in Namibia and Botswana in particular, which should be a priority for the two countries to resolve. This compartmentalization is caused by two sets of veterinary cordon fences (see Section 1.3.3 in the Review document). However, important movement corridors are still functional or partially functional and should be secured and improved as far as possible, as a very high priority.

Elephants generally avoid human presence. Settlement in movement corridors in the Zambezi Region especially pose a major threat as well as intensification of agriculture and settlement in the State Forest Reserve which is part of a major but narrow movement corridor area connecting eastern Ngamiland in Botswana through Mudumu NP and Sobbe Conservancy to Sioma Ngwezi NP in Zambia.

Land use decisions by Government can have major consequences for elephants, e.g. the Khaudum NP population has effectively lost its wet season dispersal area west of the park, unless a form of community-based conservation or mixed agriculture and wildlife land use can be established there in collaboration with the small scale commercial farmers in this area. A very vulnerable area is the land south of the B8 road in the Wildlife Management Zone of Bwabwata NP which creates an important link between the

three core areas of the park and beyond to Angola, Botswana and Zambia which makes it very important to effectively implement the management plan for this park and the land use and development plan for its Managed Resource Use and Wildlife Management Zones to prevent uncontrolled human settlement in this area. Elephants already avoid the Managed Resource Use Zone (north of the B8 road) because of the human settlement and the vehicle traffic on the road, and no settlement whatsoever should be allowed in the area south of the road (i.e. the Wildlife Management Zone) or in undesignated places north of the road (i.e. the Managed Resource Use Zone).

A further consideration is the source-sink concept which is held out to be the only long-term solution for the increasing elephant population and local over-concentrations of elephants in the KAZA TFCA (Van Aarde *et al.* 2006, Van Aarde & Jackson, 2007). This is based on the premise that ***“factors that cause locally high numbers are induced by people and include water supplementation, fencing and the reduction and fragmentation of landscapes that detract from more natural movements of elephants”*** (Van Aarde & Jackson, 2007). It builds on the theory of metapopulation management which relies on dispersal from higher density ‘source’ areas to lower density or vacant habitat ‘sink’ areas. ***“Metapopulation stability is achieved by spatial discontinuities in a population imposed by landscape heterogeneity” and “Local populations could fluctuate in numbers while the sum total of numbers across the region will remain relatively stable”*** (Van Aarde & Jackson, 2007). Further, mosaics of landscapes that surround national parks and the KAZA TFCA ‘mega park’ provide opportunities to defragment the conservation landscape and decompress elephant populations (paraphrased from Van Aarde *et al.* 2006).

This is indeed why the KAZA TFCA was established. Dispersal of elephants from high density areas in Botswana and Namibia to lower density or vacant areas in Angola and Zambia might already be on the increase, although current cross border movements could also be described as wet season dispersals and dry season contractions (noting that Purdon *et al.* (2018) considers such movements as migrations or partial migrations). The source-sink process does indeed hold great promise for long term management of the largest remaining elephant population in Africa but it will only work if landscape connectivity is maintained, particularly at specific ‘choke’ points such as the Kavango River and Kwando River movement routes and the narrow corridor from eastern Ngamiland in Botswana through Mudumu NP and Sobbe Conservancy to Sioma Ngwezi NP in Zambia. On smaller scale, the source-sink concept also applies or can be made to apply to protected areas elsewhere in Namibia and the conservancies or farming areas that border on them.

It is thus essential to actively maintain and strengthen landscape connectivity to enable elephants to respond to variation in important parameters in their environment such as rainfall, availability and quality of drinking water, quality and quantity of vegetation, incidence and extent of fire, presence of other species including human settlement and disturbance – including illegal killing - and also prevent that elephant densities increase in protected areas or other parts of their range and cause local overutilization of vegetation and other biodiversity impacts.

Greatest threats and management challenges regarding elephants in Namibia	Essential conservation and management outcomes for elephants in Namibia
Strategic Objective: To secure and increase landscape connectivity	
Loss of landscape connectivity	• Elephant movement corridors are functioning (as the highest priority for the long-term conservation of elephants in Namibia and the KAZA TFCA) • The removal of the southern boundary fence of Bwabwata NP has been negotiated with Botswana • The opening of the fence between Khaudum NP and Ngamiland, Botswana has been negotiated • Important elephant movement corridors have been mapped, demarcated and are managed to ensure access by elephants • MEFT actively participates in land use planning and ensures compliance with the Environmental Management Act (Act 7 of 2007) and the Protected Areas and Wildlife Management Act (once promulgated) to minimize impacts on landscape connectivity • MAWLR, regional land boards and traditional authorities recognize the importance of preventing settlement, agricultural projects, artificial water provisioning and the granting of land rights over core wildlife areas and movement corridors • Communal conservancies have realigned their conservancy zonation to enhance landscape connectivity • With support from MEFT, communal conservancies are taking action against unlawful settlement in core wildlife areas and movement corridors • Critically important elephant movement corridors have been declared as Landscapes of Special Conservation Importance • A programme for Payment for Ecosystem Services and Wildlife Credits has been developed to safeguard important elephant movement corridors

Strategies

1. MEFT to lead the process in Namibia of implementing Objective 1 of the KAZA TFCA Framework for Elephant Conservation and Management which is to *facilitate the development of an integrated land use planning process to secure long-term ecosystem integrity and connectivity of KAZA's elephant population* and associated short- and medium term activities (see Annex 3 in the Review document)
2. Active participation by MEFT, conservancies and other conservation partners in integrated land use planning, formulation of rural development policies and environmental impact assessments (EIAs) for proposed agricultural investments, infrastructure development and mining in the elephant distribution range to ensure that the principles of environmental management in Section 3 of the Environmental Management Act (Act 7 of 2007) and the principles of conservation in Section 3 of the Protected Areas and Wildlife Management Bill (once enacted) are applied to secure long-term ecosystem integrity and landscape connectivity in the elephant distribution range.

3. Assess the integrity, land use and management of important movement corridors in terms of current land management practices, land tenure, existing and planned infrastructure as the basis for engaging Communal Conservancies, Traditional Authorities, Regional Councils etc. to ensure long-term access by elephants to such corridors and maintaining or improving their integrity and functioning, and where appropriate, establish agreements with the relevant landholders in terms of Section 5 of the Protected Areas and Wildlife Management Bill (once enacted) concerning the future management of such corridors.
4. Raise and maintain public awareness of the importance of preventing obstruction of important elephant movement corridors, by ensuring such corridors are identified, mapped, named and demarcated (signposted at important access points) within the first two years of the implementation of this plan and regularly updated as more information comes to light on elephant movements.
5. Critically important elephant movement corridors outside protected areas to be declared as Landscapes of Special Conservation Importance or any other category of protected areas as the situation may demand, to prevent that such very important corridors are blocked.
6. MEFT to engage with MAWLR to review the functioning of the Huab and Ugab River basins and upstream damming to ensure that the small but important wetland areas and springs downstream in conservancy areas are restored and that elephant distribution and movements in these river catchments are not impeded.
7. MEFT to engage with MAWLR, regional land boards and traditional authorities on the importance of preventing settlement, agricultural projects, artificial water provisioning and the granting of land rights over core wildlife areas and movement corridors
8. MEFT to ensure the permanent removal of cattle from the Managed Resource Use Zone of Bwabwata NP as the basis for engagement with the Botswana government on the removal of the fence between Bwabwata NP and Botswana and thus implement Objective 2 ***Maintain and manage KAZA's elephants as one contiguous population*** and associated short and medium term activities of the KAZA TFCA Framework for Elephant Conservation and Management.
9. Negotiate the removal of the fences or the breaching⁴ of such fences in strategic places between Khaudum NP and Ngamiland in Botswana to enable elephant dispersal in response to rainfall, fire and disturbance, and thus implement Objective 2 ***Maintain and manage KAZA's elephants as one contiguous population*** and associated short and medium term activities of the KAZA TFCA Framework for Elephant Conservation and Management. Where fences are removed or breached, monitoring should be done of elephant movements, as well as other wildlife, e.g. through the use of telemetry collars and camera traps.
10. Remove fences or breach fences in strategic places along the western and north-western boundaries of Etosha NP to enable elephant dispersal to other areas, seasonally or permanently. The opening of sections of the western boundary fence of Etosha NP at the onset of the wet season until the end of the wet season should be investigated in collaboration with park neighbours. If this is feasible, monitor elephant usage of such areas. Where fences are removed or breached,

4 Breaching in this sense means the opening of gaps in the fence to allow elephant movements in certain areas. Elephants elsewhere have shown the ability to get used to such gaps over time. Some experimentation will be necessary regarding the ideal width of such gaps and how they could best be constructed and monitored.

monitoring should be done of elephant movements, as well as other wildlife, e.g. through the use of telemetry collars and camera traps.

11. During severe multiyear droughts remove fences or breach fences in strategic places along the western and north-western boundaries of Etosha NP to enable the park to serve as a drought refuge for elephants from the north-western Kunene and Omusati Regions.
12. MEFT to actively support communal conservancies when illegal settlement occurs that threatens the integrity of core wildlife areas and movement corridors.
13. MEFT and conservancy support organizations to assist conservancies to where possible realign their conservancy zonation to enhance landscape connectivity.
14. MEFT to encourage and support conservancies to establish more integrated management of adjacent wildlife core areas including through the proclamation of such areas as Landscapes of Special Conservation Importance and managed along the people's park concept.
15. A programme for Payment for Ecosystem Services and Wildlife Credits should be developed by MEFT and CCFN in collaboration with other partners to safeguard important elephant movement corridors outside protected areas from settlement and agricultural use.
16. MEFT should use regional Elephant Management Units with regional management structures for ongoing consultation, collective decision-making, and collaborative management to mitigate elephant impacts and improve co-existence with elephants.



Figure 2 The lower Huab River and its dry riverbed fringe vegetation, an example of the extreme aridity of the habitat of the elephants in the North West and the important east-west movement corridors

2.2 Illegal killing

Land use pressure, range and habitat loss, human elephant conflict, and illegal killing for both meat and ivory all pose threats to the long-term survival of elephant populations across Africa. However, by far the most acute threat facing African elephants in most parts of the elephant range arises from large scale illegal killing for ivory and the illegal ivory trade (SADC 2015).

Illegal killing of elephants sporadically occurs in Namibia, principally in the Zambezi Region (see Chapter 6 of the Overview document). The illegal killing of elephants has not been a significant threat to the survival of elephants in the North East of Namibia but has undoubtedly resulted in a number of very negative consequences such as: economic losses, impacts on other conservation work because of the reallocation of resources to combat illegal killing, the injuries and the loss of human lives, the skewing⁵ of the sex ratio of the elephant population, overconcentration⁶ of large groups of elephants in safe areas with resulting impacts on vegetation, restrictions on veld food collection by the residents of Bwabwata NP because of anti-poaching operations and the harming of the income-earning potential of conservancies from conservation hunting of elephants due to the removal of adult males. The threat of illegal killing for ivory remains a very serious risk for the entire KAZA TFCA elephant population and poaching effort may shift from one part of the population to another or one country to the other based on any number of factors.

Combatting illegal killing through intensified and effective anti-poaching and law enforcement will reduce the threat against elephants and the prevention of other negative impacts such as skewing of sex ratios, changing elephant behaviour, or causing overconcentration in safer areas. Combatting illegal killing will further reduce the level of criminality and illegality in protected areas and other parts of the elephant distribution range and the co-option of ordinary people into serious crime as well as the reduction of transboundary organized criminal activity.

Greatest threats and management challenges regarding elephants in Namibia	Essential conservation and management outcomes for elephants in Namibia
Strategic Objective: To protect elephants from illegal killing	
Ongoing illegal killing of elephants	• Illegal killing of elephants has been reduced and managed throughout the distribution range of elephants • Small and vulnerable sub-populations or groups are not impacted by illegal killing • Security plans⁷ have been drafted and are kept updated for all protected areas and surrounding land in the elephant distribution range and are implemented

Strategies

1. Effective implementation of the Revised National Strategy on Wildlife Protection and Law Enforcement of 2020 which provides for the combatting of illegal killing through intensified and effective anti-poaching and law enforcement and greater collaboration amongst law enforcement agencies in Namibia.

5 It can be reasonably assumed that illegal killing of elephants is selective to some extent. Unfortunately, there are no comprehensive data available to prove such selectiveness but see Error! Reference source not found.

6 Such overconcentration has been recorded in the past particularly along the Kwando River, evident from increases in average group size and the forming of large aggregations – of 500 or more – in certain areas during the height of illegal killing episodes. Elephants avoid areas where there is disturbance by humans, including illegal killing.

7 Security plans are sensitive and confidential documents prepared by MEFT and other partners in government and will contain detailed measures of intervention and prevention of crime

2. Effective implementation of the SADC Law Enforcement and Anti-Poaching Strategy 2015-2020 (SADC 2015) and subsequent iterations which emphasizes the need for and facilitates greater cross-border cooperation in wildlife protection and law enforcement.
3. Security plans to be drafted in the first two years of the implementation period of this plan and updated thereafter for all protected areas and surrounding land in the elephant distribution range.
4. Effective implementation of park-and-neighbouring area security plans.
5. Support targeted enforcement and crime prevention campaigns such as Operation Blue Rhino to enhance the efficiency of law enforcement.
6. Support and strengthen Namibia's community-based natural resource management programme to increase cooperation and participation from rural communities and their traditional leaders in the prevention and detection of wildlife crime.
7. Appointment of honorary conservation officers in vulnerable parts of the elephant range in terms of Section 18 of the Protected Areas and Wildlife Management Bill (once enacted) to assist MEFT by reporting suspicious activities.
8. Ongoing public awareness raising and education through e.g. the publication of wildlife crime statistics.
9. MEFT to support programmes and encourage partnerships with communal conservancies and NGOs to strengthen the monitoring of the Hoanib-Ombonde and Hoarusib elephants, increase surveillance, deterrence and law enforcement, mitigate human-elephant conflicts in the catchments and prevent obstruction of important movement routes.
10. MEFT to strengthen cooperation with the Kyaramacan Association in Bwabwata NP in anti-poaching and anti-trafficking work in this park.
11. Tourism and hunting operators in conservancies should provide logistical and material support to conservancies to sustain and improve game guard patrolling.
12. MEFT in conservancies should to the extent possible conduct joint patrolling with conservancy game guards in vulnerable areas.





2.3 Elephant impacts on other components of biodiversity and ecosystem processes and functioning

There is a large body of literature on the impacts of elephants on the structure and composition of woodlands and riverine forests as well as other biodiversity (see e.g. Cumming *et al.* 1997, De Beer *et al.* 2006, Hayward & Zawadzka 2010, Tripathi *et al.* 2019 but noting that there are dozens of publications on this subject). Such impacts formed the basis for management interventions primarily in the 1970s and 1980s such as culling to reduce elephant numbers in protected areas. The issue of high elephant densities resulting in negative or irreversible impacts on other components of biodiversity and ecosystem processes and functioning has been controversial ever since, as well as the need for management intervention, culling in particular. The issue has become further clouded by positions taken in CITES on the need for management interventions to control elephant numbers and consequently the sustainable use of elephants though trade in ivory to finance elephant management.

Other factors such as fire, water provisioning, fencing and human impacts have been elevated as reasons for changes in vegetation but actual declines in biodiversity due to elephants have been disputed (see e.g. Skarpe *et al.* 2004, Guldemonnd & van Aarde 2008, Valeix *et al.* 2011, Guldemonnd *et al.* 2017, Nichols *et al.* 2017). The debate is far from over as others (see e.g. De Beer *et al.* 2006, Hayward & Zawadzka 2010, Tripathi *et al.* 2019) have found that there are indeed biodiversity losses that can be attributed to high elephant densities.

It has also been suggested that the woodlands and forests in southern Africa developed in a period of low elephant densities due to the severe declines in elephant populations caused by 19th century ivory trade as well as the rinderpest pandemic of the 1890s that severely reduced wild ungulates along with cattle. There is a weakness in this argument, as mature stands of slow-growing trees such as baobab (*Adansonia digitata*) and jackal berry (*Diospyros mespiliformis*) in north-eastern Namibia and ana tree (*Faidherbia albida*), African mangosteen (*Garcinia livingstonei*), false mopane (*Guibourtia coleosperma*) and camelthorn (*Acacia erioloba*) in north-western Namibia are almost certainly much older than 130 years. It has further been suggested that elephants can actually increase biodiversity, and that it would be inappropriate to maintain savannah or woodland ecosystems in a particular state (see e.g. Skarpe *et al.* 2004, Guldemon *et al.* 2017) versus allowing both tree species and elephants to undergo long-term cycles in abundance in large open areas of elephant range.

Reducing factors that cause high elephant densities in protected areas should be the preferred response to prevent impacts on other species. From the experience in Khaudum NP, Hwange NP and Kruger NP, the artificial provisioning of water seems to be the most important cause of high elephant densities in protected areas but factors such as high frequencies of fire, unregulated human settlement or road traffic as in Bwabwata NP or illegal killing causing local over-concentration are also important.

It can be noted that in elephant management plans for neighbouring countries (Botswana, Zimbabwe and Zambia), the potential negative impact of elephants on other biodiversity is recognized as a threat and that the option of management intervention is retained. In Kruger NP, however, management of elephants by reducing numbers through culling was abandoned in favour of reducing waterholes and allowing free movements of elephants in and out of the park. In the draft elephant management plan of Botswana, a specific trade-off was made e.g. in Chobe NP where there are considerable impacts of elephants that “the state of the riparian woodlands is considered less important than ... tourism”; and that in Moremi Game Reserve “elephant reduction to mitigate negative impacts on vegetation would not be acceptable and should be accepted as inevitable”.

This raises the question of how to deal with elephant impacts on vegetation or other species through this management plan. There are two cases in Namibia to consider further, i.e. elephants in Etosha NP and elephants in North East Namibia (primarily Bwabwata NP, Khaudum NP and Mudumu NP) as there are no current indications that elephants in the North West of Namibia have any significant effects on other species.

Etosha NP

Elephants have had a marked effect on the structure of the woody vegetation of Etosha NP, but primarily around waterholes (De Villiers & Kok 1988, Lindeque 1988, de Beer *et al.* 2006, Harris *et al.* 2008), see e.g. Figure 3 and Figure 4, and some locally or regionally rare species may have been severely reduced. The comparatively low density of elephants in Etosha NP and the role of mortality in dampening population growth could mean that there is a low risk of further significant habitat modification (away from waterholes at least). Importantly, climate change effects such as lower rainfall and increased frequency of drought may aggravate habitat degradation (Shrader *et al.* 2010).

What may have been overlooked in recent studies that focussed on elephant impacts around waterholes is the decline of locally rare species such as *Sclerocarya birrea*, *Moringa ovalifolia*, *Kirkia acuminata* and *Erythrina decora* that occur south of Halali and in the dolomite hills on the southern boundary of the park. Once such species have been reduced to very low numbers it is unlikely that an overall reduction of the numbers of elephants could prevent their disappearance, as a few elephants in the right place at the right time could destroy all the remaining individuals.

The same applies to the few large specimens of *Acacia tortilis* on the plains west and southwest of the Etosha Pan or *Combretum imberbe* on the fringe of the plains or *Albizia anthelmintica* in the west of the park. In the past, the largest part of the isolated population of *Moringa ovalifolia* at *Sprokieswoud* was fenced in to prevent further elephant impacts at a time when water was supplied at nearby Grünewald in the 1970s. It is doubtful that other more dispersed tree species can be similarly treated or that it would be desirable to do so, except to protect large iconic specimens such as the single large *Combretum imberbe* tree at Okaukuejo waterhole that was protected in the 1980s and which is now the only large tree at this once scenic waterhole (Figure 4). Remnants of

around 50 other sizeable trees are still visible. The stone pack from the 1980s should be replenished to ensure the protection of this iconic tree.



Figure 3 Klein Namutoni spring, showing a completely denuded area in what used to be a *Combretum imberbe*-*Acacia tortilis* woodland of several hundred meters in diameter around the spring.



Figure 4 Okaukuejo waterhole, formerly an attractive and well-wooded spring but supplemented from boreholes since the 1980s leaving a single leadwood tree (*Combretum imberbe*) standing. Calcrete rocks were packed around its stem in the 1980s.

The eastern half of Etosha NP has a considerable number of natural springs which has nevertheless been supplemented with boreholes (e.g. Kalkheuwel, Dungaries, Halali, Nebrownii, Aus, Olifantsbad, Gemsbokvlakte). The North East Sandveld north of Namutoni and western Etosha NP are entirely supplied by boreholes. More and more boreholes have been developed in the past 30 years in the park, without any significant closure of boreholes since the 1970-1980s

(e.g. Adamax, Grünewald, Olifantstrek, Elandsvlakte, Leeubron, Natco), see Berry (1997). The current focus on rhinoceros conservation in this park will make it very difficult to close any borehole entirely to reduce elephant density, but reduction in water supply should be considered.

North East Namibia

In the North East parks, elephants occur at very high densities (see Section 1.2.1 of the Overview document) which normally trigger conversion of forests or woodlands to scrubland and grassland. Elephants might be approaching density thresholds – if sustained over longer periods - where they can impact their habitat or other wildlife at a scale where they could threaten the biodiversity of the parks in particular. Cumming *et al.* 1997 state that elephant densities as low as 0.3/km² can cause biodiversity losses.

Of particular concern is their potential impact on thinning the riparian forest or preventing riparian forest regeneration – which could be manifesting in the Mahango Core Area of Bwabwata NP. The likely problem that will occur is the reduction of very large mature trees used by large raptors, owls and ground hornbills for nesting. The most important factor affecting the North East Kalahari woodlands at present is nevertheless fire occurring at frequencies that are very harmful to woodland structure and on certain key species such as *Pterocarpus angolensis* and *Baikiaea plurijuga*. The Kwando riverine forest in Mudumu NP has already been severely degraded, probably due a combination of elephants and fire. No detailed study has yet been done on the impacts by elephants on the vegetation of the north-eastern parks, but the risks remain that elephants could change the structure of the riverine woodlands in Bwabwata NP and Khaudum NP (as they probably have already done in Mudumu NP).

As in the case of *Moringa ovalifolia* in Etosha NP, the maintenance of mature specimens of the baobab *Adansonia digitata* presents a challenge in western Bwabwata NP, but individual trees can be protected and may recover (Figure 5). Although largely unscathed, the large baobabs at Kwetchi in the Mahango Core Area are vulnerable and can be destroyed in future. The same applies to the large baobabs in Nyae Nyae Conservancy. Research is needed on the age structure and recruitment of slow growing hardwood species and rare species such as baobab in especially the riverine forests of the north-eastern parks under variable regimes of fire frequency and elephant density.



Figure 5 Baobab tree in the Buffalo Core Area of Bwabwata NP with surrounding stone pack.
The damage to the tree was done before the stone pack was put in place

Apart from Khaudum NP (and Mangetti NP) where water is primarily provided through boreholes, the other north-eastern parks have very few boreholes, which limits the possibility of reducing elephant density through rotation of water supplies. Elephant densities in these parks are more likely to be affected by landscape connectivity and the incidence of fire and human presence or disturbance by humans. The exception is Khaudum NP but it is not recommended at this stage to reduce water provisioning in Khaudum NP through rotation or closures until landscape connectivity has been improved through opening the border fence with Botswana.

Greatest threats and management challenges regarding elephants in Namibia	Essential conservation and management outcomes for elephants in Namibia
Strategic Objective: To prevent long-term negative and possibly irreversible impacts by elephants on other components of biodiversity and ecosystem processes and functioning	
Loss of rare species and habitats	• Further thinning of the riparian forests of the Kavango and Kwando Rivers has been prevented through improved fire management and the restoration of elephant movements between Botswana and Namibia to reduce the cumulative impact of fire and elephants on the riparian forests • The impact of high-density elephant populations on other species such as bushbuck, tsessebe, baobab and the riparian tree species has been evaluated • Iconic specimens of large trees in Etosha NP and baobabs in the north-eastern parks and Nyae Nyae Conservancy are protected • Vegetation structure and composition in all areas with high elephant densities are monitored
Build-up of unsustainably high elephant densities	• Landscape connectivity has been improved, allowing elephant populations to move in response to rainfall, water and food availability, fire and other disturbance • Artificial water provisioning has been reduced in specific areas and artificial waterpoints are rotated in protected areas with elephants • The fire management strategy for Namibia's protected areas is effectively implemented to reduce large scale late dry season fires in protected areas to prevent localized overconcentration of elephants in unburnt areas • Disturbance and deterrence from unplanned human settlement in Bwabwata NP and road traffic through Bwabwata NP and Mudumu NP have been reduced to prevent localized overconcentration of elephants in undisturbed areas • Illegal killing of elephants has been minimized to prevent localized overconcentration of elephants in safe areas • Cooperation agreements have been established with protected area neighbours to allow the free movements of elephants where possible • Other ways of reducing overconcentration of elephants (culling, translocation) are used as means of last resort



Strategies

1. Take measures outlined in the strategies to maintain and enhance landscape connectivity (see Section 1.3 in Overview document) to enable elephant populations to move in response to rainfall, water and food availability, fire and other disturbance and to prevent further thinning of the riparian forests of the Kavango and Kwando Rivers through to prevent localized overconcentration of elephants.
2. Rotate artificial waterpoints in Etosha NP and Khaudum NP on a two year cycle⁸ to prevent continuous browsing pressure by elephants. This will require an assessment of the impact of such rotation on the rhinoceros population of Etosha NP and for Khaudum NP, the consequences of re-establishing movements between the park and Ngamiland in Botswana.
3. No new borehole should be opened in any protected area in the elephant distribution range without closing another.
4. Implement the fire management strategy for Namibia's protected areas (MET 2016) to reduce large scale late dry season fires in protected areas to prevent localized overconcentration of elephants in unburnt areas.
5. Remove fences or breach fences in strategic places along the western and north-western boundaries of Etosha NP to enable elephant dispersal to other areas, seasonally or permanently. The opening of sections of the western boundary fence of Etosha NP at the onset of the wet season until the end of the wet season should be investigated in collaboration with park neighbours. If this is feasible, monitor elephant usage of such areas.

6. Prevent disturbance and deterrence of elephants from unplanned human settlement in Bwabwata NP and road traffic through Bwabwata NP and Mudumu NP to prevent localized overconcentration of elephants in undisturbed areas.
7. Minimize illegal killing of elephants to prevent localized overconcentration of elephants in safe areas.
8. Establish cooperation agreements with protected area neighbours to allow the free movements of elephants where possible. This will need to be limited to areas of low security risk and may need to include cattle grids or similar techniques to prevent other wildlife from crossing. Such agreements should include the following elements:
 - a. Undertakings of both Parties to act in the best interest of conservation by enabling wildlife movements in response to natural environmental factors and to prevent the accidental killing of wildlife in fences
 - b. Procedures regarding the deliberate opening of gaps in border fencing
 - c. Limitations on the construction of any new artificial watering point within 5 km of any gaps in border fencing, artificial feeding or the use of licks and salt to attract game
 - d. Procedures regarding the monitoring of wildlife movements through such gaps
 - e. Joint wildlife monitoring of the larger park and neighbouring land complex
 - f. Cooperation on the prevention of illegal killing of wildlife
 - g. No liability to MEFT for any damage that elephants may cause
 - h. No closing of previously opened fences by either Party without prior consultation with the other Party
 - i. Reporting to MEFT of any elephant mortality within 24h
 - j. Removal and storage or disposal of loose wiring to prevent creating a hazard for wildlife
9. MEFT should encourage freehold landholders to acquire elephants within Namibia by making intact family elephant groups and young males available through sales or by transferring the ownership of elephants to appropriate local structures on a non-commercial basis.
10. Individual specimens of sensitive tree species such as baobab in areas used by tourists and elsewhere should be protected against elephants by packing sharp and uneven rocks around the base of such trees to prevent elephants from reaching such trees (but also see Figure 6 showing a concrete and steel device developed to prevent elephant access in Botswana).
11. Promote research on the potential impact of elephants on other biodiversity, especially in areas with high elephant densities such as the protected areas in the North East. Research is also needed on age structure and recruitment of slow growing hardwood species and baobab in especially the riverine forests of the north-eastern parks under variable regimes of fire frequency and elephant density.
12. Monitoring of vegetation structure and composition is needed in all areas with high elephant densities, especially the Kwando and Okavango riverine forests and the Khaudum and Nyae Nyae woodlands.

13. Where there is substantial evidence that elephants are impacting other species after implementation of the strategies above, other ways of reducing overconcentration of elephants (culling, translocation⁹) should be applied as a means of last resort.



Figure 6 Concrete and steel device to prevent elephant access
(Source: photo distributed on social media without copyright)



Figure 7 A small waterhole is enough to support small numbers of adult males, family groups are likely to avoid such waterholes (Photo: A. Cilliers)

9 Contraception has been shown to be possible but is prohibitively expensive and has major unwanted side effects and behavioural changes in elephants (van Aarde & Jackson 2007). Although research is continuing (e.g. Lueders *et al.* 2017), this intervention will perhaps only ever have application in small confined populations – once ethical considerations can be overcome. This approach is not further considered in this management plan.

2.4 Human elephant conflict management

Managing human-elephant conflicts remains a great challenge throughout the elephant distribution range in Africa (see Chapter 5 in the Overview document). Little research has been done on human-elephant conflict in Namibia (O’Connell-Rodwell *et al.* 2000, Matson 2006, Schnegg & Kiaka 2018, Sutton undated) but there are clearly three situations that stand out.

Conflicts linked to access to water, small gardens, food and forage storing and damage to infrastructure in the North West

In North-western Namibia, the principal conflicts occur around access to water during the dry season and the consumption of water by elephants that was meant to be available to livestock. There is also a degree of conflict in the North West around elephant damage to small home gardens (e.g. in southern Kunene Region) or crop fields, e.g. in the upper Hoarusib catchment. Farmers in the North West in particular are still largely dependent on expensive diesel-run engines for pumping water – water which elephants consume in large quantities, and which people cannot afford. There is a real opportunity there to convert such water pumps to solar pumps to reduce this burden. Some communities, e.g. in the upper Hoarusib River, have small crop fields and vegetable gardens in addition to livestock, which result in considerable conflict with elephants and possibly some retaliatory killing. A form of fencing is needed to protect crops in such situations.

Conflicts linked to crop production in the North Central and the North East

In north-central and north-eastern Namibia, conflicts primarily occur around elephant damage to crop fields towards the end of the wet season which coincides with the cereal crop harvest time. Elephant numbers have increased and distribution has expanded, while at the same time human settlements and agriculture have expanded, often into core wildlife areas or movement corridors. Newly settled farmers west of Khaudum NP can be expected to experience increasing conflicts, involving cattle production and potentially some crop fields. In Kavango West and East Regions, conflicts around green scheme irrigation projects are increasing and plans are afoot to expand veterinary control fences and transportation infrastructure.

Conflicts on commercial farmland

Elephant presence on commercial farms that are primarily involved in livestock production has significantly increased in the past few five to 10 years, primarily in the Kamanjab-Otjikondo areas, Omatjete and Kalkveld areas, and north-eastern Grootfontein district and Mangetti area. Elephants occur in these areas throughout the year and do extensive damage to fences, gates, water installations and disrupt livestock production in various ways.

In Namibia, human-elephant conflicts are addressed through the implementation of the Revised National Policy on Human Wildlife Conflict Management 2018-2027 (MET 2018) with its integrated implementation action plan. This policy provides a comprehensive and integrated approach. The management response to the three different situations has accordingly been as outlined below:

North-western communal conservancies

- MEFT supports community-based mechanisms to mitigate conflict such as conservancy self-reliance schemes where income earned from wildlife-based tourism and conservation hunting (supplemented by grants from MEFT) is used to offset elephant damage.
- MEFT, conservancies and NGOs have collaborated to protect water installations with stacked or built stone or brick walls and/or to provide additional water for elephants away from settlements, using solar pumps.
- MEFT allocates hunting quotas to conservancies and occasionally also resorts to problem elephant control (which is highly undesirable in small populations and may result in skewed sex ratios and reduced potential to earn revenue from elephants through conservation hunting).
- MEFT responds to conflict situations by scaring elephants away; and NGOs and conservancies have also used a range of other techniques with variable success.
- In the rare instance of the loss of human life, offset payments are made through the HWCSRS.

North-central and north-eastern Namibia

- MEFT supports community-based mechanisms to mitigate conflict such as conservancy self-reliance schemes where income earned from wildlife-based tourism and conservation hunting (supplemented by grants from MEFT) is used to offset elephant damage;
- MEFT encourages traditional methods of crop protection as well as the growing of chili peppers and burning elephant dung laced with chili peppers.
- MEFT allocates hunting quotas to conservancies and occasionally also resorts to problem elephant control;
- MEFT responds to conflict situations by scaring elephants away and NGOs and conservancies have also used a range of other techniques with variable success.
- MEFT has started to mitigate losses caused by elephants by donating grain storage bins (to reduce post-harvest losses).
- In the rare instance of the loss of human life, offset payments are made through the HWCSRS.

Other land

- MEFT issues hunting permits on condition that revenues from such hunting must be applied to offset the damage caused by elephants.
- MEFT occasionally resorts to problem elephant control.
- MEFT responds to conflict situations by scaring elephants away.
- MEFT has successfully kept elephants out of the Divundu Correctional Services farm by constructing a deep trench around the farm.
- MEFT has more recently also resorted to translocating elephants to prevent conflicts.
- In the rare instance of the loss of human life, offset payments are made through the HWCSRS.

As with all human-elephant conflict mitigation responses, there is a great deal of variation in effectiveness amongst cases and localities. Major grievances remain, evident especially from the public consultations held for this plan (Chapter 2 in the Overview document), which nevertheless also identified important opportunities that are addressed in this plan.

Complete removal by destruction or translocation of elephants from certain areas or other means of keeping elephants separated from people was raised by several participants during the consultation process. This potential option is not readily compatible with the legal and policy framework of Namibia which in essence speaks to the maintenance of ecosystems, essential ecological processes and biological diversity and sustainable utilization of living natural resources. The Revised National Policy on Human Wildlife Conflict Management 2018-2027 (MET 2018) further states as a principle that ***“Wildlife is part of the natural environment that people depend on, and based on Article 95 (1) of the Constitution, must be maintained throughout the country as part of the sustainable development that the Government of Namibia is committed to pursue”***. If elephants are removed from one area there will not be grounds for refusing to remove other elephants.

Population reduction should nevertheless be considered in certain instances. Both culling and translocations are complicated and expensive options.

There are, in addition, fundamental systemic and unresolved threats to human-elephant conflict management:

- Inadequate revenues from community-based conservation is potentially the most serious threat as the basic tolerance and respect for elephants and other species of wildlife such as lions can be eroded if conservancy members do not see sufficient benefit from elephants or other wildlife. There are important challenges in this regard, i.e. the limited income from conservation hunting after the decline of wildlife because of the recent drought in the North West; the remoteness of some conservancies from the usual tourist routes and consequently a lack of tourism investment in some areas; and the lack of diversification of conservancy incomes. Conservancy incomes from elephants accrue to the whole conservancy but losses are seldom beyond the level of individual households. Mechanisms to offset losses suffered by individual farmers may not be adequate.
- MEFT and its predecessor institutions have argued for decades in CITES that the full economic value obtainable from elephants is necessary to create sufficient incentives for rural communities to co-exist with elephants. Estimates of the costs of losses caused by elephants in Namibia and the costs of installing infrastructure to prevent losses are certainly within the scope of income that can be earned from elephants just from trading in the ivory recovered from natural and management-related mortalities. Sustainable conservation and management of elephants in Namibia and effective mitigation of human elephant conflicts are therefore held ransom over animal rights fuelled unproven fears that a regulated legal trade in ivory will cause harm to other elephant populations.
- There is currently no support available to commercial farmers to deal with human-elephant conflict yet around 400 elephants occur permanently or frequently on commercial farms (around 60 in the Omatjete area, 200 in the Kamanjab area, up to 100 in the Mangetti and north-eastern Grootfontein area). Many instances involve resettled farmers and commercial farmers are generally heavily indebted and cannot sustain continuous repairs of damage. There are indications that some farms have become unusable or that production is scaled down to a part of a farm.
- Despite all previous efforts as evident from the public consultations held for this plan, there are still many rural communities who do not systematically use proven mitigation methods (especially chilli-based methods) and generally lack information about such methods and how the HWCSRS works. There are indications that there is very little chilli production in rural areas. There are major

misconceptions of the danger of electric fencing to people and livestock. MEFT field staff are further overwhelmed by responding to conflicts despite many resource constraints instead of focussing on preventative measures such as a) ensuring that all vulnerable people are informed of the correct use of mitigation methods and b) are indeed implementing them. Re-training of MEFT field staff (CBNRM wardens and regional services) as well as NGO field staff is necessary as well as setting up demonstration sites in every conservancy as the basis for improving wide community uptake. Such interventions will help to address the problem of high turnover on MEFT field staff and conservancy personnel.

Not all of these systemic problems may be possible to address through this plan but there are options that can be considered.

Greatest threats and management challenges regarding elephants in Namibia	Essential conservation and management outcomes for elephants in Namibia
Strategic Objective: To effectively mitigate human-elephant conflict	
Intolerance of elephants amongst human communities in the elephant distribution range	• Effective implementation of the Revised National Policy on Human Wildlife Conflict Management 2018-2027 and offset mechanisms for economic losses caused by elephant impacts in conservancies are reviewed, improved and supported • Rural communities and commercial farmers have been trained in mitigating elephant conflicts and understanding elephant behaviour • Elephant Management Units have been identified and are managed according to unit-specific management plans • Park entrance revenues are dedicated by Treasury and MEFT to mitigating human-elephant (and other wildlife) conflict, in line with the existing Cabinet approval and recommendations of the Second Land Conference • MEFT and conservation partners have assisted conservancies to convert all essential waterpoint infrastructure used by elephants to solar water supply systems to reduce conflicts over the consumption of water by elephants from diesel-powered pumps
Inadequate incentives for co-existence of humans and elephants	• Sustainable utilization of elephants for economic and cultural purposes is practiced • A programme for Payment For Ecosystem Services and Wildlife Credits has been developed in collaboration with other partners to safeguard important elephant movement corridors • MEFT actively supports programmes and encourages partnerships with others to strengthen rural livelihoods and to reduce dependency on a narrow range of economic activities and to equitably grow the wildlife economy • Cultural use of elephants, elephant meat and ivory is supported and facilitated

Greatest threats and management challenges regarding elephants in Namibia	Essential conservation and management outcomes for elephants in Namibia
	- Rural communities are fully involved as equal partners in decision-making concerning elephants and their management in recognition that co-management of elephants is needed by Government and affected rural communities, also in recognition of the rights of indigenous people and rural communities to determine how they use their natural resources - Local management structures have been established to mitigate elephant impacts and improve co-existence with elephants on commercial farmland - Economic use of elephants and elephant products is optimized
Retaliatory killing of elephants may be increasing	- Conservancy programmes of community game guards patrolling, and monitoring human-elephant conflict situations are supported and strengthened - Protection measures against elephants have been implemented at all key boreholes in the North West and clusters of crop fields and community gardens
Problem elephant control is ineffective	- Problem elephant control is done efficiently and speedily - Clear protocols are developed to fast-track decision-making on problem elephant control
Elephant hunting	Measures are taken to monitor elephant populations and the impacts of hunting and hunting is administered through adaptive management to ensure sustainability

Strategies

Cross-cutting throughout the elephant distribution range

Improving participatory management:

- Define local or regional Elephant Management Units as the basis for finer scale local action planning and implementation and to ensure more collaborative management of sub-national elephant populations or clusters.
- Prioritize the establishment of Elephant Management Units and working groups representing all primary stakeholders in high frequency conflict areas.

Improving information dissemination and extension:

- Address the information gap by preparing new information materials on mitigation, how and why elephants behave in certain ways and how to avoid conflicts, and how the HWCSRS works and aspects such as the advance payments to conservancies and replenishments thereof. Existing and very useful materials prepared by Desert Elephant Conservation, Elephant Human Relations Aid, Desert Lion Conservation and Tourism Supporting Conservation should be used and further adapted as required. This should be done in the first year of implementation of this plan.

- Re-train MEFT field staff (CBNRM wardens and regional services) as well as NGO field staff in proven mitigation methods in the first year of implementation of this plan.
- Set up demonstration sites in every conservancy, using the re-trained field staff as a collaborative effort of MEFT and partner organizations within the first two years of the implementation of this plan.
- MEFT to increase its visibility and presence in affected areas, train staff well in dealing with conflict cases and focus on proactive measures e.g. ensuring that mitigation methods are employed and maintained.

Improving the functioning of the HWCSRS:

- Review the HWCSRS and its implementation with the aim of:
 - o increasing offset payments for the loss of human life (possibly in the form of an endowment or insurance policy for the dependents of the deceased).
 - o including essential infrastructure such as houses and fences and small home gardens smaller than 0.25ha in the HWCSRS provided that such home gardens have been protected by chili powder and oil treatments or electric fencing.
 - o using in kind replacement of crop losses with replacement staple cereals products to be obtained from the nearest source (also to create a market for excess production in rural areas).
 - o streamlining and standardizing the inspection of damage caused by elephants and the processing of claims.
 - o providing that claims not inspected or processed within three months should automatically be paid.

Payment for Ecosystem Services and Wildlife Credits:

- Priority should be given to the development and expansion of Payment for Ecosystem Services and Wildlife Credits at an effective geographical scale. This may qualify for GEF support.

Collaring of elephants in conflict areas:

- Knowledge of elephant movements through collaring of elephants and sharing this information with local communities could be a game changer, but it is costly and limited by internet coverage. Internet and cellular telephone service providers should be asked to each 'adopt' an elephant conflict area as part of their social responsibilities to facilitate the sharing of such information.

Chilli production and use:

- Enhance the production and use of chili powder in Namibia for conflict mitigation throughout the elephant range by providing seed funding and training to conservancies and commercial farmers. This should extend to the making of chili bombs and chili powder and used engine oil mixtures for crop and fence protection.

Electric fencing:

- Establish pilot electric fences in high frequency conflict areas around clustered community gardens and crop fields to help build understanding and confidence in such fences and their maintenance requirements.
- Explore innovative use of electric fences, such as the use of single strand 2m high electric fence wires around crop fields or settlements that will not impede movements by people or livestock, as well as seasonal use of electric fences only in the second half of the crop-growing and harvest season with removal and storage for the rest of the year.
- Thoroughly explain the maintenance requirements for electric fences and encourage conservancies to appoint part time fence maintenance personnel.
- MEFT and field-based NGOs to provide backstopping.

Improving the effectiveness of mitigation:

- Diagnose the causes of failures to mitigate conflict effectively and advise on remedies.
- Share lessons learnt from the successful application of mitigation measures more widely.
- Encourage research on conflict mitigation strategies and additional mitigation measures, as well as monitoring of the effectiveness of mitigation measures. The involvement of Namibia's universities in this should be encouraged.

Other:

- Establish a collaborative effort with MAWLR, MoF/Customs, Agribank, Meat Board, Agronomic Board and farmers unions for lowering the costs through bulk purchases or imports of electric fencing equipment, solar panels, submersible pumps, water storage tanks, droppers (fence standards), steel wire, steel cable, farm gates and possibly satellite collars to enable rapid conversion of vulnerable and expensive wind and diesel pumps to solar powered water installations pump and mitigate impacts by elephants on farm infrastructure, which in certain cases have reached disaster scale.
- MEFT, MAWLR and conservancy support organizations to form a collaborative effort to diversify and modernize agricultural land use in conservancies to reduce impacts on elephant habitat and improve livelihoods. This should include conservation agriculture, tunnel horticulture, fruit tree orchards, poultry production and hydroponic systems.
- Tourism and hunting operators in conservancies are the principle sources of income to conservancies and have a common stake in the conservation and management of elephants to the benefit of all. Conservancies need greater support from such operators for human elephant conflict mitigation, elephant monitoring and community development.

North West

- Improve access to water for elephants in regular conflict areas in the North West:
 - o convert water pumps to solar pumps to reduce the burden on communities of pumping water with diesel pumps. This intervention will bring additional environmental and developmental dividends,

in that rural people will have reduced recurrent costs, spend less time and money transporting diesel in areas with scarce and distant distribution points, reduce fossil fuel consumption and CO₂ generation, reduce local diesel and oil pollution at waterpoints. This intervention should qualify for Green Climate Fund support.

- standardize the design and layout of waterpoints for elephants (and other wildlife) in relation to settlements. MEFT and conservancy support organizations should be able to quickly come up with such a standard based on experience with existing waterpoints. This standard design and layout should be used by MEFT, support organizations and conservancies and communicated to MAWLR/Rural Water Supply to ensure that all new waterpoints follow this standard and enable the gradual conversion of existing waterpoints to this standard.
- investigate in collaboration with MAWLR the functioning of the Huab and Ugab River catchments with the aim of restoring the small but important wetlands and springs in the lower Huab and Ugab Rivers by increasing downstream water flow volumes.
- continuing with the protection of unprotected waterpoints with stone walls.
- Improve protection of home gardens and crop fields by:
 - introduce or expand the use of chilli powder mixed with used engine oil or grease on fences around small home gardens and small crop fields.
 - introduce or expand the use of electric fencing around larger community gardens or crop fields such as in the upper Hoarusib River. In other areas with larger settlements, in collaboration with affected communities the clustering of smaller gardens and their protection with electric fencing should be piloted.
- Improve the sense of security for people in small settlements that are frequented by elephants by:
 - encouraging the storage of food and fodder which attract elephants within electrified enclosures instead of houses.
 - in high frequency conflict areas establish early warning systems (as developed for lions) which includes floodlights that come on when elephants approach specific areas.
 - encouraging MME/Rural electrification to give priority to high frequency conflict areas so that the most affected communities can have electric lighting at night.
- MEFT to establish stations with rapid response capability in high frequency conflict areas such as Kamanjab and Omatjete.
- MEFT and partner organizations to improve elephant conservation, population monitoring and management by:
 - establishing collaborative efforts to establish a permanent elephant register for individual identification.
 - expanding aerial survey coverage on a three yearly basis to the entire elephant distribution range in the North West.
 - conducting coordinated ground surveys and waterhole counts to record elephant age and sex structures as the basis for utilization quotas.
- Concerning the Kamanjab-Otjikondo Elephant Management Unit:
 - MEFT to agree in principle to the transfer conditional ownership of elephants to an appropriate representative structure of landowners in the Kamanjab-Otjikondo commercial farming area that

desire elephants to be on their land and manage them on a sustainable basis. It is unlikely that most landowners in the area would be able to afford to buy these elephants from the State given years of drought and sustained costs from elephant impacts that have depressed the local economy. The objective of such a transaction should not be to generate income for the State but to resolve a long-standing and high frequency elephant-human conflict situation. A potential solution for this can be to grant utilization rights and management authority over the elephants to an appropriate representative structure of landowners on the condition that internal arrangements in this farming community need to be completed within a five year period.

- Up and until this condition is met or if it cannot be met within five years, MEFT should continue and expand the monitoring of elephants with satellite collars and the sharing of information on movements with community and farmer groups and allocate a hunting and general harvest quota to generate income for HEC mitigation.
- If the condition is not met within five years and there is no prospect of achieving the proposed arrangement in the short-term thereafter, MEFT should reduce the elephant population by up to 50%, focussing on elephants that regularly occur on farms that are the most severely impacted and where the landowners will not tolerate elephants.
- Concerning the Huab-Ugab-Omatjete-Kalkveld Elephant Management Unit:
 - Encourage farmers to pursue a similar approach as in the Kamanjab-Otjikondo Elephant Management Unit.
 - Continue and expand the monitoring of elephants with satellite collars and the sharing of information on movements with community and farmer groups.
 - Allocate a hunting quota to generate income for HEC mitigation.

North Central

- Improve access to water for elephants in regular conflict areas in north-eastern Kunene Region-north-western Omusati Region in cases where elephants impact artificial water installations:
 - convert water pumps to solar pumps to reduce the burden on communities of pumping water with diesel pumps (see North West for detail).
- Improve protection of home gardens and crop fields by:
 - introduce or expand the use of chilli powder mixed with used engine oil or grease on fences around small home gardens and small crop fields.
 - introduce or expand the use of electric fencing around larger community gardens or crop fields. In other areas with larger settlements, in collaboration with affected communities the clustering of smaller gardens and their protection with electric fencing should be piloted.
- Improve the sense of security for people in areas with elephants:
 - encouraging the storage of food and fodder which attract elephants within electrified enclosures instead of houses.
 - encourage the use of chili powder mixed with used engine oil or grease on fences around grain storages.
 - MEFT to request the Roads Authority to put up elephant warning signs on public roads to avoid vehicle accidents at night.

- Facilitate the manufacturing of omakipa by availing ivory from government stocks in collaboration with manufacturing jewellers, to increase conservancy incomes that can be used for the HWCSRS.
- Encourage collaborative arrangements, and where appropriate formalize these through an agreement(s), with private nature reserves/landowners south of Etosha NP in the areas of cross-border movements of elephants and joint monitoring.
- MEFT and partner organizations to improve elephant conservation, population monitoring and management by:
 - o establishing collaborative efforts to establish a permanent elephant register for individual identification.
 - o expanding aerial survey coverage on a three yearly basis to the known elephant distribution range in the North Central area.
 - o conducting coordinated ground surveys and waterhole counts to record elephant age and sex structures as the basis for utilization quotas.
 - o in consultation with conservancies along the Kunene River west of Ruacana, consider the translocation of elephants to this area.

North East

- Improve protection of crop fields:
 - o introduce or expand the use of chilli powder mixed with used engine oil or grease on fences around small home gardens and small crop fields.
 - o encourage the clustering of crop fields to facilitate the use of electric fencing.
- Improve the sense of security for people in areas with elephants:
 - o encouraging the storage of food and fodder which attract elephants within electrified enclosures instead of houses.
 - o encourage the use of chili powder mixed with used engine oil or grease on fences around grain storages.
- Engage MAWLR and partner organizations to accelerate the introduction of conservation agriculture and intensified agricultural production through horticulture or hydroponics or fruit orchards that will facilitate the protection of production units with electric fencing.
- MEFT and partner organizations to improve elephant conservation, population monitoring and management by:
 - o establishing collaborative efforts to establish a permanent elephant register for individual identification.
 - o maintaining aerial survey coverage on a three yearly basis to the known elephant distribution range in the North East, but expanding aerial survey coverage to the conservancies around Khaudum NP.



2.5 Small populations

Special measures are needed to protect small populations of elephants such as those occurring in parts of the North West of Namibia as well as in the Mangetti area and parts of Kavango West and Kavango East Regions.

The drought of 2014 to 2020 has devastated the large ungulate population of the North West, livestock herds and human livelihoods. Elephants have not been as seriously affected as other species such as Hartmann's zebra, oryx and springbok but all the elephant calves in the Ugab River group died as the result of drought in 2019, and similar deaths were recorded in the Hoanib-Hoarusib group as well. More deaths could occur if the drought continues or if elephants are displaced from essential habitat and water points by people and if improvements to the fence of western Etosha NP prevent their movement from north-western Kunene Region into the park. Several instances occurred in the North West where people from outside or elsewhere in the Kunene Region occupied wildlife habitat in conservancies – including the core wildlife areas – such as Sesfontein, Anabeb, Ehirovipuka and Omatendeka, as well as in the Palmwag Tourism Concession Area. This was partly driven by drought but also by attempted land grabbing. Unless legal evictions are promptly executed, more such events may occur and ultimately destabilize the conservancy zonation system. Hunninck *et al.* (2017) recorded higher stress levels in elephants in the North West than in Etosha NP and attributed that to conflict with people. Access to water (and to a lesser extent damage to vegetable gardens and small crop fields) may trigger such conflict, especially where people have to buy diesel to pump water for their livestock and which gets taken by elephants in large quantities.

There is an important new initiative that would contribute to improving the conservation of the small Hoanib-Ombonde-Hoarusib elephant population, namely the people's park concept under development by Ehi-Rovipuka, Omatendeka and Anabeb Conservancies (Figure 8) that would include a substantial

part of the Ombonde River in a community-managed park and which should qualify to be proclaimed as a landscape of special conservation importance in terms of the PAWM bill once enacted. This initiative opens up the possibility that MEFT could consider giving the three tourism concession areas of Palmwag, Etendeka and Hobatere the same status which will considerably enhance the protection status of the sensitive Hoanib-Ombonde River environment and the important elephant movement corridor that it represents.

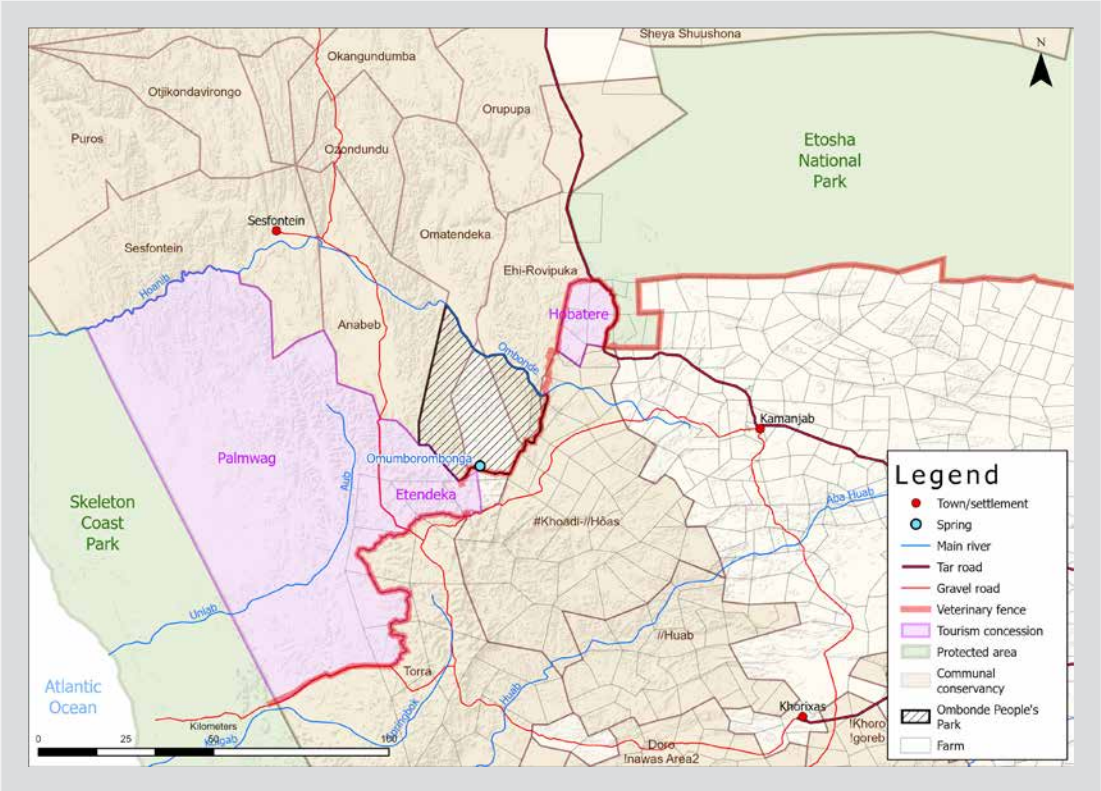


Figure 8 The proposed Ombonde People's Park adjacent to Palmwag and Etendeka tourism concession areas comprising portions (primarily the core wildlife areas) of Anabeb, Ehi-Rovipuka and Omatendeka Conservancies. Boundaries are indicative.

For elephants in the North West, a combination of measures is needed to prevent population declines. The loss of landscape connectivity and thus habitat fragmentation poses the greatest threat along with conflicts with people that may result in retaliatory killing or even problem elephant control (e.g. as the result of conflict with people over damage to gardens and small crop fields in the upper Hoarusib River in 2019). How to address these has been covered in other sections of this chapter and further measures are outlined in this section.

Greatest threats and management challenges regarding elephants in Namibia	Essential conservation and management outcomes for elephants in Namibia
Strategic Objective: To mitigate the effects of severe drought and climate change on the small populations of elephant in the hyper-arid part of the Kunene Region	
Decline of elephants in the Hoanib-Ombonde and Hoarusib River catchments to non-viable levels due to severe drought and climate change and increased conflicts with people	Functional programmes and partnerships with communal conservancies and NGOs to strengthen the monitoring of the Hoanib-Ombonde and Hoarusib elephants, increase surveillance, deterrence, and law enforcement, mitigate human-elephant conflicts in the catchments and prevent obstruction of important movement routes

Greatest threats and management challenges regarding elephants in Namibia	Essential conservation and management outcomes for elephants in Namibia
	Establishment of a community-based protected area such as a Landscape of Special Conservation Importance in the Ombonde River catchment as well as the Palmwag, Etendeka and Hobatere tourism concession areas to mitigate the threats of severe droughts and climate change
Decline of elephants in the Uniab, Huab and Ugab River catchments and elsewhere in the northern highlands part of the Kunene Region to non-viable levels	- Enhanced monitoring of population trends and mitigation of human-elephant conflicts in the Uniab, Huab and Ugab River catchments and in the northern highlands part of the Kunene Region - Restoration of wetlands and downstream water flows in the Huab and Ugab River catchments has been done

There are also small populations of elephants in the Mangetti area and parts of the Kavango West Region, possibly also north-eastern Ohangwena Region. These elephants are less well-known but occur in a part of Namibia where land use is changing rapidly through intensified agriculture. Most of the elephants in the Kavango West Region occur on the large Kavango Cattle Ranch where there are many conflicts over damage caused to fences and water installations and disruptions to cattle production. This area also has lagged behind in the development of communal conservancies as a means towards achieving co-existence with elephants. The prospects for maintaining this small population of elephants are uncertain. It is known that smaller groups of elephants have established in at least two places along the Kavango River but little else is known about them except that they move in and out of Angola.

Strategies

1. The greatest and most urgent priority is to strengthen the monitoring of the Hoanib-Ombonde and Hoarusib elephants, increase surveillance, deterrence and law enforcement, mitigate human-elephant conflicts in the catchments and prevent obstruction of important movement routes. This will prevent further mortalities and allow the population to build up to a safer level.
2. No problem elephant control must be done in Hoanib-Ombonde and Hoarusib populations or in the vicinity of the Hoanib-Ombonde and Hoarusib catchments, in particular to prevent any additional offtakes of adult males.
3. Water installations and gardens or small crop fields in the upper Hoarusib catchment must be protected as a priority, using stone walls and cable fencing (alternatively electric fencing if there is insufficient funding for cable fencing). This requires engagement with local people and a survey of vulnerable water infrastructure and gardens or crop fields.
4. The initiative of Anabeb, Ehi-rovipuka and Omatendeka Conservancies to establish a community-based protected area, i.e. the proposed Ombonde People's Park as a Landscape of Special Conservation Importance in the Ombonde catchment in terms of Section 21 (c) of the Protected Areas and Wildlife Management Bill) comprising the core wildlife areas of these conservancies should be supported. This initiative will enhance habitat protection and to mitigate the threats of severe droughts and climate change as well as unregulated tourism.

5. MEFT should also support the development of a community-based protected area such as a Landscape of Special Conservation Importance comprising the Palmwag, Etendeka and Hobatere tourism concession areas to mitigate the threats of severe droughts and climate change. This together with the proposed Ombonde People's Park will create a contiguous zone of protected habitat from the Skeleton Coast National Park to Etosha NP and enable movements by elephants in response to drought and climate change, as well as create new tourism opportunities for the conservancies.
6. Conduct a feasibility assessment for the reintroduction of elephants to the lower Kunene River area where there is considerable vacant elephant habitat.
7. Enhanced monitoring is needed of population trends and mitigation of human-elephant conflicts in the Mangetti area and parts of Kavango West and Kavango East Regions.
8. The feasibility of establishment of a communal conservancy around the Mangetti NP and the enlargement of the park should be assessed.
9. Establishment of a management agreement between MEFT and NIDA is needed regarding elephants (and other important species such as wild dogs) on Kavango Cattle Ranch

CHAPTER 3: Enablers for successful implementation

Species conservation and management plans are notoriously difficult to implement because of the cross-cutting scope of such plans and the multiple stakeholders needed. This plan cannot be implemented by one directorate in MEFT or by MEFT alone and will require an approach of collaboration and cooperation amongst stakeholders.

The enablers described below are as important as the strategic objectives and their associated essential conservation and management outcomes described in the foregoing chapter.

Enablers	
Objectives	Essential outcomes
To effectively coordinate the implementation of this plan	• An elephant management body has been established in MEFT to oversee the implementation of this plan • An elephant coordinator has been appointed • DPWM and DSS understand their respective responsibilities to implement this plan and have integrated such responsibilities in their annual workplans
To establish regionally appropriate action plans and co-management arrangements	• Regional action plans have been established for elephant conservation and management • Local management structures have been established to mitigate elephant impacts and improve co-existence with elephants on commercial farmland • Participatory management of elephants has been established for all high frequency human-elephant conflict areas through area-specific elephant management units and structures representing all primary stakeholders
To maintain liaison with all primary stakeholders and primarily those people with elephants on their land	• The public consultation process initiated for this management plan is continued through periodic opinion surveys • Feedback is given to primary stakeholders on the implementation of this plan
To ensure that monitoring and data management systems are effective	• Important information is predictably and reliably collected and managed in continuously updated and integrated data management systems • Elephant management decisions are science-based
To foster partnerships with the public (communal conservancies, communal and commercial farmers, NGOs and the private sector) on elephant conservation and management	• Cooperation and partnerships have been strengthened between MEFT and communal conservancies, communal and commercial farmers, NGOs and the private sector on elephant conservation and management
To provide information to the public on elephant behaviour, conflict avoidance and mitigation	• Information has been provided to the public on elephant behaviour, conflict avoidance and mitigation to prevent the loss of human life and injury and to reduce negative impacts by elephants on livelihoods
To secure reliable financing of elephant conservation and management in Namibia for MEFT, conservancies, freehold landowners and conservation NGOs	• MEFT, conservancies and freehold farmers with elephants their land are able to generate funding for elephant conservation and management from a diverse range of income streams to implement this plan

Strategies

1. Establish and formalize the management structure for implementation of the National elephant conservation and management plan, and devolve decision making to regional level where appropriate.
2. To officially appoint the National elephant coordinator, with clear responsibilities and accountability.



Photo: Pietro Sutura

CHAPTER 4: Elephant monitoring priorities

As highlighted throughout this plan, monitoring is a crucial aspect of elephant conservation and management, and in particular a prerequisite for adaptive management. Monitoring can be resource intensive and is a long-term undertaking.

The most important information needs which determine monitoring priorities are shown in Table 2.

4.1 Population trend, population age structure and the relative abundance of adult males

Table 2 Priorities for monitoring long-term population trends, population age structure, carcase ratios and the relative abundance of adult males

Population or area	Methodology	Frequency ¹⁰	Implementer
Zambezi Region and Bwabwata NP	Standardized fixed wing transect multi-species aerial surveys	Once every three years	MEFT
Khaudum NP and adjacent conservancies (including Na#Jaqna and Ondjou Conservancies ¹¹)	Standardized fixed wing transect multi-species aerial surveys	Once every three years	MEFT
Etosha NP, Hobatere, central northern conservancies ¹² bordering on Etosha NP and rhino belt	Standardized fixed wing transect multi-species aerial surveys	Once every three years	MEFT
North-western Omusati Region, Kunene Highlands, Hoanib-Ombonde-Hoarusib Rivers, Palmwag, Etendeka, conservancies in the Uniab, Huab and Ugab River drainage basins	Standardized fixed wing multi-species aerial surveys, based on sample block counts and total counts along rivers and around water points	Once every three years	MEFT
	Individual identification from ground surveys including waterhole counts combined with individual identification, age classification as well as camera traps	Continuous	MEFT, conservancies, NGOs
Kamanjab-Otjikondo area	Standardized fixed wing multi-species aerial surveys, based on block counts and reconnaissance flights over known occurrences to yield minimum counts	Once every three years	MEFT
	Individual identification and camera traps	Continuously	Farmers

¹⁰ Frequencies can be increased if resources allow

¹¹ Areas with waterpoints accessible or used by elephants in the dry season

¹² Areas with waterpoints accessible or used by elephants in the dry season in the known dry season distribution range

Population or area	Methodology	Frequency ¹⁰	Implementer
Omatjete-Kalkveld area	Standardized fixed wing multi-species aerial surveys, based on sample block counts and total counts along rivers and around water points	Once every three years	MEFT
	Individual identification and camera traps	Continuously	Farmers, NGOs
Mangetti- Grootfontein farms bordering on Kavango Cattle Ranch and Na#Jaqna Conservancy	Standardized fixed wing multi-species aerial surveys, based on sample block counts and total counts around water points	Once every three years	MEFT
	Individual identification and camera traps	Continuously	Farmers, NGOs
Private land	Biannual permit returns and farm inspections	Once every two years	MEFT, farmers
	Individual identification and camera traps	Continuously	Landowners

The methodologies for aerial surveys in Etosha NP, the North West and the North East are described in Kilian (2015) and Craig & Gibson (2016, 2019a, 2019b). The only modifications that should be considered (other than expanding the four main census zones as described in Table 2) are:

- aerial survey strata should be designed so that reliable estimates can be generated for the elephant management units described in this plan (see Chapter 6 and Figure 19);
- potentially to photograph each elephant sighting for the identification of adult males within family groups and future photogrammetric analysis, but a number of technical issues require further consideration;
- potentially to improve stratification in the Kunene Highlands and North-western Omusati on the basis of local knowledge of elephant occurrence, known distribution of waterholes, movement and location data of collared elephants, as the purpose of this survey should be to make a minimum estimate given the size of the area, the difficult terrain and the low density of elephants. The same approach should be followed in surveying the central northern conservancies¹³ with low elephant densities bordering on Etosha NP and in other low density areas such as Na#Jaqna and Ondjou Conservancies;
- a combination of block counts and total count flights should be used to survey the smaller populations in farmland areas, with survey effort to be guided by local knowledge of elephant occurrences as recommended in the Kunene Highlands and North-western Omusati survey;
- the KAZA TFCA is in the process of developing a harmonized aerial survey design and schedule for counting elephants in the KAZA TFCA with the first synchronized survey of all the KAZA TFCA components planned for 2021. This harmonized survey design may consequently require adjustments to Namibian surveys and survey schedules in the North East;

13 Areas with waterpoints accessible or used by elephants in the dry season

- potentially using photographic survey techniques instead of human observers. Recent work in Kenya has shown an undercounting of 14% for elephants from rear seat observers in aircraft compared to an automated oblique camera count imaging system (Lamprey *et al.* 2019). Work in this regard is also in progress by M. Hauptfleisch of NUST in Namibia and a private aerial survey company.

The methodologies for individual identification and waterhole counts¹⁴ can be drawn from existing projects and should be captured in a guideline of standard operating procedure to ensure continuity in the long term and the preservation of data. Hindfoot length measurements of males can be relatively easily done in combination with waterhole counts and individual identification and may prove valuable for the age estimation of the male component in the context of intensified monitoring to ensure the sustainability of conservation hunting – and increasing local knowledge about the characteristics of the male component of the population, and importantly, provide a reference points for the identification (and age estimation) of specific elephants that may have to be tracked on foot and destroyed as problem elephants. Age estimation from hindfoot lengths can be done based on Lindeque & van Jaarsveld (1993), see Section 3.2.1

Much can be learnt from the age classification and individual identification of elephants encountered or photographed. In the past it was standard practice for all park management and research personnel to do such classifications for every sighting in Etosha NP. A comparable system is still in use by MEFT, SRT and IRDNC for individual identification and age estimation of rhinoceros both in the Kunene Region and Etosha NP (and other areas with rhinoceros). EHRA does age classifications of elephants based on this method and conservancies record elephant sightings with some associated details. Several conservancies consulted for this plan have requested an additional form to be developed for the recording of such information, in addition to the Event Book recording system. MEFT has furthermore introduced the SMART system which can be rolled out to other stakeholders, including conservancies, hunting and tourism operators and private landowners. The SMART system can be programmed to record all the information in a simple way and upload that to a processing centre.

Shrader *et al.* (2006) and Ferreira & van Aarde (2008) developed a rapid method to estimate population variables for elephant populations (which was also partly tested in Etosha NP by Ferreira *et al.* (2003) and based on photogrammetric measurement of elephant shoulder heights (Shrader *et al.* 2006 a, b). This approach albeit complicated holds considerable potential for determining the key population parameters for the different populations of elephants in Namibia. It entails taking photos (corrected for distance with a range finder) of samples of elephants (several hundred seem to be needed) from which the elephant shoulder heights are calculated and age estimates are derived. From this data all other parameters can be calculated based on general models established. In order to apply this approach, MEFT would have to dedicate a conservation scientist position and have that person trained in the use of the required techniques. This does not mean that field classification of elephants in broader age categories should not be done, this approach will expand participation in the monitoring of elephants which creates ownership and partnerships and no sophisticated equipment or calculations are required.

¹⁴ Waterhole counts cannot be used to estimate population size unless an entire area and all waterpoints within it is covered simultaneously. There are many pitfalls in waterhole counts, but they can be a useful platform for individual recognition and obtaining identification photos and doing herd compositions.

4.2 Elephant mortalities

Essential biological information should be routinely collected from all elephant mortalities in all parts of their distribution in Namibia. The most important information to be collected in every instance is age at death, sex, and time since death. This information is relatively easy to collect reliably. Cause of death is also very important but is usually much more difficult to determine and is often arrived at by elimination.

The locality of a case of mortality should also be recorded. The advent of smart phones which through photographic recording with location tags turned on in the camera setting and the SMART monitoring technology have made it simple to obtain accurate geographical references embedded in photographs, but GPS equipment can also be used and the location detail can be written down. Physical descriptions of locality can be made as a last resort but unless the description is precise, could lead to duplication of records.

Where possible carcasses should be marked with bright coloured paint to show that they have been recorded to make such carcasses visible from the air.

Additional information can be recorded such as certain body dimensions, in order to add to or improve datasets of body dimensions in relation to age and sex, especially where such information can lead to more precise age estimation of live elephants as needed in hunting. Where individual identification is used to monitor population trends and age structure (Section 3.1), photos of the ears and tusks of the elephant carcass are valuable in order to identify the individual elephant in relation to the register of known elephants.

Certain materials also need to be collected i.e. the lower jaws and blood smears, and these items need to be individually marked with metal tags (lower jaws) and permanent marker (blood smear). If collected by any person other than an MEFT staff member, the material should be handed in at the nearest park or regional office of MEFT, together with the filled out mortality form (in cases where SMART is not available for use).

Because of the concern over illegal killing and the priority and importance of crime scene management and forensic procedures when elephant carcasses are encountered, such essential biological information has not been routinely collected from elephant mortalities in all parts of their distribution in Namibia. To understand the impacts of illegal killing on the elephant population and how that may also affect the allocation of hunting quotas, a basic minimum set of information must be collected from each and every elephant carcass encountered. This includes mortalities from all causes, as the aim is to understand the totality of mortalities, especially in the adult male fraction of the population. In small populations such as in the North West, it is particularly important to know the cause of death in each instance that a mortality is encountered.

Table 3 Priority information to be recorded from all elephant mortalities throughout Namibia in all protected areas, conservancies or any other areas with elephants

Information to be recorded	Materials, images and measurements to be collected	Frequency	Implementer
Age at death, sex, time since death, cause of death, date of discovery and location of carcass	Mandibles (lower jaws), after forensic examination has been completed	Continuously, every carcass	MEFT, conservancy personnel, hunting operators, honorary conservators, tourism operators, farmers, researchers, NGO personnel, private owners of elephants, veterinarians
	Digital photos of lower mandible showing the molar teeth on both halves of the mandible with a ruler or tape measure in view		
	Width of mandible (mm)		
	Digital photos of the tusks and ears (both sets if possible)		
	Tusks and forensic evidence	Every carcass	MEFT and PRD only. Importantly, first discoverers of a carcass must not remove anything from the scene or site
	Blood smears in cases of suspected anthrax (normally indicated by bleeding from the mouth or anus), using a glass microscope slide		



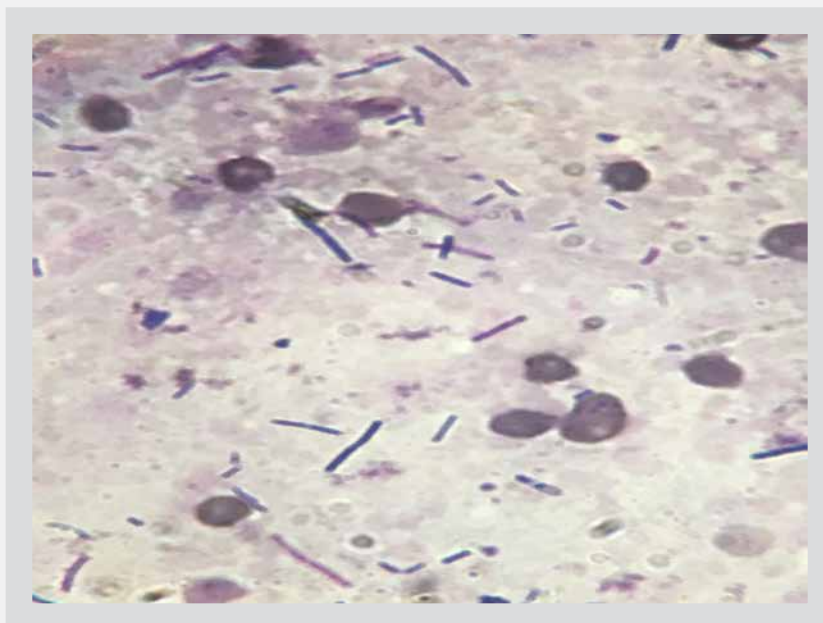


Figure 9 Diagnostic appearance of anthrax bacilli (blue-stained rods with a white outer margin) in a blood smear

4.2.1 Age estimation

Elephants through their lifetime go through a series of six¹⁵ molar teeth in each half of the upper and lower jaws which erupt in the rear of the jaw and move forwards until their roots are resorbed at the front of the jaw and the lamellar teeth break off piece by piece. The six molars are distinguishable by their relative size and the number of roughly elliptical ridges or lamellae on the surface of the teeth (see e.g. Lindeque 1991, Craig & Peake 2011).

The sizes of the molars increase from Molar 1 as the smallest to Molar 6, the largest. The dimensions of fully erupted and intact molars essentially do not overlap but partially erupted or partially worn molars do overlap in size with adjacent ones. The number of the lamellae per molar in relation to the size of the molar, especially the width which is not affected by the process of molar progression, can then be used to confirm the identification of a partially worn molar but this should be done by an experienced conservation scientist. It is thus necessary to take photos of each half of the lower jaw in which a tape measure or ruler is shown as well for scale. The mandible should be collected after forensic examination of a carcass has been completed, marked¹⁶ and stored at the closest MEFT park station or regional office (and thereafter once clean and dry to become part of the permanent collection of such materials for the park or region). Removal of the mandible also serves to mark the carcass as previously recorded.

The lower jaw (mandible) provides a relatively consistent means of making an estimate of the age at death of elephants and can be done by a park manager or conservation scientist. A photo can be taken of the tooth row and subsequently analysed or compared with the images in Figure 10 and Figure 11 (from Lindeque 1988), based on Laws (1966, 1967). The exact ages are not important and there is still debate over the age estimation of elephants and there are entirely different systems of estimating age from tooth wear and molar progression as discussed in e.g. Craig and Peake (2011).

15 Some elephants have a small 7th molar but seldom on both sides of the jaw or in both upper and lower jaws. In a sample of 525 elephants from Etosha NP only one had a 7th or supernumerary molar, i.e. 0.2% of the population (Lindeque 1991). Such teeth are rare in other populations as well and will not have a significant effect on ages estimation or average longevity.

16 For this a soft metal tag is needed which can be cut from strip of zinc-coated steel used in roof construction (or even by cutting a piece from a sheet of corrugated zinc roofing), to be attached securely with a wire to the lower jaw. The date and locality should be added to the tag by using a metal number and letter punch set which should be part of the equipment of every park station or regional office of MEFT.

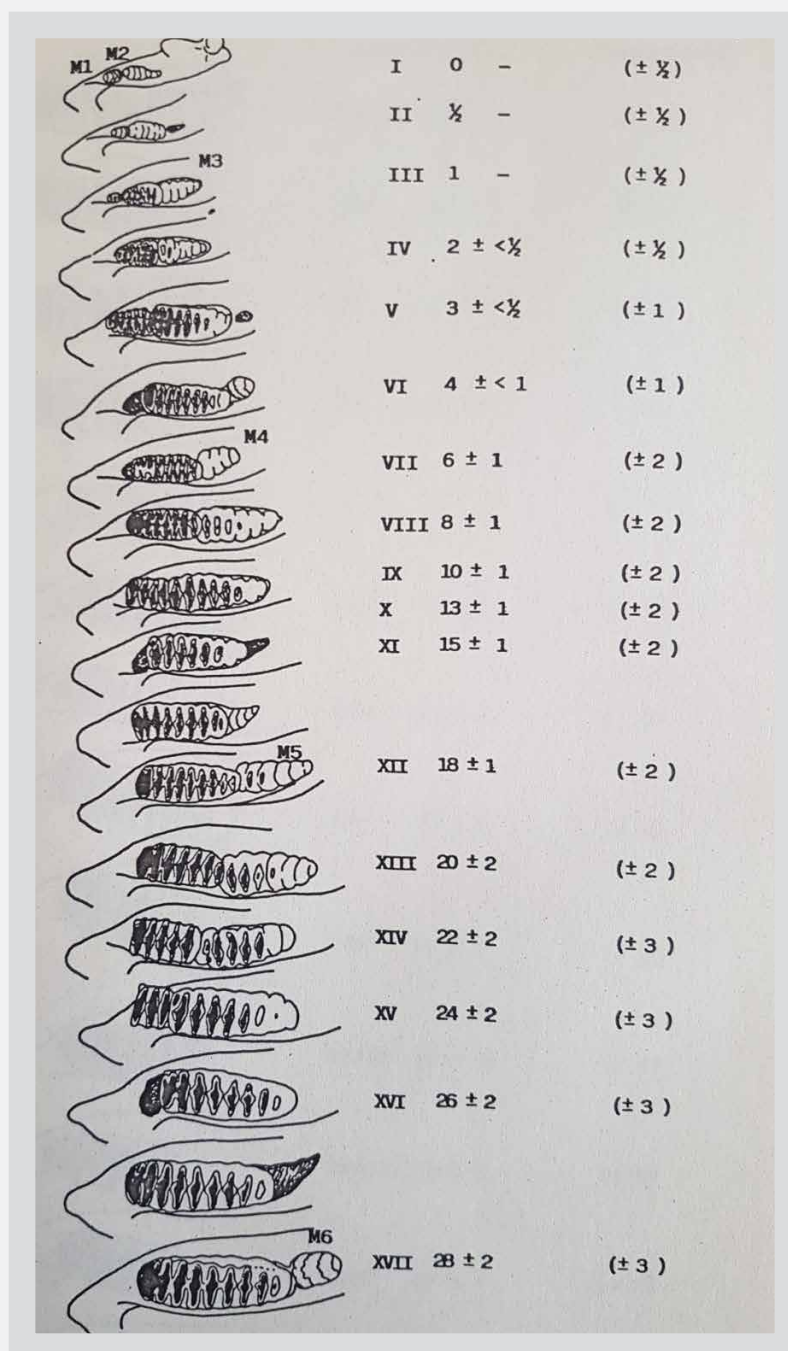


Figure 10 Drawings of elephant mandibles (lower jaws) from Lindeque (1988) based on Laws (1966, 1967) showing the sequence of eruption of the six molar teeth in the lifespan of an elephant (series continues in Figure 11). The age of an elephant can be estimated by comparing the lower jaw with these images and identifying the stage of eruption and wear of the six molars.

An approximate age can potentially be roughly estimated from the tusks, if only tusks are available. It is known that the alveolus or tusk cavity, i.e. the opening extending from the base, fills up with secondary dentine in older elephants. The shape of the opening is deep and conical in younger elephants but becomes shallow and much smaller in older elephants. Comprehensive research has not been done on the rate of the alveolus filling, but recording alveolus depth for all tusks to which a molar age can be attached will help to build up a data base that may be valuable in future.

To record the depth of the tusk cavity, an object such as a stiff but flexible metal rod, tape measure or a stick can be inserted, the depth marked, and then the stick is photographed along with the tusk

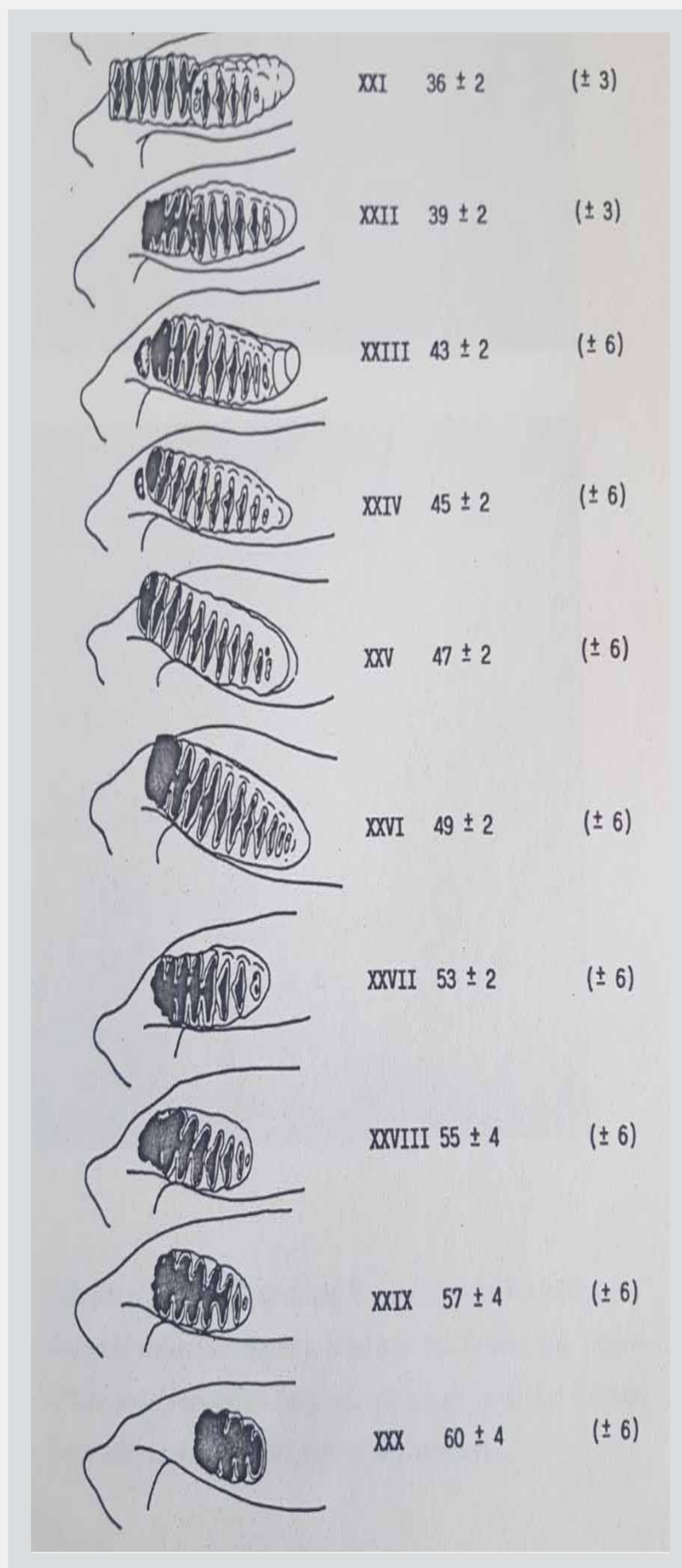


Figure 11 Drawings of elephant mandibles (lower jaws) showing the loss of Molar 5 by age 40 and the development and subsequent wear and slow disintegration of the last molar, Molar 6, between age 40 and 60. The exact ages are not important and there is still debate over the ageing of elephants, but an elephant mandible can be used to classify an elephant into age categories. The most important issue to record is whether the elephant that was illegally killed was approximately 50 years or older. This information is highly relevant when setting hunting quotas. The 50-year mark is indicated by a fully erupted Molar 6 with the first one or two lamellae in heavy wear (see the fifth drawing from the bottom). Above age 50 Molar 6 gradually becomes smaller as pieces are worn off at the front end but is not followed by any new tooth erupting.

indicating how deep the cavity was (Figure 12). This is an important measurement to take for all elephants hunted, harvested (management hunt) or illegally killed. Hunted elephants will yield age estimates based on their molars and tusk measurements which can then be related to the depth of the tusk cavity. This age-tusk diameter-alveolus depth may be the only way to obtain an age estimate for illegally killed elephants when only tusks are available.

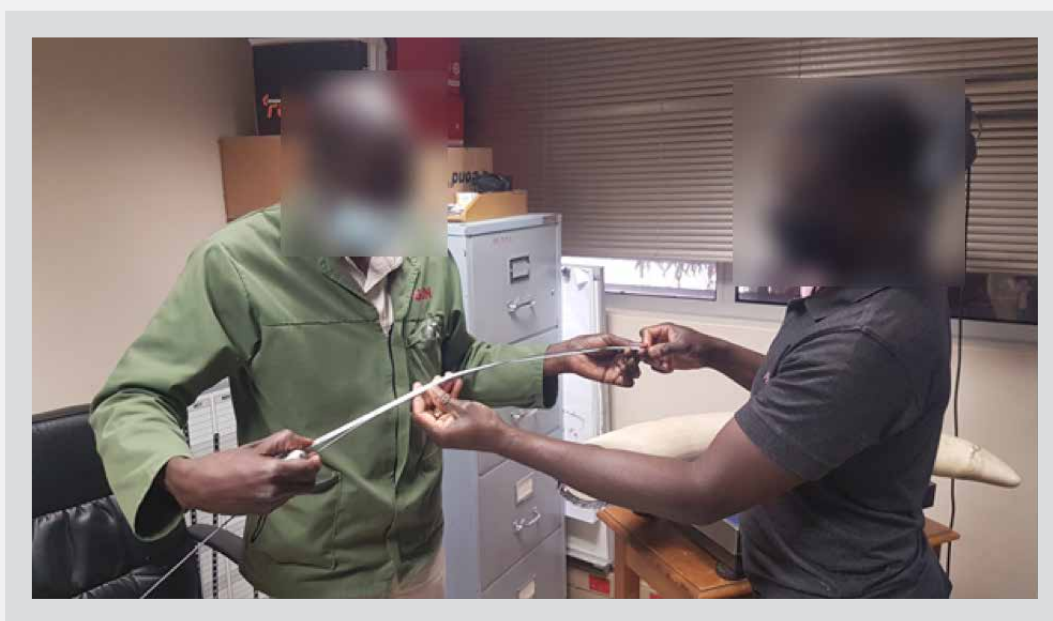


Figure 12 Officials from MEFT CITES office measuring tusk alveolus depth using a stiff wire that is inserted into the open end of a tusk. A flexible but narrow tape measure is attached to the front end of the wire for reading off the depth (invented by A. Amutenya)

Preliminary data from a sample of 198 seized tusks i.e. where age is unknown (data collected with the assistance of P. Iifo, J. Shapi and A. Amutenya) showed the following. Figure 13 shows a significant ($p < 0.05$) increase in alveolus depth in relation to tusk length as can be expected, i.e. larger tusks will have greater alveolus depth. Tusk length while recorded as a standard measurement (principally as a back-up measure to identify individual tusks) is not a very useful indicator because of wear and breakages throughout the life of the elephant. Figure 14 thus shows increasing alveolus depth in relation to the

length of tusks from the base to the lip mark ($p < 0.05$) which is not affected by wear or breakage. This is also a standard measurement of tusks in Namibia and a larger sample of such measurements would thus be available. A much tighter relationship between alveolus depth in relation to the part of the tusk embedded in the skull up to the lip mark would actually be expected (before secondary dentine is deposited, the alveolus generally extends to the lip mark).

Tusk circumference at the lip mark is also a standard measurement and is not affected by wear and breakage and shows a better correlation with alveolus depth, $p < 0.001$ (Figure 15). Tusk circumference increases with age, up to an asymptotic level in females from around age 20, which accounts for the cylindric shape of female tusks, but in males the increase is continuous throughout the lifespan at least until advanced old age. The sample of tusks measured is probably too small and does not represent a broad enough spectrum of ages and nothing more can be inferred from this data, but additional data may show a relationship that could be useful to assess the approximate age or age category of an elephant from tusk dimensions.

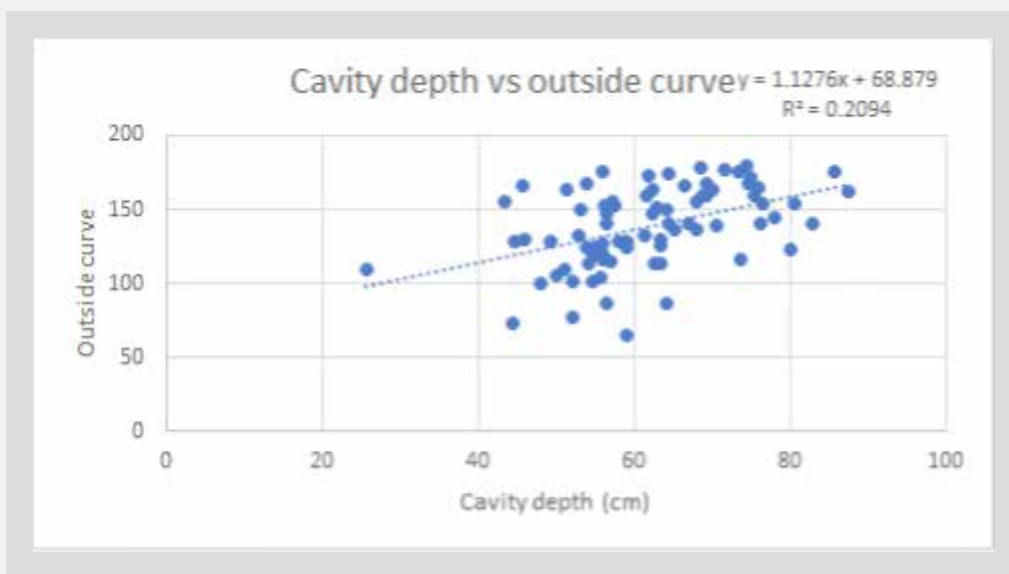


Figure 13 Tusk alveolus depth in relation to tusk length (outside curve length in mm)

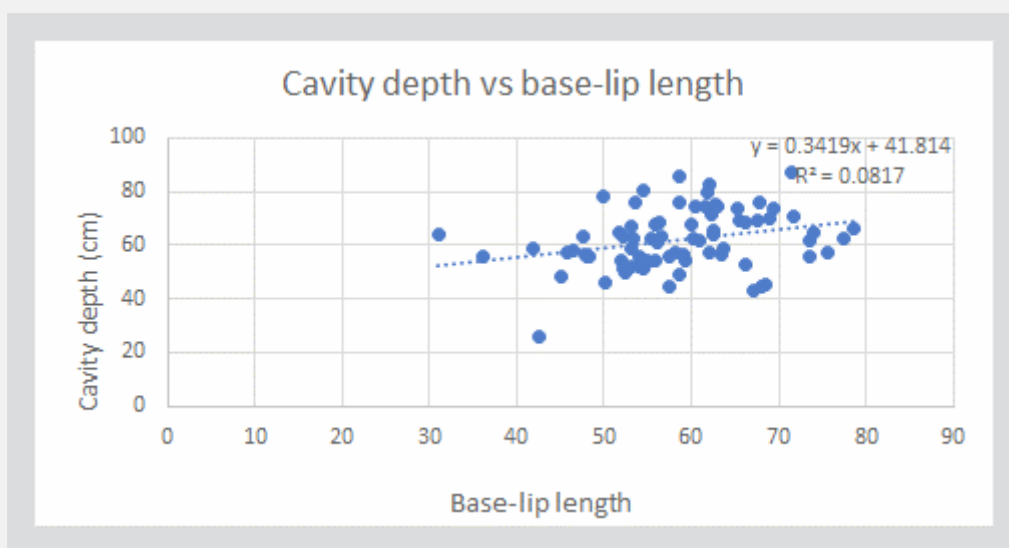


Figure 14 Tusk alveolus depth in relation to tusk length from the base to the lip mark (mm)

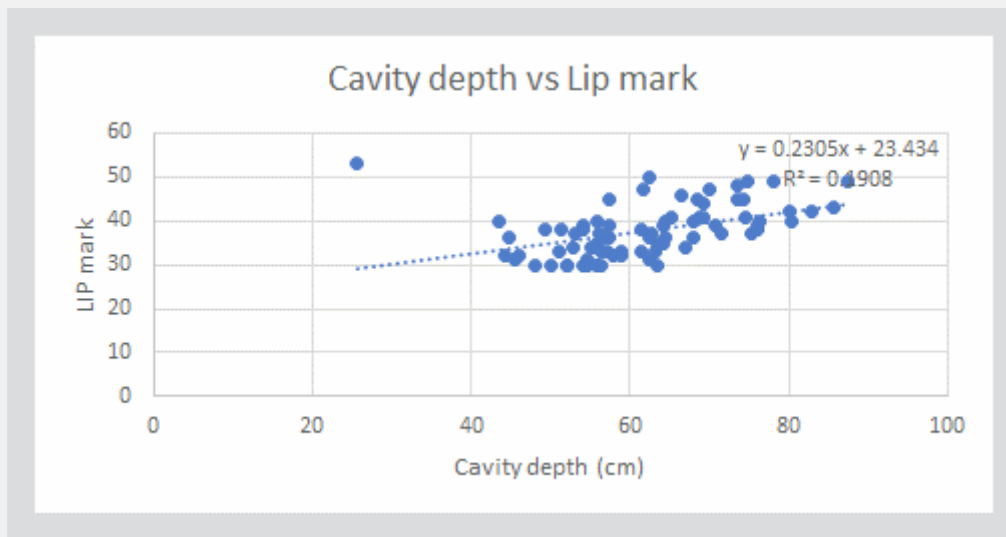


Figure 15 Tusk alveolus depth in relation to tusk circumference at the lip mark (mm)



4.2.2 Sex determination

The accuracy of determining the sex of an elephant carcass depends on a number of factors such as the relative age and size of the elephant, its state of decomposition and dismemberment and the experience of the person doing the determination. An experienced observer at a fresh carcass should have no trouble in determining whether the carcass is of a male or female elephant. If the carcass is already decomposed the generally 1) larger size of the male and the male skull (and its width) and the 2) diameter and shape of the tusks are used to indicate whether it was a male or female, noting that younger elephants are less sexually dimorphic (but young elephants between ages 2 and 20 have low mortality rates and such carcasses are rarely encountered).

The sex of an elephant (excluding young animals) can be determined from the measurements of the tusks in case only tusks were found but no carcass, as e.g. in a seizure of tusks. In a female elephant, the circumference of the tusk is almost always approximately the same over the length of the tusk, except the tip of the tusk which is worn to a point or broken, and thus has a cylindrical shape. In young adult and adult males, the circumference at the base is usually larger than the circumference at the lip mark and larger than the circumference of the distal part of the tusk (i.e. the tusks are typically tapered from the widest point at the open end or alveolus end to the lip mark and beyond the lip mark to the smallest thickness at the tip). In very old males the circumference at the base of the tusk can be markedly smaller than the circumference at the lip, but the general size, circumference and shape of such tusks would leave little room for doubt about the sex of the elephant.

Viljoen (1990) described a method of sex determination from the width of the mandible, as there is marked sexual dimorphism in this parameter. Figure 16 shows how differently the mandible width varies with age in males and females. Female elephants effectively stop growing from age 30, and mandible width reaches a maximum at this age at around 440mm. All mandibles wider than 440 mm will invariably be from males. Mandible width is therefore a very important measurement to take to confirm the sex of an elephant especially if the carcass is bloated or decomposed or if the front part of the skull was damaged in the removal of the tusks so as to obscure the size of the tusk sockets. The maximum width of the mandibles is the maximum distance from the outer edges of the mandibular condyles.

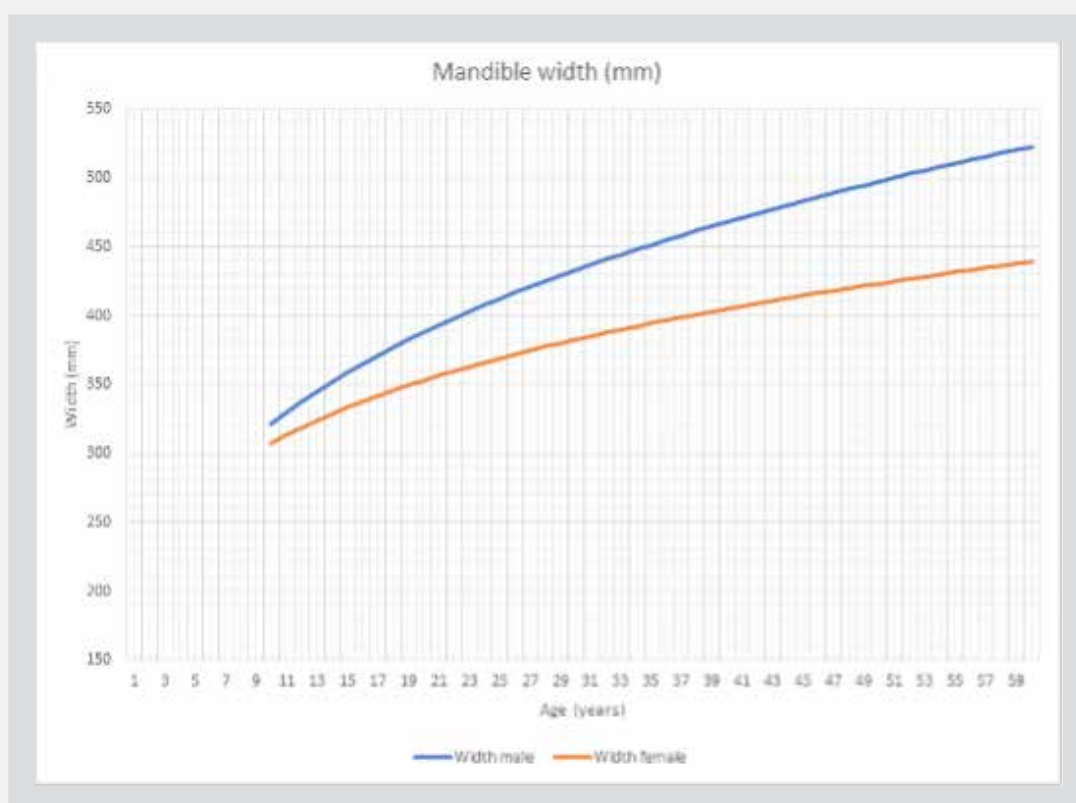


Figure 16 Mandible widths of male and female elephants (Figure adapted from Viljoen 1990)



Photo A. Cilliers

4.2.3 Time of death (age of the carcass)

Elephant carcasses should always be classified when first encountered into the now commonly used categories or stages of decomposition according to their estimated time since death (Douglas-Hamilton & Hillman 1981, Douglas-Hamilton & Burrill 1991). The four classes are:

Category 1 -	Fresh (<1 month): skin covered, with flesh present giving the body a rounded appearance; vultures often present; ground still moist from body fluids.
Category 2 -	Recent (<1 year): rot patch still visible; hide still attached to carcass; bones not scattered
Category 3 -	Old (>1 year): skin absent; bones not scattered; vegetation re-grown in rot patch.
Category 4 -	Very old (up to 10 years): bones bleached and scattered.

Photos illustrating these classes are part of the mortality form, see Section 3.4. Local circumstances and seasonal effects can be taken into account by setting up a trail camera (camera trap) at a fresh elephant carcass for the first three months and recording the decay process (while at the same time getting valuable information on carnivores and vultures). Thereafter, photos can be taken at quarterly intervals for the first year, and thereafter a fixed photo point can be established for 10 years or longer.

This classification is needed for both carcasses seen on the ground or from the air. In aerial surveys the carcass ratio, defined as the ratio of dead elephants to all elephants (dead plus live animals) is an indication of the status of the population. Douglas-Hamilton & Hillman (1981) and Douglas-Hamilton & Burrill (1991) suggest that a carcass ratio between 2 and 8% is normal for a stable or increasing population, while a ratio of over 9% indicates a declining population.

MEFT used to burn elephant carcasses to prevent double counting of carcasses seen from the air in aerial surveys or other surveys. This makes it impossible to use the carcass ratio as an indicator of population trend and in particular the incidence of illegal killing, noting that not all carcasses encountered would have been cases of illegal killing. It will be better if carcasses are left in the field from now on minus the tusks and mandibles so that carcass ratios can be used.



Figure 17 An elephant carcass less than one year old (Category 2), i.e. the rot patch is still visible, the hide is still attached to the carcass and the bones are not scattered (Photo P. Beytell, in Beytell 2017)

Tusks exposed to the elements will eventually show significant weathering and surface cracks and peeling but tusks buried through criminal activity will often be stained brown without much surface deterioration, see Figure 18.

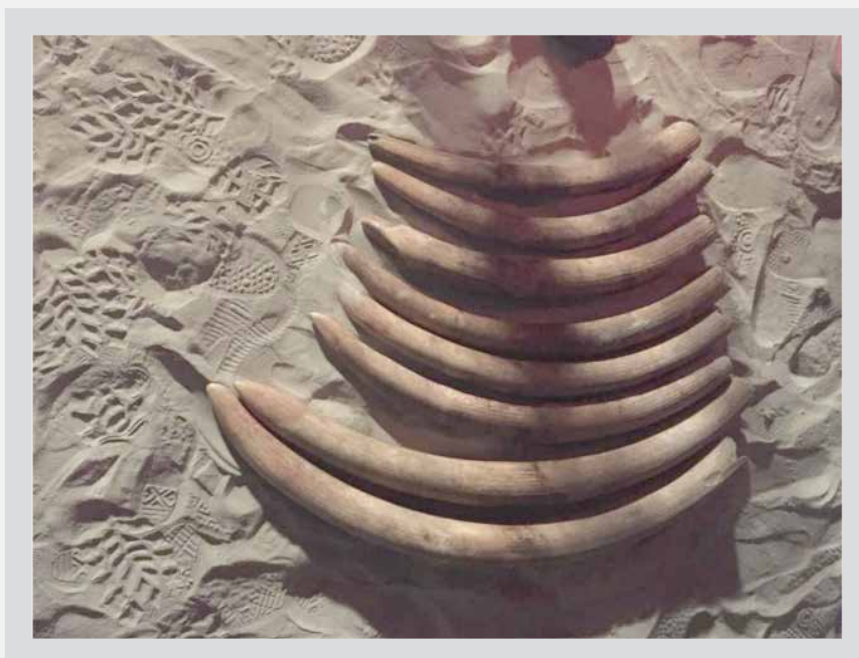


Figure 18 Tusks recovered from a buried cache, showing the typical dark brown staining

4.3 Trophy quality

As discussed in Section 7.3 of the Overview document, the monitoring of trophy quality is essential in the adaptive management of hunting and quota setting for hunting. Tusk weights and dimensions are required to be recorded by both hunting operators and MEFT park stations or regional offices. Tusk weights and dimensions are also re-measured at the central storage facility in Windhoek according to a standard operating procedure. It is important to be able to separate tusk weights and dimensions from hunting compared to management offtakes or illegal killing (or seizures of tusks) as it is particularly important to have these independent assessments of the trend in trophy sizes resulting from the individual mortality factors affecting the male component.

4.4 Standardized elephant mortality form

In order to standardize the recording of information from elephant mortalities, a standard elephant mortality form should be used, as provided in the following pages.



Ministry of Environment, Forestry and Tourism

Elephant mortality data collection form

This form must be completed for every elephant mortality, including those hunted for trophies, hunted for meat or problem animal control, illegally killed, natural mortalities, unknown mortalities, as well as ivory seizures. Please refer to notes at end of form for guidance.

Record Details

Date:	_____	Time:	_____				
Name:	_____	Designation:	_____				
Locality	_____ _____ _____	<table><thead><tr><th colspan="2">GPS Coordinates</th></tr></thead><tbody><tr><td>E</td><td>S</td></tr></tbody></table>		GPS Coordinates		E	S
GPS Coordinates							
E	S						
Concession:	_____	Operator:	_____				
Email:	_____	Cell number:	_____				
Signature:	_____	Mortality number:	_____				

Type of mortality / cause of death

Please tick as appropriate. In the case of "other mortality", please provide a confirmed or suspected cause of death.

☐	Hunted for trophies	Permit number	_____		
☐	Problem Animal				
☐	Hunted for meat				
☐	Poached	☐ Tusk seizure ¹	Case register: _____		
☐	Other mortality →	Potential cause of	_____		
			<table><tr><td>Confirmed</td><td>Suspected</td></tr></table>	Confirmed	Suspected
Confirmed	Suspected				

Age since death (tick as appropriate)³

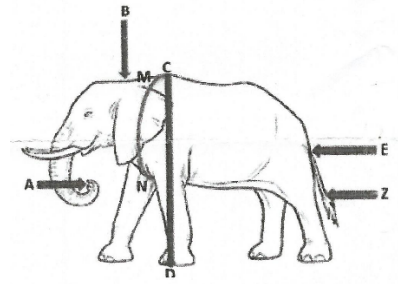
Carcass 1 Fresh (<1 month)	☐	Carcass 2 Recent (<1 year)	☐	Carcass 3 Old (>1 year)	☐	Carcass 4 Very old (up to 10 years)	☐
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Animal details

Sex⁴: ☐ Male ☐ Female ☐ Unknown

Age: _____ years Age class: _____

Animal measurements:



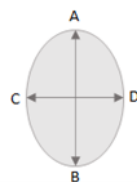
Body length (B-E) _____ cm
 Shoulder height (C-D)
 (straight line) _____ cm
 Head length (A-B) _____ cm

Jaw measurements:

Jaw width at
 widest point

cm

Feet measurements:



Length A-

Front

back

R

Width C-

D

cm

cm

cm

cm

Required (very important!):

- ~ The lower jaw must be collected and marked with the mortality number
- ~ Photograph of the lower jaw from above showing all the molars with a tape measure in view

Tusk measurements:

	Left tusk	Right tusk
ISO Code	_____	_____
Weight	_____ kg	_____ kg
Depth of tusk cavity (mm) ⁵	_____ mm	_____ mm
Circumference at base (mm)	_____ mm	_____ mm
Circumference at lip mark (mm) ⁶	_____ mm	_____ mm
Outside curve length (mm)	_____ mm	_____ mm
Outside curve length (mm) from base to lip mark	_____ mm	_____ mm

Photographs:

Full Body	Yes	No
Tusks	Yes	No
Ears	Yes	No
Tail	Yes	No
Lower jaw (left and right side) With tape measure for scale	Yes	No

*Jaw to be cleaned to such an extent that
 would make aging from photo possible*



Ministry of Environment, Forestry and Tourism

Elephant mortality data collection form

Guidelines

Checklist of material to be collected

Material to be collected if mortalities occur:

- Lower jaws of elephants (only after a forensic investigation of the incident has been completed) and after the carcass has dried out sufficiently
- In the case of anthrax mortalities, lower jaw and tusks to be treated in strong chlorine solution or in formaldehyde (formalin)

Note: These materials should be kept at the park station or regional office in a safe place (designated storage area) and should be marked when the mortality was recorded. These can be marked in the field with a permanent marker/Koki pen, but ink marks do not stay long on elephant bone, so it is necessary to use a strong metal tag attached with binding wire to the jaw. The metal tag can be cut from galvanized roofing material or similar and punched with a number and date. The same number should be added to the mortality form.

A colour photograph of the lower jaw shall be submitted to MEFT, CITES Office for assessment. If it is not possible to submit a printed photograph, send the photo by WhatsApp to XXXXXXXX or email to iifo.fillemon@met.gov.na or Josefina.Shapi@met.gov.na

Notes

1. Seizures

- If tusks are the only sources of information about an elephant mortality, e.g. when tusks are discovered or seized but no carcass is found, it is important to assess the age of the elephant and its sex.

A separate form should be completed for each tusk individually, since tusks in a seizure may come from more than one elephant:

- date of discovery or seizure
 - locality (preferably including coordinates)
 - sex estimated from the tusk circumference of L and R tusks in mm at the base and at the lip mark. Note that male tusks are conical i.e. the base of the tusk is thicker than at the lip mark (except sometime for very old elephant bulls but the tusk diameter in general for a male will be much greater than that of a female). Female tusks are almost always the same diameter at the base as at the lip mark
 - age estimated from the depth of tusk cavity for L and R tusks in mm and circumference of L and R tusks in mm at the base and at the lip mark
 - case register number if available
-

2. Checklist for determining potential cause of death

- Have the tusks been removed, and/or is there any evidence that the animal was shot or wounded by shooting (illegal killed)?
- Is there any evidence of one or more bullet wounds?
- Is there any evidence of predation by lions, i.e. bite marks on the head, neck or throat of a juvenile or sub-adult elephant?
- Is there any evidence of death by starvation – i.e. was the animal severely emaciated, ribs and hips showing prominently)?
- Is there any evidence of death from old age (teeth worn down severely with no new molar tooth emerging, thus leaving only one small molar tooth or a fragment of a molar tooth on each side of the jaw)?
- Is there any evidence of disease? Is there sign of the animal having bled from the trunk, mouth and/or anus? If so, the case must be treated as suspected anthrax and no contact must be made with the carcass or the blood. If anthrax is suspected, the case must be reported to the nearest State veterinarian or veterinary inspector. If carcass is not yet opened, efforts should be made to keep the carcass intact for at least 48 hours, to minimize sporulation and contamination of the surroundings. Once the carcass has started to decompose to stage 2 the lower jaw can be removed and taken to the park station/regional office and on a precautionary basis disinfected along with all items used to remove it and transport it.
- Is there evidence of poisoning, e.g. foam at the mouth? It is mostly predators that are targeted with poison, and there is often vomit on the scene of death, but in neighbouring countries elephants are poisoned with cyanide or organochloride pesticides put in waterholes. Vultures may also ingest poisoned bait and all vulture deaths must be recorded and reported to MET Head Office. Head Office may ask that certain samples are collected from poisoned animals for laboratory analysis.
- Is there evidence of large wounds that could have been caused by the tusks of another elephant?
- Is there evidence of a broken limb bone, broken jaw or broken ribs?

3. Determining the approximate time since death

Classification of the carcass in one of four categories based on its appearance and stage of decomposition:

- Carcass 1 - Fresh (<1 month)
Skin covered, with flesh present giving the body a rounded appearance; vultures often present; ground still moist from body fluids
- Carcass 2 - Recent (<1 year)
Rot patch from body fluids and decomposing tissue still visible around the carcass; hide still attached to carcass; bones not scattered



- Carcass 3 - Old (>1 year)
Skin absent; bones not scattered; vegetation re-grown in rot patch



- Carcass 4 - Very old (up to 10 years)
Bones bleached and scattered



4. Sex

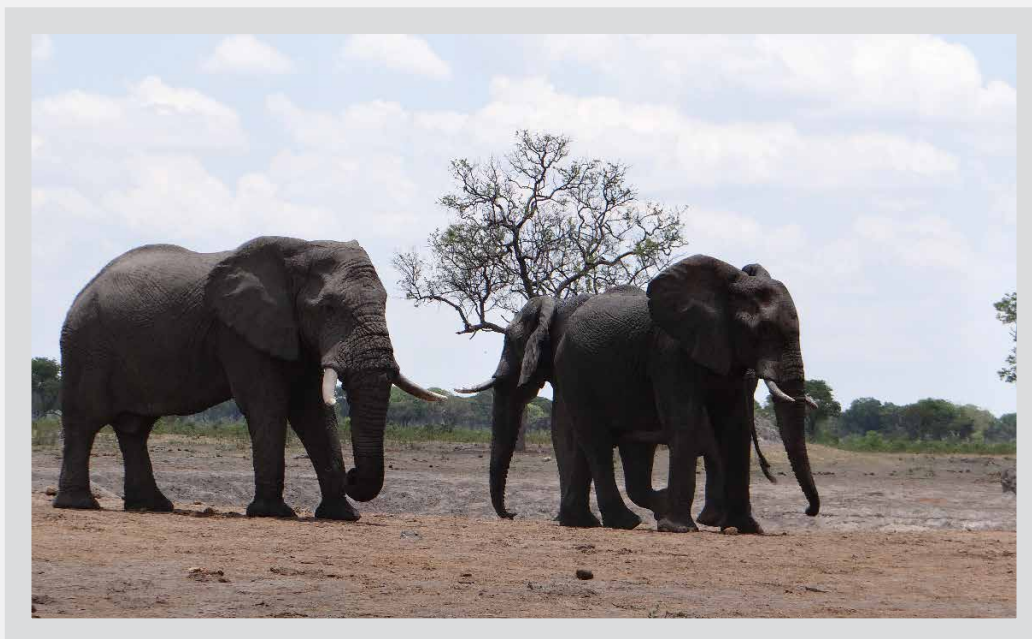
- If not a fresh carcass of a fully adult individual where the shape of the head and the genitalia indicate the sex, estimate the sex from the tusk measurements

5. Measuring the depth of tusk cavity

- Insert a rigid object e.g. a length of steel fencing wire (or car radio antenna) into the tusk opening as far as it will go without bending more than the curvature of the tusk requires and take the measurement at the longest point of the open end of the tusk and transfer that to a tape measure

6. Measuring the circumference of the tusk at the lip mark

- Take the measurement in the middle of the lip mark (the lip mark runs diagonally across the tusk and there is thus a near and far end which could influence the measurement unless it is taken in the middle of the mark)
-



4.5 Movements

Movement data have become essential in elephant management in Namibia, (see Chapter 1 of the Overview document) and have shown important movement corridors and relationships between groups. Movement data in conflict areas are particularly important and a working arrangement is in place in some areas where movement data are shared on a daily basis with affected communities as part of a conflict mitigation strategy. There is a great need to continue with the monitoring of elephant movements and priorities are shown in Table 4.

Table 4 Priorities for monitoring elephant movements

Populations/areas where ongoing monitoring of movements is needed	Objective of monitoring of movements
Kamanjab-Otjikondo	Conflict mitigation, with movement data to be shared with farming community Range use in the lower Huab and Uniab Rivers and linkages with other elephants in the lower Huab and Uniab Rivers need to be better understood, i.e. whether these elephants also use the hyper-arid lower Huab and Uniab Rivers or interact with elephants in the lower parts of the rivers Linkage with Etosha NP populations needs to be better understood, i.e. whether this is a discrete population or merely a temporary accumulation of elephants that also use Etosha NP
Omatjete-Kalkveld	Conflict mitigation, with movement data to be shared with farming community Range use in the lower Ugab River and linkage with other groups of elephant needs to be better understood, i.e. whether the groups that occur primarily on commercial farms are discrete from the groups in the lower Ugab River

Populations/areas where ongoing monitoring of movements is needed	Objective of monitoring of movements
Mangetti-Grootfontein-N $\neq$ a Jaqna-Khaudum NP	Conflict mitigation, with movement data to be shared with farming community Elephant use of the small scale commercial farms west of Khaudum NP needs to be better understood, and how wet season dispersals may have shifted to N $\neq$ a Jaqna conservancy
Kunene highlands	Long-term monitoring of this expanding elephant population is needed and its linkages with elephants in north-western Omusati and Etosha NP
Hoanib-Hoarusib	Very low number of males, male movements need to be monitored to facilitate field surveillance and links with Etosha NP population and Kunene Highlands populations need to be better understood
North-western Omusati	Long-term monitoring of this expanding elephant population is needed and its linkages with elephants in the Kunene Highlands and Etosha NP
North East when the status of fencing changes	Elephant movements need to be monitored if Botswana agrees to further open fences with Bwabwata NP and Khaudum NP
Areas where new conflicts are reported or where elephants are reported in areas in Namibia outside the normal elephant range or when elephants are translocated	Elephants seem to be expanding movements into northern Kavango West and Kavango East Regions, along the Kavango River with some indications of cross border movements with Angola. Very little is known about these elephants and their links to other groups. Sporadic appearances of elephants in unusual areas are poorly understood.



Photo: J. Heita

4.6 Human-elephant conflict

All incidents of Human-elephant conflict must be spatially recorded, ultimately in a central database, as envisaged in the “Measures and Guidelines for implementation of the revised National policy on Human Wildlife Conflict Management (2018)”. The information required is outlined in Annex 5 of the guidelines and Table 5.

Table 5 Table showing the information that must be collected and recorded for all incidents of HWC, as outlined in the Ministry Measures and Guidelines document.

	Data field required
Background	Unique incident number
	Date of report
	Station reported
	Region
	Constituency
	Name of complainant (affected party)
	Contact number (complainant)
	ID/passport number of complainant
	Relationship to owner / injured / deceased
	Owner name
	ID/passport number of owner
	Owner postal address
	Owner contact number
	Date of incident
	Complaint receiving officer
	Investigating officer
	Date of investigation
	Location of incident
	GPS coordinates
Nature of incident	Description of incident
	Type of damage
	Problem species
	Number of problem animals involved
	Group composition of problem animals
Livestock injured/killed	Cattle (cow or bull) - Number
	Cattle (cow or bull) - Value (N\$)
	Goat - Number
	Goat - Value (N\$)
	Sheep - Number
	Sheep - Value (N\$)
	Horse/donkey - Number
	Horse/donkey - Value (N\$)
	Pig - Number
	Pig - Value (N\$)
Crop losses	Type of crop
	Area affected (ha)
	Value of loss (N\$)
Infrastructure	Type of infrastructure
	Description of damage
	Value of loss (N\$)
Actions	Action taken
	Date action taken
	Claim form/s submitted

	Data field required
Livestock loss claim	Claim number
	Amount of claim (N\$)
	Does claim meet criteria (Y/N)
	If not, reason
Crop damage	Claim number
	Amount of claim (N\$)
	Does claim meet criteria (Y/N)
	If not, reason
Injury / loss of life	Claim number
	Injury / loss of life
	Name of injured/deceased
	ID of injured/deceased
	Death certificate number
	Extent of injury
	Amount of claim (N\$)
	Does claim meet criteria (Y/N)
	If not, reason
Payments	Submitted to GPTF (Y/N)
	Offset paid (N\$)
	Date of payment
Problem animals	Declared problem animal (Y/N)
Destroyed	Animal destroyed
	Number destroyed
	Date destroyed
	Location destroyed
	GPS coordinates
Trophy hunted	Animal trophy hunted
	Date hunted
	Hunting guide
	Location hunted
	GPS coordinates
Relocated	Animal/s relocated
	Number relocated
	Locality captured
	GPS coordinates
	Locality released / held
	GPS coordinates
	Collar frequency
	Animal identification

4.7 Movement corridor use and integrity

Landscape connectivity and the use and integrity of elephant movement corridors should be monitored in the long-term. Payment for ecosystem services or wildlife credit schemes will also require such monitoring which will be designed as part of such schemes. Techniques for doing such monitoring still need to be developed but could include the use of camera traps, remote sensing to monitor settlements and crop fields.

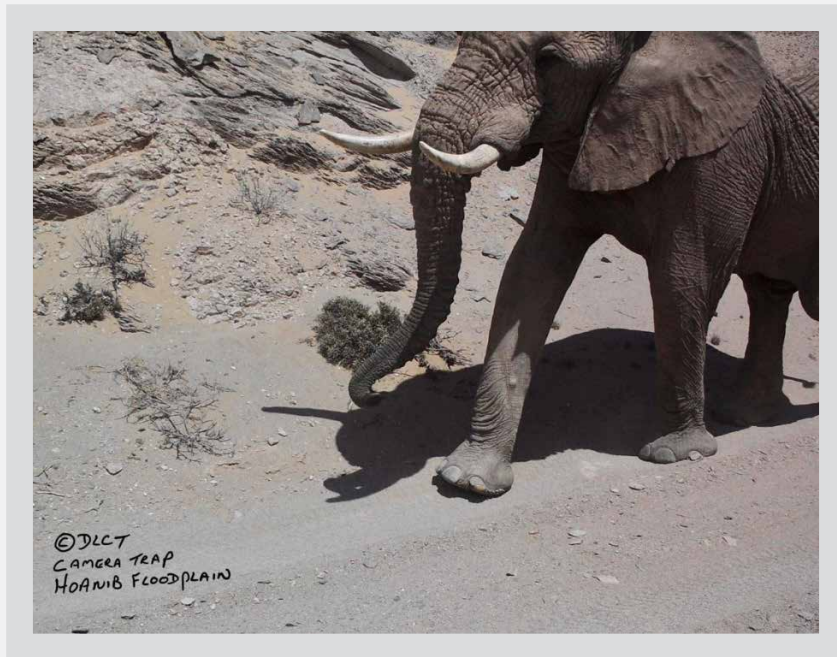


Photo: P. Stander

4.8 Impacts of elephants on other species

This is an issue that primarily applies to the protected areas of the North East, where there is concern about the impacts of elephants (and fire) on the riverine woodlands and baobabs. Other species such as bushbuck and tsessebe also seem to be sensitive to the opening up of forest and woodland areas in these parks. The high densities of elephants and the rapidly increasing population may also change the structure of the broadleaf woodlands in Khaudum NP. People with a long-standing familiarity with this park have reported an opening up of the woodlands, but there was no monitoring of such changes. These issues have been included in the management plans for the North East parks and the monitoring should be done by the park personnel.

4.9 Economic costs and benefits from elephants

Revenue and cost statistics must be retrieved by the Elephant Coordinator from the various sources (conservation hunting database, management offtake database, HEC database, concession income, Coninfo etc) on a monthly basis, per elephant management unit, and compiled into a database to allow for standardized reporting of the value and costs of elephants.

CHAPTER 5: Elephant research priorities

Although extensive research has been conducted on several aspects of elephants, much remains to be done. Some research priorities are given in Table 6.

Objective

- To ensure that research in priority topics is undertaken, and results contribute to elephant conservation and management.

Table 6 Priority research needs for elephant conservation and management

Population/area	Priority needs
Elephant range	Elephant impacts on biodiversity: Research on elephant impacts on biodiversity to ensure that elephants do not adversely impact biodiversity. This might include identifying key indicator plant and animal species that elephant are likely to impact and to regularly monitor the status of these species.
Kavango East and West Regions, Omusati Region, Kunene Region	Identification and mapping of important elephant movement corridors, and identifying management interventions needed to safeguard corridor integrity
Elephant range outside protected areas	Social perceptions, participatory management of elephants outside protected areas
Elephant range outside protected areas	Mitigation of human-elephant conflict, the efficacy of mitigation measures and novel mitigation measures
North East	Impact of illegal killing on elephant population age and sex structures
Kunene highlands and North-western Omusati Region	Population status, movements, age and sex structure
North-eastern protected areas	Age structure and recruitment of slow growing tree species in the riverine forests of the north-eastern parks under variable regimes of fire frequency and elephant density
Elephant range outside protected areas	Value of elephants to local wildlife economies

Strategies

1. Strengthen collaboration with NUST and UNAM and increase inputs from external and visiting researchers and agencies to establish long-term research programmes to address identified priorities.

CHAPTER 6: Action plans

6.1 Implementation structure

This chapter establishes Action Plans at national and regional level, outlining the area-specific outcomes applicable to each of the regions and the actions that need to be taken to achieve these outcomes. For the purposes of elephant conservation and management, the elephant range in Namibia can be divided into four geographical components:

- North West
- Central North and Etosha NP
- Kavango East, Kavango West, Otjozondjupa, Khardum NP and neighbouring conservancies
- Zambezi Region and Bwabwata NP

These are the regions for which action plans have been developed, shown in Figure 19. Within these regions there are distinct Elephant Management Units that require specific action and which should be the basis of management intervention and participatory management. These elephant management units (EMU) are also shown in Figure 19.

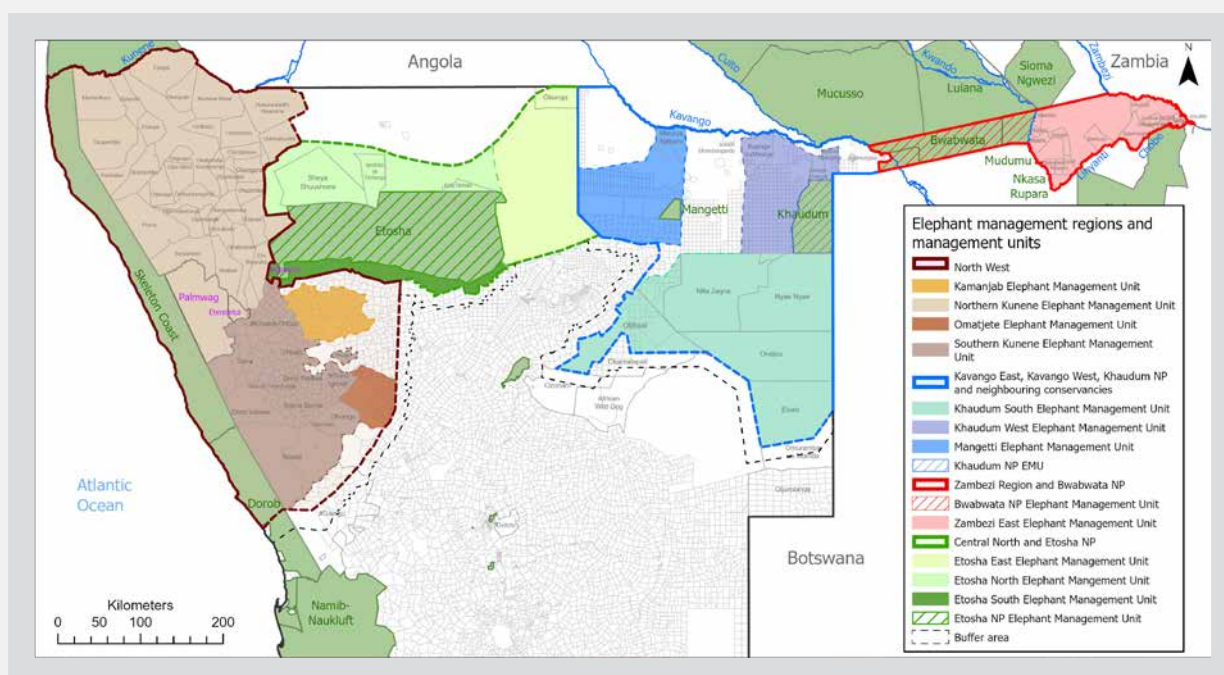


Figure 19 Geographical elephant conservation and management components (elephant management regions (EMR) and management units (EMU))

The Action Plans are derived from the strategic objectives and enabling objectives in Section 1.2.2 and the greatest threats, management challenges and essential conservation and management outcomes in Section 1.3. The Action Plans accordingly follow a standard structure. Specific actions for the Elephant Management Units are nested within the National and Regional Action Plans, as well as actions needed to set up participatory management arrangements for each Elephant Management Unit. The boundaries of the Elephant Management Regions and Elephant Management Units are indicative and may be adjusted over time. A buffer area beyond the indicative boundaries indicates that elephant management actions within this buffer are likely to be informed by the relevant EMR or EMU. Any elephants occurring outside of those buffer areas will be considered as “outliers” and will be managed by MEFT according to Standard Operating Procedures to be developed.

There are also actions required at national level, thus a fifth action plan, the National Action Plan, was developed for that, which contains all cross-cutting actions, noting that some of these are more urgent or more relevant in some of the regions than others.

As much of the urgent action to implement this plan centres around human-elephant conflict mitigation, utilization of elephants and improved monitoring of local elephant populations at Elephant Management Unit level, the setting up of these units and an appropriate governance structure for each should be a high priority for implementation in the first year of this plan. The generic terms of reference for the governance structures, hereafter referred to as Elephant Management Unit Working Groups are:

1. Appoint a chairperson and secretariat from the members for a two-year period
2. Hold quarterly meetings
3. Monitor implementation of the regional action plan and specific actions required for the Elephant Management Unit in the fields of:
 - a. Human-elephant conflict mitigation
 - b. Utilization of elephants and benefit-sharing arrangements
 - c. Species conservation
 - d. Monitoring of the elephant population in the EMU
 - e. Other areas of cooperation identified
4. Make recommendations to MEFT
5. Compile an annual progress report to MEFT

The role of support organizations in the successful implementation of the regional action plans is especially important, as much can be accomplished if forces are joined in collaborative work with MEFT and all stakeholders. MEFT will appoint a National Elephant Coordinator (NEC) that will be responsible for overseeing the development, annual review of, and implementation of Regional Action Plans and to convene coordination meetings as required. The NEC will also ensure that the Elephant Management Unit working groups are functioning effectively and contributing to the overall implementation of the Elephant Management Plan.

Figure 20 provides a graphical representation of the management structure proposed for the implementation of the National elephant conservation and management plan.

National Elephant Conservation and Management Plan Implementation structure

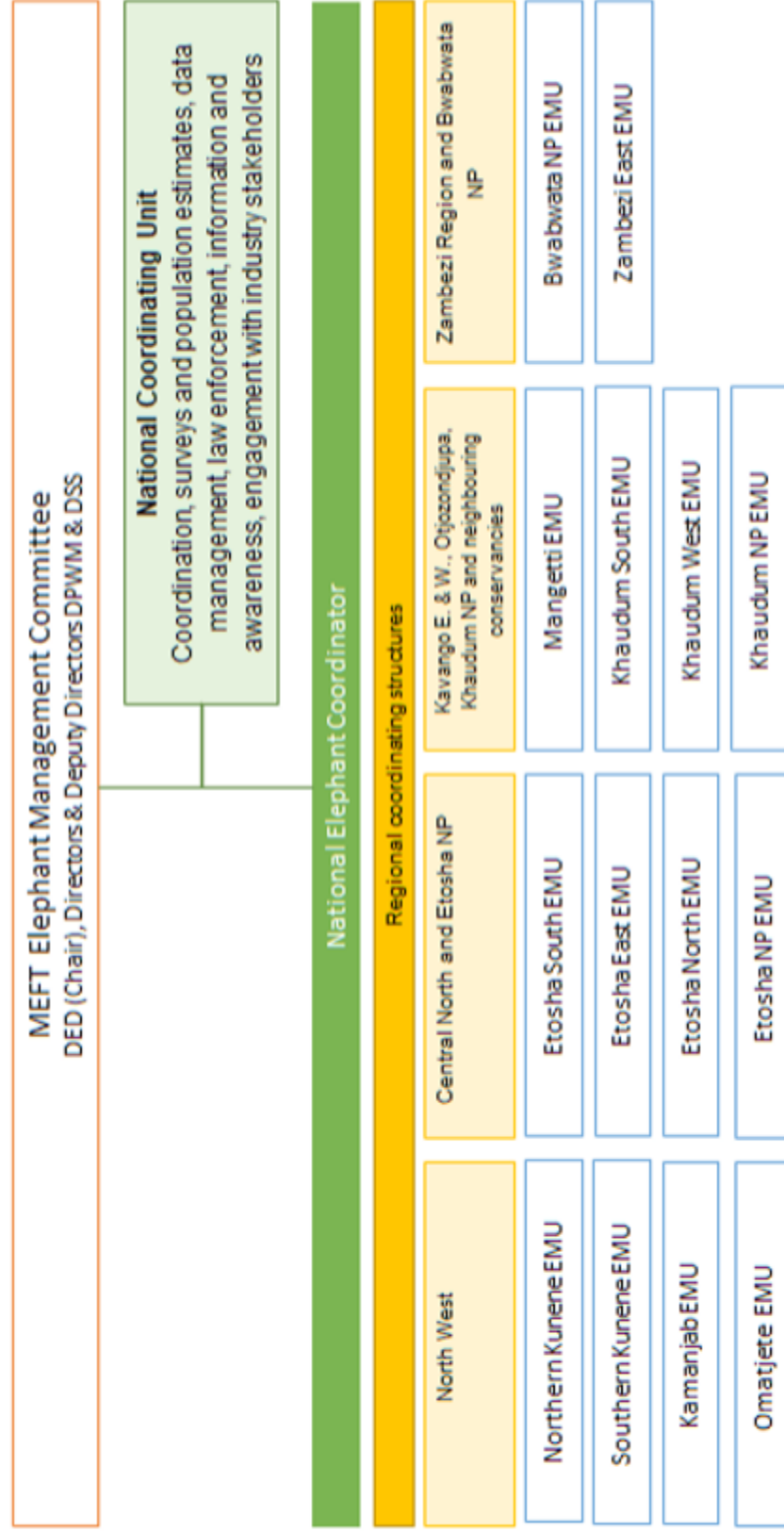


Figure 20 Implementation structure for the National elephant conservation and management plan

6.2. National (cross-cutting actions)

Outcomes	Actions	By when	By whom
Establish regionally appropriate action plans and co-management arrangements			
Co-management arrangements have been established	Develop terms of reference for National Elephant Coordinator responsibilities and officially appoint NEC	2021 (first quarter)	MEFT elephant management committee
	Confirm the terms of reference and scope of responsibilities for each Elephant Management Unit	2021 (first quarter)	MEFT elephant management committee
	Appoint a working group for each Elephant Management Unit comprising the key stakeholders which are primarily MEFT, conservancies, farmers associations and support organizations	2021 (second quarter)	MEFT elephant management committee
	Ensure that inception meetings and quarterly meetings are held at regional and EMU level	2021 (second quarter for inception meeting), thereafter quarterly	MEFT elephant management committee
	Ensure that regional action plans are annually updated as may be necessary	Annual	MEFT elephant management committee
	Ensure that action plans for each Elephant Management Unit are annually updated as may be necessary	Annual (last quarter)	MEFT elephant management committee
	Formalize cooperation agreements with protected area neighbours regarding elephant management where appropriate	Ongoing	MEFT elephant management committee
	Develop SOP for action to be taken when an elephant is outside of a defined area ("outliers" or vagrants)	2021	MEFT elephant management committee, NEC

Outcomes	Actions	By when	By whom
Fund for elephant conservation and management has been explored	Explore options for establishing an elephant conservation and management fund to support the implementation of the national elephant conservation and management plan	2021	MEFT and partners
Improved public awareness	Ongoing public awareness raising and education through e.g. the publication of wildlife crime statistics, elephant population estimates, the importance of maintaining and improving landscape connectivity and protecting elephant movement corridors, and the use of HWC mitigation measures in the elephant range following the guidelines provided by MEFT to protect home gardens, water infrastructure and crop fields to ensure livelihood protection and self-reliance	Ongoing	MEFT and partners
Improved awareness amongst traditional authorities	Ongoing public awareness raising of the importance of maintaining and improving landscape connectivity and protecting elephant movement corridors; the need to mobilize community members to actively protect their home gardens, water infrastructure and crop fields following the guidelines provided by MEFT, to ensure livelihood protection and self-reliance	Annual meeting of Council of Traditional Authorities	MEFT
Secure and increase landscape connectivity			
Important elephant movement corridors are secure and appropriately managed ¹⁷	Lead the process in Namibia of implementing Objective 1 of the KAZA TFCA Framework for Elephant Conservation and Management which is to facilitate the development of an integrated land use planning process to secure long-term ecosystem integrity and connectivity of KAZA's elephant population and associated short- and medium-term activities (see Annex 3 in overview document ¹⁸)	Ongoing	MEFT, NEC
	Engage with MAWLR, regional land boards and traditional authorities on the importance of preventing settlement, agricultural projects, artificial water provisioning, the granting of land rights over core wildlife areas and important movement corridors, also taking in consideration changing climatic conditions and the need to prevent future conflicts and impacts on livelihoods as well the need for ever-increasing government intervention in HEC management	Ongoing	MEFT
	Active participation by MEFT, conservancies and other conservation partners in integrated land use planning, formulation of rural development policies and environmental impact assessments (EIAs) for proposed agricultural investments, infrastructure development and mining in the elephant distribution range	Ongoing	MEFT, DNRRS, DWNP, DSS, NEC, conservancies, support organizations

17 Refer to Table 11 in MEFT (2021) An overview of elephant conservation and management in Namibia

18 MEFT (2021) An overview of elephant conservation and management in Namibia

Outcomes	Actions	By when	By whom
	Increase public awareness in support of long-term landscape connectivity through maintaining open and functional elephant movement corridors	Ongoing	DNRRS
	Assess and address threats to important elephant movement corridors in terms of current land management practices, land tenure, existing and planned infrastructure	Ongoing	DNRRS, EMUS
	Assist conservancies to realign their conservancy zonation to enhance landscape connectivity where possible	Ongoing	MEFT, DWNP NEC, conservancies, support organizations
	Engage, support and encourage conservancies to restore important elephant movement corridors	Ongoing	MEFT, DWNP NEC, conservancies, support organizations
	Engage, support and encourage conservancies, Traditional Authorities, Regional Councils etc. to ensure long-term access to the corridors by elephants and the maintenance thereof	Ongoing	NEC, EMUS
	Establish agreements with the relevant landholders in terms of Section 5 of the Protected Areas and Wildlife Management Bill (once enacted) concerning the future management of such corridors	Ongoing	NEC, MEFT
	Actively support communal conservancies when illegal settlement occurs that threatens the integrity of core wildlife areas and movement corridors	Ongoing	NEC, EMUS
	Develop a programme for Payment for Ecosystem Services and Wildlife Credits to safeguard important elephant movement corridors outside protected areas from settlement and agricultural use by the establishment of incentives	Ongoing	MEFT, CCFN, support organizations
	Ensure that all important elephant movement corridors are demarcated and signposted along main and secondary roads, in collaboration with traditional authorities, conservancies and landowners	Finalize Kunene Corridors mapping by April 2021	NEC, EMUS
	Ensure that all important elephant movement corridors are mapped	End of 2021	MEFT, DNRM
Important elephant movement corridors are mapped and signposted	Ensure that all important elephant movement corridors are demarcated and signposted along main, secondary and district roads, in collaboration with the Roads Authority	End of 2022	MEFT, DWNP, Roads Authority

Outcomes	Actions	By when	By whom
	Engage KAZA TFCA member states as important partners and stakeholders with regards to elephant corridors and promote cross-border collaboration and information sharing on identified and mapped corridors	Ongoing	NEC, DPWM-WSS
	Share GIS information on important elephant corridors with Traditional Authorities and land boards	Ongoing	MEFT, NEC
Elephant movements are monitored through satellite tracking of collared animals	Maintain a representative number of satellite collared elephant in each region and EMU, and monitor movements.	Ongoing	DSS
Elephant economy			
Elephant meat production has been optimized	Investigate approaches for elephant meat harvesting at EMU level in such a way that disturbance is minimized and it does not negatively impact the adult male cohort and its age structure. Look into possibility of using other species (buffalo, hippo) for meat hunting for traditional festivals in the Zambezi Region to reduce off-takes of adult males	2022	NEC, EMUS
Recovery of elephant hide for further processing has been explored	Generate economic value from elephant hide: Investigate opportunities to recover and sell elephant hides Develop SOPs for the recovery of elephant hide from all hunted elephants Check how much of the hide hunters take with them and how much is potentially available for recovery for other purposes	2021 (first quarter)	NEC, DSS
Elephant ivory omakipa are being produced, and legally sold and exported	Develop mechanisms for local production of omakipa and streamlining export certificates have been introduced, as allowed under Namibia's African elephant CITES listing	2021	NEC, DSS, MEFT
SMEs based on use of other elephant products have been supported	Support the development of small enterprises using products derived from other elephant products (e.g. dung paper, chilli bombs); investigate other SME opportunities regarding elephant tracking, bee-keeping for honey and deterring elephants; branding of products as organic and elephant friendly products	Ongoing	NEC, DNRSS, DWNP, DSS, support organizations, conservancies
A Code of Conduct for tourism in conservancies with elephants has been developed and implemented	Engage the tourism industry to develop and implement a Code of Conduct for tourism in conservancies with elephants; noting that the North West elephants in particular are being harassed by tourists and some tour guides. Feeding of elephants, passing elephants on narrow tracks, people camping at water where elephants need to drink need to be included in the Code of Conduct which should reach the tourist and not only the tour guide/operator	2021	NEC, MEFT, tourism industry, support organizations, conservancies

Outcomes	Actions	By when	By whom
Protect elephants from illegal killing Illegal killing is minimized	Effective implementation of revised national strategy on wildlife protection and law enforcement 2021-2025	Ongoing	MEFT, partner organizations
	Effective implementation of the SADC Law Enforcement and Anti-Poaching Strategy 2015-2020 (SADC 2015) and subsequent iterations which emphasizes the need for and facilitates greater cross-border cooperation in wildlife protection and law enforcement	Ongoing	MEFT
	Security plans to be drafted in the first two years of the implementation period of this plan and updated thereafter for all protected areas and surrounding land in the elephant distribution range	2022	MEFT, partner organizations, regional coordination units
	Effective implementation of park-and-neighbouring area security plans	Ongoing	MEFT, partner organizations, regional coordination units
	Support targeted enforcement and crime prevention campaigns such as Operation Blue Rhino to enhance the efficiency of law enforcement	Ongoing	MEFT, partner organizations, regional coordination units
	Support and strengthen Namibia's community-based natural resource management programme to increase cooperation and participation from rural communities and their traditional leaders in the prevention and detection of wildlife crime	Ongoing	MEFT, partner organizations, regional coordination units
	Appoint honorary conservation officers in vulnerable parts of the elephant range in terms of Section 18 of the Protected Areas and Wildlife Management Bill (once enacted) to assist MEFT by reporting suspicious activities	2021	MEFT

Outcomes	Actions	By when	By whom
Effectively mitigate human-elephant conflict and to create conditions under which elephants are a benefit to people			
Human Wildlife Conflict Self Reliance Scheme has been revised	Review the HWCERS and its implementation with the aim of: - increasing offset payments for the loss of human life - including essential infrastructure such as houses and fences and small home gardens smaller than 0.25ha in the HWCERS provided that such home gardens have been protected by chilli powder and oil treatments or electric fencing. - using in kind replacement of crop losses with replacement staple cereals products to be obtained from the nearest source (also to create a market for excess production in rural areas) - streamlining and standardizing the inspection of damage caused by elephants and the processing of claims	2021	NEC, MEFT
Spatial Monitoring and Reporting Tool (SMART) for HEC is operational throughout elephant range	Develop HEC data capture modules on SMART, equip MEFT field staff and conservancies with SMART devices and provide training	2022	NEC, DWNP-WSS, MEFT, support organizations, conservancies
Rural communities are well-informed about elephant behaviour and how to avoid conflicts	Improve the sense of security and wellbeing for people in small settlements that are frequented by elephants: - Compile information materials on elephant behaviour and avoiding conflicts. - Distribute widely - Arrange information sharing events - Encourage MME/Rural electrification to give priority to high frequency human-elephant conflict areas so that the most affected communities can have electric lighting at night	2021, ongoing	NEC, MEFT (CBNRM and regional services), support organizations
Reduce elephant impacts on food production and livelihoods	Improve protection of home gardens, community gardens, food storages and crop fields by: - Re-training of MEFT (CBNRM and regional services) and NGO field staff in practical use of effective mitigation methods - Establish demonstration sites in each conservancy with elephants covering the local range of conflict situations and the making of chilli-based deterrents - Provide incentives or seed funding for conservancies to increase production of chillies - Establish a buying agent for surplus chilli production and distribution to other users in need - Based on local knowledge, promote the use of other mitigation methods	2021, ongoing	NEC, MEFT (CBNRM and regional services), GPTF, EIF, conservancies, farmers unions, support organizations

Outcomes	Actions	By when	By whom
	Introduce the use of electric fencing around clusters of community gardens or crop fields - Advise affected communities to cluster smaller gardens or crop fields as far as possible and find out which communities would volunteer for protection with solar powered non-lethal electric fencing - Inform affected communities how injuries from an electric fence can be avoided and that livestock will learn to avoid such fences to allay fears - Pilot the protection of clustered gardens or fields with electric fencing - Provide training on the maintenance of the electric fence - Identify suitable community members who can be assigned the responsibility of maintenance and encourage conservancies to employ them as part-time fence monitors - Arrange with a supporting organization to give back-up technical support	2021, ongoing	NEC, MEFT (CBNRM and regional services), GPTF, EIF, conservancies, support organizations
	Increase visibility and presence in affected areas, train staff well in dealing with conflict cases and focus on proactive measures e.g. ensuring that mitigation methods are employed and maintained	2021	NEC, MEFT (CBNRM and regional services)
Problem animal control	- Avoid declaring and destroying any male elephant as a problem animal in the North West for the next 5 years (other conflict mitigation measures need to be applied)	Ongoing	NEC, DWNP
	- Elephants declared as problem animals to be destroyed must be hunted under supervision of MEFT (whose representative should prior to the hunt extensively consult with the conservancy personnel to be able to correctly identify the problem elephant), to prevent that any other elephant, potentially one with better trophies, is hunted instead.	Ongoing	NEC, DWNP
	- Explore a revised fee structure for the hunting of problem elephants (e.g. establish a basic fee (which could be the same as the current fee) and a sliding scale of fees based on the weight of the trophies)	Ongoing	NEC, DWNP

Outcomes	Actions	By when	By whom
Monitoring, surveys, movements, and population estimates			
Aerial surveys are conducted according to schedule	- Establish survey schedule for period of management plan - Budget for and conduct aerial surveys according to schedule	2021, ongoing	DSS, MEFT
Estimates of smaller populations are available	- Establish population estimate survey protocols for small elephant populations - Budget for and conduct surveys according to protocol and schedules	2021, ongoing	DSS, MEFT
Elephants marked with satellite collars and movements monitored	Continue and expand the use of satellite collars in all EMUs that movements are monitored and shared with EMUs and other stakeholders as appropriate	2021, ongoing	DSS, MEFT
Mortality	- Every elephant mortality to be recorded, using the standard mortality form developed for this purpose - A centralised spatial database of all recorded elephant mortalities to be developed and maintained	2021, ongoing	DSS, MEFT
Data management			
All elephant information is available at a central point	Consolidate, maintain and update spatial data sets of key information and have these readily accessible - Population estimates - Conservation hunting offtake and trophy quality - Human elephant conflict - Elephant mortalities - Illegal killing Elephant movement tracking data	2021, ongoing	NEC

Outcomes	Actions	By when	By whom
Research			
Elephant research is being undertaken in a coordinated way	Develop a comprehensive list of research needs to inform elephant conservation and management decisions	2021, ongoing	NEC
	Strengthen collaboration with NUST and UNAM and increase inputs from external and visiting researchers and agencies to establish long-term research programmes to address identified research priorities	2021, ongoing	NEC
Utilization			
Elephant population is sustainably used to create incentives for co-existence and help mitigate conflicts	Award quotas for hunting elephants for trophies or meat in Regional elephant management components or Elephant Management Units where applicable, based on the elephant population of the region or EMU, according to agreed guidelines, and using an adaptive management approach	2023, ongoing	Quota Setting Coordination Committee, DWNP-WSS, DSS, NEC
	Engage with the elephant range conservancies to explain the new quota system and develop with the conservancies a framework for benefit sharing of the shared offtake quotas	2022	DWNP-WSS, support organizations, conservancies
	Implement the age-based minimum standard for export of elephant trophies, but allow a three year grace period for the phasing in of the age-based minimum standard; thereafter MEFT to review the situation and possibly make adjustments	2021-2024	DWNP-WSS, DSS, hunting industry
	Strictly enforce the keeping of lower jaw for inspection or good photo that is geo-tagged, by not granting any export permit for hunting trophies from an elephant for which an age has not been determined	2021, ongoing	DWNP-WSS, DSS, hunting industry
	Review the terms of hunting concessions to avoid a short-term approach to hunting that may reduce selectivity in hunting, by considering the concession period but also the pricing structure (including the use of fixed pricing, and doing away with offers relating to development projects)	2021	NEC, DWNP-WSS, hunting industry
Trophy quality monitoring	Maintain a database of trophy quality that includes age estimates of each elephant hunted for each type of hunting offtake. During the three-year grace period, additional photographs and measurements must be collected of both the live elephant and features of the elephant once hunted, to build up a guideline for the evaluation of elephant age using physical appearance	2021 ongoing	DSS, DWNP-WSS, hunting industry

Outcomes	Actions	By when	By whom
Economic value of elephants			
The economic value of elephants is described and understood	In light of questions from the livestock production sector about the relative economic value of elephants, conduct a cost-benefit analysis of land use options based on elephant (and other wildlife) that would indicate the relative productivity and economic yield of wildlife-based vs livestock-based or crop production-based land use per hectare in relation to or in terms of the different bioclimatic zones in Namibia; relative proximity to the market; the cost of human-elephant conflict per hectare; the environmental and biodiversity cost of livestock and crop-production; employment creation, wage structures and foreign exchange earnings, etc.	2021-2023	MEFT in collaboration with the NCE and support organizations
Elephants in private ownership			
Elephants held in captivity whether privately owned or not are held	– Implement the recommendations in this plan regarding the elephants in private ownership – Prohibit the removal from the wild of elephants (including injured, sick or orphaned elephants) for the purpose of their rescue or rehabilitation in captivity until a policy has been developed on such removals, rescues or rehabilitation	2021, ongoing	MEFT, DWNP, DSS

6.3 Regional action plans

The regional action plans are the result of the National Consultation, and are indicative. These plans must be reviewed and implemented through the Regional Coordinating Structures, including the Elephant Management Unit working groups, noting that elements of the national cross cutting actions need to be cascaded down to each regional action plan.

North West

Outcomes	Actions	By when	By whom
Important elephant movement corridors are secure and appropriately managed	Secure and increase landscape connectivity		
	Continue to collar elephants (noting that collaring will also support HEC mitigation, see below) in the Hoarusib River (males), Kunene highlands, Kamanjab-Otjikondo area and Omatjete area	Ongoing	DSS, NEC
	Strategic collaring of elephants in all management units (Kamanjab -Anker Area; Kunene South-Fransfontein Area)		
	Manage access to collar information/data on the ground to avoid everyone having access to the data – use the Kamanjab model or the Lion monitoring model to secure information		
	Investigate how internet and network provision can be enhanced in conflict hotspot areas		
	Identify and map important elephant movement corridors	End of 2021	DNRRS, EMUS
	Demarcate (signpost at important access points) important elephant movement corridors.	End of 2021	DNRRS, in collaboration with RA
	Assess threats to important elephant movement corridors in terms of current land management practices, land tenure, existing and planned infrastructure. Known threats include tourism activities, uncoordinated opening of water points, provision of water for drought relief purposes, unregulated driving, diverging laws and policies, attitude towards elephants, drought, climate change, farming practices, overgrazing/emergency grazing, privately owned property/land, land allocation in communal areas, damming in rivers, lack of communication between MEFT and MAWLRL	End of 2022	DNRRS, EMUS

Outcomes	Actions	By when	By whom
	Assist Ombombo, Otjindjerese and Kunene River Conservancies (currently not zoned) to zone their conservancies, taking elephant distribution and movements into account Gazette zonation plans	End of 2022	DWNP WSS, EMU, conservancies, IRDNC, NACSO support organizations
	Assist Okanguati and Ombazu Conservancies (currently not zoned) to zone their conservancies, taking elephant distribution and movements into account Gazette zonation plans	End of 2022	NEC, MEFT (CBNRM and regional services), EMU, conservancies, IRDNC, NACSO support organizations
	Assist Otuzemba, Otjombande and Okatiandja Kozomenje (currently not zoned) to zone their conservancies, taking elephant distribution and movements into account Gazette zonation plans	End of 2022	NEC, MEFT (CBNRM and regional services), EMU, conservancies, IRDNC, NACSO support organizations
	Conduct a situational analysis of the (unregistered) land west of Sheya Shuushona Conservancy in terms of elephant usage	2022	NEC, MEFT (CBNRM and regional services), EMU, conservancies, IRDNC, NACSO support organizations
	Assist all conservancies in the North West to review the zonation of their conservancies and update their wildlife management plans, specifically also to realign their core wildlife areas as far as possible to include as much as possible of the important elephant movement corridors but also to create larger contiguous areas amongst neighbouring conservancies for wildlife management Gazette zonation plans	End of 2023	NEC, MEFT (CBNRM and regional services), EMU, conservancies, IRDNC, NACSO support organizations
	Encourage and support conservancies to establish more integrated management of adjacent wildlife core areas including through the proclamation of such areas as Landscapes of Special Conservation Importance	Ongoing	NEC, MEFT (CBNRM and regional services), EMU, conservancies, IRDNC, NACSO

Outcomes	Actions	By when	By whom
	Support the initiative of Ehrovipuka, Omatendeka and Anabeb Conservancies to establish a community-based protected area, i.e. the proposed Ombonde People's Park comprising the core wildlife areas of these conservancies (and register such as a Landscape Of Special Conservation Importance in the Ombonde River catchment in terms of Section 21 (c) of the Protected Areas and Wildlife Management Bill once enacted), which will secure an important elephant movement corridor and combat unregulated tourism	Ongoing	MEFT, IRDNC support organizations, conservancies
	Support the development of a community-based protected area such as a Landscape of Special Conservation Importance comprising the Palmwag, Etendeka and Hobatere tourism concession areas to mitigate the threats of severe droughts and climate change and secure an important elephant movement corridor. This together with the proposed Ombonde People's Park will create a contiguous zone of protected habitat from the Skeleton Coast National Park to Etosha NP and movements by elephants in response to drought and climate change, as well as create new tourism opportunities for the conservancies. The same principle should be applied to other important elephant movement corridors	Ongoing	MEFT, IRDNC, support organizations, conservancies
	Actively support communal conservancies when illegal settlement occurs that threatens the integrity of core wildlife areas and movement corridors	Ongoing	NEC, MEFT (CBNRM and regional services), EMU, conservancies
	Work with HQ and partner organizations to identify PES and Wildlife Credit opportunities to safeguard important elephant movement corridors outside protected areas from settlement and agricultural use	Ongoing	NEC, support organizations, conservancies, tourism operators, international community
	Assist conservancies to enforce their exclusive rights over tourism once the PAWM bill is enacted, by signposting, identifying campsites and routes and advising on payment levels	2021, ongoing	MEFT, Concession unit, WSS, support organizations, conservancies

Outcomes	Actions	By when	By whom
	Engage MAWLR to review the functioning of the Huab and Ugab River basins and upstream damming to ensure that the small but important wetland areas and springs downstream in conservancy areas are restored and that elephant distribution and movements in these river catchments are not impeded	2022	MEFT
	Conduct a feasibility assessment for the reintroduction of elephants to the lower Kunene River area where there is considerable vacant elephant habitat	2024	MEFT
Protect elephants from illegal killing			
Retaliatory killing is prevented	Promoting and practicing effective mitigation of human-elephant conflict is the best strategy to prevent retaliatory killing – Develop a long-term plan on managing HEC – Rapid response from MEFT – Empower affected people to manage and benefit (custodianship of elephants) – Provide education and training. – Increase offsets/incentives (also include commercial farmers). – Establishment of commercial conservancies. – Undertake economic modelling of elephant value	ongoing	NEC, MEFT (CBNRM and regional services), EMU, conservancies
	Assist traditional authorities in the upper Hoarusib River catchment to appoint community game guards for areas not included in conservancies	ongoing	Support organizations
	Increase aerial surveillance and ground patrols of the upper Hoarusib River catchment	ongoing	NEC, DSS
	Take measures to address human-elephant conflict in the upper Hoarusib River catchment to prevent retaliatory killing of elephants	ongoing	NEC, MEFT, support organizations, conservancies

Effectively mitigate human-elephant conflict and to create conditions under which elephants are a benefit to people				
Secure access to water by elephants and prevent negative impacts on water supplies to rural communities	Convert all key water installations used by elephants to solar pumping to reduce the burden on communities of pumping water with diesel pumps and secure a stable supply of water for elephants	2021-2026	MEFT, EIF, MAWLR, support organizations	
	- Identify and map all water installations used by elephants, indicating which are already solar powered and protected and which not - Develop a proposal to GCF (or other as appropriate) to convert all water installations used by elephants to solar pumping - Implement conversion			
	Standardize the design and layout of waterpoints for elephants (and other wildlife) in relation to settlements. - Identify effective design based on experience. - Engage MAWLR/Rural Water Supply to ensure that all new waterpoints in the elephant range follow this standard	2021 (first quarter)	NEC, MEFT, support organizations	
	Continue to protect other unprotected and less critical waterpoints with stone walls to prevent occasional damage by elephants	Ongoing	MEFT, conservancies, support organizations	
	Engage MAWLR on the development of an integrated approach concerning water resource management in the North West that will include the monitoring of the sustainability of underground water resources, and the prevention of the drilling of ever more boreholes in areas with a very high risk of land degradation and desertification and leading to more and more settlement in core wildlife areas and the displacement of wildlife	2021	MEFT	
Monitor elephant movements and share information with affected communities	Continue to collar elephants in high frequency conflict areas and share information daily with the affected community.	Ongoing	DSS, NEC	
	Encourage five internet service providers to each adopt a community in a high frequency conflict area and provide internet coverage to ensure that elephant movement information reaches all vulnerable households, in the interest of protecting rural livelihoods.	2021	NEC, MEFT, support organizations	
	In high frequency conflict areas establish early warning systems (as developed for lions) which includes floodlights that come on when elephants approach specific areas	2021-2026	NEC, EMUs, conservancies, support organizations	

Effectively mitigate human-elephant conflict and to create conditions under which elephants are a benefit to people				
Expand MEFT field presence in high frequency conflict areas	Establish MEFT stations with rapid response capability in high frequency conflict areas such as Kamanjab and Omatjete Involve all stakeholders in the EMUs Appoint honorary nature conservation officers Provide training for first responders	2022	MEFT, EMUs, support organizations	
Elephant population is sustainably used to help mitigate conflicts	Award quotas for hunting elephants for trophies or meat in EMUs where the elephant population is well-known and monitored to help offset the costs of elephant-human conflict (excluding the Hoarusib-Hoanib-Ombonde group, the Uniab River catchment and the lower Huab River group where there should be no hunting for at least 15 years) Use problem animal control or population reduction only as a last resort, in light of the relatively small population in the North West and very small populations in the individual EMUs No problem elephant control must be done in Hoanib-Ombonde and Hoarusib populations or in the vicinity of the Hoanib-Ombonde and Hoarusib catchments, the Uniab River catchment and the lower Huab River group, in particular to prevent any additional off-takes of adult males	2023 onwards	MEFT, DWNP-WSS, NEC, EMUs,	
		Ongoing	MEFT	
		Ongoing	MEFT	
Elephant population is effectively monitored	Improve elephant conservation, population monitoring and management by – Establishing collaborative efforts to compile and maintain a permanent elephant register for individual identification – Expanding aerial survey coverage on a three-yearly basis to the entire elephant distribution range in the North West – Conducting coordinated ground surveys and waterhole counts to record elephant age and sex structures as the basis for utilization quotas	Ongoing	NEC, EMUs, Regional Services, MEFT, partner organizations, conservancies	

Mitigate the effects of severe drought and climate change on the small populations of elephant in the arid and hyper-arid parts of the Kunene Region			
Further decline of the Hoanib-Ombonde and Hoarusib elephants is prevented	Strengthen the monitoring of the Hoanib-Ombonde and Hoarusib elephants, increase surveillance, deterrence and law enforcement, mitigate human-elephant conflicts in the catchments and prevent obstruction of important movement routes	2021, ongoing	MEFT, conservancies, support organizations
Kamanjab-Otjikondo Elephant Management Unit			
Devolution of authority to manage elephants	Agree in principle to the transfer of conditional ownership of elephants (i.e. rights over the elephants while they are there) to an appropriate representative structure of landowners in the Kamanjab-Otjikondo commercial farming area that desire elephants to be on their land and manage them on a sustainable basis (see Section 11.4 for more detail)	2021	NEC, EMU, MEFT
Effective HEC management	Manage conflict in the EMU through the use of revenues from hunting for trophies and management hunting for meat and hide or live sales	2021 ongoing	Kamanjab-Otjikondo EMU
	Manage movement of elephants out of the EMU to non-participating land units by appropriate fencing	2021 ongoing	Kamanjab-Otjikondo EMU
Effective monitoring of the elephant population	Continue and expand the monitoring of elephants with satellite collars and the sharing of information on movements with community and farmer groups	2021 ongoing	MEFT and Kamanjab-Otjikondo EMU
Ugab-Omatjete Elephant Management Unit			
Define Elephant Management Unit	Confirm if the Ugab-Omatjete Elephant Management Unit is interested in pursuing a similar approach as in the Kamanjab-Otjikondo EMU and what the boundary of the EMU should be	2021 first quarter	NEC, EMU

Effective HEC management	Provide farmers with information on effective waterpoint protection and layouts to minimize elephant damage to water installations	2021	NEC, EMU, Regional Services
	Continue and expand the monitoring of elephants (also with satellite collars where possible) and the sharing of information on movements with the EMU	Ongoing	DSS, NEC
	Manage conflict in the EMU through the use of revenues from hunting for trophies and management hunting for meat and hide or live sales	2021 ongoing	Ugab-Omatjete Elephant Management Unit
Northern Kunene Elephant Management Unit			
Important elephant movement corridors are secure and appropriately managed	Assist Ombombo, Otjindjerese and Kunene River Conservancies (currently not zoned) to zone their conservancies, taking elephant distribution and movements into account	End of 2022	NEC, EMU, Regional Services, conservancies, support organizations
	Assist Okanguati and Ombazu Conservancies (currently not zoned) to zone their conservancies, taking elephant distribution and movements into account	End of 2023	NEC, EMU, Regional Services, conservancies, support organizations
	Assist Otuzemba, Otjombande and Okatjandja Kozomenje (currently not zoned) to zone their conservancies, taking elephant distribution and movements into account	End of 2024	MEFT, support organizations, conservancies
Effective monitoring of the elephant population	Continue and expand the individual identification of elephants, waterhole counts and assessing age structure as the basis for setting future offtake quotas	2021 ongoing	NEC, EMU, Regional Services, conservancies, support organizations
Benefit sharing mechanisms are in place	Develop with the elephant range conservancies a framework for benefit sharing of the shared offtake quotas	2023	NEC, EMU, Regional Services, conservancies, support organizations

Northern Kunene Elephant Management Unit				
Prevent illegal killing (retaliatory killing)	Strengthen the monitoring of the Hoanib-Ombonde and Hoarusib elephants, increase surveillance, deterrence and law enforcement, mitigate human-elephant conflicts in the catchments and prevent obstruction of important movement routes	2021, ongoing	NEC, EMU, Regional Services, conservancies, support organizations	
	Assist traditional authorities in the upper Hoarusib River catchment to appoint community game guards for areas not included in conservancies	ongoing	Support organizations	
	Increase aerial surveillance and ground patrols of the upper Hoarusib River catchment	ongoing	NEC, DSS	
Southern Kunene Elephant Management Unit				
Effective monitoring of the elephant population	Continue and expand the individual identification of elephants, waterhole counts and assessing age structure of elephants in the Uniab and Huab and Ugab catchments as the basis for setting future offtake quotas	2021 ongoing	NEC, EMU, Regional Services, conservancies, support organizations	
Benefit sharing mechanisms are in place	Develop with the elephant range conservancies a framework for benefit sharing of the shared offtake quotas	2023	NEC, EMU, DWNP-WSS, MEFT, conservancies, support organizations	

North Central and Etosha NP

Outcomes	Actions	By when	By whom
Secure and increase landscape connectivity			
Important elephant movement corridors are secure and appropriately managed.	Continue to collar elephants in north-western Omusati Region (noting that collaring will also support HEC mitigation, see below)	Ongoing	DSS, NEC
	Continue collaring along NW boundary of ENP		
	Conduct a situational analysis of Ombombo Owambo (Okambobona) spring area in north-western Omusati Region which appears to be the historical centre of elephant distribution in the dry season and identify measures to ensure sustainability of use by elephants. Parameters to be looked at: water, proximity of human settlement, vegetation, HEC.	2022	NEC, MEFT, conservancies, Regional authorities, academic institutions (NUST, UNAM, international), farmers unions, Traditional Authorities, MAWLR
	Identify and map important elephant movement corridors. Existing collar data plus future collaring.	2021	NEC, DSS, MEFT, academic institutions (NUST, UNAM, international)
	Demarcate (signpost at important access points) important elephant movement corridors. Raise awareness prior to demarcation.	2021	NEC, MEFT
	Assess threats to important elephant movement corridors in terms of current land management practices, land tenure, existing and planned infrastructure.	2021	NEC, MEFT, academic institutions (NUST, UNAM, international)

Outcomes	Actions	By when	By whom
	Assist conservancies to realign their core wildlife areas as far as possible to include as much as possible of the important elephant movement corridors, especially with the aim of connecting the wildlife and multiple use zones of Sheya Shuushona, Uukwaluudhi (core area fenced off) and Uukolonkadhi Ruacana (to be fenced off) Conservancies Create awareness and sensitize communities on the importance of wildlife corridors and the concept of buffer zones around protected areas, considering in this regard King Nehale, Ipumbu ya Tshilongo, and emerging conservancies	End of 2023	NEC, MEFT, support organizations, conservancies, Namibia Development Trust,
	Actively support communal conservancies when illegal settlement occurs that threatens the integrity of core wildlife areas and movement corridors Engage the Ministry of Justice and the Law Reform Commission to strengthen and harmonize overlapping or conflicting legal frameworks to ensure that core wildlife areas cannot be settled at the expense of the conservation achievements and tourism development interests of the registered conservancies (Traditional Authority Act, amended Nature Conservation Ordinance, Communal land reform Act)	Ongoing	MEFT, support organizations, conservancies, respective TAs, respective land boards, Namibian Police, NDT MEFT, Ministry of Justice, Law Reform Commission
	Breach fences in strategic places along the western and north-western boundaries of Etosha NP to enable elephant dispersal to other areas, seasonally or permanently and to enable the park to serve as a drought refuge for elephants from the north-eastern Kunene and Omusati Regions This would require assessing and identifying possible strategic exit/entry points, awareness creation, creating buy in, enhancing collaborative management between conservancies and park management, assessing security risks for rhinos	Ongoing	NEC, MEFT, support organizations, affected conservancies and respective Traditional Authorities
	Where fences are removed or breached, monitoring should be done of elephant movements, as well as other wildlife, e.g. through the use of telemetry collars and camera traps Explore the use of an early warning system for elephants in combination with fence breaches	Ongoing	NEC, MEFT, support organizations, affected conservancies

Outcomes	Actions	By when	By whom
Protect elephants from illegal killing			
Retaliatory killing is prevented.	Effective mitigation of human-elephant conflict is the best strategy to prevent retaliatory killing Training of community members on preventative measures	ongoing	NEC, MEFT, support organizations, affected conservancies, respective TAs, academic institutions (UNAM, NUST, international)
Prevent long-term negative and possibly irreversible impacts by elephants on other components of biodiversity and ecosystem processes and functioning			
Continuous browsing pressure around artificial waterpoints is reduced in Etosha NP	Experimental rotation of artificial waterpoints in Etosha NP	2021, ongoing	NEC, MEFT
Artificial water provisioning has been reduced in Etosha NP	For every new boreholes developed close an existing one and reduce the pump capacity and troughs for new boreholes in Etosha NP (adaptive and on merit if regarded necessary). Boreholes drilled for emergency purposes (drought) should not be made permanent	2021, ongoing	NEC, MEFT
Iconic trees have been protected in Etosha NP	Place stone packs around iconic trees at waterholes and on the plains of Etosha NP Identify iconic trees for protection (e.g. large and old acacias and leadwoods at waterholes, moringas)	2021, ongoing	NEC, MEFT

Outcomes	Actions	By when	By whom
Effectively mitigate human-elephant conflict and to create conditions under which elephants are a benefit to people			
Benefit sharing mechanisms are in place	Develop with the elephant range conservancies a framework for benefit sharing of the shared offtake quotas. Improve elephant monitoring, especially the male component, and establish individual identification of adult males to improve decision-making in quota setting	2021	NEC, EMU, MEFT, affected conservancies, NDT
Elephant population is sustainably used to help mitigate conflicts	Award quotas for hunting elephants for trophies or meat in Elephant Management Units where the elephant population is well-known and monitored to help offset the costs of elephant-human conflict Use problem animal control or population reduction only as a last resort, in light of the relatively small population in the North West Omusati Region and very small populations in the individual EMUs Conduct a population viability assessment of the elephants of the North Central region in the absence of long-term connectivity with Etosha NP	ongoing	NEC, EMU, MEFT, affected conservancies, NDT
Elephant population is effectively monitored	Improve elephant conservation, population monitoring and management by - Establishing collaborative efforts to establish a permanent elephant register for herd/individual identification. - Expanding aerial survey coverage on a three yearly basis to the known elephant distribution range in the Omusati Region. - Conducting coordinated ground surveys and waterhole counts to record elephant age and sex structures as the basis for utilization quotas.	ongoing	NEC, DSS, EMU, MEFT, conservancies, support organizations, academic institutions (UNAM, NUST)

Outcomes	Actions	By when	By whom
Incidents of HEC are reduced	Improve access to water for elephants in regular conflict areas in north-eastern Kunene Region-north-western Omusati Region in cases where elephants impact artificial water installations: – convert water pumps to solar pumps to reduce the burden on communities of pumping water with diesel pumps (see North West for detail). Improve protection of water infrastructure, home gardens and crop fields by: construction of water infrastructure protection walls against elephants – increase security against theft of water installations, e.g. pumps, solar panels – introducing or expanding the use of chilli powder mixed with used engine oil or grease on fences around small home gardens and small crop fields. – introduce or expand the use of electric fencing around larger community gardens or crop fields. In other areas with larger settlements, in collaboration with affected communities the clustering of smaller gardens and their protection with electric fencing should be piloted. Improve the sense of security for people in areas with elephants: – encouraging the storage of food and fodder which attract elephants within electrified enclosures instead of houses. – encourage the use of chili powder mixed with used engine oil or grease on fences around grain storages. – request the Roads Authority to put up elephant warning signs on public roads to avoid vehicle accidents at night Encourage use of other innovative methods to deter elephants from residential areas, crop fields, water infrastructure	ongoing	NEC, DSS, EMU, MEFT, conservancies, support organizations, MAWLR (Rural Water Supply), Roads Authority

Outcomes	Actions	By when	By whom
Elephant Management Units			
Elephant Management Units are established as the situation may demand	Elephant Management Units are established as the situation may demand: - Southern EMU – Friends of the Park/southern boundary farmers’ forum - Northern EMU – northern conservancies including emerging conservancies, except King Nehale bordering ENP - Eastern EMU – King Nehale conservancy, commercial farms, game reserves, up to Okongo	ongoing	NEC, conservancies, park neighbours, farmers’ associations/unions, Traditional Authorities, private sector (game reserve and lodge owners), Regional Councils

Khaudum NP, neighbouring conservancies and elephant distribution areas in Kavango East, Kavango West and Otjozondjupa Regions

Outcomes	Actions	By when	By whom
Secure and increase landscape connectivity			
Important elephant movement corridors are secure and appropriately managed.	Continue to collar elephants (noting that collaring will also support HEC mitigation, see below)	Ongoing	NEC, DSS, MEFT, Naankuse
	Identify and map important elephant movement corridors.	2021	DNRRS, support organizations, EMU, academic institutions (NUST, UNAM, international)
	Demarcate (signpost at important access points) important elephant movement corridors.	2021	NEC, MEFT
	Assess threats to important elephant movement corridors in terms of current land management practices, land tenure, existing and planned infrastructure.	2022	NEC, DSS, EMU, MEFT
	Negotiate the removal of the fences or the breaching ¹⁹ of such fences in strategic places between Khaudum NP and Ngamiland in Botswana to enable elephant dispersal in response to rainfall, fire and disturbance, and thus implement Objective 2 <i>Maintain and manage KAZA's elephants as one contiguous population</i> and associated short and medium term activities of the KAZA TFCA Framework for Elephant Conservation and Management. Where fences are removed or breached, monitoring should be done of elephant movements, as well as other wildlife, e.g. through the use of telemetry collars and camera traps.	2021 onwards	NEC, DSS, EMU, MEFT, MAWLR Veterinary Services, KAZA Secretariat, conservancies, support organizations
	Assist conservancies to realign their core wildlife areas as far as possible to include as much as possible of the important elephant movement corridors.	2022	NEC, EMU, MEFT, support organizations, conservancies, NNF

¹⁹ Breaching in this sense means the opening of gaps in the fence to allow elephant movements in certain areas. Elephants elsewhere have shown the ability to get used to such gaps over time. Some experimentation will be necessary regarding the ideal width of such gaps and how they could best be constructed and monitored.

Outcomes	Actions	By when	By whom
	Encourage and support conservancies and community forests to establish more integrated management of adjacent wildlife core areas	2023	NEC, EMU, MEFT, support organizations, conservancies, respective Traditional Authorities, respective land boards, NDT
	Actively support communal conservancies when illegal settlement occurs that threatens the integrity of core wildlife areas and movement corridors	Ongoing	NEC, EMU, MEFT, MFMR, support organizations, conservancies, Traditional Authorities
Protect elephants from illegal killing			
Prevent illegal killing from spilling over into the area	Develop and implement a security plan for the region	2022, ongoing	DWNP, NAMPOL, NDF, NCIS
Prevent long-term negative and possibly irreversible impacts by elephants on other components of biodiversity and ecosystem processes and functioning			
Impact of high-density elephant populations on the broadleaf woodlands in Khaudum NP has been evaluated	Conduct assessment of the impact of high-density elephant populations on the broadleaf woodlands.	2022	DSS, MEFT, NUST, UNAM
Protect vulnerable specimens of long-lived tree species	Iconic specimens like baobabs in Nyae Nyae Conservancy and camelthorns at waterpoints in southern Khaudum are protected	Ongoing	NEC, DSS, Conservancy, MEFT, support organizations
Elephant populations are able to move in response to rainfall, water and food availability, fire and disturbance	Improve landscape connectivity by negotiating the removal of the Botswana fence and restoring movements between Khaudum NP and western Ngamiland	Ongoing	MEFT, DWNP-WSS, MAWLIR, KAZA secretariat and support organisations

Outcomes	Actions	By when	By whom
Effectively mitigate human-elephant conflict and to create conditions under which elephants are a benefit to people			
Secure access to water by elephants	Refurbish all waterpoints in Khaudum NP to standard design	Ongoing	NEC, DWNP, MEFT
Elephant population is effectively monitored	Continue to collar elephants in high frequency conflict areas and share information daily with the affected community	Ongoing	NEC, DSS, MEFT
	Improve elephant conservation, population monitoring and management by expanding aerial survey coverage on a three yearly basis and annual full moon waterhole counts in Khaudum and neighbouring conservancies to the entire elephant distribution range in the area	Ongoing	NEC, DSS, MEFT, NUST, Friends of parks
Mangetti-KCR Elephant Management Unit			
Establish collaboration with NIDA on elephant management in the KCR	Establishment of a management agreement between MEFT and NIDA regarding elephants (and other important species such as wild dogs) on Kavango Cattle Ranch	2021, ongoing	NEC, EMU, MEFT, NIDA, Naankuse
Elephant population is effectively monitored	Continue to collar elephants in high frequency conflict areas and share information daily with the affected community	Ongoing	NEC, DSS, MEFT, support organizations, farmer's unions
Elephant population is sustainably used to help mitigate conflicts	Award quotas for hunting elephants for trophies or meat in Elephant Management Units where the elephant population is well-known and monitored to help offset the costs of elephant-human conflict Develop a benefit distribution plan and ensure all stakeholders are involved in the benefit distribution	ongoing	NEC, EMU, DWNP, MEFT, Farmers Unions, NIDA, Naankuse, Uukwangali Traditional Authority, regional council
Community-based natural resource management is expanded in the Mangetti area	Engage communities regarding the potential establishment of a communal conservancy around the Mangetti NP	Ongoing	MEFT, Uukwangali Traditional Authority, conservancies, NNF

Outcomes	Actions	By when	By whom
Protected habitat for elephants in the Mangetti area is expanded	Engage the Kavango West Regional Council and resident regarding the potential expansion of Mangetti NP	Ongoing	DNRRS, Kavango West Regional Council, Uukwangali Traditional Authority, resident communities, small scale commercial farmers in Kavango West
Khaudum South Elephant Management Unit			
Elephant population is sustainably used to help mitigate conflicts	Award quotas for hunting elephants for trophies or meat where the elephant population is well-known and monitored to help offset the costs of elephant-human conflict	ongoing	DWNP-WSS
Benefit sharing mechanisms are in place	Develop with the elephant range conservancies a framework for benefit sharing of the shared offtake quotas	2021	MEFT, conservancies, support organizations, Omatako Traditional Authorities, NNDF
Secure access to water for elephants	Assist Na=Jaqua Conservancy to create secure access to water for elephants and other wildlife, including the western edge of the conservancy to prevent elephants from entering commercial farms to access water	2021	MEFT, conservancies, support organizations
Prevent impact by elephants on rare species	Assist Nyae Nyae Conservancy to protect baobabs against elephants	2021	DWNP, conservancy, Nyae Nyae Traditional Authority, NNDF
Khaudum West Elephant Management Unit			
Elephant population is sustainably used to help mitigate conflicts and a mixed land use is promoted	Engage the Kavango East small-scale commercial farmers association regarding a cooperative arrangement to mitigate the impacts of elephants and other wildlife in the area west of Khaudum NP through a mixed land use model	2021	DNRRS, farmers association
	Award quotas for hunting elephants for meat or trophies to help offset the costs of elephant-human conflict	ongoing	DWNP-WSS, conservancies, traditional authorities, farmers association, EMU
Benefit sharing mechanisms are in place	Develop with the elephant range conservancies a framework for benefit sharing of the shared offtake quotas	2021	DWNP-WSS, conservancies, support organizations

North East

Outcomes	Actions	By when	By whom
Secure and increase landscape connectivity			
Important elephant movement corridors are secure and appropriately managed.	Ensure the permanent removal of cattle from the Managed Resource Use Zone of Bwabwata NP as per Cabinet Decision as the basis for engagement with the Botswana government on the removal of the fence between Bwabwata NP and Botswana and thus implement Objective 2 <i>Maintain and manage KAZA's elephants as one contiguous population</i> and associated short and medium term activities of the KAZA TFCA Framework for Elephant Conservation and Management	Ongoing	DNRRS, DWNP-TFCA, Support organizations
	Identify and map important elephant movement corridors	Ongoing	NEC, DWNP-TFCA, DSS, MEFT, support organizations, conservancies
	Assess threats to important elephant movement corridors in terms of current land management practices, land tenure, existing and planned infrastructure	2021	NEC, DSS, EMU, MEFT, KAZA, support organizations
	Public awareness of wildlife corridors undertaken	2021 and ongoing	NEC, DWNP, MEFT, support organizations, conservancies
	Update map of important elephant movement corridors as more information becomes available	Ongoing	NEC, DSS, MEFT
	Demarcate (signpost at important access points) important elephant movement corridor (Note: priority task due to land conference resolutions)	2021	NEC, DWNP, EMU, conservancies, support organizations
	Priority to get Act in place and legal framework to secure elephant movement corridors	2021	DNRRS, DWNP

Outcomes	Actions	By when	By whom
	Securing tenures of the corridors through communal land reform act and new bill	2021, ongoing	DWNP, Conservancies, Traditional Authorities, Supporting NGOs
	Value to communities for securing of corridors – investigate PES or WC	2021 - ongoing	NEC, DWNP, WWF, CCFN, KAZA TFCA
	Assist conservancies to realign their core wildlife areas as far as possible to include as much as possible of the important elephant movement corridors	2021 – building on existing work	NEC, EMU, MEFT, support organizations, conservancies
	Actively support Traditional Authorities, communal conservancies and KA to address illegal settlements that threaten the integrity of core wildlife areas and movement corridors	Ongoing	DWNP, support organizations, conservancies, Office of the Attorney General
Protect elephants from illegal killing			
Illegal killing is minimized	Finalize the security plans for Bwabwata NP, Nkasa Rupara NP, Mudumu NP, Eastern floodplain	2021	NEC, DWNP, NamPol, NDF, donor funded projects, Correctional Services, Immigration, Customs
	Support finalization of Protected Areas Wildlife Management Bill and Regulations	2021	MEFT-DWNP, donor funded projects
	Selection and recruitment of wildlife protection staff	Ongoing	MEFT-DWNP, NamPol, NDF, donor funded projects
	Training of wildlife protection staff	Ongoing	MEFT-DWNP, donor funded projects
	Equipping of wildlife protection staff (includes SMART devices, uniforms etc.)	Ongoing	MEFT-DWNP, donor funded projects
	Implement security plans	Ongoing	MEFT-DWNP, NamPol, NDF
	Integrated Wildlife Crime Database accessible to Regional MEFT – linking crime scene and wildlife crime	Ongoing	MEFT-DWNP, NamPol, NDF

Outcomes	Actions	By when	By whom
	Coordination between LE entities to ensure that everybody has the same information/records	Ongoing	MEFT-DWNP, NamPol, NDF
	Awareness of surrounding communities on wildlife crime issues	Ongoing	MEFT-DWNP, donor funded projects, NGOs, Working Committees
	Develop and maintain regional mortality databases for elephants according to standard mortality form (incorporating illegally killed elephants)	Ongoing	MEFT-DWNP, donor funded projects
	Integrate the elephant mortality database into SMART	2021 - June	MEFT-DWNP, donor funded projects
	Strengthen law enforcement monitoring using SMART	Ongoing	MEFT-DWNP, donor funded projects
	Transboundary platforms – Joint commission on defense and security; working committees, public security, Joint Permanent Commission on Defense and Security	Ongoing	MEFT-DWNP - TFCA
Prevent long-term negative and possibly irreversible impacts by elephants on other components of biodiversity and ecosystem processes and functioning			
Impact of high-density elephant populations on other species such as bushbuck, tsessebe, and the riparian tree species has been evaluated	Conduct assessment of the impact of high-density elephant populations on the riverine forests and species such as bushbuck and tsessebe	Ongoing	MEFT, UNAM, NUST, Private researchers
	Finalize MoU with UNAM	2021 first quarter	MEFT, UNAM, donor supported projects
	Investigate and implement using water points inland to attract elephants away from Riverine Forests (Bwabwata, Mahango, Buffalo core area) - Identify sites - Raise funds - Develop / upgrade and maintain water points using solar	2022	MEFT, donor supported projects

Outcomes	Actions	By when	By whom
Protect vulnerable specimens of long-lived tree species	Iconic specimens of baobabs in Bwabwata NP are protected. Identify and map baobab trees (to become a responsibility of the field teams – mark positions on SMART) Explore restoration of baobab trees	Ongoing Ongoing	MEFT-DWNP DoF, UNAM, NUST
Elephant populations are able to move in response to rainfall, water and food availability, fire and disturbance.	Improve landscape connectivity by restoring movements between Bwabwata NP and northern Ngamiland.	Ongoing	MEFT, DVS, MME
Fire management strategy for Namibia's protected areas is effectively implemented to reduce large scale late dry season fires in protected areas to prevent localized overconcentration of elephants in unburnt areas.	Implement early burning strategy effectively Develop SOPs for fire management strategy (2021)	Ongoing	MEFT, DoF, Conservancies, Community forests, KA
Disturbance and deterrence from unplanned human settlement in Bwabwata NP to prevent localized overconcentration of elephants in undisturbed areas.	Implement the land use and development plan for Bwabwata NP's Managed Resource Use Zone	2021, ongoing	MEFT-DWNP, Bwabwata Advisory Committee, KA
Disturbance from road traffic through Bwabwata NP and Mudumu NP have been reduced.	Enforce speed limits in the parks and deploy traffic calming methods in the core wildlife areas of the two parks and especially at important implement elephant crossing points. - Increase signage and calming methods - Enforce speed limit (speed trapping)	2021, ongoing	MEFT-DWNP, NamPol, Roads Authority
Illegal killing of elephants has been minimized to prevent localized overconcentration of elephants in safe areas.	Implement security plan	2021, ongoing	MEFT-DWNP, NamPol, NDF

Outcomes	Actions	By when	By whom
Effectively mitigate human-elephant conflict and to create conditions under which elephants are a benefit to people			
Elephant population is sustainably used to help mitigate conflicts and for general economic development	Award quotas, and permits for hunting elephants for trophies or meat to help offset the costs of elephant-human conflict	Ongoing	DWNP WSS,
	Conduct small scale meat harvesting to supply elephant meat to rural communities and traditional authorities as a management decision. Develop regional guidelines/ SOPs to inform how this will be managed and implemented (including a checklist to guide decision making)	Ongoing	NEC, MEFT-DWNP, conservancies, traditional authorities, hunting operators
	Use problem animal control only as a last resort to prevent impacts on male component.	2021, ongoing	MEFT-DWNP
	Establish benefit sharing arrangement for the Elephant Management Unit	2022	NEC, CBNRM unit, EMU committee
	Maintain aerial survey coverage on a three yearly basis aligned as far as possible with aerial surveys in the rest of the KAZA TFCA Collaring of elephants to understand movements and corridors	2021, ongoing	DSS UNAM, NUST, private researchers, NGOs
Elephant population is effectively monitored			

Outcomes	Actions	By when	By whom
Incidents of HEC have been reduced	Improve protection of crop fields: - introduce or expand the use of chilli powder mixed with used engine oil or grease on fences around small home gardens and small crop fields. - Capacity building for applying business principles – SME development (e.g. chilli production) - encourage the clustering of crop fields to facilitate the use of electric fencing - Conservation agriculture - zonation / fencing Improve the sense of security for people in areas with elephants: - encouraging the storage of food and fodder which attract elephants within electrified enclosures instead of houses. - encourage the use of chili powder mixed with used engine oil or grease on fences around grain storages. - Engage MAWL and partner organizations to accelerate the introduction of conservation agriculture and intensified agricultural production through horticulture or hydroponics or fruit orchards that will facilitate the protection of production units with electric fencing. - Develop guidelines on specifications for HEC mitigation measures		DWNP, conservancies, support organizations
Elephant Management Units			
Elephant Management Units are established as the situation may demand	Elephant Management Units are established as the situation may demand: - Bwabwata EMU - Zambezi East EMU Identify focal person in each EMU who coordinates actions as required. Description and criteria of each EMU to be defined	ongoing	NEC, MEFT-DWNP, conservancies, Kyaramacan Association, Traditional Authority, private sector (lodge owners), Regional Councils

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Apologies if anyone has been left out, that was not intentional.

ANNEX - Stakeholder lists

The following lists of potential stakeholders for each of the Elephant Management Regions were developed during the National Stakeholder Consultation meeting. Not all would be on the working groups, but are recognised as stakeholders.

North West

Stakeholders	
Omatjete/Kalkfeld	Namibia Nature Foundation Regional Council Communal Area Land Boards
Otjikondo/Kamanjab	MEFT, Farmers Unions, Village Council Regional Council TA NUST Biodiversity Centre Tourism Partners Hunting Operators
Kunene North	MEFT, Conservancies/Associations TAs IRDNC TOSCO Desert Elephant Conservation Rural Water Supply Regional Council Farmers Unions (Ngatuuane – FUs will be identified at a later stage) NUST Biodiversity Centre Tourism Partners Hunting Operators NamParks Communal Area Land Boards
Kunene South/Erongo North	MEFT Rural Water Supply Ministry of Agriculture Regional Council NUST Biodiversity Centre Hunting Operators Tourism Partners TOSCO Namibia Nature Foundation EHRA Conservancies/Association Farmers Unions TAs NAMPARKS 5 Communal Area Land Boards IRDNC Women for Conservation Group

North Central and Etosha NP

Stakeholders	
Traditional Authorities:	Ondonga Traditional Authority Uukwambi Traditional Authority Uukwaluudhi Traditional Authority Uukolonkadhi Traditional Authority Ongandjera Traditional Authority Ehrovipuka & relevant Traditional Authorities
MEFT:	Regional Services (DD) ENP management (DD)
Conservancies:	Conservancy Chairpersons
Farmers' Unions:	Oshana Regional Farmer's Union Oshikoto Regional Farmers' Union Omusati Regional Farmers' Union Ohangwena Regional Farmers' Union Kunene (name to be identified)
Regional Councils:	Ohangwena Oshana Oshikoto Omusati Kunene
Land boards:	Oshana Communal Land board Oshikoto Communal Land board Omusati Communal Land board Ohangwena Communal Land board Kunene Communal Land board

Khaudum NP, neighbouring conservancies and elephant distribution areas in Kavango East, Kavango West and Otjozondjupa Regions

Stakeholders	
Government entities	Ministry of Environment Forestry and Tourism (MEFT) Forestry MAWLR invite someone from water affairs _ but taking into consideration that more water would present challenges too, hence, identify one or two places to place water point, e.g., Khaudum and Nyae-Nyae, to prevent challenges). Directorate of Vet services Land reform MFMR Regional councils (East, West, Otjozondjupa and Omaheke) Namibia Defense Force (NDF) War Veterans?
Parastatals	NIDA Agribusdev
Traditional Authorities (TAs)	Uukwangali Traditional Authority Mbunza Traditional Authority Shambi Traditional Authority Gciriku Traditional Authority Hambukushu Traditional Authority Nyae Nyae Traditional Authority Na #Jaqna Traditional Authority Ondjou & Eiseb Traditional Authorities
Communal Land Boards	Kavango west Kavango East Otjozondjupa Omaheke
Conservancies	Kavango East and West (CFs & Conservancy Association) Ondjou Eiseb Nyae Nyae Na #Jaqna
Farmers Associations	Meatboard Meatco NNFU regional structures (i.e., Kavango East and West NECFU (Namibia Emerging Commercial Farmers Union) Velduin and Nunugas Farmers Association Kavango East small-scale commercial farmers association Summerdown
NGOS	NNDFN NNF Naankuse CCF NDT
Tourism	Kavango Tourist lodges
Private sector	Friends of Parks NAPHA

Stakeholders	
Government entities	Ministry of Environment Forestry and Tourism (MEFT) Forestry – DNR, DEAF Agriculture (MAWLR) Land Boards DVS DAPEES Water supply and sanitation coordination (WSSC) Office of the Attorney General Office of Vice President: MA Customs Home Affairs – Immigration MME NAMPOL, NDF
KAZA	KAZA Partner States and Secretariat
Parastatals	Agribusdev NIDA
Traditional Authorities (TAs)	HaMbukushu Traditional Authority Mashi Traditional Authority Mayeyi Traditional Authority Mafwe Traditional Authority Masubia Traditional Authority
Communal Land Boards	
Conservancies & community forests	Conservancies Kyaramacan Association Community Forests
Farmers Associations	Namibia National Farmers Union Kavango East Regional Farmers Union
NGOS	IRDNC NNF WWF NACSO
Tourism	Tourism operators Hunting operators
Private sector	Friends of Parks NAPHA Small scale commercial farmers UNAM & NUST Researchers Donor funded projects

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