# An Overview of Elephant Conservation and Management in Namibia

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

Republic of Namibia

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

# ACKNOWLEDGEMENT

**Republic of Namibia**
Ministry of Environment, Forestry and Tourism

This report was commissioned and published by the Ministry of Environment, Forestry and Tourism with co-financing from the Government of the Federal Republic of Germany through the German Development Bank KfW, for the NamParks programme.

The views expressed in this publication are those of the publishers.

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**Citation:**
Ministry of Environment, Forestry and Tourism, 2020. National Elephant Management Plan 2021/2022-2030/2031

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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 |

# CHAPTER 1: Overview of elephant conservation and management in Namibia

The first elephant conservation and management plan for Namibia was done in 1991 (Ministry of Wildlife, Conservation and Tourism 1991) as part of a United Nations Environment Programme initiative through the African Elephant Conservation Coordinating Group, to support the establishment of elephant conservation and management plans at national level throughout the distribution range of elephants in Africa. A further plan was drafted in 1993 to replace the somewhat hastily prepared plan of 1991 (MWCT 1993). Only a draft of this plan has survived, but the basic elements are given in Lindeque (1995). Lindeque (1995) and Lindeque (2010) described the core elephant conservation and management issues in Namibia and together with the earlier management plans give an account that is remarkably similar to the current situation and its challenges, at a time when the elephant population was significantly smaller than at present. A further plan (Ministry of Environment and Tourism (MET) 2007) was developed in the early 2000s but was never officially approved. For the 2007 plan a comprehensive background study was prepared (Martin 2005). An analysis of management options for the elephants of north-western Namibia was also done (Martin 2009)[1]. A formal review of the 2007 plan (although it was never officially approved) was done for MET in 2016 (Cumming 2016), which led to the development of the present elephant conservation and management plan.

There are further three international frameworks that can serve as guidance for the wider elephant conservation and management in Namibia, i.e. 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 (SADC 2005), and the African Elephant Action Plan of 2010 (listed in the order of increasing geographic scope). These three frameworks contain multiple and somewhat overlapping objectives and activities which cannot be fully reflected in this national elephant management plan for fear of making this plan unwieldly, but the important strategic issues have been incorporated.

In various ways, elephant conservation and management issues in Namibia are considerably different from the other elephant range states. Namibia's elephant population is increasing, and elephant distribution range is expanding, while most other populations outside the southern African region are in decline. Uniquely in Namibia, elephants occur across a wide bioclimatic range, from the arid and mountainous North-western Namibia with sporadic and variable rainfall as low as 25-50mm per year to the easternmost part of Namibia in the Zambezi Region with over 600mm rainfall. Elephants in each bioclimatic zone present specific conservation and management challenges and are discussed separately for most part of this management plan.

The most recently published account of elephant distribution in Namibia is given in Thouless ***et al***. (2016) from data provided by MEFT, see Figure 2. In this conservation and management plan, reference is made to the elephants of North-western Namibia ((which includes the western and central parts of the Kunene Region, the north-western part of Erongo Region and western Otjozondjupa Region; the North-central area (parts of Omusati, Oshana, and Oshikoto Regions) and Etosha National Park; and the North-east (including Kavango West and Kavango East Regions, north-eastern Otjozondjupa and Omaheke Regions and the Zambezi Region)). Although there are known interlinkages amongst elephants of these three broad areas, conservation and management issues in the three areas are different and best discussed separately.

1 The model used in this analysis predicted that by 2020 the elephant population in the Kunene Region and Etosha NP, which it considered to be one and the same, would reach 3,250 of which 2,400 would be in Etosha NP and 850 in Kunene Region, but also that both Etosha NP and the communal lands would be significantly overpopulated by 2020, leading to emigration of elephants to the commercial farming areas of the Kunene Region and the Erongo Region. Kilian & /Uiseb (2015) in an assessment of this options document point out that assumptions used in the models did not correspond with actual data, but as will be seen, aspects of this prediction were accurate.

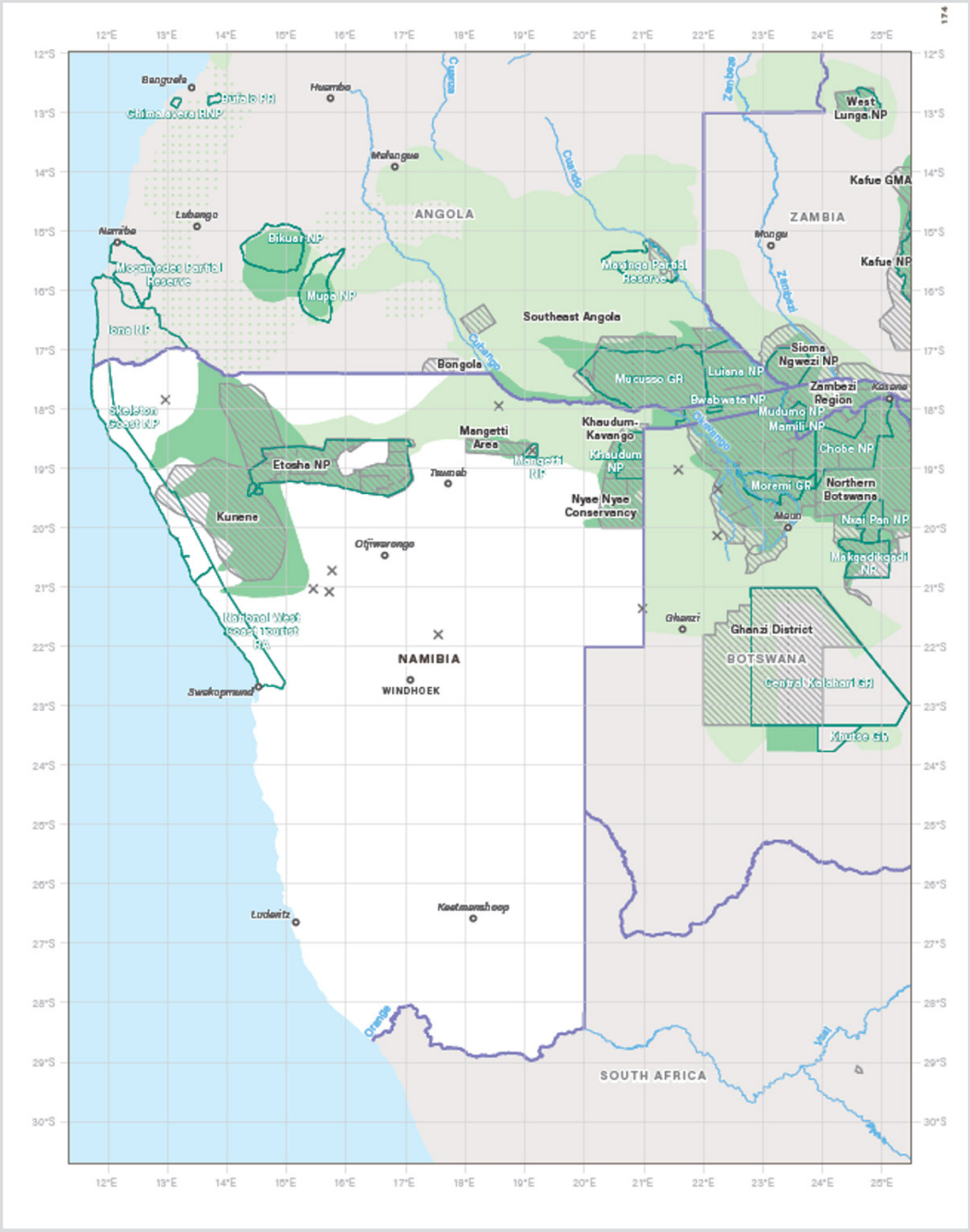



**Figure 2** Elephant distribution in Namibia from the 2016 African Elephant Status Report (Thouless *et al*. 2016). Dark green indicates known distribution, light green is possible distribution, hatched areas are data input zones and x marks individual sightings.

## 1.1 Historical status of elephants

It is valuable to be aware of the historical status of elephants in Namibia when designing a plan for the future management and conservation of elephants. As will be done elsewhere in the overview document and the management plan, three broad geographical regions, with their elephant populations, are discussed separately. This section aims to summarize the historical status of elephants in the three regions and reconstruct their population trajectories as far as possible.

There are nevertheless older records of elephants in other parts of Namibia, based on rock engravings (Kinahan 1999) (see Figure 3) and numerous historical accounts (see De Villiers & Kok 1984, Viljoen 1987, Kinahan ***et al***. 1991), also see Section 1.2.1. Remarkably, elephant tracks preserved in the silt deposits of the Kuiseb River dating to the second half of the 17th century (based on carbon dating) were still present in 1991, and it was known that another set of elephant tracks subsequently lost in a flood also occurred there and that an elephant tusk was found at Swartzbank in 1951 and a skeleton at Rooikop in 1970 (Kinahan ***et al***. 1991). These records are not of direct relevance to this plan but are worth noting.

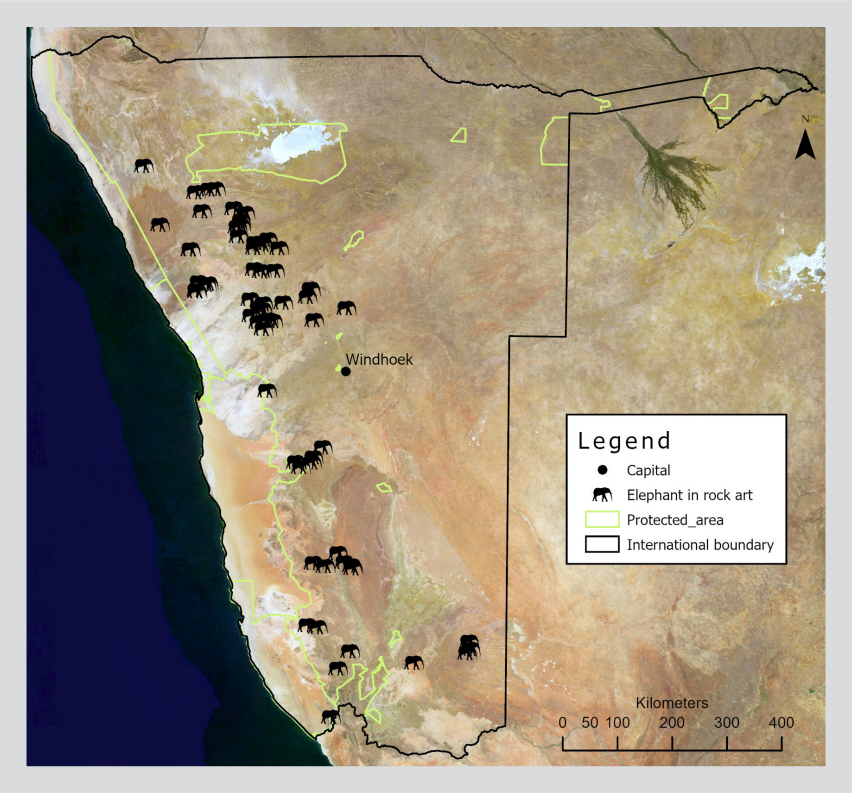



**Figure 3** Elephants in rock art in Namibia ((largely based on information in Kinahan (1999) with one additional record from Tsau //Khaeb NP))

### 1.1.1 North-western Namibia

The Kaokoveld[2] was formerly part of the largest protected area in the world at the time when Wildschutzgebiet (Game Reserve) No. 2, was proclaimed[3] by the Governor of South West Africa, Dr Friedrich von Lindequist in 1907, extending to around 80,000km² (Berry 1997). This (and the proclamation of two other game reserves at the same time by the German Colonial Administration) was done out of

2 A commonly used name for the north-western Kunene Region of Namibia. Many literature references using this designation did not define the geographic limits of this area, but it is generally understood to comprise the north-western part of the Kunene Region from the Hoanib River northwards to the Kunene River lying between the Northern Namib Desert and the Etosha NP. The current equivalent for this term could be the central western and northern parts of the Kunene Region which is not sufficiently specific, and a better designation could be the Kaokoveld biotype part of the Kunene Region.

3 Ordinance 88 of 1907

concern over the declining status of elephants (and other large mammals) (which had been heavily hunted since around 1877 by the Dorsland Trekkers who settled in the Kaokoveld at Kaoko Otavi, where they found large numbers of elephants (Bollig & Olwage 2016). The leader of this group[4] estimated that they had hunted 2,000 elephants in the Kaokoveld between 1894 or 1898[5] and 1908[6]. When they first arrived in the area from Angola in 1879, they estimated that there were 3,000 elephants in the area (Von Moltke 1943, Berry 2007). This population was considerably reduced over the next three decades. It was not only the Dorsland Trekkers that hunted elephants in this area, and there were several other hunters and elephants were also taken by the Sesfontein Nama (Von Moltke 1943) and Tjimba communities (Bollig & Olwage 2016).

In the 1930s there were variable and possibly wild estimates of the number of remaining elephants but Shortridge[7] (1934) who assembled these estimates as part of the first systematic survey of the mammals of the territory concluded that there were between 600 and 1,000 elephants in the Kaokoveld at that time[8].

Bollig & Olwage (2016) describe an administration for the area in the 1950s-1960s that was hostile to wildlife and intent on transforming the area towards cattle production, culminating in the recommendations of the Odendaal Commission and the subsequent de-proclamation of the largest part of Game Reserve No. 2 including all the land between present-day Etosha NP and Skeleton Coast NP[9] in 1970 (Berry 1997).

From various accounts Viljoen (1987) concluded that there were still between 600 and 1,000 elephants in the area by 1960. The first aerial surveys were done in 1968 and 1969 and 211 and 279 elephants were recorded respectively in the Kaokoveld. These were very short surveys and there must have been substantially more elephants than those recorded (Viljoen 1987). Owen-Smith (1970) based on extensive ground surveys over three years estimated that there were between 700 and 800 elephants in 1970. Owen-Smith (1970, 2010) provides a good account of the history and physiography of the North West of Namibia, the Kaokoveld in particular.

The first detailed study of the Kaokoveld elephants between 1975 and 1978 yielded an estimate of 207 elephants with a possible maximum of 250 in 1977 (Viljoen 1987, Viljoen 1989). He described three separate geographic groups completely isolated from each other, i.e. a northern population in the Kunene River drainage basin consisting of eight females only; an eastern population of 134 elephants from Khowarib Schlucht[10] (gorge or canyon) eastwards; and a western population of 65 elephants occurring

4 Jan Harm Robberts, from Von Moltke (1945)

5 Bollig & Olwage (2016) gives this different date.

6 This estimate of the number hunted is not verified, and there are contradictory and lower estimates in Von Moltke (1945) of 50-160 elephants hunted per year between 1880 and 1908 (Viljoen 1987) but it was also recorded that they only hunted males. At the lowest estimate of 50 elephants over 28 years, 1,400 elephants would have been hunted, but probably included some elephants hunted in neighbouring Angola and the area then known as Owamboland. If only males were hunted, there would nonetheless have been a very substantial population of elephants in north-western Namibia at that time. Bryden (1903) contains several accounts of individual elephant hunters taking more than twenty elephants in a single day or other areas like Lake Ngami in Botswana where in a single year (1849) 900 elephants were shot, which implies that the early elephant hunters were very proficient and could have made a significant impact on an elephant population.

7 Shortridge (1934) mentions that the Kaokoveld elephant at that time was considered to be a separate subspecies ***Loxodonta africana*** zukowski based on its larger size than other elephants, round ears reminiscent of the forest elephant ***Loxodonta africana*** cyclotis and its relatively small tusks.

8 Elephants in the eastern (Etosha) part of Game Reserve No. 2 fared much worse. Lieutenant Adolf Fischer as the first game warden of Game Reserve No. 2 also recorded that the last elephants in the Etosha part of the game reserve were shot in 1881 (Fischer 1914).

9 The Skeleton Coast Park is renamed to Skeleton Coast National Park in the Protected Areas and Wildlife Management Bill, expected to be enacted in 2020

10 A relatively narrow and well-watered gorge through the escarpment mountains in present-day Anabeb Conservancy

west of the 150mm rainfall isohyet. A further 82 elephants were recorded in the southern (Damaraland) part of the Kaokoveld in 1977 and 135 in 1978 ((aerial surveys done by Visagie (1977) and Le Roux (1978) in Viljoen (1987)) which he included in a transitional population[11] (see Figure 4). The total estimate of elephants in the late 1970s was 500, but see Section 1.2.3.

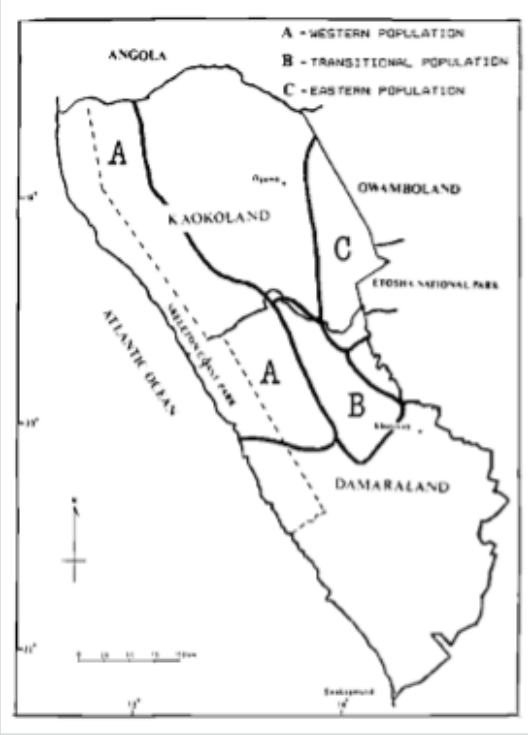



**Figure 4** Three of the four conceptual elephant populations in the Kaokoveld in the 1975-1978 period (reproduced from Viljoen 1987)

Several important events and controversies occurred or arose at that time e.g.:

- Viljoen found 123 elephant carcasses (107 that died by gunshot) and only 357[12] live elephants in 1977 (Viljoen 1987). Owen-Smith (2010) recorded 138 elephant carcasses in the Kaokoveld between 1980 and 1985. Loutit (in Martin 2005) found 58 elephant carcasses in Damaraland[13] between 1987 and 1992. There was extensive illegal killing of elephant for ivory in an area that was not generally accessible by the public and under South African military control from the mid-1970s and with a minimal presence of conservation officials up until the end of the liberation war of Namibia that ended with Independence in 1990.
- A severe drought occurred in the region, from around 1977 to 1981[14], known then as the Trans African Drought, possibly the worst drought since the Depression-era drought of the 1930s. Livestock farmers in the Kaokoveld lost 90% of their cattle (Owen-Smith 2010) and people excluded wildlife from access to springs and boreholes. Several dozen, perhaps hundreds, carcasses of cattle, kudu, Hartmann's zebra and oryx were strewn in the Ombonde and Hoanib Rivers and along the veterinary cordon fence, the "Red line" that cut across the Kaokoveld and was erected in 1976 (M. Lindeque pers. comm., J. Patterson pers. comm.

11 Not shown on his map given in Figure 4.

12 The estimate of 500 mentioned in the paragraph above probably included the 123 carcases.

13 This designation covers the southern part of the Kunene Region from the Hoanib River southwards, noting that in the literature of the 18th century the designation Damaraland was used by the early travellers such as Anderson and Möller for a larger and mostly undefined area extending further inland.

14 Officially from 1980 to 1983 but manifesting and ending earlier in the North West than in Etosha NP and the central northern part of Namibia.

and D. Gilchrist pers. comm. to M. Lindeque). Entire lion prides starved to death (D. Gilchrist pers. comm. to M. Lindeque). No elephant calves survived in the Hoanib and Hoarusib river systems both in the 1975-1978 period and again in 1982 to 1984 (Viljoen 1987, G. Owen-Smith and S. Braby pers. comm.). In nearby extreme western Etosha NP – effectively part of the Kaokoveld because of the similarity in vegetation and topography - around 150 roan antelope died in the drought around Kaross and Otjovasandu. Out of concern over the potential impact of elephants on species such as black rhinoceros and roan antelope, 570 elephants were culled in western Etosha NP in 1983 and 1985. It was noticed – but not immediately understood - at the time that some herds of elephants culled had very smoothly polished soles on their feet and must have come from mountainous and rocky terrain outside the park[15]. This was one of the reasons why the culling of elephants was stopped after 1985 (M. Lindeque, pers. comm.). It is possible that around 100 elephants (around five herds) that must have come from the eastern Kaokoveld were unintentionally culled in the process, out of a larger number (estimated at 1,500 at the time to account for the different population estimates in successive aerial survey estimates of population size in Etosha NP) that entered the park from the west during the drought and through the very permeable western boundary fence of Etosha NP (Lindeque 1988, Lindeque & Lindeque 1991).

- The impacts of such significant levels of illegal killing and drought-related mortalities significantly reduced the population but also altered the population structure. Elephants in the Kaokoveld showed a remnant or skeletal social structure (Lindeque & Lindeque 1991) and discontinuities[16] in the age structure of juvenile elephants and an age structure skewed towards adults over 20 years of age (Lindeque 1991), reflecting higher juvenile mortality than recorded in any other elephant population in Namibia. This situation persisted for at least 20 years and age class distributions in Leggett (2008) also showed a highly uneven age structure (e.g. no female elephants in the age range 15-20 years and almost none in the 25-35 year range. Leggett ***et al***. (2011) subsequently confirmed that the Hoanib-Hoarusib group represents a set of breeding females with their sexually immature offspring in association with other sets of unrelated breeding females with their offspring in a family group. There was thus no evidence of any higher order social aggregations in at least the western and eastern groups in the North West such as the bond groups or clans known from elsewhere (Moss & Poole 1983, Moss 1988, Wittemyer ***et al***. 2005, 2009).
- The notion of the "desert elephant" arose in this period, primarily due to the work of Viljoen and subsequent popularization of these elephants and the conservation threats that they faced - in particular, the dwindling western population - by numerous publications and films (e.g. Walker ca. 1982, Reardon 1986 and Hall-Martin ***et al***. 1988), and several non-technical articles in popular conservation magazines such as ***African Wildlife***, ***Custos*** and ***Quagga***, through which they acquired iconic status. That these elephants were extraordinary because of their persistence in the extremely arid and harsh conditions of the lower Hoanib and Hoarusib Rivers and surrounding barren plains and dune fields and occasional forays to the Atlantic coast, was not in dispute. Somehow the idea took hold that they were also specially adapted to these conditions by having unusually large feet, feeding less destructively, had greater mobility and requiring water less often than other elephants (only every four days in Viljoen 1989). Their geographic isolation was believed to have given rise to these unique traits. This uniqueness and isolation have largely been dispelled, but it remains extraordinary that this elephant population, and others in the low rainfall and mountainous habitats of the Kaokoveld have persisted despite severe habitat constraints and the added impacts of exceptional drought, changes in human settlement and land use of the area, and an era of intensive illegal killing.

15 Etosha NP does not have extensive rocky substrates or large mountain ranges and elephant feet are typically coarsely cracked with horny overgrowths around the edges of the soles.

16 Gaps in the age structure, such as could have been caused by periodic die-offs of calf cohorts (or, potentially, highly synchronized breeding).

- The Directorate of Nature Conservation (precursor to the Ministry of Wildlife, Conservation and Tourism that was established at Independence) proposed the proclamation of a new protected area to, amongst other reasons, prevent further negative impacts on primarily the fragile elephant and black rhinoceros populations of the Kaokoveld. This was rejected by the inhabitants and the then second-tier governments of Kaokoland and Damaraland. The centre pieces of the proposed protected area were the Palmwag tourism concession area (formerly the ANVO hunting concession area) as well as the adjacent Etendeka tourism concession area and the more distant Hobatere tourism concession area in the east bordering Etosha NP.
- In the late 1980s there were still 11-14 elephants at the Kunene River as far west as the river mouth and the last carcass of a sub-adult elephant was seen on the banks of the Kunene River at Foz de Cunene on the Angolan side around 1990 (S. Braine and R. Loutit, pers. comm.). Little is known about them, but the late Garth Owen Smith believed that they were somehow linked to the Hoarusib elephants and that this area would one day be recolonized by the Hoarusib elephants (pers. comm. to M. Lindeque). Such recolonization has not yet taken place and the Iona NP in Angola remains without elephants.
- Finally, and perhaps most significantly, it was in this part of Namibia where the first community conservation programme in southern Africa arose, largely due to the late Garth Owen-Smith and the late Chris Eyre, who had both at one time or the other worked for the Directorate of Nature Conservation and both who count as two of the greatest conservationists of Namibia. Their work commenced with the appointment of community game guards with the approval of sympathetic traditional leaders and resulted in a rapid increase in surveillance, monitoring and law enforcement and successful convictions. This involvement by rural communities by-and-large halted the illegal killing of elephant and black rhinoceros in the early 1980s, also leading to the recovery of other wildlife and the adoption of the Community-Based Natural Resource Management Policy after Independence in 1990 and the subsequent legal provisions created for the registration of communal conservancies with rights over the use of wildlife through the Nature Conservation Amendment Act, Act 5 of 1996.

Gibson (2001) in a comprehensive analysis of past survey records found that since the 1980s, population estimates of elephant from aerial surveys in north-western Namibia had shown a consistent increase in the population, see Figure 5. This increase was statistically significant at 6.2% per annum (ranging between 3.5% and 9%) between 1982 and 1998. She mentioned that under normal conditions elephant populations seldom increase at more than about 6% per annum and it is possible that immigration from Etosha NP had supplemented the reproductive recruitment of elephants living in the harsh environment of north-western Namibia[17].

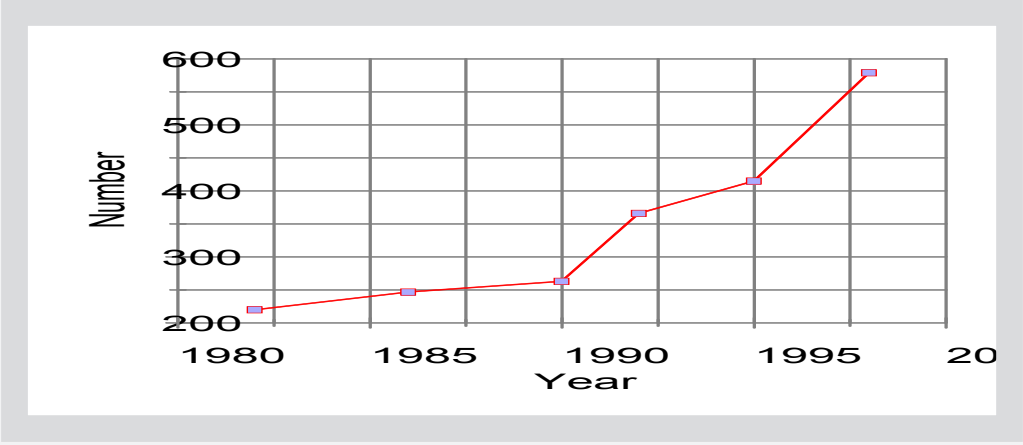



**Figure 5** Population increase of elephants in North-western Namibia from 1982 to 1998 (Gibson 2001)

17 She mentioned Damaraland but must have meant the whole North West.

K.E.A. Leggett researched the Kaokoveld elephants from 2002 to 2009 focussing on movements and home ranges as well as the population structure of the western sub-population in the Hoanib-Hoarusib Rivers and parts of the eastern sub-population and transitional group in the Ombonde-Hobatere area (Leggett ***et al***. 2003, Leggett 2006, Leggett ***et al***. 2011). R.R. Ramey II and L.M. Brown continued after Leggett. They monitored this population based on individual recognition for 12 years (2006-2018) out of which came a detailed age structure and record of breeding and mortalities.

The western group in the Hoanib-Hoarusib Rivers has remained small and vulnerable throughout the 1980s to the present, with as few as seven adult females remaining and breeding slowly with mean calving intervals of 9.1 years (Leggett ***et al***. 2011) and first-year mortality of 33% (Ramey & Brown 2016) or overall low calf survival of 67% (Leggett ***et al***. 2011). In 2016 the Hoarusib River group consisted of 16 elephants (seven in the Lower Hoarusib, 9 in the Upper Hoarusib) and 18 elephants in the Lower Hoanib (Ramey & Brown 2016), thus a decline back to the level recorded by Viljoen in 1978. The situation was the same in 2018 i.e. 34 elephants in the Hoanib-Hoarusib group, down from 36 in 2017 because two deaths occurred in 2018 (Ramey & Brown 2019).

Leggett ***et al***. (2003) also describes a decline in average group size from 6.69 recorded in 1975-1977 by Viljoen (1988) to 2.23 in 2000. This is attributed to human-induced mortality rather than drought (nine elephants were killed illegally, four were destroyed as problem animals, and one died in a collaring operation, and there were no resident adult males in this group for the past five or so years (Ramey & Brown 2016, 2018, 2019).

L. Brown and R. Ramey (pers. comm. to M. Lindeque) report that in February 2019, there were only three females of breeding age left in the Hoarusib River. One of them in her 20s has never had a calf. The other two are young and have both lost their first calves. One calf died in February 2019 at a month old when the elephants fled from Ongongo to Puros after being chased by dogs at Ongongo. Two males from this population were destroyed in the upper Hoarusib River in 2019 as the result of human-elephant conflict, and two more were killed illegally (probably as retaliatory killings) in the same area (G. Owen-Smith pers. comm. to M. Lindeque).

Figure 6 and Figure 7 from Ramey & Brown (2019) give a summary of the trend (1975-2019) and changes in the composition (2003-2019) of the Hoanib-Hoarusib group. Although this population has persisted for at least half a century in the most arid part of the elephant habitat in Namibia and possibly in the whole of Africa - through two severe drought periods (1980-1983 and again in 2014-2020) and intensive illegal killing (1977-1992) - it remains highly vulnerable to extinction, particularly so with the recent increase in human-induced mortality during seven years of one of the worst droughts on record. Elephants elsewhere in north-western Namibia have nonetheless increased over the last three decades and expanded their distribution range and are overall not threatened (Gibson 2001; see Section 1.2.3 for discussion of the current trend).

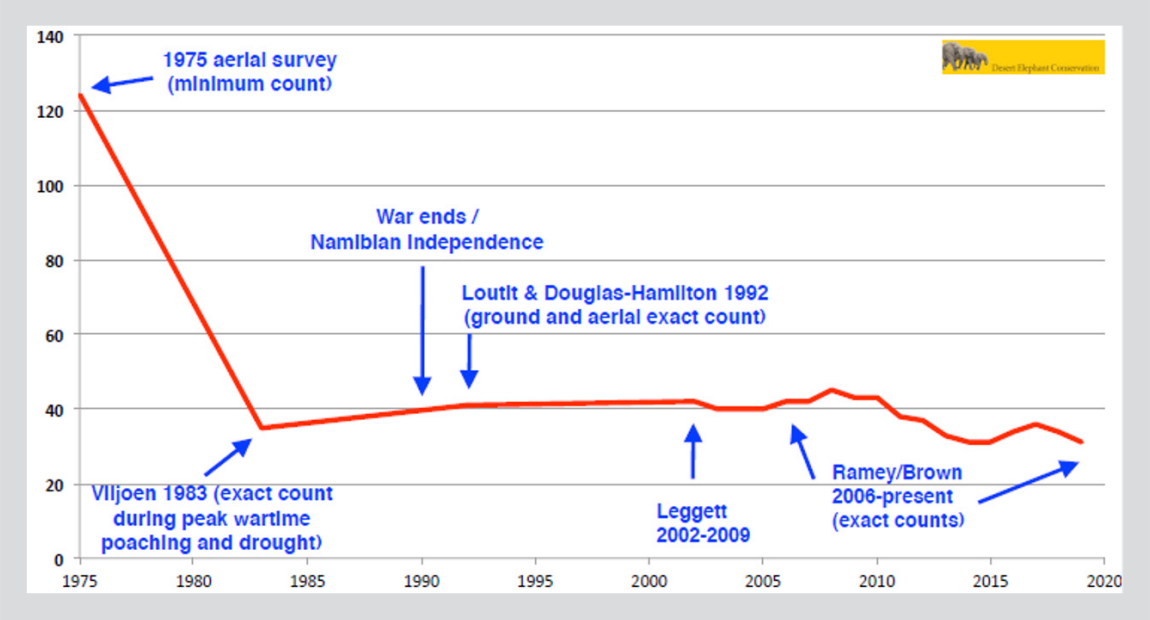



**Figure 6** Trajectory of the Hoanib-Hoarusib group since 1975 (from Ramey & Brown 2019)

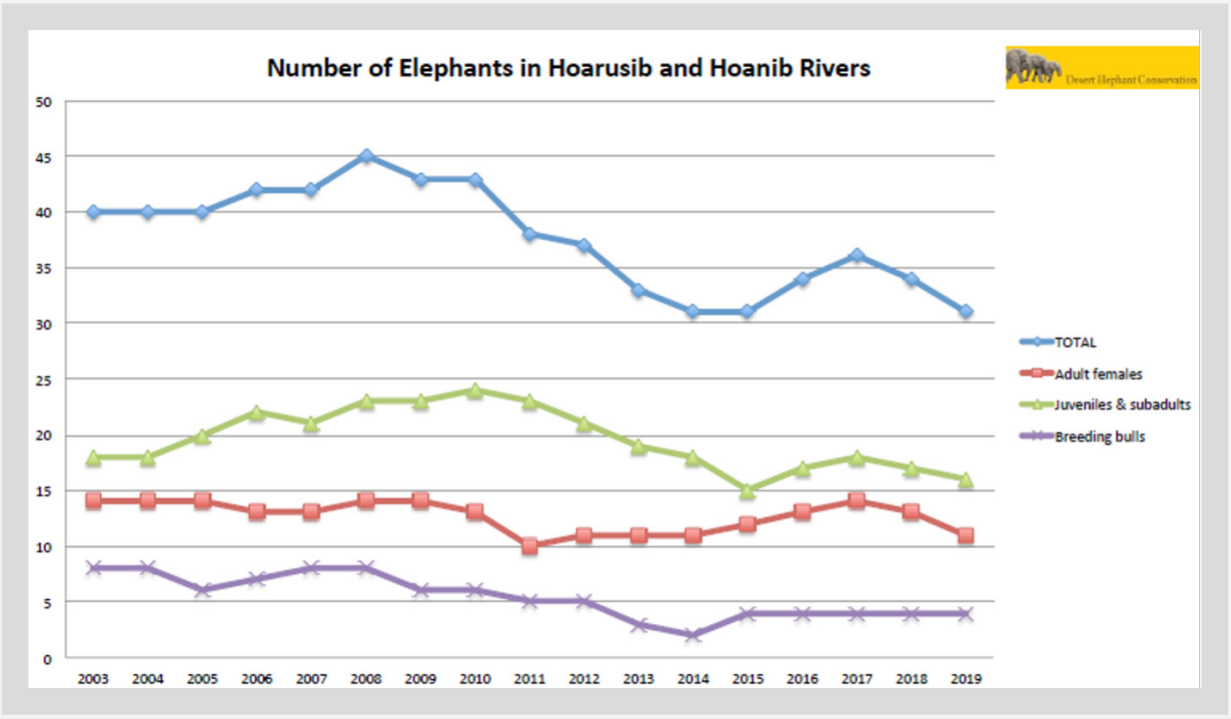



**Figure 7** Composition of the Hoanib-Hoarusib group since 2003 (from Ramey & Brown 2019, original figures kindly provided by L. Brown)

A lot less was known over the period 1975 to 1990 about the elephants in other parts of the central-western and southern Kunene Region i.e. elephants in the Uniab River and Huab River drainage areas as well as the elephants in the Ugab River area of northern Erongo Region. This is an area where elephant range extension has taken place, i.e. first a single male appeared in the Ugab River area in 1994 who left a year later and returned with a small group in 1995 (information provided by resident communities in the area as part of consultations done for this plan). Elephants thus fairly suddenly and for the first time in living memory[18] appeared in the Ugab River in 1994-1995, 60-70 km south from the closest permanent elephant occupation area in the Huab River to the north. The Ugab group is now the southernmost group of elephants in Namibia and occupy a hyper-arid part of the northern Namib desert, essentially depending on the limited vegetation of the lower Ugab River. They have recently started to move inland as far as the Omatjete area where they have caused numerous conflicts with people (see Section 2.1). This is an

18 Shortridge (1934) mentions the Ugab River as the southernmost limit of elephant distribution in the 1930s.

important range extension southwards that subsequently was followed by single males and later one small group moving periodically further south to the town of Uis and the Omaruru River and inland as far as the eastern edge of the Erongo mountains on the farm Koedoeberg (M. Lindeque pers. comm).

The Huab elephants consisted of 32 elephants in 2019 (R. Harris, pers. comm. to M. Lindeque) down from around 80-150 in the 1990s (M. Lindeque pers. comm.). Elephants in at least the eastern part of the Huab River catchment were described by Viljoen (1987) to be part of his transitional population (see Figure 4). The Huab elephants in the 1980s-1990s were known to move seasonally east-west along the Huab River (Lindeque & Lindeque 1991) and in the dry season reached as far east as the Khorixas and Fransfontein areas and livestock farms (e.g. Ehobib, Krenzhof, Sebra, Paderborn) in the Kamanjab area (M. Lindeque pers. comm.).

In the Uniab River area, there were as many as 90 in the 1980s and 1990s (M. Lindeque pers. comm.), and Ramey & Brown (2015, 2016, 2019) recorded around 50 elephants from 2015 to 2017 primarily in the Palmwag Concession Area but also extending into the Skeleton Coast NP. After 2017 the elephants could not be located in the Uniab system, attributed to the severe drought. Where they could have gone or which other groups they could have joined could not be established. Previously they have been recorded as moving eastwards in some years to the Omumborongbonga area south of the Ombonde River, see Section 1.3.1.

The range expansions and shifts in the distribution of elephants in the Huab-Uniab areas and an admixture of elephants from the Hobatere area (which is part of the eastern Hoanib-Ombonde drainage system) have thus resulted in new 'permanently' settled elephant distribution areas in the Ugab River and the Kamanjab farms in the last 15 years or so but also clearly shows the interlinkages amongst elephants in the western Kunene Region (also see the section on the North Central and Etosha National Park).

The drought of 2014 to 2020 has devastated the large ungulate population of the North West and human livelihoods. Elephants have not been as seriously affected as other species such as Hartmann's zebra, oryx and springbok but all the calves in the Ugab River group died as the result of drought in 2019 (K. /Uiseb pers. comm. to M. Lindeque) and 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 (as occurred during the 1980-1983 drought). 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 Conservancies. 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.

**Figure 8** Elephant male walking under the streetlights of Uis, Erongo Region in about 2018 (Source: social media, photo not copyrighted)


**Figure 9** Elephant presence in the Erongo Mountains west of Omaruru (photo of a part of an information display at the entrance to the Erongo Mountain Rhino Sanctuary)

### 1.1.2 North Central and Etosha National Park

Elephants were absent from Etosha NP for about 70 years. Lieutenant Adolf Fischer as the first game warden of Game Reserve No. 2 recorded that the last elephants in the Etosha part of the game reserve were shot in 1881 after having been driven into a 'swamp' (Fischer 1914). Hahn (1926, in Martin 2005) estimated no more than 50 elephants in Ovamboland[19] (present-day North Central Namibia), mainly in the east and Nelson (1926, ibid) also recorded no elephants in the Namutoni area but mentions that they occurred throughout eastern Ovamboland and that elephants in the Kaokoveld moved to Western Ovamboland in the wet season. Nelson also reported that elephants in the northern areas were decreasing but also that there were some 200 elephants in the Outjo District around 1926.

Elephants were therefore present around Etosha NP in small numbers in the 1920s and were recorded south and east of the park in the 1940s-1950s[20] (De Villiers & Kok 1984, Lindeque 1988). Remarkably, elephants re-colonized the park only in the 1950s.

The first ecological research on elephants in Etosha NP was done by P.A. de Villiers who focussed primarily on vegetation and feeding ecology (De Villiers 1980, De Villiers & Kok 1988) but also provided an account of the historical and present distribution of elephants in South West Africa[21] (De Villiers & Kok 1984). He recorded that elephants in the North-eastern Sandveld north of Namutoni moved in a northern and north-eastern direction out of the park, typically in the wet season[22]. He recorded linear movements of 120 and 130 km by adult males marked in the North-eastern Sandveld to Olifantsbad and eastwards outside the park. These observations supported earlier interpretations by biologists who had worked in Etosha NP (R.C. Bigalke and J.S. van der Spuy) in the late 1950s and early 1960s that the sub-population in eastern Etosha NP had originated from the Kavango in the East and the Owamboland areas in the North. He similarly endorsed earlier ideas that the South-Central sub-population originated from south of the park and recorded that a part of this sub-population continued to move in and out of the park throughout the 1970s. He described a Central Sub-population that used the Ekuma-Paradys area in the wet season (and the southern part of the then Owamboland) but contracted to the Narawandu-Ozonjuitji 'Mbari area in the dry season. He also described a western population that concentrated in the Otjovasandu area and parts of the west-central part of the park in the dry season. During the wet season, these elephants left the park in a northern direction to Owamboland and in a north-westerly direction to the then Kaokoland.

A second study of elephant movements and ecology was initiated by Johan Bester in 1982 but he tragically died in an aircraft crash at Halali during the 1982 aerial survey (five others died as well). A further study was done from 1983 to 1988 on the causes of the increase in the elephant population which culminated in the culling of 570 elephants in western Etosha NP in 1983 and 1985 out of concern over the potential impact of elephants on species such as black rhinoceros and roan antelope, in the aftermath of the major drought in 1980-1983 (Lindeque 1988). He found that based on the aerial survey-based population estimates, elephants in Etosha NP went through a classic eruption sequence after recolonization, i.e. a phase of slow increase from 1951 to 1970, a phase of rapid increase from 1972 to 1984 and then fluctuating around the level of 2,000 thereafter (Lindeque 1988). The age structure of the elephant population that he recorded

19 More commonly spelled Owamboland in more recent times in literature, meaning present-day Omusati, Oshana, Oshikoto and Ohangwena Regions.

20 Elephants were recorded in the1940s-1950s on the farms Oberland, Grensplaas, Mara, Soavis (Tsaovis), Otjovasandu (south of Ombika) and about 30km north of Outjo.

21 Later to become known as South West Africa/Namibia and from 1990 as Namibia.

22 E. Joubert, also a former biologist in Etosha NP and later Deputy Director: Research said that from the air in the 1950s, elephant paths could be followed all the way from Fischer's Pan to Rundu (pers. comm. to M. Lindeque, also in De Villiers & Kok 1984).

and other parameters such as the comparatively low juvenile survival rate nevertheless meant that the high rate of population growth could not have been accounted only by reproduction; immigration played an important part as well (Lindeque 1988, Lindeque 1991)[23]. When this study ended in 1987, the rate of increase was negative, i.e. -0.92%, meaning the population was in a declining phase.

A further study was done on the dynamics of the Etosha elephant population in 2003 (16 years later) which found a similar age structure of the population as recorded by Lindeque (1988, 1991) and concluded that the age structure had been stable over that 16 year period (Ferreira ***et al***. 2003, Trimble ***et al***. 2009). The rate of increase calculated at the time was also negative at -1.02%, very similar to the situation in the 1980s[24].

In conclusion, Etosha NP in the 1970s-1980s became a very important sanctuary for elephants as land use changed around the park through the intensification of settlement and agriculture. It also served as a refuge for elephants in the 1980-1983 drought and, in normal years, provided habitat during the dry season for elephants from west, north and north-east of the park (mainly because of the artificial provisioning of water in the park).

The park was recolonized from three relatively remote and inaccessible areas (the Kaokoveld, parts of the Outjo and Grootfontein districts (which were only given out for farming as late as the 1950s) and the Kavango region[25]. Distribution and movement patterns recorded in the 1980s still reflected this original recolonization and seasonal habitat role of the park. Remarkably, ever since and until today there are remnants of transboundary movements in the same areas, i.e. the Northeast Sandveld, the central northern part (from around the Oshigambo River to Okamburu) the western boundary (from Onaiso to Kaross) and southern boundary (Eindpaal-Elandsvlakte) and recorded elephant movements between north-western Etosha NP and around the Ombombo Owambo area south of Ruacana (where a large spring is situated) from elephants equipped with satellite collars in north-western Etosha NP (Lindeque & Lindeque (1990) and 15 years later from satellite collars placed on elephants in the Ombombo Owambo area and western Omusati Region (Leggett 2005, 2006b) as part of a study of the elephants of the Kunene Region

It can be asked why elephants took 70 years to recolonize Etosha NP and why the elephant population increased primarily through immigration in the 1970s and early 1980s (following a slow build-up in numbers from the 1950s) and not reproduction. The explanation could be that the park provides what really should be considered as sub-optimal or even poor habitat for elephants if judged by:

- the erratic rainfall that the park receives with up to 40% interannual variability within a complex short- and long-term oscillatory system (Engert 1997);
- the low soil fertility (high sodium and calcium levels, very low phosphorous levels, high alkalinity, low organic content, high salinity, eroded soils resulting in relatively poor nutritional (especially low protein) value of the available plant biomass (Buch & Trippner 1997, Beugler-Bell & Buch 1997, Trippner 1997, M. Lindeque pers. comm.);
- the nutritional deficits in the dry season in a landscape dominated by plant species that elephants do not prefer, i.e. annual grasses (e.g. *Schmidtia kalahariensis, Enneapogon cenchroides, Aristida*

23 Age structures estimated from ground observations by De Villiers & Kok (1988) for the 1970s showed an even lower representation by the younger age classes, suggesting that rapid growth through reproduction also did not take place at that time.

24 It should be noted that aerial surveys from 2000 to 2016 indicated a modest positive rate of increase of 1.75% in this population, in contrast to two rates of increase derived from population age structure and mortality rates. There could be several explanations for these outcomes of which sampling biases in both approaches could be a major factor.

25 Present day Kavango West Region

spp.) with low leaf: stalk ratios and anti-grazing defence mechanisms (e.g. terpenoids in ***Schmidtia kalahariensis***, spiny parts in ***Aristida*** spp.) which lignify almost immediately after the last rains and become poorly digestible; limited browse options because of the dominance of mopane (***Colophospermum mopane***) in the tree and shrub layers which although nutritious, is loaded with secondary metabolites like tannins and phenols as a defence against browsing (Cooper & Owen-Smith 1985, Makhado ***et al***. 2016) and low availability of some of the typical important food plants for elephant in north-western Namibia (i.e. the taller Acacia species e.g. ***A. tortilis, A. reficiens, Albizia anthelmintica, Faidherbia albida, Commiphora*** spp. and ***Sclerocarya birrea***). Palatable and well-digestible or nutritious perennial grasses i.e. the 'decreasers'[26] are highly variable in occurrence and abundance and severely decline to near total absence during droughts (e.g. ***Antephora pubescens, Digitaria*** spp., ***Panicum*** spp. and to a lesser extent ***Cenchrus ciliaris***) leaving in essence an unpalatable annual grass stratum which is of low nutritional value (M. Lindeque, pers. comm.).

- the generally saline water of the park; with water available through springs or boreholes in the central and eastern parts of the park being strongly alkali-saline and technically not suitable for livestock[27] watering (Auer 1997); high evaporation rates (>250 mm/year) (Mendelsohn ***et al***. 2002) which results in the rapid deterioration in the quality of water exposed at the surface and high levels of competition amongst elephants to drink from borehole outlets or the eyes of springs where the water is freshest (with intraspecies competition and aggression around water outlets being one of the most important causes for the almost universal broken tusks amongst the elephant population);
- the high fire frequencies in the higher rainfall years[28] which in the mopane-dominated areas result in very extensive fires that are very hazardous to large mammals due to rapidly spreading and very hot crown fires fuelled by the high ester and phenol content of mopane leaves. The past management practice of saturation block burning in the dry season or combating unwanted fires by backburning an entire side or even two adjoining sides of a fire management block length have created extremely dangerous fires and cases of fire-related mortalities in large mammals including elephants were recorded[29];
- perhaps most importantly, the cumulative effects of these limiting factors when the elephant population is prevented from accessing its former wet season dispersal range, i.e. the more plant species-rich Kaokoveld vegetation types and drainage systems with their preferred dry season food plant ***Faidherbia albida***; the more tree-species-rich dolomite mountain ranges south of the park, the marula (***Sclerocarya birrea***) fields of the Otavi and Grootfontein districts; the dense Combretum-Acacia-Commiphora woodlands of the Mangetti region and the Baikiaea-Burkea-Acacia woodlands further north and east in the Kavango West Region.

These factors together account for the low population growth rates due to high juvenile mortality (and the prevalence of anthrax in the park which occasionally caused high mortalities amongst elephant and adult males in particular). Elephants in Etosha NP breed relatively fast but have a high juvenile mortality and are thus not limited by reproduction but by juvenile mortality30 (Lindeque 1988, Ferreira ***et al***. 2003,

26 Palatable perennial grass species that tend to decline and become absent under grazing pressure and erratic rainfall conditions

27 There are no quality standards for wildlife watering in Namibia

28 Fire frequencies have been measured in Etosha NP since the 1980s but this information has unfortunately not been published, except for information on four recent years as part of the 2016 Fire Management Strategy for Namibia's Protected Areas.

29 The current fire management strategy for Etosha NP and the other national parks within the elephant distribution range relies on early dry season mosaic burning of around 50% of the area to reduce fuel loads significantly so than no more than 10% of the parks would burn during the late dry season when very hot and destructive fires occur with many undesirable consequences for vegetation composition and structure and especially large species of wildlife if saturation burns occur.

30 Juvenile mortality is caused by some lion predation but primarily by poor nutrition during the weaning and post-weaning period (Lindeque 1988) possibly coupled with the exertions for a small calf to keep up with a herd travelling long distances in a semi-arid environment and being outcompeted at water points for access to clean water.

Trimble ***et al***. 2009), consistent with other megaherbivores (Owen-Smith 1988); and the comparatively low density of elephants in Etosha NP compared to other semi-arid areas (De Villiers & Kok 1988). This is a classical end-of-the-range scenario as described by Caughley ***et al***. (1988) where limiting environmental factors are expressed in depressed population performance across a range of parameters at the edge of the distribution range[31].

The Etosha NP elephant population from the late 1990s and in a period of higher rainfall started to increase at an average rate of 1.75% p.a. (see Section 1.2.3), noting that this rate of increase is nevertheless relatively low compared to other elephant populations in Namibia and elsewhere.

Little is known about the elephants occurring in the North Central region and throughout the 1980s and 1990s a relatively small number of elephants occurred there in primarily the wet season as attested to by the large number of fence breaks on the northern boundary of Etosha NP. The exception was the northwest Omusati Region where larger numbers occurred and periodically moved in and out of Etosha NP (Lindeque & Lindeque 1991, Leggett 2005, 2006b). This is further discussed in Section 1.3 as most of the research done on the elephants from northwest Omusati Region relates to movements.

### 1.1.3 North-east elephant population

Elephants have historically occurred throughout the North East of Namibia, including what is presently the Kavango East and West Regions, the Grootfontein and Tsumkwe districts of the Otjozondjupa Region and the Zambezi Region. Little else was known about them over this extensive area in terms of relative abundance or historical trends, although they were undoubtedly heavily hunted before 1900 (Shortridge 1934, De Villiers & Kok 1984).

For many years before Independence (i.e. from the 1960s to 1989), important wildlife areas in the North East such as the West Caprivi Game Reserve (now Bwabwata NP) were under military occupation with little significant involvement of the then Directorate of Nature Conservation. There is no published

31 The recorded increase in the elephant population since Relatively high rainfall in the past decade in Etosha NP

research report on elephant conservation or management from that era, but several aerial surveys were conducted before and after Independence in 1990 (Rodwell ***et al***. 1994)[32]. The Caprivi State Forest[33] was recognized as an important elephant area since the 1980s but declined in importance after 1988 as elephant numbers increased west of the Kwando River (thus in present-day Bwabwata NP) and in Mudumu NP (Rodwell 1995).

A significant achievement was the proclamation of Caprivi Game Park, Mudumu NP, Nkasa Rupara NP and Khaudum Game Park in 1990 just before Independence. After Independence there were disputes over some of the boundaries of these new protected areas and a process of public consultation was launched by the Ministry of Wildlife Conservation and Tourism (the predecessor to MET and MEFT) that contributed to the formulation of the CBNRM policies, legal provisions and the registration of communal conservancies over almost the entire elephant range in the Zambezi Region, western and eastern Bushmanland (as the Tsumkwe district of the Otjozondjupa Region was known then), followed by other areas in the Kavango East and West Regions later on.

Very little research has been done on elephants in the North East apart from aerial surveys until recent work on elephant movements, with the exception of an important study from 1992-1995 by Tim Rodwell which was not published and is now hard to access, but there are several unpublished reports or documents (some incomplete) available from this study (Rodwell 1995, Rodwell ***et al***. 1995). The number of elephants in what is now the Zambezi Region and the Kavango East Region in the period 1980 to 1990 was variable and there were no standardized aerial surveys done, but a minimum estimate compiled from Rodwell ***et al***. for 1980-1982 would be ca. 2,700 elephants and by 1990 ca. 3,400[34]. Rodwell ***et al***. (1995) in their 1994 aerial survey found ca. 5,500 elephants which indicates a steady increase in elephant numbers since at least the 1980s (see also Section 1.2.3). This was an important benchmark following many years of wartime impacts on elephants in the region (see e.g. Chase & Griffin 2009, 2011).

Less is known about elephants in the area of Khaudum NP and what are today the Nyae Nyae and N≠a Jaqna Conservancies because there were fewer aerial surveys done in these areas. There were several areas in the North East known as "bull areas" by conservation officials (especially the late Ben Beytell, former Director of Parks and Wildlife Management, pers. comm. to M. Lindeque) and hunters (especially Kai-Uwe Denker, who hunted for many years in the North East and meticulously kept copious notes and diaries which later formed the basis for several books on his hunting experiences (Denker 2018, Denker 2000)). Denker (pers. comm. to M. Lindeque) also confirmed that "***I have encountered very clear so-called "bull country" during my elephant hunting. The entire Bushmanland*** (now Nyae Nyae and N≠a Jaqna Conservancies) ***was bull country during the late 1980s until at least 2000. During my time there (2002 to 2011) at first there were just very few cows at Nama Pan and Nhoma and otherwise only bulls. The increasing opening of waterholes has changed traditional bull country to herd country. Towards the end of my time in Nyae Nyae plentiful herds became a nuisance in many regions of Nyae Nyae, as one constantly was in between cows during tracking. Ben Beytell told me that during his time there had only been 70 to 80 bulls in the entire Bushmanland and no cows. During*** (the late Volker) ***Grellmann's time (1988 - 1993) there were said to be around 400 bulls only. I was in the area (for Grellmann) in 1991 for the first time and encountered a herd around Nhoma, otherwise only bulls. To the west of Khaudum there also was clear "bull country" and "herd country" only on a smaller scale, not as big as in Bushmanland. In Khaudum likewise there was bull country***

32 No information is available about any aerial survey done in the North East before 1994. It is known that some partial aerial surveys were flown during wartime before Independence using military aircraft (M. Lindeque pers. comm.) but it is regrettable that none of the survey reports could be traced. During the period of writing this management plan, the National Archives were closed for renovation, but MEFT should endeavour to reconstruct the survey record for the North East from this source.

33 Likely to be renamed the State Forest Reserve

34 There is a second and more general unpublished draft report from Rodwell that quotes slightly lower numbers (Rodwell 1995).

*(very prominent along the western section of the Khaudum Omuramba ranging into the hunting concession). The omurambas to the south of Khaudum Omuramba, only a short distance away, was herd country. The same to the north of Khaudum and in Mahango".* The availability of water in these areas mentioned after boreholes were drilled soon obscured this differentiation in habitat and range use by male elephants and breeding herds.

The elephant population in Khaudum NP is of relatively recent origin. In the 1980s the first aerial survey[35] recorded only 600 elephants in the park and no elephants in what is now Nyae Nyae Conservancy[36] (M. Lindeque pers. comm.), also see the reference to the late Ben Beytell above. It has increased rapidly since then (see Section 1.2.3). The Khaudum NP population formerly had access to a very large area in eastern and western Kavango (now central Kavango East and eastern Kavango West Regions) that was essentially entirely waterless during the dry season, but which was extensively used in the rainy season. This area has in the past few years been converted to small scale commercial farms and a narrow buffer zone between the farms and the park has since been settled as well.

There is a further poorly studied group of elephants in the area of the Mangetti NP and adjacent land, especially the ca. 200,000 ha Kavango Cattle Ranch straddling the border between eastern Oshikoto Region and Kavango West Region. In the 1980s there were an estimated 55 elephants in the central Kavango area (F. Krauss, pers. comm. to M. Lindeque). A complete aerial survey of elephants in this very large area has not been done to date but there could be as many as 120 elephants or possibly 150-200 elephants (Naankuse, pers. comm. to P. Lindeque). Elephants have had a long history in this very sparsely populated and until recently largely waterless area, and were linked to the Etosha NP elephant population, as mentioned in the previous section. More recently, it was found that this group of elephants through (at least) the male component, is connected to elephants in Angola or use elephant habitat in Angola. A bull collared along the Kavango River moved from the Musese area to the Kavango Cattle Ranch. In 2020, two elephants in this area moved between Namibia and Angola on frequent basis (K. / Uiseb pers. comm. to M. Lindeque). There was no evidence of this degree of connectivity from the 1980s to around 2015 (M. Lindeque pers. comm). and it is of great ecological and conservation significance that an old connection may have been restored in the past few years.

**Photo:** P. Erb

35 The 1986 aerial survey report could not be located for reference in this plan.

36 The Juhoansi people of the Nyae Nyae Conservancy were largely unfamiliar with elephants as recently as the 1980s (B. Beytell pers. comm. to M. Lindeque). Currently there are well over 2,000 elephants in the conservancy, the third or fourth largest elephant population in Namibia.

## 1.2 Current status and trends

### 1.2.1 Distribution

Figure 10 shows the current distribution of elephants in Namibia in terms of density contours derived from the most recent aerial survey data and tracked elephant movements (see methodology in Annex 1) and is thus limited by the extent of the area surveyed and where elephants were collared).

The highest densities of elephants are reached during the dry season. In the Zambezi Region, individual aerial surveys have recorded local densities of >8 elephants $km^{-2}$. Such levels may be temporary as animals move around, reducing the overall occupancy; aerial surveys are, after all, based on the locations of animals on a single day. However, the illustrated contours in Figure 10 are based on locations throughout the dry season over several years and represent impressive densities. In the Zambezi Region, the 2 $km^{-2}$ density contour contains an area of 2,100 $km^2$. Range increases during the wet season results in lower densities overall (see below).

The distribution of Namibia's elephants presented in Figure 10 corresponds to the 'known' distribution reported to the IUCN 2016 African Elephant Status Report (AESR) (Thouless ***et al***. 2016). The AESR also shows 'possible' range filling much of the rest of the north of Namibia, in which occasional sightings have been made. There have been no systematic surveys in most of that range except the 1998 survey which covered the area north of Etosha NP to the Angola border but it is likely that the very few elephants that are there visit the area fleetingly or seasonally, amounting to an occupancy on average of fewer than one in several thousand $km^2$ (less than the outer contour of the density map). None of the elephants with collars fitted and tracked to date have ventured into this range.

Elephants have also been reported in northern Ohangwena Region and south and west of the Nyae Nyae Conservancy in Na≠Jaqna, Ondjou and Eiseb Conservancies but these areas are currently not part of the aerial survey zones, and the elephant range extends further west and south along the Botswana border than indicated in Figure 10 and further north along the Angola border north-northeast of Etosha NP.

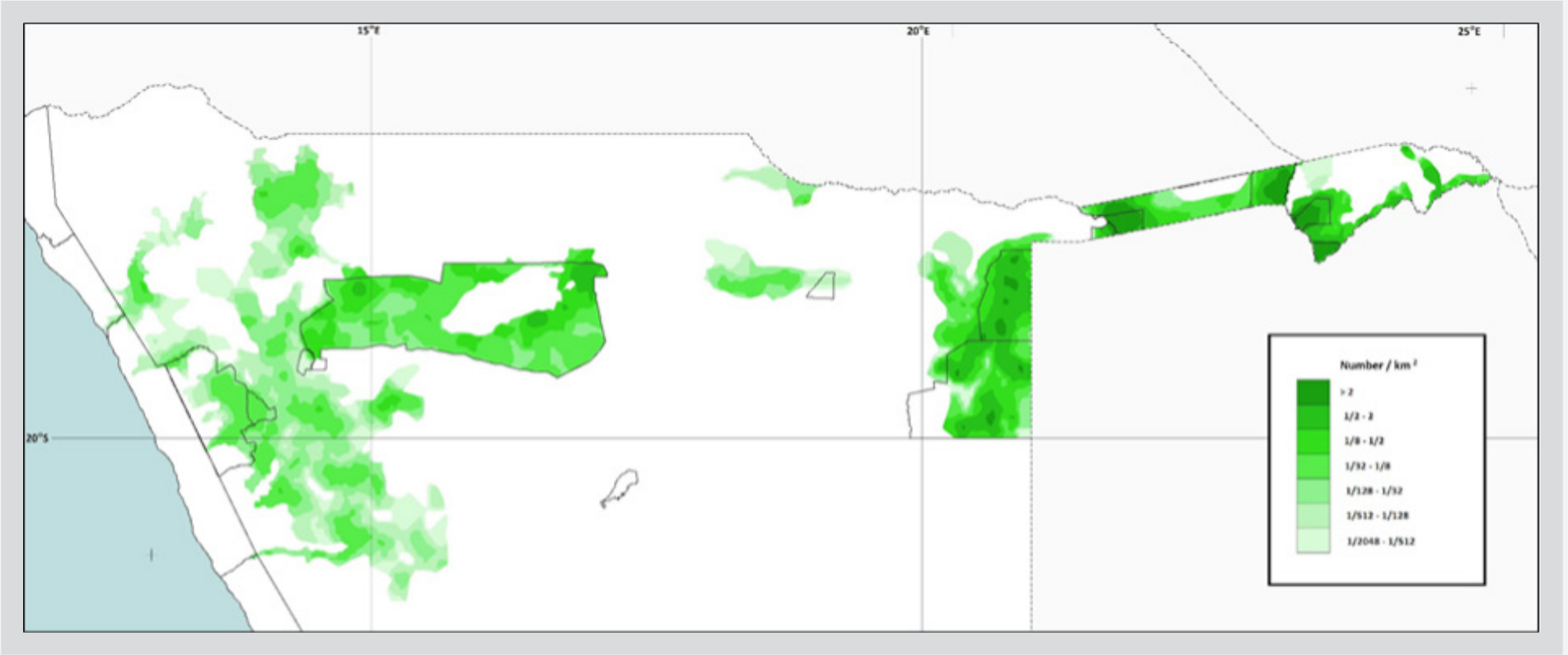



**Figure 10** Dry season density of elephants in Namibia

### 1.2.1.1 Seasonal distribution

Dry season distribution is smaller than wet season distribution. It mostly overlaps with the wet season range although there are small areas which are only dry season range.

Table 1 summarises the wet and dry ranges as exclusively dry range, overlap and exclusively wet range for each regional range component. The change in range is expressed as: 100% $(\frac{wet+overlap}{dry+overlap} - 1)$ where wet and dry refer to the exclusive parts of the range.

It is challenging to produce a wet season map equivalent to the dry season density map in Figure 10 as there are only dry season aerial survey estimates and the wet season tracking data lack information for some areas. Nevertheless, comparing the extent of wet season locations with that of dry season locations provides an estimate of the wet season expansion in relative terms.

Figure 11, Figure 12 and Figure 13 show the distributions of dry and wet season telemetry locations for all collars in the data set (dry season being taken to be from May to October). Locations outside Namibia have been included in these maps. For the present purpose, the areas of the distributions are taken to be the number of grid cells containing one or more locations when the cell size is two minutes on a side. The cell size is 13 km$^2$ at 18.5° S. This method gives a smaller area than would enclosing all points within a polygon because in the latter many gaps are included.

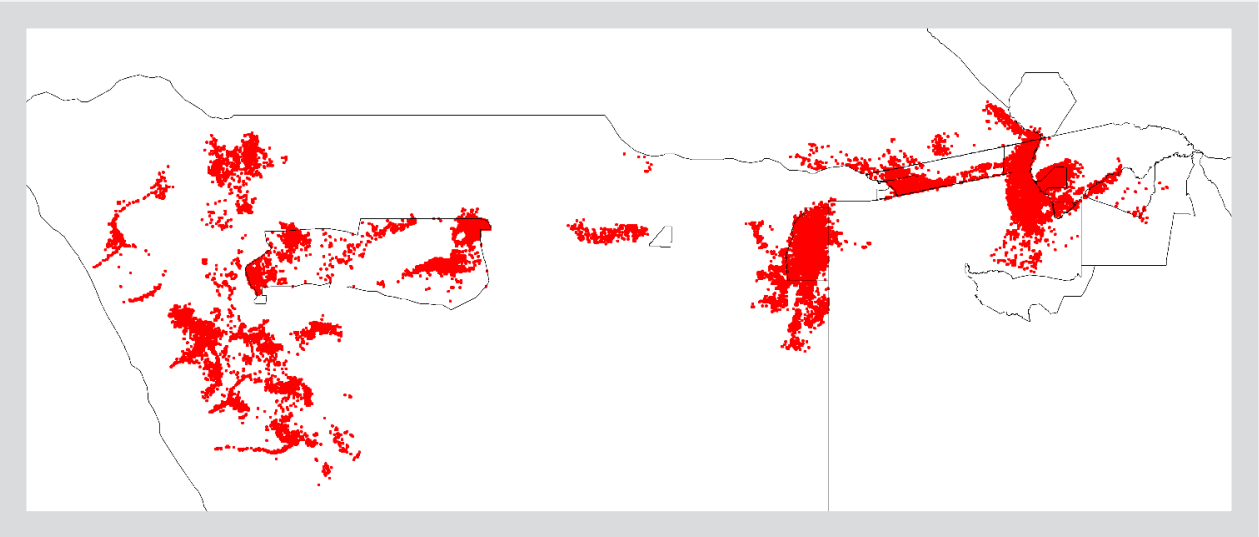


**Figure 11** Dry season tracking locations from collared elephants

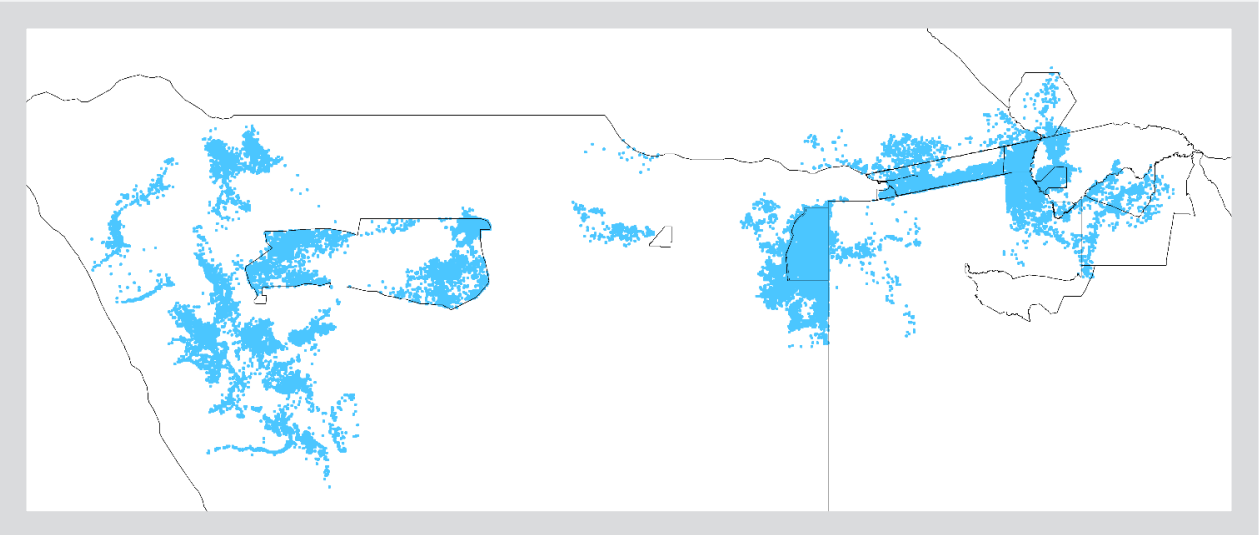


**Figure 12** wet season tracking locations from collared elephants

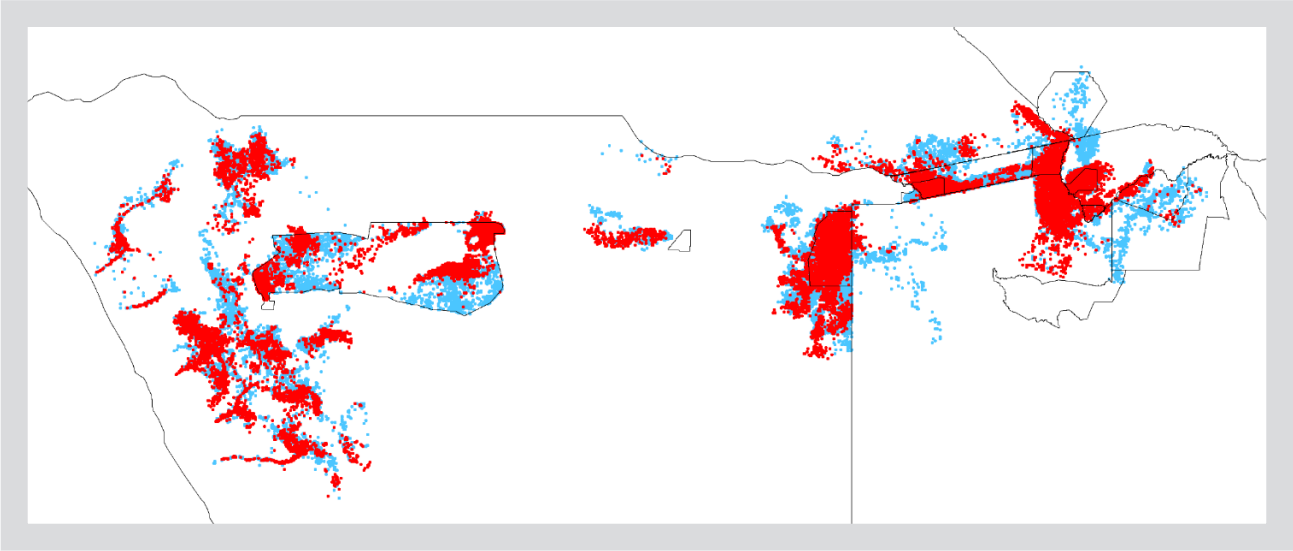


**Figure 13** Seasonal distributions, showing dry season distribution overlaid on wet season distribution

**Table 1** Seasonal range areas and wet season expansion

| Population | Component km² | | | Overall seasonal km² | | % increase |
|---|---|---|---|---|---|---|
| | dry | overlap | wet | dry | wet | |
| Zambezi Region-Bwabwata NP | 4,368 | 10,764 | 10,764 | 15,132 | 21,528 | 42 |
| Khaudum NP-Nyae Nyae Conservancy | 1,287 | 7,735 | 4,563 | 9,022 | 12,298 | 36 |
| Kavango West Region-Mangetti area | 741 | 858 | 832 | 1,599 | 1,690 | 6 |
| Etosha NP | 1,794 | 5,915 | 6,084 | 7,709 | 11,999 | 56 |
| North West | 5,538 | 13,884 | 8,801 | 19,422 | 22,685 | 17 |

It can be seen that the greatest wet season increase in range is in the Etosha NP population. The increase in wet season range gives a measure of the decrease in average density between dry and wet seasons. For example, in Zambezi Region, with an increase of 42%, the average density must be (1/1.42). 100% = 70% of its dry season value.

Roughly 31% of the elephant population occurs outside protected areas (in the dry season when surveys are done) and more during the wet season when range expansion outside protected areas takes place.

**Table 2** Approximate distribution of elephants inside and outside protected areas based on the most recent dry season population estimates

| | Total per protected area or region | % |
|---|---|---|
| Population estimate | 23,736 (total) | |
| | | |
| **In protected areas** | **16,376** | **69%** |
| Etosha NP | 2,355 | |
| Bwabwata NP | 6,703 | |
| Khaudum NP | 4,208 | |

| | Total per protected area or region | % |
|---|---|---|
| Kwando parks (Mudumu and Nkasa Rupara NP)[37] | 3,110 | |
| | | |
| **Outside protected areas** | **7,361** | **31%** |
| Zambezi Region | 1,850 | |
| North West | 1,173 | |
| Nyae Nyae and part of Na#Jaqna Conservancies | 3,792 | |
| Mangetti area | 200 | |
| Kwando conservancies[38] | 346 | |

### 1.2.1.2 Area of the range

The AESR 2016 (Thouless ***et al***. 2016) reports 112,471km$^2$ of "known range". The outer limits of range on the map (Figure 10) covers 98,000 km$^2$. Even with the best information, where there is no hard boundary (such as a fence) to the distribution, density grades into very low densities at the edge. The extent of the range is then difficult to determine so that any estimate is necessarily speculative. Describing the trend of range over time, depending as it does on a series of subjective estimates, is difficult. The difficulty is increased by trends in the quality of the available information, i.e. more and more intensive surveys and more information from telemetry will improve detectability and extend the apparent boundaries. This has gone hand in hand with an increase in elephant numbers and densities, which also contribute to detectability. There will, therefore, always be some doubt as to whether changes in range are real or the result of improved information. Nevertheless, with these caveats in mind, it is possible to point to some areas of likely range extension, the most prominent of which is in the North West of Namibia.

Expansion of the range over time may represent real changes, or increase in density and hence detectability, within pre-existing range. Nevertheless, the following recent changes are noteworthy:

- The range in Northern Kunene region formerly extended to the Kunene River (Viljoen 1987) and was still largely intact in 1970 (Viljoen 1987). However, by 1982, most of the range north of the Hoanib River, except for an area in the east bordering Omusati region, had been lost. Since that time, the range up to the Hoarusib River has been recolonized by elephants and the eastern part adjacent to Omusati Region has extended almost as far as Ruacana.
- Elephants in Kunene Region have expanded south across the Ugab River into the Erongo Region and are encountered as far as the Omatjete and Kalkveld areas and occasionally in the Omaruru River, Uis and the Erongo Mountains. The apparent range extension in this area is around 13,000 km$^2$ since the 2002 map presented in the African Elephant Database update (Blanc ***et al***. 2003).
- Farms to the east of Kamanjab had few if any elephants before 2000. None were seen during the 1998 survey (Craig 1999). Two groups were thought to be present in 2000 but a reconnaissance flight failed to see any (D. Gibson pers. comm.). By 2016, farmers in the area claimed there were around 200 and a survey carried out in that year estimated 150. The additional area of range here is 2,200 km$^2$.
- Telemetry collars were fitted in Kavango West Region and the data now reveals additional known range of about 1,400 km$^2$.

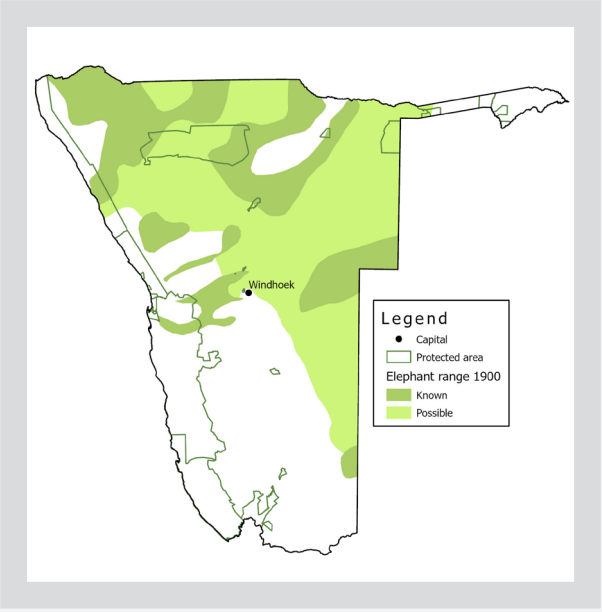
37 Taken to represent 90% of the Kwando survey stratum

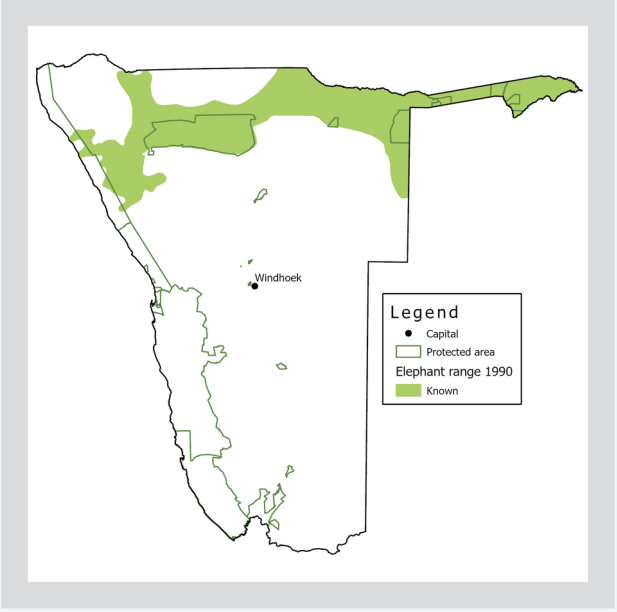
38 Taken to represent 10% of the Kwando survey stratum

- The population of elephants in Khaudum NP and Nyae Nyae Conservancy area has been increasing since records began. An extension of the range westwards into Kavango East Region, which may be new range since 2000, is apparent in the telemetry data, which adds an extra 3,500km$^2$ to known range.
- Kavango West Region has seen expansion of the range in at least two areas. The western constituencies on the Kavango River have reported elephants from before 2016. Telemetry collars were fitted in this area and the data now reveals an additional known range of about 1,400km$^2$.

Overall, the above additions to known range since 1995 are 20,000km$^2$, which is around 20% of the current known range. Including range increase since 1982 in the North West, expansion since that date has been at least 40,000km$^2$, which is around 40% of the current range, with most of the expansion being in the Northwest.

A number of previous descriptions of distribution range has been made in the past, as shown in Figure 14 and Table 3, noting that there are few historical records that include range maps. The African Elephant Database has maps of overall range in Namibia going back to 1991 (Douglas-Hamilton ***et al***. 1992) based on information on known distributions provided by MET staff. The maps in Figure 14 were based on less accurate records than used in Figure 11, Figure 12 and Figure 13, but are nonetheless of interest. It is likely that the general distribution areas were generally as described but the areas of distribution calculated for this plan from the maps and descriptions referenced in Table 3 are only indicative. It is thus not possible to definitively show a change in distribution area at national scale because of the lack of precision in previous assessments, although it is indisputable that local range extensions occurred.



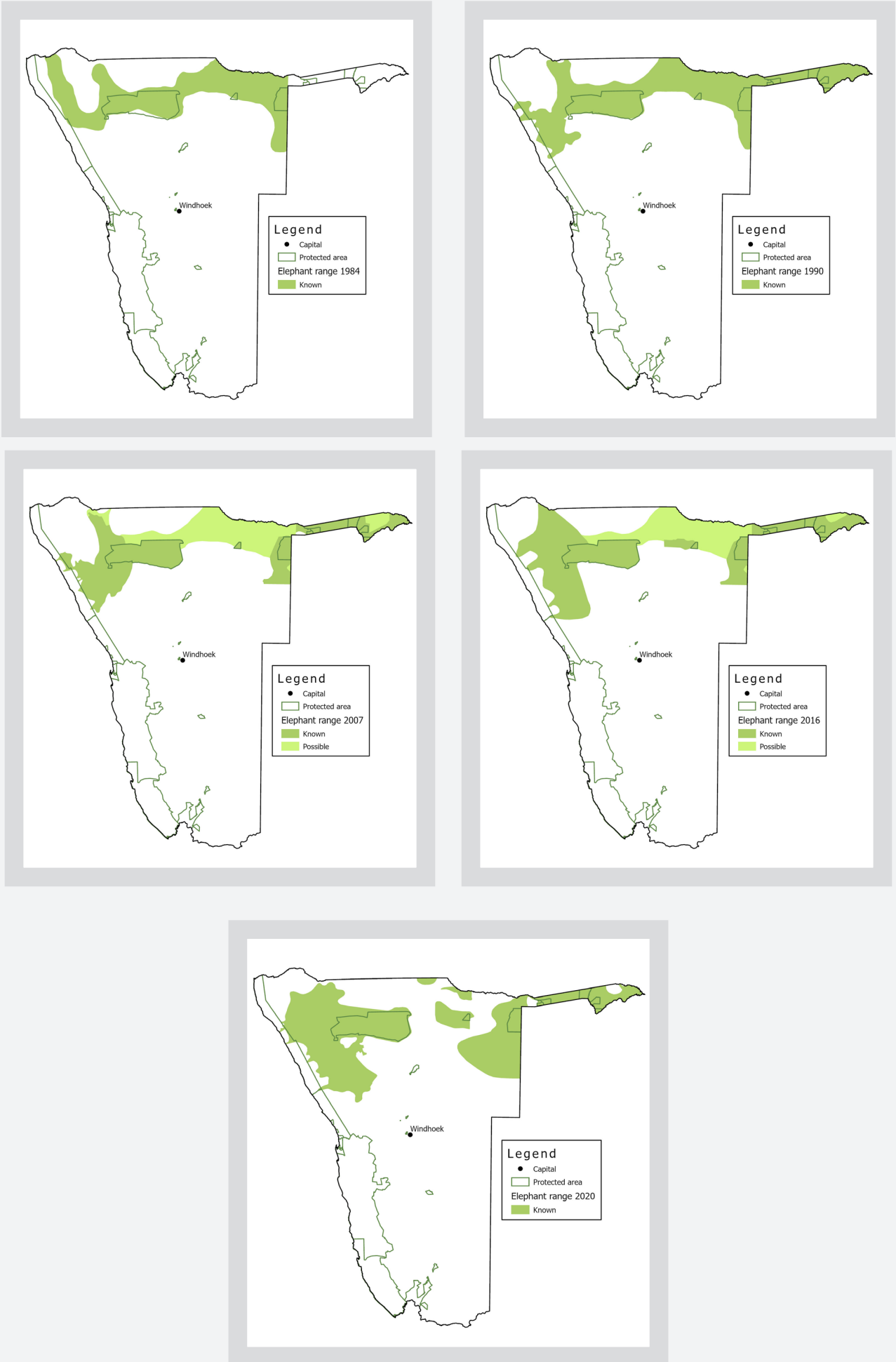



**Figure 14** Previous descriptions of elephant distribution range in Namibia (sources given in Table 3)

**Table 3** Approximate areas of elephant distribution

| Year | Approximate known distribution area (km²) | Approximate possible distribution area (km²) | Approximate total distribution area (km²) | Source |
|---|---|---|---|---|
| Pre 1900 | 182,162 | 285,554 | 467,716 | De Villiers & Kok (1984) |
| 1975 | 154,255 | No estimate | 154,255 | Joubert & Mostert (1975), MWCT (1991) |
| 1984 | 113,096 | No estimate | 113,096 but no estimate for the part of the North East lying east of the Khaudum NP | MWCT (1991, 1993) |
| 1990 | 142,322 | No estimate | 142,322 | MWCT (1991, 1993) |
| 2007 | 89,008 | 57,913 | 146,921 | Blanc ***et al***. (2007) |
| 2016 | 112,471 | 51,598 | 164,069 | Thouless ***et al***. (2016) |
| 2020 | 98,000 | No estimate | No estimate | This plan |
| 2020 | 175,614 | | | This plan, based on all records from aerial surveys, elephant collaring, human-elephant conflicts, hunting for trophies and meat and problem animal control, and commercial farms reporting elephants in the last two years |

The bottom map in Figure 14 shows a presumptive maximum distribution based on all records from aerial surveys and elephant collaring, georeferenced sightings in the Ugab-Omatjete area (from EHRA) and Skeleton Coast Park (M. Lindeque pers. obs.), human-elephant conflicts, hunting for trophies and meat and problem animal control, commercial farms reporting elephants in the last two years (part of the public consultation process used for this plan) and known elephant presence in conservancies in the northern Kunene Region (IRDNC). This is the best available approximation of current (ca. 2020) elephant distribution in Namibia.

If all reported cases of human-elephant conflict were georeferenced, the described distribution range of elephants would undoubtedly increase. Future recording of elephant conflict through the SMART system will facilitate that (see Chapter 5).

### 1.2.2 Movements

Considerable work has been done in recent years on elephant movements in Namibia based on GPS data from collared elephants. Much of the data of MEFT and co-workers have not been published yet except for the North East, see Naidoo ***et al***. (2018a,b), Brennan ***et al***. (in press), Naidoo ***et al***. (in press), with these publications focussing principally on aspects of landscape connectivity (see Section 1.3) expanding on earlier work by Rodwell (unpublished) in the North East in the early 1990s. Previously, Viljoen (1989), Viljoen & Bothma (1990), Lindeque & Lindeque (1991) and Leggett (2006a, 2006b, 2009), Leggett ***et al***. (2003, 2004) described elephant movements in the North West and Etosha NP.

Movement data from elephants in Namibia have furthermore been included in a number of publications on various ecological aspects of elephants including habitat use, landscape connectivity, density, migratory behaviour, habitat selection, impacts of fences and water and vegetation preferences, see Harris *et al*. (2008), Young & van Aarde (2010), Roever *et al*. (2012, 2013), Loarie *et al*. (2009a,b, 2013) and Purdon *et al*. (2018). This large body of work cannot be discussed in any detail in this plan but provides important insights in elephant movements in relation to environmental variability that are of relevance to a number of aspects of this plan.

#### 1.2.2.1 Cross-border movements

Distribution of telemetry sightings enables a measure of relative time spent in neighbouring countries by animals collared within Namibia. There are cross-border movements by the Zambezi and Khaudum NP and Nyae Nyae populations (noting that there are also cross-border movements to and from Angola known from north-eastern Ohangwena Region and Kavango West Region from limited data).

Table 4 summarises the proportion of daily locations of the collars from these regions which are outside the country.

**Table 4** Seasonal percentage of locations from two elephant populations outside of Namibia from elephants fitted with GPS collars in Namibia.

| Population | Dry Season | Wet Season | Overall |
|---|---|---|---|
| Zambezi | 42.9 | 40.6 | 41.7 |
| Khaudum/Tsumkwe | 1.7 | 3.2 | 2.4 |

From this it is clear that the Zambezi population in particular is a population shared with neighbouring countries. Further information on the extent of cross-border movements by elephants collared in neighbouring countries is given in Section 1.3.

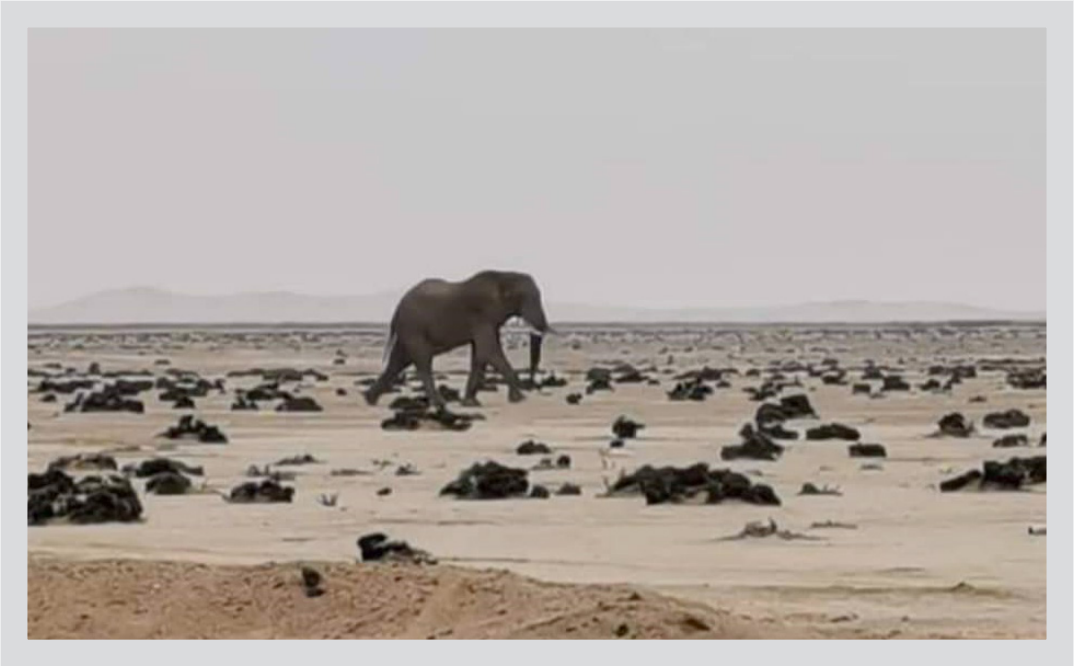
### Sporadic occurrences of elephants in other regions

Elephants occur sporadically in other parts of Namibia where there are no resident populations or no regular seasonal presence. These occurrences often involve substantial long-distance movements based on the distance between the locations of such elephants from the nearest known populations, but actual data on such sporadic or vagrant movements are limited. Elephants, always single or at most two adult males, have e.g. been recorded at Okakarara and Waterberg NP (160km straight line distance from the nearest population in Nyae Nyae Conservancy), west of Outjo (50km straight line distance from the nearest population in the vicinity of Khorixas, before there were more regular occurrences of elephants in the upper Huab and Ugab Rivers in the Kamanjab and Otjikondo areas northwest and north of Outjo) and in the Aminuis and Epukiro areas where they were thought to have come from Botswana where the nearest elephants occur near Ghanzi, 120-150km away to the east.

Perhaps the most striking vagrant movement ever recorded was that of an elephant that was recorded at Mile 14 in Dorob NP on the coast and subsequently in the Swakop River in December 2019[39]. This elephant became popularly known as the 'Christmas elephant' (see Figure 15) and stayed in the Swakop River area until February 2020 when it was translocated to a private nature reserve east of Windhoek.

39 It was first herded by MEFT away to the Omaruru River, and was collared there. After about a month the elephant walked towards Walvis Bay and was guided by MEFT to the lower Swakop River.

Interestingly, this elephant probably did not come from the nearest known population in the Ugab River area where all the males are individually known, leaving the Ghanzi area in Botswana (approx. 710km away) or Nyae Nyae Conservancy (approx. 700km away), or potentially Erindi private nature reserve (approx. 240km away, but well-fenced with no escapes reported) as probable origins. This elephant, and the others mentioned, managed to cross hundreds of farms and farm fences without being noticed and without doing much damage.



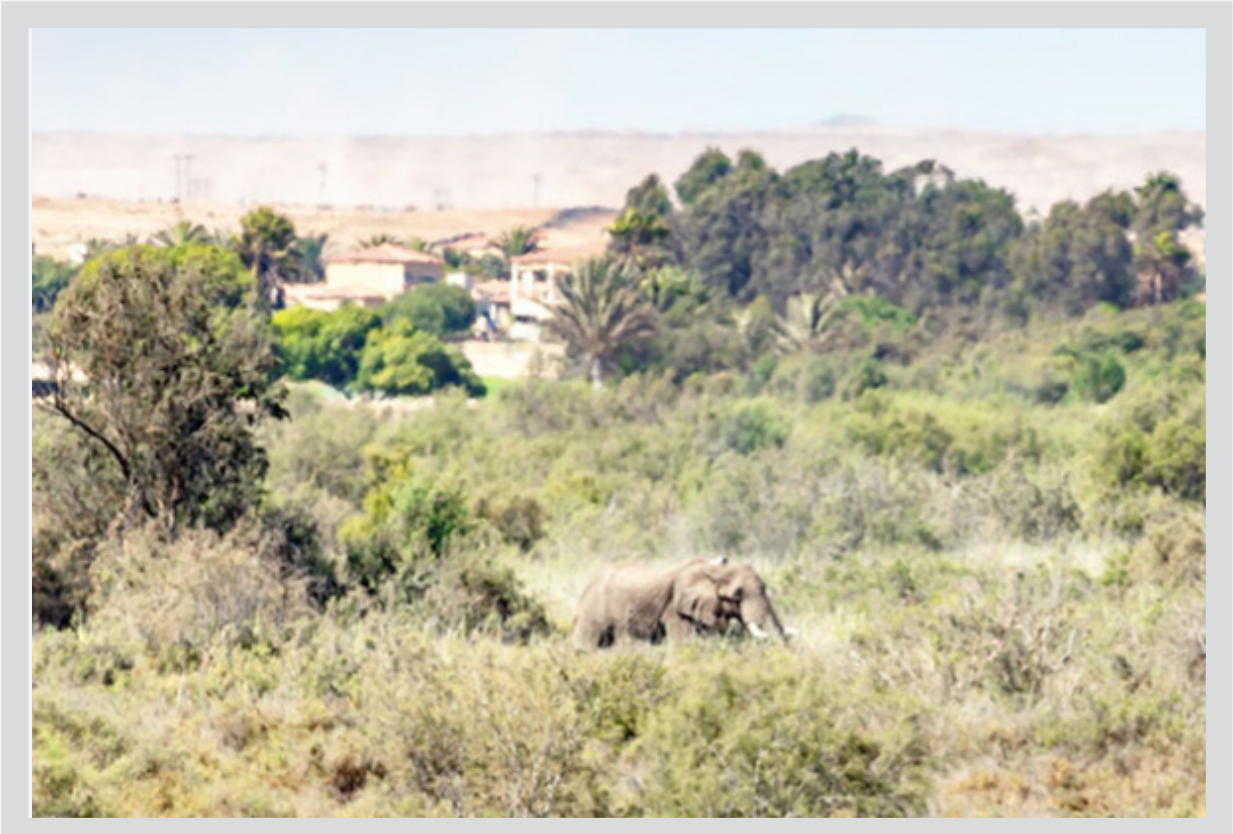


**Figure 15** The "Christmas" elephant male in the Swakop River at Rossmund in February 2020 (top photo reproduced from social media, not copyrighted, and the bottom photo is from The Namibian newspaper)

## 1.2.3 Population trends

### Countrywide estimates

Namibia's elephant population principally occurs in the North East (Zambezi Region, Khaudum NP and Nyae Nyae Conservancy), Etosha NP and the North West. Elephants are found outside these three areas (see Section 1.2.1), but there are no comprehensive aerial survey data to provide estimates of their numbers.

Because there are fewer surveys in some areas than others and only a few cases of surveys being carried out simultaneously countrywide, it is necessary to combine some of the estimates from consecutive years to provide enough points to conduct a trend analysis for the entire country. These are summarised in Table 5. The methodology used is given in Annex 2.

**Table 5** Estimates of numbers of elephants for countrywide total (cl = confidence limits)

| YEAR | Etosha NP | | Zambezi Region and Bwabwata NP | | Khaudum NP and parts of neighbouring conservancies | | North West | | Namibia | |
|---|---|---|---|---|---|---|---|---|---|---|
| | estimate | 95% cl | estimate | 95% cl | estimate | 95% cl | estimate | 95% cl | estimate | 95% cl |
| 1995 | 1,188 | 405 | 4,883 | 1,248 | 1,104 | 555 | 508 | 0 | 7,683 | 1,425 |
| 1998 | 2,206 | 893 | 4,576 | 1,248 | 2,776 | 1,158 | 579 | 560 | 10,137 | 2,008 |
| 2004 | | | 8,725 | 2,251 | 4,127 | 2,125 | | | 14,548 | 3,242 |
| 2005 | 2,611 | 671 | 6,474 | 2,445 | | | 210 | 164 | | |
| 2011 | 2,509 | 930 | 10,847 | 3,619 | 4,731 | 1,955 | 351 | 240 | 18,438 | 4,224 |
| 2015 | 2,911 | 697 | 13,136 | 3,435 | 6,413 | 2,566 | | | 23,633 | 4,397 |
| 2016 | | | | | | | 1,173 | 681 | | |

There is a clear upward trend in the overall number of elephants as shown in Figure 16.

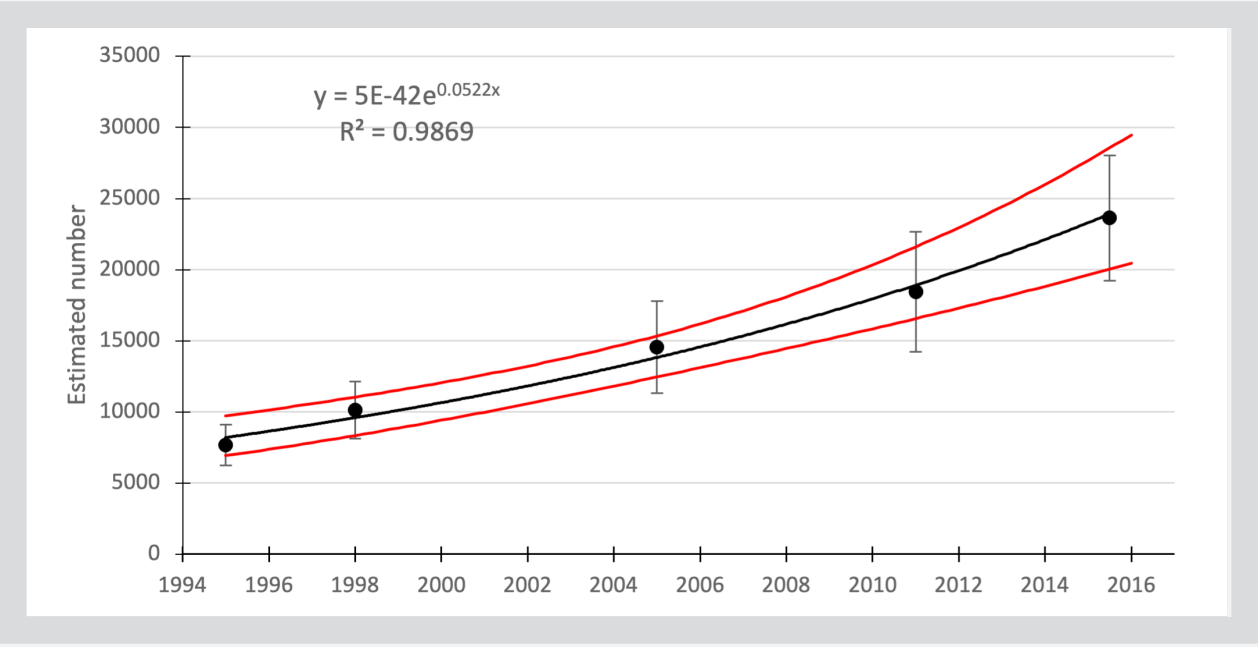



**Figure 16** Elephant population trend for Namibia from 1995 to 2016 (red lines show the 95% confidence limits on the trend line)

The estimated rate of population increase p.a. for Namibia's elephant is 5.36% (between 4.20% and 6.53%). The trend is statistically significant (F=225.29, p = 0.00064***).

The country estimate of 23,663 ± 4,397 in Table 5 is based on the most recent comparable surveys available. The estimates for some of the contributing areas have not been updated since 2015/2016.

It should nevertheless be noted that there has been a considerable increase in the numbers of elephants recorded in the Khaudum NP and neighbouring conservancies in 2019 i.e. 7,999 ± 3,028 and a slight decrease in the Zambezi Region and Bwabwata NP in 2019 i.e. 12,008 ± 2,598. The trend analysis for the countrywide estimates omits these 2019 estimates because there are no later estimates for the other regions than used already in the 2016 country estimate.

If the 2019 estimates were to be combined with the most recent estimates for the other regions a composite estimate of 24,091 ± 4,107 would result and is an indicative estimate of the current population size.

## Etosha National Park

Table 6 gives all recorded estimates of elephants in Etosha NP since 1951 and Figure 17 shows the population trend.

**Table 6** Record of estimates of elephant numbers in Etosha NP based on aerial surveys

| Year | Estimate | 95% CI | Method | Source/Reference |
|---|---|---|---|---|
| 1951 | 20 | | not stated | Erb (1995) |
| 1952 | 60 | | not stated | Erb (1995) |
| 1954 | 200 | | not stated | Erb (1995) |
| 1958 | 160 | | not stated | Erb (1995) |
| 1960 | 300 | | not stated | Erb (1995) |
| 1966 | 200 | | not stated | Erb (1995) |
| 1968 | 301 | | total[40] | Ebedes *et al*. (1970) |
| 1969 | 64 | | total | Ebedes *et al*. (1970) |
| 1969 | 116 | | not stated | du Preez (1971) |
| 1970 | 494 | | total with transects in some areas | Ebedes *et al*. (1970) |
| 1970 | 550 | | not stated | Ebedes *et al*. (1970) |
| 1970 | 232 | | not stated | du Preez (1971) |
| 1971 | 124 | | not stated | du Preez (1971) |
| 1972 | 447 | | total and reconnaissance[41] | du Preez (1972a) |
| 1972 | 433 | | not stated | du Preez (1972b) |
| 1972 | 419 | | recon | du Preez (1972c) |
| 1972 | 863 | | not stated | Reid & du Preez (1972a) |
| 1972 | 686 | | total | Reid & du Preez (1972b) |
| 1973 | 292 | | not stated | du Preez (1973a) |
| 1973 | 477 | | not stated | du Preez (1973b) |
| 1973 | 281 | | not stated | du Preez (1973c) |
| 1973 | 715 | | not stated | du Preez (1973d) |
| 1973 | 1,293 | | transects and reconnaissance | Joubert (1973) |
| 1974 | 904 | | not stated | du Preez (1974) |
| 1974 | 835 | | transects and reconnaissance | Berry (1974) |
| 1976 | 1,170 | | transects | Berry (1976) |
| 1977 | 836 | | transects | Berry (1977) |

| Year | Estimate | 95% CI | Method | Source/Reference |
|---|---|---|---|---|
| 1978 | 824 | | not stated | Berry (1978) |
| 1978 | 1,298 | | total and transects | de Villiers & Kyle (1978) |
| 1979 | 1,947 | 542 | block and transects | de Villiers & Kyle (1979) |
| 1982 | 2,202 | | total | Berry H. & de Villiers (1982) |
| 1983 | 1,819 | | total and ground counts | Berry H & Nott (1983) |
| 1983 | 1,437 | | total | Lindeque (1984) |
| 1984 | 364 | | total | Berry (1984) |
| 1984 | 1,158 | | total | Lindeque (1984) |
| 1984 | 2,464 | | total | Berry (1984) |
| 1984 | 2,081 | 672 | total | Lindeque (1984) |
| 1986 | 196 | | total (partial survey) | Scheepers (1986) |
| 1987 | 2,021 | | total | Lindeque & Lindeque (1987) |
| 1990 | 1,469 | | not stated | Erb (1995) |
| 1995 | 1,188 | 405 | transect sample | Erb (1995) |
| 1998 | 2,206 | 882 | transects and blocks | Craig (1998) |
| 2000 | 2,018 | 767 | transect sample | Erb (2000) |
| 2002 | 2,417 | 633 | transect sample | Kilian (2002) |
| 2005 | 2,611 | 671 | transect sample | MET (2005) |
| 2011[42] | 2,509 | 930 | transect sample | Craig (2011) |
| 2012 | 2,810 | 768 | transect sample | Kolberg (2012) |
| 2015 | 2,911 | 697 | transect sample | Kilian (2015) |
| 2018 | 2,355 | 311 | not stated | Kilian (2020) |

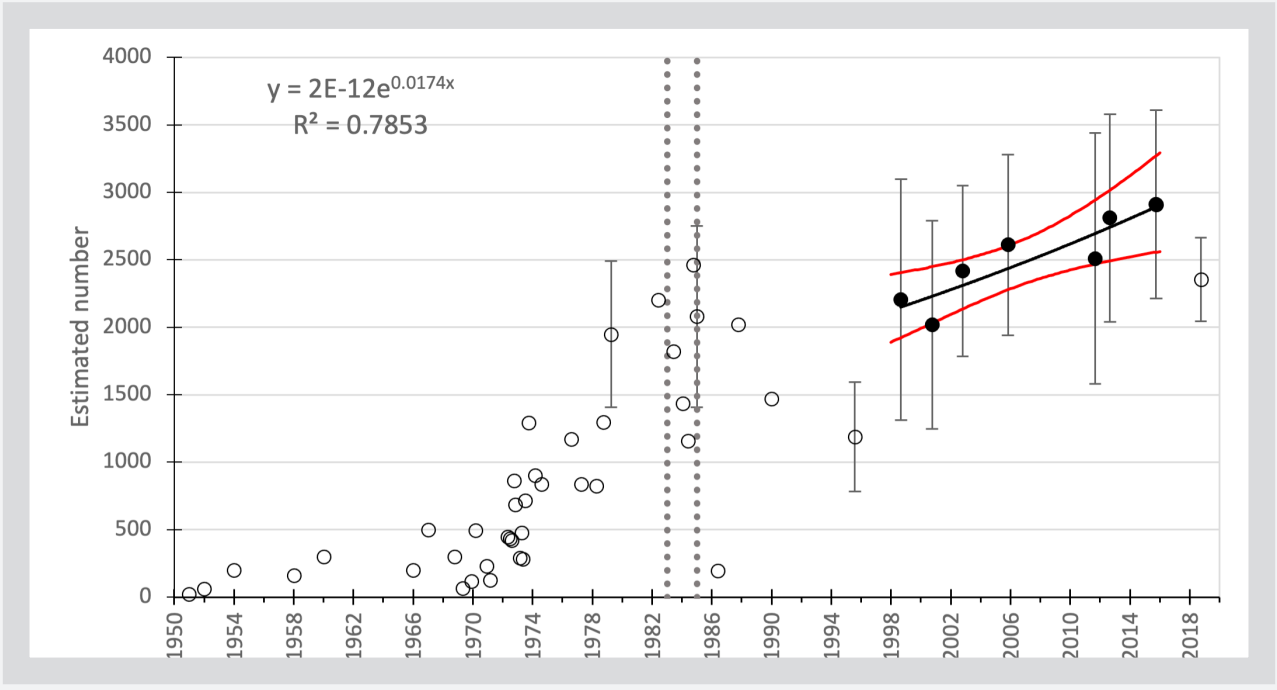



**Figure 17** Elephant population trend for Etosha National Park (red lines show the 95% confidence limits on the trend line). Culls are indicated by vertical dotted lines: 220 in 1983, 350 in 1985.

40 Total in this context means a total areal coverage of the park

41 Reconnaissance in this context generally means conducting flights to specific areas to search for elephants

42 The 2011 estimate was 3,378 ± 1,757. An outlier was removed which brought the estimate to within comparable range of other estimates for that period.

The estimated number for 1995 was omitted from the trend because of the deviations from the line[43]. In 2011, the estimate for one of the strata was based on a single sighting of 30 animals which resulted in an extremely wide confidence interval. For the trend analysis, the overall estimate therefore excluded the estimate (899 ± 2,365) for this stratum and added the number seen to the total estimate.

Early surveys of Etosha NP have produced extremely variable counts of elephants which are not strictly comparable. Estimates increased by a factor of about eight between 1970 and 1980. This estimate appears to be too high to have resulted from natural increase (see Section 1.1.2). A change in survey methods or quality over that period could also account for this variability but there were other indications that significant immigration occurred at that time (see Section 1.1.2). Since 1998, surveys have shown that the elephant population has been increasing slowly. The estimated rate of population increase p.a. for Etosha National Park's elephant population is 1.75% (between 0.65% & 2.87%). The trend is statistically very significant (F=16.71, p = 0.0095**).

## Zambezi Region and Bwabwata NP

Table 7 gives all recorded estimates of elephants in the Zambezi Region and Bwabwata NP and Figure 18 shows the population trend.

**Table 7** Record of estimates of elephant numbers in the Zambezi Region and Bwabwata NP based on aerial surveys

| Year | Estimate | 95% CI | Method | Source/Reference |
|---|---|---|---|---|
| 1994 | 7,950 | 4,695 | transect sample | ULG (1994) |
| 1994 | 5,556 | | transect sample | Rodwell *et al.*(1994) |
| 1995 | 4,883 | 1,248 | transect sample | Lindeque *et al.* (1995) |
| 1998 | 4,576 | 1,249 | transect sample | MET (1999) |
| 2004 | 8,725 | 2,467 | transect sample | Kolberg (2004) |
| 2005 | 6,474 | 2,445 | transect sample | Chase & Griffin (2006) |
| 2007 | 3,062 | - | total | Chase (2007) |
| 2007 | 11,339 | 1,178 | transect sample and total | Chase (2008) |
| 2009 | 3,450 | - | total | Chase (2009) |
| 2011 | 10,847 | 3,547 | transect sample | MET (2012) |
| 2013 | 9,165 | 1,967 | transect sample | Craig & Gibson (2013) |
| 2014 | 14,097 | 2,636 | transect sample | Craig & Gibson (2014) |
| 2015 | 13,136 | 3,428 | transect sample | Gibson & Craig (2015) |
| 2019 | 12,008 | 2,594 | transect sample | Craig & Gibson (2019) |

43 The residual for that year was close to 2 and removing it reduced the residuals for all other points.

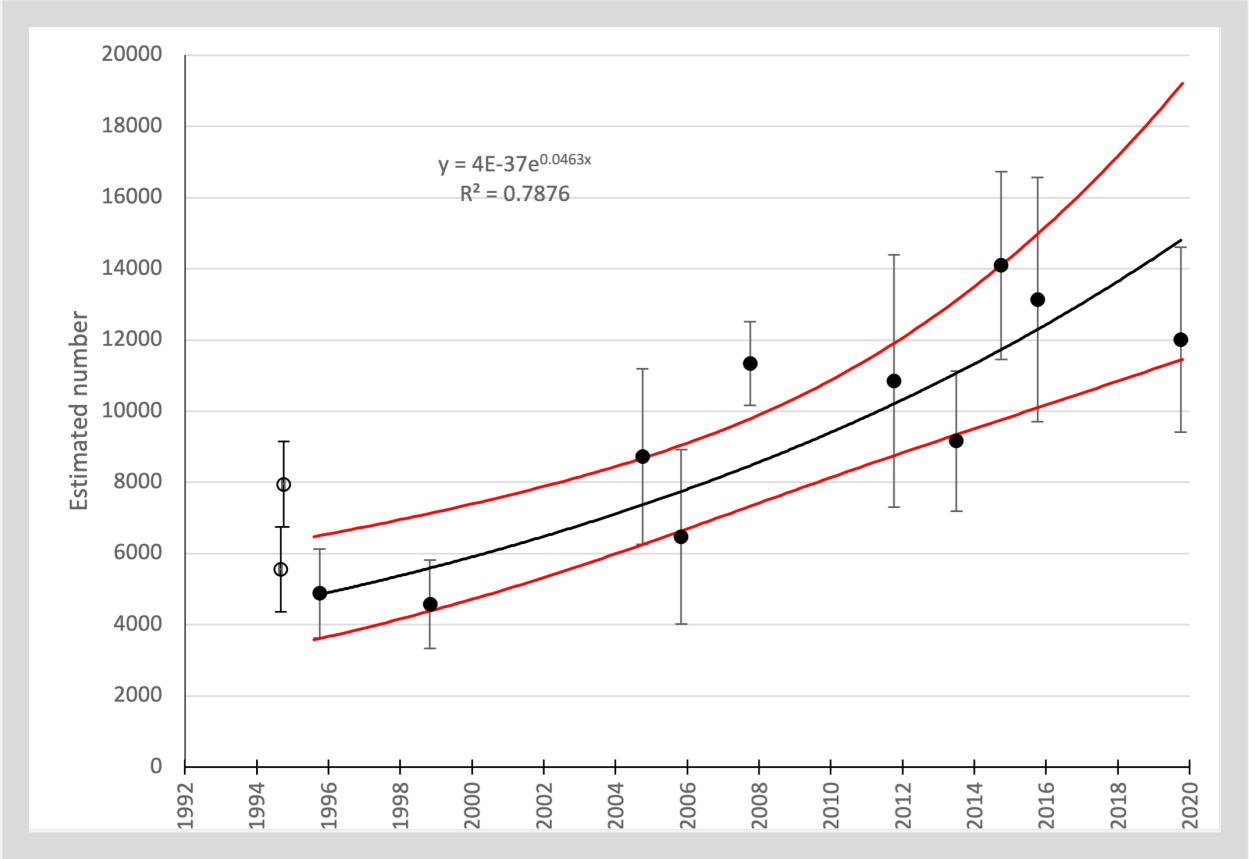



**Figure 18** Elephant population trend for Zambezi Region and Bwabwata NP (red lines show the 95% confidence limits on the trend line)

The largest of Namibia's elephant populations is found in Zambezi Region and Bwabwata NP where there were between 9,400 and 14,600 animals in the 2019 dry season. The population is not closed and there is considerable movement between Namibia and Botswana as well as Angola and Zambia to a lesser extent.

Numbers within Zambezi Region may be subject to some fluctuations on account of cross-border movement. Nevertheless, there has been a consistent and significant increase in the population at an estimated and biologically realistic annual rate of 4.76% (between 2.73% and 6.84%). This trend is statistically significant ($F=29.88$, $p = 0.0006^{***}$).

Of all areas supporting elephants in Namibia, the Zambezi Region has been most affected by illegal killing (Craig & Gibson 2013; Craig & Gibson 2014, Craig & Gibson 2019; Gibson & Craig 2015) from 2013. This is demonstrated by carcass ratios calculated from sightings of carcasses during surveys. There is no estimate for the 2019 surveys because of the removal of carcases by MEFT as part of security surveillance for illegal killing.

**Table 8** Carcass ratios in Zambezi Region and Bwabwata NP from aerial surveys

| Year | % Carcass Ratio |
|---|---|
| 1994 | 3.93 |
| 2011 | 2.63 |
| 2013 | 7.98 |
| 2014 | 5.12 |
| 2015 | 8.27 |

The last three points on the trend graph in Figure 18 show a consistent decline, which is not statistically significant though a real effect cannot be ruled out (Craig & Gibson 2019).

There is also a possibility, because of the connectedness of the populations, of the Zambezi population being impacted by illegal hunting in neighbouring states. That this was occurring, and continues, in Botswana was recorded on the 2014 (Craig & Gibson 2014) and 2019 (Craig & Gibson 2019) Zambezi Region and Bwabwata NP surveys.

## Khaudum National Park and Nyae Nyae Conservancy

Table 9 gives all recorded estimates of elephants in the Khaudum NP and Nyae Nyae Conservancy (including a small margin of neighbouring land west of the Khaudum NP but excluding the western part of Nyae Nyae Conservancy, see survey boundary in Craig & Gibson (2019)) and Figure 19 shows the population trend.

**Table 9** Record of estimates of elephant numbers in the Khaudum NP and Nyae Nyae Conservancy based on aerial surveys

| Year | Estimate | 95% CI | Method | Source/Reference |
|---|---|---|---|---|
| 1995 | 1,104 | 555 | Transect | Elesmap (1995) |
| 1998 | 2,777 | 1,158 | Transect | Craig (1998) |
| 2000 | 663 | 808 | Transect | Craig (2000) |
| 2004 | 4,127 | 2,125 | Transect | Kolberg (2004) |
| 2011 | 4,731 | 3,185 | Transect | Craig (2012) |
| 2013 | 3,638 | 1,148 | Transect | Craig & Gibson (2019) |
| 2015 | 6,413 | 2,566 | Transect | Gibson & Craig (2015) |
| 2019 | 7,999 | 3,028 | Transect | Craig & Gibson (2019) |

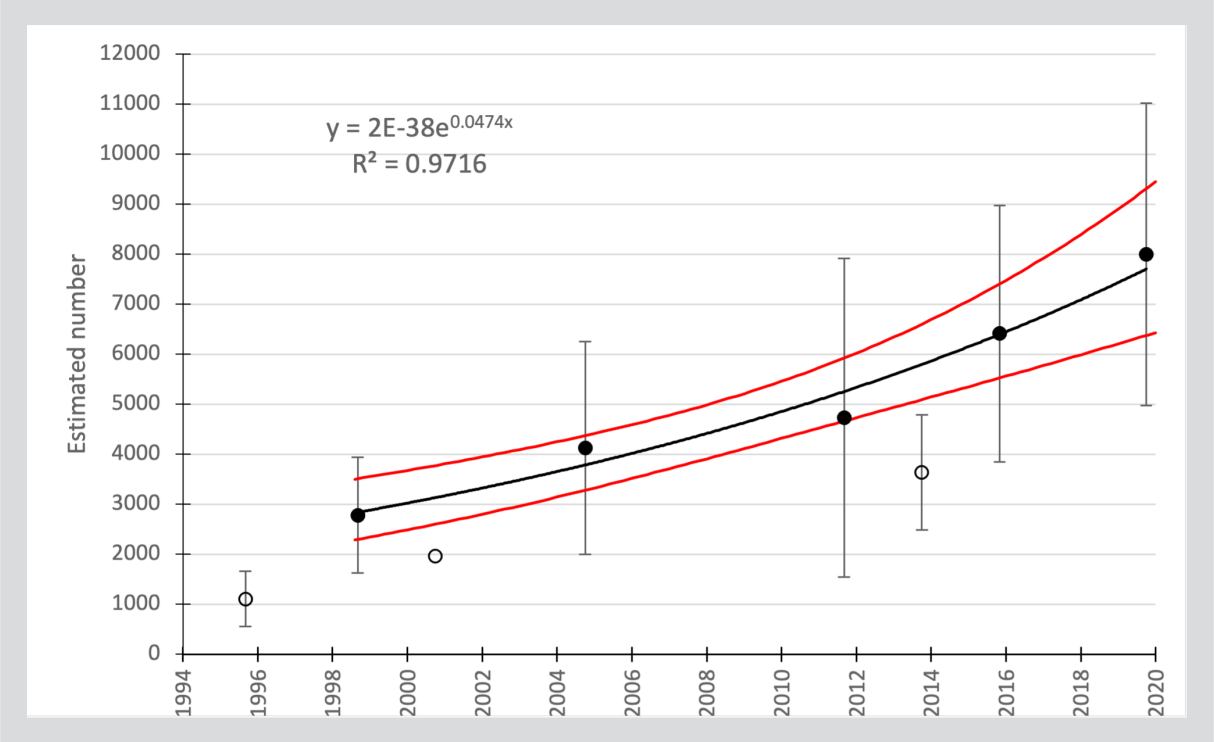



**Figure 19** Elephant population trend for the Khaudum NP and Nyae Nyae Conservancy (red lines show the 95% confidence limits on the trend line)

Khaudum NP and Nyae Nyae Conservancy have been combined for the purposes of estimating numbers of elephants as there is no barrier to movements between the two. The population has increased at a very highly significant rate (F=95.16, p= 0.0023***) of 4.85% (between 3.24% and 6.48%).

Three estimates were omitted from the trend analysis:

- The 1995 survey employed a non-standard approach to sampling.
- The 2000 survey was incompletely reported.
- The estimate for 2013 is an outlier. There was an elephant capture operation in the area at the same time as the aerial survey which disturbed the animals and may have caused them to move away leading to a low estimate.

Cross-border movement with Botswana is small compared with Zambezi Region. Links to the Bwabwata NP are limited and have not been detected by telemetry data (see Section 1.2.2). Numbers are therefore unlikely to be greatly affected by population movements. There has been no recorded illegal killing of elephants in the area up to 2020.

## North West Namibia

Table 10 gives all recorded estimates of elephants in North West Namibia and Figure 20 shows the population trend.

**Table 10** Record of estimates of elephant numbers in North West Namibia based on aerial surveys

| Year | Estimate | 95% CI | Method | Source/Reference |
|---|---|---|---|---|
| 1969 | 279 | | not stated | Joubert (1972) |
| 1972 | 211 | | not stated | Joubert (1972) |
| 1975 | 260 | | not stated | de Villiers (1975) |
| 1975 | 70 | | unknown | Kolberg *et al*. (2009) |
| 1976 | 162 | | unknown | Viljoen in Loutit (1995) |
| 1977 | 82 | | unknown | Visage (1977) |
| 1977 | 667 | | unknown | Viljoen Loutit (1995) |
| 1978 | 135 | | unknown | Kolberg *et al*. (2009) |
| 1979 | 192 | | transects, but not clear | Mulder (1979) |
| 1981 | 138 | | unknown | Kolberg *et al*. (2009) |
| 1982 | 214 | | unknown | Loutit (1995) |
| 1982 | 220 | | unknown | Kolberg *et al*. (2009) |
| 1982 | 357 | | total | Viljoen (1982) |
| 1983 | 126 | | random strips | Owen-Smith (1983a) |
| 1983 | 178 | | reconnaissance | Owen-Smith (1983b) |
| 1986 | 247 | | total | Britz *et al*. (1986) |
| 1990 | 260 | | total, but not clear | Carter (1990) |
| 1990 | 253 | | not stated | Loutit (1995) |
| 1992 | 366 | | reconnaissance | Loutit & Douglas-Hamilton (1992) |
| 1993 | 340 | | transects and reconnaissance | Loutit (1995) |
| 1995 | 508 | | reconnaissance | Craig (1996) |
| 1998 | 579 | 560 | blocks and transects | Craig (1999) |
| 1998 | 50 | | block | Kolberg *et al*. (2009) |
| 1999 | 56 | | reconnaissance | Leggett (2000) |
| 2000 | 663 | 122 | block and transects | MET (2000) |

| Year | Estimate | 95% CI | Method | Source/Reference |
|---|---|---|---|---|
| 2005 | 210 | 164 | transects | Unknown (2005) |
| 2005 | 169 | | transects | Kolberg *et al*. (2009) |
| 2007 | 365 | 193 | transects | Unknown (2007) |
| 2007 | 117 | | transects | Kolberg *et al*. (2009) |
| 2009 | 352 | 243 | total | Kolberg *et al*. (2009) |
| 2011 | 351 | 240 | blocks | Craig (2011) |
| 2014 | No estimate generated | | blocks | Craig & Gibson (2014) |
| 2016 | 1,173[44] | 681 | block and transects | Craig & Gibson (2016) |

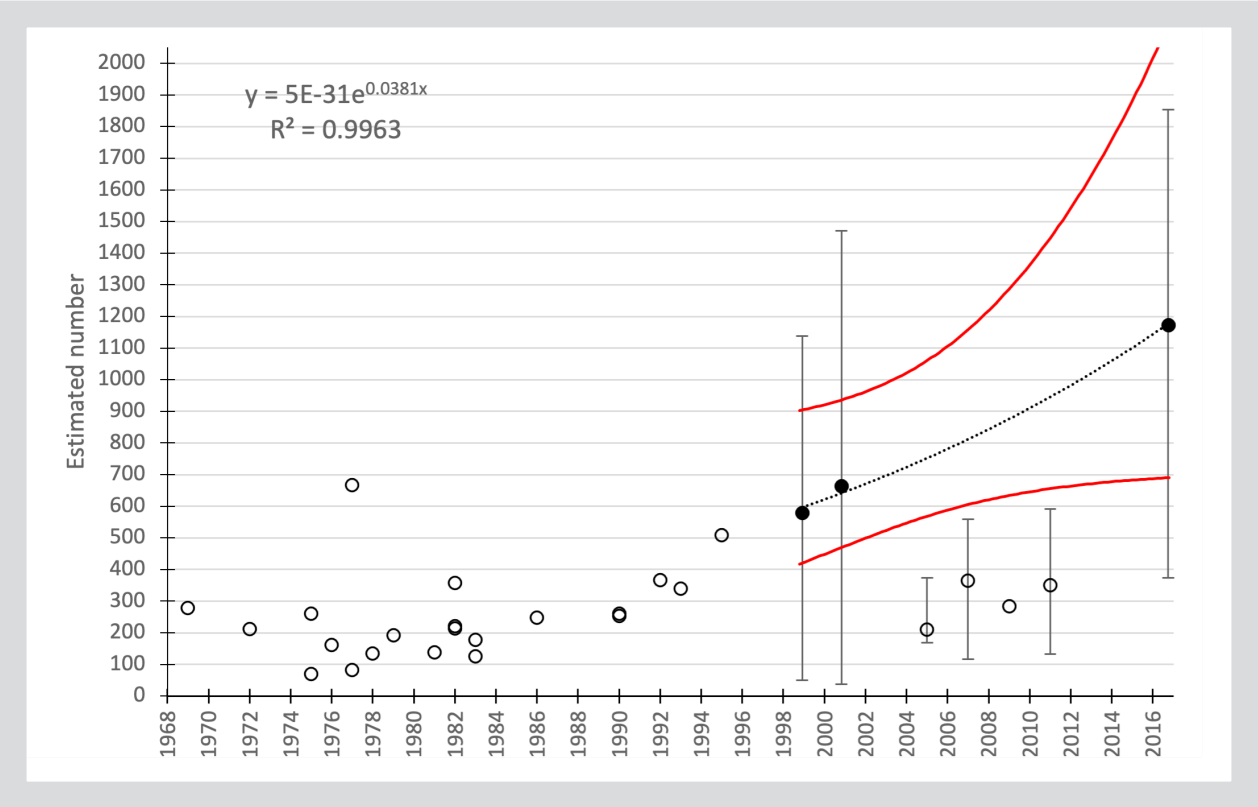



**Figure 20** Elephant population trend for North West Namibia (red lines show the 95% confidence limits on the trend line)

Information about elephant numbers in north-western Namibia is patchy primarily because of the difficulties of conducting surveys in the area. A variety of methods have been used and surveys have seldom covered the same parts of the elephant range. As a result, only a few of the North West surveys are strictly comparable and numbers produced by early surveys are extremely variable.

Correctly conducted total counts (i.e. with a search rate of less than 1.5 km$^2$ per minute) would require over 500 flying hours. Sample counts are therefore the best option and because transect counts are unsuitable for surveys of North West Namibia, as it is impossible to maintain a fixed height above ground level in the mountainous terrain, block counts are used for much of the area.

As the number of elephants in this population is of the order of 1,000 in an area exceeding 50,000 km$^2$, sample counts result in extremely low precision. Greater sampling effort might improve this, but, for example, the 2016 survey took around 100 flying hours – more than is normally expended on the whole of the North East, which has 20 times the elephant population. Improving the North West estimates to a similar level of precision as the North Eastern estimates would require 5 times the effort employed in

44 The 2016 estimate was 1,716 ± 1,299. One outlier was removed, resulting in the estimate of 1,173 ± 681 (see Craig & Gibson (2016)

2016 and considerably more resources. Since the population contributes little to the national total, the low precision of estimates for the North West is of little significance nationally though very important at the local level.

Until 1995, reconnaissance flights attempting to conduct total counts seem to have been reasonably effective due to good local knowledge (i.e. the estimates are not far below subsequent sample counts).

Surveys took place between 2005 and 2011 that were inadequate for a number of reasons. The sample counts with adequate coverage and search effort conducted in 1998, 2000 and 2016 suggest a greater number, but with very low precision.

The intention with the 2011 and 2016 surveys was to obtain a good sample count in the overall range while maximising the number seen by total counting areas, especially along rivers, intending to produce an estimate which might be imprecise but backed by a good minimum number seen. The 2011 survey counted 133 as a minimum number but the sample section of the survey had inadequate survey effort. The 2016 survey gave 373 as a minimum count with an overall estimate of 1,716 (adjusted down to 1,173 as a result of one outlying value).

Although the 2016 number increased since the previous comparable surveys in 1998 and 2000, there are insufficient surveys to demonstrate change or to obtain an estimate of it. The estimated rate of change for the North West population is 3.86% per annum (between -0.08% & 7.95%). This is not statistically significant ($F=154.63$, $p = 0.0511$ n.s.).

## 1.3 Landscape connectivity and movement corridors – past and present

### 1.3.1 North-western Namibia

An early point of contention was the belief that elephants were only seasonally or periodically present in the Kaokoveld and migrated between Etosha NP and the Kaokoveld (Bigalke 1958 and Tinley 1966 in Viljoen 1989). Neither Owen-Smith (1970) nor Viljoen (1987, 1989) believed this to be the case, and found no evidence of any regular or large-scale movements between the two areas. Viljoen (1987) described an elephant distribution in the Kaokoveld that was contiguous with western Etosha NP (Figure 4, also see De Villiers & Kok 1984) but divided into three separate geographic groups with no contact amongst them (Viljoen (1987, 1989). In the late 1970s at a time of historically low numbers of elephants in the Kaokoveld and during the severe drought at that time, this might have indeed been the case although no tracking of actual movements was possible then. Viljoen (1987) also described a transitional population in the area of Grootberg and the Huab River and surrounding farmland. This population would move northeast in the wet season towards Omumborombonga (a substantial perennial spring) where they made contact with the eastern population and in the dry season moved south-west where they infrequently made contact with the western population (Viljoen 1987, 1989).

The main issue was the apparent isolation of the three separate geographic groups, but this isolation was obviously not complete based on the described transitional population to the south and other facts that became apparent in later studies. Lindeque (1988) described significant movements of elephants from the Kaokoveld into Etosha NP during the severe drought years of 1980 to 1983. Lindeque & Lindeque (1991) did the first study in Namibia using satellite tracking of elephants which recorded the largest scale elephant movements and the largest elephant home ranges known at the time in Africa, see Figure 21. Despite the early failure of the only satellite transmitter placed on the Hoanib River group, this study showed that:

- There were movements and associations between the small remnant herd of seven, later five, in the lower Hoarusib River and the larger group of around 25 in the Hoanib River, and that this well-studied group was joined by a previously unknown elephant female collared in the Hoarusib River at Leyland's Drift.
- The Hoanib group moved further east than previously known, to within 5km of the Khowarib Schlucht, a narrow gorge through the escarpment mountains east of Sesfontein. This gorge was evidently a well-used route for elephant movements over a very long period based on the presence of elephant rubbing stones (M. Lindeque, pers. comm.). The gorge was clearly a point of potential contact or overlap between three of the populations described by Viljoen (1987, 1989).
- Two elephants collared in the Uniab and Huab Rivers, i.e. of the transitional population of Viljoen (1987, 1989), occupied home ranges that straddled the veterinary cordon fence.
- Elephants responded rapidly to the onset of distant rain by sudden shifts in distribution, often synchronized between different herds, but before actual rainfall occurred and possibly triggered by the sound of distant thunderstorms.

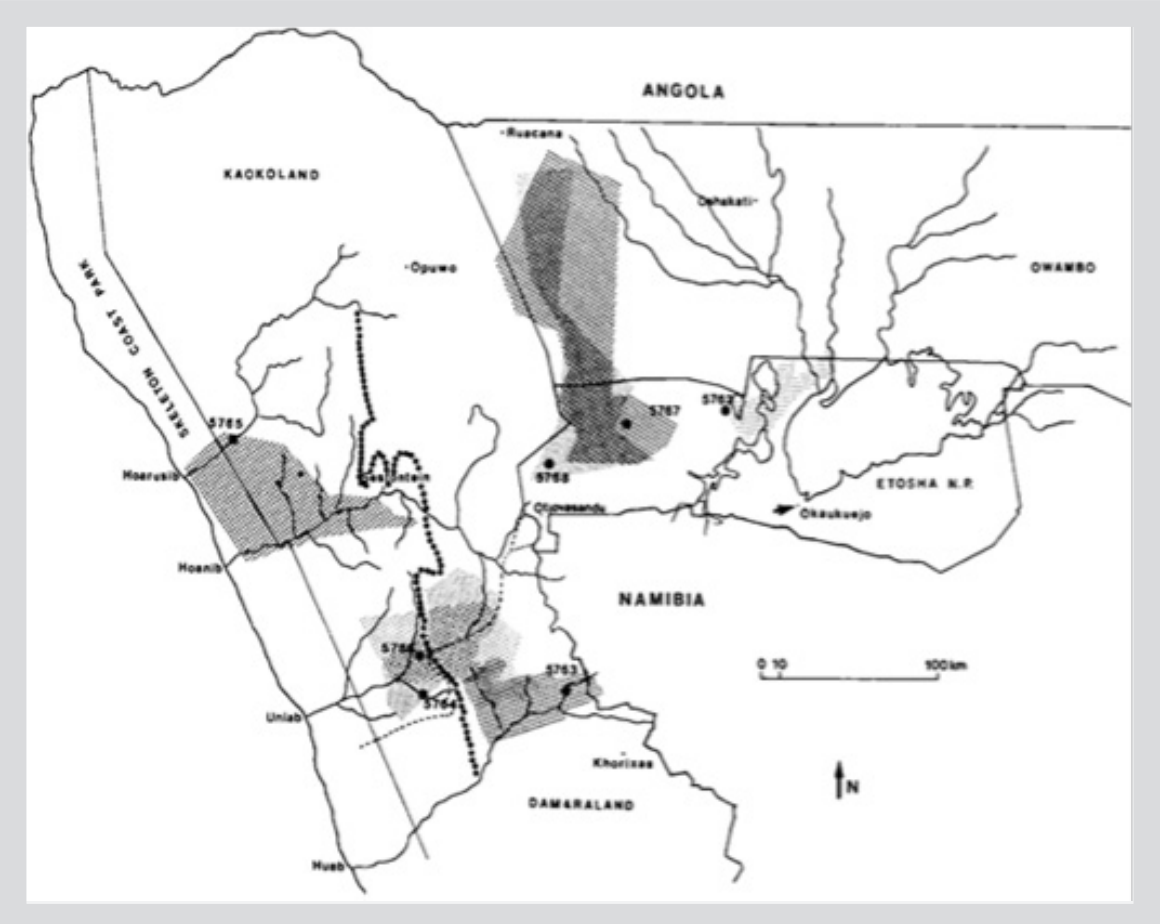



**Figure 21** Elephant movements in north-western Namibia and Etosha NP (Lindeque & Lindeque 1991). The broken line indicates the location of the veterinary cordon fence and the dotted line the escarpment

Leggett (2006) was the first to use GPS platforms on collars in Namibia to study elephant movements and home ranges in north-western Namibia (see Figure 22 reconstructed from his data). He found that:

- The recorded home ranges were even larger than reported by Lindeque & Lindeque (1991).

- A male from the western group collared at Puros in the Hoarusib River moved as far east as the eastern Ombonde River-Omumborombonga area, about 15km west of Hobatere tourism concession area bordering Etosha NP and overlapping with four other elephants collared in Hobatere Tourism Concession Area. This elephant must have come through the Khowarib Schlucht (canyon) which is the only route through the escarpment mountains from west to east and clearly an ancient movement route for elephants (see Figure 23).
- One of the males collared in the Hobatere Tourism Concession Area had a home range extending to the lower-middle Huab River (as well as a small part of western Etosha NP), thus showing the link between the eastern and transitional populations of Viljoen (1987, 1989). Another male collared in Hobatere had a home range that included the upper Huab River.
- All four of the elephants (one female, three males) collared in the Hobatere area had home ranges extending into western Etosha NP.
- Elephants collared in the Ombombo Owambo area (in present-day Uukwaluudhi Conservancy) and western Omusati Region moved to and from north-western Etosha NP (see also Leggett 2005, 2006b and Section 1.3.2).
- Synchronized movements of elephant herds occurred at the onset of the rainy season but before actual rainfall occurred (see also Garstang ***et al***. 2014).

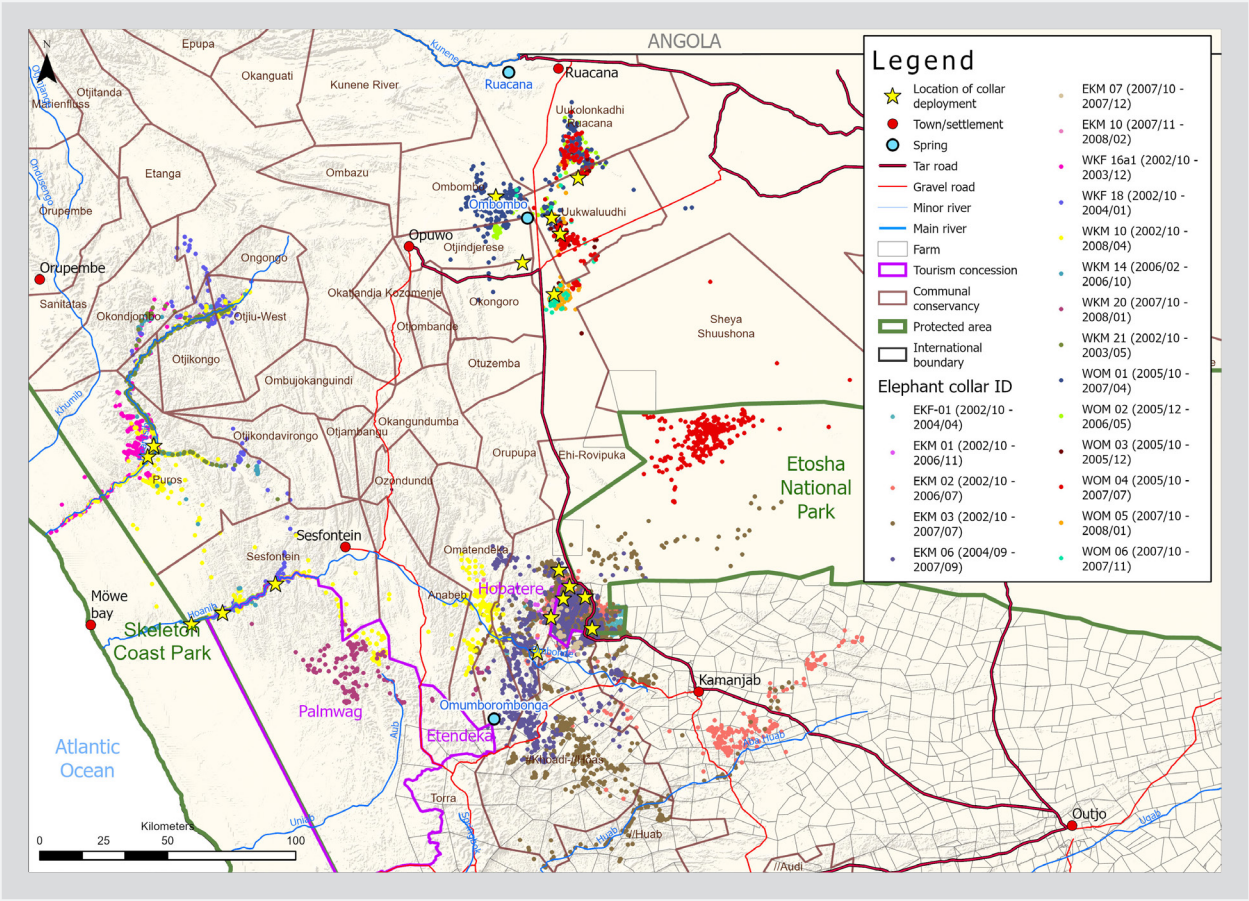



**Figure 22** Elephant movements in North West Namibia recorded by Leggett (2006), data kindly provided by K. Leggett

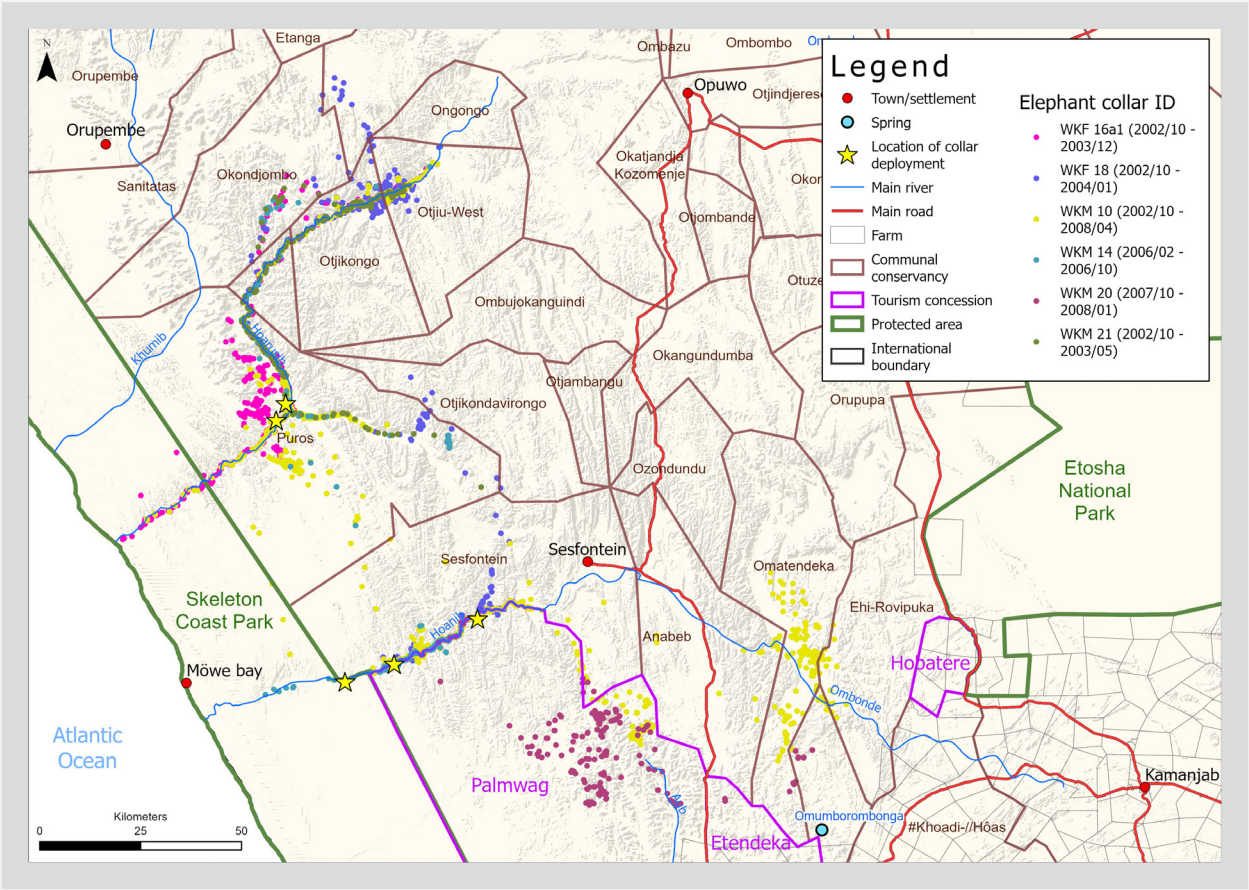



**Figure 23** Elephant movements in North West Namibia recorded by Leggett (2006), showing only the locations for elephants using the Hoarusib, Hoanib-Ombonde and Uniab River systems, data kindly provided by K. Leggett

These studies (Lindeque 1988, Lindeque & Lindeque 1991 and Leggett 2006) together show rather conclusively that there is no long-term isolation of the various groups of elephants in the Kaokoveld or between these groups and the Etosha NP population. This does not diminish the conservation value of the Kaokoveld elephants at all. This population holds vitally important long-term collective knowledge – potentially irreplaceable - of their distribution range with its extremely sparse and distantly located water sources in a hyper arid to arid environment that is unique in Africa. Ishida ***et al***. (2016) subsequently confirmed that there is no genetic difference or separation between the elephants of the North West and Etosha NP. In the shorter term and at sub-group level, there had been extended periods (e.g. 3 years from 1975 to 1977 (Viljoen 1987) and 12 years from 2005 to 2016 (Ramey & Brown 2016)) over which the Hoanib-Hoarusib River group was known to have been isolated from other elephants, which attests to their remarkable resilience but also their high and ongoing vulnerability[45].

More recent movement data from elephants collared between 2009 and 2015 by MEFT (W. Kilian) show a contiguous elephant population in north-western Namibia and Etosha NP (Figure 24) but limited movements in and out of Etosha NP from the west and north-west.

45 This isolation is also shown in Figure 24

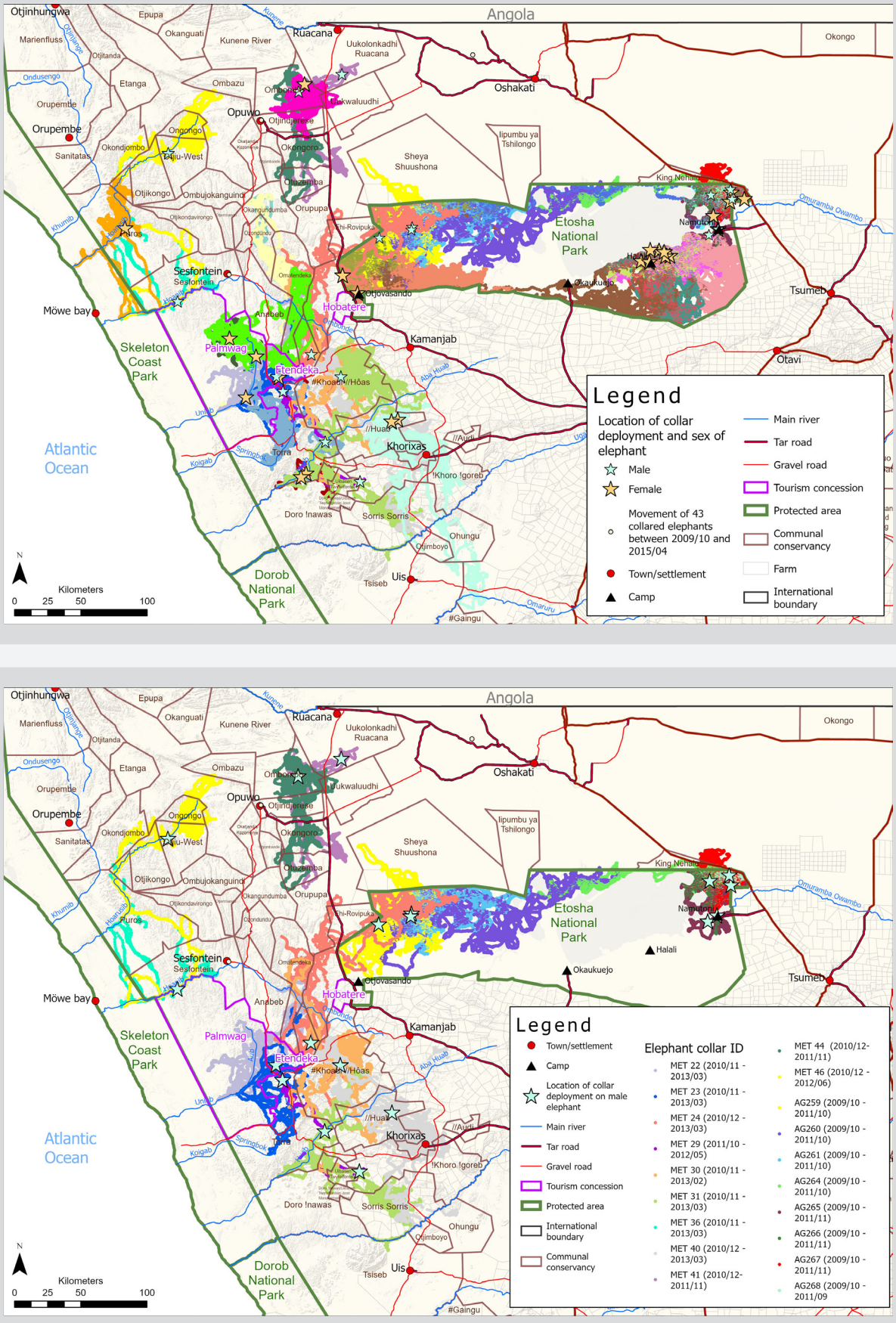



**Figure 24** Movements of elephants collared in north-western Namibia from 2009 to 2015 (the upper map shows all collared elephants, the lower map shows only the male elephants collared) (data kindly provided by W. Kilian)

There are three specific cases to highlight as well, elephants in the Huab-Kamanjab-Otjikondo-Etosha southern boundary area, elephants in the Palmwag-Uniab River catchment and the vacant Kunene River elephant habitat.

### *Huab-Kamanjab-Otjikondo-Etosha southern boundary*

Lindeque & Lindeque (1991) (Figure 21) and Leggett (2006) (Figure 22) recorded movements by elephants collared in the lower Huab River in a north-east direction during the west season, into the Kamanjab area and in the direction of Etosha NP, and there were regular conflicts with commercial farmers along the Huab River as well as lots of evidence from the ground of elephant usage of the Huab River well into the commercial farming area west of the Khorixas-Kamanjab Road (C35) (R. Loutit and T. Hall, pers. comm. to M. Lindeque). From the public consultation process, 20 farms were regularly affected in that area up to 2005 (J. du Plessis, chairperson of the Kamanjab Farmer's Association, see Section 2.2) with further eastwards expansion after 2005 to the Kamanjab and Otjikondo areas, where now around 60 farms regularly or occasionally have elephants.

More recently, elephants collared in the Huab River catchment area by MEFT (K. Uiseb and M. Hauptfleisch, pers. comm. to M. Lindeque, see Figure 25), i.e. part of the transitional population of Viljoen (1987), and the group through which he postulated that a degree of connectivity amongst the elephants of the North West is maintained, moved to within a few km of Etosha NP in 2019 on the farm Volouiga (shown as Etosha View in Figure 25) which borders on Etosha NP. The owner of Volouiga, Dr B. Oelofsen, also recorded elephants coming onto his farm in 2002, 2003 and 2004, specifically a group of two adult females with their offspring. The owners of the adjacent farm Windpoort (W. Versfeld and T. Osborne) also confirmed that elephants have infrequently broken into the farm over a period of at least 20 years, always from the south west and always in December (but in 2020 they came to the farm in October, and again in December).

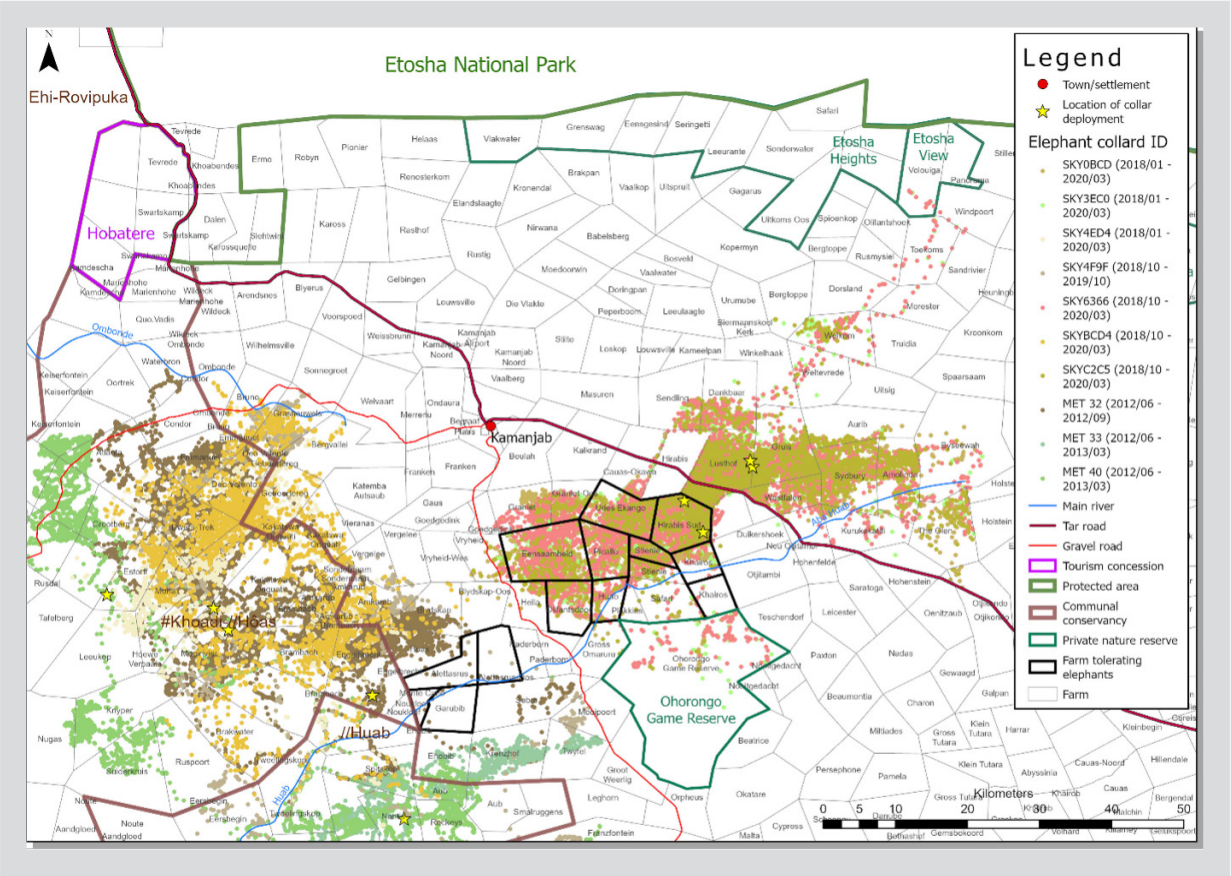



**Figure 25** Movements of six adult female elephants in family groups (breeding herds) collared in the lower Huab River from 1 October 2018 to 31 October 2019. Note that one collared elephant moved as far north-east as the farm Volouiga, which borders on Etosha NP. Three elephants reached the farm Welkom in the same direction, about 20km from Etosha NP. The designation of farms in the Kamanjab area that are tolerant to elephants came from the public consultation process for this plan but requires confirmation. Data kindly provided by K. /Uiseb and M. Hauptfleisch

It is probably only a question of time before these elephants will move into Etosha NP or mingle with the elephants on Etosha Heights Private Nature Reserve which borders the farm Volouiga to the west. The Etosha Heights elephants (50-100 are more or less permanently resident) came from Etosha NP and continue to periodically move in and out of the private nature reserve and national park (A. Nel and P. du Preez, pers. comm. to M. Lindeque). At least one adult male elephant also moved onto Windpoort and adjacent farms in December 2020, but from the East. His calm demeanour suggested that he came from Etosha NP and was used to vehicles and people. This area is clearly a zone of range overlap between elephants that primarily occur in Etosha NP and elephants that primarily occur in the Huab-Kamanjab-Otjikondo area.

Figure 26 show the routes used by these elephants in 2002-2007 and 2018-2020 in more detail. There is remarkable correspondence in the route used by five collared elephants over an approximately 18-year period along the Huab River towards the southern boundary of Etosha NP and once the leave the river (as it peters out) continuing in the same direction which is also in line with the ephemeral drainage system from the dolomite mountains south of the park towards Grootvlakte (and ending in the Charles Marais dam area). It seems as if an old elephant movement corridor is shown by these movements and it is extraordinary that it still persists despite no evidence of such movements from the 1980s until around 2000, and numerous conflicts with livestock farmers ***en route***.

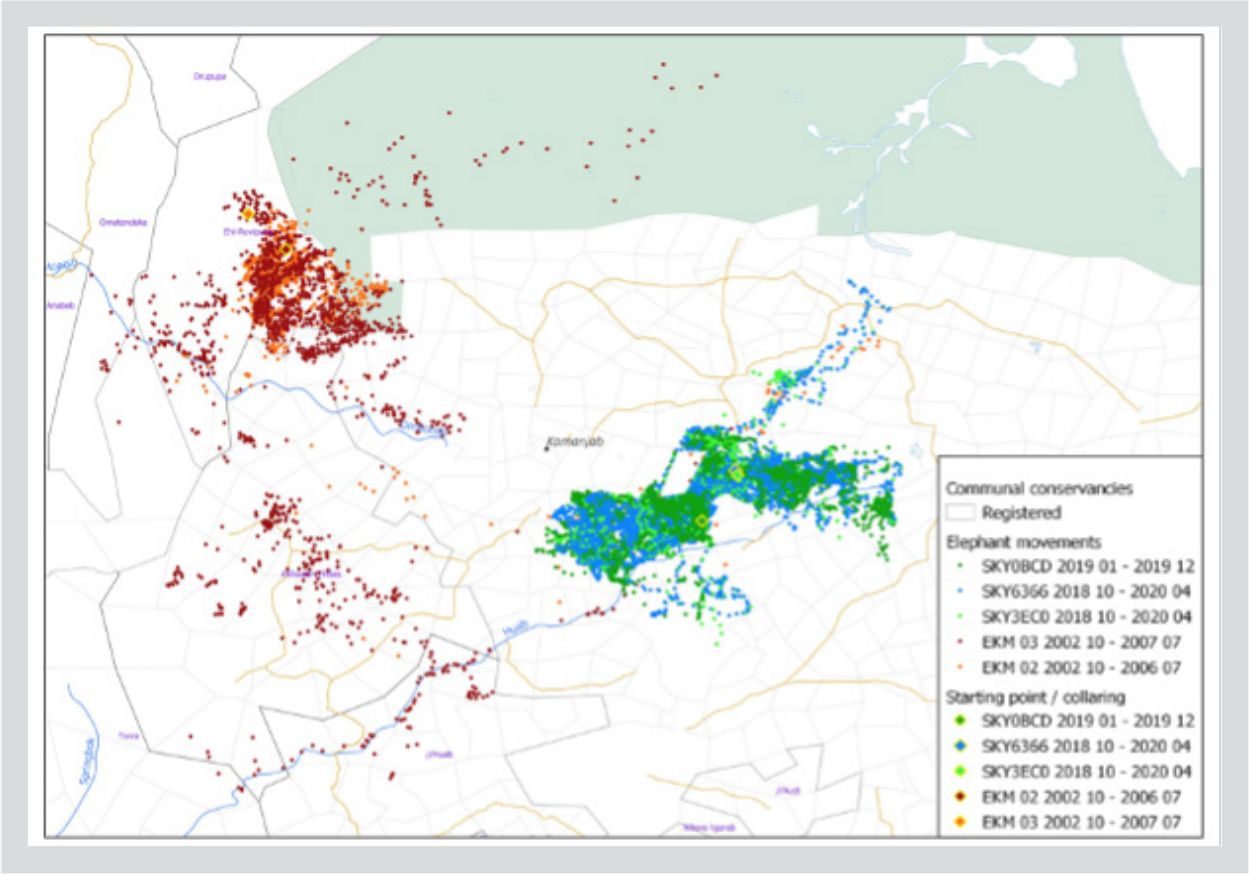



**Figure 26** Movements of five elephants collared in the area south and south-west of Etosha NP by K. Leggett in 2002 to 2007 (the brown colours, all adult males) and MEFT in 2018 to 2020 (the green and blue colours, all family groups (breeding herds))

As further insight, Figure 27 which shows the movements of just one of these five elephants, EKM 03, that followed the Huab River, additionally shows that this elephant male over a period of four years and nine months (October 2002 to July 2007) of tracking used a very large area comprising:

- the hyper arid eastern part of Torra Conservancy and the watershed between the Koichab-Springbok River and Huab River catchments and the lower Huab River from Nil Desperandum[46] in Torra Conservancy and upstream to Avante in ≠Khoadi-//Hôas Conservancy, Aandgloed, Noute, Eersbegin, Tweelingskop and Spitskop in the Huab Conservancy up to the point where the Huab River enters the commercial farming area
- Farms Ehobib, Paderborn, Sebra (the eastern boundary of the elephant distribution in the Kamanjab district until 2005), then north-eastwards to farms Gross Omaruru, Huab, Hirabis South, Uries Ekango, Hirabis, Lusthof, Dankbaar and Sendeling
- In ≠Khoadi-//Hôas Conservancy in the area between the Huab River and the Ombonde River and the Grootberg mountains in the West, Kuyper, Brakwater, Mooirivier, Freyer, Brambach, Kakatswa Onguati, Vêrpaaie, Leeukop, Moria, Tafelberg, Rusdal, Grootberg, Estorff, Anker
- In ≠Khoadi-//Hôas Conservancy north of the Grootberg mountains towards the Ombonde River and Hobatere, the farms Dwarstrek, 612, Deo Volente, Keisersfontein (shared with Ehi-Rovipuka Conservancy), farms 619 and 621, Kamdescha, Marienhöhe, Quo Vadis
- Hobatere tourism concession area
- Southern Ehi-Rovipuka Conservancy (primarily the core wildlife area) and southern Omatendeka Conservancy and Omumborongbonga spring, i.e. the area designated to become the Ombonde People's Park
- Western Etosha NP including the Kaross Rare Species Camp eastwards between the southern boundary of the park and the 19th latitude road up to Sonderkop
- Farms Wildeck, Arendsnes, Blyerus, farm Kaross, Ermo, Wilhelmsville, farm Ombonde, Bruno, Grasheuwels, Sonnegroet, Welvaart, all west of Kamanjab

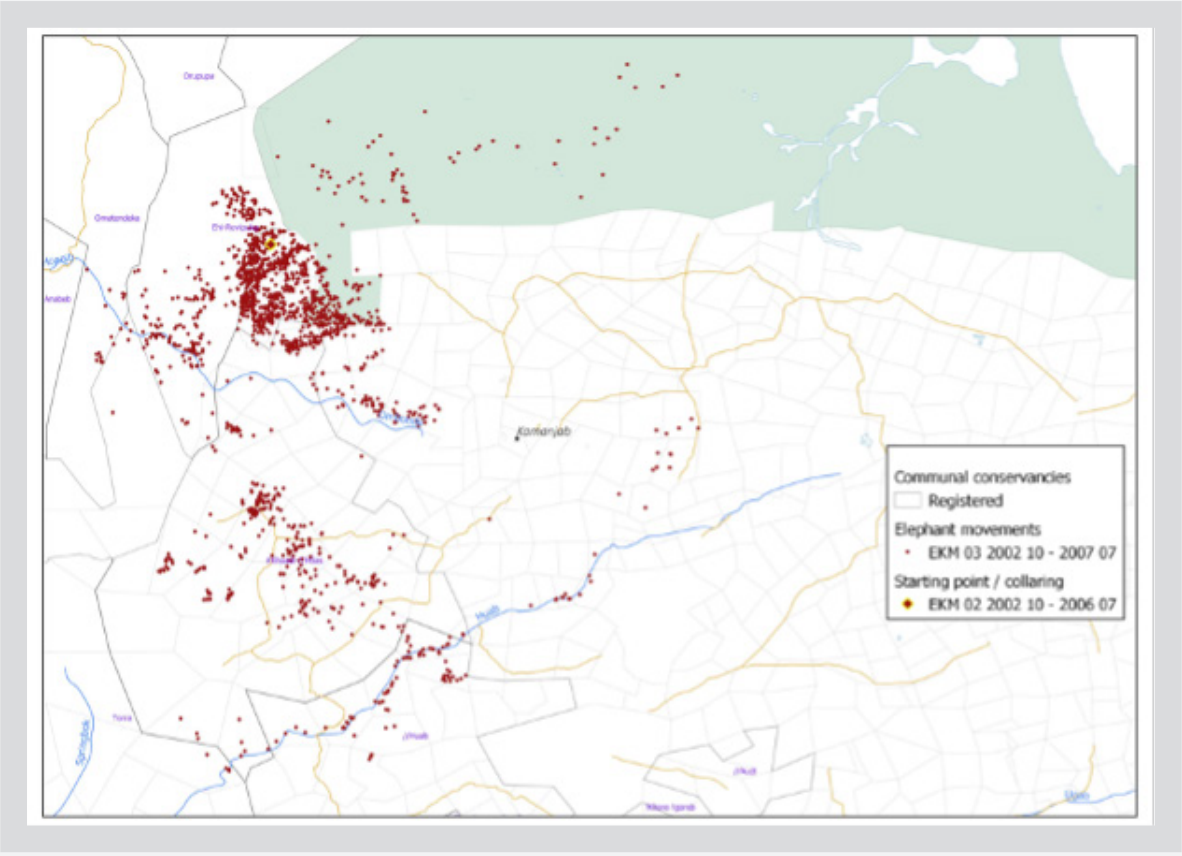



**Figure 27** Movements of elephant EKM 03 collared west of Etosha NP in the Hobatere area and tracked by K. Leggett in 2005-2007

46 Farm or "Pos", meaning a livestock watering point allocated to one or more family for farming purposes, with the same applying to all the other names in the sub-section

This detail is given to make the scale of movements more understandable. All Namibians and visitors who work in conservation in the North West would be very familiar with most of these sites and indeed farm names. Only farms with an actual GPS location were included, thus not adjacent farms through which the elephant must have moved to the next farm where a GPS location was obtained. Even without the connecting farms, elephant male EKM 03 over this period used an astonishing variety of different land management units and natural features, i.e.:

- five different conservancies (Torra, ≠Khoadi-//Hôas, Huab, Ehi-Rovipuka and Omatendeka)
- two major river systems (Huab, Ombonde)
- 30 communal area farms/livestock posts
- 23 commercial livestock farms, of which perhaps half are (currently) also active in tourism and hunting, and a few that are purely used for tourism and hunting
- one tourism concession area (Hobatere)
- one national park (Etosha NP)
- one rare species camp (Kaross)
- one future mining area (Lofdal)

This elephant - over the specified period - was undoubtedly:

- a tourism asset in Hobatere, Etosha NP and the five conservancies
- a potential candidate to be part of an annual hunting quota for any one of five conservancies over five years
- a source of conflict and infrastructure damage on many if not all the 23 commercial farms and 30 communal farms that he traversed
- a candidate for destruction as a problem elephant for damaging fences of Etosha NP and Kaross Game Camp and possibly also the veterinary cordon fence along the northern boundary of Hobatere
- a candidate for destruction as a problem elephant for damaging waterpoint and fence infrastructure on any of the 53 farming locations that he frequented, if he had persistently caused damage and was sufficiently identifiable or endowed with large tusks to make him an attractive target for a hunting operator (it was often the elephant with the largest tusks that ended up being shot as a problem animal)
- relatively safe from illegal killing or being a hunting quarry for those cooperative hunting operators that do not hunt elephants with neckbands or radio-collars

and importantly, subject to entirely different and incompatible management regimes triggered purely by his physical location and degree of interaction with people and infrastructure for an hour, a day, a week, a month etc. If the conservation objective for elephants in North West Namibia at that time had been for example to:

- strictly protect the relatively small male components in the hyper arid (in this case the lower Huab River) or arid (Ombonde and upper Huab Rivers) parts of the Kunene Region; or
- strictly protect the east-west movement corridors along the river drainage systems; or
- increase tourism revenues in conservancies, Hobatere, Etosha NP; or
- conduct sustainable conservation hunting as a means of providing incentives for co-existence with elephants and funding conservancy management; or
- reduce impacts on livelihoods from the destruction by elephants of farming (water and fencing) infrastructure;

all of these could have failed simply because the same elephant could have been subjected to all five and mostly incompatible management objectives.

It is not known if EKM 03 is still alive, no monitoring system was established as an outcome of the research project of K. Leggett. No conservancy member or local Namibian NGO was as far as known involved in the project which was largely done by what is now known as foreign "voluntourists" who can certainly fund fieldwork for some time but not necessarily contribute to a longer-term research and monitoring framework. EKM 03 also demonstrates how much more information can be obtained over a nearly five year period than the more typical collaring period of one to two years.

A new understanding of the structure of the elephant population in the North West is therefore possible from the wealth of information available from all of the elephant movement studies mentioned. There is effectively a contiguous population of elephants in the North West, encompassing Etosha NP and much of the Kunene Region which should for all intents and purposes be seen as the same population and managed coherently for the same objectives. The further west in the distribution range in the Kunene Region (in the declining east to west gradient of annual rainfall), the harsher the conditions for elephant existence and the more vulnerable individuals and groups are to drought, loss of access to water, disturbance by tourists, conflict with people, retaliatory killing and indeed conservation hunting. In normal or good years, elephants can thrive in the western part of the distribution area if these vulnerability factors can be minimized or eliminated. In prolonged droughts, juvenile mortalities will occur and the small groups of elephants in the hyper-arid parts should be carefully protected to prevent additive mortality factors. In prolonged droughts, elephant distribution is likely to shift eastwards into Etosha NP or eastwards onto commercial farmland. The core wildlife areas of the conservancies are currently not sufficiently well aligned or connected or managed to ensure freedom from competition with people and livestock during droughts. In prolonged droughts when there is much suffering by wildlife, people and livestock, mitigation of impacts is crucially important. Drilling more boreholes for water is the wrong response, protection of waterpoints, home gardens, small (irrigated) crop fields and farm infrastructure (waterpoints, windmills, reservoirs, gates and fences) are the right ones but need to be put in place well in advance of any future drought (see Chapter 5 and the operational part of the management plan). Identification of movement corridors is crucial as well as demarcating them and seeking solutions for managing them over the long term to keep their integrity as movement corridors.

### *Palmwag-Uniab River Catchment*

As noted in Section 1.1.1, a striking change has occurred in the last few years regarding elephant presence in the Uniab River and especially the Palmwag tourism concession area which encompasses much of the lower Uniab River. This area has been a stronghold for elephants in the far North West hyper arid area for at least 45 years (M. Lindeque, pers. comm.), but from 2017 they almost entirely vacated this area (Ramey & Brown 2019), attributed to the severe drought. The around 50 elephants that were last recorded there in 2016 have still not been located. Importantly, in a landscape connectivity sense, habitat that sustained elephants for 45 years or more and through the previous major drought in the 1980s had for the past three years been so severely affected by drought with many of the springs for which the Palmwag area was known for having dried up to an extent that the elephants had to move elsewhere. Where they have gone is still unknown but without the ability to locate and access alternative habitat they probably would have perished. An entire sub-population of elephants in the North West which had persisted for decades may have been lost in one year if landscape connectivity had been compromised, showing how serious a matter maintaining landscape connectivity is and the importance of enhancing the protection of movement corridors.

### *Kunene River*

There is still the issue of the northern population described by Viljoen (1987, 1989). The last group along the western Kunene River disappeared in the mid-1980s and elephants never re-occupied this part of the Kunene catchment. Loutit and Douglas-Hamilton (1992) recorded various estimates of elephant counted by others in the north-western part of the Kunene Region bordering on the Kunene River, including 25-40 at Ehomba seen by the late Chris Eyre in February 1992, and 43 seen near Ombarundu by E. Freyer. They also recounted as follows:

*"The only evidence of elephants seen from the air were fresh tracks in the vicinity of a water reservoir where a subsequent visit on the ground showed that seven elephants had drunk. Tracks of a further 8 or 9 elephants were seen in the same period (14th Oct 92) crossing the main road 117 km north of Hobatere. In addition, eight dead elephants were spotted from the air estimated to have died 3 to 7 years previously. Five of these carcases were in the Ehomba mountain area. One was found along the powerline, where according to C Eyre, several elephants were known to have been blown up by mines during the recent war (...) Another group has been reported moving in and out of Angola to the east of Ruacana. These might link up with local residents. The herd once resident in the lower Cunene river, numbering 12 animals moved after the death of a young adult male in November 1990. It has never been relocated and must be considered missing, presumed killed by unknown persons from Angola."*

The most recent aerial survey of 2016 (Craig & Gibson 2016) recorded elephants in two of the northernmost conservancies in Namibia, i.e. Ombombo and Uukolonkadhi Ruacana Conservancies, in the same general area covered by Loutit and Douglas-Hamilton (1992). It is possible that these elephants will eventually move into the Kunene River valley.

**Figure 28** Example of a hyper-arid landscape routinely traversed by elephants in north-western Namibia

**Figure 29** Elephants in north-western Namibia depend on a very limited number of perennial springs but also dig for water in dry riverbeds

**Figure 30** Elephants in north-western Namibia forage mostly in dry riverbeds but also use very sparse vegetation such as the dwarf *Commiphora* species depicted here on nearly vegetation-less hills and mountains, far removed from water sources

## 1.3.2 Etosha NP and North Central Namibia

With Etosha NP being surrounded by relatively densely populated communal land in the North and commercial farms in the South and East, and with the current commitment of the MEFT to improve the northern and western fence of the park, it may appear as if there is no option other than to consider the Etosha elephant population as isolated. Recent GPS tracking of elephants in Etosha NP by W. Kilian tends to confirm this as very few of the elephants moved outside the park over the period 2009-2015 (Figure 31).

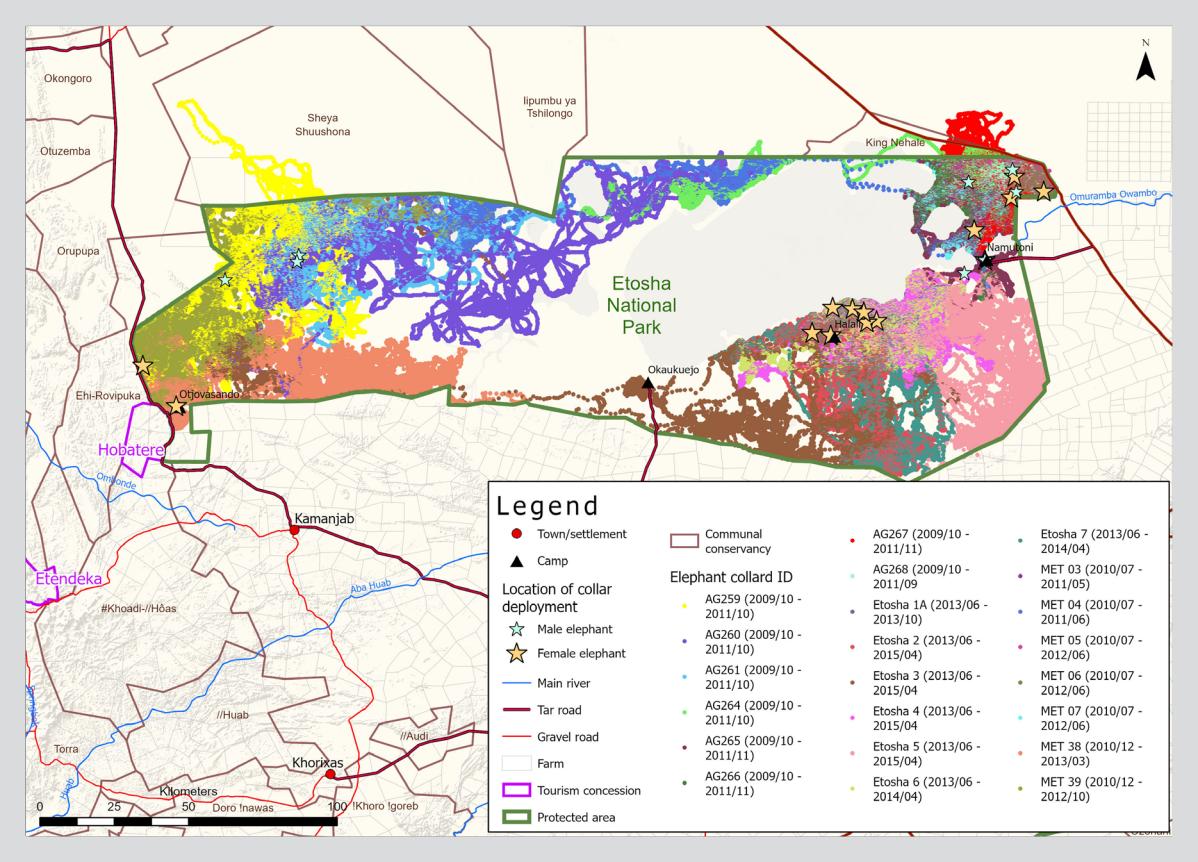



**Figure 31** Movements of elephants collarred in Etosha NP from 2009 to 2015 (data kindly provided by W. Kilian)

This is nevertheless not the only way of considering the Etosha elephant population; time scale is very significant when considering connectivity in a long-lived species like elephants and on a large landscape scale with increasing threats of climate change:

- From the discussion of the North West elephant population in Section 1.1.2, it is clear that Etosha NP in the major drought of 1980-1983 saw an influx of elephants from the Kaokoveld and acted as a local drought refuge for elephants (Lindeque 1988). Leggett (2006) also showed that four elephants collared in Hobatere Tourism Concession next to the south-western boundary of Etosha NP had home ranges that extended far west into the Huab River catchment but also included small parts of western Etosha NP.
- Elephants recolonized Etosha NP from the surrounding areas. In the 1970s and 1980s, major human-elephant conflicts had to be attended to the south of the park, but it was also known that some elephants in eastern Etosha NP mainly left the park in the wet season to seek out marula (*Sclerocarya birrea*) trees in fruit, south and south-east of the park in the Grootfontein district up to 40km away from the park, and did not damage farm infrastructure. Famously[47], elephants in conflict areas (cattle farms) south of the park in the central region were herded back into the park on horseback, but it is less well known that at least 120, possibly more than 200 (120 were recorded in just one remaining file in Okaukuejo) were destroyed outside the park (M. Lindeque, pers. comm.). Most of these were

47 A film was made of the process

adult or young adult males (De Villiers & Kok 1984, Lindeque 1988). De Villiers & Kok (1984) described the historical distribution of elephant in Namibia through a comprehensive review of the literature of the early explorer, hunters and missionaries, and concluded that the principal reason why elephants continued to leave the park in the wet season was to return to their former wet season distribution range outside the park. This also led to the construction of an elephant-proof cable fence on large sections of the southern and south-eastern borders of the park where frequent conflicts occurred with cattle farmers. Strangely, the incidence of conflicts south of the park abruptly dropped off after 1977 (De Villiers & Kok 1984), even in areas where there was no cable fence. The explanation at the time was that the elephants that had wanted to go south into the Outjo district or who had home ranges straddling the border were all eliminated by then (M. Lindeque, pers. comm.). De Villiers & Kok (1984) also argued that the artificial provision of water in Etosha NP had removed some of the reasons for leaving the park. This argument does not fit in with the general perception that elephants primarily left the park during the rainy season, in other words, had wet-season dispersal areas or home ranges that were located outside or partly outside the park.

- Throughout the 1980s, 1990s and 2000s up to around 2018 there had always been multiple elephant breaks in the western boundary fence of Etosha NP; in one year in the 1990s more than 1,000 breaks were recorded (A. Cilliers, pers. comm. to M. Lindeque). These fence crossings do not necessarily imply that there had been only large scale or long-distance movements in and out of Etosha NP, but a significant degree of elephant movements across this boundary did occur. This fence was upgraded in 2018 and 2019 and work is still ongoing. Despite the relatively large number of GPS collars recently deployed on elephants in Etosha NP, such transboundary movements were not recorded (W. Kilian pers. comm. to M. Lindeque), almost certainly because all collars were deployed in the park rather than around the park, thus reducing the probabilities greatly of actually recording exits from or entries into the park. Much the same applies to the northern boundary of Etosha NP where elephants routinely moved in and out of the park until the fence was upgraded and partially electrified in 2018-2019, with further work still ongoing. Small numbers of elephants also regularly broke out of the north-eastern part of Etosha NP into the farm Onguma and the Oshivelo area over roughly the same period. In the 1990s, elephant tracks from just east of Onguma and following the course of the Omuramba Owambo (which ends in Fischer's Pan in Etosha NP) were followed into the Mangetti area in far eastern Oshikoto Region and western Kavango West Region (M. Lindeque, pers. comm.). Further, the inner hard nuts of the fruits of the manketti tree ***Schinziophyton*** (formerly ***Ricinodendron***) ***rautanenii*** were found in the late 1980s in elephant dung at Klein Namutoni. Manketti does not occur in Etosha NP and although sparsely present in far northern Omusati, Oshana and Ohangwena Regions, more typically occurs in the Mangetti area of Oshikoto and Kavango West Regions and from there on eastwards (M. Lindeque, pers. comm., Curtis & Mannheimer 2005).
- Lindeque & Lindeque (1991) showed significant movements from Etosha NP northwards through western Omusati Region and far eastern Kunene Region, through what is today Sheya Shuushona, Uukwaluudhi and Uukolonkadhi Conservancies[48], see Figure 21. The late Chris Eyre, at the time the Chief Nature Conservation Officer in the northern Kunene Region also recorded elephants at Ombombo Owambo, a large spring or seasonal waterhole in what is now Uukwaluudhi Conservancy and had to deal with multiple seasonal human-elephant conflicts at Ehomba[49] about 70 km north-east of Ombombo Owambo. At the time there were no elephants permanently resident in the north-eastern corner of Kunene Region - north-western corner of Omusati Region, and the seasonal presence of elephants there could only be explained by elephants moving northwards out of Etosha NP in the wet season.

48 This is the same area where the first Director of Nature Conservation B.J. de la Bat counted 300 elephants (in the 1950s) and close to Ombombo Owambo where many elephants were also recorded at that time (De Villiers & Kok 1984).

49 Confirmed by J. Paterson who was stationed in Skeleton Coast Park at the time and who assisted Chris Eyre with these problem cases, pers. comm. to M. Lindeque

– Leggett (2006a,b) found that an adult male collared in north-western Omusati Region moved between this area and north-western Etosha NP, thus confirming that this degree of landscape connectivity persisted at least until the 2000s, see Figure 22. Keith Leggett collared several male elephants in north-western Omusati Region. Despite early collar failures which plagued the earlier satellite tracking studies, he recorded the same movement between north-western Etosha NP and north-western Omusati Region that Lindeque & Lindeque (1990) found, but from elephants collared in the opposite end of this movement range, see Figure 32 compared to Figure 21.

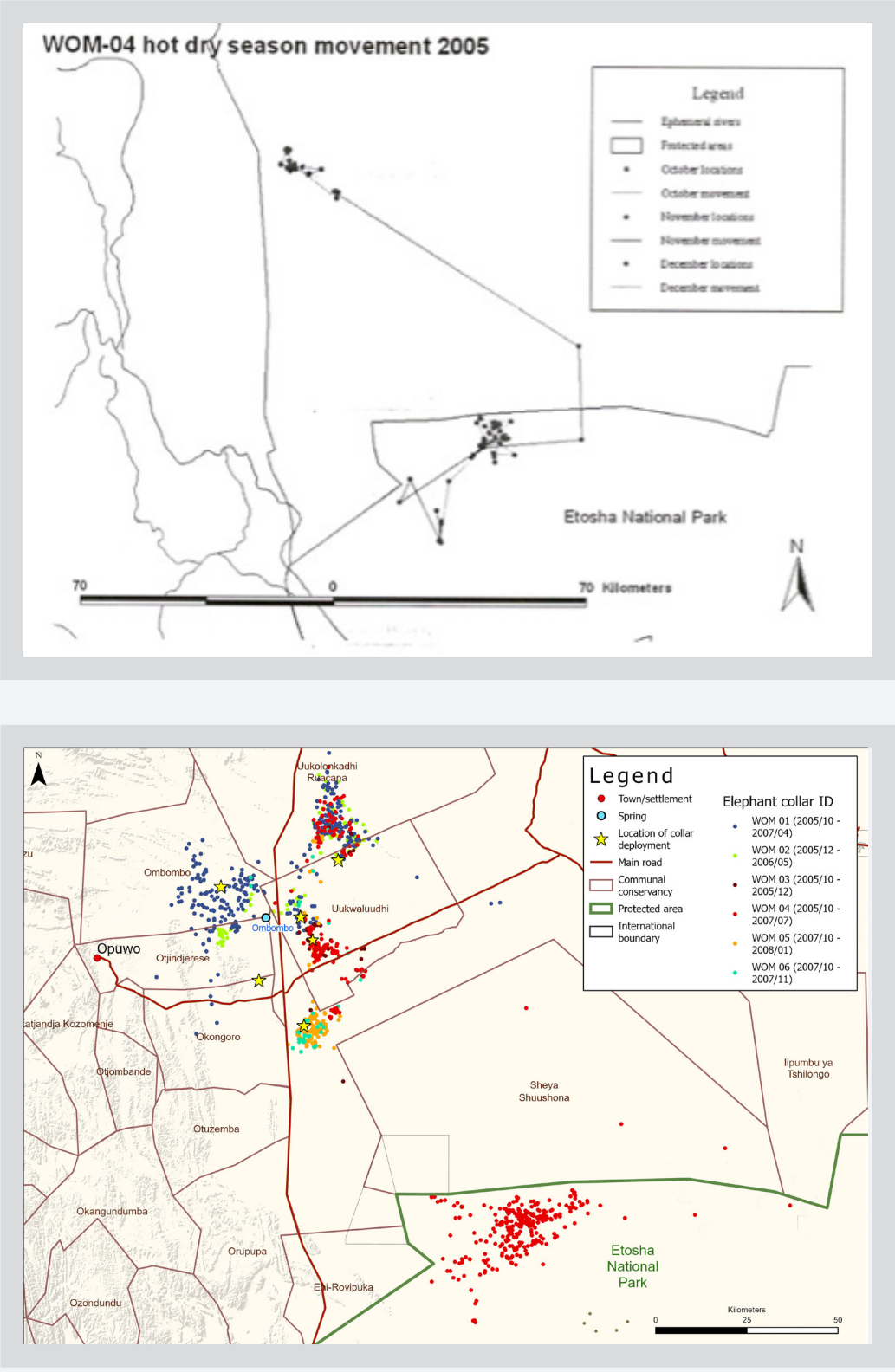



**Figure 32** Elephant movements between western Etosha NP and north-west Omusati Region. The top map is from Leggett (2006) and the bottom map shows all the tracking data for the elephants that Keith Leggett collared in north-west Omusati Region and north-east Kunene Region

– Data from elephants collared west of Etosha NP by MEFT (W. Kilian) from 2009 to 2015 (Figure 33) did not show movement between north-western Etosha NP and the Omusati Region but shows extensive range use in north-western Etosha NP by one of the elephants collared near Omumborongbonga in the upper Uniab River drainage area east of the Etendeka tourism concession area[50]. Further, a male elephant collared in western Etosha NP in 2010 did move out of the park towards north-western Omusati Region (see Figure 31).

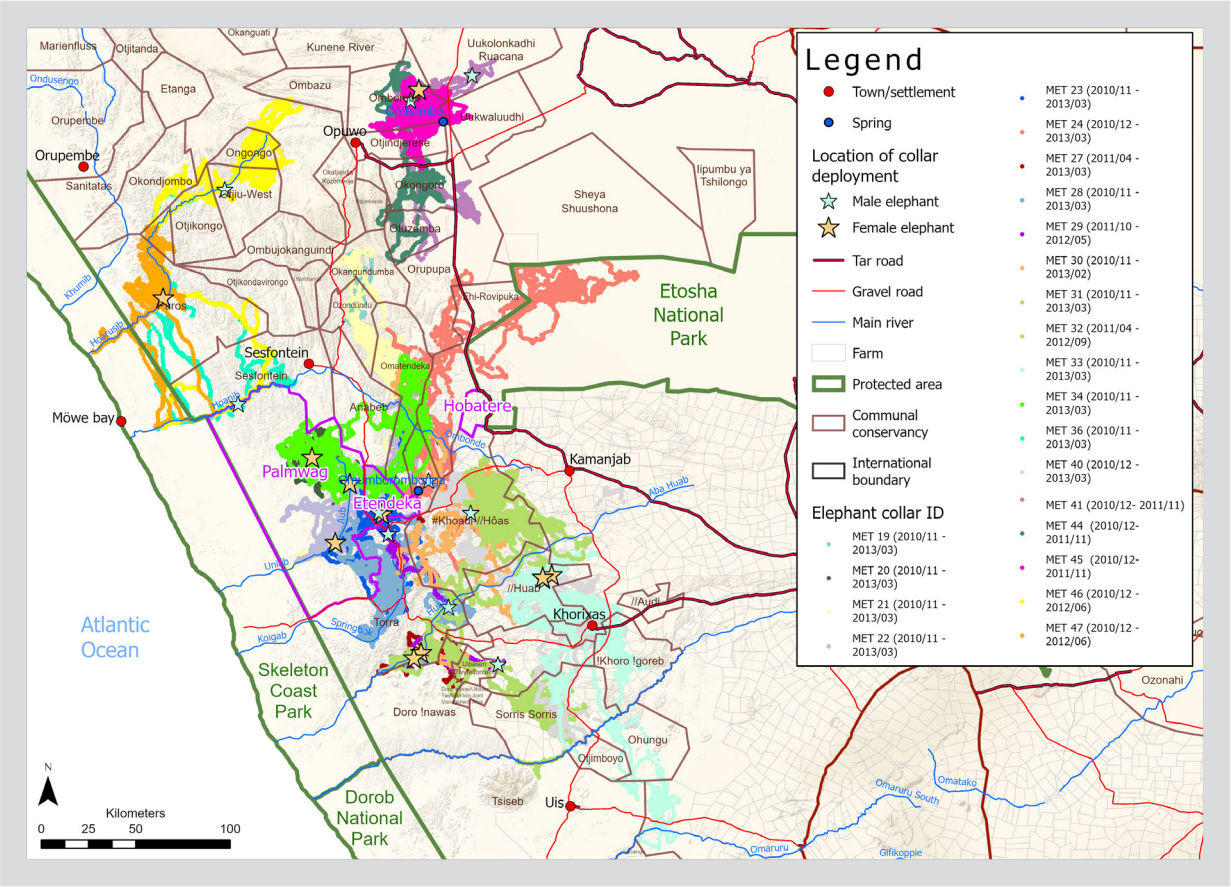



**Figure 33** Movements of elephants collared west of Etosha NP from 2009 to 2015 (data kindly provided by W. Kilian)

– Purdon ***et al***. (2018) in a study of elephant movements and migrations in several areas in southern Africa including Etosha NP also showed movement between north-western Etosha NP and north-western Omusati Region (see Figure 34) and within Etosha NP from 2002 to 2008 and concluded that these movements can be classified as migrations. They conclude that "***elephants are a facultative partially migratory species, where only some individuals in a population migrate opportunistically, and not every year. Elephants migrated between distinct seasonal ranges corresponding to southern Africa's dry and wet seasons. The timing of wet season migrations was associated with the onset of rainfall and the subsequent greening up of forage. Conversely, the duration, distance, and the timing of dry season migrations varied idiosyncratically. The drivers of elephant migration are likely a complex interaction between individual traits, density, and the distribution and availability of resources***". This interpretation is consistent with earlier observations but presents a considerable management challenge to MEFT. Migration is an important and, in some instances, an essential ecological process and the Protected Areas and Wildlife Management Bill includes as a principle of conservation "the maintenance and restoration of essential ecological processes, integrity and life support systems". From the elephants collared in Etosha NP in 2002, Purdon ***et al***. (2018)

50 This opens up the possibility that the Uniab River group of 'desert elephants' who disappeared in the recent drought, could now be in the area designated to become the future Ombonde People's Park

determined that 30% of the elephants are facultatively and partially migratory. This means that around 30% of the population migrate opportunistically, and not every year. How essential this partial migration is to the persistence of the elephant population in Etosha is not known, but it certainly would be highly significant to maintaining elephants in the Omusati Region. Plans to improve the northern boundary fence of Etosha NP may need to be adjusted, to allow for movement in and out of the park, especially in the north-western part of the park where three studies over three decades as well as several older anecdotal observations and unpublished reports shows that elephants from north-western Etosha NP regularly migrate to the Omusati Region.

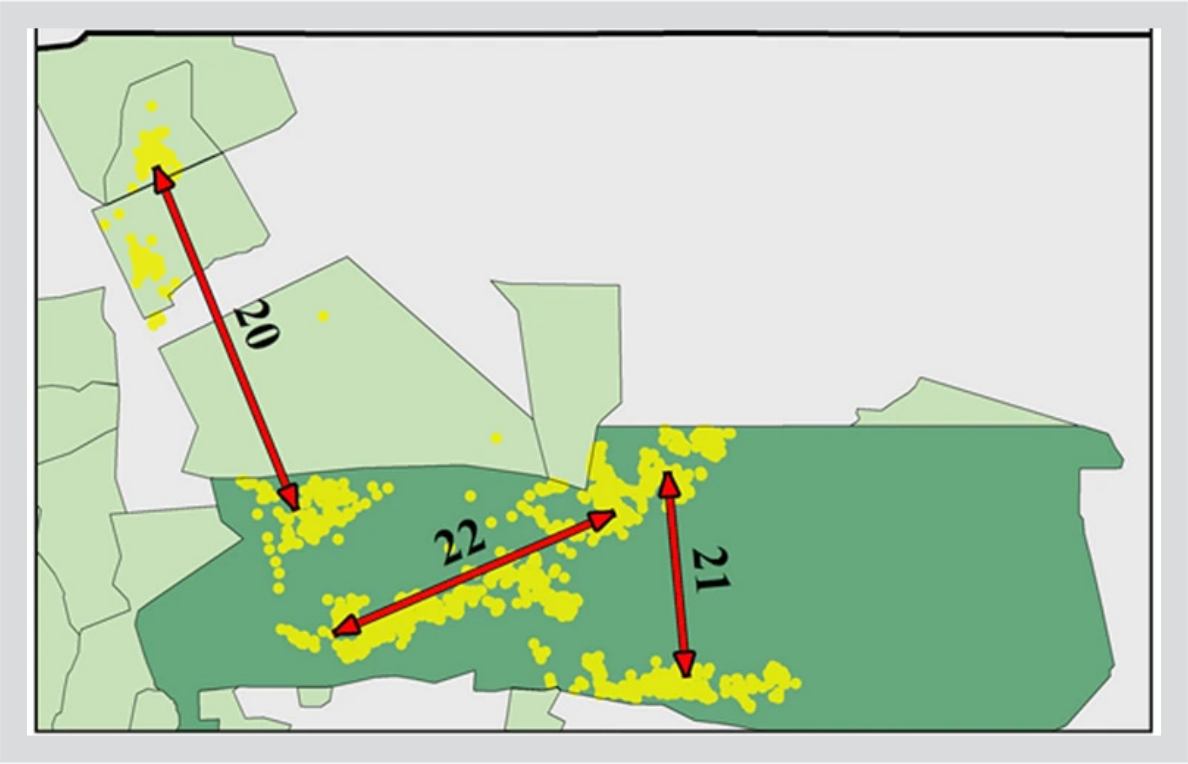



**Figure 34** Elephant movements and migrations in Etosha NP and north-western Omusati Region in 2002 to 2008 (reproduced from Purdon ***et al***. 2018) Arrows indicate the direction of movements considered to be migrations; numbers are numbered individual migrations from Purdon ***et al***. (2018).

- More recently, significant changes in land use have occurred around Etosha NP. Not only is the almost the entire western boundary of the park bordered by Ehi-Rovipuka Conservancy but a substantial part of the northern boundary is bordered by Sheya Shuushona, Iipumbu ya Tshilongo and King Nehale Conservancies. East and south of the park, land use has changed significantly from primarily cattle production in the 1990s to primarily wildlife and tourism at present along major sections of the park boundary, see Figure 36. Units enclosed with a black border in Figure 36 are private nature reserves or are managed as such, with all internal fences removed. The southern boundary fence of the park and particularly the veterinary cordon fence are not actively maintained and elephants in certain areas frequently cross the boundary but this time not leading to demands for their removal. A significant number of elephants (70 in 2019) have in this way become semi-resident in Etosha Heights Private Nature Reserve and it is likely that this trend will continue in other land units of similar nature. This development opens up the potential of a win-win cooperative arrangement with neighbouring landholders. Importantly, not all of the shaded units south and east of the park that are still used for livestock production may be willing in the short to medium term to move further to the wildlife land use end of the spectrum but Figure 36 shows the potential. The shaded units south and east of the park amount to 3,126 km$^2$ and the length of the common boundary between these units and the

park is 305 km. This is around 35% of the total length of the Etosha NP boundary and should be and potentially could be 305 km of park border that MEFT would not have to prioritize for security and maintenance in future.

- This general area of shaded units south of the park already hold the second or third largest black and white rhinoceros numbers for any area of Namibia and the establishment of metapopulation and integrated management have been mooted as part of the 'rhino belt' concept.


**Figure 35** Tourism and wildlife conservation-based land units adjacent to Etosha NP (data kindly provided by P. du Preez, A. Nel, S. Crawford and W. Versfeld)

- Further afield, almost the whole of the former Kaokoveld, i.e. the northern Kunene Region, is now encompassed by Communal Conservancies, see Figure 36.


**Figure 36** Communal Conservancies in north-western Namibia

### 1.3.3 North-eastern Namibia

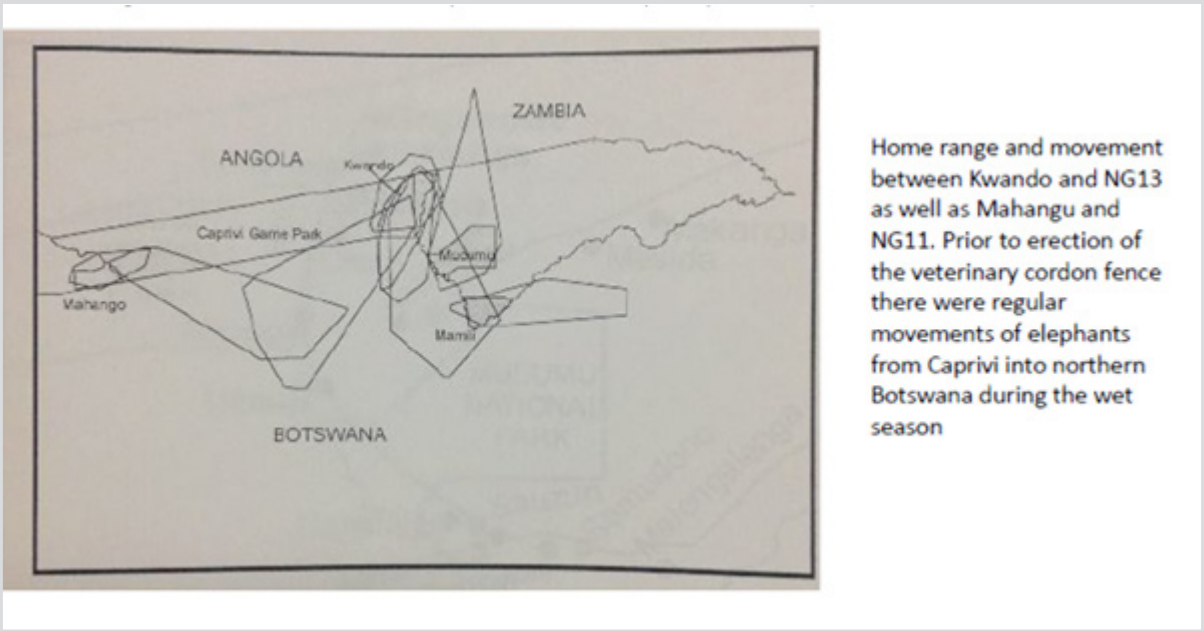
It has been known as far back as the 1930s (Shortridge 1934) that elephants concentrated around perennial water sources (rivers in the far north-east but also large permanent springs in the Grootfontein district (e.g. Rietfontein) and large water bodies – perhaps seasonal springs - in the Omuramba Omatako) but dispersed in the wet season away from these areas. This is similar to the movements that still occur today (but detailed analysis of the large quantity of GPS datapoints from collared elephants may also show other influences on their movements such as fire and disturbance, both of which elephants avoid, along with human settlements).

Rodwell (1995) did the second study of elephant movements using satellite telemetry in Africa at that time (see Figure 37). His study is the only record of elephant movements in the North East before the Botswana border fences were erected. The following was evident from this study, much of which is not only of historical value but still pertinent today:

- The largest fractions of the home ranges of two family groups collared in the Buffalo and Kwando-Mahango core areas of Bwabwata NP were located in northern Ngamiland, Botswana (blocks known as NG13 and NG 11);
- Movements from the Mudumu NP area extended to Sioma Ngwezi NP in Zambia;

- Elephants collared in Nkasa Rupara NP (then Mamili NP) moved east across the Linyanti River into Botswana;
- The collared elephants did not move into Angola at all except two herds that moved only a few kilometres across the border in the Kwando River area, but three herds moved in and out of Namibia along the Kwando River in a southerly direction, with half or more of their home ranges falling in Botswana;
- Elephants did not venture into the central part of the Bwabwata NP, what is now the Managed Resource Use Area and the Wildlife Management Area;
- One collared elephant was illegally killed 15 km west of the Kwando River very close to the Angolan border;
- One collared female elephant, the elephant with the largest home range of all, was killed by the Botswana government in a human-wildlife conflict situation about 140 km south-west of the Kwando River where she was collared at Horsehoe in Bwabwata NP.
- The elephant with the smallest home range of all was the only male collared, in Mahango Game Park (now Mahango Core Area of Bwabwata NP). This is unusual, and it may have been an old male, because males generally have been recorded to have larger home ranges than females.

In the Mahango Core Area **Photo:** Tertu Iileka



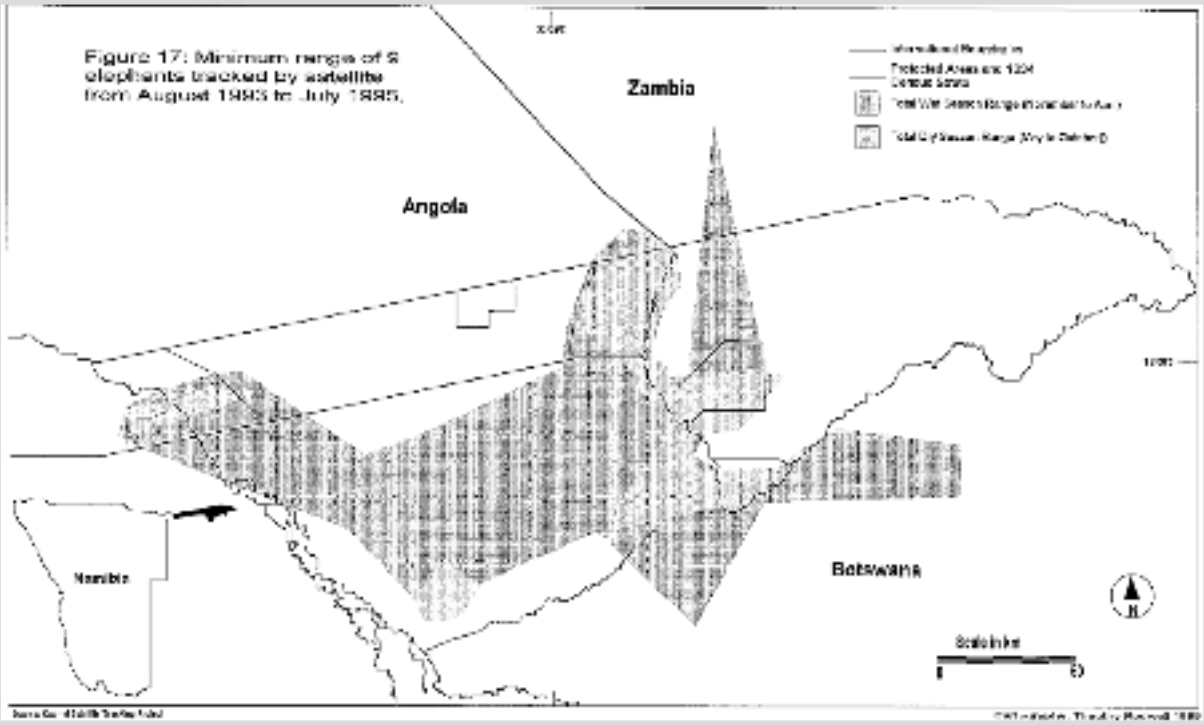




**Figure 37** Images of home ranges of nine elephants marked in the Caprivi Game Park, Mahango Game Park, Mudumu NP and Mamili NP in 1993-1995 (top image from Rodwell from a poster provided by R. Taylor, bottom image from Rodwell 1995)

In 1996 the Botswana Government erected a double low 1.2m electrified veterinary control fence for buffalo with a single strand of steel cable roughly halfway up in the fence, with the two fences 10m apart along the entire Bwabwata NP border (A. Songhurst and R. Taylor pers. comm. to M. Lindeque) (Figure 39). It no longer seems to be electrified or always actively maintained. This fence would allow elephants to cross but in practice it has stopped all movements by family units and most but not all elephant bull movements. A similar type of fence arrangement was put up by Botswana running north-south between Khaudum NP and Ngamiland (Figure 40) but is not always actively maintained. It also has effectively blocked all family units and most but not all elephant bull movements. It is extraordinary that these fences have remained effective despite the lack of maintenance.

**Figure 38** Highly effective fence erected by Botswana on the boundary with Bwabwata NP, consisting of five wire strands reinforced by mesh (in some sections only) and electrified (possibly only in some sections but not maintained). Note that the steel cable is in place of the 4th or 5th wire strand from the bottom, and as shown in the photo largely maintains the integrity of the fence even if larger animals cross it.

**Figure 39** Fences between Khaudum NP (on the left) and western Ngamiland (on the right). The left-most fence is Namibian, the middle and righthand fences are part of the veterinary cordon of Botswana. Note the low height of all the fences and the cable strand in the fence in the middle.

Following consultation between the two governments in 1997, Botswana agreed to remove 30 km of the veterinary fence from the Kwando River westwards up to where the so-called Buffalo fence in Botswana intersected the national border. This 30 km of international border has remained unfenced.

Recent research on elephant movements using GPS collars has shown a remarkably different picture to that recorded by Rodwell (1995), as elephant movements subsequently became severely constrained, see Figure 40. Virtually a mirror image of elephant movements occurred south and east of these fences in Botswana (Figure 41). Sporadic breaks allowed some movements across the fence, mostly by males, but it is periodically maintained by Botswana. This has resulted in severe long-term compartmentalization of the regional elephant population and potentially also artificially high densities in parts of Bwabwata NP, the Khaudum NP and Nyae Nyae Conservancy.

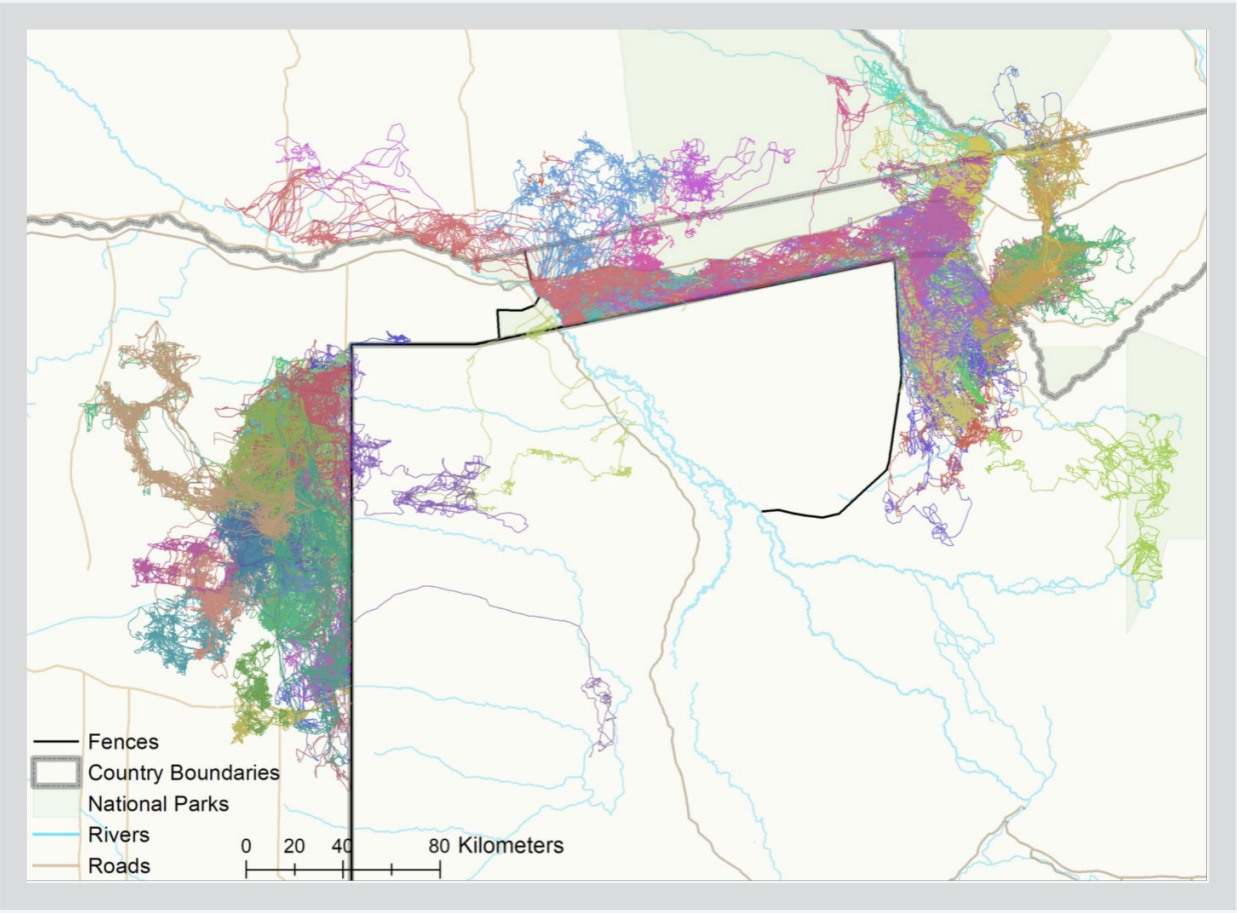



**Figure 40** Movement of GPS-collared elephants (adult females) in north-eastern Namibia (Naidoo ***et al***. 2018, the map was kindly provided by Robin Naidoo). Note the elephant movement from Namibia to northern Botswana along the Kwando River through the 30 km stretch of veterinary cordon fence taken down in 2001, as well as movements into Angola and Zambia through the eastern and western parts of Bwabwata NP and from eastern Ngamiland through Mudumu NP and Sobbe Conservancy to Sioma Ngwezi NP in Zambia

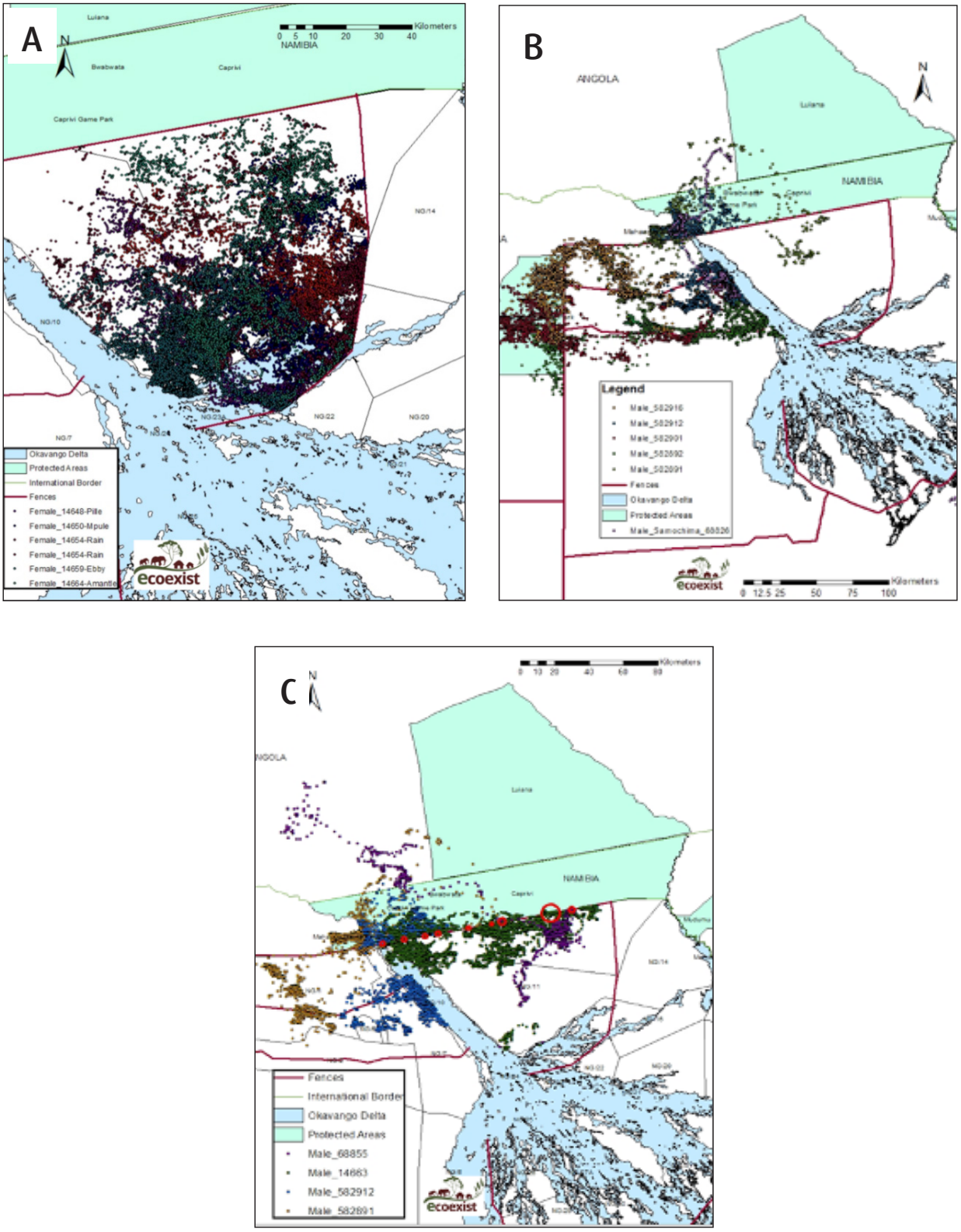



**Figure 41 A-C** Movement of GPS-collared elephants in Botswana south and south west of Bwabwata NP. (Reproduced from Songhurst *et al*. 2018, with original maps kindly provided by Anna Songhurst). A shows the movements of breeding herds collared in Ngamiland and B shows the movements of adults males collared in western Ngamiland, i.e. movements into Khaudum NP as well as western Bwabwata NP and into Angola. C shows movements by elephants collared in Ngamiland into and through Bwabwata NP into Angola, possibly during a period when the fence between Botswana and Bwabwata NP was not well-maintained.

A separate study by Purdon ***et al***. (2018) of elephant movements in the KAZA TFCA from 2001 to 2014 shows a very similar picture and further identified several movement patterns that can be considered as migrations. The absence of movements between Bwabwata NP and Ngamiland in Botswana was confirmed in this study (see Figure 42).

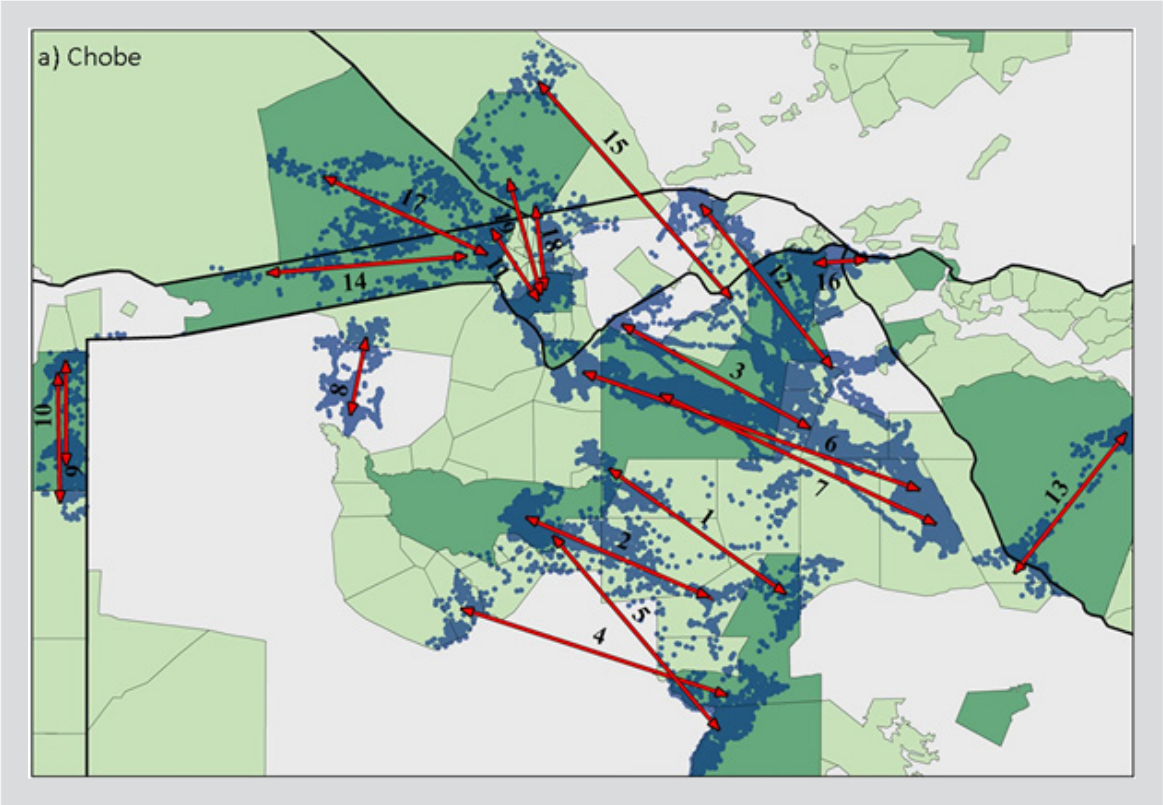
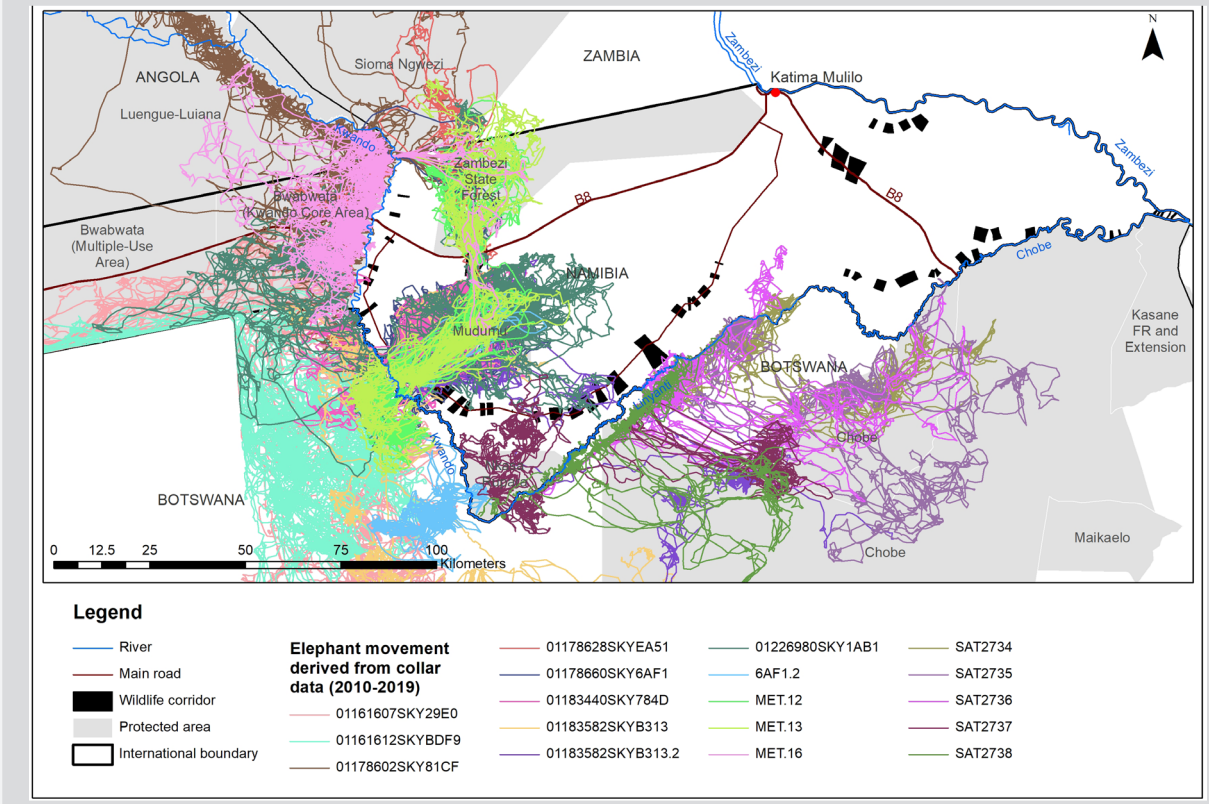



**Figure 42** Elephant movements in north-eastern Namibia and adjacent areas that were classified as migrations (reproduced from Purdon ***et al***. (2018)). Arrows indicate the direction of movements considered to be migrations; numbers are numbered individual migrations from Purdon ***et al***. (2018).

These records of elephant movements show the presence of at least three large zones of movement (which could also be termed corridors) from and across Bwabwata NP into neighbouring countries. In the west, this zone largely coincides with the Mahango and Buffalo Core Areas northwards to and across the Angolan border. In the east of the park, the zone coincides with the Kwando Core Area. These zones or corridors are connected by the area south of the B8 road in the Managed Resource Use Area of Bwabwata NP which itself becomes a zone or corridor. Another major zone of movement occurs east of the park in the area of the State Forest, Sobbe Conservancy and Mudumu NP. As also evident from the movements of breeding herds in Khaudum NP, the Botswana border fences effectively blocked movements, although adult males were able to cross both the Khaudum NP-Botswana and the Bwabwata NP-Botswana border fences, on some occasions at least.

MEFT in 2019 embarked on the identification and mapping of important wildlife movement corridors in the Zambezi Region and updating wildlife corridors previously designated by principally local communities as part of the Integrated Regional Land Use Plan (IRLUP) for Zambezi Region, shown in black polygons in Figure 44, noting that these previous designations covered all wildlife and not elephants specifically, and in relation to the ribbon pattern of settlement and cultivation along the principal roads. The availability of extensive elephant movement data has made it possible to refine the delineation of important elephant movement corridors. This work is still in progress (and will be extended to other regions). It will form the basis for defining management arrangements that will prevent further settlement by people in important wildlife corridors. Some aspects in this regard are addressed in this plan.



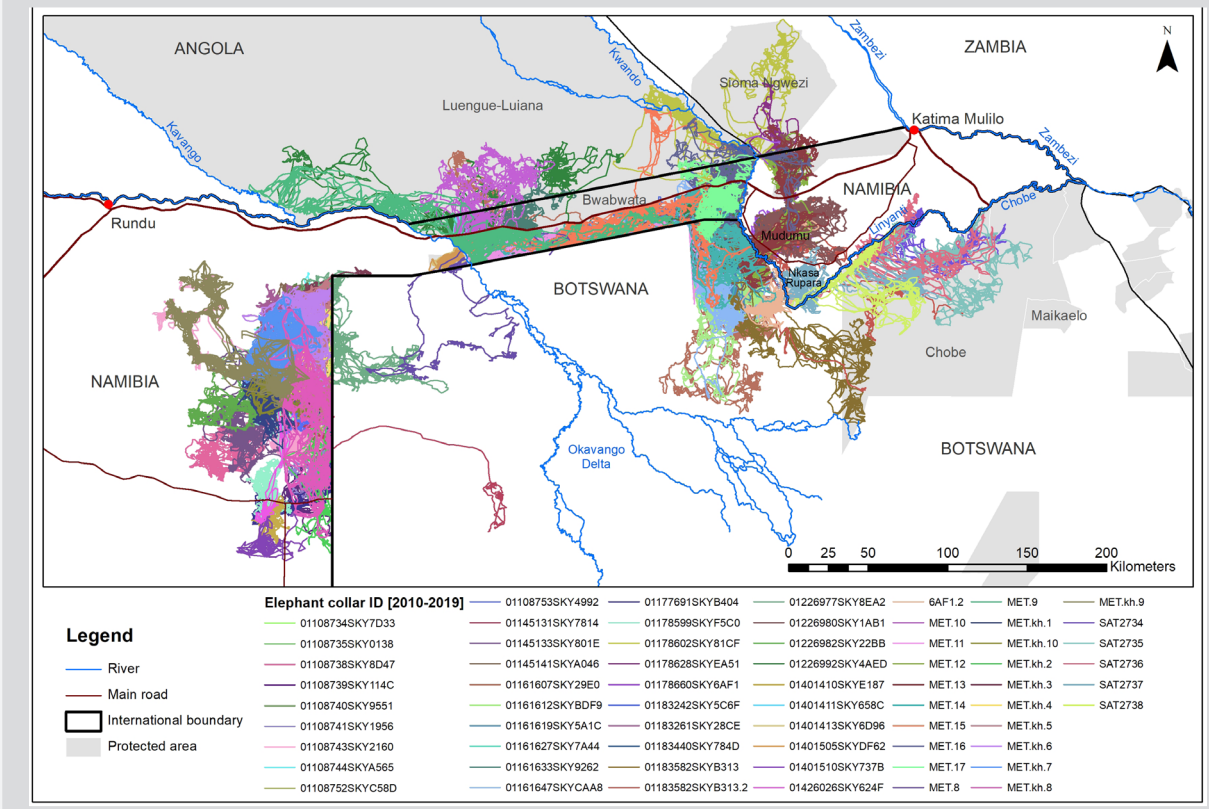




**Figure 43** Elephant movements in relation to areas previously designated as wildlife corridors in the Integrated Regional Land Use Plan (IRLUP) for Zambezi Region. The bottom map shows all recorded elephant movements (source: K. Dierkes)

Figure 45, Figure 46 and Figure 47 show elephant movement data overlain by sightings of human activities (settlements, crop fields, livestock) recorded in the 2019 aerial surveys (Craig & Gibson 2019a, 2019b) of the North East. In essence, elephants avoid people i.e. there is minimal overlap between elephant movements and human presence.

Of particular interest is the fact that the border fence gap west of the Kwando River between Bwabwata NP and Botswana seems to be primarily used for movement by elephants between the Buffalo Core Area in Bwabwata NP, along the central Wildlife Management Zone and block NG14 in Botswana (Figure 48). These elephants do not cross the border fences and in Botswana are constrained by the Buffalo fence that runs from the border with Bwabwata NP 30km west of the Kwando River due south and curving south-westwards (see Figure 48).

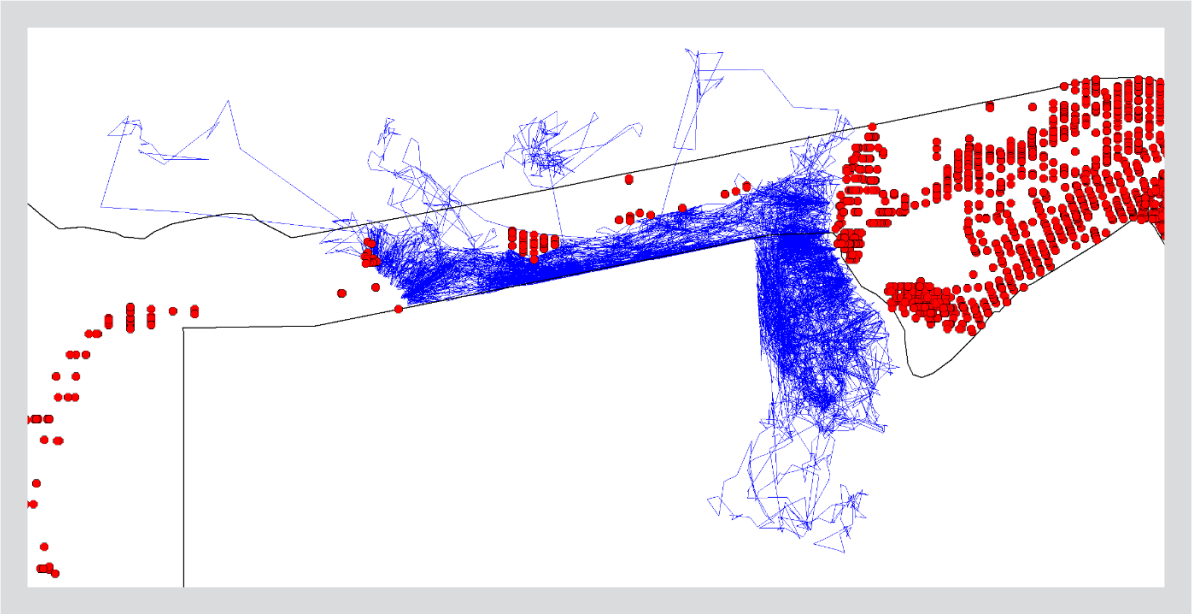


**Figure 45** All recorded elephant movement tracks linking the area in Botswana (NG14) west of the Kwando River with the Buffalo Core Area of Bwabwata NP and, for some animals, Angola. Circles are sightings of human activities from the 2019 aerial survey.

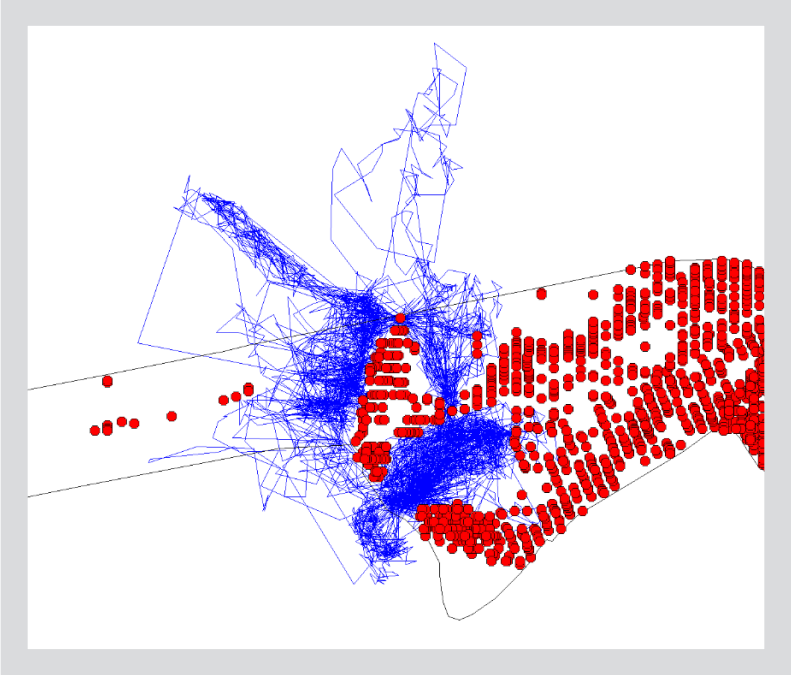


**Figure 46** All recorded elephant movement tracks linking the Zambezi State Forest with the Kwando Core Area of Bwabwata NP and Mudumu NP. Circles are sightings of human activities from the 2019 aerial survey.

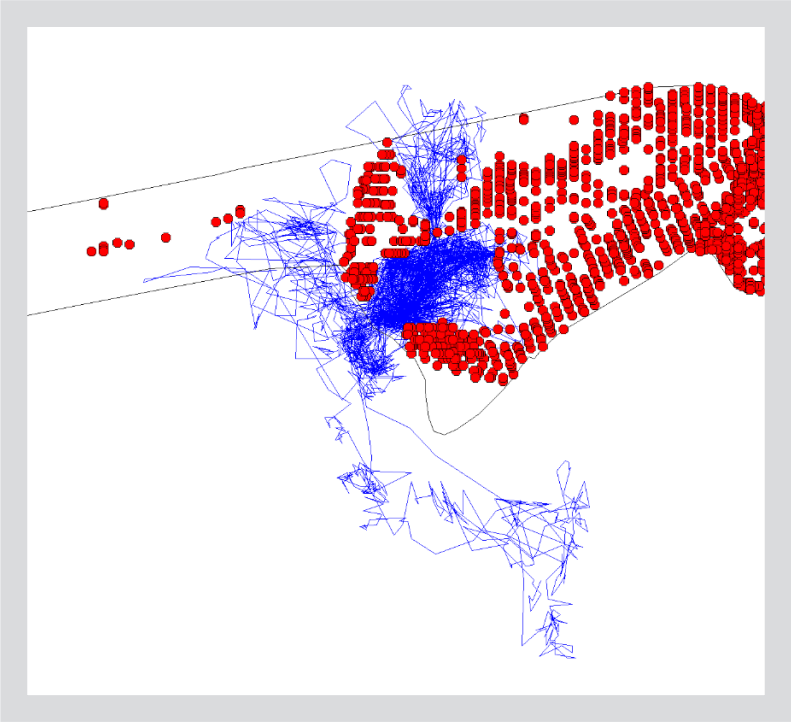


**Figure 47** All recorded elephant movement tracks crossing the Kwando River from Mudumu NP. Circles are sightings of human activities from the 2019 aerial survey.

Detailed elephant movement records provide highly valuable insights into the functioning of such elephant movement corridors. Figure 48 shows what has become known as the Sobbe corridor in finer detail and Figure 49 shows the corridor in a satellite image.

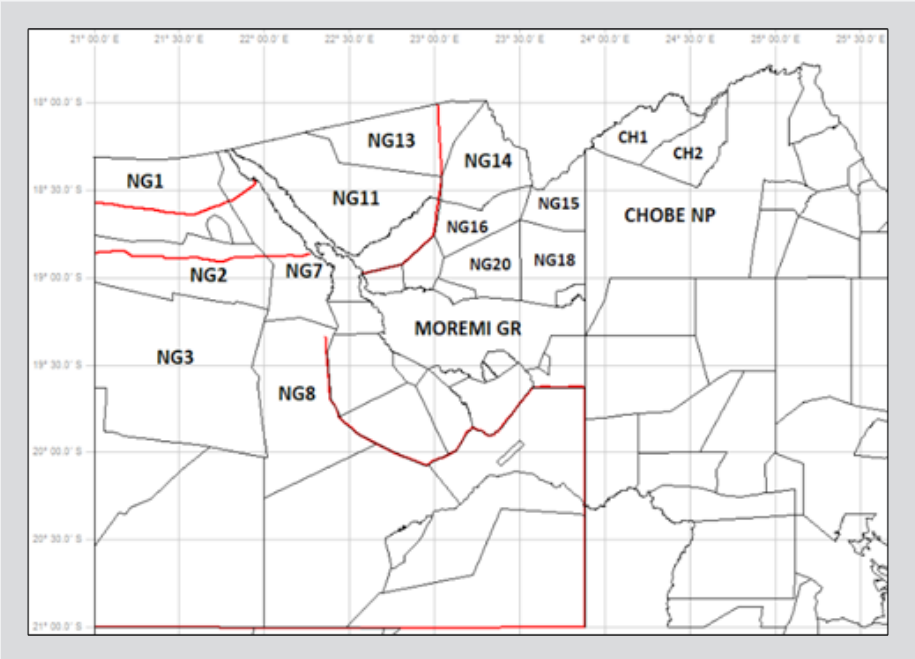



**Figure 48** Botswana land use categories. Veterinary fences are shown in red. NG is Ngamiland, CH is Chobe, referring to controlled hunting areas which comprise both hunting and non-hunting (e.g. photographic tourism areas) utilization.

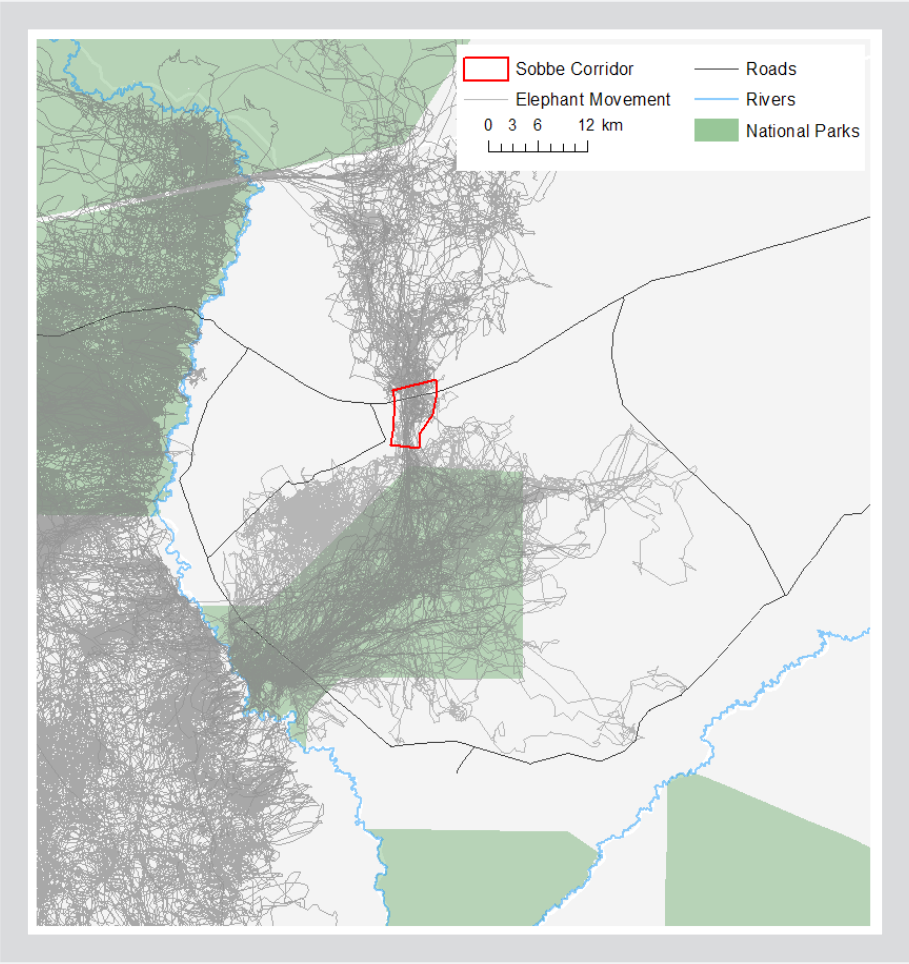



**Figure 49** Movements of elephants equipped with GPS tracking devices from west of the Kwando River in Botswana, through Mudumu NP and through the Sobbe Conservancy and the State Forest to southern Zambia. The importance of the Sobbe corridor is self-evident. The Kwando and Linyanti Rivers are indicated in blue, and Mudumu and Nkasa Rupara NP in green

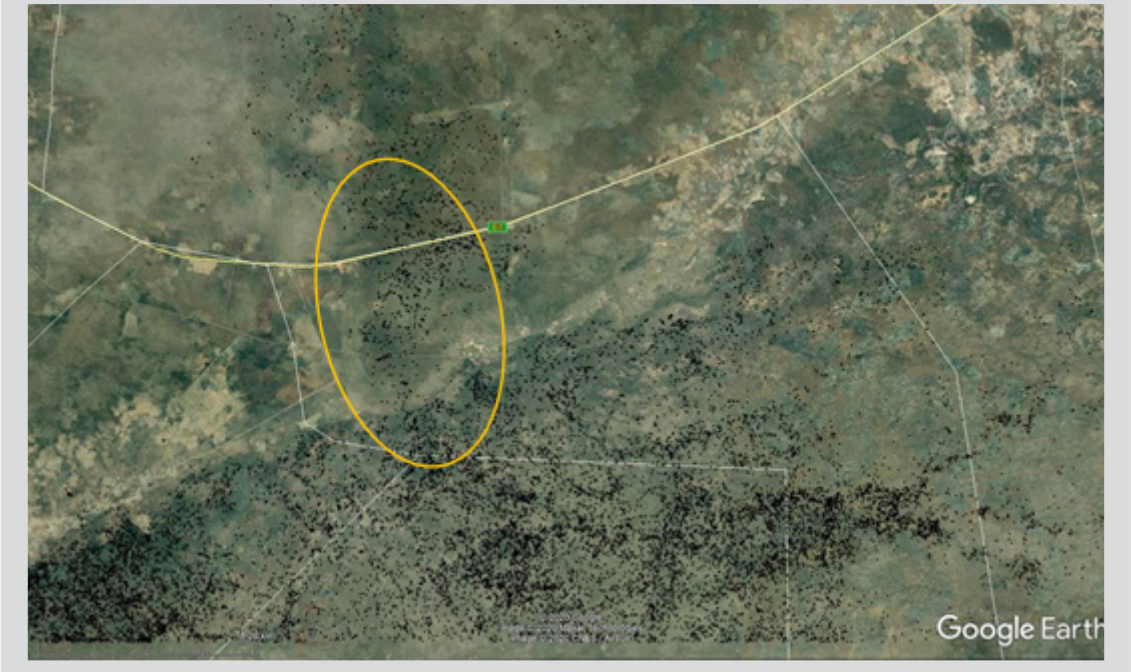



**Figure 50** Satellite photo of the Sobbe corridor (yellow oval) (also see Figure 48) overlain by elephant sightings (black dots) from collared elephants. Note the relative absence of crop fields in the corridor area but dense settlements and cultivation on either side.

### 1.3.4 Key elephant movement corridors

Figure 51 and Figure 52 summarize by means of arrows on the wet/dry season distribution map where the important or notable channels of movement are. Of particular interest are where movements appear to depend on narrow choke points, and especially so outside protected areas where the risks of changes in land use or obstruction of movements is the highest.

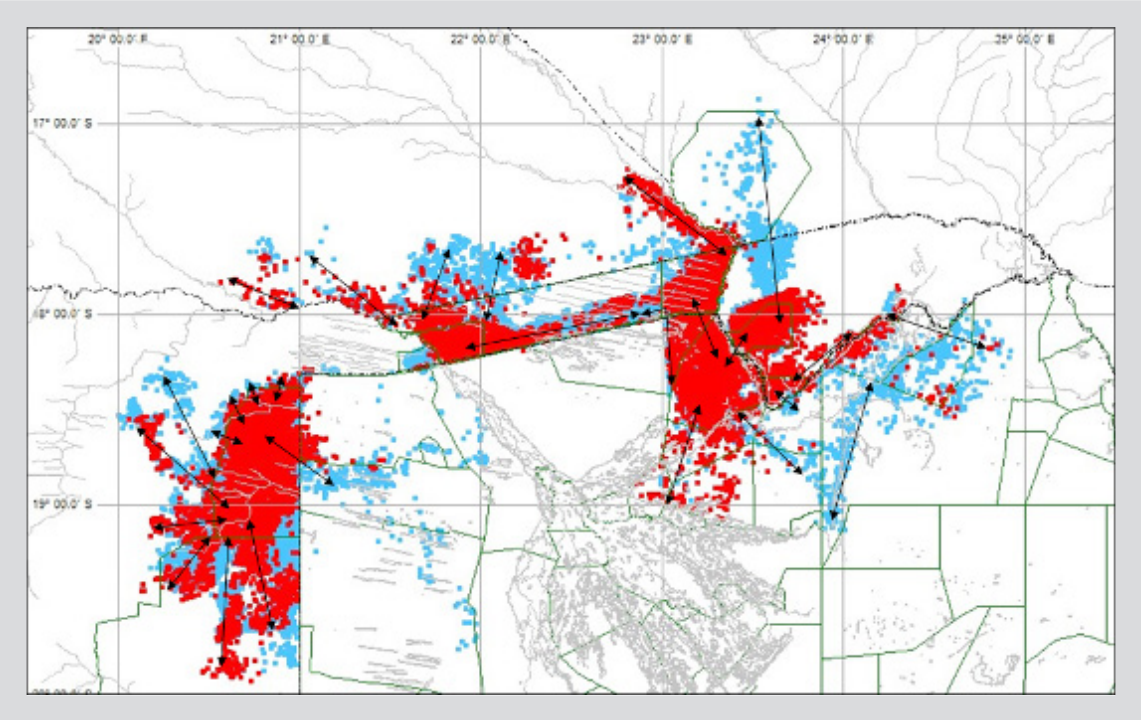


**Figure 51** Elephant distributions during wet (blue) and dry (red) seasons NE Namibia. Arrows indicate important movement

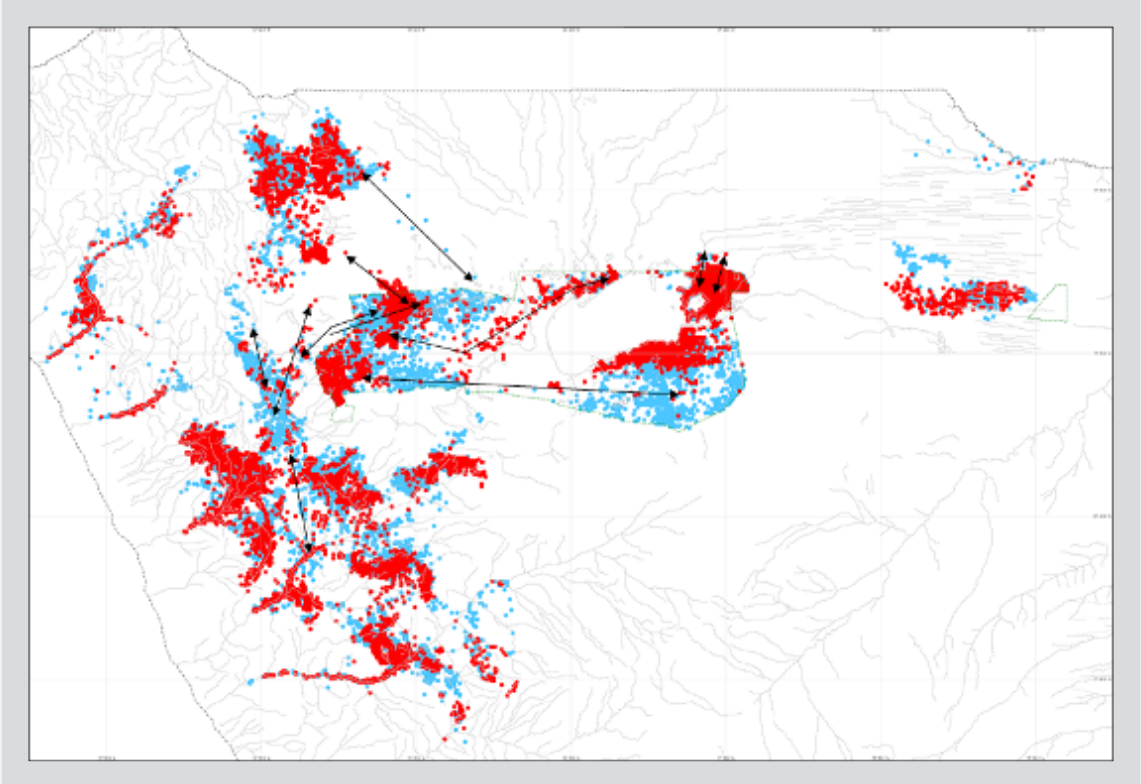


**Figure 52** Elephant distributions during wet (blue) and dry (red) seasons NW Namibia. Arrows indicate important movement

Importantly, the information in Figure 51 and Figure 52 is limited to recorded movements by elephants collared which may not be representative of the larger population. Without forestalling the ongoing work by MEFT to identify and delineate important elephant movement corridors, the known corridors that are for the purposes of this plan considered to be important are shown in Table 11.

**Table 11** Provisional list and classification of elephant movement corridors

| Important elephant movement corridors | Status | Vulnerability |
|---|---|---|
| **North West** | | |
| Hoanib River-Khowarib Schlucht-Ombonde River-Hobatere | Mostly intact, partially impacted by human activity including settlement, tourism including unregulated tourism. The proposed Ombonde People's Park will secure a large portion of this corridor. | Very high |
| Hoarusib River | Mostly intact, partially impacted by human activity including settlements and small gardens in the upper Hoarusib River, tourism including unregulated tourism. | Moderate |
| Palmwag-Uniab River-Huab River | This route is poorly known but it is clear from the current drought that the elephant population in the Palmwag-Uniab River and the Huab River are more interconnected than previously thought and have undergone significant shifts in distribution southwards and probably eastwards. Research on movements is needed. Realignment of conservancy zonation may be valuable. | Unknown |
| Kunene central highlands-Etosha NP | This route is poorly known but provides access by elephants from the northern and north-eastern Kunene Region to Etosha NP especially during droughts and it may become even more important with climate change. Research on movements is needed. Improvements to the western boundary fence of Etosha NP pose a high risk and additional small scale commercial farming development. It is a major concern that small scale commercial farming schemes may be developed (as in Kavango East) ***without*** complying with the requirements of the Environmental Management Act, Act 7 of 2007. MEFT should be extremely vigilant to ensure compliance and thus planned mitigation of any development impact or important movement corridors, wildlife dispersal areas and access to drought (or climate change) refugia may be permanently compromised. | High |
| Ehomba-Ruacana-Nkolonkadhi Ruacana-Uukwaluudhi-Etosha NP | *See under North Central and Etosha NP* | High |
| Huab River-Ugab River | This route is poorly known but is entirely contained within conservancies. It is clear from the current drought that the elephant population in the Huab River and Ugab River areas are more interconnected than previously thought and have undergone significant shifts in distribution southwards and probably eastwards. Research on movements is needed. Realignment of conservancy zonation may be valuable. This is a high priority area for conflict mitigation. | Low |

| Important elephant movement corridors | Status | Vulnerability |
|---|---|---|
| Huab River-Kamanjab-Otjikondo-Etosha Heights area | This route is aligned but not restricted to the Huab River and its tributaries. Elephants used to move inland along this route during the wet season and contract westwards during the dry season but in recent years have progressively moved further inland in the commercial farming area and have not returned to the lower Huab River. Farm dams in the upper Huab are thought to have impacted seasonal river flows and the seasonality of elephant movements, exacerbated by the inability of communal farmers in the lower Huab River to provide water to elephants. Research on movements is needed. Realignment of conservancy zonation may be valuable. This is a high priority area for conflict mitigation. | High |
| North Central and Etosha NP | | |
| Ehomba-Ruacana-Nkolonkadhi Ruacana-Uukwaluudhi-Etosha NP | This route is well-established (but information is lacking on a number of aspects because of the limited collars deployed on this population) and provides access by elephants from the north eastern Kunene Region and north-western Omusati Region to Etosha NP seasonally and will be especially important during droughts when it can be expected that elephant distribution will contract towards Etosha NP. Research on movements is needed. Improvements to the north-western boundary fence of Etosha NP pose a high risk. | High |
| North-eastern Etosha NP-Mangetti area | This is an old route recorded in use for more than 70 years (and which formerly extended up to Rundu) but information is lacking on a number of aspects because of the limited collars deployed on this population. High degrees of conflicts have occurred due to multiple fences in the Mangetti area and expanding settlements and crop farming. Elephants have increasingly moved south into commercial farming areas of the Grootfontein District just south of the Kavango Cattle Ranch in Kavango West Region. This is a high priority area for conflict mitigation. | Very high |
| North East | | |
| Luengue-Luiana NP-Mavinga NP-Buffalo Core Area-Wildlife Management Zone-Eastern Ngamiland | This is a well-established and high volume corridor that is currently artificial due to the fence between Bwabwata NP and Botswana, resulting in severe compartmentalization of the western KAZA TFCA elephant population. | Very high |
| Luengue-Luiana NP- Mavinga NP-Kwando Core Area-Luengue-Luiana NP- Mavinga NP | This is a well-established and high volume corridor that is currently artificial due to the fence between Bwabwata NP and Botswana, resulting in severe compartmentalization of the western KAZA TFCA elephant population. | Very high |
| Eastern Ngamiland-Mudumu NP-Sobbe Conservancy-Zambezi State Forest-Sioma Ngwezi NP | This is a well-established and high volume corridor passing through a narrow choke point in Sobbe Conservancy. Enhanced protection of the Zambezi State Forest is critically important, as well as interventions to assist Sobbe Conservancy to keep this corridor unobstructed. | High |

| Important elephant movement corridors | Status | Vulnerability |
|---|---|---|
| Khaudum NP-Nyae Nyae Conservancy-Western Ngamiland | This is an almost completely obstructed corridor and dispersal area due to the fence between Khaudum NP, Nyae Nyae Conservancy and Botswana, resulting in severe compartmentalization of the western KAZA TFCA elephant population and artificially high elephant densities in Khaudum NP and Nyae Nyae Conservancy. | Very high |
| Khaudum NP-Kavango East farmlands | Small scale commercial farming development west of Khaudum NP has resulted in the effective loss of the wet season range (or dispersal area) for the second largest elephant population in Namibia. An agreement not to allow settlement or farm development in an already too narrow buffer zone along the western boundary of the park was defied. It is a major concern that such small scale commercial farming schemes may be developed ***without*** complying with the requirements of the Environmental Management Act, Act 7 of 2007. MEFT should be extremely vigilant to ensure compliance and thus planned mitigation of any development impact or important movement corridors, wildlife dispersal areas and access to drought (or climate change) refugia may be permanently compromised. Research is needed on the impacts of this loss of wet season range on the elephant population and the probable diversion of dispersal movements into N≠a Jaqna and Nyae Nyae Conservancies.<br><br>As a form of mitigation to the loss of a natural dispersal range, the occupants of the small scale farms can be involved (based on initial consultations with their representatives) in a cooperative elephant (and other wildlife) management and utilization scheme and creating incentives for co-existence with wildlife. | Very high |

Knowledge of movements is incomplete and other important corridors may still be identified through further research.

MEFT has an existing obligation derived from the 2nd Land Conference regarding the identification or important wildlife corridors and taking measures to prevent settlement in such corridors. This is a complex issue but the starting point in relation to elephants is to use all available information to identify and map known corridors. Thereafter, various stakeholders, decision-makers and the public must be informed of such corridors in the shortest possible time to prevent further land right allocation, settlement, water provisioning or other disturbance in these corridors. This needs to include the demarcation and signposting of important corridors on the ground, to be visible to all.

From the public consultation process (the national workshop in Windhoek) it appeared that some stakeholders may see the demarcation and signposting of elephant movement corridors as a threat to their interests, and views were expressed that such corridors should not be demarcated or signposted without extensive consultation. These are problematic views grounded on an incorrect understanding of what an important elephant movement corridor is and what the process entails that MEFT has already been assigned to do. Some of the misapprehension may be that MEFT in this process will ***create*** new elephant movement corridors. This is not the case, MEFT has to record, map, demarcate and signpost existing corridors, using all available information on elephant movements and distribution, past and present.

Considering that elephants in Namibia have some of the largest home ranges and longest movements recorded for elephants anywhere in the world, especially in the arid North West, and that some of the movement corridors in Table 11 are already known to be in the order of 50 km long or more, extensive consultation cannot be considered as a prerequisite before corridors are described, within the timeframe that MEFT has been given to do this. Consultation also cannot be seen as a prerequisite for the demarcation and signposting of corridors derived from the best available scientific information, no amount of consultation can substitute for the application of the available scientific information.

Where there is an important role for extensive consultation is in the subsequent process of identifying management actions to prevent the future obstruction of corridors or the restoration of partially obstructed corridors, and achieving this in a manner consistent with the interests of MEFT to promote co-existence of elephants and people by encouraging the economic use of elephants and the mitigation of conflicts between elephants and people.

Etosha National Park **Photo:** CCFN

This plan was informed by substantial public consultation by MEFT with a wide range of stakeholders, including rural communities (in some instances including their traditional authorities or traditional authority representatives), almost all conservancies in the elephant distribution range (38 were interviewed), farmer's associations in all areas affected by elephants, all key conservation organizations operating in Namibia, all conservancy support organizations, a leading hunting organization in Namibia, several Regional Councils in regions with high numbers of elephants and conflicts, the Kavango Zambezi Transfrontier Conservation Area Secretariat, all private owners of elephants in Namibia and irrigation scheme (Green Scheme) operators in the Kavango East and West Regions. Representatives of the Ministry of Agriculture, Water and Land Reform attended several of the regional consultation meetings. Voluntary organizations working on elephant monitoring and human-elephant conflict mitigation in the North West and elephant conservation, research and human-elephant conflict mitigation in the Mangetti area also participated in some of the regional consultations.

These consultations were done primarily through interviews, public meetings and some questionnaires. Most of the consultations included the Director of Parks and Wildlife Management, regional deputy directors, protected area managers and regional service personnel of MEFT, the Deputy Director for Research in Scientific Services and conservation scientists working on elephants in MEFT. A steering committee comprised of the Directorates of Scientific Services and Parks and Wildlife Management oversaw this process and guided the development of the plan. A full list of the parties consulted is available from MEFT, noting that many more were invited to take part in consultations but could not participate for various reasons, but at least they were given the opportunity to do so. The COVID-19 pandemic and movement restrictions within the timeframe for this planning process made further consultations difficult or impossible. The consultative process culminated in a national consultation meeting held in Windhoek from 19 to 20 November 2020.

It is not possible to give a verbatim account of all of the inputs received through these consultations in this plan, but the following key issues should be noted and accommodated. These are provided in no order of priority. Similar inputs were occasionally combined; inputs are given as direct quotes as recorded and in paraphrased or summarized form, mostly when there were many similar inputs, but only where necessary. A few explanatory notes were added in parenthesis. Sources are not identified beyond categories and sometimes on a geographical basis, noting that records of consultations are kept on file for later retrieval if so required. The inputs received were numerous and lengthy but are extremely insightful.

Notably, several conservancies stated that they are always requested for information but seldom get feedback. It is thus essential to create a feedback mechanism as an outflow of this planning process.

## 2.1 Rural people, conservancies, and traditional leaders

### *Co-existence with elephants*

- Elephants must be seen as valuable to people as the basis of a co-existence arrangement on communal land outside protected areas or else people will not tolerate them.
- Revenues earned from elephant hunting are absolutely crucial and irreplaceable for conservancy operational costs and rural development programmes.

- Elephants are valuable resources that bring in income from hunting and tourism.
- Rural livelihoods depend on income from elephant hunting.
- Without elephant hunting conservancies will not be effective. Elephants bring more income than other species.
- An information campaign is needed urgently now that the elephant population is increasing rapidly and expanding into new areas to inform people of elephant behaviour and how to avoid conflict, death and injury and how to mitigate against conflicts.
- People feel a deep cultural connection with elephants as the symbol of Africa and are proud of their role in elephant conservation.
- Elephants are part of us, our identities and our totems.
- It is an honour to us that MEFT occasionally allocates hunting quotas to us to allow us to generate income.
- Elephants were created by God along with people. God created both humans and elephants but separated them. It is difficult to live together. Some of us have learnt how to live together. It is better to keep elephants and people separate.
- People feel good about having elephants in the conservancies.
- It is a beautiful animal to have and a joy to the community. We get most of our income from hunting elephants, and they attract tourists.
- People are proud of having elephants. People feel blessed to have elephants and feel so rich.
- I feel they are family. We share what we have even if I do not prefer it that way, what can I do? (elderly woman of around 90 years talking about elephants in the North West).
- We are willing to live with elephants. We just need continuous awareness to our members on how to deal with them.
- Tourism revenues from seeing elephants in parks must be shared.
- Benefits from elephants are income to conservancies and create employment.
- Elephant meat is very highly regarded by almost all rural communities and is seen as a delicacy. People fight over the elephant meat and in the North Central the trunk and the feet are given to the traditional authorities because they contain the best meat. Elephant meat is highly regarded and a staple food for some communities. When an elephant is hunted the meat is shared with everyone. We have recipes for cooking elephant meat. You will get pregnant if you eat elephant meat. People in the Omaheke Region mostly do not eat or like elephant meat. When you are pregnant you do not eat elephant meat.
- Elephants bring tourists which bring income. In the North West, most conservancy income is from tourism and not hunting. We have tourism lodges because there are elephants.
- Elephants provide food for our livestock by breaking tree branches which our livestock can access (North West).
- We use elephant dung as medicine to treat fever (North Central).
- People feel good and bad about elephants, good because they bring tourists and income, bad because they cause conflicts.

- Most people do not benefit or do not benefit enough from elephants. MEFT should relook at the CBNRM model to ensure that the costs of living with elephants do not outweigh the benefits.
- Rural people also enjoy watching elephants.
- We are proud to be part of elephant conservation as future generations will be proud of our interventions.
- Elephants are an entry point for resource mobilization.
- We do not really feel good about having elephant. Elephants are destructive animals and they destroy our crops and gardens and water points. People are also scared of them because they are dangerous.
- Elephant tracking (taking tourists on foot, following elephant tracks, to see elephants relatively close up) should be done just like rhino tracking is done as an additional income earning activity.
- Payment for ecosystem services or wildlife credits will create more harmony between people and elephants. Expand the payment for ecosystem services and wildlife credits to include elephants.
- Elephants are the logo of our conservancy.
- Elephants are an asset to the conservancy as long as they are manageable.
- We feel elephants belong here, we are a conservancy and we have agreed to co-exist.
- It is great to have elephants, considering the era that we live in. However there are challenges especially when it comes to damages. MEFT does not compensate all losses from elephants; we don't get compensation unless a person is killed by an elephant. The compensation payments are too low, very little and the rules are too tight.
- People know and respect the laws of the country and want to obey them.
- People must be consulted on any elephant-related issues when it comes to policy amendments etc.

### *Elephant numbers*

- There are too many elephants in some conservancies, especially conservancies close to the North East Parks, also in the North West (Ugab River area and Huab River area) and in Tsumkwe district.
- The elephant population is increasing and expanding to new areas.
- Our conservancy has between 2,000 and 3,000 elephants (actual numbers in the 2019 aerial survey were 3,678).
- Elephants used to live in the river but now there is no food and they are coming to our homesteads (North West).
- Elephants and people should be separated.
- MEFT must set a limit to the number of elephants in some areas.
- Water availability determines elephant numbers and movements.
- There are too few elephants in some conservancies, people want more so that their benefits would become more; we want more elephants so that we can benefit. The current population is not resident. We want to have our own elephants.
- There are just enough elephants, there is not food for more because of the drought in the North West.
- Elephant numbers must be reduced in the Ugab River area, and elephants should be monitored to avoid conflicts with people.
- More elephants are needed in the far eastern North East; more elephants are wanted in the far North Central-Kunene Region border area. We need the elephant population to increase (far North West).
- Some conservancies have more than 1,000 elephants in parts of the year.
- People should be informed not to go into the forests with dogs because dogs chase elephants away.
- We have too many elephants and would like to exchange them for rhinos. Areas with more habitat can take some of our elephants.
- We have very few and we want to have more elephants.
- We have very few because we do not have enough water. We need more waterpoints so that the elephant population can increase.
- Conservancies with too many elephants should be given higher hunting quotas. If there aren't enough bulls with good trophy quality to hunt, elephant quotas should be given for meat, on a sustainable basis. Some elephants can also be translocated to other areas. But be very selective, leave females and calves to remain productive.

### *Human-elephant conflict*

- Elephants damage crops, grain storages, fences, gardens, water installations, water tanks, water pipes, houses when people store food or fodder in them, sometimes they attack and kill people. Crop damage is the biggest problem, mostly to maize, millet, mahango, watermelons and pumpkins.
- Elephants damage our water pipes over and over again after we fix them. The damage is just too much (North West).
- Small home gardens are very vulnerable to elephants, damages caused do not qualify for offset payments at present; electric fencing may be an option for larger community gardens; protective walls around home gardens can be effective; we need electric fences around our gardens (North West).

**Photo:** J. Kasaona, IRDNC

- Elephants scare people and make them live in danger. Rural people fear elephants, especially at night, and fear for their lives.
- People are killed by elephants now and then. The killing of people by elephant has devasting consequences for dependents and households. A tourist was killed by an elephant in 2019.
- In the North West, elephants damage kraals (livestock pens) and sometimes kill or injure livestock. In the North Central elephants have damaged people's vehicles. We lost two cattle to elephants in 2019.
- Elephant in the North East sometimes close off river channels by disturbing reed beds that affect the flow of water.
- Elephants cause car accidents in the North Central as they are barely visible at night.
- Providing water to elephants in the North West is the most effective mitigation against conflicts; if elephants have water, they do not bother people. People cannot afford to pump water for elephants with their diesel pumps (in the North West). Introduce solar systems and do away with diesel pumps for water. Water provision could be improved with solar pumping and not diesel.
- Most conservancies have several waterpoints that are not protected against elephants and need assistance.
- Many waterpoints were damaged by elephants in the North Central during the drought. Some mines in some areas are helping to pump water for elephants (North West); we are supplying farmers with some diesel and replace damaged pipes and taps.
- There is just too much damage from elephants.
- We stopped growing crops or making gardens because of elephant damage (North West).
- Our gardens are too small (less than 1ha) to qualify for offset payments (North West). Old and vulnerable people only have small gardens, they must be accommodated in the policy.
- Traditional methods (beating drums, fires, cracking whips, burning animal manure, clapping hands, making noise) of preventing crop damage by elephants are not effective.

- Chili bombs (elephant or cow dung mixed with chili powder and burnt) work best. Vuvuzelas, beating drums, fences around crop fields with tin cans attached are also used. Trenches around water points are effective. Other people feel that fences with tin cans around crop fields work best. Some people burn tires, shoot firearms in the air or use fireworks to scare off elephants. Driving elephants away with vehicles also can be effective. Using chili powder mixed with used engine oil and grease applied to fences is very effective, but must be replenished, especially in the rainy season. Making noise is also effective. The use of spotlights to scare elephants away from crop fields and homesteads can be effective.
- Fireworks work the best. Not everyone can afford fireworks.
- Painting rocks white around fences or waterpoints is effective. Stone packs around small gardens are not always effective.
- Hanging corrugated iron from fences make them visible at night and prevent elephants from entering crop fields. This works well. Trenches dug around fences also work.
- We burn ***Euphorbia damarana*** bushes to keep elephants away. Burning cattle hides also works. Burning animal manure works well. Fires work but we don't do that anymore because of our fire management plan.
- Elephants get used to the mitigation measures. Some measures are no longer effective.
- We have no method that works to keep elephants away. The mitigation measures are not enough. We need human resources to make any of them work, they need ongoing management. We need a joint effort of MEFT, conservancies and game guards.
- MEFT is not able to assist in time, they come after the damage has been done.
- Although a lot has been done, there are many more waterpoints to be protected against elephants in some areas. Some conservancies have already protected their own waterpoints, MEFT and NGOs have assisted to protect others. EHRA has protected more than 200 waterpoints in the North West. Unprotected waterpoints are continuously destroyed by elephants. MEFT has to assist with protection walls around waterpoints, also Rural Water Supply (MAWLR).
- Trenches around solar panels works well. Putting water pipes underground and covering them with sand works. Elevate the water tank and surround it with rocks.
- Farmers must be trained in conflict mitigation measures. Conservancies (some) are training their members in the use of mitigation measures. MEFT and NGOs must assist with training and information campaigns. Conservancy residents must be informed of how and why elephants behave in certain ways and how to avoid conflicts.
- The current human wildlife conflict offset system is not adequate. Both MEFT and the conservancies must adjust payments (upwards) and introduce other mechanisms.
- The offset system does not cover damaged infrastructure and members are not even reporting infrastructure damage anymore. This policy must be changed, or else we will not even know the full extent of elephant damage. People can't afford to repair all the damaged infrastructure and the conservancies cannot supplement all repair costs.
- The elephant damage offset scheme is too slow and does not fully cover the costs of crop losses and does not cover damaged infrastructure at all such as fences and homesteads.
- The self-reliance scheme must include infrastructure. Some conservancies (North West) have used own resources to fix damaged water infrastructure.

- The elephant credit system is in place but it takes too long and funds are not sufficient.
- Elephants also damage trees and cause deforestation.
- Conservancies contribute to the offset payment system as MEFT contributions are not sufficient. Conservancies sometimes put in more money than MEFT. Conservancies without income or with insufficient income cannot offset damages or supplement or assist farmers with additional mitigation measures. Some conservancies provide diesel to farmers as a form of compensation (offsetting of costs).
- We didn't know that we can request more funds from MEFT when the money for offsets have run out. Is this really true?
- Elephants go onto farms to look for water because some conservancies do not have waterpoints for wildlife.
- Private dams on the Huab River are blocking water from flowing downstream. Our area has dried up and there is no water for elephants, thus creating all these problems. Wetlands must be restored in the Ugab River to prevent the elephants from going onto the farms. There are too many dams in the river.
- MEFT has to increase contributions to the HWCSRS. MEFT should contribute N$90,000 or 100,000 to each conservancy with elephants instead of only N$60,000. NGOs and support organizations should also contribute to match the contribution by MEFT.
- MEFT has to speed up the process of declaring a problem elephant and responding to conflict cases, especially when there has been a loss of human life. MEFT should decentralize the declaration of problem elephants.
- Increasing hunting and own use quotas will help.
- There is a need for more electric fencing to keep elephants out of villages, crop fields and gardens, but communities need assistance and education about electric fences and their maintenance. People fear that electric fences can kill or injure people and livestock. People change their crop fields year after year making it difficult to use fencing to protect them. Maintaining electric fences would be a challenge. Electric fences are very costly and when they were previously introduced there was no interest from the community to maintain them.
- A pilot electric fencing system is needed to test its efficiency.
- If there will not be enough money to protect all the crop fields with electric fencing, elephants will just concentrate on the unprotected fields and cause more problems.
- The benefits from elephants are too low compared to the damages they cause.
- Some conservancies have introduced elephant guards to share information on elephant movements.
- MEFT has already promised long ago to share information with us on elephant movements. This has not happened. Why is there not a solution for the internet problem?
- MEFT should come up with mitigation measures that are effective, sustainable, innovative and proactive, instead of being reactive.
- MEFT should give additional tourism or hunting concessions to conservancies in protected areas (conservancies near Bwabwata NP).
- Conservancies want to benefit from other species in protected areas. MEFT should translocate sable and roan to conservancies in the North East. People also want to harvest resources such as reeds, water lilies and devil's claw in the parks.

- Hunting operators should assist with removing problem elephants.
- MEFT and support organizations should capacitate conservancy members to take ownership in managing elephants.
- Conservancy monitoring and recording of elephant conflicts are generally effective but people are willing to try new methods if that will bring improvements. Distance and a lack of sufficient game guards or transport hinder the recording of all conflict incidents in some cases. If cases are not recorded offset payments cannot be made.
- MEFT, hunting and tourism operators and NGOs etc. should assist conservancies to increase water supplies to wildlife and protect water installations against elephants. Elephant-friendly drinking troughs are needed. More water for wildlife is urgently needed in specific areas (in the North Central, the North West and the North East).
- Our elephant dams are working very well (Omatjete area). It is important to make water for elephants far away from the villages, 60 or 100m.
- People need information and assistance to establish chili gardens and make chili bombs. Some conservancies have been trained in the Zambezi Region how to make chili bombs. Some have not yet started to use chili bombs. Some sold the chili bombs instead of using them. Nobody is buying the chili that we grow.
- There is a need for insurance for the people who track elephants (game guards).
- MEFT should stop chasing elephants from one conservancy to another but rather remove the problem elephant.
- Early warning systems as used for lions must be developed for elephants. Technical advice is needed for these systems and new farming methods in arid areas. MAWLR should introduce hydroponic systems for food security of the community and fodder production for the livestock.
- Tourism companies must assist with mitigation measures because we all benefit from these elephants. We recognize the value of tourism and employment created for young people in the lodges but farmers struggle continuously.
- Any process to manage elephants must involve us. Reduce the numbers and monitor the results. Remove only the problem ones, not all. Identify the elephants with bad behaviour and remove them, leave the others.
- Kambonde was a 20 year old bull. He broke into around 50 houses to look for food. He should have been shot but instead the hunter selected a bull with bigger tusks.
- MEFT must establish proper inspections of damages.
- MEFT sometimes doesn't respond at all to conflicts. We need a rapid response, it must be people based, involve our people and use technology.
- MEFT only responds in cases when elephants are killed.
- Are tourists and lodges feeding elephants? Is this changing their behaviour? (Ugab River area). We have more problems now because there is tourism in the rivers.
- Tour operators chase elephants away from lodges or campsites, such disturbed elephants could pose a threat to us.
- There must be a response team that will help with elephant management like the early warning system used for managing lions.

- MEFT should ask for a budget that caters for water supply in areas where elephants occur. The main issue is providing water for elephants. We can no longer afford to buy diesel; this forces elephants to look for water at our homes (North West).
- We need a new elephant and lion wildlife credit scheme. NGOs should contribute match funding. One lodge in Ugab area is already doing this. Tourists pay N$25 per sighting, it is then matched by the lodge and NACSO. We need to raise additional funding from elephant tracking. The wildlife credit scheme cannot work at conservancy level. Elephants from one conservancy come drink water at ours and are seen by tourists but the payment goes to the other conservancy. Tourism operators and tourists should pay a fee for all elephants sightings to support the implementation of the elephant management plan. Funds generated from elephants should be invested back into communities to strengthen the relationship between the members and wildlife. MEFT to introduce an elephant sighting scheme for funds to be invested in elephant conservation.
- Anichab school hostel needs streetlights. Elephants always look for water in the school yard, because they don't have a good sewerage system. Employees walk in the dark to the hostel to start preparing food early in the morning for the children, this is not safe. Ministry of Education must fix things at this school.
- Government must protect people from elephants. If someone is killed by an elephant the payment is low, lower than the value of the elephant. Elephants are more valuable than human life. Livelihoods depend on crops. Elephants destroy crops, government protects elephants but not crops, we don't get enough compensation for crops. The full value of crops damaged is not replaced.
- Elephants are now more than before. They are now in Mukwe Constituency, Shadikongoro, Ncaute where we didn't see them previously.

**Figure 53** Very small home garden in Sorris Sorris Conservancy

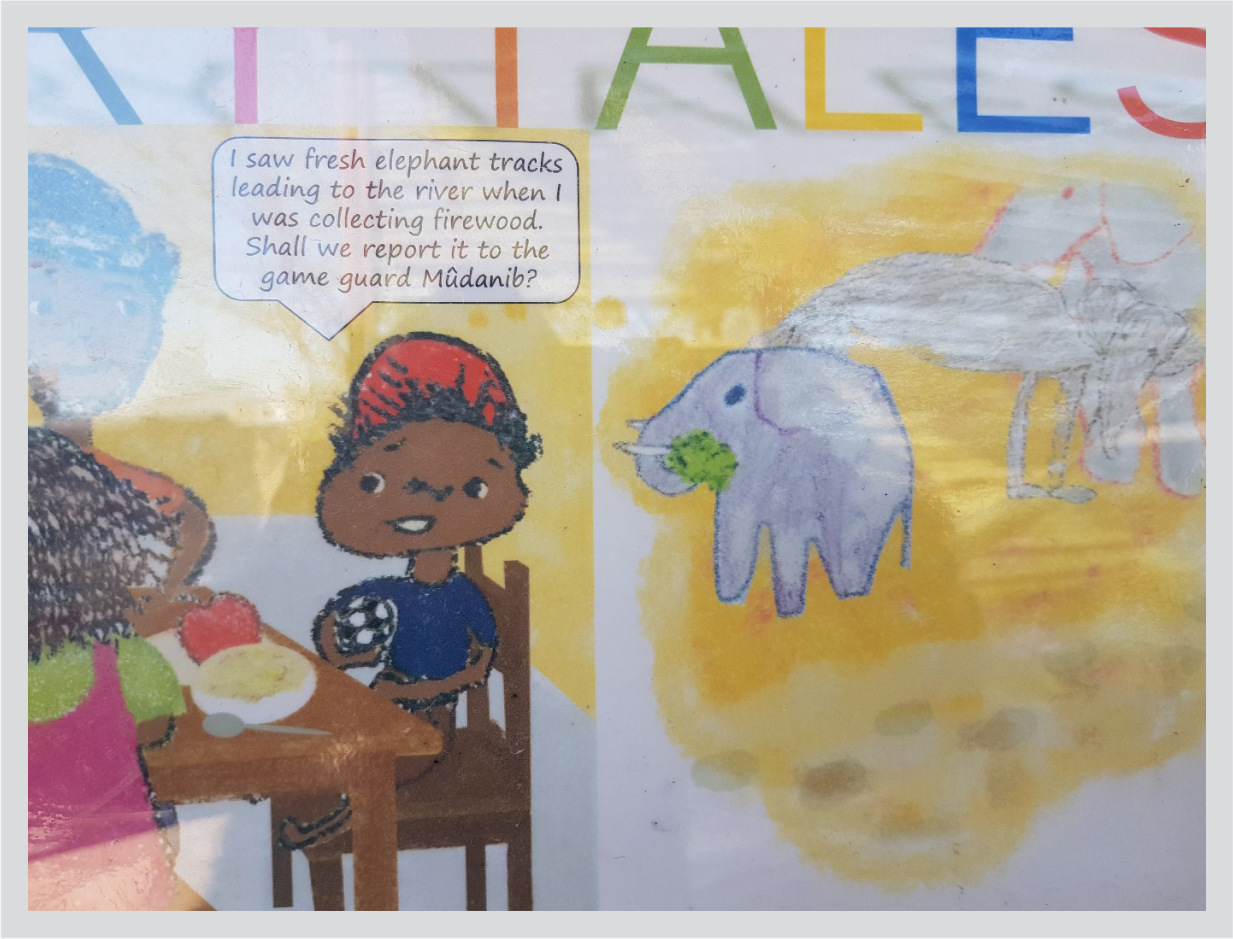
**Figure 54** Typical stone wall put up around water infrastructure to prevent elephant damage

### *Elephant management and monitoring*

- MEFT should continue with aerial surveys and collaring elephants. MEFT should do more aerial censuses to determine how many elephants there are in the conservancies. MEFT should do censuses of elephants in all conservancies every three years.
- Elephant monitoring should be improved. MEFT should continue to collar elephants to monitor movements.
- Conservancy event book monitoring is very effective and records are kept of all conflicts (and several other issues), except where conservancies cannot afford to employ enough game guards to cover all areas.
- Conservancy monitoring should be improved. The event book system does not make provision for recording the type of elephant involved in conflicts, if it was the first conflict that the elephant has caused, or a way of identifying the elephant so that we know exactly which one to take out. We need a separate form for recording this information. Some conservancies need vehicles to improve monitoring. Conservancies should use camera traps to monitor elephants.
- Conservancies should monitor the number of elephant bulls in their areas. Conservancies should have members trained to monitor elephants. Conduct regular patrols to be able to identify and know the elephants that are in the conservancy. Some conservancy income must be used for elephant monitoring.
- Conservancies need specific or focal support for elephant management and monitoring.
- Conservancies should improve the event book recording of elephants to record herd compositions (adults, juveniles and calves). Other impacts such as closing of river channels by elephants should be recorded.
- Conservancies want to do joint monitoring and anti-poaching patrols with MEFT. MEFT should support conservancies with facilities for anti-poaching units.

- We have provided MEFT with a fly camp for their patrols. They didn't use it much. Now we want them to open an office here. Field staff must be in the field (Omatjete).
- Conservancies should share data on elephant monitoring and movements.
- MEFT should expand projects on Payment for Ecosystem Services.
- MEFT should assist with transport during game counts.
- MEFT should assist with diesel for water pumping (North West).
- Boreholes are needed in a few places in conservancies in the North East (Sobbe, Mayuni) to provide water for elephants.
- Tourism operators should help to monitor elephant movements and support anti-poaching activities.
- Conservancies need assistance with getting equipment for conservation work e.g. binoculars, GPSs, tents, water bottles, boats, rucksacks, torches or lights, bedrolls, two-way radios, cameras.
- MEFT should assist conservancies in awareness campaigns against poaching and on elephant management.
- MEFT regional services and conservancies need to collaborate on elephant management. A WhatsApp group should be created to enhance communication.
- MEFT should set up a joint management committee with conservancies on parks.
- MEFT should help to strengthen the joint anti-poaching unit of the Mudumu landscape.
- MEFT should provide training in elephant management, crime scene investigation, use of GPS, interpreting elephant tracks, and recording elephant age, sex and trophy size.
- Tourism operators should help to monitor elephant movements, report poaching incidents and support anti-poaching activities. Tourism operators should support conservancies with equipment such as boats, fencing and transport for patrols.
- Hunting operators should support anti-poaching activities in conservancies.
- MEFT should develop an elephant management plan for the Ugab River basin and establish a management committee for the Ugab elephants. The wetlands in the Ugab River should be rehabilitated so that the elephants do not move inland.
- MEFT should share information on the movement of collared elephants with conservancies in the North West on a real time basis. MEFT should alert conservancies when elephants come close to vulnerable areas.
- MEFT should establish a fund for the monitoring of elephants.
- Tourism operators should share equitably with conservancies their income from elephants.
- MEFT (Government) should not approve mineral prospecting in our wildlife zones.
- Conservancies bordering on Chobe NP in Botswana need more cooperation from the park.
- NGOs like IRDNC needs to be stationed in the far North East to assist conservancies better. Support organizations must be close to us. IRDNC should be given the mandate just like MEFT to investigate conflict incidences. Support organizations must help us to get radio communication to better report conflicts.
- MEFT should station personnel in Omatjete to help with the many elephant conflicts.

- Hunting and tourism operators must work hand in hand with conservancies and maintain a good relationship.
- Support organizations should provide more financing for anti-poaching work by conservancies, conflict mitigation measures and research on conflict mitigation, and assist in providing water for elephants.
- MEFT should increase law enforcement with fully-motivated staff and patrol more frequently.
- MEFT should develop wildlife management specific to each area, including control and monitoring of elephant movements.
- Better cooperation between parks and conservancies is needed; parks should not operate in silos. Enough water for elephants should be provided in parks. Parks should strengthen their neighbourhood relations with adjacent conservancies in elephant management and other wildlife.
- The north-eastern fence of Etosha NP should be electrified and regularly maintained. Etosha NP should finish upgrading their fence to be an elephant-proof fence well electrified.
- MEFT in the national parks should use modern up-to-date security for elephants e.g. the use of electronic or satellite surveillance.
- Elephants sometimes fall into hand-dug wells and get killed in the North Central when they look for water because there are no or not enough wildlife watering points.
- MEFT needs to increase its manpower for law enforcement on the ground.
- Tourism companies should limit the number of tour guides and groups in the North West because they disturb elephants. Tour guides chase elephants. This must be looked into. Self-drive tourists may also disturb elephants. These tourists do not benefit us, there are no benefits to conservancies and they may affect elephant behaviour. They try to dodge payments and sneak into areas to camp without payment, e.g. at Brandberg. Unregulated tourists cause a loss to us. They undermine our lodge investors. Even busloads of people camp on our farms with no payment and no benefit to us. We are concerned about the use of quadbikes and motorbikes in the Ugab River, they are disturbing elephants. People who camp anywhere don't cover their fires and they leave their rubbish.
- We need lights and cell phone reception to get warning messages but not all farms have cell phone reception. Can there be a technological solution, combining elephant collars and cell phones? We need an early warning system like we have for lions.
- We need both a proactive and reactive approach. Proactive should include the protection of infrastructure, monitoring of elephants and their movements, an early warning system and removing problem individuals. Reactive should include offsetting elephant damage or replace or repair it.
- It is very difficult for the conservancy to do anything because of the directive on allocating 50% of income to community benefits.
- Elephant problems originate from parks; conservancies bordering parks should benefit from parks through employment, joint venture arrangements with tourism lodges in parks, traversing rights in parks.
- Government should prioritize rural electrification in elephants areas, then we will have light and feel safe.




### *Conservancy zonation and movement corridors*

- People are settling in elephant habitat and obstruct elephant movements.
- Illegal settlement in core conservation areas in conservancies is a big problem. Encroachment is taking place in core wildlife areas by people mainly seeking grazing. Some core wildlife areas fall within ancestral lands or land allocated by traditional authorities. If given incentives and alternative land, people may move. Cooperation will be needed from the conservancy, its members and the traditional authority.
- Conservancy zonation is not fully effective because there is not enough water for elephants which cause them to move into settlement areas. Some core wildlife areas require additional waterpoints for wildlife.
- Conservancy zonation is not fully effective because some traditional authorities or headmen are allowing people to settle in wildlife corridors. Traditional authorities need to be made aware and educated about corridors and the importance of conservancy zonation.
- Conservancy zonation should be updated. We are willing to do so, lots of new developments have taken place and there is a need to adjust. We agree to the need to align zonation where possible with neighbouring conservancies (almost all conservancies). We agree to the need but it will be very challenging, we all need to be on the same page on this.
- Poaching is threatening the core wildlife areas.
- Devil's claw collectors are encroaching wildlife areas and settling there.
- MEFT has to work with MAWLR to establish legal protection of elephant (and other wildlife) corridors.

- MEFT should intensify the protection of the Zambezi State Forest and wildlife corridors into the State Forest.
- Corridors linking conservancies and zonation should be strengthened and integrated to create a network for animal movements and achieve joint corridor management.
- Some conservancies are willing to change the zonation to better include important movement corridors or align better with the core wildlife areas of neighbouring conservancies, but the human population is increasing and people need land for agriculture.
- Mudumu North Complex want to develop a Memorandum of Understanding on elephant management.
- Elephant management should be coordinated amongst conservancies.
- Some conservancies in the North West are planning to demarcate elephant corridors.
- Drought in the North West has caused people to graze livestock in core wildlife areas.
- Small miners are allowed to operate in core wildlife areas and are the cause of poaching and wildlife moving into other areas for safety (North West).
- Changes in conservancy zonation is possible but may require additional waterpoints in some areas.
- Some conservancies are conducting awareness campaigns against settling in wildlife areas; some have applied to the Courts for eviction orders.
- The floodplains along the North East rivers are safe corridors as people cannot settle there.
- We are planning to plant gum trees to demarcate corridors and make space for elephants to move.
- Hunting and tourism operators should assist conservancies to put up signage to demarcate elephant movement corridors.
- Conservancy zonation in some cases already provide for elephant movement corridors.
- Some conservancies allow livestock grazing in wildlife areas but no farming with crops or setting up cattle posts.
- Conservancies in the North Central are in the process or want to fence off their core wildlife areas but need assistance from their hunting partners.
- People were relocated in the drought to core wildlife areas by traditional authorities. Conservancies in the North West do not pay out if such people incur damages.
- We have had problems with people settling in core wildlife areas. In one case the conservancy management committee, the police and the traditional authority engaged with him and he moved.
- There are people living in the core wildlife areas now, but we make efforts to remove them. The ones who refuse we take to the police. We currently have active court cases (to evict people).
- We have problems with people settling in our core wildlife area, there is an ongoing court case at the High Court. The illegal settlers are now also poaching.
- Our conservancy zonation plan is fine, animals are already able to move within the current zonation to any area.

### *Elephant hunting*

- Conservancies (in the North East) only has one source of income which is hunting. Without elephant hunting conservancies will not be operational.
- Hunting quotas are too small. MEFT should increase elephant hunting quotas and let all conservancies with elephants benefit.
- MEFT should increase hunting and own use quotas. Hunting elephants provides meat for the community members and is an important source of protein.
- Hunting operators should adhere to conservancy zonation plans when hunting and not hunt in core wildlife areas. Hunting operators must comply with conservancy regulations. Only bulls may be hunted.
- Hunting operators should hunt the old elephants. We want to keep the young ones for the future.
- Hunting operators should submit their annual report back to conservancies to assist with quota setting. Conservancies must monitor their hunting contracts. Hunting operators should start conducting contract monitoring meetings with their conservancies.
- Hunting operators should increase the prices for own use elephants and trophy elephants.
- Hunting operators should adhere to their contractual obligations to conservancies, including social responsibility undertakings. In the North Central, hunting operators must include in their proposals and contracts additional commitments e.g. borehole drilling to invest in conservancies and to sustain the wildlife population.
- Hunting operators must adhere to hunting regulations and the laws governing hunting in Namibia.
- Hunting operators must be ethical in their hunts. Hunt in a way that elephants die instantly and do not suffer.
- Hunting operators should communicate with tourism operators about hunting activities in core wildlife areas to avoid conflicts.

- Hunting operators must treat their camp staff and our guides with respect.
- Hunting operators should employ people from the conservancy during the hunting season. They must employ people and not just use our game guards.
- Conservancies (except recently established ones) are aware that elephant hunting trophy size in the North East is declining and that quotas are limited to prevent such declines. Elephant quotas should depend on the population. The less the population the less the quota.
- Conservancies (in the North West and North Central) understand the importance of maintaining high trophy quality.
- We did not know that quotas are limited to maintain trophy quality. We thought it was because MEFT didn't want to give us quotas; we thought it was because of the drought (North West).
- We fully support limiting quotas to ensure that we do not wipe out all our trophy quality elephant at once and become poor in future. We do not want the future generation to blame us for not being able to benefit from elephants because of our current unreasonable and unsustainable utilization of wildlife.
- We are supporting the limited quota system for hunting so that we can ensure that even after 2030 we can still get elephants on our quota. We are more interested in trophy sizes than in meat unless it is a problem elephant.
- Without elephant hunting, poaching and elephant conflicts will increase. Farmers will retaliate against elephants.
- MEFT must accompany all elephants hunts or do random inspections of elephant hunting. Relying on game guards is not enough. Sometimes the game guards are disregarded. Who are we to even demand to see the permit? Hunters can be difficult and intimidating.
- Hunting operators should provide equipment for slaughtering and transporting meat.
- Hunting operators should assist by building a hide for full moon counts of elephants.
- In case of problem animals, we do not support the hunting of just any bulls. We need proper investigations to be done and to remove the right problem elephant.
- Elephant meat is very much highly regarded. It is soft and there is usually lots of it. Community members fight over it. Even the police when they are present fails to ensure control during elephant meat distribution.
- The fat in the feet is highly regarded for its medicinal value. Elephant skin is used to prevent crop seeds from damage (during storage) as well as for medicinal purposes.
- MEFT should reduce the elephant hunting quotas in Bwabwata NP in favour of neighbouring conservancies.
- Elephant hunting in some conservancies in the North East is very difficult because the elephants are mostly present only in the wet season, by the time that hunting starts the elephants are no longer around.
- Some conservancies are too small for elephant hunting.
- Hunting operators should construct waterpoints for wildlife and assist with transport for patrols.
- Hunting operators should train conservancy members in identifying elephants, skinning and distribute meat to areas recommended by the conservancy committee.

- Hunting operators should capacitate conservancy members to become hunting operators.
- MEFT should consider granting elephant hunting quotas in Mudumu NP and Nkasa Rupara NP. Elephants in this area are a shared resource and conservancies should be allowed to benefit from elephants in parks.
- Hunting operators should be allowed to use silencers to prevent that the noise from shooting chase elephants away.
- No cows or calves must be hunted.
- Hunting operators should make one dumping site for elephant bones because currently scattered bones are scaring elephants away.
- Hunters must not select a matured trophy elephant when another one was declared as a problem elephant.
- We support sustainable conservation hunting of elephants but we fully condemn illegal and unregulated hunting of elephants in Namibia. We support elephant hunting as long as it is done sustainably and ethically.
- NGOs and support organizations should assist in marketing the Namibian CBNRM programme to attract the best trophy hunting operators.
- We feel good about hunting elephants because it generates income for us. It is legal. Our trophy hunter takes the oldest bull. For us it is like taking one of our cattle for sale or to feed the family.
- Some conservancies believe that CITES regulate elephant hunting and that hunting regulates elephant numbers.

### *CITES, animal rights groups and anti-hunting campaigns*

- Rural communities are angry and upset with CITES, activists and animal rights groups. These people always speak from the comfort of their offices and homes. They do not experience the problems and damages that we are experiencing.
- It is within their democratic right to campaign, but they should not forget to consult us on the ground who daily manage and live with wildlife.
- If they succeed in their campaign, if there is no sustainable and regulated hunting of elephants, there will be no elephants left in our conservancy.
- While we respect their freedom of expression and democracy, they should bear in mind that should they continue with their campaigns against hunting that they are indirectly campaigning for the end of CBNRM, increased poaching and killings.
- These campaigns must understand that exerting power without assuming responsibility is colonial and unacceptable. Where are the alternatives for us who have to bear the costs? Hunting is another mechanism of managing elephants and ensure balanced ecosystems. Do they not know this?
- Poverty will increase if hunting is stopped. We will go hungry.
- People are only willing to live with elephants if they are benefitting from them. Elephant conservation motives will be lost if there is no elephant hunting and conflicts will increase because of competition for resources.

- They should come here and dictate to us. We have rights to our resources. Elephant hunting has brought development in our community, such as electrification, hostels for schools, kindergartens, water points, conservancy offices. If it were not for elephant hunting there would be no development.
- Conservancies want them to know that they depend on income generated from elephants which they invest back in conservation. If hunting is stopped, poaching will increase because the conservancies will not have the resources to employ game guards or income to contribute to community livelihoods. Other species will also suffer as a consequence.
- We live with the elephants and take care of them, so we need to benefit in return.
- If hunting is stopped, we will die. We survive on elephant hunting, so now if we are to give this up, do we get an alternative from these people?
- If hunting is stopped there will be more unemployment in areas with already high unemployment.
- Some elephant bulls are chased out of the herds and they start causing problems so we need to hunt them.
- These elephants are ours; we are the ones who conserve them and manage them. We are the real conservators.
- These people need to come here and experience these conflicts. It is not easy to live with wildlife.
- These animal lovers are disturbing the peace. We think there is money for them involved. They obstruct the interest of rural people and raise funds for conservation which never come here. Our damaged infrastructure is never repaired by the animal lovers. NGO funds should be channelled directly to communities to offset damage.
- Do you have elephants like we do? Do you suffer like we do? How do you deal with elephants then?
- We know how to conserve our elephants and we utilize them in a sustainable manner so that we can benefit from them.
- We Africans are using our elephants in a sustainable way and have been doing this for decades.
- This is our wildlife, and we know how to manage them.
- It is fine, we will not hunt elephants until we have reached our population target, but if the elephant population is high and someone stops us from hunting, they must cover all the damages, monitoring costs and income to the conservancy.
- These people should respect the livelihoods and rights of rural people who live with wildlife.
- If we do not hunt elephants the number of conflict incidences will go up.
- Only he who feels it knows it. They should come and stay with these elephants. We put in all the monitoring and management efforts. Those who conserve have the right to manage and benefit from the resources. We have international policies that guide hunting, and our national policies are in line with these. We are not barbaric hunters.
- Rural livelihoods depend on income generated from elephants.
- If elephant hunting is stopped there will be less income to conservancies and benefits to members, less development projects, loss of employment, more poaching, other species will decline, more human wildlife conflicts.
- If these groups want to stop hunting, they must pay to offset damages caused by elephants and fund our development projects.

- If they do not want us to hunt, they have to pay for elephant conservation.
- We are the ones managing elephants and we need to pay for management costs.
- Elephant hunting pays for our community game guards and rangers.
- Conservancies depend on elephant hunting to conserve biodiversity and improve livelihoods.
- If elephant hunting is stopped, conservancies will close down (elephant hunting income contributes about 80% of conservancy income (in the North East)) and conservation will come to a halt and communities will suffer.
- Conservancies use income from elephant hunting for community benefit e.g. scholarships, electrification of villages, water provisioning, funeral cover, human-elephant conflict offset payments, support to schools and kindergartens. Conservancy members are employed with funds coming from elephant hunting.
- We have used money generated from elephant hunting to upgrade water infrastructure.
- These people must be educated that hunting elephants will reduce damages from elephants.
- We support sustainable hunting because if the numbers become too much, they will destroy our crops. Our hunting is very controlled and is in line with national and international obligations. We do not hunt for the sake of it, we get very limited quotas once in a while.
- If elephant hunting is stopped, we will lose our hunting operator (and thus also the hunting income from other species).
- Stop complaining about things that you don't know about. We live with elephants at a huge cost. There is a lot that is done to monitor them and ensure that our offtakes are sustainable. If we are managing elephants, we need to benefit from them. If you do not want us to hunt you must compensate our losses and damages.
- They must be human enough and considerate of others. Conservation is our source of life and we need to sustainably manage and utilize our resources. They should visit us to come and hear our side of conservation and hunting of elephants, especially the socio-economic and ecological impacts resulting from sustainable harvesting of elephants.
- Communities and conservancies get benefits from hunting elephants whenever there are enough numbers by getting money and meat to be able to look after the conservancy and be able to protect and conserve all other wildlife species. If there is no hunting on a sustainable basis the illegal hunting will take place and conservation will be thrown into chaos and conservation will cease to exist in southern Africa if not the whole continent.
- The conservancy does not support hunting of elephants for tourism purposes; however, it feels that there is a need to strike a balance between consumptive use and non-consumptive uses.
- They must tell us the best way to deal with human-elephant conflicts. Or, better yet, they must come and get the elephants to their back yards. It is easy to talk when you don't face the problem. So tell them to come get elephants for their homes too.

## 2.2 Freehold farmers and farmers associations

***Kamanjab area (Note that in addition to discussions at a meeting, a written submission was given as reflected here)***

- In 1995 there were 20 farms affected, now it is 60. Losses caused by elephant damage are unsustainable. There are too many wind pumps to protect. It costs N$30,000-50,000 each to fix. Resettled farmers are also affected. Cattle go missing when elephants break fences, and cattle or calves are occasionally killed. Old ana trees, sterculias and albizias are pushed over by elephants.
- We have tried using old tires. Elephants don't like stepping into tires. It works best if they are painted white and tied together. Farm gates painted red are left alone. Nothing else works.
- Farmers get no support for living with elephants. The bigger issue is, will the elephants stay forever? If so, people must adapt and pay for that. We cannot afford to adapt at our cost.
- Elephants bring no benefits.
- We need a local management plan which landowners are part of.
- In the Kamanjab area, we are faced with a complex and unique situation where elephant that technically belong to the government, and is seen as a national treasure, became a regional nuisance for private landowners and the inhabitants of resettlement farms.
- These people suffer huge losses on a regular basis due to the presence of these animals.
- What makes it even more complex is the fact that the demography in our area has changed to such an extent from where elephant in the past were unacceptable and unwelcome, to where some landowners now welcome them.
- We thus have a situation now, in some instances, where one landowner, because of his farming practices and infrastructure cannot afford or tolerate elephant on his land, while his neighbour with very little infrastructure and a tourist establishment, welcomes them because he financially benefits from their presence.
- Through a systematic electrification project, funded by the utilization of elephant through trophy hunting the past couple of years, we began to address and limit the elephant problem. It helps, but we are just treating the symptoms and not the cause of the "disease".
- The cause of the current human wildlife conflict in our area specifically with elephant is elephant numbers that grew to such an extent from where elephant that were once endangered by humans are now endangering the existence of humans in the area. We will have to find a balance somehow.
- We will also have to set boundaries to where we will allow elephant to extend their range. We all know as they do so, they destroy infrastructure and bring an end to commercial farming practices.
- Somewhere the unpopular decision will have to be taken and executed to lower elephant numbers in this area. This can be done by translocation, which is expensive and a logistic nightmare, or by culling which is much easier but very controversial. This again will not solve the problem, but at least it will buy some time to come up with a more permanent solution.
- An environmental tax paid by ecotourists could also be considered to help fund projects limiting human wildlife conflict. Trophy hunters are currently the only group of tourists that make a significant contribution to conservation.
- Land tax on privately owned land where elephant occur on a regular basis should be adjusted downwards or exempted, since such landowners suffer huge losses due to animals that they do not benefit from.

- The only long-term solution will be to transfer ownership and the right to utilize, manage and control elephant on private land to the landowners and resettlement farmers. Should that happen, and those that thus far only suffered losses due to these animals can somehow benefit from them, the antagonism regarding local elephants will greatly diminish. Only then will the concept of sustainable utilization come to its full right, and will local landowners and farmers see it as a regional asset. More landowners will except the presence of elephant on their land, and the dilemma of neighbours that have drastic differences in opinion about it will sort itself out.

Photo A. Cilliers

### *Grootfontein district*

- There are far too many elephants in some parts of Namibia. There is a need to count the elephants, set a management target and manage the elephant population accordingly. Why can't a national target for elephants be set? MEFT must set a management target or limit to the number of elephants in Namibia and commercial farming areas specifically and manage elephants within these limits.
- Farmers in this area have asked for action on elephants and made written submissions to MEFT for four years, but no action was taken. The problems started over 10 years ago in the Grootfontein district, and in the eastern area seven years ago. Government responses are inadequate, MEFT often does not have vehicles available and arrive too late. It is pointless anyway to chase elephants from one farm to the next.
- A count in 2017 showed 70-105 elephants in the Mangetti area, more recently another group of 30 moved in from the west. There are 40-50 bulls amongst these. They don't have good trophies.

- We have approached Namibia Development Corporation (now Namibia Industrial Development Agency), who manages the Kavango Cattle Ranch (KCR)) in November 2015 already to keep their elephants out of our land. What happened to their plans to fence in the elephants? Up to December 2018 they were going to fence in the elephants and take responsibility for them, and the wild dogs.
- Elephants should be kept out of commercial farming areas altogether. Farmers in the area are not able to use large parts of their farms because of the elephants. The elephants must be taken back where they came from.
- Commercial farmers cannot afford to repair damaged infrastructure or to protect all their infrastructure, especially water installations, against elephants.
- A hunting quota for elephant has provided some relief but is not sufficient. Problem animal control is not effective. It is difficult to get a permit to shoot a problem elephant. MEFT treated recently settled farmers better than the established farmers by allowing them to have their quota elephant hunted in KCR and at night. And revenue from the hunting was shared only with recently established farmers, which is discriminatory, even racist.
- Government does not adhere to the fencing ordinance, where costs for fence repairs have to be shared equally between neighbours. Not even fencing material is provided to us. We need to be compensated.
- Veterinary Services do not maintain the fence of the surveillance zone (southern boundary of KCR). Veterinary Services do not have the resources to maintain this fence. Elephants are a threat to beef exports. The veterinary cordon fence is in poor condition. There are six quarantine farms in the KCR south of the veterinary cordon fence. These can no longer be used because of elephants breaking the fences or entering them.
- What were the conditions given by MEFT for elephants to be kept on the farm Eden? The Eden fences are not being maintained. Elephants are attracted from Nyae Nyae Conservancy to go and visit the elephants in Eden and end up on neighbouring farms. In this case electric fencing on the outside of the farm is needed, not just the inside. Or is it the elephants from Eden, privately owned, that move in and out of the farm?
- Farm owners want the Eden elephants to be tagged so that it is possible to know who is responsible for damages done on neighbouring farms.
- The Velduin Farmers Association (northern Grootfontein District bordering on KCR) proposes a phased approach. In the short term, a quota for hunting elephants is needed to generate finances to repair or upgrade fences to keep elephants out. In the long-term, a game reserve should be created out of KCR with private sector involvement in investment, tourism development and management.
- The Naruchas Farmers Association (eastern Grootfontein District bordering on Nyae Nyae and N≠a Jaqna Conservancies) proposes that a quota for hunting elephants is needed to generate finances to electric-fence "the corner" (between Na#Jaqna Conservancy, Otjituuo Conservancy and the commercial farms) to keep elephants out and to maintain this fence; to establish a waterpoint for elephants in Na#Jaqna Conservancy east of this fence; and private owners of elephants in the area must maintain compliance with their permit conditions.

***Omatjete and Kalkveld (note that this meeting had to be cut short due to an announcement of impending travel restrictions, but additional input was requested and received via email)***

- Government only supports the communal farmers with elephant problems, not the commercial farmers even resettled farmers. We have a lot of debt; we may lose the farm.
- We pay taxes but we don't get support from Government. We can't afford to continuously pay for repairs, and we have lots of other work on the farms.
- We are regularly in contact with MEFT about these problems, we have sent them reports, photos and WhatsApp messages but so far there has been no solutions.
- We don't want the elephants that do damage. The others can stay.
- It will help to get a hunting quota to offset some of the costs. If there aren't any elephants with trophy quality tusks, why can't we hunt others and use the meat which can even be processed and sold?
- For us is not affordable anymore to repair all infrastructure which is destroyed by the elephants, we had seven years of drought where we are still suffering financial loss and now the elephants are getting us more and more to financial losses and we are not refunded for any expenses from the government even though the elephants are not our game. Commercial farmers are here to farm with cattle and there is no way to farm with elephants as well.
- Those who want to protect the desert elephants are responsible to keep them in the conservancies or move them to farms where they are welcome. The elephant used to live in the conservancies where they even got funds either from some donations or even trophy hunting.
- All losses in conservancies are repaired from some donations or government but we as farmers are getting no funds either from the government or anyone. We have more than 20 km fences with our government neighbours or communal land which only we as farmer repaired for years already, nothing was done by the government. These fences should be repaired by government and the farmer jointly. About 7 km of this fence is destroyed by the elephants.
- Is there not a possibility to get electric fences around the commercial farms that the elephants stay at the conservancies with help from the government and sponsorships from the EHRA. The other problem will be that all solar panels etc. will be stolen by the thieves. They even stole all iron poles, fences out of the neighbour fences.
- We suggest the following points:
    - There is no space for elephants on commercial farms, we cannot farm cattle and elephants. That is a no go. Elephants belong to conservancies where they generate money from tourism, we generate money from agriculture cattle farming.
    - Government must take responsibility for the free roaming elephants; they say that is their property so they must be responsible for them. Now we are left alone with no commitment from MEFT.
    - Trophy hunting should be allowed for problem elephants so we can get some compensation for our expenses. The permits must be lodged easier and quicker to solve the problem.
    - Where possible electric fences should be put up in areas where they come out of the conservancy so that they can stay in conservancies.

- Minimize the number of elephants. Elephants are feeding from the big trees, and big trees are not so common in the west of the country, so destroying their habitat and moving on inland. A proper aerial count of elephants should be done and then reduce them to an environmentally sustainable number. From the meat government can make bully beef through Meatco to feed the nation as in the eighties.
- Government must do their jobs properly for example as mentioned in the meeting at Omatjete, they tagged two elephants in Ugab to warn people where they are roaming but up to now, we got no information from MEFT where they are roaming. Now they want more funds for tagging more elephants, but the first tagging brought us nowhere. First get the system going.
- The country cannot afford that elephants interfering with commercial farming. There are lot of farms out of production and some are scaling down of production due to elephant problems.
- If there is no solution to get rid of the elephant government must refund us for the expenses of damages in a quick way.

- I hope the Government will take the responsibility of the elephants in near future and will assist us in this problem. We farmers have got big problems with elephants, it is not only as the warden mention the elephants only break the fences and that is no problem; we must live in future with them. That was what they mentioned at the beginning if they came to our farm, at this stage nobody coming even anymore.
- This year my expenses up to now as follows due to elephants:
  - Water dams N$ 80,000
  - 3m poles N$ 25,575
  - Normal poles N$ 15 000
  - Droppers N$ 9,430
  - Wire, work and overtime N$ 12,000
  - Gates N$ 5,600
  - Loss of 3 cattle to the value of N$ 26 500 due to broken border fences to communal land
  - Total expenses N$ 174,105 for losses in only this year
- Hopefully, there will be a solution for the commercial farmers. There are a lot of promises from the MEFT which never realize.
- 38 commercial farms south of the Ugab River up to Omatjete have been significantly damaged by elephants, the most severe damage has occurred on the farms closest to Omatjete.
- EHRA is sharing information on elephant movements with commercial farms.
- There is a problem with water in the conservancies and communal land in the area, so the elephants are forced to move onto our farms.
- The elephants are here to stay, they might move around and visit other areas, but they will always be around. Us, humans have to adapt to having them around us, as they will not adapt to us.
- Having said that, in order to minimize conflict, we have to ensure that there is sufficient water provision to the elephants. This is done by sustainably extracting water from boreholes (with solar energy) and providing suitable water troughs and also proper mitigation has to be implemented.
- MEFT cannot always be available to attend to reports of elephants at villages, some villages only report that elephants are in the vicinity and people are (understandably) scared of leaving their homesteads and or herd livestock, but the elephants are not causing any harm or damages.

- To address this issue, training and awareness need to be conducted in order for communities to be able to know how to handle such situations and react accordingly without MEFT intervention.
- If MEFT sends out staff to attend to HWC matters, it must be taken into consideration that staff needs to be paid DSA and overtime. This is very challenging, considering that the MEFT, is facing serious financial constraints regarding DSA, overtime and transport. In other words, when receiving a report, MEFT has to weigh the seriousness of the report received to the current financial situation of the MEFT and resources available and also other duties such as inspections, patrols etc.
- So in a perfect world, the MEFT should only attend to HWC reports where physical damage to property and/or injury or death to livestock and/or human injury and/or loss of human life has occurred.

## 2.3 Farmers Unions

***The three Namibian National Farmers Unions (NNFU, NAU and NECFU) submitted a paper titled 'Position on the draft elephant management plan', extending to 11 pages in the final version received after the national consultation meeting. The entire text is not repeated here and points made regarding regional actions proposed will be referenced in the operational elephant management plan.***

Livestock and crop farming are most people's main livelihood activity and farming in Namibia is not easy and profit margins are thin. The recent extended drought has decimated both wildlife and livestock numbers especially in the western and southern parts of the country. The drought has also affected elephant populations in the far western populations. Wildlife presents a good diversification option in Namibia especially given the severe climate change predictions for Namibia and the impact that this is expected to have on livestock and crop production. The successful devolution of rights to manage and benefit from wildlife in Namibia has resulted in more wildlife being found outside of Parks than inside parks. This success has been based on Namibia's sustainable use policies, strategies and regulations.

For wildlife to play a meaningful role the benefits from all wildlife, have to be FULLY realised and management rights and equitable benefits devolved to the local level. The underlying principle is that the benefits of living with wildlife must outweigh the costs of living with wildlife. Elephants have a very high cost attached to living with them and it is therefore critical that the principle of the benefits outweighing costs is applied fully to elephants. This is the basis of enabling and ensuring elephants can sustainably be kept outside of Parks in Namibia.

The negative impacts of living with elephants are however so high that these costs must first be mitigated effectively through outside funding, and the realisation of the full value of elephants will enable sustainability. The Farmers Unions covering the communal and title areas of the country are committed to wildlife and elephant conservation but this must be planned, negative impacts must be mitigated and the full sustainable economic value of wildlife and especially elephants must be realised. The current conservation success has already led to real challenges being experienced by farmers in the communal and title deed areas, who have decided to live with wildlife and elephants. In order to build on this conservation success, Namibia needs to carefully review the current situation and address key issues that affect continued local level support of elephants and wildlife, address inadequacies in the enabling environment and implementation to date and deal decisively with currently unresolvable conflicts that exist now. Current legislation that enables conditional rights of use and management in title deed and communal land to be devolved to the lowest level must be reviewed and strengthened to include the

ability to realise the full value of elephants and allow the control of all wildlife and elephant numbers and management. This strengthening will ensure that the current conservation successes in Namibia that have already received international recognition as a conservation success, will be consolidated and secured further.

Elephant numbers have increased threefold since independence and the range of elephants has expanded considerably outside of Protected Areas bringing elephants into contact with more people more frequently. The area where elephants expanded that are inhabited by people has increased by hundreds of thousands of ha in communal and title deed land. This expansion has happened in a largely unplanned manner exposing people to elephants who had not planned for this. The increase in numbers has resulted in new tensions in areas where commitments to wildlife and elephant conservation have been made in the past and elephants have also moved into areas that are totally unprepared socially and from an infrastructure perspective for living with elephants. Elephants are also moving in and out of intensively settled and cropped areas for example some areas north of Etosha National Park and the presence of elephants in these highly settled areas are totally incompatible with this land use. In addition, the current drought has made farmers financially very insecure and elephants have driven farmers beyond a tolerable threshold and pose a real threat to many farmers' livelihoods. To further compound this, elephants breaking through the Veterinary Cordon Fence (VCF) threaten international trade agreements. Many livelihoods south and north of the VCF are at risk because of the impact of elephants. The following recommendations made by the Namibian Farmers Unions are to ensure that the current elephant management plan addresses key issues to avoid an unfolding elephant conservation disaster in Namibia and ensure elephants become a valued resource for land managers in future.

Farmers in the western parts of Namibia in communal and title deed land are experiencing more frequent and more severe droughts. This is largely as a result of poor rangeland management and is exacerbated by climate change. The impact of climate change in the western parts of Namibia is expected to be severe and all farmers need to be prepared for this. The diversification into well managed wildlife with tourism and elephants can be an important part of the long term strategy of farmers in all western parts of the elephant range. All farmers whether communal or title deed need to adopt regenerative grazing planning – where well managed ruminants will regenerate the landscape, increase biodiversity and increase primary production of forage for all animals. All farmers must apply the principles or practices included in the Revised National Rangeland Strategy (2019) if they are to sustain domestic stock with or without wildlife and elephants.

The Elephant Management plan must start with a review of the present situation in communal and title deed areas and explicitly state that the management plan is as much about elephants as it is about people, biodiversity, livelihoods and economics. People will decide the future distribution as well as limits of behaviour irrespective of the current elephant distribution. It is critical that the full value of elephants is realised and that the ability to manage elephants sustainably at the local level is enabled. With this in mind, each management plan must evaluate six criteria and zone each area appropriately:

1. Where elephants are totally incompatible with land use (e.g. intensively cropped and highly settled areas), elephants must be totally excluded from these areas and a zero tolerance policy established. Elephants moving into these areas and causing damage will result in the farmer being fully compensated if all agreed management criteria are in place.

2. Where elephants have been resident for years but the numbers have increased and /or the frequency and intensity of interaction has increased a review of mitigation measures is required to enable farmers' lives to improve through diversification of economic options. The development

of management zones and the ability to enforce these management zones will be critical. The concept of securing grazing areas for livestock that also act as core wildlife areas and corridors needs to be pursued. Within these management areas elephants' behaviour and movement will be restricted (for example they must be kept out of small scale gardens, outside of homestead fenced areas). Elephants must learn where they are allowed and where they are not allowed. Full compensation will be paid for elephant damage if all agreed management criteria have been applied.

3. Where elephants have moved into areas and the infrastructure is not compatible with elephants and/or people are not used to living with elephants – in these areas a consolidation process needs to take place –where the range of elephants is reduced to where they can be accommodated now, buffer zones established around the consolidated area and the incremental expansion of elephants facilitated in a planned manner. Expansion will be enabled by first putting mitigation measures in place and then the range of elephants is allowed to expand. Zero tolerance of elephants outside the buffer zones will be exercised outside of the buffer zone and full compensation paid within buffer zones.

4. Where elephants are breaking through the veterinary cordon fences and threatening the livestock industry immediate action is required to address this issue and full compensation will be paid to farmers provided agreed management criteria have been applied.

5. Farmers in the communal and title deed areas receive payments from national schemes that reward farmers living with elephants for pre-set actions and outcomes. A real opportunity presents itself where farmers' lives must be improved by having elephants. Here elephant funds must contribute to the rebuilding of farmers core livelihoods and elephant funds could be used to purchase livestock that must be regeneratively grazed as per the plan to improve the resource base.

6. All elephant plans will include a regenerative grazing plan to improve the resource base, improve biodiversity and improve productivity and secure elephants, game and/or livestock in these areas. A regenerative grazing plan will include the ability to manage time and numbers of all animals including elephants in relation to available resources, especially water. This management will ensure that the carrying capacity of elephants for a given area is maintained to ensure the resource base is not damaged over the long term.

In order for this to work there are a number of enablers that are pre-requisites for this plan to be mobilised and these are: the management of elephants must be devolved to the lowest management level; the full value of elephants must be achieved and mitigation measures must be paid for by outside funding to make this economically viable.

The Farmers Unions want the following actions to be taken to rectify this situation:

1. The management of elephants is actively enabled by:
    a. First and foremost ensuring that the real value of elephants is realised and that management and benefits are devolved to the lowest possible management level in title deed and communal areas. This will include addressing international trade agreements, the strengthening of communal conservancy legislation, the review and re-introduction of appropriately strengthened commercial conservancies. Whilst Commercial Conservancies are being enabled management must be devolved to farmer led entities that can include Regional and sub-

Regional Management Committees or title deed farmers. All stakeholders such as MEFT, DVS, DAPEES etc must be on these regional and sub regional units but the initiative must be led and driven by organised farmer groups recognised under this elephant management plan. Without this step all further efforts will not be sustainable. Local level management must include the ability to manage numbers of elephants (carrying capacity) and all animals and control the timing of utilisation to ensure a regenerative grazing/ browsing plan is in place that ensures long term sustainability.

b. Mitigating the cost of living with elephants in communal and title deed areas will require extensive funds from outside sources to offset the high costs of living with elephants to be raised.

3. The presence of elephants is actively prevented/ discouraged in areas where unresolvable conflicts exist (crop farming areas or highly settled areas or homesteads) and / or preparations for living with elephants are not in place (some communal and title deed areas). These zones will be outlined in the communal or title deed conservancy management plan. Elephants will not be entertained where they are not wanted. These elephants will need to be effectively stopped, contained, moved or utilised.

4. Elephant behaviour also needs to be addressed where they are wanted and boundaries re-established between elephants and humans. For example where elephants are wanted and a management plan is in place, elephant movement and behaviour must be restricted. It is unacceptable that elephants feel at home in settlements, farmsteads or drink water or take animal feed through a window of a home while people are inside. Elephants without boundaries will lead to the need to take more severe action in future. These limitations need to be established in all areas.

5. The effective implementation of 1, 2 and 3 above will restrict the number of HWC incidents and enable full and market related compensation to be paid to farmers for damage caused by elephants. Living with elephants must be a benefit and not a burden.

6. Elephants must help rebuild farmer's economy after the drought and during the Covid restrictions – which have put many farmers on their knees. This will include assistance with re-stocking of livestock provided regenerative rangeland management principles are applied as well as support to other main livelihood activities and diversification of livelihood incomes.

7. Regenerative rangeland management practices must be introduced wherever elephants are and be compulsory to receiving the benefits of mitigation and financial benefits from elephants. Elephants must incentivise good management that results in improved resource base and improved biodiversity and resilience.

8. Where international trade agreements are threatened by elephants breaking through the veterinary cordon fence, immediate and decisive action needs to be taken to enforce the law and secure livelihoods.

It is proposed that in order for this to be achieved a set of operational principles and actions with enabling processes be adopted that will guide the development of local level solutions.

The Unions propose a Vision for elephants in Namibia that is positive but at the same time restricts where elephants can be at a given point in time and that detailed planning and implementation of effective plans must be done to mitigate the impacts of living with elephants:

**Vision**

The Namibian elephant population is a positive resource to people living with elephants and that:

- elephants contribute significantly to the land users' prosperity and quality of life
- the elephant population is allowed to expand to new areas and connectivity is established provided this is done in a planned and consultative manner that adds value to local farmers lives
- the management of elephants promotes regenerative farming practices and that elephants become an effective mechanism for mitigating the negative impacts of climate change.
- where elephants are incompatible with livelihoods they will not be tolerated, and effective and timely measures are implemented to keep elephants out of these areas.

In order to achieve this vision, the Farmers Unions propose a number of principles and actions that need to be taken in the long-term interests of people, the environment and elephants in Namibia.

The Famers Unions recommend the following principles, key actions and timeframes:

| Principles | Actions to be taken | Timeframe |
|---|---|---|
| Farmers or farmer groups access to elephant mitigation, compensation, benefits and enabling environment must be the same throughout the country. | • Ensure that communal and title deed farmers and farmer groups have the same access to all benefits and mitigation measures raised in the management plan. | Now onwards |
| Enabling incentives and mitigation measures will be developed to maximize sustainable income sources from elephants and reduce costs for communal and title deed land. | • Rights of management and sustainable use of elephants and other game devolved to the lowest management level. This will ensure optimal benefits from elephants.<br>• Rights of management devolved and use options expanded to realize the sustainable real potential value of elephants.<br>• Devolved rights of management of elephants enable control of elephant numbers, implementation of regenerative grazing/browsing plans taking into account limited resources such as water. | Early 2021<br>Early 2021 |
| Where international trade commitments are threatened and GRN responsibility is not being carried out – immediate action must be taken to secure these priority VCF areas. | • Rights of control of elephants in 'no go' areas to be devolved to the lowest management level (e.g. Title Deed farmer level). This will include the shooting of elephants that breach the VCF in identified priority areas | 2020 by urgent directive |
| Where elephants are present and not compatible with land use (e.g. cropping areas and areas where infrastructure and management is not compatible with elephants) then measures must be put in place to stop this movement into these areas effectively and / or remove elephants if no alternate solution can be found. | • Devolve management to local level to stop movement into incompatible zones.<br>• Capture and move or sell elephants by MEFT.<br>• Shoot elephants at the local level and utilize elephants.<br>• Full, fair and market related compensation paid for damages caused by elephants moving into unwanted areas. | Early 2021 |

| Principles | Actions to be taken | Timeframe |
|---|---|---|
| Where elephants are present and compatible, and agreements are in place to manage elephants – the current situation must be reviewed and provide agreed mitigation measures and ensure maximum sustainable benefits go to landowner/ holder or groups. Farmer management groups as defined should form the basis of this. | • Raise funds for national review of needs per area<br>• Raise funds for implementation of mitigation measures<br>• Ensure benefits are sustainably maximized.<br>• Control elephants at the local level and set limits to where they can go, including shooting elephants where needed.<br>• Full, fair and market related compensation paid for damages caused by elephants moving into unwanted areas within broader approved areas. | 2020<br>Mid 2021<br>2022 |
| Plans to expand the range and connectivity of elephants must be planned through consultation, funds raised, and mitigation implemented and then embarked upon. Farmer management groups as defined should form the basis of this. | • Develop plans in consultation with farmers / farmer groups with agreed mitigation measures and benefits<br>• Implement mitigation measures and then execute plans.<br>• Full, fair and market related compensation paid for damages caused by elephants moving outside of corridors. | 2022<br>2023<br>2024 |
| Elephants' respect for humans needs to be restored and their movement and behavior limited. Elephants must accommodate people's needs not the other way around | • Work with the intelligence of elephants for them to learn what is acceptable and what is not.<br>• This must be done at the local management level | 2021 |
| All fund-raising options must be embarked upon by various stakeholders to achieve these ends. | • identify local funding options including GPTF and EIF<br>• identify other private local and international sources of funding<br>• enable management units to raise funds enabled by this plan.<br>• establish enabling mechanisms for funding to flow to priorities enabled by this plan. | 2021 |
| Create synergies and linkages with other land practices but most importantly regenerative rangeland management practices. These practices are required in all areas including parks to improve the resource base and increase the biodiversity, sustainable stocking rates as well as resilience of the Namibian landscape. | • Parks investigate and implement regenerative rangeland management practices<br>• Regenerative rangeland management becomes a compulsory part of every elephant management plan.<br>• Elephants must also be a part of the regenerative grazing plan as they can have very negative long term impacts on the environment | 2022<br>2021 |
| MEFT plays an enabling rather than a controlling role | • MEFT to create the enabling environment for success of the environment, wildlife and elephant sector. | 2021 |
| The private sector and landowners lead this process with technical support and guidance from the MEFT | • Identify and enable all sustainable elephant benefits | 2021 |

Photo A. Cilliers

## 2.4 Conservation organizations and CBNRM support organizations

### *Co-existence with elephants*

- On the global stage and when compared to other animals (e.g. cattle), elephant are actually very rare. Rarity can be exploited for economic gain and in this regard, elephant can potentially be one of Namibia's competitive advantages in the world. The elephant management plan should accommodate different scales – local, regional, national – but should also look at the global scale – and what Namibia's population means globally – and Namibia's competitive advantage – where other parts of Africa the available range is systematically contracting into protected areas only – in Namibia there is still scope for open landscapes beyond protected areas – which will become more valuable as time goes on.
- Africa's competitive advantage lies in the wildlife – that nobody else has – and within Africa – Namibia is well positioned – as no other country in Africa has the open landscapes for wildlife that Namibia has, or the necessary legislation.
- It will be important for the management plan to show the existing and potential economic value through tourism, hunting, meat, products, existence etc. in order to unlock a wildlife economy. It would be helpful to have some scenario planning to demonstrate competitive advantage 30-40 years from now. With climate change wildlife in Namibia will become increasingly valuable and important and Namibia will increasingly get more of the market share.
- Costs from elephants are a small percentage of the benefits.
- Revenues earned from elephant hunting are essential and irreplaceable for conservancy operational costs and rural development programmes.

- Elephants are valuable resources that can earn more income to communities than any other form of land use.
- There has to be a common vision across government – including all relevant Ministries, NPC etc. Elephants are the milk cows – but it is actually about all wildlife.
- Integrating cross Ministry/Directorates at senior and middle-level management, exposing them to the issues and advocating the avoidance of working in silos. A far greater holistic approach is needed. Ministry(s) of Finance and Economic Planning are crucially important. Scenario approach of long-term economic value is needed.
- Political understanding of the importance of Namibia in the continental context – Namibia's approach to elephant conservation – the challenge is how to pitch it to the highest level to create the understanding and buy-in – can it be linked to climate change / the need for increased food / jobs / the economic value of tourism, hunting – realization that changes are happening and these species can offer a more viable and sustainable alternative.
- Not enough is being done to unlock the full potential economic value from elephants, not just in terms of the existing economies of sustainable consumptive use and tourism, but also exploring opportunities in the new economy e.g. payments for ecological services.
- Elephants must be seen as valuable to people as the basis of a co-existence arrangement on communal land outside protected areas or else people will not tolerate them.
- Ultimately, the potential elephant population will depend on how well we deal with people and elephants, regardless of whether there are too many or too few.
- If there is no proprietorship of elephants, there will be less tolerance.
- There is a strong cultural attachment to elephants, but conflict has to be managed.
- People in conservancies generally have a sense of ownership over elephants. There is a lot of appreciation, especially amongst older people, that wildlife has come back. There is actually a high level of tolerance.
- People are proud of elephants. Several conservancies have included elephants in their conservancy names e.g. Ondjou and ≠Khoadi-//Hôas, despite the havoc caused by elephants.
- Especially in Zambezi Region, benefits from elephants to people need to be increased.
- There is no internal equity, some people carry a higher share of the damage but get no higher income.
- There is very negative discourse about elephants in rural areas. It is all about conflict, we need change this to value.
- There is far less animosity towards elephants compared to the 1990s. There has been a remarkable change in attitude, conservancies have created social empowerment. There is greater animosity and anger where CBNRM is not working.
- People generally don't like elephants – but some people in these communities appreciate their potential value in terms of income generation through hunting – but they need to convince the rest of the community to register a conservancy in order to unlock this value but meet resistance because of the incorrect perception that conservancies 'bring' elephant. Need to explain that conservancies don't 'bring' elephant (they are already there) but rather allow communities to manage and benefit from elephant. At the same time need to find means to reduce costs of living with elephant.

- There is not enough viable wildlife-based income to offset losses and damages.
- People have a love-hate relationship with elephants. It all depends whether elephants bring income and whether people see elephant as a benefit or not. Even if there is no benefit now, people expect that in future.
- People think of elephants as belonging to government and not them. We need to make them believe that the elephants are theirs, like rhinos.
- Frustrated farmers want elephants to be reduced, especially those who plant and irrigate.
- In the North West there is so much goodwill towards elephants but I hate the fact that we cannot do more when elephants destroy livelihoods. In the North East there is also much goodwill, there are more elephants and more support from MEFT, and more benefits from elephants.
- In the North Central people have accepted to live with wildlife but tangible benefits need to be given.
- Community engagement through awareness creation, communication and consultation is needed as well as better understanding the views of local people towards elephants, followed by needs-based awareness creation, training and education.
- Building the local economy and adding value through tourism is needed. Tourism industry stakeholders are interested in guided excursions and viewpoints to enhance elephant sightings at waterpoints. IRDNC is developing a Highlands Tourism Development Plan aimed at low impact tourism linking caves, campsites and elephant in tourism routes to improve local development and well-being. Training of Community Game Guards is needed so they can become guides for elephant tourism, which would also generate other much-needed jobs.
- Land use planning approaches are needed to address:
    - Improved collective decision making – create a platform for the collective to have a say in decisions. If decision making is more inclusive, this could help individuals to feel part of the process.
    - Not enough emphasis is put on the cultural value of the wildlife / elephants.
    - If economic value is reduced, it will be even more difficult – and vice versa if economic value increases.
    - Aim to increase collective value and minimize individual costs but understand individual costs better as these are the households which will take up land for example in corridors and increasingly alienate both themselves and others from wildlife.
    - Pride can play a role as well – so how do we harness the pride in what conservancies have achieved – not only at conservancy level, but also at national (political) level?
- Ministry of Education doesn't do enough in rural areas. Rural people still don't understand elephants. We need a campaign, like we did with rhinos.
- MAWLR officials are talking down conservancies at conservancy AGMs.
- Elephant conservation should be guided by socio-economic issues. Even internationally elephant conservation is not driven by science, just see what happens at CITES.
- Conservancies must diversify and not only depend on wildlife or elephants. Conservation agriculture needs more effort by MAWLR. MAWLR does no proper planning with projects.
- We need a livelihood focus in CBNRM and enterprise development. Wildlife is the most viable form of land use; agriculture has declining prospects.
- Perhaps we need small scale domestication of elephants so that people can better understand them.

### *Numbers of elephants*

- In terms of habitat availability there are not too many elephants; in terms of social carrying capacity, there are too many elephants.
- There is local overpopulation but not at national level. Good management can support more elephants.
- There aren't too many elephants in Namibia.
- People do not perceive elephants as being too many since CBNRM started. Elephant numbers have increased since CBNRM started.
- Much depends on the situation/point of view, on whether elephants are considered too many or not – for example, their economic value. Actually, if the full economic potential can be realized, there could be even more elephants (and less cattle). Within existing elephant range where elephant numbers are currently high, there needs to be consideration with regard to the full range of biodiversity conserved which implies a "lower" density of elephants or a "camera-based" higher elephant density that foreign visitors want together with their strong protectionist values, but which may not be compatible with biodiversity conservation.
- Whether there are too many elephants in Namibia depends on the capacity of the country. What is that capacity? Perhaps there are too many in the North East. In the North West there is still lots of space but better management is needed. There is lots of interest and goodwill in the North West but conservancies don't have good structures or do not use them or follow-up on issues or lack capacity or strategies.
- People in the Ugab area feel there are too many elephants although they only have a very small group of elephants. These people are not used to elephants. We (NGOs and MEFT) have not been able to engage them strategically, no wonder they are against elephants.
- There are too many in Kunene Region, possibly also in Zambezi but there is dispersal to other countries. New roads in Zambezi Region are displacing elephants, e.g. in Sikunga Conservancy.
- We need better numbers (more surveys).
- Kunene Region still has space for more elephants, they are dispersing into the eastern highlands. We need more research on this.
- There should be a decision-making process rather than a single solution – as options will differ from place to place.
- It is important to put the correct information about elephant numbers out. Wrong figures are being used wildly.

### *Human-elephant conflict*

- There isn't a single view on conflict – it depends on who is asked, whether a farmer, a committee member, someone employed within the conservancy etc. It is important to recognize that many non-conservancy primarily livestock farmers in Zambezi and no doubt Kavango, are not wildlife lovers – elephants destroy crops, granaries (and water supplies in NW Kunene) and predators kill livestock. Perceptions and facts need to be separated out. The "Big Five" (elephant, lion, leopard, buffalo, rhino) are also psychologically damaging but the impacts of the "Small Five" (birds, monkeys/baboons, insects, rodents, locusts etc.) are rarely recognized.

- Individuals are carrying the costs, whilst the benefits are collective. Very important to recognize and understand this distinction and how best to deal with it.
- The offset payment system is generally not working because the panels are not meeting, claims are not being dealt with or consistently handled, funds are limited, and there is a lack of motivation and negative attitudes amongst the members.
- Some conservancies have a human-elephant conflict fund, claims are decided by a panel. N$100,000 is paid for a human death; nothing for cattle killed; N$ 800-1,000 per hectare of crops damaged. Non-members of the conservancies claim but are not covered by the fund.
- Implementation of the offset system needs to be improved. It is not efficient and not meaningful to people. Do away with the GPTF contribution, conservancies that can afford it must pay the cost of offsetting damages. Equity in conservancies is important, those members who are impacted by wildlife needs to proportionally benefit more than other members.
- Elephants are monocot (grass) feeders but change to dicots (trees and shrubs) when monocots are not available. People leave maize in the fields to dry, can the cobs not be removed earlier and dried in a safe place?
- Crop fields closest to elephant movement corridors need to get priority protection.
- Gardens less than 1 ha do not qualify for offset payments.
- A single high electric wire is enough to keep elephants out of crop fields. Bigger electric fences failed when previously tried. People use chili bombs, sleep in the fields, fire shots, use vuvuzelas. Not sure how effective these are.
- MEFT has to always show care, this is very important. A culture of care is needed. Are the MEFT staff aware of that? What support is given to MEFT field staff? They have an impossible task. Do they have the right people for this?
- Why is a food bank approach not used instead of the offset scheme? If people lose crops, replace that with maize meal or whatever was lost, not money. This may be prone to corruption and will need skills and resources but there are organizations that can provide such support.
- We must prioritize the high-risk areas.
- People need training in mitigating elephant impacts. This needs constant engagement.
- A kit for small farmers consisting of an electric fence and a storage bin for crop products is a good idea.
- All aspects of the offset payment system must be improved. It is very important that infrastructure such as water installations should be covered. Small gardens are not covered, yet these are very important to people in the North West. Communities are confused about the system, it needs to be clarified what is covered and what not, e.g. some think loss of human life is not covered. The human wildlife conflict policy is not working properly, claims are not processed.
- Field presence must be increased. A rapid reaction team will go a long way to address the conflict problem.
- Protection of waterpoints against elephants is good, but the walls must not be too high. There must always be access to water for the calves. There are very good examples of well-designed and protected waterpoints, including some done by MEFT and NGOs. MEFT should work on a model design that can be shared with conservancies so that more waterpoints can be protected.

- Land use planning and hunting are solutions. Land use planning however is not being implemented correctly – plans are not adhered to – how can one improve this? By recognition of wildlife zones (proclamation)? Would this give a stronger legal basis? The enforcement of land-use plans is the central problem and this is actually beyond the powers of the conservancies, and probably even the MEFT. The enforcement powers need to hold all stakeholders accountable including traditional authorities, conservancies and in particular other line ministries.
- Enforcement and incentives are needed.
- Water protection works (in the North West and Nyae Nyae this has been very effective) but is not a cure all. We need to provide other water for livestock and humans and cover the costs of pumping water for elephants.
- Zonation (land-use planning) to separate elephants from those human activities that conflict with animals - ultimately this should lead to increased urbanization in combination with more permanent, distinct and highly protected cropland areas
- We need to look more creatively around using a collective combination of various disturbance mechanisms to (e.g. hunting, culling, electric fencing, chasing, etc.) to displace elephants away from croplands or where elephants are not wanted. The displacement effect of hunting helps.
- Electric fences have been tried but there are problems of maintenance. Management and effort outweigh perceived cost of losses. Electric fences could be used in conjunction with conservation agriculture which reduces size of fields required and the requirement to move fields. It allows for clustering of fields and collective protection. Chief Mayuni has been asking for this.
- Could fencing be used as a "service" provided by MET – to deflect elephants? Sometimes even a solid fence could be used for this. There are different ways that electric fencing could be used, keeping also in mind that in the case of field cropping, this would only be needed for a short time of the year.
- Early planning and harvesting reduce conflict – when crops are harvested when surrounding areas are still green – but this not always possible due to climate and rainfall.
- Can more be done using animal behaviour (e.g. the work done by Flip (Stander) with lions). Telemetry shows that elephants avoid some areas – do we understand why and can this be used to reduce conflict / influence elephant behaviour? Virtual fences may also be an option.
- Lethal problem animal control can still work effectively if done correctly – it can have the same disturbance effect than culling, chasing, shooting at – it must be part of a decision-making process – which should be included in the plan. The problem nowadays is that everyone is scared of shooting an elephant for fear of incurring the wrath of all the protectionists, but experience has shown properly done, PAC can work. In Zimbabwe elephants were kept off and behind tsetse game control fences through shooting (and learning – although some will say not).
- Capacity within MET is needed for proper PAC – must be institutionalized but great care and caution must be taken if it is to be institutionalized and can be the start of a slippery slope downhill.
- Declared problem animals should not be trophy hunted. This has created too many problems and can lead to reputational damage, although it was previously felt it was a way to maximize income. This does not necessarily mean that the PH cannot help in the shooting – but not with a client and not as a trophy.
- PES or wildlife credits payments play an increasing role but can't depend on hunting and tourism alone. We need to increase returns and consider conservancies that do not have hunting or tourism

– but have elephants. There is still scepticism about the ability to find willing payers, but it has to be tried, the right formula or pitch will need to be found. If we can get exclusive wildlife zones or corridors registered or gazetted (legally proclaimed), wildlife credits could be linked to size (e.g. an amount per annum per ha to keep the zone exclusive for wildlife). It will be very good if this approach is included as an option in the management plan.

- We need a feasibility study on PES. We need to pay for the sanctuary status of the dry rivers which are the lifelines of both elephants and people. WWF is currently doing a study to try to understand why it is difficult to get payments for ecosystem services and what will facilitate this long-term significant funding.
- Regarding the offsets or self-reliance scheme there is currently no consistent arrangement of dealing with the GPTF payments and any conservancy contribution is very difficult to reconcile especially as conservancy contributions are currently considered voluntary.
- Conservancy contribution (match funding) should be a condition for conservancies that have concessions (both hunting and tourism) but which can be exempted in conservancies where income is still low (based on clear criteria).
- The offsets or self-reliance scheme needs to have a good accounting mechanism. One way would be to have a standard register for all HWC incidents, that includes details of conflict, and any payments made – with separate columns of payments from the GPTF money, and payments from the conservancy. Conservancies can choose to either top up payments or pay for damage other than by species covered by the HWC policy or pay out if there is a delay in MEFT doing an inspection.
- Offsets for loss of life must just be paid by MEFT (GPTF).
- There could still be a role for insurance, but there seems to be no appetite at this time.
- MEFT personnel need training in conflict situations e.g. when a person is killed by an elephant. How are they supposed to handle such situations?

### *Elephant management and monitoring*

- A multi-pronged approach is needed (for the increasing elephant population) involving land use planning, protection of corridors, protecting people's resources, cropping of elephants, hunting.
- Improved knowledge through monitoring and research is needed to increase our knowledge of the elephant population, its numbers, herds, movements, needs and requirements.
- Hotspot areas in conservancies (e.g. corridors, areas near parks) need to be treated differently from other areas. A recipe is needed: in key villages, ensure that there is a waterpoint for elephants 300-400 m away from the village; water installations must be protected against elephant, first provide water to elephants, then to people; there must always be water available for elephants; in the conservancy there should be two or three waterpoints set up like that; fodder banks must be kept outside houses, include these in the protection walls for water installations or used raised platforms made of metal. In crop farming areas, elephant corridors must be kept open; fields must be clumped together and fenced off, but understanding that there is cultural opposition to this; chili bombs must be used; other deterrents like bees, drones (which sound like bees), and in areas where bees don't do well, use a loudspeaker playing bee or drone sounds; introduce conservation agriculture to reduce slash and burn farming destroying elephant habitat; fences must be maintained to avoid fence habituation. This needs to be done for all hotspots, taking into account elephant routes.

- At KAZA TFCA level the need has already been highlighted to identify where we can expect elephants to be, and where not, and to know if we have enough areas now in place and if we need to focus on certain areas. This work needs to be accelerated and driven as much as possible by the partner countries themselves rather than NGO outsiders although NGOs have an important technical role. The Strategic Framework for the Conservation and Management of KAZA's Elephants speaks to this, e.g. Objective 1 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" but the time for speaking is over and action is urgently needed.
- Land-use planning needs to be more opportunistic in terms of unlocking the economic potential from a wildlife economy and more proactive in terms of promoting urbanization for more efficient delivery of social services whilst at the same time reducing human elephant conflict.
- It should be possible to develop maps showing the potential dispersal areas, and within these the areas that are secured (e.g. protected areas), and the areas that will require a specific strategy to secure (wildlife zones in conservancies, communal areas outside conservancies). KEWG is working with the Secretariat to do just this across the KAZA landscape but individual country efforts need to be "nested" within the larger landscape. Namibia elephant management plan should do this at the WDA level within the country as WDAs are themselves transboundary.
- In Zambezi there is still potential for some new conservancies.
- The importance of the Namibia component of KAZA TFCA needs to be highlighted.
- We need to look at the regional land use plans to see where these support potential wildlife areas or corridors and where land-use already to a large extent excludes opportunity for wildlife. Local level planning as done with Lexus in the Botswana Panhandle and the Namibian regional land use plans need to be nested to avoid conflict situations arising.
- Strategies to secure the WDA can include conservancies and the use of the "protective landscape" category of protected area option within the new Bill.
- A systems approach is needed in place of current weak management. This needs to be incentivized, e.g. to adopt electric fences; irrigation for vegetable gardens can be offered; minimum tillage has many benefits and four to six times higher crop production. A GEF project is needed for this.
- Elephants in different areas must be treated differently, e.g. the North East vs. the rest. In small populations every individual is important.
- Management options should be:
- Keep movement corridors as open as possible.
- Displacement culls/hunts – with the prime objective of moving them away.
- Utilization of breeding groups – some reduction of numbers locally whilst unlocking benefits through food security and products. Capture and relocation (this will not reduce sufficient numbers) but give people a warm fuzzy feeling and offset the negative publicity around lethal control measures (and have the spin-off of starting new populations in other countries giving Namibia international kudos, and re-establishing local ecological processes in those countries).
- Water restriction to reduce breeding rates and to 'move' elephant across the landscape.
- Elephant populations need to be managed, culled, meat used, hunting for trophies and as a last resort contraception. Don't reduce the elephants in Kunene Region but find a way to make them meaningful.

The pumping of water is a big issue, the diesel pumps must be replaced with solar. We need a Green Climate Fund project on this.

- Not enough is done about using water as a management tool – currently the risk is that if more and more water is provided, then it exacerbates the problem. So water management is very important – rather allow elephants to die naturally and collect the products. Water is one of the few tools at our disposal for managing elephants in dry to arid savannas. The strong counter-argument to culling is to manage elephants in space – keep them moving – water can do this.
- MEFT needs to recognize conservancies as partners in elephant conservation. The CBNRM programme portrays that wildlife belongs to the people but MEFT and government actions shows this to be untrue. Local people are not consulted and are not equal partners. MEFT has become so focused on compliance by conservancies to the rules that it misses the plot on other things, e.g. quotas. MEFT needs a more targeted approach where the compliance problems are addressed rather than treat all conservancies the same. This reinforces the idea that conservancies have no power and no ownership.
- Capacity of MEFT at local level and in regional services is low. Local MEFT personnel don't understand their roles (in relation to conservancies and human wildlife conflict mitigation).
- MEFT needs to work more proactively with MAWLR (regarding land issues, settlement, rural water supply).
- Information flow between MEFT, partners and NGOs needs to be improved.
- Implementation of laws, policies and plans need to be improved. A more holistic approach is needed to harmonize plans vs. a sectoral approach.
- Better understanding is needed of the impact of natural features on elephant conservation e.g. drought and water resources.
- Event book monitoring of elephant conflicts is good but not perfect; claims do not match event book records.
- Tourism operators in conservancies need to change their attitudes. Operators who do not adhere to agreements with conservancies need to be closed down and MEFT and NTB need to enforce this. This has many ramifications for the stature of tourism as a preferred economic sector (the sustainability and socio-economic value of tourism). The tourism industry misses the big picture. They need to follow a wildlife economy approach. They need to invest in the resources and systems that their businesses depend on. They need to do much more than now. This applies to NWR too, they need to contribute to management costs of the parks.
- Conservancies do not benefit enough from tourism, both self-drive unregulated tourism and formal tourism operators. Conservancies are not paid for traversing their areas or camping in their areas.
- MEFT needs to encourage public-private partnerships in the funding and implementation of this elephant management plan. Plan to set up a vehicle to leverage funding. Private partners have funding but need to know if it will be used for the greater good.
- The NACSO approach to CBNRM is too narrow, it is necessary to support non-conventional approaches to conservancy livelihoods and conservation programmes, including farming.
- Elephant impact on other species is often ignored. There is too much focus on human-elephant conflict.
- There are young passionate people in the conservancy system. Strengthen the community component in elephant management and links between conservancies. Get people to work together, do joint patrols and counts, develop a common purpose.

- MEFT should strive for a better operational environment with conservancies and avoid a power relationship.
- About 90% of the park boundaries in Namibia now have wildlife friendly neighbours, this is hugely important, MEFT doesn't need to spend resources in defending park boundaries as in other countries.
- The tourism industry should do more and can provide more e.g. technical, logistical and material support.
- Tourism operations in parks including concessions must have the responsibility and obligation to contribute to park management, e.g. help to maintain fences, control fires etc.
- Rural populations are static or declining and exporting people to urban areas. In future we will only have 30% of the rural population that we have now.
- Strengthen collaboration amongst actors, create a team.
- Support a landscape approach to wildlife management, avoid fencing at all cost.
- MEFT needs more large mammal biologists. Monitoring and research on elephants are too ad hoc.
- More information is needed on cached ivory recovered, i.e. sex, age, size, origin. This information is not well-institutionalized.
- We need more information on elephant age structures and recruitment and more information on natural mortalities. MEFT staff need to be trained and equipped to do field diagnoses for e.g. anthrax.
- CBNRM and elephants are not prioritized by MEFT. MEFT core funding is a problem, same with NACSO. MEFT struggles to participate in joint activities, NGOs often have to pay travel costs. But it looks like NACSO is increasingly being bypassed and cut off from funding. MEFT needs to engage NACSO and clarify their role and enhance cooperation. MEFT should reprioritize CBNRM and elephant management.
- Elephant conservation and management is not the sole mandate of MEFT. Elephants are a major national asset. This must be a collective responsibility of all arms of government.
- It must be included in the duties of Governors and Regional Councils to protect our natural resources, including elephants. They cannot act as if there is only agriculture and infrastructure that matter.
- Conservation needs to be included in school curricula. People live amongst elephants in rural areas but know little about them. More environmental education centers are needed, each region needs at least one, each park should have at least one.
- More support, training and mentoring is needed for MEFT field staff in elephant areas. Many are inexperienced and young. MEFT presence in the large areas of the elephant distribution is very low, so even more important that people know their roles very well.
- Need to enact some form of land use planning that is actually adhered to and implemented, it must be cross sectoral that also incorporates local level perceptions and visions for their future.
- There should be an overarching vision on wildlife and tourism. We haven't used the KAZA treaty to leverage this enough – but at the same time the driver should be to use national legislation to achieve the outcomes (such as conservancies, protected landscapes, state forest etc.). Namibia needs to take the lead – and this elephant management plan can act as an example
- The State Forest issue has rolled on and on since at least 2011 and still remains unresolved. One has to ask why? The State Forest is pivotal to Zambezi and KAZA TFCA.

- The KAZA National Committee could play a greater role. This should be captured as part of management plan and operational plan. One problem is that MEFT (and other country wildlife authorities) have been unable to appoint individual(s) whose sole responsibility is TFCAs, and in turn specific TFCAs such as KAZA. So national priorities become more important than TFCA ones. Consequently representation at KAZA meeting is invariably someone else, although the MEFT is better than most of the others. Conversely DVS (Directorate of Veterinary Services) is abysmal.
- Recognize that elephants within KAZA TFCA area of Namibia are more than 50% of the national population.
- More could be done to bring the conservancy associations into the fold through more pro-active engagement. The Chairman's Forum is a good initiative and can be more effective in discussing key issues. We need to build capacity for regional conservancy associations and regional forums.
- Civil society needs to do more to organize themselves in order to act as a voice – and associations need to be more pro-active.
- The inter-ministerial national CBNRM forum needs to be revived – to nurture better collaboration and understanding between ministries.
- Civil society and governance and how can we collectively work with government to address the elephant issues can be addressed by creating a national focus on elephants which include NGOs. The Botswana Social Dialogue on elephants, hunting etc. was an important initiative, despite some mixed objectives, and is worth considering doing but much better so. See recommendations in Cumming and Jones (Cumming & Jones 2005). Create a platform to discuss wildlife economy and wildlife as a land use so long as it is a platform the common man can relate to.

### *Conservancy zonation and movement corridors*

- Conservancy zonation was very effective in the past, but encroachment of core wildlife areas has more recently occurred, by conservancy members and outsiders. Conservancies adhered to the zonation but traditional authorities have allocated land for farming in wildlife zones.
- It is very important to maintain elephant habitat, thus we need to deal with the encroachment and illegal grazing in core wildlife areas. Better monitoring of elephant mortality due to new settlers in core wildlife areas is needed, they could be poaching.
- There is no (or insufficient) connectivity between wildlife core areas in adjacent conservancies.
- There is no real difference between zones.
- Elephants are seen as a public international good. Who carries the cost of keeping corridors open? We need public international investment, and we need to ramp up PES systems. The current projects are too small-scale.
- The wildlife core area zonation is not working in Zambezi. The individual core areas are too small and not aligned with others. We need a landscape approach to zonation.
- We are working with conservancies in Zambezi Region to identify movement corridors, align zones better and develop new rules for utilization. Wildlife management and utilization plans are being revised. The highland conservancies in Kunene have agreed to rezone.
- Legal mechanisms to deal with invasions or illegal settlement are complex, expensive and take too long.

- Registering of land rights in core wildlife areas and corridors in Zambezi is becoming a problem. Conservancies should register such rights in their name.
- MEFT and NGOs have done a lot of work to identify elephant and other wildlife movement corridors and mechanisms to ensure their protection. There are self-developed rules at conservancy level enforced through traditional authorities and game guards.
- More funding is needed for many aspects of conservancy support but also corridor protection.
- In principle zonation does have enhanced value for wildlife, but there has been some erosion where people have encroached for settlement, cultivation and livestock, this includes both conservancy members and non-conservancy members.
- Although conservancies have a legal basis to control the use of zones, we need to strengthen this basis and its enforcement:
    - Pursue a formalization of the zones
    - Robust management plan
    - Review the position of the wildlife zones (for continuity and context to surrounding areas)
- Customary land rights were not considered in deciding on wildlife zones and are starting to create challenges. Conservancies are not clear in what rights they have. Some customary land right holders are starting to demand payments for access and utilization. Legislation or regulations are needed to clarify and address this. Clarity is needed on what the legal status of customary land rights within conservancies is.
- Commonage has good legislative recourse – for example settlement on commonage can be fined. The concept also allows for special status for specific uses (common good uses such as schools). Maybe this provides a mechanism for protecting corridors?
- More and more people are getting leaseholds for tourism in Zambezi.
- There has been a SEA in Zambezi but this is not being institutionalized.
- No real buy in at national level for tourism or wildlife industries, as demonstrated by initiatives such as the proposed trans-Caprivi link, the State Forest issues etc.
- Maintaining corridors and connectivity is becoming a growing issue, especially in Zambezi which is pivotal to KAZA, but how well aware people are of this is unknown.
- Collectively we (IRDNC, WWF) have made significant investments of time and funds over the past few years in very much process-oriented work towards identifying, establishing and attempting to "institutionalize" corridors at a community level, recognizing the long term maintenance of such corridors through human-occupied space is crucial to biological and ecological connectivity across the KAZA landscape. Our science-based connectivity work on collared elephant movements and "testing" identified corridor fidelity to such movement, e.g. work by Naidoo and others has also been an important component of our work, and reflects too, a considerable investment of time and financial resources.
- We seem to be facing growing resistance to the notion of corridors, even in space designated as wildlife zones, at least in some conservancies. Whilst excellent progress on guidelines, rules and procedures for corridors has been made, a perceived (and most likely real) lack of increased benefits, and often associated with HWC appears to be undermining our efforts.

- We are not focusing sufficiently on the underlying root causes of the problem. When for example, will benefits ever be sufficient? Will HWC ever cease to be a problem? I doubt never in both cases, as we are dealing with increasing demands on land (space) and the natural resources thereon (soil, water, vegetation, habitat) as a consequence of both growing elephant populations/numbers and more importantly growing human populations. Growing elephant numbers may also be an artefact of human growth and associated perceptions there are a lot more elephants, only because more and more people are bumping into them more frequently.
- Solutions to the problem is manifested in how to achieve co-existence if this is at all possible. A key objective of the emerging KAZA Elephant Conservation Planning Framework is to establish where elephants are likely to persist into the future – where will there be, and not be, elephants by 2050? Importantly, Zambezi in particular because of geography and connectivity across borders, is central to this.
- Perhaps we need to be considering community-based participatory future scenario planning exercises, and in so doing identify those critical corridors which are crucial to elephant (and other wildlife) connectivity, e.g. Sobbe and invest in really ensuring their long term security. The others may have to be lost, but that should be arrived at by an objective decision-making process, rather than by default which I fear is where we are heading presently.
- Many conservancies already operate in clusters, so zonation can be addressed at this cluster level.
- Conservancies north of Etosha, nothing is being done to capitalize on their position. Some progress with the joint venture partners but ideally more opportunities could be realized if the Etosha fence was effectively moved 20 km northwards – providing a buffer within which conservancies could benefit. Previous attempts to motivate this have been unsuccessful. An adaptive management approach should be taken and ideas such as this should be tried. Mechanisms can be put in place to allow for some benefit to MEFT as well.
- There will be willingness at a conservancy level to change zonation but the actual implementation will be dictated by persons on the ground who have existing rights in areas to be newly zoned, or those people who simply ignore the zonation. It will boil down to the matter of enforcement.
- Not all corridors have been mapped, we need more collared elephants.

### *Elephant hunting*

- Conservancies support hunting and are very dependent on income from hunting for conservancy operations and development projects.
- There is a false binary choice between hunting and other options.
- How hunting is portrayed is very important. Particular care is needed with hunting along the Chobe River. There cannot be conflicts with tourism or Botswana over hunting. Failure to attend to this will endanger the entire elephant management approach.
- We have the wrong spatial scale for elephant hunting, i.e. quotas per conservancy. We need quotas for larger areas and a benefit sharing system. We need functional management units for elephants.
- Elephants must never be shot out of a group. Cars must never be associated with hunting; this will affect tourism.

The relationship between hunting operators and conservancies is difficult to manage. There are over-expectations in MEFT and conservancies and NGOs about the earnings that are possible from hunting, and tourism.

- Quota setting timelines need to be adhered to – quotas should be available at least 6 months in advance. There must be a strong focus on adaptive management.
- Conservancies are aware that hunting quotas are limited to prevent that trophy sizes decline. There has been a lot of emphasis on this and training although it may not trickle down to all members. In the business planning process it was clear that conservancies understood that quotas will be going down so they have a sense about it. However, the institutional memory is with the committees, and new committees may not have received the same level of training.
- Revenue is very important, conservancies have fixed operating costs, so what buffer is there when quotas are reduced? People did understand that quotas for other wildlife had to be reduced because of the drought.
- Quotas should be linked to the biological status of the population, not income needs.
- It is important to consider not only conservation hunting but other offtakes such as PAC, illegal killing and own use. This is important, care must be taken that the other (albeit legitimate) offtakes do not affect trophy quality, especially PAC which has the habit of "running away".
- Maintaining of trophy quality is very important and must be part of the quota setting process.
- Quotas for elephants should be issued at 'population' or combined level – not individual conservancy level.
- Traditional authority quotas should be coming from protected areas, but what will be the response regarding traditional and cultural events when elephant, buffalo etc. are wanted?
- There is no reason that there should not be small "family group" offtake for providing meat where elephants are locally abundant, through formalized cropping.
- Consider harvesting elephants for meat from parks e.g. during droughts.

### *CITES, animal rights groups and anti-hunting campaigns*

- Trade restrictions should focus on problem countries, not well managed populations.
- Trade restrictions threaten our conservation model.
- Ivory originating from conservancies should be recorded as such and if there is a sale, proceeds of their ivory should go to conservancies. All monies from CAMPFIRE districts ivory as a result of the Zimbabwe one-off ivory sale in 1998 went directly back to those district and communities. It made a significant impact generating some US$750,000.

## 2.5 Hunting organization

***Note that a detailed written submission was received which is reflected below in paraphrased form. Other inputs made at two meetings are considered as covered by the written statement.***

- It is of utmost importance to define a minimum standard for trophy elephant that supports a sustainable utilization approach for the future. Trophy hunting cannot be used to manage animal populations for ecological objectives on its own but provides a major economic contribution.

- The most sensible criterium that can be used to justify the harvesting of an elephant for conservation or trophy hunting is only age.
- We propose a new minimum standard for elephant trophies that will meet three criteria: It must be science-based; We need to keep the export market open; we need to offer something that the client wants. Therefore a trophy to be exported may not be from an elephant with more than 25% of the molar tooth row occupied by Molar 5, thus an elephant of 39-40 years of age. All mandibles must be tagged with a metal tag and number, just like leopards. Once a trophy is harvested it must be reported to MEFT within 48h or 72h. The report-back must include photos and measurements of the mandible, head, tusks, ears and hind feet soles. This will also help with training (i.e. to have a record of morphological changes with age). There should be strict adherence and no tusk may be exported if the elephant was too young.
- We propose herewith a measurable unit to which harvested trophies can be tested: The ***total length in centimetres of the molar or combination of molars*** on one side of the lower mandible should be measured. To qualify as a trophy such animal should ***NOT have more than 25% of its M5 molar*** still in the lower mandible. Certain conditions as described below should be implemented for each trophy animal.
- On issuing an elephant trophy hunting permit the following must accompany such a permit as is the case for leopard trophy hunting permits and accompanying documents.
    - Metal tag with an individual number
    - Form to record scientific data (see the document compiled by the Big Game committee)
- Once the trophy elephant has been harvested, the following procedures must be followed and clear, well focused photos should accompany the permit return:
    - The harvested animal must be reported to MEFT permit office within 48 or 72 hrs.
    - One photo must be taken of the trophy animal after shooting and before skinning, showing the following:
        - full head,
        - trunk,
        - tusks, and
        - ears.
    - Photo showing each tusk of the trophy animal after shooting, before skinning and metal tag with tag number readable.
    - Photo showing the full sole of the back foot (cleaned from any mud or obstructions that will prevent seeing the details on the sole), with tape measure to indicate size and metal tag with tag number readable.
    - Photo showing the lower mandible, detached from the skull, soon after cutting it clean from all skin, meat and washed (free of blood and mud):
        - on which both molars are clearly visible,
        - metal tag with the tag number clearly visible, and
        - a measurement readable from the photo of the total molar length, to the closest centimetre.
- It is recommended that trophies not qualifying to the minimum standard as described above should not be exported from Namibia. Elephant trophy export should be handled in the same way as leopard trophies.

- On a minimum trophy size for elephant, we recommend and emphasize that stringent minimum requirements are needed to ensure that Namibia stays on the forefront of wildlife management. A new system based on science will be needed to ensure that our Namibian elephant trophies will be imported by other countries and earning the needed revenue to continue reinforcing acceptance from the people that live with these animals. It must be an implementable system that fits all regions of Namibia and could consist of phases to sensitize residents living with these animals.
- Conservancies have become accustomed and been made used to large incomes generated from trophy elephants. We have to keep in mind what will the effect be of a new stringent qualification system on local communities in Namibia currently benefiting and the people harvesting these animals:
    - Current high producing areas will be greatly affected negatively. From an information sharing meeting held by MET during 2019, while informing role players on the new elephant quota system that will be implemented from 2020, the MEFT CITES office presented information on the trend of elephant trophies that was hunted during the last 4-8 something years. It was astonishing how low the Zambezi regions average trophy quality has dropped over the last years.
    - Conservancies situated North of Etosha NP and the eastern Zambezi Region cannot really claim to have resident elephant populations and hunting elephants in these conservancies is more seasonal. Hunting in these regions is focused on problem or available animals currently moving through the area. Therefore, an extremely low trophy size is being recorded from that area.
    - From low trophy quality, one can conclude that the average age of trophy animals will be shockingly young. Meaning animals that have not even reaching breeding age are being harvested as trophies which totally goes against scientific acceptance for trophy hunting and sustainability.
    - Rectifying this problem will take some careful planning but will only be achieved in a couple of decades.
- By introducing radical minimum standards from one season to the next will create tremendous implementation and acceptance problems if suddenly only 5-10 % of the trophy elephant quota will be utilized by hunting outfitters.
    - Conservancies has become accustomed to cover huge salary and expense bills with income generated from trophy elephant hunting.
    - Elephants provide large quantities of meat to communities living with such elephants.
    - Conservancy hunting outfitters contracts have high percentages of elephant trophies on guarantee quotas.
- There are several professional hunters that got training and certified as professional hunter big game in the Zambezi Region over the last 10-15 years. They have little exposure to a more age-balanced elephant population. These professional hunters will need to be retrained and equipped with the necessary skills to judge according to the new requirements, leading to vastly improved big game professional hunters qualification systems.
- The new qualifying requirement as described above can only be measured and assessed for sure once the animal is dead. Judging an animal before shooting it according to it being "very big, tower over largest females by three feet or more at shoulder; neck thick; overall body heavy set; tusks circumference at lip strikingly greater than younger males" and other physical appearance, stays appearances and nothing measurable. With leopard you have a male with testes, not always easy to see but visible most of the time. Elephant on the contrary only offers appearance.

- Cattle and people in hunting zones - it is of utmost importance that we not only protect the sustainability of all species, but also Namibia's hunting image and to conserve habitat for all species. We advocate our beautiful and untouched wilderness, but everywhere cattle are grazing and people collecting wood, fishing and wandering in hunting zones and national parks. This has a negative impact on the hunting image by international clientele. The management plan must also include and envision the longevity of using these natural resources to the best of our ability and also means to protect the Namibian hunting culture.
- Taking the challenges (as listed above) of implementing a new strict age-based trophy qualification into consideration, we conclude that we must think of an alternative to the current trophy harvesting system for certain areas within Namibia. Under the topic "Non-Trophy Animals" below, we divided Namibia into distinct different elephant population groups. Currently the conservancies east of the Kwando River has a high trophy elephant quota but is also one of the areas / population groups where way to young elephants are being harvested as trophies. Please see "Other Harvesting Options" below.
- On non-trophy animals, also known as "own use" or "traditional authority" animals. It is proposed that a fitting name be found for non-trophy or cull hunts.
- Non-trophy elephant by definition should be:
- males: all of the below:
    - with molar M6 in full use and no part of molar M5 remaining.
    - tusks must have been broken or the heaviest tusk must weigh less than 30lbs (13,6 kg), and
    - not have circumference greater than 42-44 cm.
- females:
    - older cows with no dependent calves or
    - being tuskless from birth, no developed tusk sockets and
    - refrain from shooting matriarchs.
- The recommendation is that Namibia should be divided into three distinct elephant habitats and sub-population regions. While defining region boundaries the focus was mainly put on sub-population movements within Namibia and not sub-population sizes occurring in these regions.
    - North East including Zambezi Region and Bwabwata NP
    - Greater Bushmanland-Khaudum Complex
    - Greater Etosha Complex
- On a new system to harvest non-trophy animals, there should be the following requirements:
    - an elephant management plan is needed per region
    - the three regions as listed above should be issued annual quotas for trophy and non-trophy hunting
    - this non-trophy quota can be auctioned to outfitters that have gone through a strict qualification proses with well-defined criteria
    - each region will be subdivided into 3-4 hunting blocks - during a given year, hunting will only take place in one subdivided block per region
    - harvesting activity will be rotated yearly in the sub divided blocks resulting in 2-3 blocks resting other than low level trophy hunting

- it might be recommended that no trophy hunting of elephant will take place within the block that is currently being used to harvest for non-trophy elephant. Other trophy species on quota will be hunted without interruption but with great communication between the two hunting parties
- the idea is to can and commercially market the canned meat from the non-trophy elephant.
- It is important to have safe zones where no non-trophy hunts will take place within such regions, i.e.:
- on the eastern floodplains (of the Zambezi Region) or
- in sight of the Zambezi, Chobe, Linyanti, Kwando, Okavango and Kunene Rivers or
- in sight of public roads unless an arrangement has been made with the local community and MEFT or 5 km from existing tourist facilities (lodges and hunting camps) or 1 km from a national park boundary.
- On non-trophy elephant harvesting in the North East, this area will cover the whole of the Zambezi Region through Bwabwata NP just west of the Mahango Core Area of Bwabwata NP:
- Excluded areas (no non-trophy hunting allowed): Bwabwata East and West, Nkasa Rupara NP, Mudumu NP and the Mahango Core Area of Bwabwata NP
- Area for non-trophy elephant harvesting, subdivided into:
- Eastern flood plains, starting just west of Lake Liambezi going up to Katima Mulilo and as far east as Impalila Island
- Mudumu South complex, from Bamunu Conservancy going west including areas not yet formed as conservancies past Dzoti, Wuparo up to Balyerwa Conservancies.
- Mudumu North complex, from Mashi, Sobbe and Mayuni Conservancies up to Kwandu Conservancy on the Zambian border
- West of the Mahango Core Area of Bwabwata NP from the Okavango River going west for 100km. This area seems not to have enough elephant movement but therefore the Bwabwata NP Multiple Use Area (now the Wildlife Management Zone) might need to be incorporated.
- Elephants leave and migrate back to Botswana with the first rains in most of the area (eastern Zambezi region, greater floodplains). Some areas have a different seasonal migration pattern e.g. along the Kwando River. In most of the area available for hunting, elephants spend between 4 to 6 months before returning to Botswana.
- Abundance and trend of the population in this region:
    - traditionally female herds
    - the greater Nkasa Rupara wetland area and Lake Liambezi have dried out over the last 4-5 year due to the Kwando River not flooding
    - unstable population numbers dropping in certain areas withing the region since 2016
    - this region has been extremely hard hit with poaching
    - various reports stating offtake quotas being too high for the region
    - plummeting trophy quality or tremendous decrease in hunt success
- The above information indicates that whatever management policy is implemented in this region will not have an effect if it is not in line with the country where the elephants originate from. It is safe to say that it is only a harvesting strategy which will be used to create acceptance in the region by the local residents to live with the elephants for a short part of the season which they are present. It also provides a limited level of renumeration for harvest damage. The question must be raised if this area

is suited for trophy hunting in its purest form. Is it not time to rethink trophy hunting of elephant in this region to prevent the inevitable results of implementing a radical new minimum where only 10% of the current off take will qualify? This will in the short run have a detrimental effect on local human acceptance towards elephants. It is not reasonable to expect bull country trophy results from cow country. Why not rethink the current quota system where a small or available quota is distributed into 2-3 age related categories? Making such male animals, from mixed age groups available for export, generating not as much finances as top-quality trophy animals but earning more than regular "own use" animals. Acceptance for the new approach has to be earned by motivating population size with good annual count date as well as local resident acceptance to live with elephants in peace.

- On non-trophy elephant harvesting in the Greater Bushmanland- Khaudum Complex i.e. from Ondjou Conservancy, including Nyae-Nyae Conservancy, Na≠Jaqna Conservancy, Kavango East up to 100km west of Mahango Core Area in Bwabwata NP (there might be a more suitable boundary for instance an existing veterinary fence or something):
- Excluded areas (no non-trophy hunting allowed): Khaudum NP and Mangetti NP.
- Area for non-trophy elephant harvesting, subdivided as may be necessary, noting that this area provides big logistical challenges for commercial meat recovery.
- On distribution and movement within the area; this is a vast area consisting of preferred elephant habitat. This population makes use of this area as their core range with small groups migrating seasonally and erratically out from this area. It is a good example of a well-balanced population.
- On abundance and trend of the population in this region:
    - female herds are on the increase from the Khaudum core area and Nyae-Nyae Conservancy with the increase of new water developments in the greater region.
    - male elephants seem to shift further outwards to Botswana, Ondjou Conservancy, and further west than Na≠Jaqna Conservancy into commercial farmland where an increase in human-elephant conflict has been recorded as well as far south as Gobabis.
    - trend of effort spent to harvest a trophy animal (see operator hunting reports and MET CITES office for harvest trophy size trend)
    - little evidence is available of mature males migrating seasonally to Botswana and then being legally harvested and some poached.
    - This region has a reputation of producing some of Africa's biggest trophy elephants, with good management and moderate offtake quotas it can continue being renowned as one of Africa's best. Commercial harvesting of non-trophy elephants for canning might prove logistically challenging in this region.
- On non-trophy elephant harvesting in the Greater Bushmanland- Khaudum Complex Greater Etosha Complex, including Kavango West, north of Etosha, west of Etosha and as far south possibly as Khorixas:
- Excluded areas (no non-trophy hunting allowed): Etosha NP, Skeleton Coast NP, Palmwag Etendeka and Hobatere tourism concession areas
- Area for non-trophy elephant harvesting, subdivided into:
    - Kavango West
    - North of Etosha up to Ruacana
    - Kamanjab

- No trophy or own use hunting of the so-called true desert adapted elephant populations west of the 150mm isohyet in the Kunene and Erongo Regions should be considered. (in extreme situations, problem causing individual animals should be identified by MEFT and the shooting thereof be the last resort, under strict supervision of MEFT. Alternative options/solutions must first be explored).
- Highland elephant populations in the northern Kunene Region (these are the elephants moving east of the 150mm isohyet up to the Opuwo/Ruacana main tarred road or intermediate populations within the conservancies or communal areas should be made available for own use. No trophy hunting, problem causing individual animals should be identified by MEFT and the shooting thereof happening under strict supervision of MEFT in the specific areas where the problem occurred or damage was caused.
- The Kamanjab elephant population must only be hunted as own use. These elephants must be hunted on an annual basis as to achieve a specific goal. These elephants are predominantly herd groups with a few breeding bulls permanently resident in a specific area due to the availability of predominantly water. The hunting of this population should be different in that only big game professional hunters resident in this area be allowed to conduct these hunts. History has proven and evidence exists that external hunters have a reputation of non-compliance in all facets during the hunting of elephant in this area. Problem causing individual animals should be identified by MEFT and the shooting thereof happening under strict supervision of MEFT in the specific areas where the problem occurred, or damages was caused.
- The provision of alternative water points in areas known as predominantly bull country, must be carefully considered, as it may cause more harm than any good.
- Other harvesting options can be considered for reasons listed above; this option is mainly intended for the conservancies in the Zambezi Region. The objective will be to attempt rebuilding a healthy bull age structure in this region's elephant population. The influence of heavy poaching or illegal hunting and slightly high regulated hunting off-take in conservancies over the last 8-10 years has removed the majority of medium to old bulls from this region (visible in current trophy size trends and hunt success rate). A sensitive system is needed to prevent a long (15 year) moratorium on elephant hunting to accomplish this aim. Acknowledging that a good management and harvesting plan is crucial to convincing paying clients in accepting our elephant products and assuring that local communities living with elephants continue their acceptance of living with elephants.
- Private game reserves along the Kruger NP in South Africa, have grouped together and removed all fences to form larger areas for wildlife to roam. These enlarged game reserves are known as Balule, Timbavati and Klaserie game reserves and as a group together with Kruger NP are referred to as the "Greater Kruger". An elephant harvesting system has been created to add value to the elephants that roam the Greater Kruger complex. The Kruger NP is renowned for its old, large 100 pound plus elephant bulls. It was crucial for park management that their valuable bulls were not lured out of the park and get legally shot while roaming in the Greater Kruger complex. A harvesting plan was implemented where tusk size categories with distinct limits were implemented.
- It is from this system that we might learn how to create a transition phase in our new management plan for the conservancies with elephant quotas in the eastern Zambezi. Conservancy quotas differ but if we work on a figure of 4 trophy elephant, 1 own use and 1 traditional authority elephant (as under the current system) for explanatory purposes, equals 6 elephants currently being harvested as males in one conservancy. Proposed for the new system we advise to move away from the word trophy and think of a new description. In this submission we will use the word "harvesting". Elephant harvest categories (1 kilogram = 2,2 pounds) should be:

- Trophy bulls as described above according to the age-related criteria (fully exportable)
    - Elephant bull 40 lb class. This will be a bull of which its heaviest tusk is under 50 lbs (22,72 kg) (fully exportable)
    - Elephant bull 30 lb class. This will be a bull of which its heaviest tusk is under 40 lbs (18,18 kg) (fully exportable)
    - Each of the above categories will have its own price the outfitter will pay to the conservancy. A sliding scale from the best quality with a high price to the lowest quality with a price between the current trophy and own use. This ensures a steady inflow of funds for the conservancy.
    - The above three categories make up the full spectrum of quota. These three categories will replace the current trophy, own use and traditional authority quotas. The conservancy can still allocate the meat of a 30 lb class bull as they are easier to harvest and most Zambezi Region traditional authority festivals take place during the height of the elephant seasonal presence.
    - For example as described above and applying the new categories, the example conservancy will then have the following quota to start with:
        - Trophy bull x 1
        - 40 lb Class x 1
        - 30 lb Class x 2
    - Thus a total of 4 elephants on quota of which all are exportable and no own use or traditional authority quota. This will have an immediate reduction on the available quota but with a minimum effect on conservancy income.
- Future management of this quota after implementation:
    - Trophy bull –
        - During the first three seasons of a given quota period the PH and outfitter receives a written warning for every elephant bull that does not qualify to the age-related criteria as a trophy bull and the conservancy is informed of the weak performance of the PH and conservancy's elephant population.
        - If three trophy bulls have been harvested and none qualifies under the age-related system, one trophy bull will be removed from quota of that specific conservancy (keeping in mind that it is every PH and outfitter's full intention to have the client shoot the largest possible trophy bull as it is the best possible marketing tool).
        - This will prove that there are not enough old bulls to be harvested amongst that specific population and teach the conservancies to choose outfitters with experienced PHs to hunt for them.
        - After the first three trophy bulls have been harvested in a conservancy and at least one has qualified under the new strict age related criteria for a trophy, the following penalties will occur for further bulls hunted that do not qualify as a trophy:
        - From the second quota season (year 4-6) the first bull that does not qualify, a penalty of 50% of the shoot or harvest fee payable by the outfitter towards a wildlife research project in the region or aerial game count.
        - From the second quota season (year 4-6) the third (3) bull that does not qualify, a penalty of 100% of the shoot / harvest fee payable by the outfitter towards a wildlife research project in the region or aerial game count.
        - From the second quota season (year 4-6) for every three consecutive bulls that do not qualify as a trophy, one trophy will be subtracted from the conservancy's quota.

- Forty (40) lb class –
    - If the bull is larger than his intended category the outfitter will receive a written warning for each elephant during the first season of implementation of new regulations.
    - During the second season of implementation, from the first offence the outfitter will be penalized with an additional 50% of the shoot or harvest fee towards a wildlife research project in the region or aerial game count.
    - During the third season the penalties will be 100% of the shoot or harvest fee.
    - From the outfitter's 5th offence he/she will be penalized with 200% of the shoot or harvest fee.
    - If three consecutive bulls hunted in this category of which the largest tusk does not at least weigh 30 lb (13,6 kg), one bull will be removed from this conservancy's quota.
- Thirty (30) lb class x 2 –
    - If the bull is larger than his intended category the outfitter will receive a written warning for each elephant during the first season of implementation of new regulations.
    - During the second season of implementation, from the first offence the outfitter will be penalized with an additional 50% of the shoot or harvest fee towards a wildlife research project in the region or aerial game count.
    - During the third season the penalties will be 100% of the shoot or harvest fee.
    - From the outfitter's 5th offence he/she will be penalized with 200% of the shoot or harvest fee.
    - If three (3) consecutive bulls hunted in this category of which the largest tusk does not at least weigh 20 lb (9,09 kg), one bull will be removed from this conservancy's quota.

- For this region Namibia will then refer to as a harvesting quota instead of a trophy quota of a visiting (not resident) elephant population, which is necessary to ensure acceptance by the local human residents to allow the elephants to roam their land.
- After 3-6 years, one to two quota seasons in bad producing areas will have even less elephants on quota as they have not been utilized and this will allow more bull to grow older and improve the overall age balance in the population. The financial income is also reduced over a period and not just removed. This will take much longer than a moratorium but is a more sensitive approach.
- If MEFT can support that all elephants should not be on any guarantee payment schedule, it will allow a more accurate elephant hunt success rate date and trophy quality immediately improving with PHs only harvesting older bulls. It will also show good conservation minded principles from MEFT to support such an initiative, i.e. conservation over income.
- The new management plan must have the necessary tools incorporated to have all elephant related information available. United States Fish & Wildlife requires a lot of information concerning elephant populations, population trends, hunting area information, corridors being used by elephant, local communities respecting such corridors and allowing free wildlife movement, wildlife breeding or core zone status being maintained (cattle encroachment and all the related poaching with dogs issues accompanied therewith), income generated from trophy hunting, income distribution, projects and social support provided by the hunting outfitter with money generated from hunting elephant, and proof of anti-poaching done by hunting outfitters and government must be available to report on. This kind of information and reporting thereof will become even more important in the future as these organizations approve import permits in destination countries of trophies originating from Namibia and other hunting destinations worldwide.

- Problem animals outside of registered conservancies with an existing outfitter hunting contract must be treated the same countrywide, utilizing the system that has been put in place by MEFT in Windhoek to advertise any problem animals to qualified PHs at standard rates.
- Big Game qualification requirements and training for Professional Hunters must be revisited and standards improved.
- National Parks are serving as trophy animal suppliers to conservancies. These core populations must be managed exceptionally well and strict.

*Note that one additional and very detailed submission was received from a freehold farmer in the Grootfontein District who is also a professional hunter (and a former MEFT staff member) with considerable elephant hunting experience in the North East. Some of his contributions are given below:*

- I must mention that the old elephant bulls are not the problem. Here it seems to be the younger bulls 15 to 30-year old that leave the breading herds that cause the most damage. Old bulls do occasionally visit but cause minimal damage. I experienced this in Etosha as well, majority of problem elephant shot were young bulls. Even elephant shot in Kavango, Mangetti and Huab area were younger bulls. Cannot recall any trophy quality elephant being shot as a problem elephant. I have had great success chasing certain individual problem elephant off the property and they have never returned.
- A sad thing to say but old trophy bulls are very few in Namibia, there are only pockets, Bushmanland (Nyae Nyae and Na#Jaqna Conservancies), East Kavango (Kavango East Region) and perhaps north of Etosha. In Bwabwata there are no old bulls left all due to the uncontrolled poaching that started intensifying in 2012.
- I am of the opinion that no trophy hunting should be permitted in National Parks. Designated buffer zones should be established along the boundaries of parks for hunting of elephant. This will help with the human wildlife conflict. Parks should be regarded as core areas. Big bulls within Etosha, Khaudum and Damaraland (southern part of Kunene Region) should be protected at all costs. Staff must be adequately trained to monitor and observe elephants in their respective areas, especially population structure and numbers of large older bulls. Staff must also be trained to deal with problem elephant. I am sorry to say but all staff, that have visited our area with regard to elephant have no idea how to deal with problem elephant. They have no clue how to approach, chase or shoot an elephant if necessary. More than often they do not investigate the problem. Reaction time should be swift.
- Community game guards must be adequately trained and assisted by MEFT to establish elephant numbers, and possible trophy numbers etc.
- When we hunted Salambala Conservancy in 2009, we would locate at least 15 to 30 bulls and at least 2 to 3 breeding herds every day. Today you might find some tracks and if you are lucky an elephant hiding in a mopane thicket. Tracks that you might find in the morning are elephant coming from Botswana at night to feed and before daybreak they are back in Botswana. A clear indication of human disturbance and over utilization. I can guarantee, the elephant behaviour in the other conservancies up there is the same. Comparing elephant numbers, concentrations etc. and distribution patterns in the North East, elephant behaviour has changed. Numbers have declined, compared to when I worked there in 1983 and hunting there in 1998/99. It does not mean that elephant populations have declined they have just moved to quiet areas in Botswana because of the high human population and disturbance of the area.

- Tourism companies must train their guides not to be a nuisance at waterholes in Etosha NP e.g. two-way radios blaring, loud talking to guests at waterholes, climbing out of their open vehicles, driving and parking vehicles in front of elephant trying to approach or leave the watering hole. They do not respect the space and peace elephant desire. Very soon the space that lodges are occupying along the river systems in the east will result in elephant with nowhere to drink or feed.
- A simple but detailed elephant observation form should be made and completed by all operators during hunts.
- There is also evidence of a dramatic decline in elephant trophy quality in the eastern parks and conservancies, all due to over-utilization, poaching (main factor) and human interference. Hunted elephant should not be categorized as trophy or self-use, but rather as management bulls. To shoot an elephant is a privilege and they need all the respect they deserve. Elephant must remain the most expensive hunt in Africa. Second to the rhino it is the only animal that has financial value, from the ivory. To ensure that the correct elephant are hunted, the guaranteed quota system on elephant must be scrapped. The guaranteed quota system places a financial burden on concessionaires. Hunters become desperate and seem to shoot young or poor-quality trophies with clients just to repay their concession fees. Self-use elephant must be removed from a quota, the high disturbance factors on a population especially breeding herds does not warrant this. I agree a concession fee should be paid prior to any hunting taking place. If there are no trophy quality elephant in a concession, then hunting should not be allowed, if there is, everyone benefits.
- A minimum tusk weight should be introduced, of 20 kg on the heaviest tusk. Annually the trophy quality must be assessed and quota allocated accordingly. A sliding scale should also be introduced, e.g. ex amount to 23 kg (U$ 20,000) then increased amount to 25kg (U$ 25,000) and 27 kg (U$ 30,000). After that, an extra payment should be charged for every 1 kg (U$ 500) heavier than 27 kg. I used the sliding scale and I was quite happy not to shoot a heavy tusker if clients were not prepared to pay for heavy ivory.

## 2.6 KAZA TFCA Secretariat

***The KAZA TFCA Secretariat was interviewed on the next steps towards implementing the Strategic Planning Framework for the Conservation and Management of Elephants in the Kavango Zambezi Transfrontier Conservation Area and responded in writing and further discussed verbally as follows (summarized), regarding specific aspects of the framework:***

*Objective 1: Facilitate the development of an integrated land use planning process to secure long-term ecosystem integrity and connectivity of KAZA's elephant population.*

- *In the short-term, to undertake a single Strategic Environmental Assessment (SEA) for KAZA or several individual ones on key transboundary wildlife corridors to strengthen and secure governments' recognition to the importance of maintaining key KAZA corridors. This should be linked to large landscape planning in contrast to more traditional land use planning.*
- The next steps should be resource mobilization for the SEA and it is expected that the Partner States should take a lead, first by using their normal budget resources and/or raising funds from interested donors/parties. However, it is not always possible that the Partner States will have resource to implement these regional strategies so, this is where stakeholders support is important. The biggest challenge so far is the internalization of the documents developed at a regional level. Partner States should find measures of ensuring that internalization process is done and proposed measures are implemented internally otherwise ownership and internalization of these document will forever remain someone' responsibility.
- *In the medium term, support justification for the re-alignment and/or removal of veterinary and wildlife fences especially of crucial sections along country borders which can be informed by SEA.*
- The next steps should be resource mobilization for the re-alignment and/or removal of the fences and it is expected that the Partner States should take a lead, first by using their normal budget resources and/or raising funds from interested donors/parties. The activity has been shared with the KAZA TFCA Animal Health Sub-Working Group (AHSWG) which has received a lot of support from Cornell University under the AHEAD programme. We are hopeful that this will remain an Agenda item for AHSWG so that a solution can be found for the fences. Please note that historically the re-alignment and/or removal of the fences was based on conditions set between the two Partner States, which mostly Namibia had to comply to certain conditions.

*Objective 2: Maintain and manage KAZA's elephants as one contiguous population*

- *In the short term, undertake KAZA-wide synchronized aerial surveys to determine numbers and seasonal distributions*
- The first joint aerial survey is planned for the 2021 dry season.
- *In the short term, further analyze existing movement data to identify knowledge gaps*
- Towards the mapping of the critically important movement corridors for each WDA, the KAZA Secretariat and Partner States have secured collars with funding from DEFRA towards that, each Partner State has been allocated eight GPS collars for elephant movement monitoring. We are hopeful that Partner States should also take-up this activity and deploy more collars for monitoring movement. On the compilation of all elephant movement data into one map to show such corridors as proposed by the KAZA Elephant Working Group (KEWG), the KEWG is key in maintaining an network of experts with the relevant data and there is a proposal for a Policy Brief on elephant connectivity submitted through KEWG, which has been endorsed by four of the Partner States.

*Objective 3: Promote and support co-existence of humans and elephants for ecological, social and economic benefits*

- *In the short term, support alternative livelihood initiatives among communities and exchange of best practices in mitigating conflict*
- The KAZA Secretariat and Partner States have published a KAZA TFCA HWC best practice mitigations measures document. This document has been distilled into several other HWC mitigations measures for various species.
- *In the medium term, expedite Commodity Based Trade (CBT) for beef within the region to enhance income generation for communities*
- The next steps should be resource mobilization for the CBT and it is expected that the Partner States should take a lead, first by using their normal budget resources and/or raising funds from interested donors/parties. Already there are pilot projects in Northern Botswana, Ngamiland, which are aimed at supporting communal farmers to develop capacity and conform to the conditions of CBT.
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## CHAPTER 3: CITES and reconciling the interests of Namibia vs global society

An important question is what the impact of the Convention on International Trade in Endangered Species (CITES) has been on elephant conservation in Namibia. Although Namibia's conservation achievements concerning elephants and other species are widely known[51],[52], it has not always received international support for its elephant conservation programmes, specifically in CITES, and more recently, virtually no support but much hostility. Decisions taken by CITES to block the generation of much needed funding for elephant conservation through trade in elephant products such as ivory, which has the highest value of all elephant products, have worked against Namibia's interests and may compromise its national conservation strategies.

Campaigns to obstruct conservation hunting,[53] of elephants (and other species) within and beyond CITES have not been entirely successful but have resulted in national decisions not to allow the import of hunting trophies (e.g. The Netherlands, France and at the time of writing the United Kingdom was leaning in this direction) or at sub-national level (e.g. California in the United States of America but subject to legal challenges) or international airlines refusing to transport hunting trophies. It is not as if the trade-offs needed for wildlife conservation in rural Africa are not known or not understood by those who lead the obstruction of successful elephant conservation programmes in southern Africa (see e.g. Adams & McShane 1992, Bonner 1993), all of this is done with full recognition that elephant conservation and community-based natural resource management in Namibia will be harmed, but pandering to animal rights organizations continues. It remains to be seen if these programmes can survive in the medium to long term because of externally imposed constraints on Namibia's ability to sustain them (also see Barbier ***et al***. 1990, Swanson & Barbier 1992, Sugg & Kreuter 1994, Pearce & Moran 1994, Hutton & Dickson 2000, Moore 2010, Somerville 2016, Matinca 2018).

Other SADC Member States such as Botswana, Mozambique, South Africa, Tanzania, Zambia and Zimbabwe are in the same boat. These countries together hold by far the largest numbers of elephants in Africa, and some of the only elephant populations that have been consistently increasing over decades or have been expanding in distribution range, yet these successful conservation models have regularly been obstructed.

It has to be mentioned that the main driving forces behind such obstruction have for decades largely been activist NGOs and animal rights organizations who have increasingly co-opted African CITES Parties and more recently also Parties from other regions[54]. Many observers have remarked that CITES issues, including trade in ivory, have been a fund-raising boon to such NGOs and that fund-raising may have become the greatest motivation for such organizations. Conservation certainly is not.

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51 This is sometimes wrongly and patronizingly construed as Namibia and likeminded countries seeking to be 'rewarded for good conservation outcomes'. There is no such thing and Namibia should strongly oppose such claims. Namibia's conservation programmes are derived from Constitutional obligations and its interests in financing its conservation programmes and rural development based on sovereign rights over natural resources and Namibia's rights as a party to CITES to trade in legally and sustainably produced wildlife products.

52 See for example Lindsey ***et al***. 2017

53 MEFT introduced the term 'conservation hunting' in about 2017 in place of trophy hunting to place the emphasis on the conservation value of hunting instead of the trophies for better contextual understanding of the role of hunting in conservation. The intention was further to put greater value on the overall experience of a sustainable and ethical hunt than on the size of the trophies obtained, as part of hunter education.

54 Most of the activist NGOs and animal rights organizations involved in CITES originated in Europe and the United States of America, where they have exerted very strong pressure through relentless campaigning on their governments, including legal challenges, petitions, letter-writing campaigns and 'naming and shaming' those who dare to hold contrary positions. Several hundred NGOs currently participate in CITES processes which the Conference of the Parties (CoP) and its subsidiary bodies, the Standing Committee and the Animals Committee, have allowed to happen and may still regret or worse, may already regret but can do nothing about it for fear of the uproar amongst NGOs that will result. Southern African Parties to CITES have publicly expressed their concern about this and the undue pressure exerted by NGOs.

Formerly reputable intergovernmental organizations such as the International Union for the Conservation of Nature (IUCN) have allowed animal rights organizations to join and adopted resolutions (motions) against e.g. trade in ivory that were even stronger and more restrictive than similar resolutions taken by CITES. In this instance Namibia has opted to remain a member of IUCN to continue engagement within, but this situation should be watched. There are limits to what a sovereign country should tolerate from organizations acting against its interests.

Parts of reputable global NGOs such as the World Wildlife Fund (WWF) have taken strong stances against conservation hunting, aligning with broader international campaigns to ban hunting. The WWF office in Namibia in contrast has been a strong supporter of Namibia's conservation programmes.

A point to consider is that Namibia has sovereign rights over its natural resources as articulated in Article 100 of the Namibian Constitution and stated in the United Nations General Assembly Resolution 1803 (XVII) of 14 December 1962, which affirms permanent sovereignty over natural resources to the members of the United Nations. The Namibian State in Article 95 of the Constitution is further obliged to *"actively promote and maintain the welfare of the people by adopting, inter alia, policies aimed at ... maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future ..."*

The Convention on Biological Diversity in Article 3 Principle provides that *"States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction".*

CITES in its Preamble states that "*peoples and States are and should be the best protectors of their own wild fauna and flora*". The Conference of the Parties to CITES, as the official decision-making body of CITES is known, went further in 1992 by adopting Resolution Conf. 8.3 (Rev. CoP13) *Recognition of the benefits of trade in wildlife* which states:

> **NOTING** that the majority of species of wild fauna and flora that CITES seeks to protect and enhance occur in the developing countries of the world;
>
> **RECOGNIZING** that the sustainable use of wild fauna and flora, whether consumptive or non-consumptive, provides an economically competitive land-use option;
>
> **BEING AWARE** that, unless conservation programmes take into account the needs of local people and provide incentives for sustainable use of wild fauna and flora, conversion to alternative forms of land use may occur;
>
> **RECOGNIZING** that over-utilization is detrimental to the conservation of wild fauna and flora;
>
> **RECOGNIZING** further that legal trade in a species should not lead to increases in illegal trade anywhere in its range;
>
> **RECOGNIZING** also that the returns from legal use may provide funds and incentives to support the management of wild fauna and flora to contain the illegal trade;
>
> **ACKNOWLEDGING** that the aesthetic, scientific, cultural, recreational and other largely non-consumptive uses of wild fauna and flora are also of enormous importance;

**RECOGNIZING** that there are many species for which trade would be detrimental to their survival;

**THE CONFERENCE OF THE PARTIES TO THE CONVENTION**

**1. RECOGNIZES** that commercial trade may be beneficial to the conservation of species and ecosystems or to the development of local people when carried out at levels that are not detrimental to the survival of the species in question; and

**2. RECOGNIZES** that implementation of CITES-listing decisions should take into account potential impacts on the livelihoods of the poor.

The problem is that when it comes to elephants, this Resolution is not applied and undue weight is given to unproven assertions that legal trade from Namibia (and other countries) will stimulate illegal killing and trade in other parts of the elephant range. This is an untenable situation for Namibia because of the wide disparities in conservation outcomes throughout the 37 countries that make up the elephant range in Africa. In West Africa, the known number of elephants in 2016 was 11,489 +-2,583 in 13 countries and the elephant distribution range is thought to have declined by almost 20%, from 176,000km$^2$ in 2006 to 143,000 km$^2$ in 2016 (Thouless ***et al***. 2016). This is less than the elephants counted in 2019 just in the Zambezi Region of Namibia. It is obvious that as long as there is a decline in some populations, perhaps just in one population, or illegal killing of elephants somewhere in Africa, this will count for more to the 'global society' than the importance of maintaining the elephant population of Namibia. It is further highly unlikely that even if all populations are stable or increasing that trade will be reopened because of the fundamental and irreconcilable philosophical differences held by the animal rights groups through their influence on CITES Parties. It is also hard to imagine that countries that have destroyed their ivory stockpiles in the public spotlight will ever support trade in ivory.

Namibia's sovereign rights and obligations are thus actively undermined by an institution, CITES, that Namibia voluntarily joined as long ago as 1990. Implicitly, the purpose of having joined CITES was to conduct trade in wildlife with other countries within the scope and checks and balances of CITES. If such trade is obstructed, the purpose of being a Party to CITES becomes void. Namibia is in a fundamentally unjust situation.

In terms of Namibia's constitutional provisions, national policies and conservation strategies, this management plan and the overwhelming sentiment expressed by all those consulted for this plan, the conservation of elephants will ultimately depend on the nation's ability to generate more benefits from elephants than they cost to society, and in particular to those people who live closest to them, are most affected by them, and on whose land lies important elephant habitat and movement corridors. If this trade off cannot be made, there is no hope that elephant and other wildlife land use will outcompete other land use choices that will result in wildlife habitat conversion, obstruction and compartmentalization of wildlife movements and habitat.

Outcomes at CITES on elephants have had and will continue to have dramatic impacts on elephant conservation in Namibia. Financing of protected area management, human-elephant conflict mitigation, implementation of the CBNRM programme, law enforcement and elephant monitoring has already been severely impacted by the obstruction at CITES of Namibia's ability to generate substantial revenue from trading in elephant products that can be sustainably and competitively produced. If elephant hunting is further obstructed these impacts will be even greater.

It is often said that tourism should be pursued instead. Importantly, tourism is only a part of a potential solution. Tourism can potentially support protected area management in some instances if MEFT can retain a greater share of tourism revenues, but protected areas in the elephant distribution range are not suitable for more intensive tourism use because of environmental sensitivity (e.g. Skeleton Coast NP, Nkasa Rupara NP), limited access options or unspectacular terrain (e.g. Khaudum NP, Mangetti NP). Tourism based on elephants outside protected areas can support conservancy earnings from tourism joint ventures and employment but not to the extent that these conservancies can adequately offset elephant impacts on their members' livelihoods. With the limited tourism development in conservancies at present there are already sustainability and equity concerns (see Chapter 2) and outside conservancies on communal land farming areas or on commercial farms, tourism has virtually no value or potential value. Tourism is furthermore vulnerable to external impacts such as the oil price impacting long haul travel costs or pandemics such as Ebola (even though the countries that experienced Ebola outbreaks are often closer to the tourism source markets geographically than to Namibia) or the current COVID-19 pandemic.

Cumming ***et al***. (2006) introduced the concept of scale mismatches as an explanation of ***"many of the problems encountered by societies in managing natural resources arise because of a mismatch between the scale of management and the scale(s) of the ecological processes being managed".*** This applies to CITES decisions on elephants and the communities that have to manage them, as shown in Figure 55,where local interests are pitted against a global institution and process that are 1) not responsive to national or community inputs from those who have the most at stake, and 2) unwilling to change the rules to give greater weight to national or community inputs – or even just to allow community voices to be heard on the elephant issue.

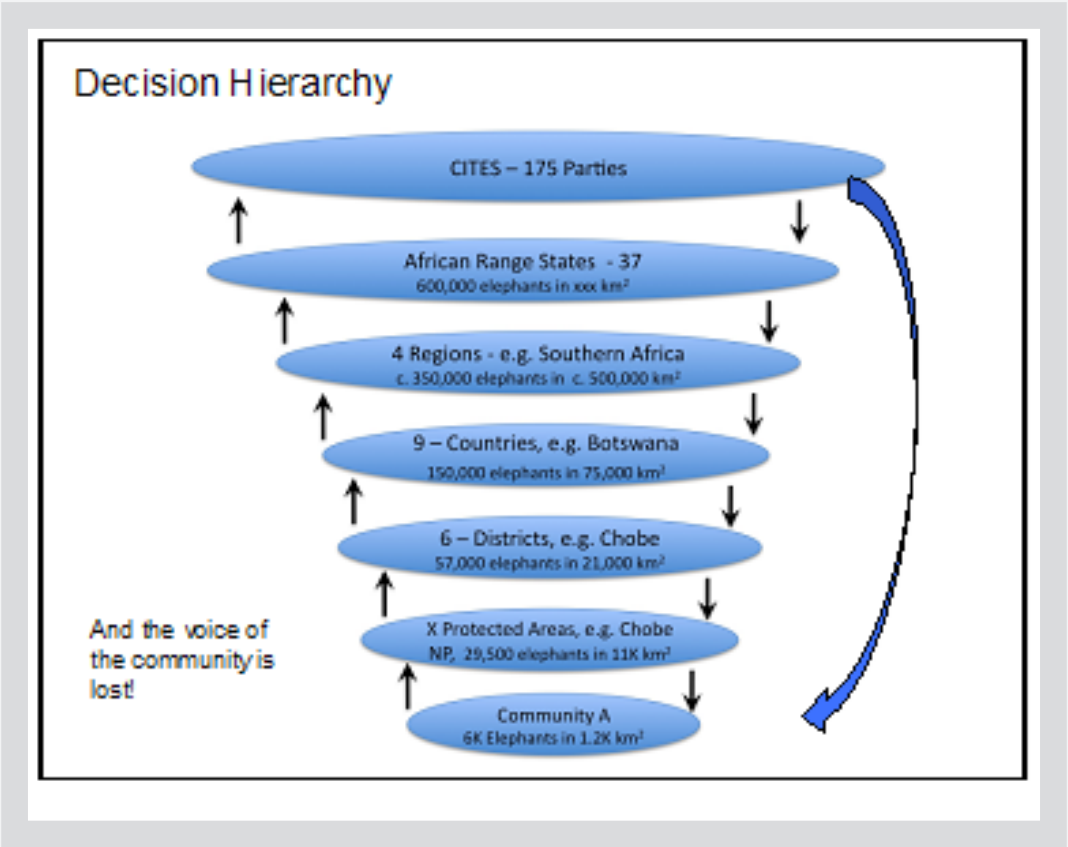



**Figure 55** Diagram showing the scale mismatch between CITES decisions on elephants and a community managing elephants at a local level, using an example from Botswana (Source: D. Cumming)

No calculation of the opportunity costs to elephant conservation and community livelihoods has yet been done for Namibia. The amount of ivory in the Namibian stockpile is not in the public domain but at an estimated value of US$1,000/kg at present, a ton of ivory is worth US$ 1 million (around N$ 14.5 million). Taking a population of just 20,000 elephants and a natural mortality rate of 4% per year yielding an average tusk weight of 10kg (which is roughly the average for Namibia for natural mortalities), the annual ivory yield from just 800 elephants dying from natural causes is 16 tons of ivory, worth US$ 16 million (N$ 232 million). More sophisticated calculations are needed but this gives a rough indication of the scale of value lost to Namibia, which is also several times more than the cost of all human-wildlife conflicts combined, and, importantly, more than the value of subsistence agricultural production in the elephant range in northern Namibia.

There are limited options remaining for Namibia:

- One option is to be satisfied that trade in other species or other elephant products is still possible (but may be increasingly threatened in future as more and more species get listed in CITES and ever harsher constraints on trade are imposed). More specifically, there have been repeated proposals driven by certain African countries and their animal rights or anti-use and anti-trade NGO allies to transfer all of the elephant populations included in Appendix II back to Appendix I which will close down all commercial trade options in elephant products. Stricter measures (known as stricter domestic measures in CITES) adopted by hunting source markets may reduce options further.
- A further option is to take a long-term approach of working within CITES to ultimately get approval to trade in ivory, a position that Namibian society may not accept, and which may not deliver essential financing of elephant conservation in time to be effective.
- Namibia may consider high level diplomatic engagement with other African countries in particular and in the ambit of the African Union and its mechanisms to seek accord on non-interference in and non-obstruction of the use of its natural resources.
- One more option is for Namibia to legally challenge CITES outcomes in violation of its rights under this Convention and the World Trade Organization and seek redress but this will require resources that Namibia may not have.
- The best option, however, could be to encourage indigenous people (in United Nations framing) and rural communities to agitate internationally and continuously for recognition of their rights over the use of natural resources.
- The last option is to leave CITES, trade with whoever is willing to buy or perhaps just to make the strongest possible statement of objection and disenfranchisement and face the risk of retaliation that other wildlife products, e.g. hunting trophies, will not be accepted for import by countries that remain in CITES. It is not realistic to expect that major ivory markets will follow suit and trade with Namibia outside CITES.

It is thus an open question whether it will be possible or realistic to reconcile Namibian interests with the apparent interests of global society, and furthermore, within the timeframe of this elephant conservation and management plan. The plan therefore has to be based on the assumption that the ***status quo*** will remain.

# CHAPTER 4: Elephants and the wildlife economy

Enhancing the contribution that elephants make to the sustainable socio-economic development of Namibia and the KAZA TFCA and to the improved wellbeing of the Namibian people is one of the objectives of the National elephant conservation and management plan.

With all the difficulties in CITES to trade in one of the most valuable wildlife products on earth (i.e. elephant ivory) that Namibia has in abundance and can generate sustainably and ethically, an important mechanism for enhancing the contribution of elephants to socio-economic development has been compromised. Previous trades in ivory resulted in revenues to the made-for-purpose Game Products Trust Fund established through the Game Products Trust Fund Act, Act 7 of 1997, which was and is used to fund a wide range of conservation activities including the combatting of illegal killing, mitigating human-wildlife conflicts and the community-based natural resource management programme.

Namibia has further allocated elephant hunting quotas to communities and promoted tourism investment and development in communal conservancies. The income from both hunting and tourism reached N$ 148 million in 2018 (Ministry of Environment and Tourism and the Namibian Association of CBNRM Support Organizations 2018) and has probably exceeded N$160 million in 2019. This income is used for the running costs of conservancies which includes the appointment of a manager, game guards, natural resource monitors and other conservancy staff positions, wildlife protection and monitoring, as well as human-wildlife conflict offsets and community development projects. In 2019, the Minister of Environment and Tourism directed that half of all conservancy incomes must be spent on social development programmes that would benefit all conservancy residents. Such programmes have included support to clinics, schools, kindergartens, bursaries (scholarships) for tertiary studies, electrification of villages, agricultural projects, water supply projects and providing transport to pensioners and sick people. Hunting accounts for around 35% of all conservancy income, noting that the percentage contribution from elephant hunting to total hunting revenue has declined from 50% in 2016, 46% in 2017, 38% in 2018 to 37% in 2019.

Tourism has been held out to be the panacea for rural development by those opposed to hunting but requires substantial investment and is more successful in scenic areas with lots of wildlife and which are readily accessible by tourists. Many communal conservancies are located in remote areas with little infrastructure, a situation that favours hunting but not tourism. The outbreak of the Covid-19 pandemic in 2020 has severely impacted tourism and hunting in Namibia and therefore conservancy incomes. It is widely predicted that it will be some years before these industries will fully recover. It is thus timely to consider other means of enhancing the contribution of elephants to socio-economic development (see Chapter 8).

Much has been said about wildlife being a competitive advantage for Namibia. Tourism which only includes in National Account terms hotels and restaurants is already the third largest economic sector in Namibia. The Tourism Satellite Account (of 2018) includes more tourism and wildlife-based economic activities and employment and although it needs to be updated, demonstrates the considerable economic importance of wildlife. A further argument is that climate change will increase this importance as especially agricultural production will diminish through increased aridification of Namibia. Other impacts may be on the fishing sector through changes in ocean temperatures and currents with diminished yields in this other important economic sector. The availability of water for the mining sector in parts of Namibia is equally in question because of the likely consequences of climate change on rainfall, rivers and dams.

The question is therefore why land use and infrastructure development decisions often go against wildlife interests. The probable answer is that at the average individual household livelihood level in areas with

wildlife in Namibia, the wildlife economy dividend has not been significant enough. There is not enough equity within conservancies that generate income from wildlife as individual farmer members carry a disproportionate part of the costs of living with wildlife.

Initiatives are under way to strengthen the wildlife economy, e.g. the creation of an African regional high level platform on the wildlife economy, the first KAZA TFCA Elephant Summit held in 2019 and other interventions such as the development of landscape strategies for biodiversity economy development launched by MEFT in 2020.

The most important issue, however, is that the ability of rural communities to generate optimal incomes from wildlife is severely constrained. A major part of this is due to CITES trade restrictions on the most valuable wildlife products that such communities can produce, including ivory, but there are also systemic restrictions that need to be addressed. These include ownership of wildlife including elephants, local decision-making, incentives for co-existence, effective resolution of human-elephant conflict and the scale of conservation management in rural areas. Some of these aspects are included in the National elephant conservation and management plan, but others need to be addressed through a review of the CBNRM programme and related policies.

## 4.1 Other means of supporting elephant conservation

Apart from hunting, tourism and potentially trade in ivory, there are other means of supporting elephant conservation that should be considered. These will potentially require considerable capital investment and skills development but these additional means of earning revenues to offset or mitigate human-elephant conflict in particular as well as finance other aspects of elephant conservation and management and conservancy operations could make a significant contribution.

### 4.1.1 Elephant meat products

Specific own use and traditional authority (for traditional festivals) quotas as well as conservation hunting quotas have been allocated to conservancies and the meat that comes from that is distributed within the relevant conservancy (also see Chapter 7). Elephant meat is highly valued in almost the entire rural Namibia and is a significant in-kind benefit to conservancy members, valued at N$9.5 million[55] in 2018 (MET/NACSO 2018). Elephant meat is also a by-product of other management action including problem elephant control and culling. It is an obligation of the hunting outfitter in all instances to ensure that no elephant meat is wasted and is provided to communities or beneficiaries such as school hostels or old age homes. In cases of hunting (mostly problem elephant control) outside conservancies, MEFT usually designates where the meat should go, often involving Regional Councillors or Traditional Authorities.

Culling has thus far been regarded as an intervention of last resort, but e.g. Zimbabwe has had reasonable success with small scale culling (i.e. a single herd) in the past (the 1990s) in what was referred to as 'disturbance culling' to solve local conflict situations or to drive elephants away from a particular area. Zimbabwe has recently (2009 and 2010) again used small scale culling to reduce local overpopulation in Savé Valley Conservancy (Le Bel ***et al***. 2013). In this example an average of 417±44kg (range 51-993 kg) of deboned meat was produced per elephant. This is a significant amount of meat that will be highly valued by virtually any rural community.

55 This value includes all meat from hunting of all species, but elephant meat accounts for most of this value.

It is conceivable that Namibia may be required to do the same in certain situations. In addition to own use or traditional festivals, elephants could also be harvested for drought relief or other reasons such as purely increasing meat distribution. Much better use of such opportunities could be made if the hide is recovered, see below. Importantly, harvesting of a small herd of elephants (i.e. no adult males) for meat could alleviate the hunting pressure on males that are hunted for own use and traditional festivals where the current rule means that only males can be hunted for such purposes (see Chapter 7).

MEFT should therefore do an assessment of what equipment and facilities will be needed to recover meat efficiently to sell or distribute this to communities and traditional authorities. Cold storage and transport will be needed.

If larger scale removals are to be done, larger quantities of meat will be produced, but probably not sufficient quantities to warrant processing other than perhaps making dried meat (biltong). If regular small scale culling is introduced, other forms of processing such as canning would become an option to pursue.

A further option is to supply some elephant meat to crocodile farms, of which there are likely to be three operational in the next few years. This is a way of converting elephant meat into higher value crocodile skin (but markets seem to be oversupplied at present), although there is such demand for elephant meat amongst communities that this should only be an option of last resort.

Harvesting elephants for meat production is no different from the harvesting of any other wildlife species. It will be controversial because of the animal rights perspective that has invaded public opinion, and the decision to harvest elephants (culling or hunting) is thus not a wildlife management issue but a political issue.

### 4.1.2 Elephant hide and leather

Namibia is able to trade in elephant hide and leather (this is provided for in the annotation to the listing of the Namibian population of elephants in Appendix II of CITES) but has not done so because of the limited number of elephants killed each year under controlled conditions (noting that hunters tend to export most of the hide to their countries of origin). None of the tanneries in Namibia are likely able to process elephant hide[56] but there are tanneries in South Africa and Zimbabwe that can do so. Further, training will be necessary to ensure effective hide recovery and curing[57], and storage facilities will need to be established (shipping containers are an obvious option). Elephant hide (salted and dried) in the southern African region can fetch USD 9/kg for back, flank and abdomen panels and USD3.5/kg for ear, head, trunk and leg hide, which makes it a valuable product as several hundred kilogrammes of hide can be recovered from an adult elephant and lesser quantities from smaller elephants. At an estimated average of 100kg[58] of dry hide per elephant (at 50% weight loss from wet hide), this could amount to approximately USD750 per elephant, or around N$13,000. It would need to be established if there is still a demand for elephant hide in Japan and Singapore which used to buy elephant hide from southern Africa, where prices would likely be higher but transport costs also.
Elephant hide is usually a by-product of management action including problem elephant control and culling. Elephant leather (USD15-17/kg), which may be obtainable from the tanneries in the region that

56 Processing elephant hide into leather requires special equipment because of its thickness.

57 This is a relatively simple process of soaking the hide overnight in a brine solution with an antibacterial agent, the next day the hide is treated with coarse salt, folded and kept for 21 days before delivery to the tannery (Zambezi Tanners, Bulawayo pers. comm. to M. Lindeque).

58 Le Bel ***et al***. 2013 recorded and average of 144 ± 12 kg (range 26-323kg) wet hide per elephant. For this estimate, an average of 100kg dry hide per elephant was used at an average price of USD7.5/kg. Zambezi Tanners in Zimbabwe stated that an average of 150kg per animal can be expected.

are able to process elephant hide, can be used for the manufacturing of a wide range of consumer items, which will further increase income.

MEFT should therefore do an assessment of what equipment and facilities will be needed to recover hide efficiently and correctly to sell this by-product. A tannery in Zimbabwe in 2018 offered to provide the necessary training to MEFT officials.

### 4.1.3 Live elephants

There is a limited demand for live elephants in the international market, but live elephants can fetch prices of N$100,000 or more. In the annotation to the listing of the Namibian population of elephants in Appendix II of CITES, Namibia is limited to exports of live elephants for ***in situ*** conservation purposes. Elephants can therefore be provided for translocation to other countries with elephant range, current or former, and such transactions can be on commercial terms.

Recently elephants were somewhat controversially (but unnecessarily so) exported to non-range States under Appendix I conditions, which provide that the importing of a specimen in Appendix I may not be done for primarily commercial purposes, i.e. the live elephant imported in this instance may not be used for commerce. The export side of the transaction can be for fully commercial purposes, i.e. elephants can be sold for export. The determination whether an elephant imported is for primarily commercial purposes is made by the importing country and not Namibia as exporter. In effect, there is basically no difference between the two regimes from a Namibian perspective.

There is a further option of making a limited number of small groups of elephants available for sale within Namibia.

### 4.1.4 Omakipa

Namibia has approval from CITES (i.e. in the annotation to the listing of the Namibian population of elephants in Appendix II of CITES) to export finished items of jewellery into which omakipa (singular ekipa) ivory amulets have been incorporated. The requirement for the inclusion of omakipa in finished jewellery pieces was done to make omakipa more individually identifiable, prevent export of antique omakipa or the manufacturing of omakipa outside regulated channels. The European Union, a large source market for tourists to Namibia, applies the provision in Article VII 3. (b) of CITES which exempts personal or household effects from species included in Appendix II from CITES provided that ***they were acquired by the owner outside the State of usual residence and in the State where removal from the wild occurred and are being imported into the state of usual residence by the owner, provided that the State where removal from the wild occurred requires the prior grant of export permits before any export of such specimens.*** Other countries may do the same, but this would have to be confirmed to avoid that such items are confiscated upon importation despite this Article VII provision because of stricter domestic measures.

This will be a way of encouraging traditional manufacturing of these highly prized cultural items under controlled conditions by availing limited amounts of raw ivory from natural or management-related mortalities as well as ivory fragments recovered from national parks to selected and registered carvers. This will also be a stimulus for the dwindling number of manufacturing jewellers in Namibia. METF has previously developed a control system for such items including individual numbering and the issuance of a card with a photo of the item and explaining its status in CITES and can issue certificates of origin or

export permits for such items. Omakipa are associated with the Owambo people and reviving this ancient craft will provide an important source of income for conservancies north of Etosha NP. Both omakipa carvers and manufacturing jewellers would require to be registered, and MEFT can control the numbers of both through the registration process as well as the amount of ivory that is released to the carvers.

Figure 56 shows examples of omakipa incorporated into attractive finished modern African jewellery pieces combined with Namibian gemstones (tourmaline, garnet) and semi-precious stones.

**Figure 56** Examples of omakipa incorporated into attractive finished modern African jewellery pieces combined with Namibian gemstones (tourmaline, garnet) and semi-precious stones

Figure 57 is an example of how a certificate of origin, preferably the size of a credit card, could look like to confirm legal origin and facilitate import into tourism destination markets.

<table>
<tr><td>  <br></td><td>Republic of Namibia<br><br>Ministry of Environment, Forestry and Tourism</td><td colspan="2">CERTIFICATE OF LEGAL ORIGIN</td><td>Certificate number<br>XXXXX</td></tr>
<tr><td colspan="5">This certifies that the item described hereunder was legally produced in Namibia and contains elephant ivory from a sustainable and approved source.</td></tr>
<tr><td rowspan="2">  </td><td>Description:</td><td colspan="3">Double threaded necklace made with ostrich shells, with a single elephant ivory ekipa mounted in silver and two red tourmalines mounted in silver.</td></tr>
<tr><td>Serial number of finished item:</td><td colspan="3">NA XXXXX</td></tr>
<tr><td rowspan="2">Approved by</td><td>Registered jeweller:</td><td colspan="3">Xxxxx<br>Registration number: xxxxx</td></tr>
<tr><td>Registered carver(s):</td><td colspan="3">Xxxxxx<br>Registration number: xxxxx</td></tr>
</table>

**Figure 57** A potential certificate of origin, the size of a credit card, to confirm legal origin and facilitate import into tourism destination markets

### 4.1.5 Other ivory carvings

Nothing in CITES prevents the manufacturing and sale of omakipa or any other types of ivory carvings in the domestic market. MEFT could potentially encourage and facilitate the manufacturing of such items, including for traditional use such as ceremonial gear, provided that no exports are permitted (as long as current CITES provisions prevail), and that such manufacturing and trade can be controlled. MEFT has regulatory provisions to register manufacturers of such items, and ample stocks of ivory to provide to such manufacturers to avoid any illegal harvesting from the wild for such purposes.

Namibia has at the last two CITES CoPs and at the last IUCN World Conservation Congress strongly opposed the closure of all ivory markets, including its own, although Namibia has ***de facto*** not allowed the sale of ivory in the domestic market for some years. CITES provisions call for the closure of ivory markets linked with illegal killing and trade but do not include the closure of regulated and legal markets. Ivory is recognized as a precious material and cultural item by several ethnic groups in Namibia and there would be a considerable domestic demand for certain types of carvings other than omakipa such as traditional regalia, bracelets and rings. There is nevertheless a need for public education and law enforcement to prevent that any illegal manufacturing occurs.

The sale of worked ivory other than omakipa (which because of their particular identity and requirement for inclusion in finished jewellery items) in Namibia could nevertheless result in opportunistic imports of worked ivory from other countries through the large informal intra-African trade flows and is the least preferred option.

### 4.1.6 Other elephant products

There is scope for expanding the manufacturing of other elephant products e.g. paper made from elephant dung. One enterprise at Onankali has previously produced at a small scale such items but this particular enterprise is located far away from the elephant range and probably struggled to get sufficient supplies. Other novelty products from elephant dung include elephant dung flavoured craft gin (made in Zimbabwe), elephant dung sold for medicinal purposes during the COVID-19 pandemic (see Figure 58) and there would probably be a market for compost made from elephant dung. Such small niche products should not be overlooked, every job created counts.

**Figure 58** Elephant dung collection and offered for sale as a cure for COVID-19! (photo NNF)

Perhaps the most potential lies in the manufacturing and sale of elephant dung and chilli powder bombs or bricks which are burnt to deter elephants from crop fields. There is strong endorsement from rural communities that such items are effective in crop protection, and there is some indication that there is a trade demand for such chilli bombs as they are mostly referred to in Namibia. Not everyone that grows crops or have small vegetable and fruit gardens may have access to enough elephant dung or chili powder to take care of their own needs, the same applies for the used cooking or engine oil or grease mixed with chili powder that is applied to fences around crop fields, gardens and homesteads and which is effective in deterring elephants. MEFT and conservancy support organizations should consider making seed funding available to expand the production and sale of such items which would not only create employment and income but improve human-elephant conflict mitigation.

### 4.1.7 Tourism

Tourism on State land outside protected areas and tourism which is not part of a concession agreement with a conservancy can be considered as unregulated tourism. Conservancies and other rural communities strongly resent such tourism which brings no income to them and do not wish to have tourists access their land without payment or control as to where people could drive, camp and how to manage their fires and wastes. As evident from the public consultations, people see such tourism as undermining the investments made by their tourism joint venture investors. There are even stronger concerns over the use of motorcycles or quad bikes in the dry riverbeds of north-western Namibia due to its disturbance of wildlife.

There is further reason to be concerned about the potential impacts of tourism on elephants in certain areas such as frequently visited dry river systems in north-western Namibia such as the Hoanib, Hoarusib and Ugab Rivers. Current legislation does not provide for the regulation of tourism outside State-protected areas and ill-informed self-drive tourists (but increasingly also tour operators) may unintentionally disturb elephants by their activities or by camping too close to water points. There is some suspicion of disturbance also through aircraft, including paragliders, even the use of drones for photography, or tour guides feeding elephants. It is important to engage the tourism sector in this regard. The statements below that came out of the public consultation process are telling.

> *Are tourists and lodges feeding elephants? Is this changing their behaviour? (Ugab River area). We have more problems now because there is tourism in the rivers. Tourism companies should limit the number of tour guides and groups in the North West because they disturb elephants. Tour guides chase elephants. This must be looked into. Self-drive tourists may also disturb elephants. These tourists do not benefit us, there are no benefits to conservancies and they may affect elephant behaviour. They try to dodge payments and sneak into areas to camp without payment, e.g. at Brandberg. Unregulated tourists cause a loss to us. They undermine our lodge investors. Even busloads of people camp on our farms with no payment and no benefit to us. We are concerned about the use of quadbikes and motorbikes in the Ugab River, they are disturbing elephants. People who camp anywhere don't cover their fires and they leave their rubbish. Tour operators chase elephants away from lodges or campsites, such disturbed elephants could pose a threat to us.*

Unregulated tourism is one of the most important reasons why three conservancies in the Kunene Region are intent on seeking proclamation of parts of their conservancies as landscapes of special conservation importance, which would grant them access control and direct tourism towards approved and serviced campsites and ablutions. This is likely to be followed by other conservancies for the same reason.

In this manner the economic contribution from tourism to such conservancies would increase. There are other issues of equal concern, however. There is a general perception amongst conservancies that they do not benefit sufficiently from tourism, and tourism earnings for conservancies (which exceeded N$100 million in direct concession-related incomes in 2018 with additional employment worth nearly N$50 million in employment through joint venture tourism (MET/NACSO 2018)) which together with other revenues of which hunting is the most important are not sufficient to cover all their operational costs or make sufficient contributions to the development of their communities or individual livelihoods.

Tourism is scale sensitive in the Namibian environment and cost sensitive in general, and it may not be possible to significantly increase tourism earnings. There are nevertheless some instances where lodges operate in conservancies without paying any concession fees. The proposed Protected Area and Wildlife

Management Bill will once enacted vest exclusive tourism rights to conservancies and may bring this unhealthy situation to an end. There are nevertheless several other ways in which tourism operations can support conservancy operations, based on what came out of the public consultations (see Chapter 2), e.g.:

- Tourism companies must assist with mitigation measures because we all benefit from these elephants. We recognize the value of tourism and employment created for young people in the lodges but farmers struggle continuously.
- Tourism operators should help to monitor elephant movements and support anti-poaching activities. Tourism operators should help to monitor elephant movements, report poaching incidents and support anti-poaching activities. Tourism operators should support conservancies with equipment such as boats, fencing and transport for patrols. Conservancies need assistance with getting equipment for conservation work e.g. binoculars, GPSs, tents, water bottles, boats, rucksacks, torches or lights, bedrolls, two-way radios, cameras. Tourism operators should help to monitor elephant movements, report poaching incidents and support anti-poaching activities.
- Tourism operators should share equitably with conservancies their income from elephants.
- Hunting and tourism operators must work hand in hand with conservancies and maintain a good relationship.
- Hunting and tourism operators should assist conservancies to put up signage to demarcate elephant movement corridors.
- Elephant tracking (taking tourists on foot, following elephant tracks, to see elephants relatively close up) should be done just like rhino tracking is done as an additional income earning activity.

This can be summarized in the following intervention areas that the tourism industry should be made aware of and which potentially could be included in a code of conduct for tourism in conservancies with elephants, noting that there are commendable tourism companies that already engage in these areas and others in some instances:

| Possible components for a "code of conduct" for tourism in conservancies with elephants |
|---|
| 1. Tourism companies should do more to assist conservancies with human-elephant conflict mitigation measures out of a common interest to maintain co-existence between people and elephants in conservancies and obtaining sustainable benefits from elephants. |
| 2. Tourism operators should do more to help monitor elephant movements, report incidents of illegal killing and support anti-poaching activities. This could be accomplished by direct reporting through e.g. the SMART system or sighting forms as well as through material means including funding, equipment and transport. |
| 3. Tourism operators should from their side do more to work cooperatively with conservancies and hunting concessionaires to avoid and manage conflict amongst the different interest groups. |
| 4. Tourism operators should assist conservancies to put up signage to demarcate elephant movement corridors. |
| 5. Tourism operators should become involved in water security for elephants and assist conservancies to protect water installations against elephants and adapt them to elephant use. |

| Possible components for a "code of conduct" for tourism in conservancies with elephants |
|---|
| 6. Tourism operators should be more sensitive to the issue of equitable sharing of benefits from tourism. Conservancies contribute land, wildlife, scenery and culture to tourism joint ventures. Operators contribute capital investment, marketing and operational skills, and often also create a platform for community members to sell crafts and arts to visitors. Although in several cases tourism operators do considerably more to support community development in conservancies through a range of interventions, there are cases where more can be done. One relatively low-hanging fruit is the procurement of goods and services from conservancies or conservancy members such as food items (e.g. vegetables, eggs, milk, meat etc.) which could incentivize production and benefit local livelihoods. |
| 7. Tourism companies should adopt a common code of conduct in areas with elephants to prevent unnecessary disturbance or behavioural changes and improve the training of their tour guides. A common standard for treating campfires is needed and no waste must be disposed of in any manner within conservancies. |
| 8. Accommodation establishments which do not have concession arrangements with the conservancies in which they are located should be required to correct this situation within a limited period, e.g. one year, or face deregistration by MEFT/NTB. |
| 9. Tour operators which traverse conservancies or camp within conservancies should negotiate traversing or camping rights with such conservancies or groups of conservancies. |
| 10. Car rental companies which supply vehicles for self-drive tourists should provide information to their clients on approved camping sites, routes and other aspects of the proposed code of conduct, and how to prevent disturbance of elephants and other wildlife. |
| 11. Tourism operators should explore ways to offer elephant tracking (taking tourists on foot, following elephant tracks, to see elephants relatively close up) should be done just like rhino tracking is done as an additional income earning activity. |

### 4.1.8 Agriculture and enterprise development

Giving more priority and support for agriculture and enterprise development in conservancies beyond human-elephant conflict mitigation presents considerable opportunities to support elephant conservation directly and indirectly. Conservation agriculture is possibly the most important of such opportunities as land clearance and thus wildlife habitat transformation for crop fields can be significantly reduced while increasing yields (up to four or six-fold in some parts of Namibia). Conservation agriculture that involves the clustering of crop fields will enable the use of electric fencing which otherwise cannot be used for hundreds if not thousands of individual and scattered crop fields. Clustering of gardens instead of individual small home gardens in the North West will also enable the use of electric fencing.

Giving training and technical support to conservancies or individual conservancy members to target some production towards higher value products in demand for tourist consumption is another. Horticulture using tunnels or hydroponics offers considerable potential as well.

The problem has been that MEFT, MAWLR or conservancy support organizations have not been able to focus on these matters and that the CBNRM policy does not explicitly provide for these areas of engagement. It is nevertheless clear that these livelihood issues need to be given greater attention in future.

### 4.1.9 Payment for Ecosystem Services and Wildlife Credits

There are considerable opportunities in the concept of Payment for Ecosystem Services (PES) and the associated Wildlife Credits scheme used in Namibia.

Quoting from the very comprehensive draft CCFN guidelines on Payment for Ecosystem Services (CCFN 2020): *"Ecosystem services are the benefits derived from the natural environment. These could be an actual direct benefit such as clean water or food or can be an existence value (reflecting the benefit people receive from knowing that a particular environmental resource, or endangered species, or any other organism or thing exists)... ... PES represents an approach which constitutes both a financing*

*mechanism and a financial incentive for conservation. The concept revolves around one of the most fundamental principles of economics, that of supply and demand, and assumes that there will be people and institutions willing to pay for a conservation/ environmental outcome. A PES system therefore aims to establish a market for the exchange of ecosystem services through payments that adequately compensate custodians of the natural resources (in this case the conservancy members) for any economic losses or opportunity costs they might incur in delivering the service, such as giving up grazing opportunities or collect resources in a defined area; living with problem causing wildlife; or incurring losses through Human Wildlife Conflict...*

*PES is an umbrella term that can be used for the entire suite of economic arrangements used to reward the conservation of ecosystem services and performances or compensate for the risks of living with problem causing species. Traditionally, payments would be made for ecosystem services such as provision of water, clean air, and carbon sequestration. However, there is also another component which involves payments for conservation performance outcomes which in the context of Namibia has been branded as Wildlife Credits ...*

*Conservation Performance Payments: provide payments made to individuals or communities conditional on achieving a specific conservation outcome[59]. The payment is based on a defined verifiable success event... The basic idea behind these various PES arrangements is that those who provide ecosystem services, conservation performances, and/or who carry the risks of living with wildlife, should be paid...*

*There are two economic arrangements that can be considered under the umbrella term of PES:*

- ***Conventional PES** that involves a series of payments to natural resource managers in return for a guaranteed flow of ecosystem services or, more commonly, for management actions likely to enhance their provision, over-and-above what would otherwise be provided in the absence of payment.*
- ***Conservation payments** that involves monetary (or in-kind) payment made by a paying agency to individuals or groups. Payments are based on defined and verifiable criteria, with payments made on a strict quid pro quo basis. In the Namibian context conservation payments has been branded as Wildlife Credits and will be referred to as such throughout this Guide. There are three general categories of payments that would fall under the Wildlife Credits:*
    - *Conservation Risk Payments: provide payments to individuals or communities exposed to increased risks from living with problem causing species such as predators and elephants. The payment recognises that living with problem causing species leads to increased costs and/or direct losses, and therefore, if others value the existence of these species in an area, they must be prepared to pay those incurring the costs.*
    - *Conservation Service Payments: provide payments to individuals or communities providing a service that benefits the conservation of one or more species or ecosystems, at a direct or opportunity cost to themselves. The payment recognises that these individuals or communities are providing a service that is valued by others.*
    - *Conservation Performance Payments: provide payments made to individuals or communities conditional on achieving a specific conservation outcome. The payment is based on a defined verifiable success event.*

59 A good example is the protection of an important elephant movement corridor against settlement as e.g. the wildlife credit scheme currently in place for the Sobbe elephant corridor.

*The basic idea behind these various PES arrangements is that those who provide ecosystem services, conservation performances, and/or who carry the risks of living with wildlife, should be paid for doing so. PES therefore provides an opportunity to put a price on previously un-priced ecosystem services and conservation performance like climate regulation, water quality regulation, wildlife trends, the 'existence value' of rare and endangered species, and the provision of habitat for wildlife and, in doing so, brings them into the wider economy.*

*Wildlife Credits aims to scale up the number of locally managed species or conservation schemes so that the level of investment for conservation of the target species or local level conservation outcomes can be increased. Wildlife Credits has so far been piloted in six conservancies, to test whether the approach can be used as a way of incentivising, compensating and/or rewarding people living with rare or problematic species, while at the same time ensuring that good returns continue to be ploughed back into conservation initiatives. Wildlife Credits arrangements are based on a contract signed by the participating partners.*

*Therefore, if there is an external desire for wildlife range to be maintained, it is imperative that sufficient additional revenue is secured for conservancies (and their members) to allow them to fully cover the cost of living with the wildlife (refer to table below), and to leave them better off than in the absence of wildlife. PES offers such a potential as it can tap into new remote sources of revenue (beyond locally based tourism activities and trophy hunting), dramatically expanding the market for payments to conservation services. It has the added advantage that it can be used to reward biodiversity conservation irrespective of its potential for tourism, and it is conditional on a conservation / ecosystem service outcome."*

The public consultation process showed that there is a high demand for PES approaches in the elephant distribution range in Namibia, and several pilot Wildlife Credit schemes are already operational. There is a great need to scale up these arrangements and MEFT and conservancy support organizations should prioritize PES and Wildlife Credit schemes.

## 4.2 Fund for elephant conservation and management

Throughout the public consultation process, many people and organizations commented on the need for a fund for elephant conservation in Namibia. There is wide recognition that the MEFT budget, GPTF, EIF, income to conservancies, donor support to the CCFN and NGO project finances are not adequate to cover the range of priority actions needed, especially regarding human-elephant conflict mitigation. There are acute needs, especially when considering the currently un-funded areas such as the plight of commercial farmers who get no support whatsoever for human-elephant conflict mitigation, the much-needed expansion of the CBNRM programme to include conservation agriculture and enterprise development and the costs of implementing an early warning system for elephants based on RFID technology (such as developed and greatly appreciated for lions in North West Namibia through Desert Lion Conservation).

Other high cost actions that are greatly needed and under-funded are e.g. elephant monitoring with satellite telemetry (each collar costs around N$70,000 and lasts for around two years only), aerial surveys which may or may not be funded through MEFT budgets which could result in important gaps in the survey record as had already happened.

How such a fund should be financed was not stipulated apart from suggestions that tourists should pay a levy for seeing elephants. MEFT is moving in this direction with the announcement of a conservation fee or levy in lieu of increased park entrance fees, with the idea that such fees be paid into and disbursed

through the GPTF. There is probably no real need for a separate elephant conservation fund given existing instruments such as the GPTF, EIF and CCFN, noting that the costs of setting up a new fund and administering it could be considerable. It may be an option, however, to establish an elephant conservation portfolio in such instruments, given the importance of the matter.

**Photo:** Dan Stephens

# CHAPTER 5: Human-elephant conflict

Human-elephant conflict management is a hugely complex field, see e.g. Hoare & du Toit (1999), Hoare (1999, 2000, 2012), Dublin & Hoare (2004), Chiyo ***et al***. (2011, 2012) that ranges from understanding land use mosaics and individual behavioural differences to the vertical integration of conflict management and the range of mitigation methods, amongst others. Recent studies have also looked at behavioural and spatial adaptation (both human and elephant) to reduce the areas of conflict (Songhurst ***et al***. 2015, Songhurst & Coulson 2013). Maintaining landscape connectivity for elephants remains a key element in managing the elephant-human interface.

With about 31 % of Namibia's elephant population and about 65 % of the known elephant distribution range occurring outside formally protected areas, primarily on communal land and some free-hold land, it is not surprising that one of the major challenges experienced for elephant management in Namibia is human-elephant conflict (HEC) e.g. by raiding crops, disrupting livestock production and occasionally killing livestock, destroying water supplies, demolishing grain stores and houses[60], injuring and even killing people. The costs of such conflict can be significant. The search for effective measures to deal with human-elephant conflict is one of the most significant challenges for elephant management (Hoare 2012, KAZA TFCA undated).

This chapter deals primarily with the direct visible impacts of human-elephant conflict and mitigation measures but cognisance should be taken that the problem of human-elephant conflict is the result of a much wider range of influences as shown in Figure 59, that exceed the scope of the elephant conservation and management plan but fall within the realm of the National Policy on Human Wildlife Conflict Management, which needs to address the causes of conflict rooted in national and international policies and values. The most important of these is CITES which prevents the generation of value from elephants that would far outstrip the value of costs created by elephants and indeed the value of agricultural production. This conceptual framework calls for a shift in focus from the direct impacts from elephants to addressing the other influences.

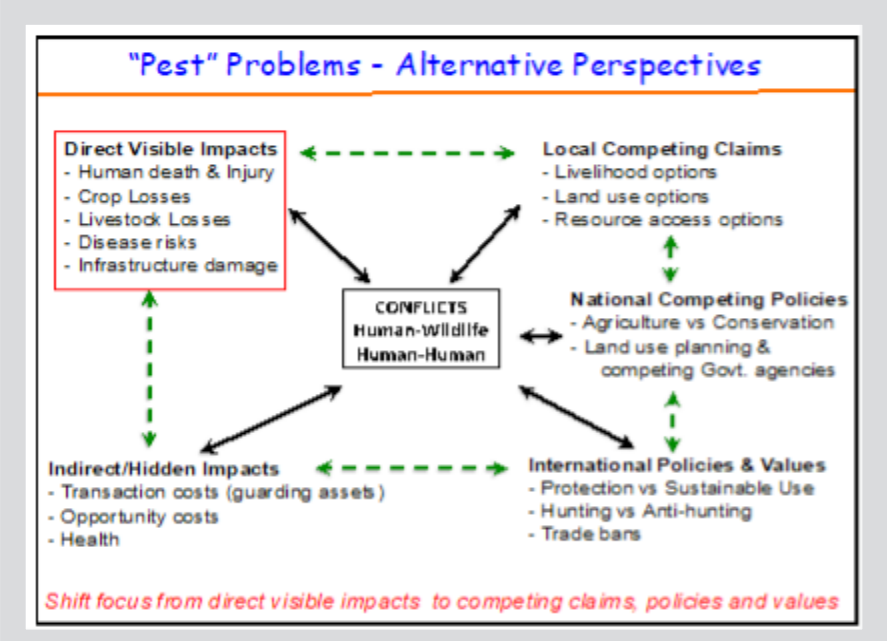



**Figure 59** A broader conceptual framework for human-wildlife conflicts (also applicable to human-elephant conflicts), source: D. Cumming

60 During the current drought, people in especially the Kunene Region have taken to collecting acacia and ana tree pods and storing these and other fodder materials for livestock in their dwellings. Elephants must be able to smell such fodder and have on a number of occasions broken down houses to get to the pods.

This notion is supported by Schaffer ***et al***. (2019) who suggest that on-going and future changes to land use, conservation policy, economic markets and climate, will challenge the efficacy of current human-elephant conflict prevention and mitigation strategies, and that a shift of thinking away from conflict towards supporting the mutual well-being of humans and elephants through coexistence is needed. This can be achieved by addressing the underlying conflict drivers (as e.g. shown in Figure 59), and the evolving needs of both humans and elephants.

## 5.1 Trends in human-elephant conflict

There is currently no consolidated national database of incidents of HWC or HEC, so information on trends was extracted from different sources. Furthermore, although elephants are responsible for a considerable amount of infrastructure damage, detailed data on this damage was not available, as offset payments for infrastructure damage are not included in the Human Wildlife Conflict Self Reliance Scheme (HWCSRS). The data available therefore primarily focussed on crop losses.

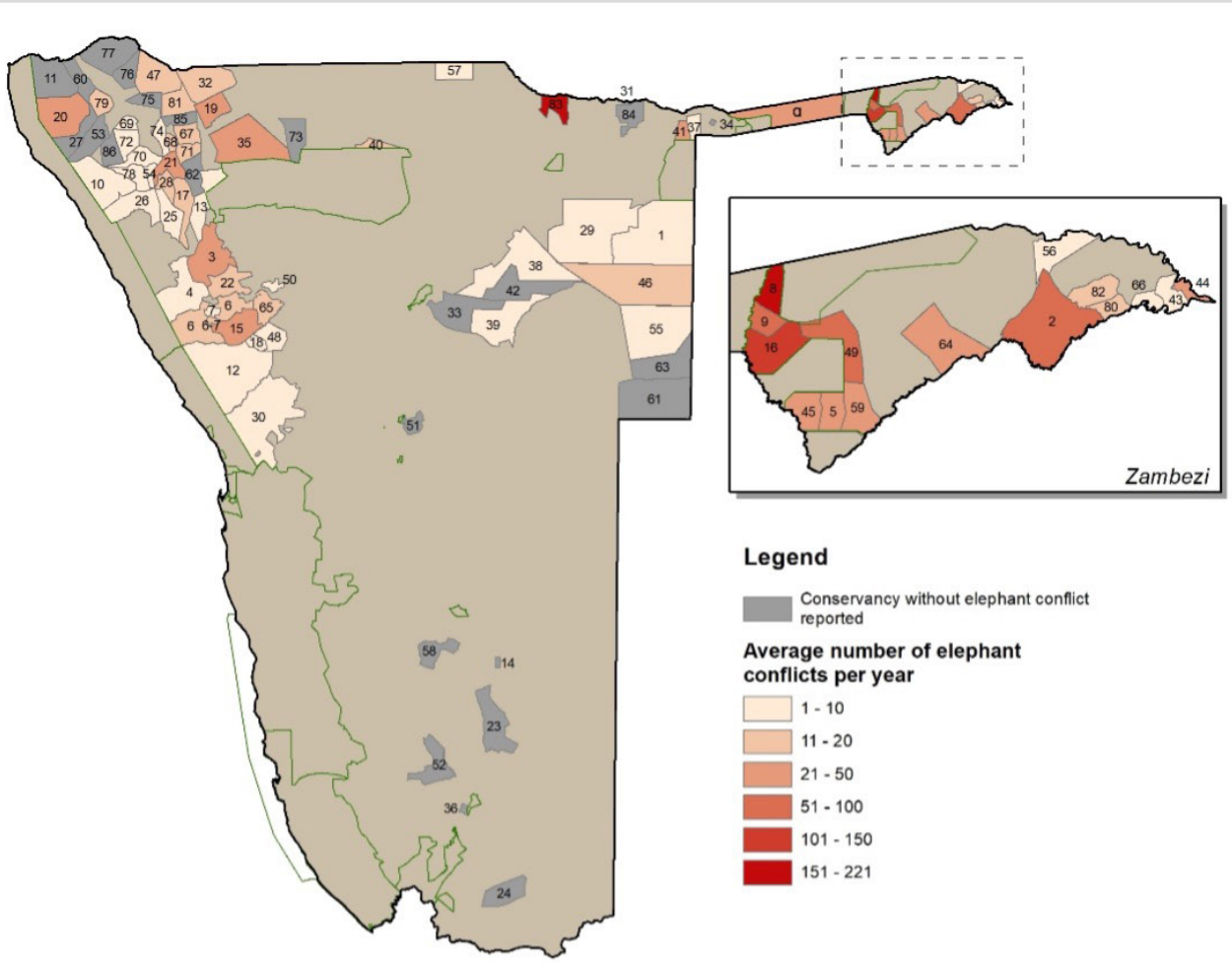
### 5.1.1 Human-elephant conflict in conservancies

Figure 59 shows the map of all conservancies, with the average recorded number of human-elephant conflict incidents between 2001-2019, captured from the event book system (Coninfo[61] summary data). Figure 60 shows the annual incidents since 2001, with a peak in 2007, and a general declining trend thereafter. Most incidents of conflict are recorded in the Zambezi and Kunene regions, where most conservancies are located within the elephant range. The number of conservancies has progressively increased over time, as more conservancies became gazetted, and taking this into consideration, there has been a general decrease in the recorded incidence of HEC per conservancy.

Elephants mostly come into conflict with humans over food and water, causing losses of crops (grains and gardens), or damage to infrastructure in search of water and/or food. They are also considered a threat to people's safety and life, although data from offset payments made by the Ministry of Environment, Forestry and Tourism (MEFT) through the Game Products Trust Fund (GPTF) indicates that elephants account for only 8% of the reported cases of loss of life due to Human Wildlife Conflict (Figure 61), with crocodile and hippopotamus accounting for the majority of cases.

The monthly distribution of HEC incidents is provided in Figure 62, and shows a peak during the rainy season. The Coninfo data provides two series of information: one on the species responsible for conflict incidents, and a separate data set indicating the type of conflict (human life, livestock loss, crop loss and other losses). The linkage between the problem species and the losses caused is not specifically captured onto Coninfo (although would be available in the original reporting in the event book system registers). Nonetheless, data from the MEFT monthly reports suggests that 97% of crop damage in communal land outside conservancies is caused by elephants, and it is reasonable to extrapolate that a similar ratio would apply within conservancies. Figure 64 provides the annual trends as well as monthly trends of incidences of crop damage reported within conservancies between 2001-2019. Most incidents are reported between January to May, which coincides with the dryland cropping season. Incidences appear to be higher in years of higher rainfall when dryland cropping is more likely to succeed.

61 Short for Conservancy Information, Coninfo is a database of monitoring data from conservancies overseen by NACSO and its working groups. http://www.nacso.org.na/resources/




| No | Conservancy | Registration Date | No | Conservancy | Registration Date | No | Conservancy | Registration Date | No | Conservancy | Registration Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Nyae Nyae | Feb-98 | 22 | //Huab | Jul-03 | 44 | Impalila | Dec-05 | 66 | Kabulabula | Nov-11 |
| 2 | Salambala | Jun-98 | 23 | !Khob !naub | Jul-03 | 45 | Balyerwa | Oct-06 | 67 | Okongoro | Feb-12 |
| 3 | ≠Khoadi-//Hôas | Jun-98 | 24 | //Gamaseb | Jul-03 | 46 | Ondjou | Oct-06 | 68 | Otjombande | Feb-12 |
| 4 | Torra | Jun-98 | 25 | Anabeb | Jul-03 | 47 | Kunene River | Oct-06 | 69 | Ongongo | Feb-12 |
| 5 | Wuparo | Dec-99 | 26 | Sesfontein | Jul-03 | 48 | Ohungu | Oct-06 | 70 | Ombujokanguindi | Feb-12 |
| 6 | Doro !nawas | Dec-99 | 27 | Sanitatas | Jul-03 | 49 | Sobbe | Oct-06 | 71 | Otuzemba | Feb-12 |
| 7 | Uibasen Twyfelfontein | Dec-99 | 28 | Ozondundu | Jul-03 | 50 | //Audi | Oct-06 | 72 | Otjiu-West | May-12 |
| 6-7 | Doro !nawas - Uibasen JMA | Dec-99 | 29 | N≠a Jaqna | Jul-03 | 51 | Ovitoto | May-08 | 73 | Iipumbu ya Tshilongo | May-12 |
| 8 | Kwandu | Dec-99 | 30 | ≠Gaingu | Mar-04 | 52 | !Han /Awab | May-08 | 74 | Okatjandja Kozomenje | May-12 |
| 9 | Mayuni | Dec-99 | 31 | Joseph Mbambangandu | Mar-04 | 53 | Okondjombo | Sep-08 | 75 | Ombazu | May-12 |
| 10 | Puros | May-00 | 32 | Uukolonkadhi Ruacana | Sep-05 | 54 | Otjambangu | Mar-09 | 76 | Okanguati | May-12 |
| 11 | Marienfluss | Jan-01 | 33 | Ozonahi | Sep-05 | 55 | Eiseb | Mar-09 | 77 | Epupa | Oct-12 |
| 12 | Tsiseb | Jan-01 | 34 | Shamungwa | Sep-05 | 56 | Sikunga | Jul-09 | 78 | Otjikondavirongo | Mar-13 |
| 13 | Ehi-Rovipuka | Jan-01 | 35 | Sheya Shuushona | Sep-05 | 57 | Okongo | Aug-09 | 79 | Etanga | Mar-13 |
| 14 | Oskop | Feb-01 | 36 | !Gawachab | Sep-05 | 58 | Huibes | Oct-09 | 80 | Nakobolelwa | Oct-14 |
| 15 | Sorris Sorris | Oct-01 | 37 | Muduva Nyangana | Sep-05 | 59 | Dzoti | Oct-09 | 81 | Ombombo | Oct-14 |
| 16 | Mashi | Mar-03 | 38 | Otjituuo | Sep-05 | 60 | Otjitanda | Mar-11 | 82 | Lusese | Oct-14 |
| 17 | Omatendeka | Mar-03 | 39 | African Wild Dog | Sep-05 | 61 | Otjombinde | Mar-11 | 83 | Maurus Nekaro | Aug-17 |
| 18 | Otjimboyo | Mar-03 | 40 | King Nehale | Sep-05 | 62 | Orupupa | Mar-11 | 84 | Kapinga kaMwalye | Aug-18 |
| 19 | Uukwaluudhi | Mar-03 | 41 | George Mukoya | Sep-05 | 63 | Omuramba ua Mbinda | Mar-11 | 85 | Otjindjerese | Aug-18 |
| 20 | Orupembe | Jul-03 | 42 | Okamatapati | Sep-05 | 64 | Bamunu | Mar-11 | 86 | Otjikongo | Aug-18 |
| 21 | Okangundumba | Jul-03 | 43 | Kasika | Dec-05 | 65 | !Khore !goreb | Sep-11 | α | Kyaramacan Association | |

**Figure 60** Map of Namibia showing all registered conservancies (March 2020) with an indication of the average number of human-elephant conflict incidents recorded annually between 2001-2019 (source: K. Dierkes, WWF in Namibia)

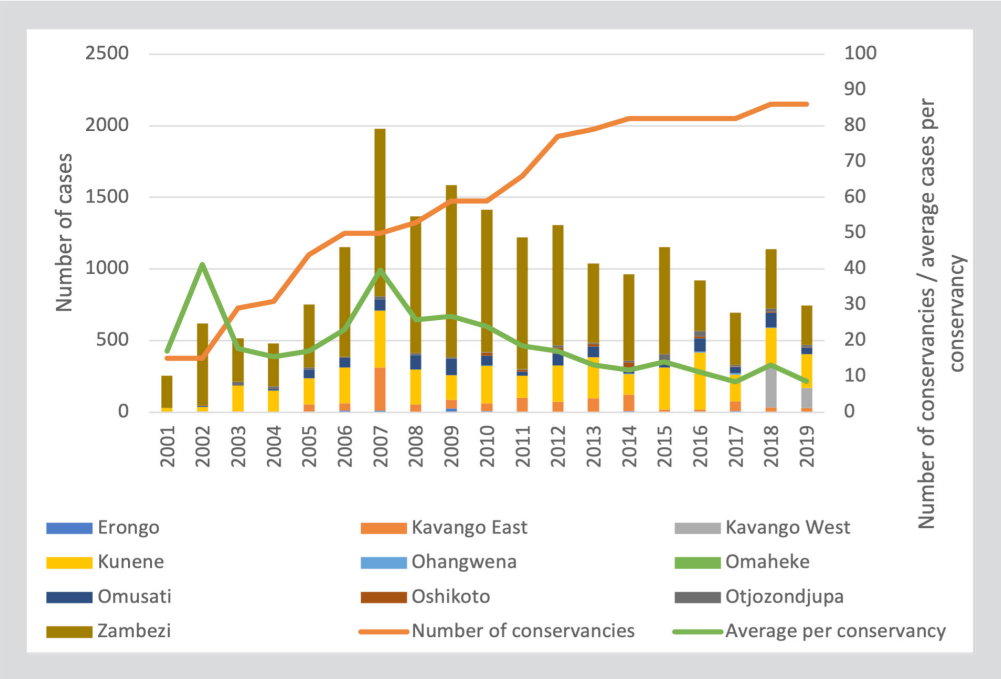



**Figure 61** Incidents of human-elephant conflict recorded through the conservancy event book system, including number of registered conservancies and average number of cases per conservancy (Source: Coninfo database)

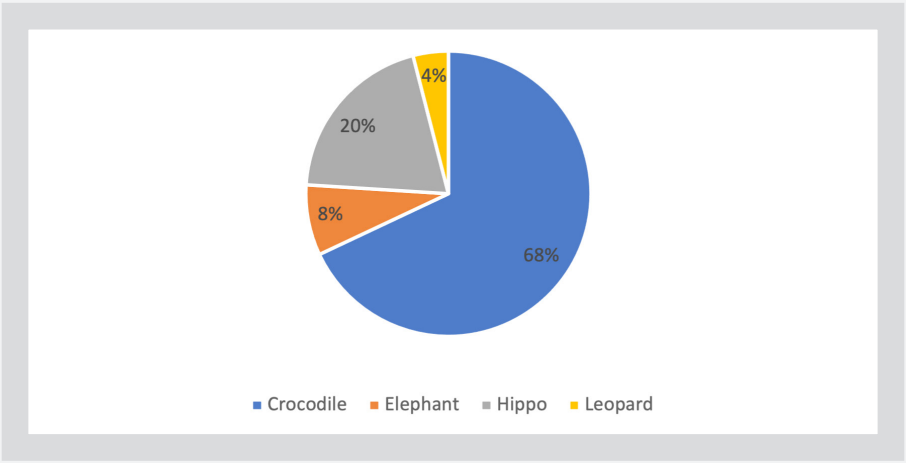



**Figure 62** Species responsible for loss of human life (Source: GPTF HWCSRS data – 2010-2018)

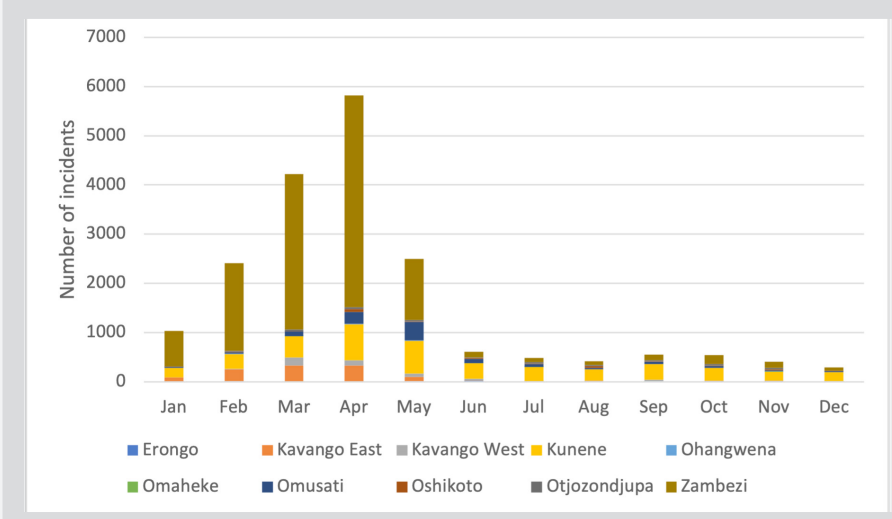



**Figure 63** Number of incidents of HEC in conservancies per month (total over period 2001-2019) (Source: Coninfo)

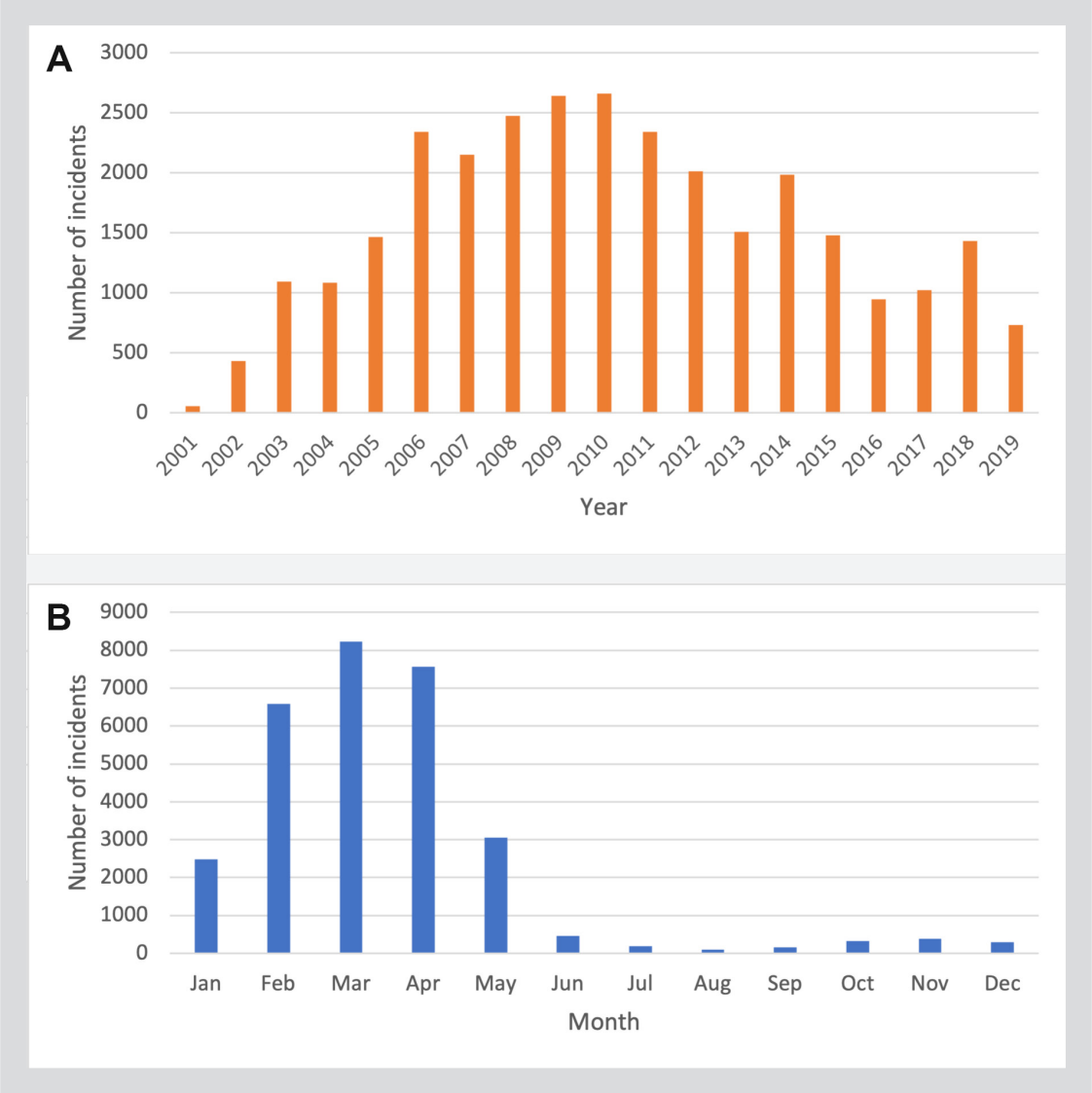



**Figure 64** Graphs showing the total annual number of recorded incidence of crop damage caused by wildlife between 2001 and 2019 in conservancies (A), as well as the combined monthly distribution of these incidents (B) (Source: Coninfo)

A study by Matson (2006) showed that in Nyae Nyae Conservancy, damage of infrastructure to the value of N$ 551,500 was caused by elephants over a five-year period (2000-2005). Between 2000 and 2003, the number of conflicts between people and elephants increased steadily but began to decline in 2004 when protection measures were introduced around water installations, even though the number of elephants was increasing.

### 5.1.2 Human-elephant conflict in communal land outside conservancies

Regional offices of the MEFT are responsible for attending to reported cases of Human Wildlife Conflict. Figure 65 shows the monthly area of crop damage caused by elephants, as recorded by MEFT regional services, and reported in the monthly reports, and in the case of Kavango East and West, the data provided on spreadsheet (Deputy Director A. Kannyinga, pers. comm. to P. Lindeque). According to this data, the estimated value of the crop losses, based on the HWCSRS offset values was N$ 2,147,750 in 2018, and N$ 1,720,000 in 2019.

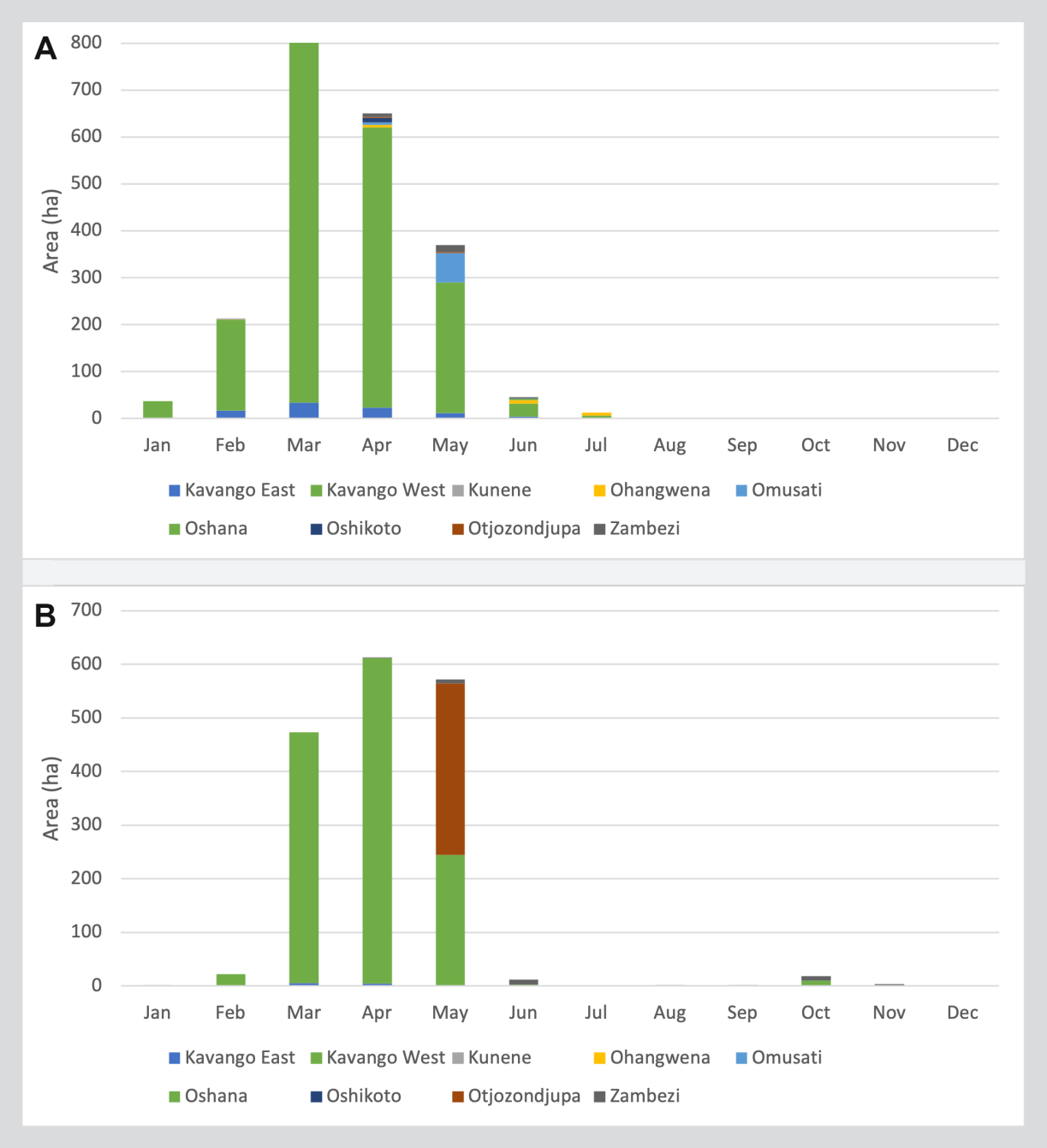



**Figure 65** Graphs showing the monthly area of crop losses recorded in 2018 (A) and 2019 (B) in communal land outside conservancies (Source: HWCSRS claims)

As most crop production is rain fed, as in conservancies, the peak in crop losses reported outside conservancies coincides with the end of the rainy season, when crops are maturing. Figure 65 provides the data for the same period but extracted from the claims processed by the Game Products Trust Fund. Although the pattern is similar, the magnitude of reported losses is significantly different. It is imperative that a standard centralised database is developed for recording all HWC data, to avoid inconsistencies in reporting.

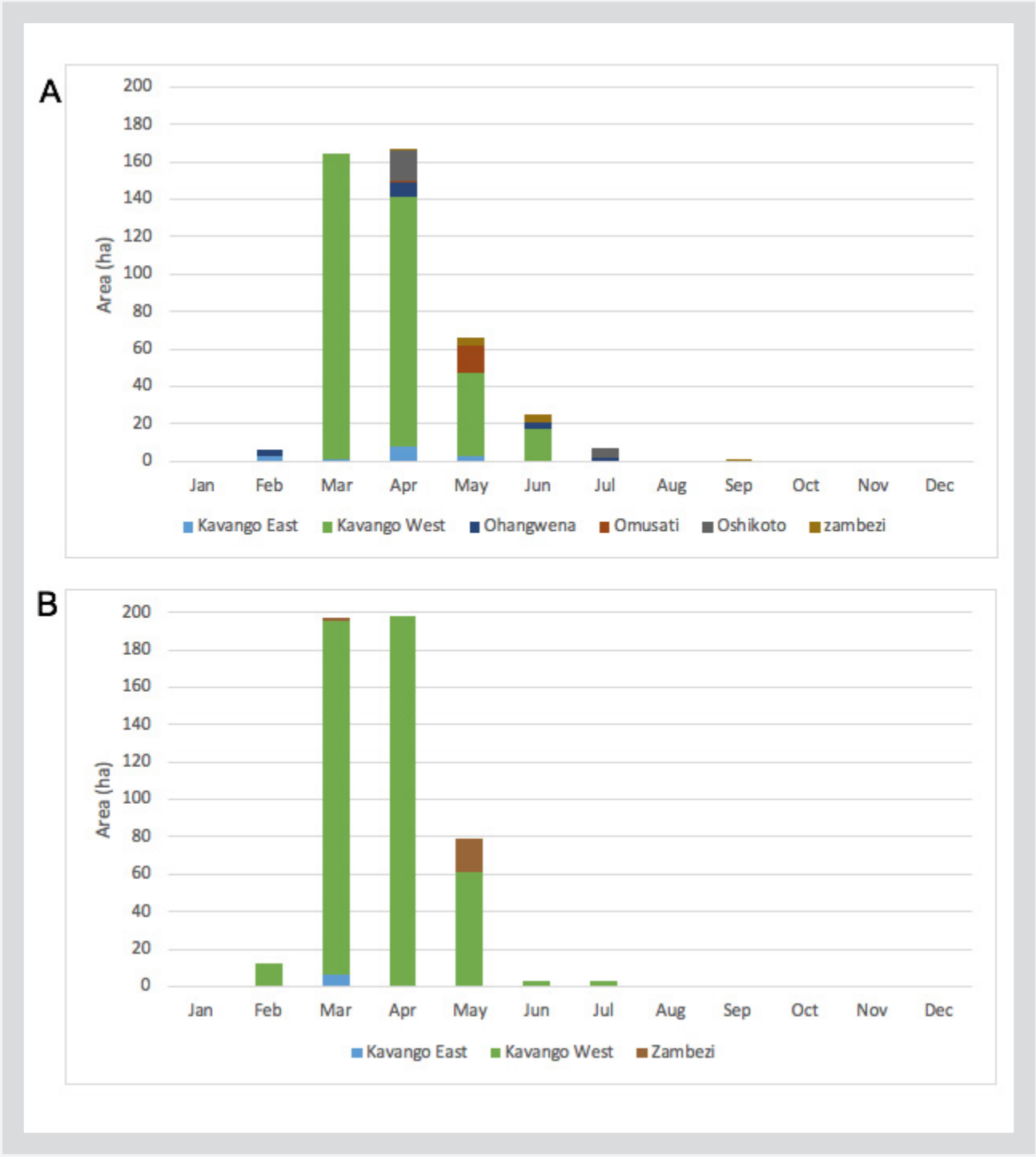



**Figure 66** Graphs showing the monthly area of crop losses due to elephants recorded in 2018 (A) and 2019 (B) in communal land outside conservancies (Source: MEFT monthly reports)

Figure 66 provides the breakdown of reported crop loss data per region, showing that the incidence appears to be significantly higher in Kavango West Region. It is not immediately clear why this would be the case, as dryland cropping occurs in the Kavango East and Zambezi Regions as well. It could be beneficial to understand the dynamics of damage assessment in the Kavango West Region, as this region has the lowest number of elephants in the North East.

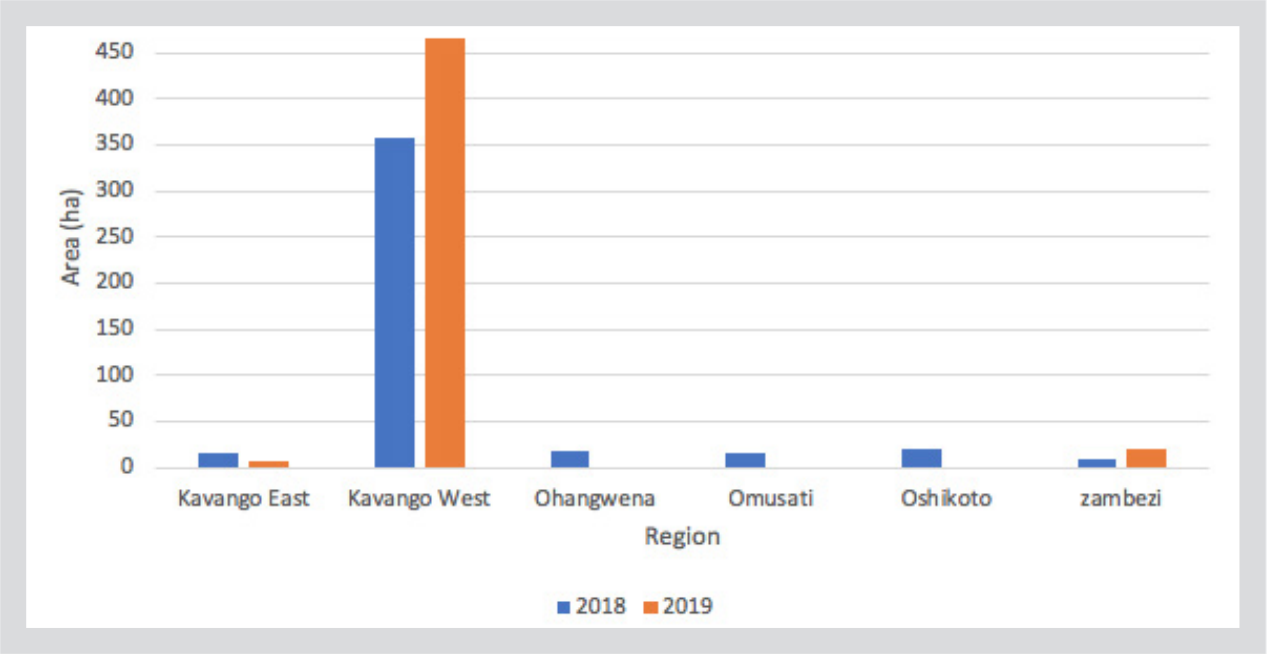



**Figure 67** Graph showing the annual area (ha) of crop damage caused by elephants per region, for 2018 and 2019 (Source: MEFT monthly reports).

### 5.1.3 Human-elephant conflict on freehold land

No detailed data on HEC on freehold land exist, partly because the Human Wildlife Conflict Self Reliance Scheme outlined in the Revised National Policy on Human Wildlife Conflict Management (2018) does not apply to freehold land, and there is therefore no standard reporting. Nonetheless, where elephants occur on freehold land, they invariably cause problems, except where compatible land uses, such as tourism, have been adopted. Figure 68 shows the main nodes where human elephant conflicts occur which include (but are not restricted to) freehold land, and each is described further below. At least 180 freehold farms have been affected by free-moving elephants to a degree or other, based on information collected during the public consultation process for this plan.

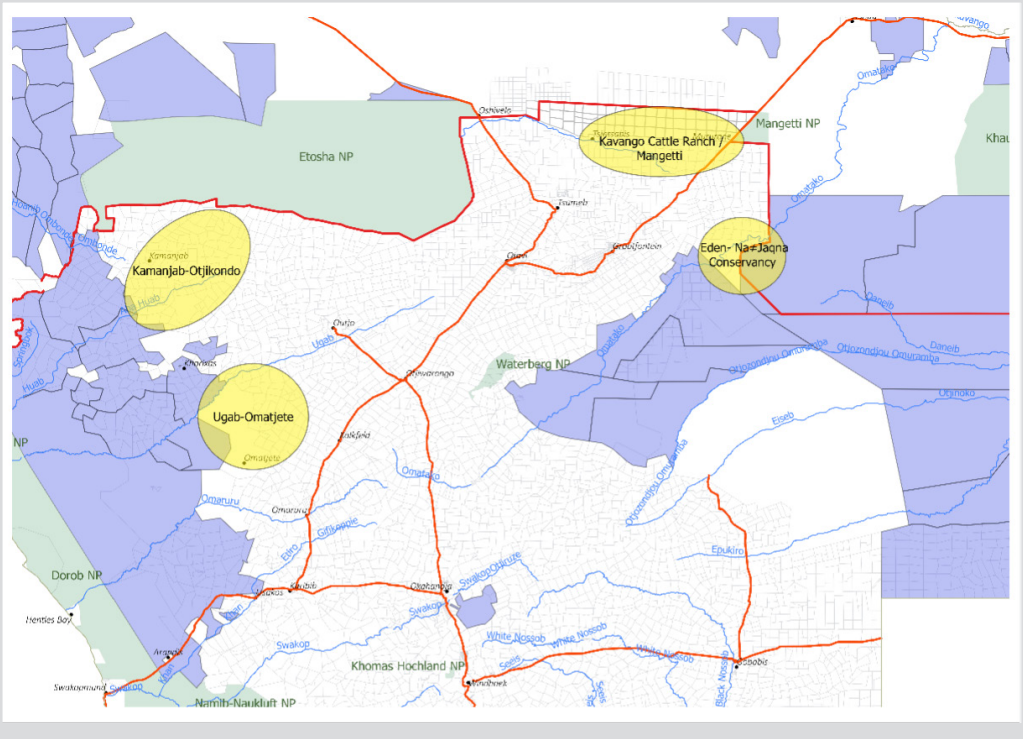



**Figure 68** Map showing main conflict nodes with elephants on freehold land

## Ugab-Omatjete node

One male elephant followed later by a group of seven re-colonized the lower Ugab River in 1994 from the Huab River area supplemented by a further group from the upper Ugab River in the north-east (possibly from the Kamanjab area) and since around 2018 the elephants have started to move eastwards along the river but also the surrounding area (information provided by resident communities during the public consultations). Elephants moved onto commercial farms from 2010 onwards.

There have been 23 elephants in the western Ugab River area from 1994 to 2020. No calves out of the nine recorded births since 2014 have survived (Harris ***et al***. 2019). In the eastern Ugab River area from Okondati to Omatjete and about 10km south of the Ugab River, there were 36 elephants in 2016 (EHRA 2016) and 37 in 2020. The overall population is thus small and stable.

A lack of water is seen as the cause for elephants moving upstream in the river onto commercial farms, for three reasons, the springs in the lower Ugab River have dried up due to dams upstream, low downstream flows because of the eight year-long drought, and communal farmers can longer afford to pump water for elephants because of the cost of diesel. Residents are also concerned that tourism in the lower Ugab River is affecting the elephants negatively, forcing them to go east and may have increased their level of aggression (from the public consultations).

MEFT has collared elephants in the area on three occasions since 1994. Elephants collared in the Khorixas and Fransfontein areas moved to Omatjete or the vicinity. A family group collared at Omatjete never left the area, but a male collared at Okongwe moved to Khorixas and Fransfontein before returning to Omatjete and nearby commercial farms. The intention was to share the movement data daily with the community, but internet coverage has not been sufficient in this area to make this possible, which has caused frustration.

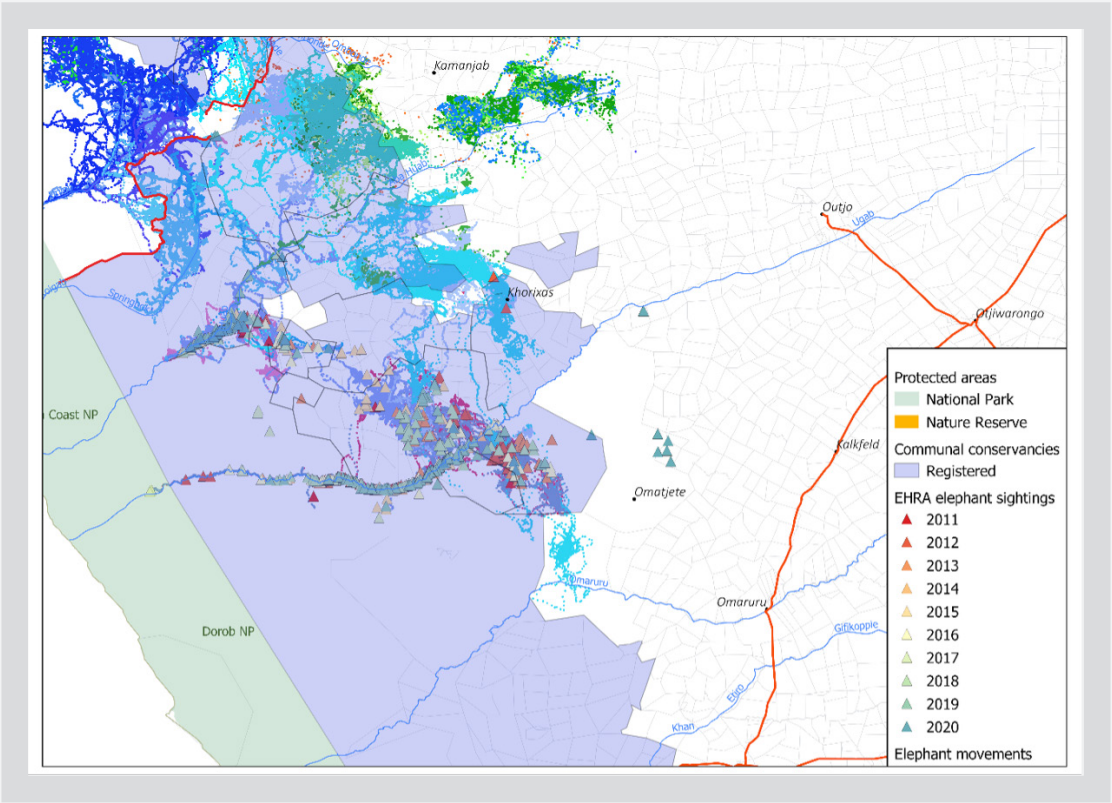



**Figure 69** Map showing elephant sightings by EHRA over the period 2011-2020 in the Ugab/ Omatjete area

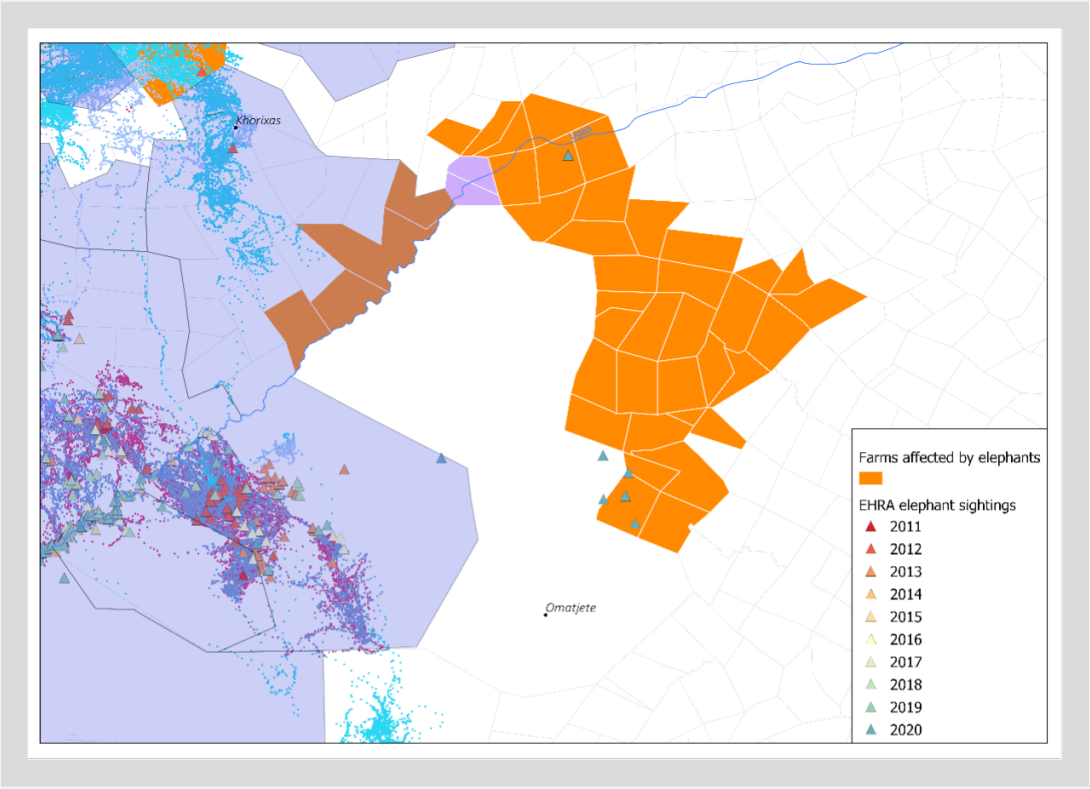



**Figure 70** Map showing the farms affected by elephants in the Ugab-Omatjete area (Source: EHRA).

**Figure 71** Elephant damage to water and fencing infrastructure on commercial farms near Omatjete (Photos: A. Koch)

### 5.1.3.1 Kamanjab-Otjikondo node

The background to the elephants occurring in the Kamanjab area was described in Sections 1.1.1 and 1.3.1. Elephants have been known to periodically move east along the Huab River as long ago as the 1980s but have since 1991 started to cause problems on commercial farms west of the C35 road (Khorixas-Fransfontein-Kamanjab). From 1994 elephant numbers increased east of the C35 road and by around 2005 most of the elephants had moved even further north-east (about 70 km) along the Huab River and settled in the Kamanjab area and never returned to their former range (information obtained through the public consultation process). There are currently as many as 200 elephants occupying around 70 livestock farms around Kamanjab, only about 40-50km south of Etosha NP. From MEFT's collaring of

elephants in the Huab River in 2018, it became clear that this group occasionally moves as far north-east as one farm away from Etosha NP (see Section 1.3.2). Importantly, Leggett (2006a) also recorded the movement of an adult male from Hobatere to east-south-east of Kamanjab and north east along the Huab River to within three farms of Etosha NP (Figure 72). Elephants have in the last few years moved even further east to the Otjikondo area and in 2019 to the Toshari area east of the C3 road (Outjo-Okaukuejo), from information provided during the public consultations. It is likely that these elephants have come from the Kamanjab area.

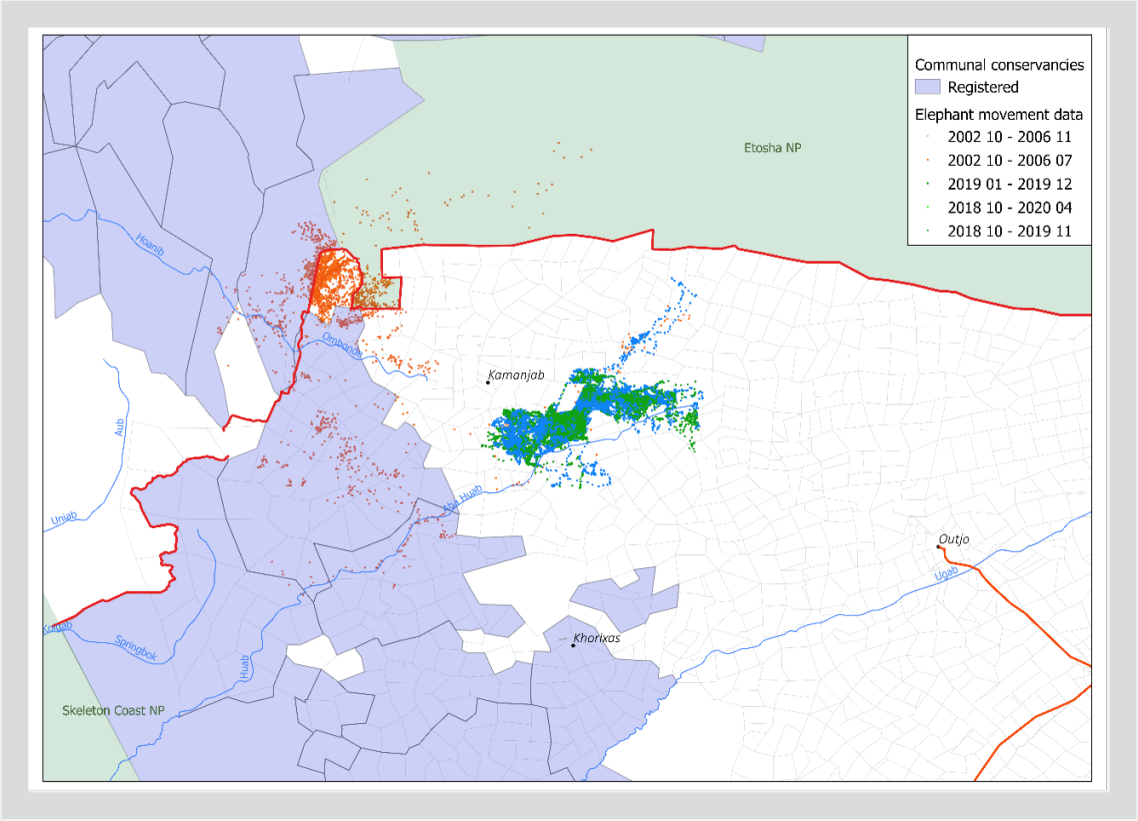



**Figure 72** Map showing elephant movement data from the 2002-2004 period (in oranges and reds) and from the 2018-2020 period (in blues and greens)

Approximately 200 elephants frequent this area. Movement information from seven elephants collared in the area is provided in Figure 73. Two of the collared elephants remained within the communal conservancy areas, whilst the remaining five spent some or most of their time on freehold farms.

Figure 73 shows the collared elephant data position points in and around farm Hirabis, demonstrating the effectiveness of the electric fence surrounding this farm to exclude elephants (see Figure 75). That this relatively inexpensive low fence with a single electric strand at the top (estimated cost is N$1,000 per km) has been successful in preventing elephant movements is remarkable and holds considerable potential to reduce human-elephant conflicts on other farms in the Kamanjab-Otjikondo area and in other farming areas.

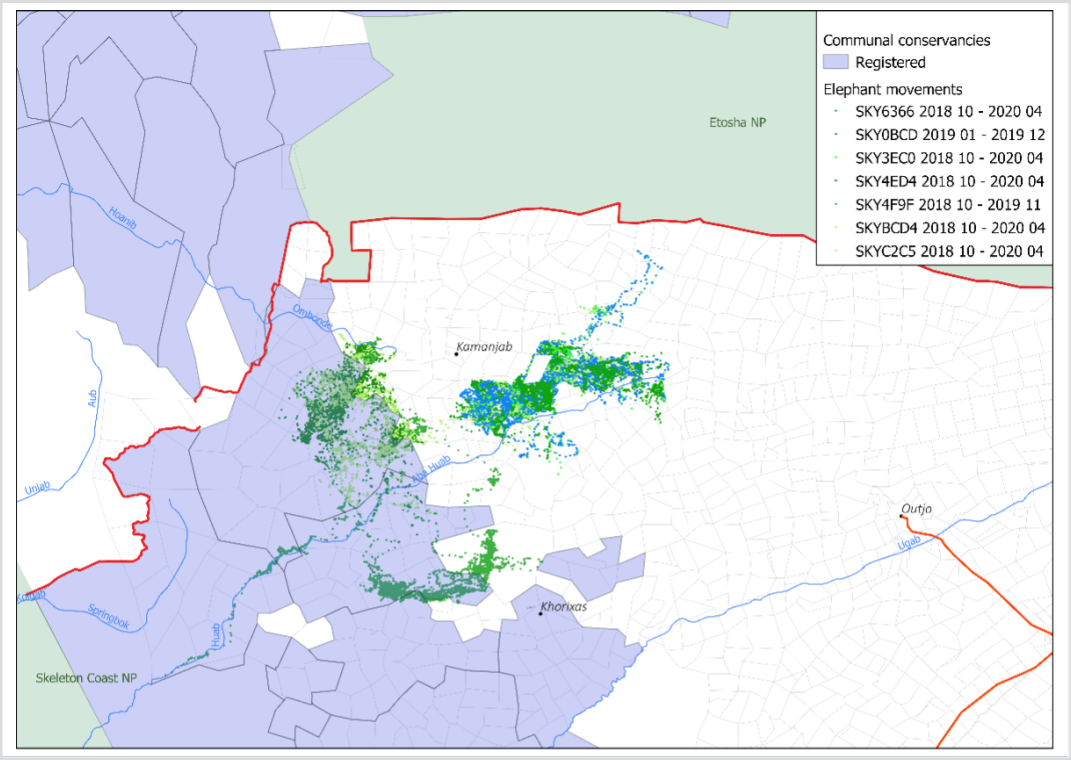



**Figure 73** Map showing the movements recorded from seven collared elephants in the Kamanjab surroundings between October 2018 and April 2020 (Source: M. Hauptfleisch, NUST).

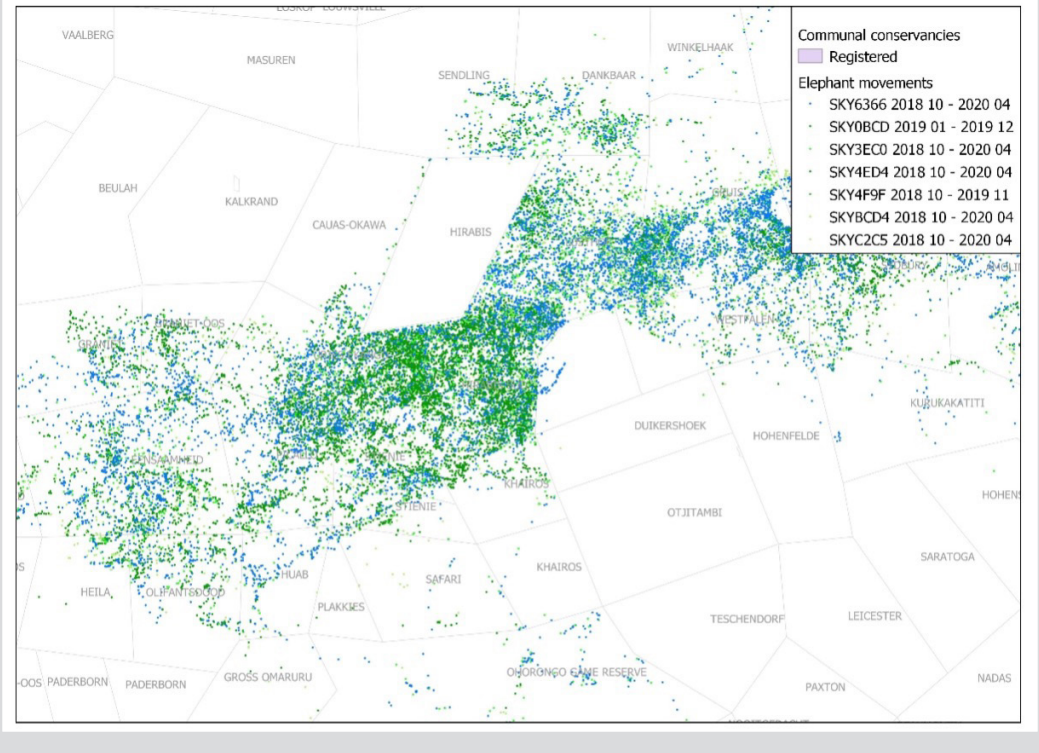



**Figure 74** Elephant movements in the Kamanjab area. Note the movements around but not through the farm Hirabis. This demonstrates the effectiveness of electric fencing

**Figure 75** Electrified fence around the farm Hirabis (Photo M. Hauptfleisch, NUST via R. Harris, EHRA)

The satellite tracking data provide valuable insights into the movement patterns, and further analysis on seasonal and or daily movements might provide a better understanding of the movements to inform mitigation measures. As an example, in Figure 76, "elephant friendly or tolerant" farms (i.e. those involved in hunting or tourism in some way as provided by Mr Jan du Plessis, Chairman of the Kamanjab Farmers Association) are shown in relation to the collared elephant movements. The patterns of collared elephant movements can potentially be used to inform interventions to strategically divert elephants away from certain areas and farms using electric fencing, whilst still retaining the elephants for those who are benefitting or would want to do so in future, through hunting or tourism.

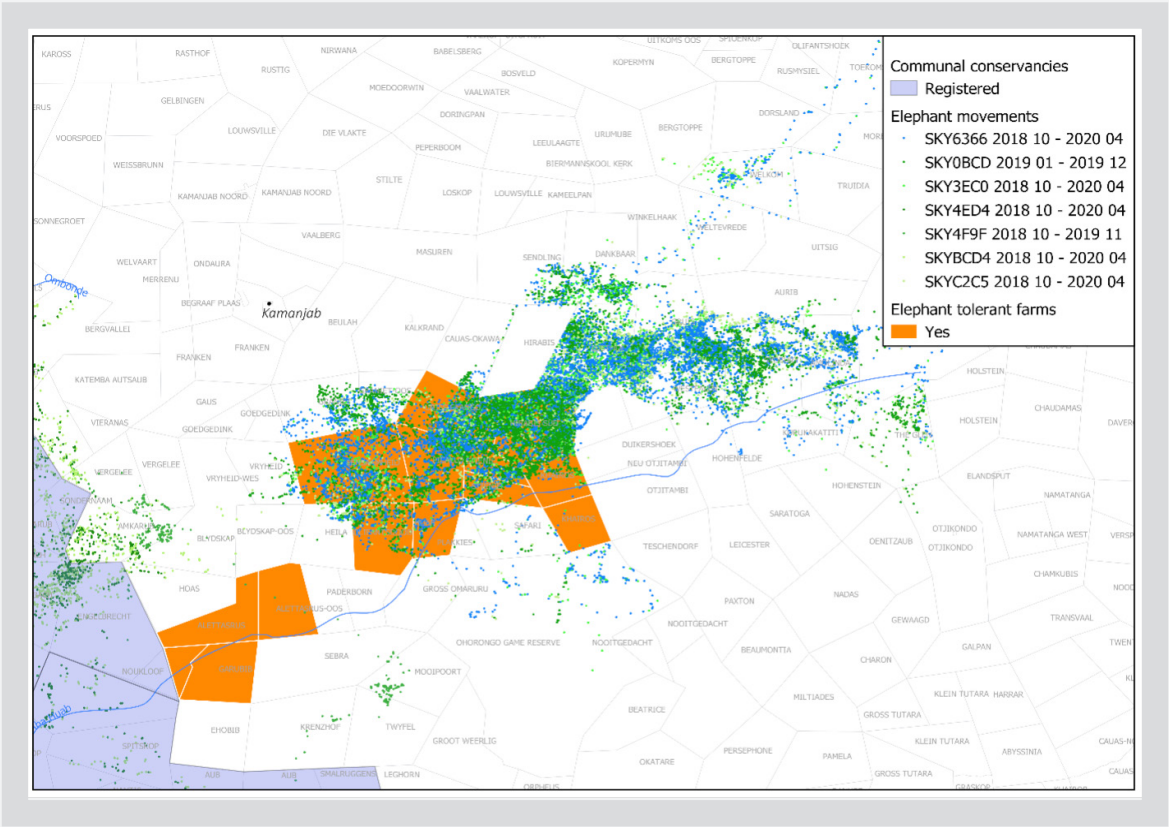



Figure 76 Elephant movements in relation to "elephant tolerant" farms (shaded in orange) in the Kamanjab area

MEFT in 2016 made a commitment to undertake a number of actions to address this conflict situation, namely, to do an aerial survey of the elephants, collar some elephants and share the movement data with the farming community, grant a hunting quota that the farming community should decide to use where and when and by whom, and use the income from hunting as they deemed fit. MEFT also promised to explore the establishment of an office in Kamanjab. All of these actions were taken, except opening an office in Kamanjab which could not be implemented because of cost-cutting measures. The farming community used the income from hunting to purchase mobile electric fencing units to assist the most-affected farms.

There are nevertheless still pressing problems in this area (see Section 2.2) requiring further action. Importantly, this community has been interested in becoming the owners of the elephants since 2009, as reiterated again during the public consultations.

### 5.1.3.2 Kavango Cattle Ranch / Mangetti node

The Kavango Cattle Ranch (KCR), consisting of 45 farms, was established in 1973. The Mangetti West farms (16 farms) in the Oshikoto Region were developed at a later stage. The original concept was to develop commercial farms in an area north of the veterinary cordon fence (VCF) by removing all possibly infected cattle from the area, imposing strict quarantine, and restocking with animals that were free of lung-sickness, with the ultimate aim to shift the VCF to the northern border of the farms.

The presence of elephants and African wild dog (***Lycaon pictus***) within KCR has presented a significant challenge to cattle production. The elephants cause substantial damage on KCR, with fences and water infrastructure regularly destroyed, contributing to production losses and costly repairs. The damage (see e.g. Figure 77) makes it difficult to practice any form of rigorous cattle or rangeland management due to the inability to keep cattle groups separated from each other or within defined camps.

**Figure 77** Photograph showing the impact of elephants on infrastructure in the Kavango Cattle Ranch

In around 2010, conflicts caused by elephants started to occur south of the KCR on commercial farms, principally those bordering on KCR (see Section 2.2). A considerable degree of damage to fences and water installations has been caused ever since. The Namibia Development Corporation at the time decided to create a 60,000ha fenced unit in western KCR for elephants, wild dogs and other wildlife species and to manage that for hunting and tourism, in order to get rid of the elephants in particular from the rest of the KCR to areas that should be used exclusively for cattle production. A business plan to this effect was developed in 2016, and the fencing of the wildlife area was commissioned, but the project has since been dormant.

Since 2014, N/a'an ku sê Foundation(Naankuse) has placed satellite collars on elephants in KCR and monitored their movements. The 2014-2015 data showed that during the dry season, the elephants were mostly restricted to the KCR farms (with its many boreholes and water points), whilst in the wet season, there was some movement out of KCR, mostly to the north, but with some movement southwards onto the commercial farms (Figure 78 and Figure 79). An interesting observation of the movement data was that elephants clearly avoided the headquarters complex of KCR by a radius of approximately 2-3 km.

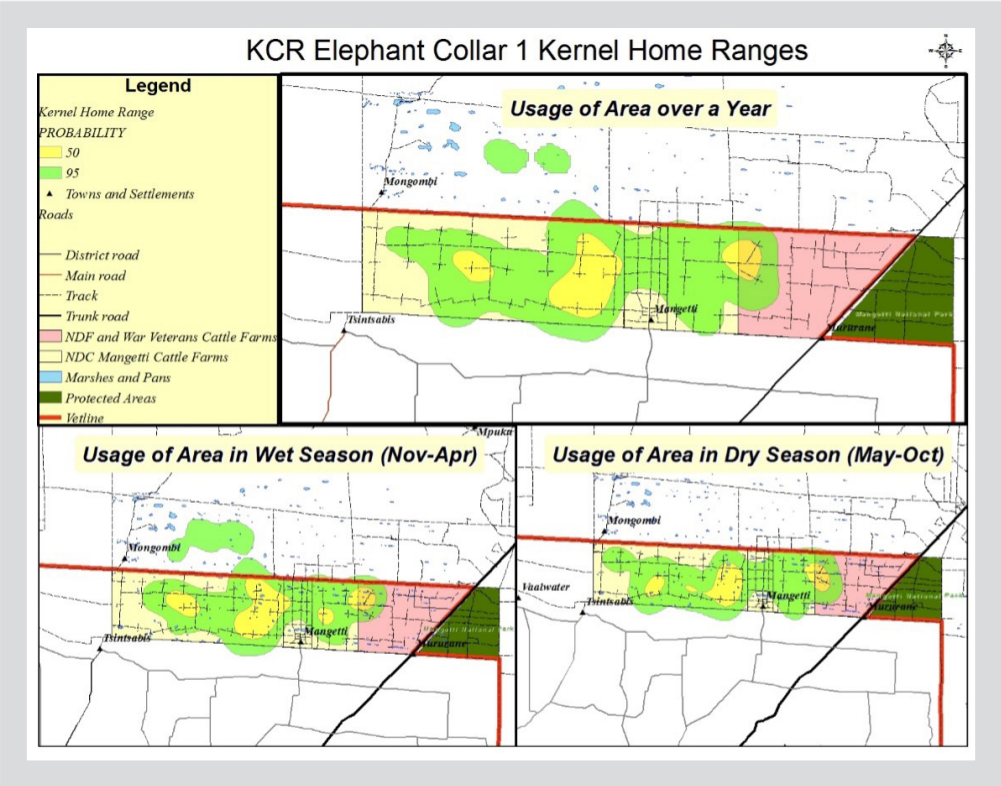



**Figure 78** Home range analysis for collared elephant 1, based on ten months of data, from October 2014 to August 2015 (analysis provided by Piet Beytell, MEFT)

Satellite collar data obtained since then have shown similar patterns, but with a slight shift eastwards over the two recent years, perhaps due to the drought (Figure 78). Also notable is that in the five years of data, the collared elephants have not ventured into the Mangetti NP at all.

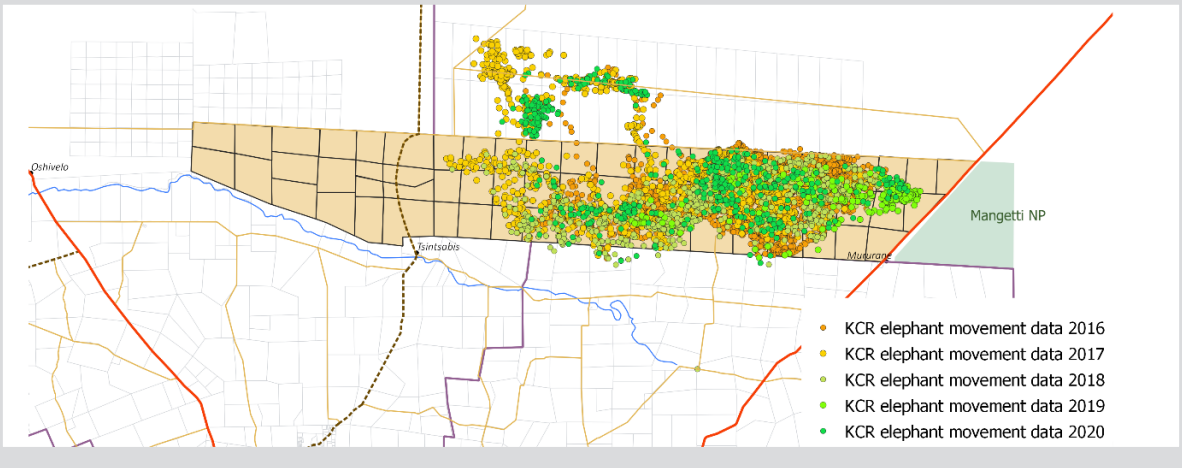



**Figure 79** Elephant movement data from Kavango Cattle Ranch between 2016 to 2020 (Source: N/a'an ku sê)

Based on drone footage obtained in late 2017, and known births, KCR had a herd of over 110 individual elephants and a significant number of non-resident bull elephants (both groups and individuals), as well as a second smaller herd which entered the KCR in early 2018 (Naankuse, 2020) The population of elephants inhabiting the KCR was thus estimated to be between 150-200 individuals.

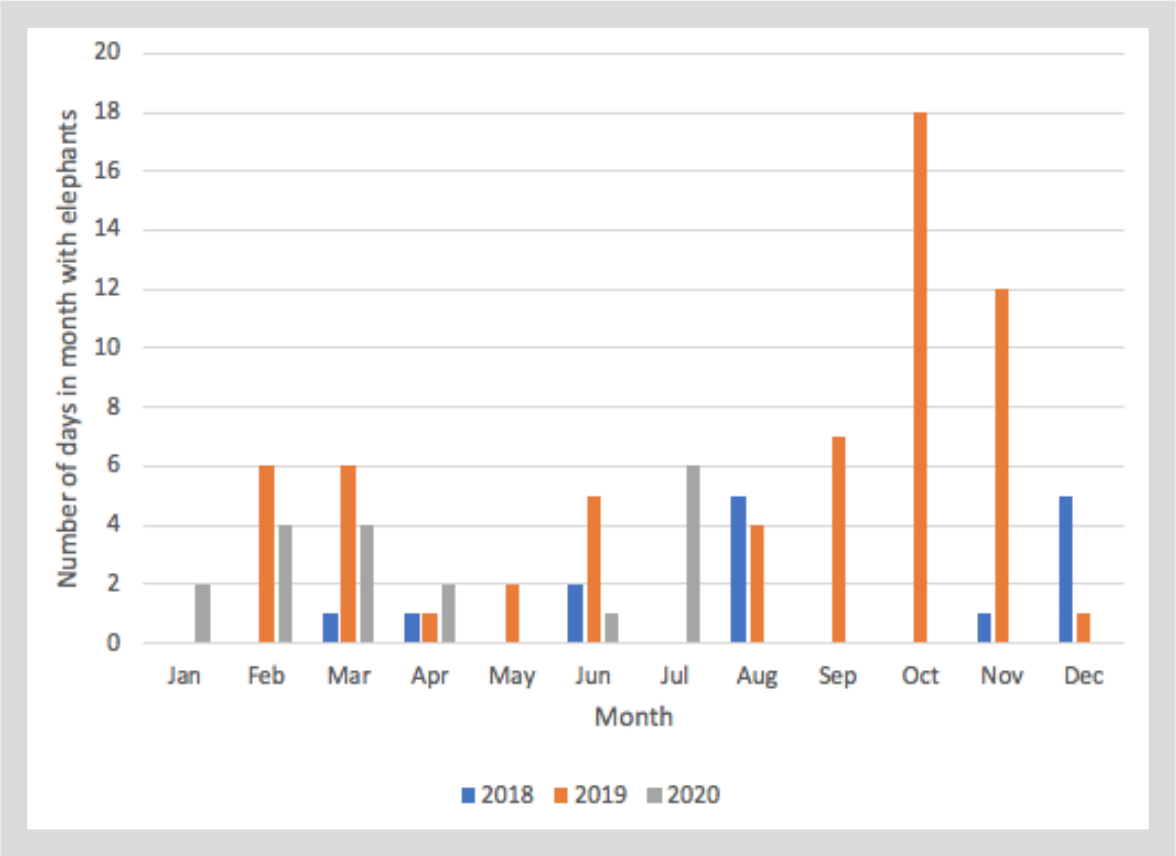
Subsequently, it was noted that changes had occurred in the makeup and behaviour of the herds and groups of bulls, with splits observed in the large herd, resulting in at least three smaller groups observed and reported. Additionally, changes occurred in terms of the bulls inhabiting the area, with larger than usual groups of bulls reported. Small herds consisting of cows and calves, as well as groups of bulls, were reported to have moved south of the KCR and onto commercial farmland more frequently than had been recorded in previous years.

From September 2018 Naankuse had a research team based at Mangetti, monitoring this elephant population, and focusing on conflict incidents on the commercial farms. According to this work, it is believed that one of the major factors influencing the elephants residing on the KCR year-long without any significant migratory behaviour is the relatively abundant sources of water in the form of dams and troughs into which water is pumped for the cattle (Smit ***et al***. 2007 in Naankuse Report). It is the damage caused by the elephants while accessing these managed water sources that results in the high levels of conflict, both on the KCR and on southern farmland. The research conducted by Naankuse found that high levels of conflict occur mainly when water is difficult to access, or is entirely inaccessible because of limited water in troughs and dams results in damage as elephants attempt to access the low levels of water available and efforts from female elephants to allow juvenile elephants access to water often result in severe damage to infrastructure.

The types of damage most often recorded were:

- Broken cattle kraals, fences and gates
- Cracked, buckled or collapsed water dams
- Cracked and broken water troughs
- Broken water pumps, including pipe inlets and outlets
- Pipes pulled up from the ground and pulled apart.

To illustrate the scale of conflict, Figure 80 shows the monthly number of days with elephants on the farm Uitsig from 2018. The owner, Riaan White, recorded the incidents of elephant incursions from December 2017. Elephant group size varied from single animals to a herd of over 45, so in Figure 80, the data has been converted into "elephant days" per month. Detailed records were maintained of the costs involved in monitoring and repairs, amounting to N$ 109,535 in 2018 and N$ 209,469 in 2019 for this farm.



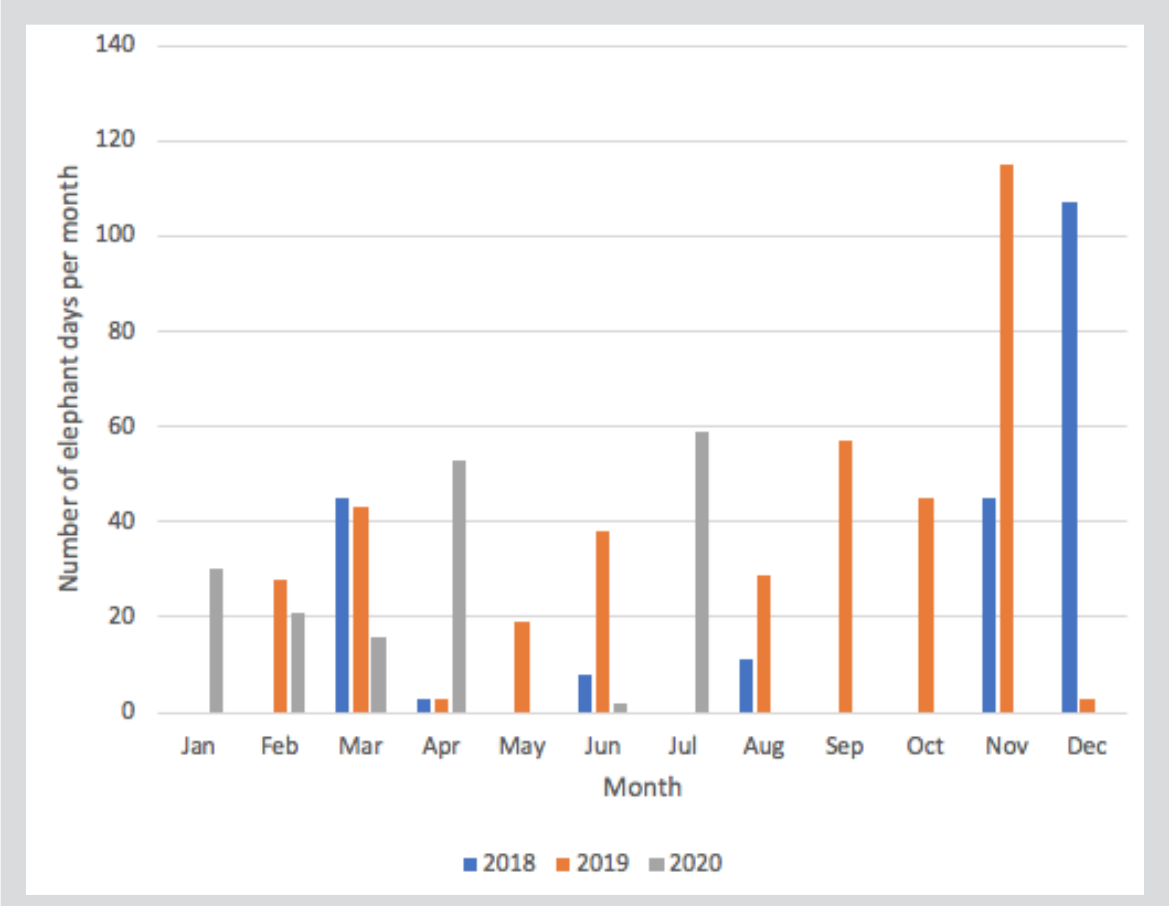




**Figure 80** Graph showing the number of days each month when elephants were recorded on farm Uitsig (2018 – July 2020) (Source: Riaan White)

**Figure 81** Elephants breaking out of the Mangetti (Kavango Cattle Ranch) into the farm Uitsig (Photo: Riaan White)

Pressing problems continue to occur in this node and there is a great deal of frustration amongst the farmers affected directly or indirectly (see Section 2.2).

#### 5.1.3.3 Eden- Na≠Jaqna Conservancy node

Conflicts in this part of Grootfontein district bordering on Na≠Jaqna Conservancy started to appear in around 2013 and seems to have originated because of the presence of elephants on a commercial farm (Eden) bordering on Na≠Jaqna Conservancy and a lack of water in Na≠Jaqna Conservancy. Interestingly, it is alleged that the presence of the elephants on Eden has attracted elephants from Na≠Jaqna Conservancy to this farm and the neighbouring area. In this manner considerable damage has been caused on the farms neighbouring Eden. Elephants enter the farms Sandveld and Oorkant on a regular basis to drink, and the farms experience challenges to supply sufficient water for these elephant and to maintain and repair fences. In the case of Sandveld, this includes 29 km of game proof fence bordering on Na≠Jaqna and 19km bordering on Otjituuo Conservancies, and the owner, Allan Cilliers, reported that the cost of damages to structures have increased to well over N$ 200,000. The concern is not only about the cost of damage, but the impact on wildlife on the farm as other valuable wildlife species escape through the fence breaks.

One of the possible reasons is that seasonal water pans and permanent waters in the neighbouring Na≠Jaqna Conservancy have been occupied by illegal settlers, and although the conservancy committee has requested that these people be removed, they have not to date succeeded.

Electrifying the fence between Na≠Jaqna Conservancy in the Eden area and providing water for elephants east of this fence in Na≠Jaqna Conservancy were the solutions proposed during the public consultations. MEFT is also aware that much of Na≠Jaqna Conservancy is underutilized by wildlife and that there is ample suitable habitat for elephant.

**Figure 82** Photographs showing damage to game fences caused by elephants on farm Sandveld (Photos: Allan Cilliers)

### 5.1.4 Problem animal control

A result of human-elephant conflict is that on an annual basis, elephants are declared as problems and destroyed. Table 12 provides a breakdown of problem elephants declared and destroyed in 2018 and 2019, according to the MEFT management areas, and providing an indication of how many were hunted for trophies. Figure 83 provides an overview of the number of elephants destroyed on conservancies between 2009 and 2019.

**Table 12** Number of elephants declared as problem animals in 2018 and 2019, broken down into those destroyed by the Ministry of Environment, Forestry and Tourism, and those hunted for trophies (Source: extracted from MEFT monthly reports 2018 and 2019)

| MEFT management area | 2018 | | | 2019 | | |
|---|---|---|---|---|---|---|
| | Destroyed by MEFT | Hunted for trophy | Total | Destroyed by MEFT | Hunted for trophy | Total |
| North West | 2 | 4 | 6 | 5 | 2 | 7 |
| North Central | 1 | 2 | 3 | 1 | 1 | 2 |
| North East | 2 | 1 | 3 | 6 | | 6 |
| Central | 2 | 1 | 3 | 2 | 1 | 3 |
| **Total** | **7** | **8** | **15** | **14** | **4** | **18** |

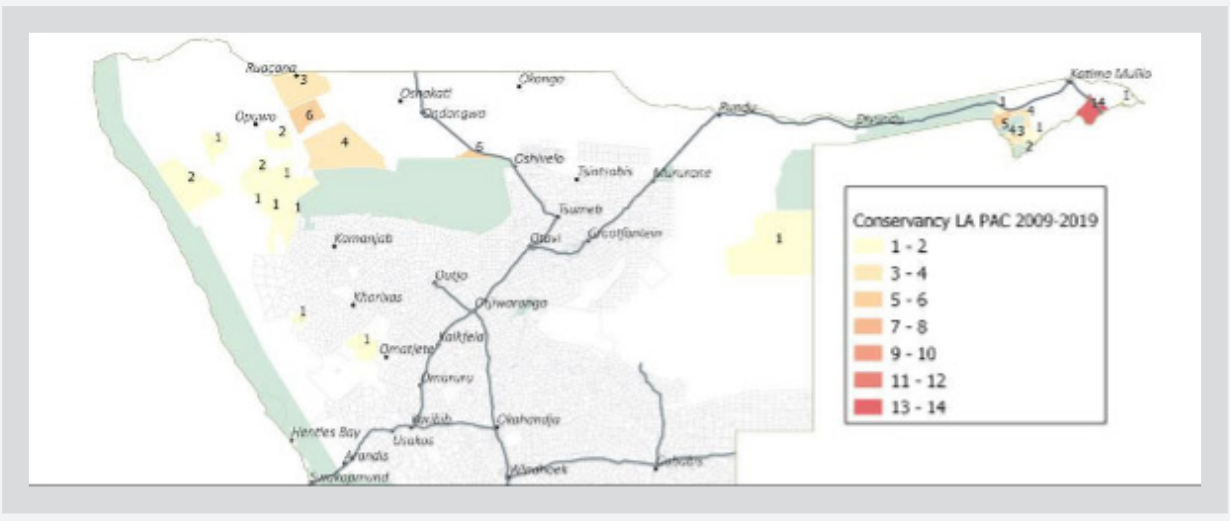



**Figure 83** Map showing the number of elephants destroyed as problem animals on conservancies between 2009 and 2019

## 5.2 Human Elephant Conflict Management

Namibia's National Policy on Human Wildlife Conflict Management was revised and approved by Cabinet in April 2018[62]. In addition to the revised Policy, the Ministry developed a document describing measures and guidelines for the implementation of the Policy[63]:

- The Revised National Policy on Human Wildlife Conflict Management (2018 – 2027) provides a framework for addressing HWC efficiently and effectively to promote both biodiversity conservation as well as human development. It documents the MEFT strategies for mitigating and managing HWC as well as explaining the principles underpinning the HWC self-reliance scheme (HWCSRS).
- The Measures and Guidelines for Implementation of the Revised National Policy on Human Wildlife Conflict Management (2018) provides detailed information on dealing with HWC situations as well as providing technical solutions for mitigating HWC.

Table 13 provides an overview of the strategies and specific objectives outlined in the HWC policy.

**Table 13** Table outlining the twelve strategies for HWC listed in the revised national policy on HWC management, with their rationale and specific objectives.

| Strategy | Rationale | Specific Objectives |
|---|---|---|
| *Research and Monitoring* | To manage Human-Wildlife conflict effectively and efficiently it is crucial to have adequate data that is available in a usable form for key decision-makers. | – To develop a standardized monitoring and reporting systems<br>– To monitor and evaluate the effectiveness of different HWC mitigation methods and to disseminate findings to all stakeholders.<br>– To determine the social behaviour and movement of certain species that can cause conflicts.<br>– To develop data and statistics for effective management of human wildlife conflict |
| *Duty of care, land use planning and integrated measures to avoid human wildlife conflict* | Every person and all organs of State have a general duty of care to take reasonable measures to prevent or minimize damage being caused or to be caused by wild animals. | To ensure that every person, organizations, and organs of State,<br>– take responsibility for carrying out appropriate land-use planning (in accordance with the provisions of the Ministry responsible for land matters),<br>– take reasonable measures to prevent or minimize damage caused by wild animals and developing integrated measures that are aimed to avoid and/or reduce HWC. |
| *Human capacity and resources* | The Ministry should have human resources available for addressing HWC management and to build the capacity of personnel to carry out HWC functions.<br>These steps are required to address the growing number of HWC incidents and to help reduce the impacts of HWC on local livelihoods, particularly in communal areas. | – To ensure that MEFT creates specific and focused HWC staff component and that such staff component have sufficient and appropriately trained personnel to address the HWC problems and issues present in the specific regions.<br>– To ensure that MEFT HWC management personnel are sufficiently and appropriately equipped to carry out their tasks.<br>– To create a collaborative approach for prevention and mitigation of HWC with local wildlife management units. |

62 Revised National Policy on Human Wildlife Conflict Management 2018-2027

63 Measures and guidelines for implementation of the revised National policy on Human Wildlife Conflict Management

| Strategy | Rationale | Specific Objectives |
|---|---|---|
| *Community care and engagement* | Community-based Natural Resource Management (CBNRM) programme provides local communities with several incentives to manage natural resources such as wildlife sustainably.<br>Through forming conservancies, local communities gain rights over wildlife that enables them to generate income from several different use options. | – To create sufficient economic and other benefits from the use of wildlife so that rural communities and farmers will view wildlife as an asset rather than a liability. |
| *Delegation of decision-making authority* | Destruction of individual wild animals will not permanently remove HWC, but in some cases it becomes necessary to destroy a specific animal which persistently causes problems or threatens human life. In such cases it is crucial for decisions to be taken quickly so that the identified problem causing animal can be speedily dealt with. | – To devolve decision-making authority over the destroying of identified problem-causing wild animals to a staff member (s) and/or local management unit so that the correct individual animal can be speedily destroyed, providing protection to people and their property.<br>– To provide sufficient safeguards to ensure that specific animals are destroyed for good reason. |
| *Removal of problem causing animals* | The Ministry recognizes that the removal of problem causing animals either by lethal removal or by translocation does not always solve the problem and there are conservation reasons for limiting lethal removal to those instances where it is absolutely necessary. However, there are times when removal will be necessary in particular where life and property are threatened, where animals persistently cause problems or where the numbers of wild animals are so high that conflict becomes an intolerable burden on resident people. | – To provide a framework for the removal of problem-causing animals when appropriate.<br>– To set a condition on the filming of wild animals removed as problem causing animals. |
| *Appropriate technical solutions for mitigating human wildlife conflict* | One of the methods for managing Human Wildlife Conflict efficiently and effectively is to implement measures to prevent or reduce conflict.<br>There are a number of technical solutions to preventing conflict that have been tried and tested. However, some species, such as elephants, become habituated to certain solutions and there is a need for ongoing experimentation with new methodologies. | – To promote the development and application by every person, organization, state office, Ministry or agency and all relevant stakeholders of appropriate and effective plans and measures to prevent or reduce HWC. |
| *Disaster Management* | There is strong evidence, both globally and in Namibia, of an increase in the observed frequency and intensity of weather and climate-related hazards.<br>When there are droughts and floods, human wildlife conflict is also experienced as humans and wild animals compete for the little available resources. | – To ensure that human wildlife conflict management is part of the disaster risk management and disaster risk reduction programmes, in line with the Disaster Risk Management Act, 2012 (Act No. 10 of 2012).<br>– To ensure that preventative and mitigation measures are provided for during times of drought and floods in the country. |

| Strategy | Rationale | Specific Objectives |
|---|---|---|
| *Application of revenues from problem causing animals to avoid future conflicts and to address the losses of affected persons* | If generating income from problem-causing animals is to be successful in addressing problems at household level, then the income needs to be used to provide relief to those persons that suffered the impact and/or to avoid the repetition of the same problems in future. | – To ensure that income derived from the hunting or sale of problem-causing animals is applied to avoid future conflicts between humans and wildlife. |
| *Protected Areas Neighbours and Residents* | Many of the conflicts between people and wildlife occur when wildlife leaves Protected Areas and enters neighbouring farmland and conservancies.<br><br>This situation, where wildlife leaving protected areas amounts to the export of economic and social costs to neighbours, undermines the conservation objectives of the parks by creating negative and sometimes hostile responses from neighbours. | – To reduce the impact on park neighbours of wildlife that leaves protected areas and causes problems.<br>– To provide economic and other benefits from Protected Areas to park neighbours. |
| *Human Wildlife Conflict Management Schemes (HWCSRS)* | **Scheme for Human Wildlife Conflict Mitigation and Preventative Measures**<br><br>A variety of approaches can be implemented in order to manage the conflict efficiently and effectively. These include prevention strategies which endeavour to avoid the conflict occurring in the first place and take action towards addressing its root causes, and protection strategies that are implemented when the conflict is certain to happen or has already occurred, as well as mitigation strategies that attempt to reduce the level of impact and lessen the problem. | – To create a programme or project within the Ministry, that is internally and externally funded, to support implementation of mitigation and preventative measures for human wildlife conflict.<br>– To establish a budget vote to support a programme for human wildlife conflict mitigation and preventative measure in the Ministry. |
| | **Human Wildlife Conflict Self Reliance Scheme**<br><br>It is not Government policy to provide compensation to farmers for losses due to wild animals. Furthermore, compensation schemes implemented elsewhere have proved to be very problematic and open to abuse. There is a need to find other means to offset the losses caused by wildlife and at the same time build the self-reliance of farmers. | – To provide the means to directly offset the losses of communities and individual farmers caused to livestock and crops.<br>– To promote the equitable distribution of benefits so that individuals who suffer losses can benefit from wildlife income.<br>– To meet the moral obligation of Government to support a family who has lost a family member to certain species of wild animals under conditions where the affected person could not reasonably have been expected to defend himself/herself or to avoid the incident, and where the family has to incur costs for a funeral and related costs. |

| Strategy | Rationale | Specific Objectives |
|---|---|---|
| *Public awareness, stakeholder engagement and coordination* | In order to address HWC efficiently and effectively, there is a need to conduct awareness and educate the communities, farmers and the general public on the preventive and mitigation measures that should be put in place.<br><br>It is also necessary to provide information on species behavioural patterns in order to help the public understand how best to avoid conflict arising.<br><br>There is also a need to engage other stakeholders such as the traditional authorities, Regional Councils, NGOs and line Ministries on how best to manage HWC. | – To ensure that all relevant stakeholders are aware of the need for HWC prevention and mitigation measures and have access to information on how to manage HWC according to their own circumstances and requirements.<br>– To ensure that HWC management activities and responses are coordinated between all relevant stakeholders. |

To guide the verification and investigation of reported HWC incidents, MEFT has developed two sets of Standard Operating Procedures (SOPs):

- Standard Operating Procedures for verification and investigation of Human Wildlife Conflict incidents in registered conservancies; and
- Standard Operating Procedures for verification and investigation of Human Wildlife Conflict incidents in communal areas.

The HWCSRS does not equitably address the issues related to human-elephant conflict, compared to losses caused by predators. Firstly, the scheme does not cover infrastructure damage or loss, which forms a major component of the conflict with elephants. Secondly, in proportion to market value, the offset values allocated for crop loss are significantly lower than for loss of livestock (Table 14). The offset values as outlined in the HWC Policy do not consider the intrinsic "livelihood" value to households. For example, the loss of a goat (± 40-60 kg) is valued at double the loss of a quarter ha of crops, which could conservatively have yielded 250 kg of grain (Table 14).

**Table 14** HWCSRS offset values compared to market values

| Type of Loss | Offset value (N$) | Approximate market value (N$)* | Offset as % of estimated market value |
|---|---|---|---|
| Human life or injury | | | |
| Life | 100,000 | NA | |
| Injury (according to degree of injury) | 10,000 – 50,000 | NA | |
| Livestock | | | |
| Cattle (cow or bull) | 3,000 | 10,000 | 30% |
| Goat | 500 | 1,000 | 50% |
| Sheep | 700 | 850 | 82% |
| Horse | 800 | 3,500 | 23% |
| Donkey | 500 | 1,000 | 50% |
| Pig | 700 | 1,200 | 58% |
| Crops | | | |
| One quarter of a hectare | 250 | 1,000 | 25% |
| One hectare | 1,000 | 4,000 | 25% |
| These are average estimates based on current prices and approximate weights / yields per ha expected in the communal areas of Namibia. It is especially difficult to estimate the value of crops due to extremely variable yields, and the fact that they are mostly produced for own use (subsistence) | | | |

### 5.2.1 Managing conflict and promoting coexistence

Human-elephant conflict occurs throughout the elephant range in Africa, and there are several guides and manuals on managing human-elephant conflict, e.g. the KAZA TFCA has developed a manual for reducing and mitigating human-elephant conflict (KAZA TFCA undated); the African Elephant Fund has published a Technical Manual on Human-Wildlife Conflict: Elephants (2018); the Food and Agriculture Organisation also published a Farmers Manual for Human Elephant Conflict (2008); and WWF Southern African Regional Programme Office produced a Human Wildlife Conflict Manual. In Namibia, MEFT has developed Measures and Guidelines for Implementation of the Revised National Policy on Human Wildlife Conflict Management (2018) upon which Table 15 is based. EHRA further compiled an Elephant Conflict Mitigation Workshop and Training manual (undated) and is in the process of establishing a training centre in the Erongo Region. These focus to a large extent on technical solutions to avoid conflict, some of which may simply shift the conflict somewhere else (e.g. chasing elephants, scaring tactics or deterrents).

It is evident from the public consultations that there are still many rural communities that are not familiar with all potential options and that there is a great need for more information regarding conflict avoidance and understanding elephant behaviour. To address this should be a high priority during the implementation period of this plan.

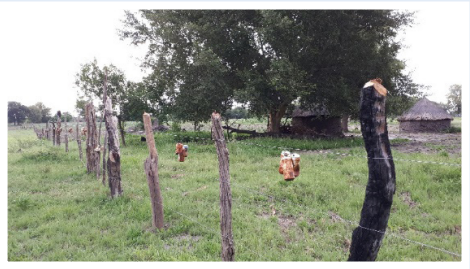
The KAZA TFCA strategic planning framework for the conservation and management of elephants in the Kavango Zambezi Transfrontier Conservation Area identifies as Objective 3 to "***Promote and support co-existence of humans and elephants for ecological, social and economic benefits***". The Namibian National Policy on Human Wildlife Conflict Management already touches on some of these issues, and Namibia's conservancy programme is a good foundation for addressing human-elephant co-existence. A landscape, or "elephant management/co-existence units" approach can serve to create the necessary framework within which the appropriate mechanisms for co-existence can be developed. The conflict nodes already described in Sections 5.1.1 – 5.1.3 can serve as the basis for these management units.

Photos: J. Heita

This spatial or landscape approach does not preclude the appropriate application of technical solutions as appropriate. Table 15 provides a non-exhaustive list of technical solutions that have been used, with different degrees of success, to deal with human-elephant conflict. These are based on both local and regional experiences.

**Table 15** Technical solutions for mitigating Human Elephant Conflict

| Type of damage | Prevention measure | Effectiveness | Comments |
|---|---|---|---|
| **Water infrastructure damage** | Elephant proof walls around water installations | High | Building elephant proof walls around water installations prevents access by elephants, and therefore reduces damage. Walls need to be at least two large rocks in width, and be 1.8m high, to prevent elephants knocking the wall down or climbing over. The walls need to be a sufficient distance from water tanks and pumps to prevent elephants reaching the installations from outside the wall. If well-constructed it is possible to erect a wall without cement that can still keep elephants out. Leaving a small gap in the wall for human access can work if the wall is sufficiently strong, but if the wall is weak elephants will enlarge the gap and gain entry.<br><br>Alternative access to water, i.e. a separate waterpoint or a trough or low-walled elephant dam needs to be available for the elephants otherwise they will find a way to get water, which may include digging up the pipelines leading in or out of the water installation. |
| | Trenches around water installations | High | Digging trenches around water installations or other areas to be protected from elephants is a deterrent. Trenches need to be approximately 2 m wide and at least 1.5 m deep and should be reinforced. Trenches must be maintained, as erosion of trench side walls into the trench can impact the effectiveness of the trench. |
| | Elephant block barriers | undetermined | Surrounding the water infrastructure with cement- and-metal grid structures (block barriers) to deter elephant from getting close enough to water points or other infrastructure to cause damage. The pointed metal pieces make it uncomfortable for the elephant to step on. These grids are constructed on site. This mitigation measure is currently being trialled in Namibia but has been used extensively in Botswana.<br><br>An alternative approach as used in parts of north-western Namibia is to place large rocks around water installations, with better results if they are painted white.<br><br>  |
| | Alternative water for elephants at a distance from homesteads | Medium | Providing alternative water for elephants at a distance from homesteads means elephants do not need to approach homesteads and other water infrastructure. However, this is only effective as long as there is water at the water point, which can result in increased costs for diesel to keep the pumps going if solar pumps are not available. In addition, water infrastructure for people needs to also be protected, otherwise elephants will use both water points. |
| | Elephant friendly water points with storage tanks and solar pumps – and overflow going to communities | High | Water infrastructure developed using solar energy result in less recurrent costs to communities. By creating water points for wildlife, but which benefit communities, an intrinsic value for the wildlife is created, and communities are likely to become more tolerant.<br><br>Such infrastructure requires resources which are most likely to come from donor funding. |

| Type of damage | Prevention measure | Effectiveness | Comments |
|---|---|---|---|
| | Rapid response unit (MEFT) | Untested | The MEFT will create a rapid response unit for HWC. A suitably equipped rapid response unit within the Ministry of Environment, Forestry and Tourism serves to be able to investigate and address conflict soon after it is reported, in order to avert an escalation of conflict, or citizens taking the law into their own hands. A well-functioning rapid response unit also serves as a good public relations tool to appease those affected by conflict, as they will know that their problems are being given due consideration and attention. |
| | Early warning system: tracking of herds, known individual identification | Medium/Low | This is done where elephant populations are low and herds quite distinct – and for example with the help of volunteers. It requires the necessary technology and resources and will generally depend on donor funded projects. This strategy could be implemented in NPs to track when herds leave NPs so that neighbouring communities can be informed. |
| | Tracking app | Untested | The development of a phone application that can show farmers the location of collared elephants in the previous 24 hours is under consideration. |
| **Farm fences** | Elephant permeable fences and gates | Untested | Research is required into designs for farm fencing that allows elephants to cross without damaging the fence, keeping other species contained.<br><br>Elephants can cross cattle grids which block livestock and other ungulate movements |
| **Crop / garden damage** | Wire with tins around crop fields | Medium/Low | Hanging tins along the fences around crop fields or homesteads serves to deter elephants entering the area, due to the noise emitted when the wires are disturbed. The noise will also alert people of the presence of animals. However, this system needs to be used in combination with other methods, and it is likely that elephants will become habituated, making the system less effective.  |
| | Chilli pepper buffer crop | Medium | Chillies can be planted on the periphery of other crops as the first plants elephants will encounter as they move towards arable land. Although other mammals will eat chillies, they are avoided by elephants. |
| | Chilli pepper fences | High | Used engine or cooking oil (or engine grease but this is expensive) is mixed with chillies (minimum three cups of chilli powder in 5l of oil), and smeared on strings placed around the fields which should be between 1.5 and 2.0 meters above the ground. Better results are obtained if strips of cloth impregnated with chilli oil/grease are placed on these fence strings about 8 meters apart. The fences with chilli pepper oil/grease are not physical barriers and can be made of no more than string strong enough to carry the impregnated chilli strips. These are being effectively used in Botswana. It is necessary to re-apply the chilli pepper oil/grease application especially during the rainy season. Supply of sufficient chillies is required. Care must be taken to use protective gloves and goggles when handling chillies. |

| Type of damage | Prevention measure | Effectiveness | Comments |
|---|---|---|---|
| | Chilli bombs | Medium/High | Ground chilli (hand full) is mixed with elephant dung and compacted into a brick mould and dried. A hot coal is placed in the chilli bomb, and depending on its size and shape, each bomb burns slowly for 2 to 8 hours, producing noxious smoke which drives elephants away (for 3 – 4 hours), depending on wind strength. The chilli bombs are placed 5 – 8 meters apart, but several factors can influence the optimum placing including the number of elephants, their direction of movement and wind direction.<br>There is a chance that elephants will become acclimatized. Supply of sufficient chillies is required and bombs are only effective when elephants close by, so it means that fields must be attended and bombs lit at the right time. Care must be taken to use protective gloves and goggles when handling chillies. |
| | Chilli darts | High/medium | Harvested chillies are processed into a potent distillate that can be delivered via a drop out dart system to deter small elephant herds and elephant bulls that are destroying fields and homesteads. Chilli darts can be highly effective in deterring single elephant bulls.<br>Requires the necessary darting equipment and expertise. |
| | Fencing (electric / cable fencing) | High | Electric fences can successfully deter elephants from entering a specific area. However, electric fencing fails mainly due to the inability to maintain such fences. There is a chance of elephants becoming acclimatized to electric fencing as well. |
| | Bee fences | Untested in Namibia | Reportedly effective in other countries. Requires beehives placed at 5-10m intervals along fence lines. A challenge is that bees are seasonally active and may not occupy all hives all year round. Beekeeping skills are needed. |
| | Beehive sounds | Untested in Namibia | Reportedly effective in other countries. Sound recordings of bees or beehives are played, requiring suitable equipment. |
| | Traditional methods – drums, whips, loud noises | High/Medium | Effective but relies on crop guards being present. Elephants however are highly adaptable, and may rapidly habituate (i.e.<br>get used to) to 'empty threat' deterrent methods – those which scare, but cause no physical harm. The effectiveness of<br>any traditional methods is therefore reduced once elephants are exposed to them multiple times, and elephants can become acclimatized and even more aggressive towards people. |
| | Night guards (solar flashing lights) | Not fully tested | Night guard lights are solar powered lights that are put around the area to be protected, and flash at night. They have not yet been widely tested – and there would be a chance of elephants becoming acclimatized |
| **Stored food / grains** | Separate secure storage | Not fully tested in Namibia | Using plastic storage bins instead of traditional baskets or constructing food storages out of bricks and mortar; a first trial is underway and must still be evaluated |
| **Human life** | Human-elephant co-existence techniques and safety skills training | Medium | This involves teaching people to better understand elephant behaviour and the do's and don'ts in elephant areas to protect own life. Electric lights at villages and homesteads (also supplied through solar systems) can prevent accidents. |

### 5.2.2 Monitoring Human-Elephant Conflict (HEC)

Measuring and monitoring the incidence of Human-Elephant Conflict is essential to understand trends and determine over the long term whether measures taken are effective, allowing for adaptive management. The MEFT is working towards a consolidated database of HWC, as required by the policy, and this needs to be expedited. The data is mostly derived from incident investigation reports, and currently focus is given to cases that "qualify" under the HWCSRS for offset payments. This means that the recording of incidents of infrastructure damage is not routinely and consistently captured. Ideally, all incidents need to be captured, whether they qualify for offset payments or not, in order to understand the full extent of the problem.

Methods for recording HWC need to be standardised and applied consistently, to be meaningful (Songhurst 2017). The SOPs developed for the investigation of HWC inside and outside conservancies provides a foundation for a standardised approach. A register for recording HWC incidents has also been developed for Conservancies, as a means of standardising the data captured on incidents of conflict.

Conflict incidents must be georeferenced. MEFT is progressively adopting the Spatial Monitoring and Reporting Tool (SMART) for data capture in the field, and reporting. SMART is an app-based tool (cybertracker) connected to a SMART database. This is an important tool that can greatly facilitate the capture of data in a standardized way and allows for a spatial representation as well. The implementation of the SMART system for recording HWC incidents would require training of the MEFT regional services personnel and new management arrangements by MEFT as a different administrative unit in MEFT would be the user of the data and manager of the database than current arrangements concerning the use of the system in protected areas.

In addition to the incident data, information on mitigation measures should be recorded. For example, the number and position of water points that have been protected against those that have not been protected, where electric fencing has been used, where chilli pepper fences have been used etc. This information is required to assess the effectiveness of these measures.

### 5.2.3 Recommendations

The following overarching recommendations are made in the context of this chapter, while more detailed and localized activities are identified in Section 11.4 as part of the implementation strategy concerning human elephant conflict management.

#### Landscape approach

1. Using a landscape approach for human-elephant co-existence management and devolving decision-making and utilization rights to the local level as far as possible should be pursued. This includes defining elephant management units that correlate with the spatial characteristics of regional elephant populations and human-elephant conflicts and establishing an appropriate structure for consultation and cooperation amongst all primary stakeholders.

#### Human Wildlife Conflict Self Reliance Scheme

2. From the public consultation process, the general sense is that the HWCSRS, while appreciated, is not effective. A major issue is that infrastructure damage is not covered as well as small home gardens which are important for livelihoods in certain regions, and commercial farmland is also not covered. There is also a lack of understanding of the system and how it is applied. Constraints identified include the lack of logistical support (transport and personnel) for conservancies to assess conflicts reported and that panels appointed to adjudicate on claims do not meet frequently

enough. There also seem to be problems in the standardization of damage assessment in some regions. MEFT should therefore review the HWCSRS and its implementation to address these concerns. MEFT should also review the coverage of the scheme to include HEC on freehold farms to increase tolerance of elephants.

### Technical solutions

3. Effective application of technical solutions for mitigating HEC as widely as possible should be a priority objective of MEFT, conservancies, commercial farmers and partner organizations. Re-training of MEFT staff responsible for CBNRM and regional services as well as field staff of conservation organizations is needed, as well as setting up demonstration sites in every conservancy or other regions where conflict occurs. Information materials should be updated and widely distributed in poster and pamphlet form.

4. Replacement of diesel water pumps with solar pumping systems should be a very high priority in north-western Namibia to secure and stabilize access to water by elephants and to remove the financial burden of contributing to elephant conservation carried by the local communities in the form of buying diesel for pumping of water for elephants. Most conflicts in the North West revolve around water. Such intervention will have positive livelihood impacts on rural people (and broader environmental benefits).

5. Collaring of elephants to monitor movements and inform management should be prioritized, as well as sharing real time information with elephant management units. Expanding this system to include early-warning systems such as used for lions in the North West should be explored.

### Information management

6. Maintaining a central geo-referenced database of all HEC incidents is essential, as well as improving the standardization of recording conflicts, damage and mitigation.

### Research

7. Research into methods and designs for reducing the impact of conflict such as fence design, waterpoint protection is needed, as well as the effectiveness of local mitigation measures.

### Social engagement

8. With this plan, MEFT has established a far-reaching public consultation process that revealed many important perspectives and facts. Ongoing social engagement of this nature is required to ensure a participatory approach in elephant conservation and management.

### Drivers of conflict

9. It is unavoidable that conflicting policies and values, both at national and international level need to be addressed. Land, land reform, agriculture and livelihoods are some of the most complex and sensitive issues in Namibia and substantive policy reforms will be a challenge. There are nevertheless a number of actions that MEFT and other stakeholders can undertake in this regard:

    a. The competitiveness of a wildlife-based (including elephant) land use needs to be better documented and quantified through a comprehensive economic study done in collaboration with other stakeholders. Accurate quantification of the costs incurred from human-wildlife conflicts should be part of this as well as the economic yield from subsistence farming, conservation agriculture, tourism, other natural resource uses in contrast to the potential earnings from a wildlife economy with and without the market distortions that currently exist.

b. Land use planning, land reform, and strategic environmental impact assessments lie at the heart of longer-term resolution of HEC. MEFT, conservancies, commercial farmers and partner organizations need to actively participate in such processes to prevent the aggravation of problems.

c. Engagement at international policy level needs to be scaled up and in particular the problem of conflicting values need to be addressed by empowering rural communities to stand up for their interests in international policy-making processes, and demanding that their rights over natural resources be respected. Without this, the predominant narratives of the animal rights and allied groups will continue to prevail.

# CHAPTER 6: Illegal killing and the impact of illegal killing

The illegal use of natural resources, particularly for commercial purposes, generally poses a threat to conservation and remains a major management issue for MEFT. As illegal activities are generally conducted in unsustainable ways, they further undermine the ability of the environment to support growing human populations and plant and animal life.

One of the highest priorities for law enforcement is the illegal killing of elephants. This is a recent phenomenon in the north-east of Namibia and is a major concern although the incidence of such killing has declined since a peak in 2016. Figure 84 shows the recorded incidence of illegal killing of elephants in Namibia from 2014 to 2019 and Table 16 shows the incidence of illegal killing of elephants in Namibia from 1990 to 2019, using all available data.

Table 17 shows the incidence of illegal killing of elephants in north-eastern Namibia from 2016 to 2019, disaggregated into the national parks and other areas. Bwabwata NP accounts for the highest number of illegal killings of elephant in Namibia since 2014, around 50% to 80% of all cases occurred in the park.

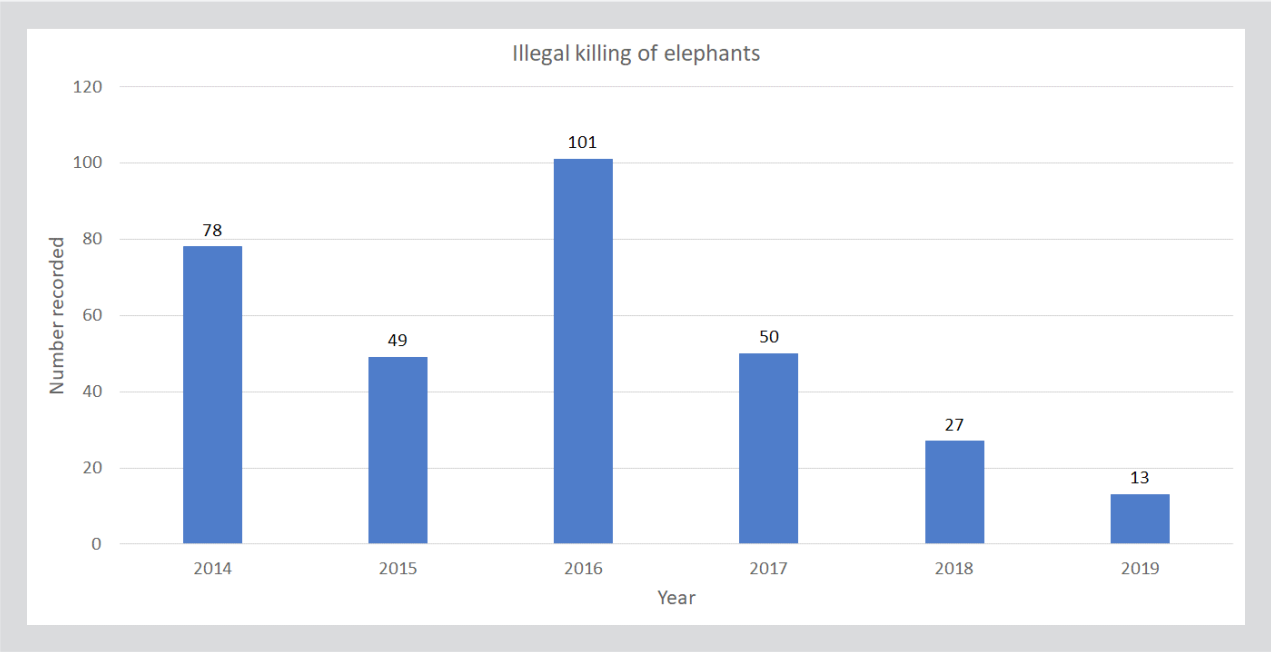



**Figure 84** Incidence of illegal killing of elephants in Namibia from 2014 to 2019 (National poaching database, MEFT)[64]

**Table 16** Incidence of illegal killing of elephants in Namibia from 1990 to 2019 per Region

| | Zambezi | Kavango West and East | Omusati | Oshana | Otjozondjupa | Kunene | National Total | Source |
|---|---|---|---|---|---|---|---|---|
| 1990 | | | | | | | 6 | Report to CITES |
| 1991 | | | | | | | 1 | Report to CITES |
| 1992 | | | | | | | 6 | Report to CITES |
| 1993 | | | | | | | 10 | Report to CITES |
| 1994 | | | | | | | 7 | Report to CITES |
| 1995 | | | | | | | 6 | Report to CITES |
| 1996 | | | | | | | 11 | Report to CITES |
| 1997 | | | | | | | 4 | Report to CITES |
| 1998 | | | | | | | 4 | Report to CITES |

64 Kindly supplied by Birgit Kötting. Note that the annual totals in Figure 74 include incidents outside the north-eastern Regions

| | Zambezi | Kavango West and East | Omusati | Oshana | Otjozondjupa | Kunene | National Total | Source |
|---|---|---|---|---|---|---|---|---|
| 1999 | | | | | | | 12 | Report to CITES |
| 2000 | | | | | | | 2 | Report to CITES |
| 2001 | | | | | | | 2 | Report to CITES |
| 2002 | | | | | | | 5 | Report to CITES |
| 2003 | | | | | | | 7 | Report to CITES |
| 2004 | 1 | | | | | | 1 | Zambezi MIKE data |
| 2005 | 1 | | | | | | 1 | Zambezi MIKE data |
| 2006 | 4 | | | | | | 4 | Zambezi MIKE data |
| 2007 | | | | | | | 0 | Zambezi MIKE data |
| 2008 | | | | | | | 0 | Zambezi MIKE data |
| 2009 | 2 | | | | | | 2 | Zambezi MIKE data |
| 2010 | 3 | | | | | | 3 | Zambezi MIKE data |
| 2011 | 14 | | | | | | 14 | Zambezi MIKE data |
| 2012 | 30 | | | | | | 30 | Zambezi MIKE data |
| 2013 | 13 | | | | | | 13 | Zambezi MIKE data |
| 2014 | 5 | | | | | | 78 | Zambezi MIKE data |
| 2015 | | | | | | | 49 | National poaching database |
| 2016 | 44 | 55 | | | | | 101 | National poaching database |
| 2017 | 9 | 38 | 1 | 1 | 1 | | 50 | National poaching database |
| 2018 | 7 | 14 | | | | 6 | 27 | National poaching database |
| 2019 | 5 | 5 | | | | 3 | 13 | National poaching database |

The data in Figure 84 and Table 17 should in future be consolidated into a single database and the inconsistencies in annual totals need to be reconciled. Such inconsistencies seem to occur when subsequent discoveries of cases are attributed to previous years based on the condition of the carcass, which are then not consolidated in all data sources. It is further important to include detail of where the illegal killing occurred in all instances.

**Table 17** Incidence of illegal killing of elephants in north-eastern Namibia from 2016 to 2019, disaggregated into the national parks and other areas (National poaching database, MEFT)

| Area | 2016 | 2017 | 2018 | 2019 | Total |
|---|---|---|---|---|---|
| Bwabwata NP | 60 | 45 | 12 | 7 | 124 |
| Mudumu NP | 3 | | 1 | | 4 |
| Nkasa Rupara NP | 6 | | | | 6 |
| Conservancies Zambezi | 15 | 2 | 1 | 1 | 19 |
| Conservancies Kavango East | 5 | | | | 5 |
| Communal land outside Conservancies Zambezi | 7 | 1 | | 1 | 9 |
| Communal land outside Conservancies Kavango East and West | 1 | 2 | 5 | | 8 |
| **Total** | **97** | **50** | **19** | **9** | **175** |

Figure 84 and Table 17 show that the incidence of illegal killing of elephant declined over a four-year (2016-2019) period, which is a significant achievement.

The illegal killing of elephants presents an immediate threat and creates many negative impacts, e.g.:

- the loss of valuable individuals that belong to a specially protected species
- the loss of the economic value that the elephant represents
- redirecting resources away from other priorities to focus on crime prevention and law enforcement
- if severe enough, skewing the age and sex structure of the population
- if severe enough, affecting elephant movement and behaviour and increasing their fear of and aggression towards people
- reducing the efficiency of harvesting of plant products by the park residents in the case of Bwabwata NP where such harvesting has at times been disrupted by law enforcement operations
- threatening the viability of elephant hunting if males avoid certain areas because of illegal killing or if too many males have been illegally killed
- creating risks of death or injury to personnel of MEFT and other law enforcement agencies (it is public knowledge that one member of the Namibia Defence Force was killed during an anti-poaching operation), park residents (in the case of Bwabwata NP where it is public knowledge that two park residents were killed during anti-poaching operations) and tourists (it is public knowledge that one tourist was wounded during an anti-poaching operation, but recovered thereafter), hunting operators (one professional hunter was shot at in Bwabwata NP), not to mention illegal hunters (the number of which have been killed is not in the public domain).

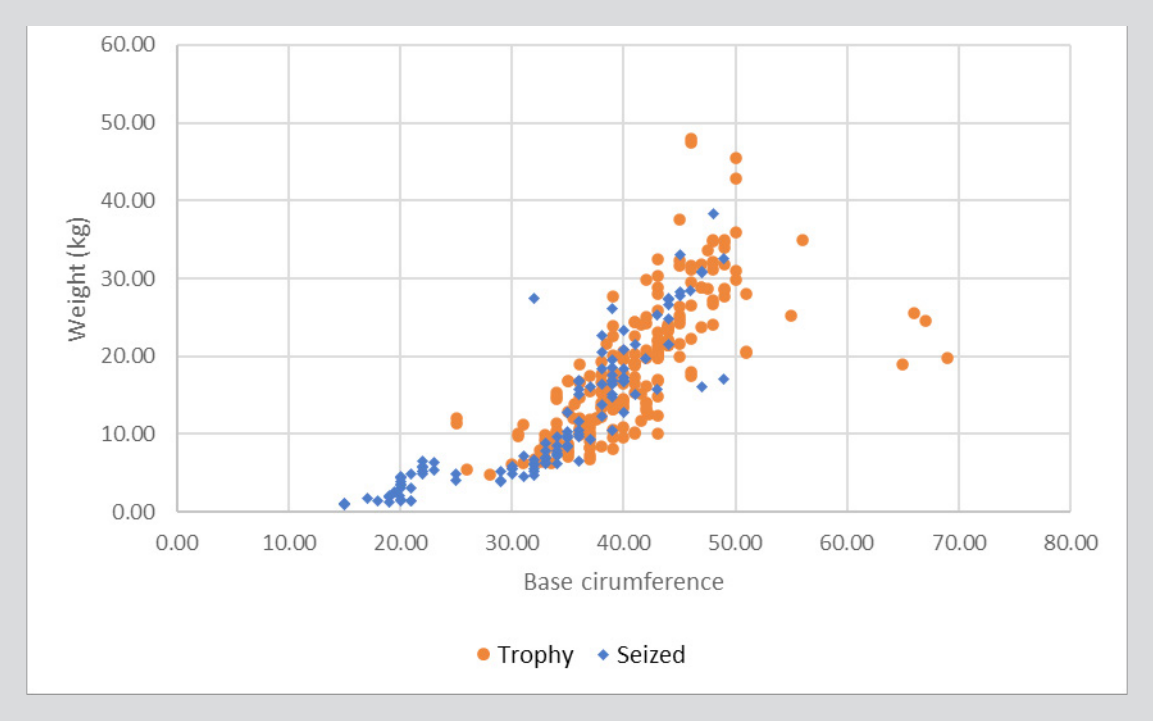
Photo: A. Cilliers

Importantly, illegal killing may already have reduced the number of huntable elephants in the higher age-larger trophy category in the Zambezi Region (also see Chapter 7). It is important to understand how selective such illegal killing is (it can be presumed that mostly males are targeted when males are available) and it is thus important to record the sex and age of all elephants illegally killed and all other elephant carcases recorded. It is equally important to enhance the monitoring of the age structure of the standing elephant population which can be done through recording herd compositions and aerial surveys (see Chapter 3 in the National elephant conservation and management plan).

The selectivity of illegal killing is an important issue. If illegal killing is highly selective for adult male elephants with large tusks, i.e. the same cohort available for conservation hunting, the sustainability of conservation hunting will be affected. The problem is that there are no data available to determine the degree of selectivity, as illegal killing results in the removal of the tusks. Other carcass measurements may have helped to determine if there was selection for the size or age of elephants, but such data have thus far not been recorded. A proxy for data on illegally killed elephants may be data on tusks seized in law enforcement operations, most of which can be assumed to have originated from illegal killing. These are the only data available that could possibly indicate the degree of selectivity in illegal killing in Namibia. Figure 85 shows an analysis of measurements taken of tusks seized[65] in Namibia in 2019 compared to tusks from elephants hunted through conservation hunting (which is also a selective form of removal). The origin of tusks in the seized sample is unknown, some could have been seized in transit from Botswana through Namibia, but the sample of seized tusks nevertheless represents a selection of elephants targeted through illegal killing. The data in Figure 85 suggest that the seized ivory has not been specifically selected for size and includes tusks that are smaller and lighter than those hunted for trophies.

65 Seizure in this context is the act of obtaining elephant tusks through a law enforcement process from people who had such tusks illegally in their possession

Nonetheless, amongst the seized tusks, are many that fall in the same size category than those legally hunted, representing animals that are no longer available for conservation hunting.



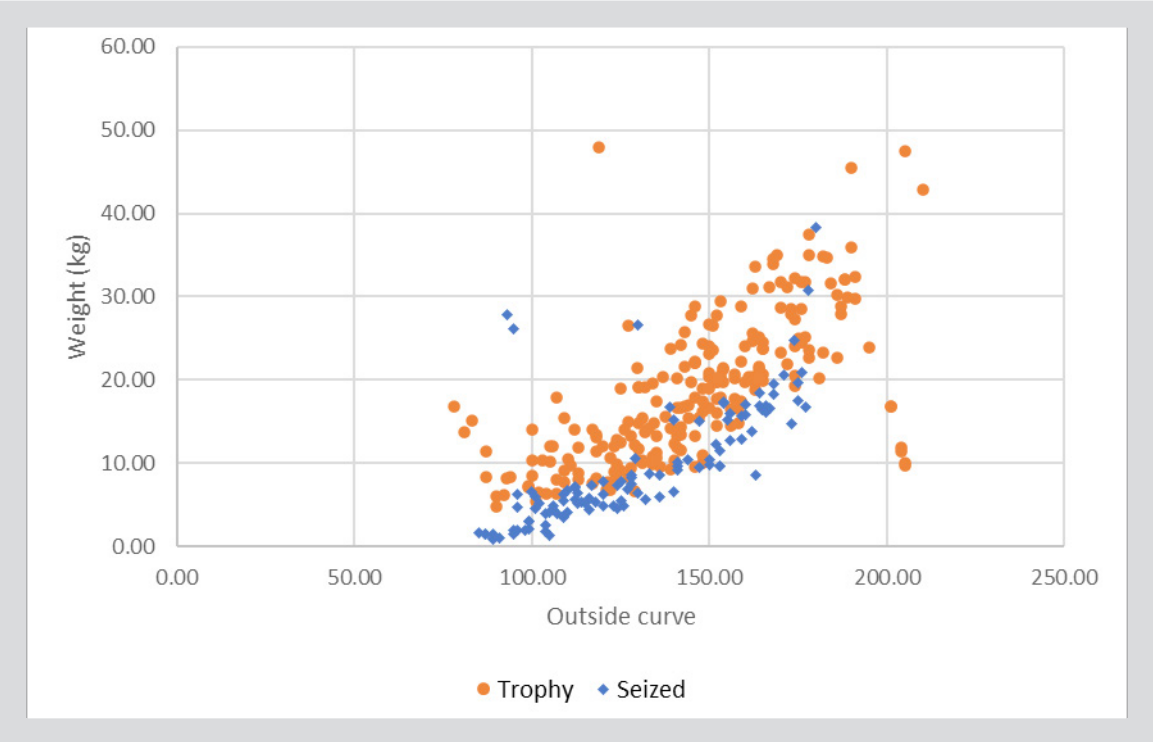




**Figure 85** Analysis of measurements taken of tusks seized in Namibia in 2019 compared to tusks from elephants hunted through conservation hunting (data on seized elephants collected with the assistance of F. Iifo, J. Shapi and A. Amutenya, CITES office, MEFT, who also provided the data on conservation hunting)

There is no evidence that illegal killing has had a significant impact on the viability of the Namibian elephant population (see Section 1.2) or its trend of steady increase since the 1990s. This is a considerable achievement, but illegal killing presents an ongoing threat that requires continued vigilance and investment in law enforcement and cooperation with neighbouring countries, especially in the KAZA TFCA. There is evidence from intercepts that elephant tusks obtained from illegal killing in northern Botswana are

smuggled through the Zambezi Region into Zambia and possibly Angola. Good cooperation with these countries and a detection system based on informers have resulted in many interceptions of such tusks and subsequent prosecution.

The combatting of illegal killing of elephants is handled through the Revised National Strategy in Wildlife Protection and Law Enforcement of 2020 and the SADC Law Enforcement and Anti-Poaching Strategy 2015-2020 (and subsequent iterations). There are security plans for Etosha NP and Bwabwata NP (drafts) but security plans for each protected area and neighbouring land in north-eastern Namibia should be developed during the implementation period of this plan.

There is a further dimension concerning illegal killing that has to be considered. In certain situations, especially in the North West and where elephants are in conflict with farmers, there are indications that a minor level of retaliatory shooting of elephants takes place, which may result in deaths, thus retaliatory killing. It is seldom possible to obtain sufficient evidence for a prosecution. This aspect should be included in the development of security plans.

## 6.1 Recommendations

1. Develop security plans for each protected area and neighbouring land in north-eastern Namibia during the implementation period of this plan.
2. Record the sex and age of all elephants illegally killed and all other elephant carcases recorded, to further guide the setting of hunting quotas (see Chapter 7).
3. Enhance the monitoring of the age structure of the standing elephant population which can be done through recording herd compositions and aerial surveys (see Chapter 12).
4. The practice of destroying elephant carcases by burning which was introduced during the peak of the period of illegal killing in order to facilitate aerial surveillance of affected areas, should be abolished as this prevents important biological information to be collected and makes carcass ratio determination through routine aerial surveys ineffective.

Ideally only old male elephants that have already contributed to breeding should be hunted. Old adult males are generally not involved in breeding[66] and are gradually declining in body condition due to the erosion of their molar teeth. After full eruption of the sixth and last molar tooth at approximately age 47 (Laws 1966), the available molar surface gradually diminishes due to erosion and breakages of one molar lamella after the other and increasing resorption of the molar roots. Variable diets in terms of nutritional value and texture, past injuries or infections or the occasional presence of a supernumerary or extra 7th molar in one or more quadrants of the upper and lower jaws may cause variation amongst different populations and individuals in the rates of regression of the size of the molar tooth row and thus the grinding surface available for mastication until the animal literally cannot feed itself and death ensues. By age 55, only about half of M6 remains in the tooth row and from this time onwards the elephant will increasingly become senescent (Sikes 1971).

Interestingly, different quadrants of the lower and upper jaws sometimes show large variations in tooth wear which causes problems in age estimation (see Figure 86), but in practice only the mandibles are used for age estimation.

**Figure 86** An example of variation in tooth wear in the upper and lower toothrows of a female elephant. If only the skull (maxillary toothrows) is looked at the elephant would be aged 57 from the left maxillary toothrow, 47 from the right maxillary toothrow and 60 from the mandibles. The mandibles also show the advanced resorption of the molar roots of an elephant in the last stages of its life. Note also the typical narrow female mandible, which in males are is much wider. (Photo: W. Versfeld)

If the hunting effort is focussed on the 55 years and older cohort, the highest trophy quality will be yielded with the least impact on the rest of the population, but only a small fraction of the population consists of males aged 55 years and older. Maximum trophy sizes are generally produced by elephants that are 55 years and older (Parker 1979, Pilgram & Western 1986, Martin 2005, Craig & Peake 2011), but noting that there is a wide range of tusk weights for any given age of male elephants older than 20 years (Craig ***et al***. 2011) and that many old elephants have broken tusks. The fraction of the population consisting of old males is generally not known in the absence of intensive long-term field surveys in all locations where elephants are to be hunted.

66 There has recently been some polemical discussion about this. There are no data on breeding success of individual elephant males in southern Africa and suggestions that old adult males are particularly prolific breeders only come from studies with an anti-hunting connection.

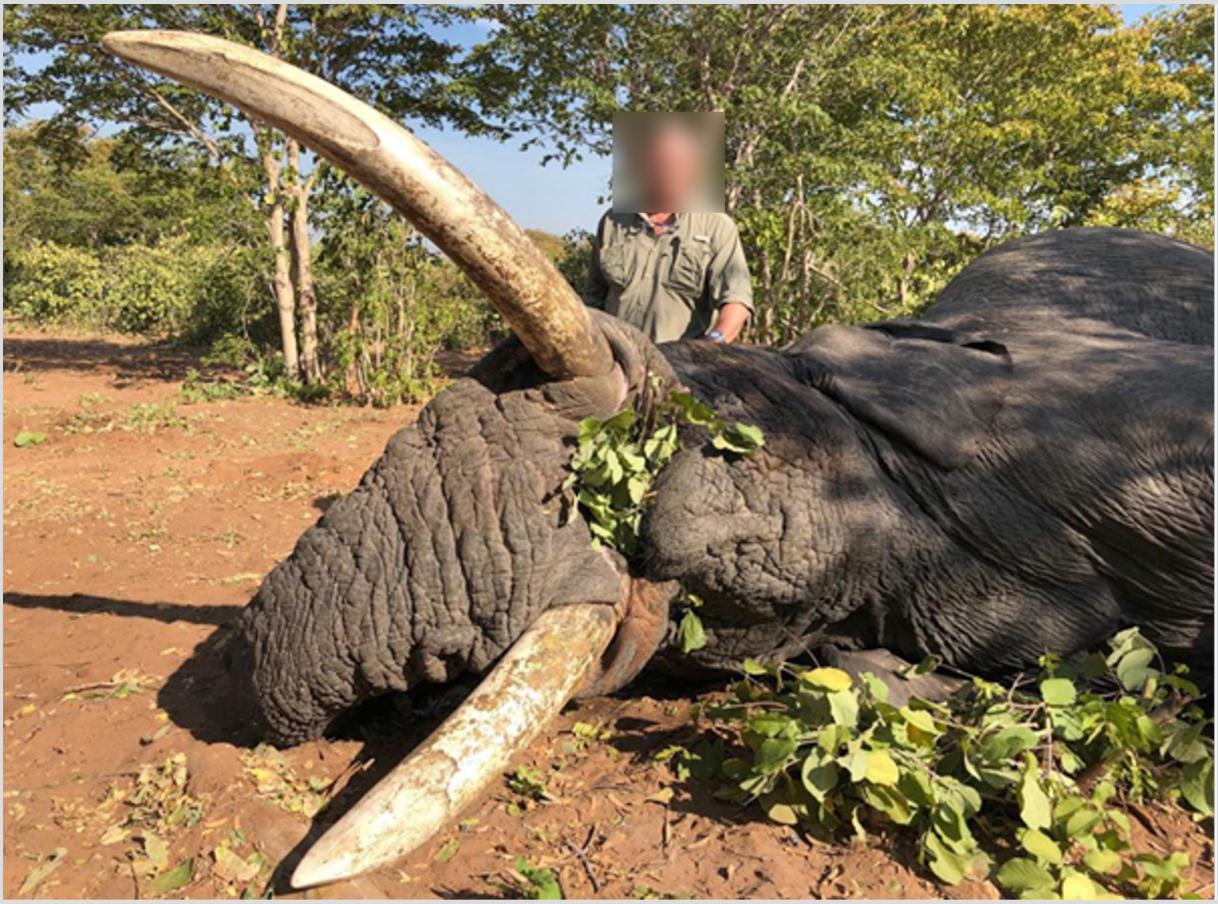


**Figure 87** One of the largest elephant bulls hunted in Africa over the past 10 years or more was hunted in May 2019 in the western Bwabwata NP hunting concession. The left tusk weighted 45.5kg or 98lb. The elephant only had a fragment of the last (sixth molar) left and was around 60 years old (Photo: Michel Manthiakis)

The 55+ year old fraction of an elephant population consists of a small and finite, but renewable if managed correctly, cohort of adult males. A number of factors determine how big the available 55+ year cohort for hunting is, i.e.:

1. Surviving males from the age category immediately below age 55 that are added to the 55+ cohort
2. Immigration (but this is rather unlikely in the 55 year and older age group) of old males
3. Natural mortality that depletes this cohort; normally the assumption is that all elephants will die by age 60 due to the erosion of their molar teeth which results in them not being able to maintain a sufficient dietary intake and starvation sets in. In practice, there are very few elephants older than 55 years.
4. Mortality from hunting of the cohort below 55 years of age, where applicable.
5. Mortality from illegal killing of the cohort below 55 years of age and the 55+ cohort, where applicable.
6. Mortality levels in the cohort below 55 years of age and the 55+ cohort from other management related killing such as problem elephant control or meat harvesting.

Importantly, males removed below age 55 due to factors 4.-6. above will directly affect the size of the 55 years-and-older cohort as there would be overall fewer elephants reaching the age of 55+. Problem animal control, meat harvesting and illegal killing (assuming that males are generally targeted) therefore directly impact on the size of the huntable cohort and these mortality factors therefore need to be incorporated when hunting quotas are established. If the management objective is to produce a sustainable offtake of trophies without a reduction in trophy size, such additive mortalities should be eliminated or minimized to the greatest extent possible.

Hunters generally prefer to hunt elephants with large trophies, but there is also a preference amongst some hunters to hunt old elephants rather than select only for trophy size. An important consideration that responsible hunters apply is that the elephant should be beyond its prime if possible but definitely at a time of his life when he has already had opportunities to breed (K.-U. Denker, pers. comm. to M. Lindeque). Selection for age and not tusk size should therefore be encouraged, and Namibia's Age-Related Measurement System for Hunting Trophies (ARMS), other than the Safari Club International or Rowland Ward measuring systems, ranks trophies on age and not length or weight. There are hunters that do not necessarily want to hunt an elephant with large tusks or who will be satisfied with smaller tusks (as also mentioned in Craig ***et al***. 2011) and at least one hunting operator in Namibia has offered a sliding scale in payments relative to tusk weight (A. Cilliers pers. comm. to M. Lindeque) and at some point in the past Zimbabwe applied a sliding scale for payments in relation to tusk size (R. Martin, pers. comm. to M. Lindeque).

It is relatively hard to estimate the age of an elephant in the field, but it is equally hard to estimate the trophy size of a live elephant in the field. Figure 88 and Figure 89 depict very large and very old elephants with tusks of 81/77 lb (37.2/34.9 kg) and 105/101 lb (47.6/45.8 kg) respectively, showing how tusks in this large weight category may appear small in large-bodied males. Figure 90 shows an example of a tusk weighing 29kg with only about a quarter of the tusk protruding beyond the lip. Visible tusk length in the field is therefore an unreliable indication of both trophy size (weight) and age.

The overall physical appearance of the elephant is much more reliable. There are several characteristics of the external appearance and behaviour that give an indication of advanced age in elephant males, see Denker (2018) for a comprehensive discussion. The appearance of the head and neck, sunken frontal areas and the severe folding and hardening of the skin on the forehead and base of the tusk as well as the fraying of the ears are reliable indicators of advanced age (see e.g. the underside of the trunk in Figure 87, the severely corrugated appearance of the trunk and the sunken frontal and post-orbital areas, ragged ears and corrugated trunk in Figure 91). The young male elephant in Figure 92, however, shows poor body condition and sunken post-orbital areas due to an infection in the right tusk which prevented it from feeding (S. Jacobs. pers. comm. to M. Lindeque).

Other indicators of old age are the state of the ears, which in old elephants become severely frayed (but see Figure 93) and the soles of the feet as evident from their tracks. Denker (2018) describes the very severely cracked footprints of old elephants compared to footprints of younger males that show smooth areas at the heels. Elephants in sandy areas tend to have rougher foot soles regardless of age compared to elephants occurring in rocky terrain (Lindeque 1988). Smooth heel patches (regardless of the overall appearance of the tracks) should not be used as an indicator of old age in elephants (K.-U. Denker pers. comm. to M. Lindeque).

**Figure 88** A very large and very old elephant with tusks of 81/77 lb (37.2/34.9 kg) showing how tusks of this weight may appear small in large-bodied bulls (Photo: K.-U. Denker, Khaudum concession)

**Figure 89** A very large (but not very old) elephant with tusks of 105/101 lb (47.6/45.8 kg) showing how tusks this heavy may appear small in a large-bodied bull (Photo: K.-U. Denker, Khaudum concession)

**Figure 90** The short tusk in the centre (the fifth from the left) weighed 64 lb (29kg). Note how small a part of the tusk protruded beyond the lip mark. The other tusk from the same elephant (6th from left) weighed 93 lb (42.2kg) (Photo: K.-U. Denker, Khaudum concession)

**Figure 91** Typical appearance of a very old male elephant in Etosha NP (two views of the same elephant). Note the sunken temporal and post-orbital areas and severe corrugations of the skin at the base of the trunk (also visible under the trunk, see e.g. Figure 88) and the frayed edge of the ear.

**Figure 92** An elephant in poor body condition with the appearance of being an old male (but note the intact ear) turned out to be only 36 years old with a severe abscess around the right tusk which prevented it from feeding (Photo: S. Jacobs)

**Figure 93** Adult female elephant in the Hoarusib River at Puros. Tattered ears cannot be used as a sole indicator of age, as in this case (although its ear patterns are very useful for individual identification) (Photo: P. Stander, Desert Lion Conservation)

Hindfoot length increases with age, and hindfoot lengths can be easily measured from tracks. Figure 94 shows the relationship between hindfoot length and age from a large sample (550) of elephants from Etosha NP (Lindeque & van Jaarsveld 1993) based on Von Bertalanffy growth models. This shows the sexual dimorphism of elephants very well. Hindfoot length like other body measurements continue to increase throughout the lifespan of the male elephant but growth slows down from around age 40. Female hindfoot length (like other body measurements) reaches an asymptote from around age 25. There will always be some individual variation in body size parameters (not shown in Figure 94) but any elephant track with a hindfoot length greater than 47cm is very likely to be from a male, and if the length is 55 cm or longer, the elephant is most likely to be 40 years and older.

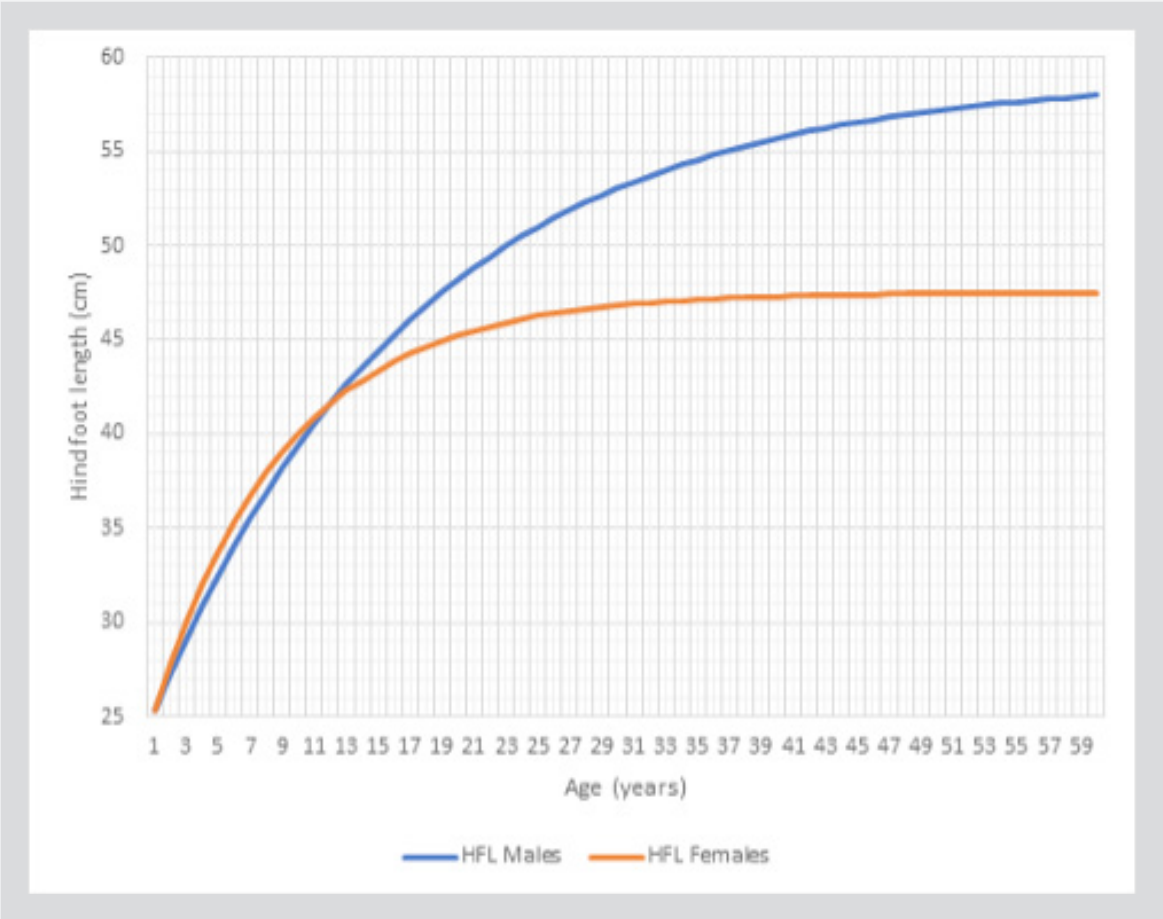



**Figure 94** Hindfoot lengths of male and female elephant against age (after Lindeque & van Jaarsveld 1993)

There is no reason to believe that elephants in other parts of Namibia are generally smaller or larger than elephants from Etosha NP although it has long been thought that Namibian elephants, particularly from the North West are taller than elephants from elsewhere, and some very tall elephants have indeed been measured with shoulder heights of over 4m in the North West, Etosha NP and in the Khaudum area. These measurements were invariably made from elephants lying on their sides which may not be an accurate reflection of standing height. Shrader ***et al***. (2006) have fairly conclusively shown that there are no significant differences in shoulder height in different savanna elephant populations, thus presumably also not in hindfoot length.

## 7.1 Quotas based on population age structure and sex ratio

In theory, if all the males in the population are known a more precise quota can be constructed, e.g. 1% of the total number of males can be hunted per year. In practice, only a fraction albeit a substantial fraction of the males, namely the adult males that are found away from family groups (breeding herds), is enumerated in aerial surveys. Taking just the most recent surveys for three regions, Table 18 shows the number of males recorded in male groups in aerial surveys and what a 1% offtake quota would look like. It is noticeable how much the number of males as a percentage of each population varies amongst the survey areas, something that needs further investigation. This could mean that male mortality varies greatly amongst the survey areas or that there is a variable and unknown fraction of males that cannot be distinguished and recorded within breeding herds, or as Denker (2018) recorded, that old male elephants tend to occur in low density parts of the elephant range which may exclude some from census strata. It would have been valuable if all elephants sighted had been photographed but this is not part of the recently used aerial survey protocol. Until there is greater certainty about the number of males in each survey area and management unit, it is not advisable to use this approach for quota setting.

**Table 18** Number of males recorded in male groups in recent aerial surveys in three survey areas and hypothetical 1% offtake quotas

| Survey area | Year of survey | Number of males estimated (and males as a % of the total number of elephants estimated) | 1% offtake per year |
|---|---|---|---|
| North-western Kunene Region | 2016 | 59 (3.4%) | 0.6 |
| Khaudum NP and Nyae Nyae Conservancy | 2015 | 1,322 (20.6%) | 13.2 |
| Khaudum NP and Nyae Nyae Conservancy | 2019 | 1,582 (19.8%) | 15.8 |
| Zambezi Region and western Bwabwata NP | 2014 | 1,083 (7.7%) | 10.8 |
| Zambezi Region and western Bwabwata NP | 2015 | 978 (7.5%) | 9.8 |
| Zambezi Region and western Bwabwata NP | 2019 | 1,146 (9.5%) | 11.5 |

## 7.2 Quotas based on guidelines derived from the rate of increase

An alternative approach towards quota setting is therefore needed, using the total number of elephants in a population, survey area or management unit. The general guideline of 0.5% of the total population is used as the starting point for setting a hunting quota. This guideline was developed in Zimbabwe in the 1980s or earlier (see Cumming & Martin 1984[67]) from experience and empirical evidence (C. Craig pers. comm.) and subsequently expressed in terms of harvesting theory in the seminal paper of Caughley & Krebs (1983). They provide a general model for working out a cropping percentage based on the maximum rate of increase ($r_{max}$) of a species (which is inversely correlated with body mass):

67 Note that Martin (2005) upon which the guidelines in MET (2008) were based did extensive modelling of mean tusk weight in response to offtake rates. The rate of 0.45% mentioned here differs from Figure 91 where an offtake rate of 0.5% yields a mean tusk weight of 21 kg.

They give: $r_{max} = 1.5W^{-.36}$ where W is the mean adult mass in kg. The cropping percentage is then worked out as:

Cropping % = $100(e^r -1)/e^r$ where $r = r_{max}/2$ assuming a logistic growth model. From this cropping percentage a hunting quota for trophies can be calculated as one tenth of the cropping percentage. This results in a cropping percentage or offtake rate of approximately 0.5%.

This rate was used in all previous elephant management plans in Namibia. MET (2008) states that *"In the absence of any other management (including problem animal control), the proportion of an elephant population that can be hunted for trophies is about 0.5%. These trophies would all be males over 30 years old. To achieve a mean tusk weight of 20kg, trophy hunting quotas should be set at 0.45%[68] with no culling or 1.15%[69] if a culling regime is in place. When the problem animal control offtake rises to 0.5%, the hunting quota must be reduced to 0.2% of the population if there is no culling but can be maintained at 0.8% with an ongoing 3% cull. If problem animal control is restricted mostly to male elephants 15 years and older, the maximum sustainable offtake is about 1.15% of the population. As the problem animal control is increased the trophy hunting quota must be reduced to remain sustainable and when problem animal control reaches 1.5% there are insufficient animals reaching an age of 30 years to allow sport hunting."*

The approach outlined above essentially means that an elephant population can be cropped (harvested) at half of its maximum growth rate. This is a common-sense and safe approach as the offtake rate is always kept below the capacity of the population to increase and populations would tend to increase despite this rate of offtake. It is also an approximation of the maximum sustainable yield (MSY) of the population which as a general guideline approximates half of the maximum growth rate ($r_{max}/2$) but the calculation of MSY and especially MSY for a selectively harvested population is much more complicated than that (see Caughley 1977). Elephant populations rarely achieve the theoretical maximum rate of increase but it refers to the theoretical potential of a population to increase and is thus valuable in setting the starting point of a harvesting regime. It is also possible to use the actual rate of increase to derive a cropping rate. This is an option that can be explored in future but in terms of large-scale management and based on the history of practice, the offtake rate of 0.5% is used in this plan as the starting point.

One potential weakness in the guideline approach is that in a population skewed towards females (e.g. the North West and Zambezi Region and western Bwabwata NP, see Table 18) percentage offtake would inflate the hunting pressure on males.

The management guidelines in MET (2008) were derived from a more comprehensive account of management strategies (Martin 2005) which provides further rationale for these recommendations and brings in the aspect of devising targets for minimum tusk weights based on different offtake rates. Martin (2005) did extensive modelling of mean tusk weight in response to offtake rates, and the impact of hunting quotas on adult male age structure, as shown in Figure 95. In this simulation, an offtake rate of 0.5% yields a mean tusk weight of 21kg. If MEFT were to decide on a hunting offtake regime that should produce higher mean tusk weights, from Figure 95, offtake rates should be reduced accordingly.

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68 Note that Martin (2005) upon which the guidelines in MET (2008) were based did extensive modelling of mean tusk weight in response to offtake rates. The rate of 0.45% mentioned here differs from Figure 91 where an offtake rate of 0.5% yields a mean tusk weight of 21 kg.

69 The implication here is that hunting quotas can be increased if the management objective is to reduce population size by culling (where family herds are removed), also as a means of adjusting the sex ratio by removing a higher number of males through hunting.

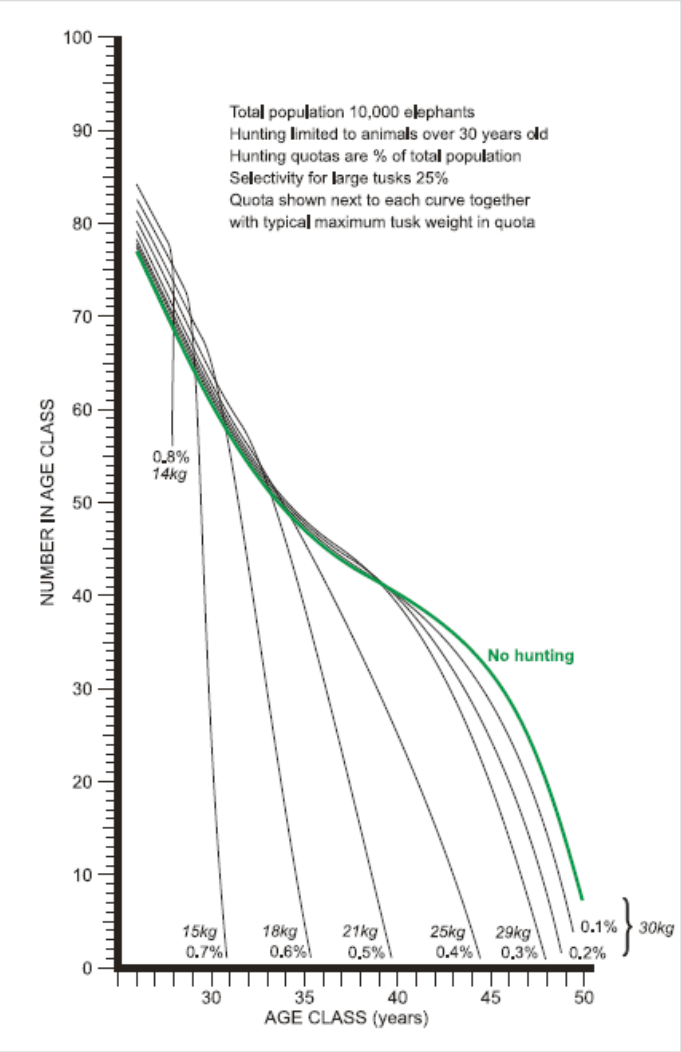



**Figure 95** Effect of hunting quotas on elephant adult male age structure (from Martin 2005)

Other countries such as Botswana and Zimbabwe seem to have explicitly used the management objective of maintaining trophy quality above a certain threshold size regardless of the age of the elephant hunted. With the smaller and disjunct elephant populations of Namibia this may be a greater challenge than in larger populations (G. Stuart-Hill pers. comm. to M. Lindeque).

Both Martin (2005) and MET (2008) emphasize the effect of other management-related mortalities on the sustainability of offtakes. Martin ***et al***. (1991) further advises that when about 0.75% of an elephant population is removed through, e.g. problem animal control, culling or illegal killing, hunting quotas should be reduced, to zero if necessary. MEFT has endeavoured to minimize problem animal control by granting quotas for own use and quotas for traditional authorities and traditional festivals, but problem animal control (mostly young adult or adult males) is nevertheless still done, and depending on the area, may affect the adult male cohort and thus the sustainability of conservation hunting. If own use and quotas for traditional authorities are used for hunting elephants within the same age group as the cohort available for conservation hunting, such offtakes will impact the sustainability of hunting. Together with illegal killing, these additional sources of mortality in the adult male cohort may compromise conservation hunting altogether. Some trade-offs need to be made and it will be very important for conservancies to clearly understand this, which most seem to do (Section 2.1). It may be necessary to reduce the conservation hunting quota proportionally for every adult male removed through these additional sources of mortality.

## 7.3 Adaptive management in quota setting

Importantly, the offtake rate of 0.5% of the total population should only be used as a starting point within an adaptive management system requiring rigorous monitoring of trophy quality as well as monitoring of other offtakes from the male component of the population such as illegal killing, problem elephant control or own use or traditional authority offtakes where these apply.

Trends in trophy quality are critically important in this adaptive management process. Trophy quality is a concept that originated from the long-standing practice amongst primarily American and British hunters to register their hunting trophies with one or more international systems that record and rank individual trophy sizes. These systems also created considerable competition amongst hunters, and it must be said, also negative impacts by focusing hunting interest on the size of the trophy rather than the quality of the hunting experience and its contribution to the conservation of the species. European hunters largely view this differently, and much more value is given to the quality of the hunting experience and its role in the management of the population[70] than the size of the trophies. From a southern African and Namibian perspective, trophy quality is very important. First, it is a driver of hunting preference in important source markets and thus market demand and secondly, it is an offtake-based indicator of the impact of hunting on populations, i.e. whether a population is harvested at a level that can continue to produce animals of a certain age and size class. Trophy quality in elephants is generally measured in the weight of the tusks (leading to the famed '100 pounder' tusks which have been so desirable to many hunters for a century or more) but could also be based on other criteria. Namibia has introduced the Age-related Measuring System (ARMS) that was developed through the visionary efforts of the Erongo Verzeichnis (Register) by a group of professional hunters dedicated to the sustainability of hunting. It was subsequently adopted by the Namibian Professional Hunting Association and MEFT in 2019. ARMS is being rolled out at present and will in future provide a valuable alternative measure of trophy quality

Figure 96, Figure 97, Figure 98, Figure 99 and Figure 100 show trends in trophy quality based on tusk weights at national and regional level (data provided by P. Iifo, CITES office, MEFT).

While the overall trend in tusk weights exported from Namibia may be of interest, trophy quality assessment for the purpose of this chapter should be limited to elephants hunted under a conservation hunting quota and exported by a hunting client. Cases of problem animals hunted were as far as possible excluded from the analysis, but it is possible that there could be some of such cases in the earlier years when the distinction was not made in the records; the same applies to elephants harvested by hunters for own use quotas or traditional authorities but exporting the tusks as hunting trophies.

In each graph, the mean weight per year for the largest tusk per pair is given and the Standard Deviation (this is a calculated value of the degree of variation around the mean value and the vertical spread of the bars indicating this standard deviation value should not be confused with the total range of all tusk weights, which is not given in these graphs, and which will have a wider spread than the standard deviation). Dotted lines indicate linear trend; the regression formula is given in the top right corner; and $R^2$ denotes the correlation coefficient as calculated. The statistical significance of the correlation coefficient, i.e. the degree to which the linear model fits the data, is determined by the sample size (degrees of freedom) read against published statistical tables (in most books on statistics) and also available on the internet. The statistical significance is expressed as a probability p that the correlation coefficient is or is not significantly different from 0 at either the 5% (0.05), 1% (0.01) or 0.1% (0.001) level . If the correlation coefficient ($R^2$) is lower than the p value at either the 5%, 1% or 0.1% probability level, the

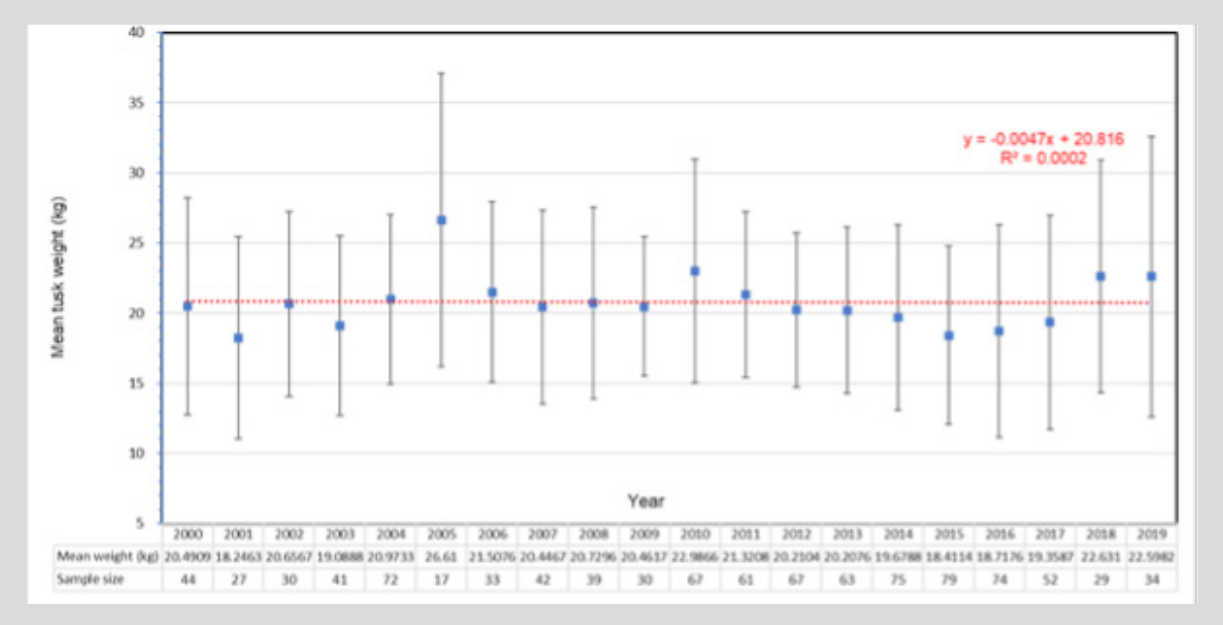
70 In the German-speaking countries of Europe and parts of eastern Europe, the concept of 'Hegeabschuss' is applied, meaning selective hunting to improve the health of the population (K.-U. Denker, pers. comm. to M. Lindeque), which is close to the notion of management hunting in southern Africa and does not involve the selection of the biggest and best trophies, often the opposite.

correlation is not statistically valid; if it is higher, the correlation is statistically valid. Significance at e.g. 0.1% probability denotes a higher degree of certainty that there is e.g. indeed a linear increase or a decrease over the relevant time period than e.g. significance at the 5% level. The asterisk or two asterisks that appear in the text together with the p value, e.g. $p<0.05^{*}$ or $p<0.01^{**}$ indicate that the correlation is significant (one asterisk) or highly significant (two asterisks). Note that this very basic and non-expert explanation is given purely for the benefit of stakeholders that do not normally deal with statistics and their interpretation, because the trends apparent from tusk weights inform future quota setting in the adaptive management process.

The reliability of the adaptive management process can be improved by ensuring that the hunting trophy dataset on spreadsheet is complete, accurate and backed up by a complete paper archive record. Some records had to be discarded from the analysis in this plan as the information linked to the record was incomplete. It will be very important to ensure that all new or future records are absolutely complete because the full data available from the relatively small hunting quotas and thus relatively small statistical samples per year and per region are needed as the basis for important decisions about quota setting .

Over the past twenty years from 2000 to 2019, the analysis shows that at national level (Figure 96), the mean trophy quality per year has remained relatively steady, noting that there was a very slight decrease over the 20 year period which is not statistically significant ($p > 0.05$). The average tusk weight over this period, indicated by the regression line has stayed well above 20kg and approximates the modelled predictions in previous plans based on a 0.5 or 0.45% offtake. It can be said that MEFT has largely achieved its elephant quota management target over this time period.

The dataset used in Figure 96 may include an unknown but probably small fraction of records representing hunting for own use or traditional authorities but where the tusks were nevertheless exported by a hunting client. This form of hunting generally targets elephants with small trophies and if anything would have reduced the mean tusk weight. It is thus very important that all future hunting and elephant trophy records should unambiguously indicate the type of quota under which a specific elephant was hunted. MEFT needs to absolutely separate mean tusk sizes from conservation hunting vs own use or traditional festivals, to obtain the most value out of the monitoring of trophy quality and thus apply adaptive management correctly.

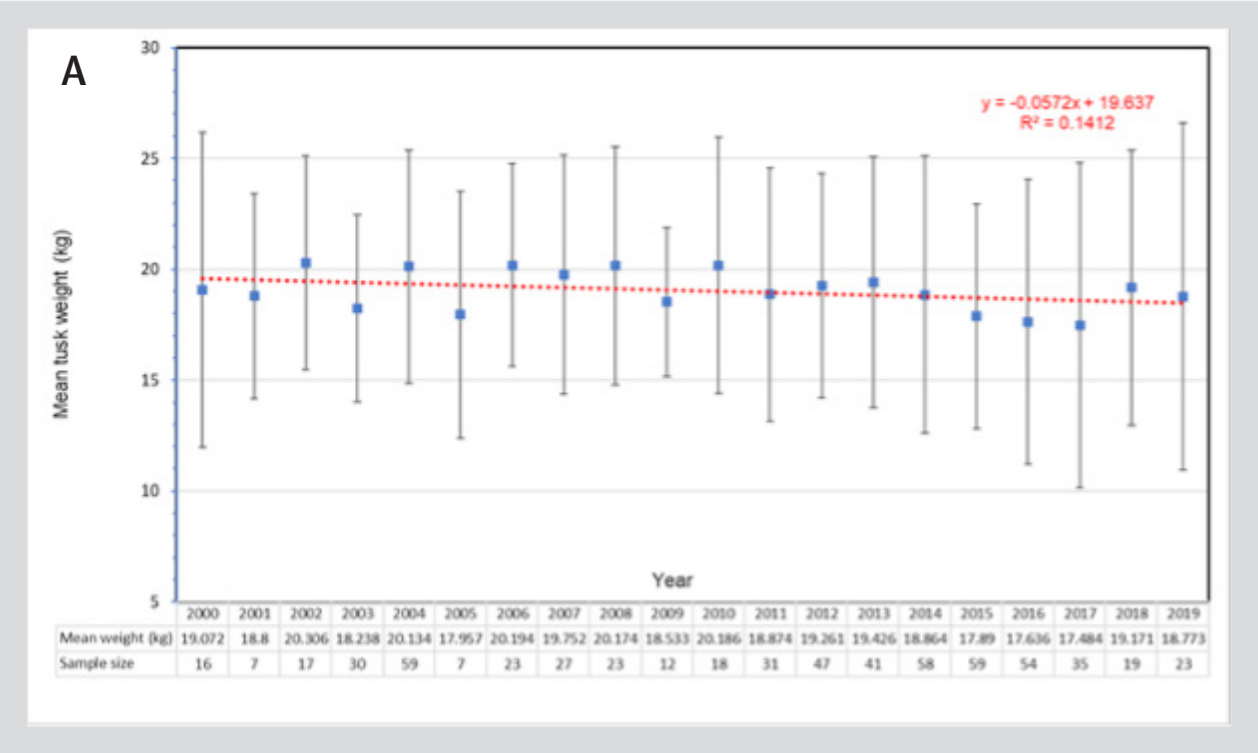



| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean weight (kg) | 20.4909 | 18.2463 | 20.6567 | 19.0888 | 20.9733 | 26.61 | 21.5076 | 20.4467 | 20.7296 | 20.4617 | 22.9866 | 21.3208 | 20.2104 | 20.2076 | 19.6788 | 18.4114 | 18.7176 | 19.3587 | 22.631 | 22.5982 |
| Sample size | 44 | 27 | 30 | 41 | 72 | 17 | 33 | 42 | 39 | 30 | 67 | 61 | 67 | 63 | 75 | 79 | 74 | 52 | 29 | 34 |

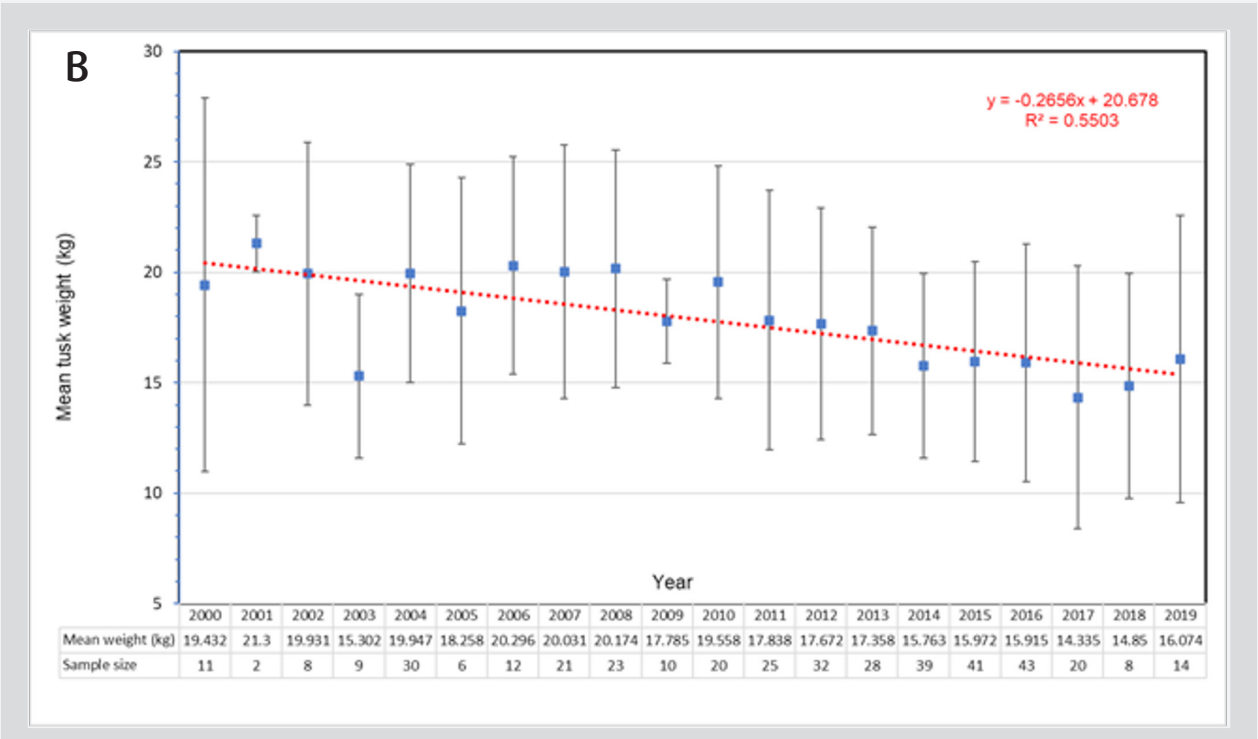
**Figure 96** Trophy quality at national level for the period 2000 to 2019, for all complete records of elephants hunted on a hunting permit, thus conservation hunting (and an unknown fraction of records representing hunting for own use or traditional authorities but where the tusks were nevertheless exported by a hunting client).

Within this larger national dataset over the past 20 years, there are important, and in some instances statistically significant, trends for individual regions, as shown below.

In the North East (Figure 97 A) there has been a decline which is not statistically significant ($p>0.05$) in mean tusk weight. If data from Bwabwata NP are excluded, there is a sharp decline in the North East which is statistically highly significant ($p<0.01^{**}$), as shown in Figure 97 B. This seems to indicate that the relatively high incidence in illegal killing in the Zambezi Region (see Chapter 6) has significantly affected the age and sex structure of the North East population, exacerbated by the high numbers of males harvested for meat.



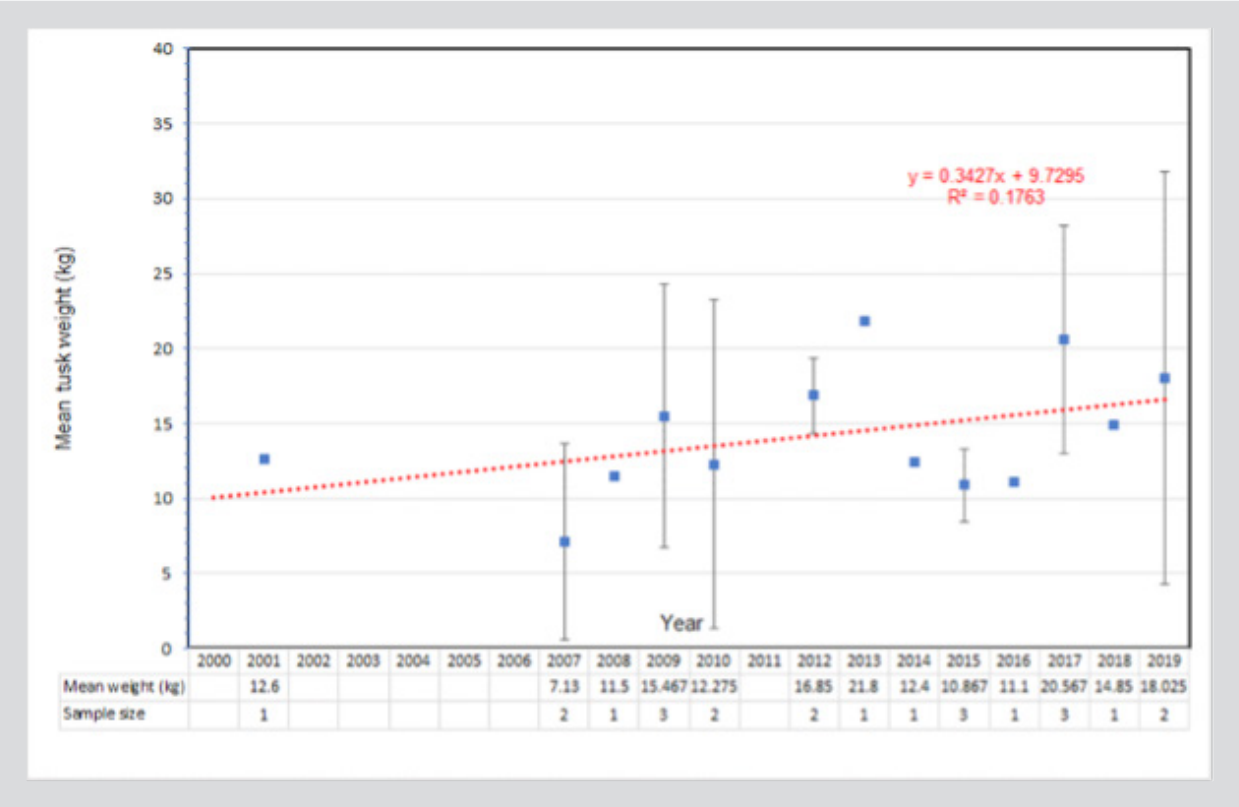

| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean weight (kg) | 19.072 | 18.8 | 20.306 | 18.238 | 20.134 | 17.957 | 20.194 | 19.752 | 20.174 | 18.533 | 20.186 | 18.874 | 19.261 | 19.426 | 18.864 | 17.89 | 17.636 | 17.484 | 19.171 | 18.773 |
| Sample size | 16 | 7 | 17 | 30 | 59 | 7 | 23 | 27 | 23 | 12 | 18 | 31 | 47 | 41 | 58 | 59 | 54 | 35 | 19 | 23 |




| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean weight (kg) | 19.432 | 21.3 | 19.931 | 15.302 | 19.947 | 18.258 | 20.296 | 20.031 | 20.174 | 17.785 | 19.558 | 17.838 | 17.672 | 17.358 | 15.763 | 15.972 | 15.915 | 14.335 | 14.85 | 16.074 |
| Sample size | 11 | 2 | 8 | 9 | 30 | 6 | 12 | 21 | 23 | 10 | 20 | 25 | 32 | 28 | 39 | 41 | 43 | 20 | 8 | 14 |

**Figure 97** Trophy quality in the North East of Namibia for the period 2000 to 2019. "A" shows the data for the North East with Bwabwata NP included, "B" excludes Bwabwata NP

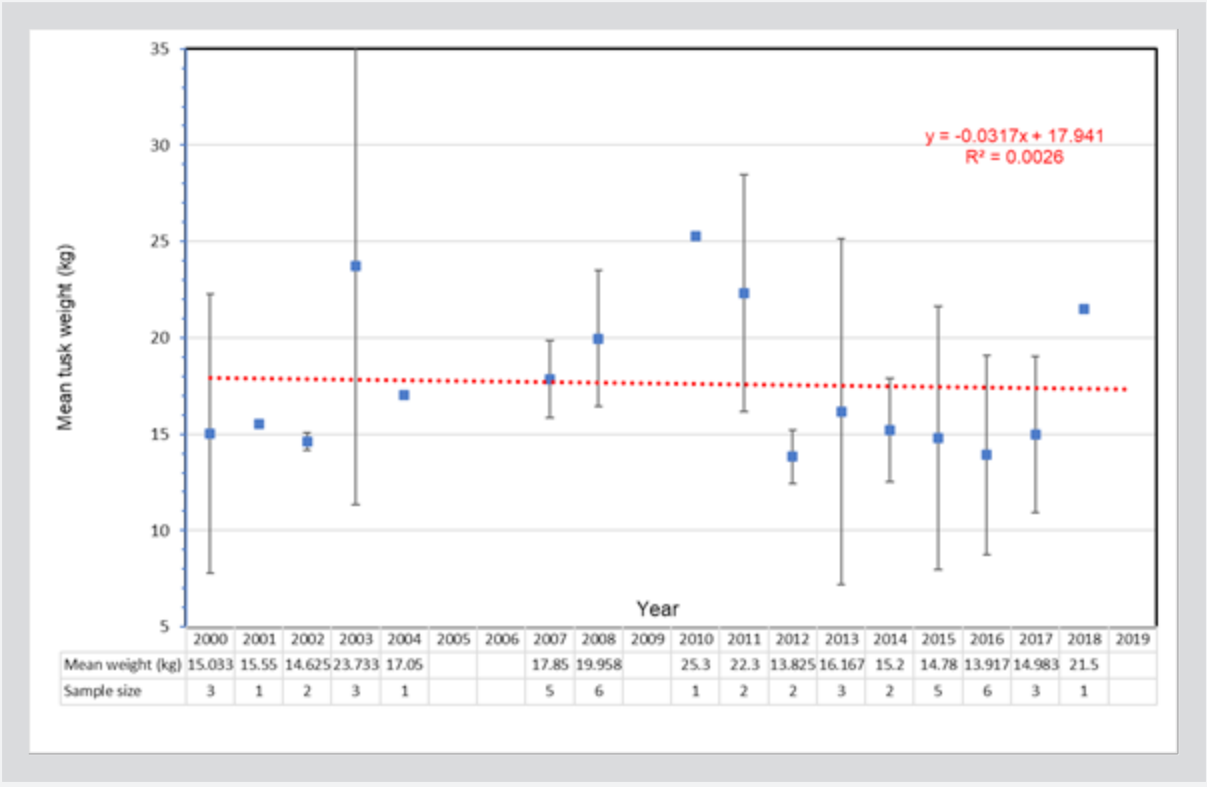
Trophy quality in the North Central (Figure 98) has increased but the trend is not statistically significantly ($p>0.05$); there is a high degree of interannual variation probably due to the relatively small sample sizes.




| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean weight (kg) | | 12.6 | | | | | | 7.13 | 11.5 | 15.467 | 12.275 | | 16.85 | 21.8 | 12.4 | 10.867 | 11.1 | 20.567 | 14.85 | 18.025 |
| Sample size | | 1 | | | | | | 2 | 1 | 3 | 2 | | 2 | 1 | 1 | 3 | 1 | 3 | 1 | 2 |

**Figure 98** Trophy quality in the North Central part of Namibia for the period 2000 to 2019

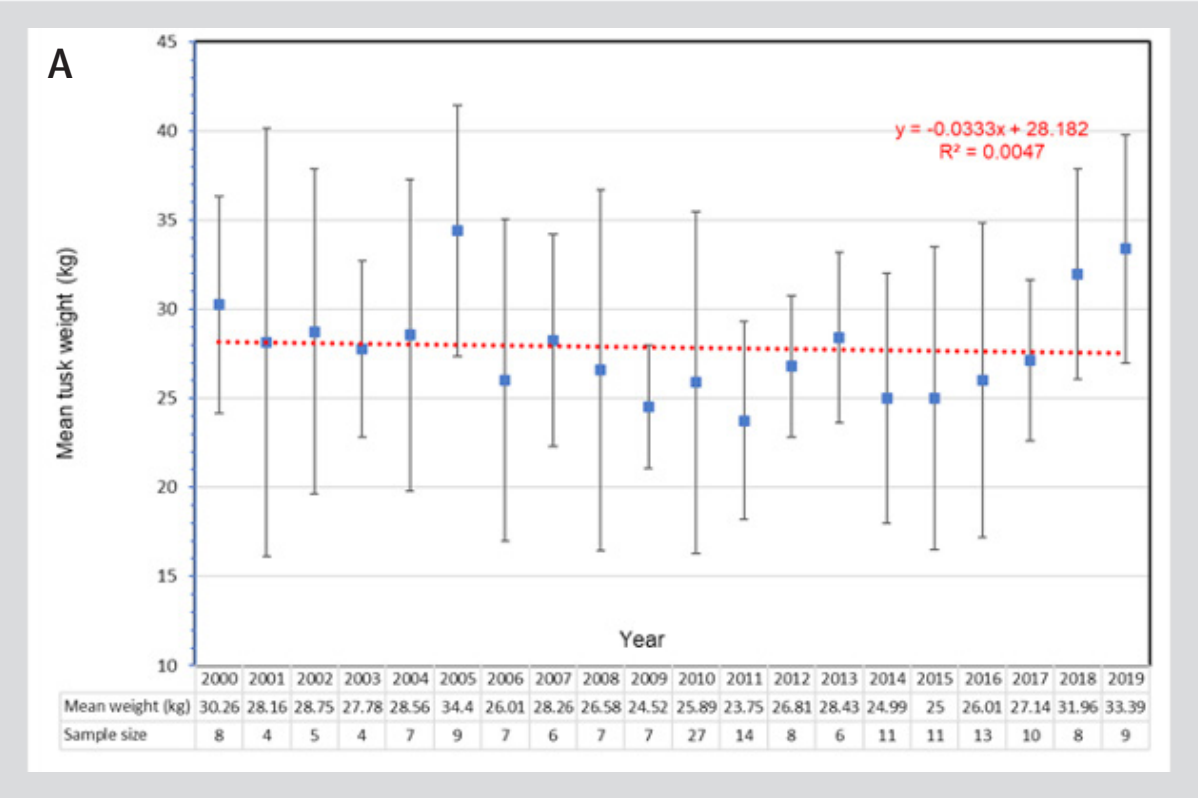
Trophy quality in the North West (Figure 99) seems to have declined but the decline is not statistically significant ($p>0.05$) but sample sizes are small and variation high per year. This is probably a case where the small sample of elephants hunted in this part of Namibia does not produce a reliable mean tusk weight to effectively monitor changes in trophy quality.




| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean weight (kg) | 15.033 | 15.55 | 14.625 | 23.733 | 17.05 | | | 17.85 | 19.958 | | 25.3 | 22.3 | 13.825 | 16.167 | 15.2 | 14.78 | 13.917 | 14.983 | 21.5 | |
| Sample size | 3 | 1 | 2 | 3 | 1 | | | 5 | 6 | | 1 | 2 | 2 | 3 | 2 | 5 | 6 | 3 | 1 | |

**Figure 99** Trophy quality of elephants hunted in the North West of Namibia over the period 2000 to 2019

Mean tusk weights in Nyae Nyae Conservancy (Figure 100) (as a proxy for the combined Khaudum NP- Nyae Nyae Conservancy population, the second largest elephant population in Namibia) are higher than anywhere else in Namibia but may have marginally declined from around 28kg to 27.5kg over 20 years of hunting, but there is considerable variation within years. This trend is not statistically significant ($p>0.05$). This sub-population has produced extra-ordinary trophies over the last 20 years, as evident from Figure 100 B, noting that only the largest tusk in each pair is used.




| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean weight (kg) | 30.26 | 28.16 | 28.75 | 27.78 | 28.56 | 34.4 | 26.01 | 28.26 | 26.58 | 24.52 | 25.89 | 23.75 | 26.81 | 28.43 | 24.99 | 25 | 26.01 | 27.14 | 31.96 | 33.39 |
| Sample size | 8 | 4 | 5 | 4 | 7 | 9 | 7 | 6 | 7 | 7 | 27 | 14 | 8 | 6 | 11 | 11 | 13 | 10 | 8 | 9 |

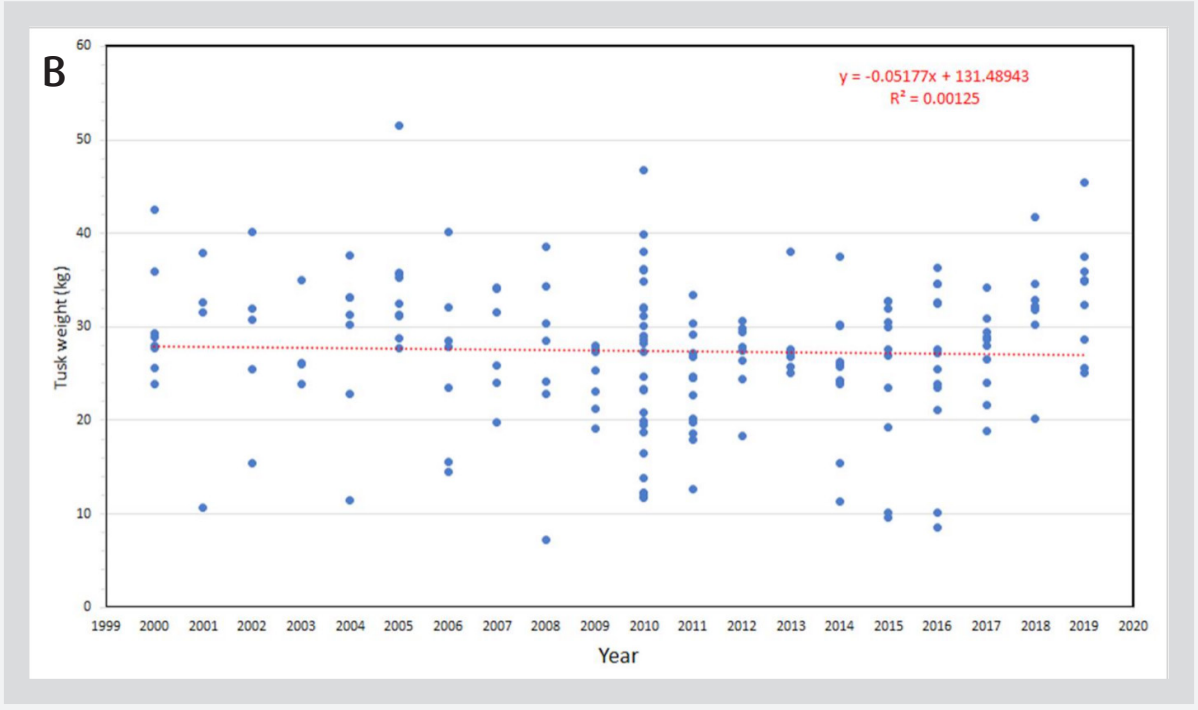


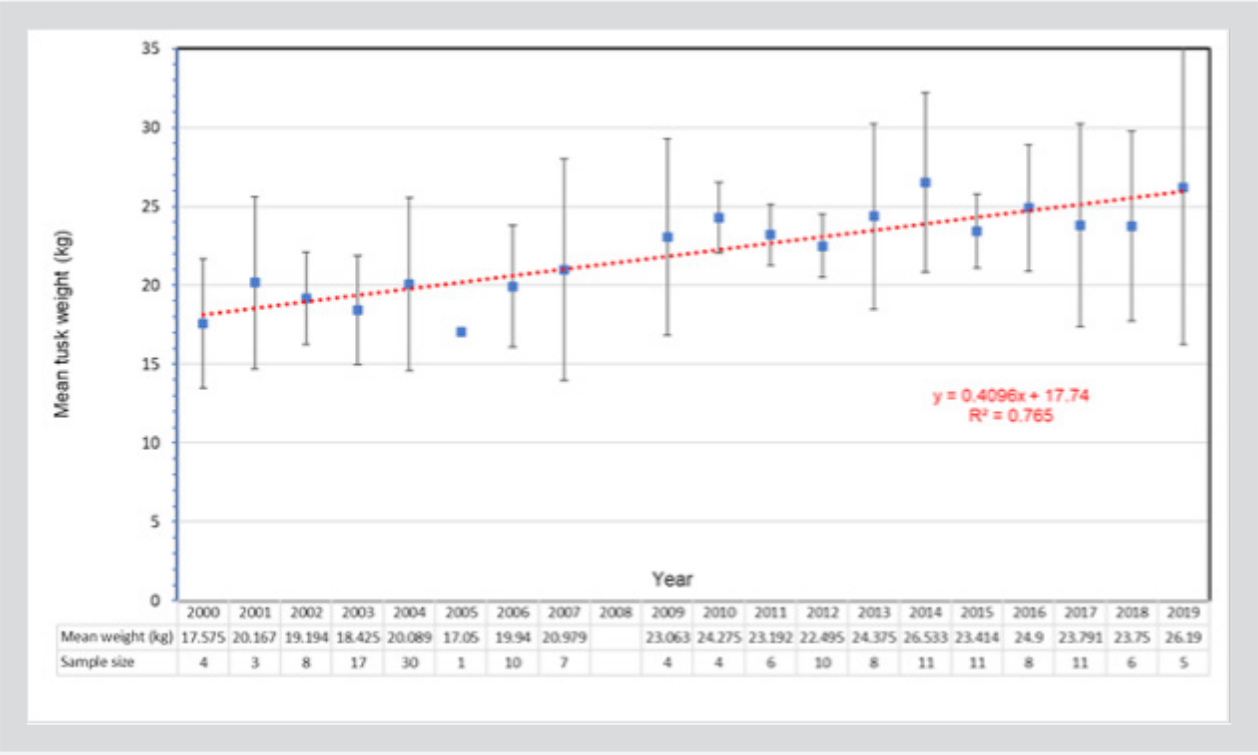

**Figure 100** Trophy quality in Nyae Nyae Conservancy for the period 2000 to 2019. "A" shows the mean tusk weights per year and B the actual data (only the largest tusk per pair). In "B", the regression is calculated based on all individual points rather than mean tusk weights per year.

Trends in trophy quality at finer scale show more complexity, recognizing that other factors come into play at finer scale such as the connectivity of sub-regional elephant populations which may vary annually, the relative size of conservancies, protected areas and elephant numbers in them, relative level of offtake and the efficiency or selectivity of individual hunting operators.

For example, Figure 101 and Figure 102 show trends in trophy quality in the Bwabwata West and Bwabwata East hunting concessions, where the highest elephant densities in Namibia are found.

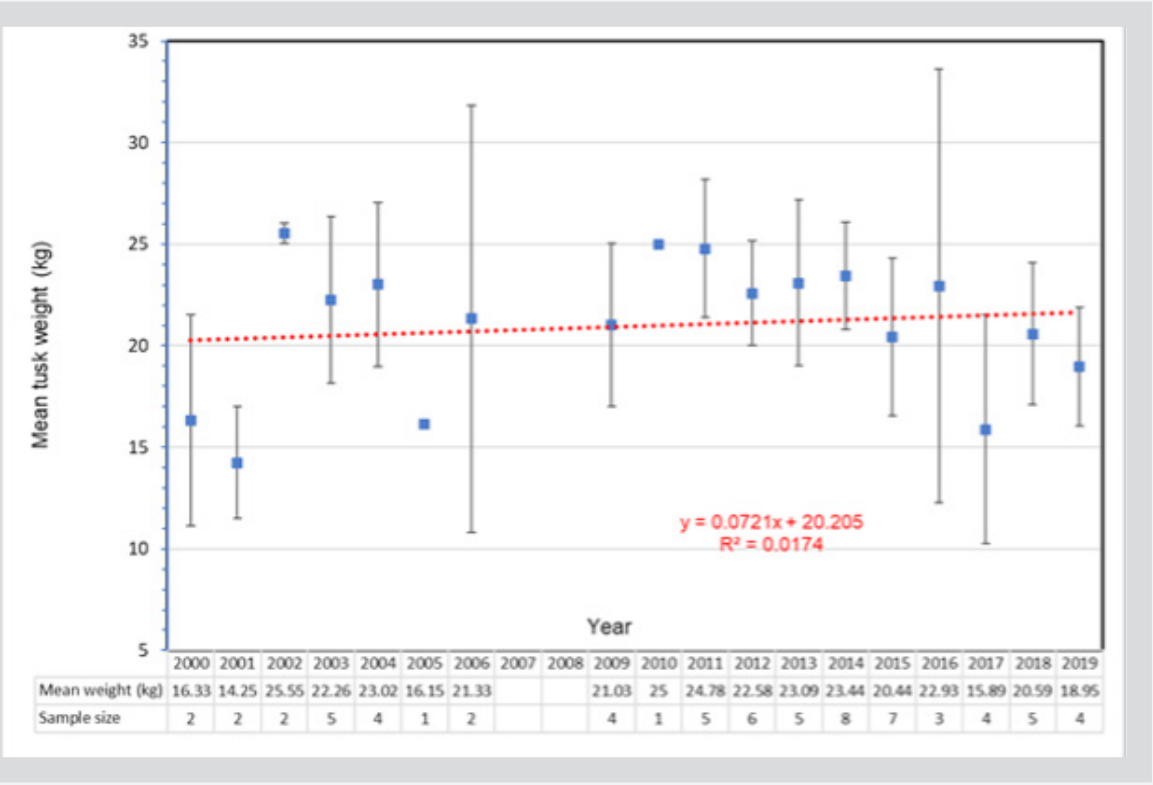
Trophy quality has significantly increased in Bwabwata West ($p<.001^{***}$). Although the trend line for Bwabwata East suggests a marginal increase, this trend is not statistically significant. There is clearly much greater intra-annual and inter-annual variation in mean tusk weights in Bwabwata East than in Bwabwata West.

Bwabwata East is the part of Bwabwata NP that has experienced the most illegal killing. Table 16 and Table 17 in Chapter 6 indicate that illegal killing in north-eastern Namibia and including Bwabwata NP picked up from around 2010 onwards. If the mean tusk weights in Figure 102 from 2010 onwards are regressed separately, as shown in Figure 103, thus covering the period when most illegal killing occurred, there was a significant decline ($p<0.05^{*}$) in trophy quality of more than 20%. Importantly, Figure 103 also points to the lag effect of illegal killing on trophy quality, which can logically be expected if there was intensive selective hunting for large tusks in a slow-growing long-lived species. Illegal killing peaked in 2016 and 2017. Future monitoring of trophy quality will indicate how long it takes after the cessation of illegal killing before trophy quality improves.



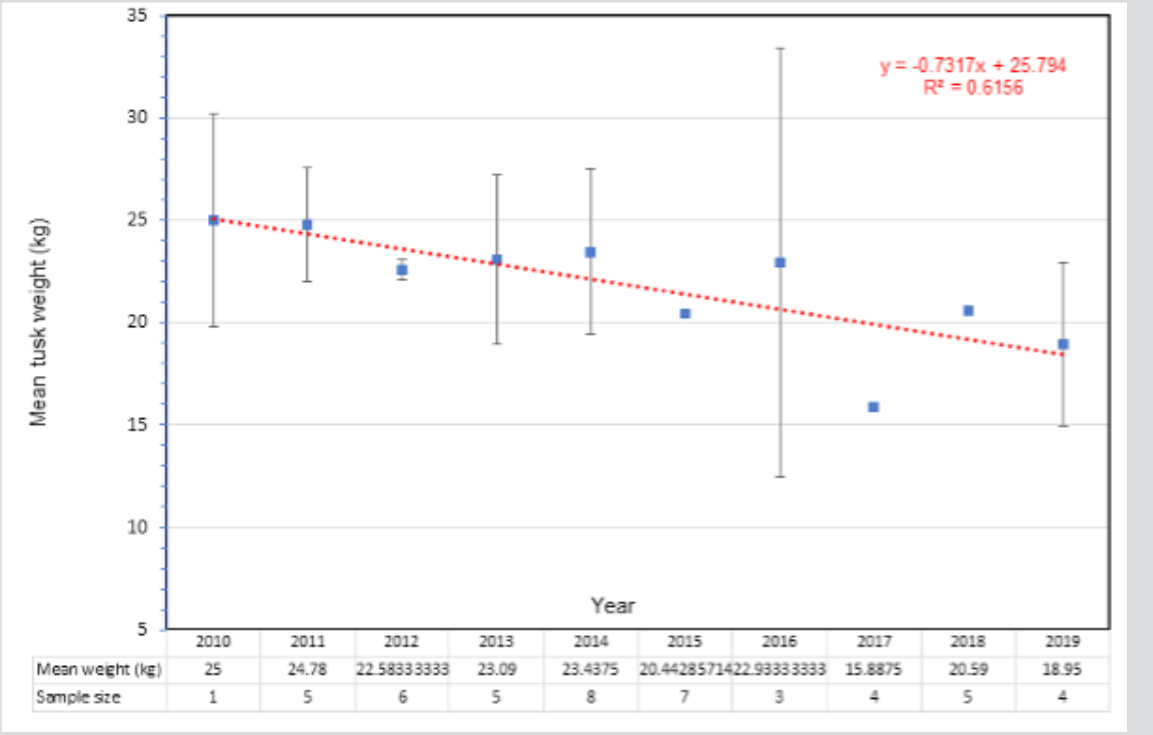

| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean weight (kg) | 17.575 | 20.167 | 19.194 | 18.425 | 20.089 | 17.05 | 19.94 | 20.979 | | 23.063 | 24.275 | 23.192 | 22.495 | 24.375 | 26.533 | 23.414 | 24.9 | 23.791 | 23.75 | 26.19 |
| Sample size | 4 | 3 | 8 | 17 | 30 | 1 | 10 | 7 | | 4 | 4 | 6 | 10 | 8 | 11 | 11 | 8 | 11 | 6 | 5 |

**Figure 101** Trophy quality in Bwabwata West for the period 2000 to 2018




| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean weight (kg) | 16.33 | 14.25 | 25.55 | 22.26 | 23.02 | 16.15 | 21.33 | | | 21.03 | 25 | 24.78 | 22.58 | 23.09 | 23.44 | 20.44 | 22.93 | 15.89 | 20.59 | 18.95 |
| Sample size | 2 | 2 | 2 | 5 | 4 | 1 | 2 | | | 4 | 1 | 5 | 6 | 5 | 8 | 7 | 3 | 4 | 5 | 4 |

**Figure 102** Trophy quality in Bwabwata East for the period 2000 to 2018




| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|---|---|
| Mean weight (kg) | 25 | 24.78 | 22.58333333 | 23.09 | 23.4375 | 20.44285714 | 22.93333333 | 15.8875 | 20.59 | 18.95 |
| Sample size | 1 | 5 | 6 | 5 | 8 | 7 | 3 | 4 | 5 | 4 |

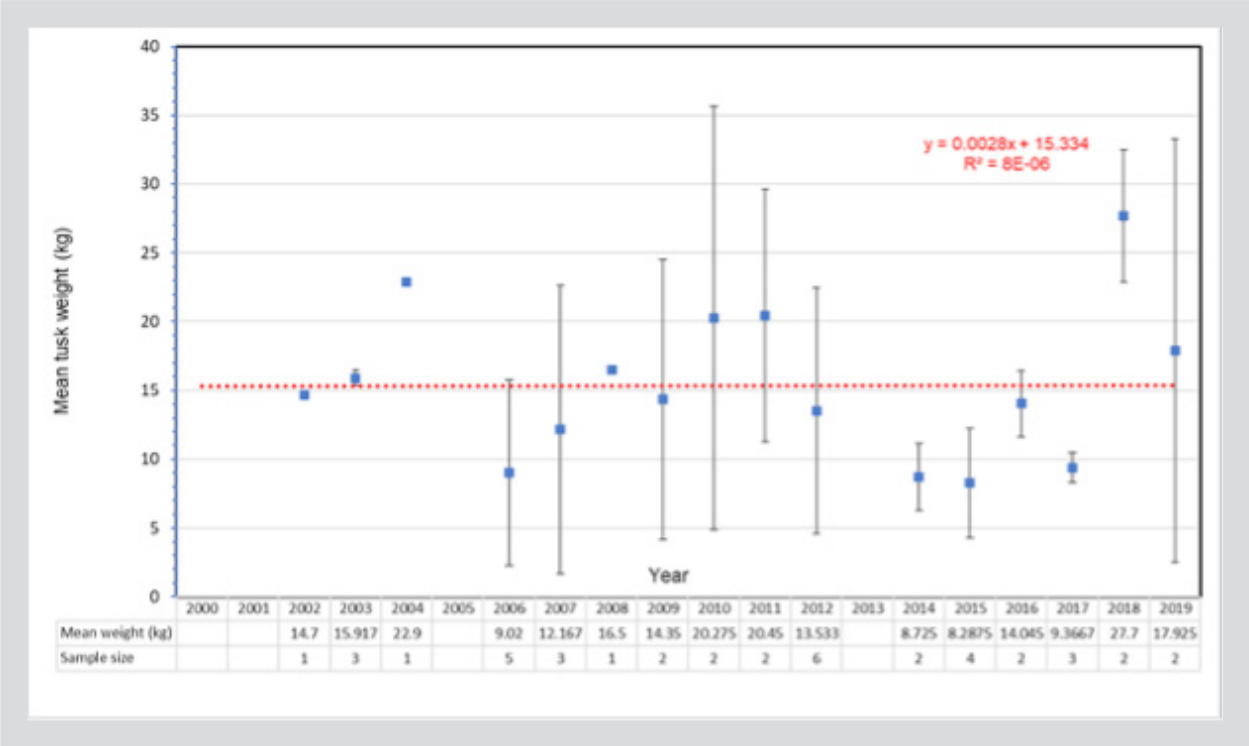
**Figure 103** Trophy quality in Bwabwata East for the period 2010 to 2019

Seen together with Figure 97 B, offtake levels in Bwabwata East and the Zambezi Region are clearly not sustainable and have resulted in similar declines in trophy quality, thus requiring a management response (see section 7.10).

Further analysis at conservancy level is possible but is not presented here because of the need to deal with hunting on a larger scale than conservancy level in line with the elephant management unit concept.

Importantly, data on the incidences of the various types of offtakes and the biological characteristics of the elephants removed from the population are not currently well-integrated (and have not been completely updated); this is an issue that MEFT needs to address by ensuring that all data are entered into a comprehensive database and assigning one unit to be responsible for that, and adopting the requirement that no new quotas can be established before an analysis of all illegal killing, management mortalities and hunting mortalities has been done.

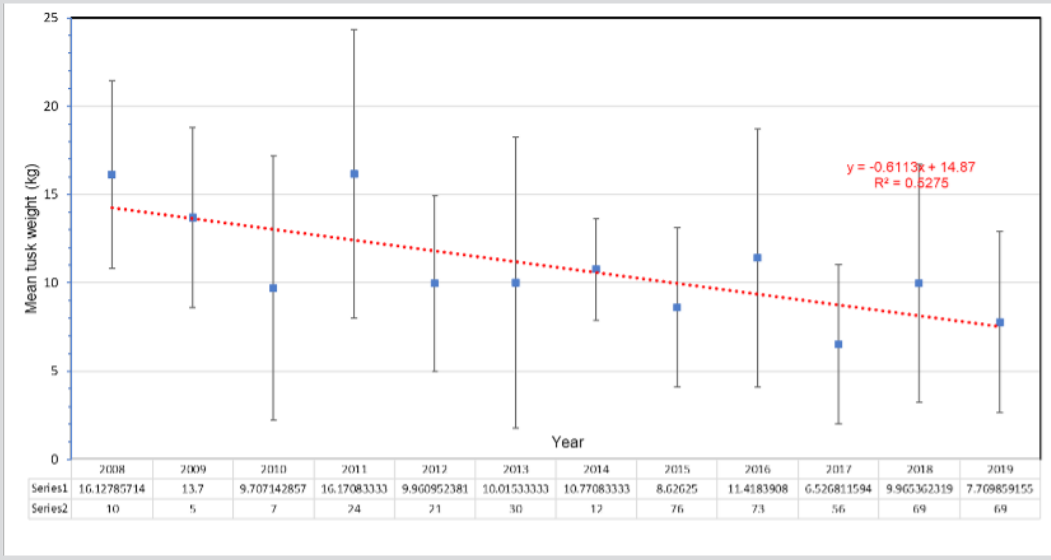
Figure 104 shows the trend in trophy quality for problem animal control overall at national level. Mean tusk weights are lower than for any group of elephants hunted for trophies, but there is large intra-annual variation. There is no significant trend in the data.




| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean weight (kg) | | | 14.7 | 15.917 | 22.9 | | 9.02 | 12.167 | 16.5 | 14.35 | 20.275 | 20.45 | 13.533 | | 8.725 | 8.2875 | 14.045 | 9.3667 | 27.7 | 17.925 |
| Sample size | | | 1 | 3 | 1 | | 5 | 3 | 1 | 2 | 2 | 2 | 6 | | 2 | 4 | 2 | 3 | 2 | 2 |

**Figure 104** Mean tusk weight for problem animal control at national level

Figure 105 shows the trend in mean tusk weight for elephants harvested for meat at national level. Mean tusk weights have significantly declined ($p<.01^{**}$) which could indicate that progress is made in the selection of elephants with small tusks for meat harvesting. It can also be argued that since meat harvesting is limited to the Zambezi Region only, that mean tusk weights while consistently lower than mean tusk weights from conservation hunting, have mirrored the decline in mean tusk weights from conservation hunting (Figure 97 B). As concluded for Bwabwata East and the Zambezi Region together, the combined offtake from conservation hunting and meat harvesting in the Zambezi Region has clearly not been sustainable and requires a management response (see section 7.10).




| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Series1 | 16.12785714 | 13.7 | 9.707142857 | 16.17083333 | 9.960952381 | 10.01533333 | 10.77083333 | 8.62625 | 11.4183908 | 6.526811594 | 9.965362319 | 7.709859155 |
| Series2 | 10 | 5 | 7 | 24 | 21 | 30 | 12 | 76 | 73 | 56 | 69 | 69 |

**Figure 105** Mean tusk weight for meat harvesting at national level

Monitoring trophy quality, although very important, is only part of the adaptive management process that is needed. Table 19 presents an assessment of the data needs for an adaptive management system for hunting quotas, indicating that considerably more information must be recorded from all elephant mortalities than has been the case in recent years. The elephant mortality form presented in Chapter 3 of the National elephant conservation and management plan makes provision for this. It is important to monitor the population and apply management at the same scales, thus, to simplify references to different geographical areas (e.g. survey strata, conservancies, hunting concessions, quota areas) of importance in the administration of hunting and elephant management, the concept of an Elephant Management Unit is used, i.e. the area in which a total offtake quota is given and covered by a long-term monitoring system.

**Table 19** Data requirements for quota setting and the application of an adaptive management approach towards the hunting of elephants

| Data needed per elephant management unit | Sources for such data |
|---|---|
| **Population size, trend and structure** | |
| Total population size (± Confidence limits) | – Latest aerial survey estimates for the elephant management unit<br>– Survey strata and elephant management units should be aligned with each other to ensure that there are survey data on the scale at which management and offtakes occur |
| Total no. of males (± Confidence limits) as a % of the total population | – Latest aerial survey estimates of males (i.e. bull groups which may include some young adults or even sub-adults) in the elephant management unit<br>– Note that if there is no other estimate of the total number of males for areas in which hunting quotas are given, it may be possible to derive estimates from ground-based surveys in future. Waterhole counts cannot be used, however, as they tend to overestimate the number of elephants because elephants and bulls in particular may drink multiple times over a 24h period, unless the elephants are photographed over the counting period or individually identifiable which may not be possible in large populations |
| Trend in trophy quality for the hunting concession | – Trend in tusk weight over the past 10 years at least, preferably longer, for the elephant management unit<br>– This means that trophy quality trends may need to be recalculated once each elephant management unit is defined |

| Data needed per elephant management unit | Sources for such data |
|---|---|
| Carcass ratios from all previous aerial surveys | – Calculated from the number of carcasses recorded as a percentage of the live elephant population estimate<br>– All carcasses seen must be categorized in the four time categories used in aerial surveys (see Craig & Gibson 2019a)<br>– This ratio is an indicator of overall mortality levels in an elephant population |
| **All records of male mortalities in the previous quota cycle** | |
| Hunting quota for the previous quota setting cycle | – Total and annualized conservation hunting quota allocated by MEFT for the previous quota cycle |
| Actual hunting quota offtake and age of the elephants hunted | – Actual offtakes are likely to be lower than the quotas established<br>– This is determined from the report-back by the hunting operator for each permit issued, which must include standard weight and measurements for both tusks of every elephant hunted i.e. tusk weight, tusk circumference at the lip line, tusk length along the outside curve from the base of the tusk to the center of the lip mark and from the base to the tip, an estimate of the degree of filling of the alveolar cavity (and a photo record), mandible (and photos of the tooth row on each side of the mandible) for an estimate of age (see Section 12.2) |
| Number and age of males illegally killed | – All records of illegal killing<br>– This means that all elephant mortalities from illegal killing must be recorded and that an age estimate must be obtained for every mortality. Because elephants found dead are treated as suspected cases of illegal killing, a wide range of forensic information is recorded but biological information such as sex and age seems not to have been recorded. Lower jaws must be collected (after forensic investigation has been completed in the field) of all elephants illegally killed and photographs of the molar teeth in each half of the lower jaw must be taken and filed. Lower jaws must be securely marked with case number, date, sex and locality. Records must include GPS coordinates.<br>– All carcasses seen must be categorized in the four time categories used in aerial surveys (see Craig & Gibson 2019a, also shown in the elephant mortality form in Section 12. 2) to ensure that the mortality is assigned to the correct calendar year<br>– If only the tusks are available for whatever reason (e.g. from a seizure), the standard weights and measurements are needed as well as a photo of the open side (pulp cavity). The best measure of the relative degree of filling up of the pulp cavity is to insert a thin but fairly rigid rod (e.g. a radio antenna), wire or straight twig into the open end as far as it can go and then record the depth against a tape measure<br>– 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 (see Section 12.2.2 for a more detailed discussion). |
| Number and age of male elephants killed due to management hunting (for own use and traditional authorities) | – The mortality form must be completed. Lower jaws must be collected of all elephants killed for any other management purpose and photographs of the molar teeth in each half of the lower jaw must be taken and filed. Lower jaws must be securely marked with the date, locality and sex |

| Data needed per elephant management unit | Sources for such data |
|---|---|
| Number and age of male elephants killed through problem animal control | – The mortality form must be completed. Lower jaws must be collected of all elephants killed for any other management purpose and photographs of the molar teeth in each half of the lower jaw must be taken and filed. Lower jaws must be securely marked with the date, locality and sex |
| Number and age of elephants that died from natural causes | – The mortality form must be completed. Lower jaws must be collected of all elephants killed for any other management purpose and photographs of the molar teeth in each half of the lower jaw must be taken and filed. Lower jaws must be securely marked with the date, locality and sex<br>– This means that all elephant mortalities must be recorded and that an age estimate must be obtained for every mortality<br>– 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 (see the NECMP for a more detailed discussion).<br>– All carcasses seen must be categorized in the four time categories used in aerial surveys (see Craig & Gibson 2019a, also shown in the elephant mortality form in Chapter 3 of the NECMP), to ensure that the mortality is assigned to the correct calendar year |

Ideally, all the information in Table 19 should be collected and will in the long run provide a valuable indication of overall trends in abundance and age structure of a specific elephant population for the purposes of setting hunting quotas. Trophy quality can nevertheless be used to manage hunting offtakes in an adaptive manner in the absence of other data.

Monitoring trophy quality may furthermore not be effective in small populations that are prone to stochastic variation in age structure and other parameters and where there are insufficient samples harvested each year to give a reliable measure of trophy size and trend. A different and more precautionary approach is required if smaller elephant populations are to be regularly hunted. This would require regular field estimates of the male component i.e. the actual number of adult males and their age distribution rather than using a percentage quota. If the male age structure of a small population is known, it may be possible to select individual elephants to be hunted. Considerable effort needs to be invested to individually identify all the males in small populations and to derive the best possible putative age estimate for each using external appearance (requiring training, practise and experience).

## 7.4 Quota utilization

Figure 106 shows the actual number of elephants hunted for trophies in the 2009-2019 period as well as the number of problem elephants removed through hunting. The latter component refers to the situation where MEFT decided to let a problem elephant be removed by a hunting operator and client rather than destroying the elephant by MEFT itself.

Table 20 shows the degree of utilization of hunting quotas for conservancies over the past three years and that there is considerable underutilization of quotas. The reasons for the substantial underutilization are complex and may include the availability of clients (noting that the marketing of elephant hunting in some source countries may have been affected by uncertainties about whether elephant hunting trophies will be allowed to be transported on certain airlines or imported into certain countries), incorrect pricing or the lack of available huntable males. The Namibian Association of Professional Hunters (NAPHA)

(pers. comm. to M. Lindeque) is of the opinion that the latter cause is the most important, and that their members with hunting concessions in especially the North East and particularly in the Zambezi Region excluding Bwabwata NP have consistently struggled to find enough males with sizeable trophies.

There are a number of potential explanations for this:

- the Zambezi Region has for decades not been known as an area that produces large trophies
- elephant males in the North East and particular the Zambezi Region and Bwabwata NP seem to be unusually less mobile than elsewhere (see Figure 107), meaning that there is maybe a smaller pool of adult males that is more susceptible to local impacts, also through hunting, than was previously understood
- the Zambezi Region has seen the highest incidence of illegal killing which can be assumed to primarily target large males
- the hunting zones are too small, calling for a rethink of the allocation of quotas per conservancy instead of a cluster of conservancies
- other quotas for traditional authority or traditional festivals – which have a higher utilization rate – may be impacting on conservation hunting quotas.

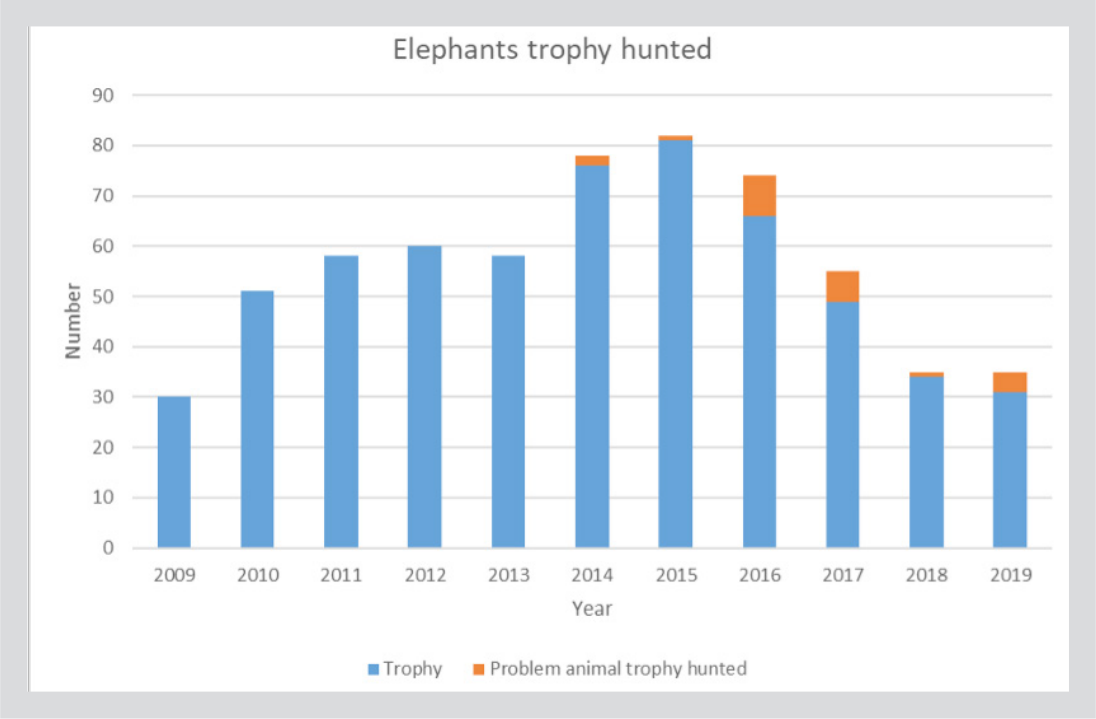



**Figure 106** Actual number of elephants hunted for trophies in the 2009-2019 period as well as the number of problem elephants removed through hunting

**Table 20** Quotas issued vs utilisation of elephants in conservancies for 2017-2019

| | 2017 | 2018 | 2019 |
|---|---|---|---|
| | | | |
| Conservation hunting quota | 62 | 61 | 61 |
| Conservation hunting quota utilized | 26 | 30 | 27 |
| % Utilization | 42% | 49% | 44% |
| | | | |
| Own use quota | 69 | 69 | 69 |
| Own use utilized | 49 | 45 | 54 |
| % Utilization | 71% | 65% | 78% |

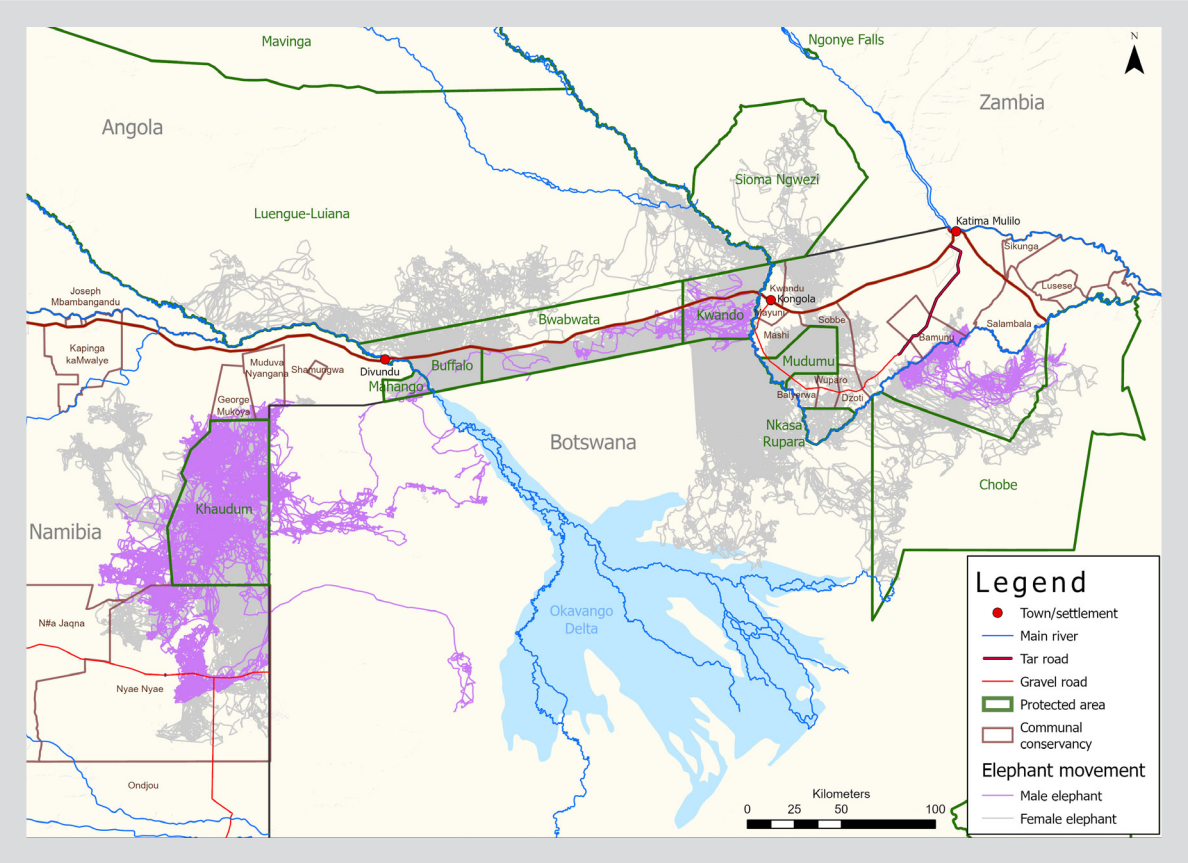



**Figure 107** Movements of elephants collared in North East Namibia, males and females separately. Note that male elephants collared in Bwabwata NP and Zambezi Region moved less than females and appear to have more localized home ranges. Additional collaring of males is needed in the region to confirm this conclusion

## 7.5 Quota setting

MEFT currently allocates quotas on a three-year cycle. Table 21 shows conservation hunting quotas, own use quotas and quotas for traditional authorities (TA) and traditional festivals (F) allocated over two three-year cycles in the four main survey and management regions. MEFT has thus far allocated hunting, own use and traditional authority/traditional festival quotas per conservancy and not always per year but over a three year period but Table 21 presents the composite and annualized quotas for the four main survey and management regions. In four instances, three in the North West and one at national level, has the combined quota allocated exceeded 0.5% of the population.

**Table 21** Composite elephant conservation hunting quotas, own use quotas and quotas for Traditional Authorities (TA) and traditional festivals (F) allocated over two three-year cycles in the four main survey and management regions

| | | North West | North Central (Etosha NP) | North east (Khaudum NP and parts of neighbouring conservancies) | North east (Zambezi Region and Bwabwata NP) | Total |
|---|---|---|---|---|---|---|
| 2017-2019 | Population estimate | 1,173 | 2,911 | 6,413 | 13,136 | 23,633 |
| | Annualized conservation hunting quota allocated and as a | 2.65 | 2.66 | 17.00 | 68.00 | 90.31 |
| | % of population | 0.23% | 0.09% | 0.27% | 0.52% | 0.38% |
| | Annualized management quota (own use + TA/F) and as a | - | - | 8.00 | 53.00 | 61.00 |
| | % of population | 0.00% | 0.00% | 0.12% | 0.40% | 0.26% |
| | Annualized combined quota and as a | 2.65 | 2.66 | 25.00 | 121.00 | 151.31 |
| | % of population | 0.23% | 0.09% | 0.39% | 0.92% | 0.64% |

| | | North West | North Central (Etosha NP) | North east (Khaudum NP and parts of neighbouring conservancies) | North east (Zambezi Region and Bwabwata NP) | Total |
|---|---|---|---|---|---|---|
| 2020-2022 | Population estimate | 1.173 | 2,355 | 7,999 | 12 008 | 23,535 |
| | Annualized conservation hunting quota allocated and as a | - | 2.30 | 11.80 | 45.00 | 59.10 |
| | % of population | 0.00% | 0.10% | 0.15% | 0.37% | 0.25% |
| | Annualized management quota (own use + TA/F) and as a | - | - | 7.00 | 36.00 | 43.00 |
| | % of population | 0.00% | 0.00% | 0.09% | 0.30% | 0.18% |
| | Annualized combined quota and as a | 0 | 2.3 | 18.8 | 81 | 102.1 |
| | % of population | 0.00% | 0.10% | 0.24% | 0.67% | 0.43% |

Quotas were in excess of 0.5% in four instances as indicated in Table 21, but low quota utilization means that the actual utilization was below the 0.5% guideline.

Table 22 shows the same information but with the addition of problem animal control cases and the incidence of illegal killing (all for this purpose assumed to be males).

**Table 22** Composite elephant conservation hunting quotas, own use quotas and quotas for Traditional Authorities (TA) and traditional festivals (F) allocated for the 2017-2019 period in the four main survey and management regions, as well as incidents of problem animal control (PAC) and illegal killing

| | | North West | North Central (Etosha NP) | North east (Khaudum NP and parts of neighbouring conservancies) | North east (Zambezi Region and Bwabwata NP) | Total |
|---|---|---|---|---|---|---|
| 2017-2019 | Population estimate | 1,173 | 2,911 | 6,413 | 13,136 | 23,633 |
| | Annualized conservation hunting quota allocated and as a | 2.65 | 2.66 | 17.00 | 68.00 | 90.31 |
| | % of population | 0.23% | 0.09% | 0.27% | 0.52% | 0.38% |
| | Annualized management quota (own use + TA/F) and as a | - | - | 8.00 | 53.00 | 61.00 |
| | % of population | 0.00% | 0.00% | 0.12% | 0.40% | 0.26% |
| | Average number of PAC and as a | 3.50 | 1.00 | 2.00 | 4.00 | 10.50 |
| | % of population | 0.30% | 0.03% | 0.03% | 0.03% | 0.04% |
| | Average number of illegal killing cases and as a | 3.00 | 0.67 | 0.33 | 26.00 | 30.00 |
| | % of population | 0.26% | 0.02% | 0.01% | 0.20% | 0.13% |
| | Annualized composite quotas and other offtakes as a | 9.15 | 4.33 | 27.33 | 151.00 | 191.81 |
| | % of population | 0.78% | 0.15% | 0.43% | 1.15% | 0.81% |

Table 22 (note that the 2020-2022 period cannot be shown in this table as the number of cases of problem animal control and illegal killing will only become known in future) shows four instances where the overall offtake exceeded 0,5% of the population. In the North West with its small elephant population, problem animal control and illegal killing (i.e. retaliatory killing) exceeded the hunting offtake, in equal measure, and when combined, amounted to an offtake of 0.56% of the population. This high level of additive mortalities is the most likely explanation for the decline in trophy quality in this region shown in Figure 99. All offtakes combined results in a removal of 0.78% of the population which is clearly not sustainable.

In the North East, there is clearly a higher level of overall mortality than the male component of the population can sustain. Own use and traditional use quotas together with illegal killing far exceeded the conservation hunting quota which itself exceeded the 0.5% guideline. That an even greater decline in trophy quality in this region as shown in Figure 97 has not occurred is probably due to the open nature of this population as part of a much larger population in western KAZA TFCA and the low quota utilization rate.

## 7.6 Contractual arrangements

Undue pressure on hunting operators results from the current system of requiring a guaranteed up-front payment for all or some elephants on quota (based on inputs received during the public consultation process). This may result in the hunting of younger elephants which in the long run will negatively affect the age structure of the elephant population and the hunting industry itself. Guaranteed up-front payment requirements should thus be discontinued in conservancy-operator contracts. A new safeguard could be included to terminate the contract or increase the concession fees if the hunting operator fails to obtain hunters to use the quota in the first year.

It is likely that the term of quota setting cycles may have aggravated these problems. A three-year quota leads to a three year hunting concession contract, and thus brings in a short-term approach towards hunting that may reduce selectivity in hunting. A hunting operator would not have any incentive to selectively hunt only older males and not males in their prime because of the term of contract. Other countries (e.g. Tanzania with 10-year concessions) use longer quota cycles which may enable operators to be more selective. This is an issue that MEFT needs to consider, especially for the North West and Zambezi Region in particular. This also means that competition for hunting concessions will intensify which may increase prices offered.

## 7.7 Minimum standard for export of elephant trophies

There is currently no minimum standard for the export of elephant trophies. There may have been a proposal to establish such a minimum standard, but it does not seem to have been formalized. The risk is that without a minimum standard and collated export data that include elephants hunted on quota and elephants hunted on a management quota or as problem animals, there could be wide variation in trophy size masking any real trend in the trophy size of elephants hunted as part of a conservation hunting quota. MEFT therefore had intended to introduce 17kg as the minimum trophy weight that can be exported. It is further very important that in whatever reporting is done to internal or external stakeholders that trophy sizes from different types of quotas are not lumped together.

A minimum export size will be difficult to apply. Only the largest tusk in a pair is used for the monitoring of trophy quality (and thus shown in Figure 96). It will have to be considered if the export restriction will apply to all tusks below 17kg or only to pairs of tusks where both tusks are below 17kg. It is further not

advisable to set a threshold as an objective. Figure 96 shows that a large number of trophies[71] are smaller than 17kg, yet that the overall management target of maintaining mean tusk weight above 20 kg has been achieved over the past 20 years. It is thus not essential for the management of conservation hunting to have a minimum size for export, it is more appropriate to set a target size (or age) understanding that the result will be a spread of values. The target should be adjusted adaptively to minimise the number of trophies that fall below the desired lower limit. In practice MEFT will adjust the percentage of total population offtake guideline when it shows through monitoring that trophy quality is declining (or increasing).

The hunting organization consulted for this plan has proposed an alternative minimum standard for the export of trophies from conservation hunting quotas that is not based on trophy size but the age of the elephant, specifically that only tusks from elephants where the remaining fraction of Molar 5 (M5) should not make up more than 25% of the molar toothrow consisting of Molar 6 (M6) and the remaining fraction of the M5 (if any). This would mean that only bulls of approximately 40 years or older may be hunted. If only the M6 is left the measuring is not necessary. This refers to age class XXII of Laws 1966, which translates into an approximate age of 39 ± 2 years (Laws 1966) or 39 ± 3 years (Laws 1967) which for practical purposes can be referred to as age 40.

This proposed criterion can only be assessed after the elephant has been hunted. This means that the hunting operator will have to be well-skilled in using the external appearance of the elephant such as a very big body size towering over the largest females by 90cm or more at the shoulder, thick neck, heavy set body, the tusk circumference at the lip is strikingly greater than in younger males, and longer hindfoot lengths (see Figure 94).

This is an aspirational proposal by the Namibian hunting industry which should be supported but would nevertheless be difficult to implement. How effective such assessment will be, should be shown by the application of the age-based minimum standard (together with the 17kg weight limit) for the next three years. Thus, a three-year grace period is proposed for the phasing in of the age-based minimum standard. Thereafter MEFT should review the situation and possibly make adjustments. The hunting sector will need to be alerted well in advance of the proposed change, and meticulous data will need to be collected of each elephant hunted, including photographs, to build up the guideline for aging elephants from external appearance.

## 7.8 Management quotas

It is proposed here to in future use the term 'management quotas' for the current own use and traditional authority quotas. As shown in Section 7.5, management quotas or offtakes for the purpose of meat harvesting may, if not done correctly, erode the trophy quality of the male cohort. In the North East in particular, where there are concerns that trophy quality has declined due to significant levels of illegal killing, management quotas have clearly aggravated the situation.

Ideally, the best elephant to target for meat production is an old adult male with both tusks severely broken off, thus an elephant with minimal trophy potential. However, if the minimum standard is changed to an age-based standard, then these animals will have higher trophy potential (noting that there may not be a market for elephants with virtually no tusks remaining).

The current practice is to require that the hunting operator should harvest all the elephants on the own use and traditional authority quotas (i.e. the management quota) with the use of a hunter, to optimize the revenue earned by conservancies. If either of the proposed minimum standards are not met, hunting

71 Figure 97 only shows the largest tusk in each pair' i.e. the smallest tusk in a pair is not used in the monitoring of trophy quality. If a minimum export size is established, it should also not apply to the smallest tusk r nimimu,

an elephant with tusks below the minimum size allowed for export as part of the hunting quota will be penalized, namely that such tusks may not be exported, but there is no penalty for hunting an elephant with large trophies for meat harvesting.

The hunting organization consulted for this plan has made extensive proposals regarding the issue of harvesting elephants for meat (see Section 2.4), centering around the restriction of meat harvesting to specific parts of the elephant range, size limits for tusks carried by elephants hunted, and penalties for non-compliance and thus greater supervision by MEFT. This proposal is broadly in line with current thinking in MEFT to change quota allocations from individual conservancies to clusters of conservancies to enhance sustainability and improve efficiency of hunting.

There is an alternative approach to meat harvesting which would altogether exclude the adult male cohort, see Section 8.1, but requiring a much greater level of MEFT involvement and organizational arrangements than the current system (see Section 8.1). This alternative, i.e. small scale culling of family groups, in the North East should be implemented for the duration of this management plan to reduce the male mortality level in this population, and allow recovery of the male age structure that is likely to have been caused by illegal killing in combination with harvest quotas. The alternative approach will require greater pressure on MEFT resources and may potentially also be met with opposition from beneficiary communities, not to mention international pressure. MEFT nevertheless has a responsibility to manage its parts of the KAZA TFCA population responsibly and sustainably.

## 7.9 Problem animal control through hunting

The current arrangement is generally that problem elephants are offered to hunting operators to hunt with clients to optimize the revenue earned from problem elephants. In conservancies, this means that the hunting operator in that conservancy can do this additional hunting of any problem elephants. Problem animals outside conservancies with an existing outfitter hunting contract are advertised by MEFT to qualified professional hunters at standard rates.

The revenues generated in such instances is shared between the MEFT (the MEFT portion through the Game Products Trust Fund is currently N$20,000) and the community which had been affected by that specific problem elephant. There are no, nor can there be, any specific quota for problem elephants (although e.g. Zimbabwe has set such quotas in the past).

In practice, some challenges have occurred, and there is a perception that hunting operators will select an elephant with large tusks instead of a particularly identified problem elephant (see Section 2.1). Further, hunting operators may not always have clients available to deal with a problem elephant.

MEFT has also (e.g. in the case of Kamanjab and Grootfontein commercial farming areas) allocated hunting quotas to specific communities in lieu of removing specific problem elephants. This is a sound approach where all the elephants in a specific area contribute or potentially contribute to conflicts by allocating a hunting quota for the purpose of generating revenue to mitigate elephant impacts.

## 7.10 Recommendations

Setting hunting quotas has thus proven to be a complex issue, and while the overall hunting quota allocations by MEFT are below the 0.5% guideline, a number of improvements can be considered:

### Conservation hunting quotas and requirements for quota-setting

1. The guideline of 0.5% of the total population should continue to be used as an overall guideline for the national population. This level of quota can be expected to yield mean tusk weights of around 20kg and Figure 96 shows that the mean tusk weight in Namibia has been just under 21kg, thus approximating the predicted mean tusk weight.

2. In future, quotas should be allocated per Elephant Management Unit instead of individual conservancies. This will address a number of problems and increase the viability of hunting overall. This requires that a benefit sharing system be established to ensure equitable sharing of hunting revenues and elephant meat.

3. Because of the probable impact of illegal killing of adult males and management quotas in the Zambezi Region and Bwabwata NP, 0.3% of the total population should be used as the basis for setting offtake quotas for a period of 10 years (along with other measures as discussed in Section 7.8 and indicated below). If there is a significant increase in illegal killing for two years in a row, the situation must be reviewed, and quotas may have to be reduced or withdrawn altogether. The fastest way of accomplishing a recovery in trophy quality in the Zambezi Region would be a moratorium on hunting for a number of years (at least five years). This is not the recommended option because of the impacts this will cause for conservancies but a moratorium needs to be retained as an option if the level of 0.3% offtake from the total population does not achieve an improvement in trophy quality. If trophy quality improves for two years in a row and approximates 20kg, the 0.3% level can be reconsidered for the remainder of the 10 year period, noting however, that there will be a variable lag effect in the recovery of trophy quality following a perturbation and that more information is needed on the male age structure than is available now in order to project the duration of the lag effect.

4. Quotas for the North West should be based on 0.3% of the total population because of the low percentage of males in the population for 10 years ((along with other measures as discussed in Section 7.8 and greatly reducing if not entirely eliminating illegal (retaliatory) killing and problem animal control through enhanced human-elephant conflict mitigation)), or until a detailed assessment has been made of the size and age structure of the adult male component or cohort.

5. No elephant male in the Hoanib-Hoarusib group (thus in the Hoarusib-Hoanib-Ombonde River catchments) should be hunted or destroyed as a problem animal, including in the upper Hoarusib River catchment area, for at least 15 years, because there are so few males in this group or associated with this group. Every male in this group is particularly valuable and other means of conflict mitigation must be used than lethal removal. This could include translocation to the lower Uniab or Kunene Rivers in which instance the elephant should be fitted with a satellite transmitter.

6. Quotas for the North West and in Zambezi Region should be issued on a five-year (extendable to 10 years) cycle and evaluated after five years based on trends in trophy quality. A performance clause should be built into hunting concession contracts for these quotas.

7. Quotas for elephant management units should be aligned with aerial survey strata or the other way around which could be accomplished with relatively minor adjustments to the current aerial

surveys without reducing their comparability with previous surveys, to ensure that monitoring information can be applied to elephant management units. MEFT should e.g. adjust the aerial survey areas to include N≠a Jaqna and Ondjou Conservancies in the current Khaudum NP and Nyae Nyae Conservancy survey. (Note, this does not imply that the lower density areas of N≠a Jaqna and Ondjou Conservancies should be surveyed at the same intensity as the Khaudum NP and Nyae Nyae Conservancy strata).

8. Quotas should not be allocated to conservancies or elephant management units that fall outside any one of the aerial survey monitoring strata or are not subject to a detailed ground assessment of the adult male component.

9. In all instances, the age of elephants hunted must be reliably determined (see Section 3.2 of the management plan on monitoring) to allow MEFT to monitor the average age and spread of ages in the trophy offtake as the basis for applying adaptive management in quota setting.

10. All data on the incidences of the various types of offtakes and the biological characteristics of the elephants removed from the population must be entered into a comprehensive and standardized database that must be the responsibility of one unit at MEFT Headquarters.

11. No new quotas should be established for an elephant management unit a) before an analysis of the trend in trophy quality, all illegal killing, management mortalities, problem elephant control, natural mortality and hunting mortalities has been done and b) for areas that have not been surveyed by air in the last three years or from the ground through individual recognition, age classification of the majority of adult males or waterhole counts in the dry season in the last three years.

12. Guaranteed up-front payment requirements should be discontinued in conservancy-hunting operator contracts. A new safeguard should be included to terminate the contract or double the concession fees if the hunting operator fails to obtain the number of hunters to use the quota for the first two years.

13. MEFT should set its annual export quota notified to CITES at the total annualized quota for that year plus 50%[72] noting that this will be an upper limit that allows for the export of elephants hunted in a previous year where necessary because of the problems and delays in obtaining import permits from some countries.

### Minimum standard for export

14. MEFT should introduce a minimum standard for the export of hunting trophies (tusks) using the age-based minimum standard of 40 years for the next three years (2021-2023). Thus, a three-year grace period should be established for the phasing in of the 40-year age-based minimum standard. Thereafter MEFT should review the situation and possibly make adjustments in consultation with the hunting industry.

15. It is very likely that the aspirational 40-year age-based minimum standard will not be met in all instances, meaning that a degree of approximation or allowance for deviation should be considered. Setting a target that 90% of the elephant hunted should meet the age-based minimum standard of 40 years would allow for such approximation.

72 If Table 23 is used, this means 202; if Table 24 is used, the amount should be 141

## Population assessment and monitoring

16. Aerial survey strata and elephant management units should be aligned with each other to ensure that there are survey data on the scale at which management and offtakes occur.

17. Carcass ratios must be determined for all aerial surveys from the number of carcasses recorded as a percentage of the live elephant plus dead elephant population estimate. All carcasses seen must be categorized in the four time categories used in aerial surveys (see Craig & Gibson 2019a). This ratio is an indicator of overall mortality levels in an elephant population

18. Small elephant populations where hunting quotas are given should be more intensively monitored and quotas should be based on a more detailed knowledge of the size and age structure of the male component in these populations. It may not be efficient to rely on aerial surveys because of the high costs involved in surveying small and sparsely distributed small populations, thus a ground-based survey protocol should be established (see Chapter 12).

19. Total mortality, especially male mortality, should be better monitored and data consolidated to be able to take all mortality factors fully into account when setting quotas. In particular, all mortalities should be aged (see Section 12.2) and hunting permit returns must in all instances include the photos of both sides of the mandible to enable an age estimation to be made, and mandibles should be handed in to the relevant park headquarter station or regional office of MEFT. Additional information may be required to be collected for elephant mortalities, see Chapter 12. An age estimate is needed for all male mortalities.

20. Trophy quality should be monitored as is currently done but improved with the addition of age estimates of each elephant hunted for each type of hunting offtake.

21. 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.

22. Elephant management units should be monitored by aerial survey not less than every three years or quotas should not be issued.

## Hunting of problem animals

23. In areas with relatively few adult males such in the North West, no male elephant should be declared and destroyed as a problem elephant for the next 5 years and other conflict mitigation measures need to be applied.

24. MEFT and affected communities should recognize that male elephants show variable aggression in relation to their changing hormonal status. An elephant in musth (with extensive temporal gland secretion, penis dragging or urine dribbling) should not be considered as a habitually aggressive or problem elephant. People should instead be warned to avoid it.

25. Elephants declared as problem animals to be destroyed should 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.

26. MEFT should review its 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.

### Management hunting (i.e. hunting of elephants for own use, traditional authorities, or cultural festivals)

27. MEFT should phase out management hunting quotas of male elephants altogether in the North East (the only region where this is done) to optimize the resource available for conservation hunting and compensate for ongoing impacts on male age structures and abundance that may have resulted from illegal killing or problem elephant control. The alternative is to conduct small-scale culling of family groups to provide an equivalent or higher amount of meat to beneficiary communities. Culling will result in controversy[73]. If culling is to be considered, the approach followed in Savé Valley Conservancy (Le Bel ***et al***. 2013) should be the reference point.

28. Until phased out, elephants hunted for own use or for traditional authorities of cultural festivals should be offered to hunting operator clients but may not be young elephants, prime males or elephants with large tusks (i.e. old elephants with severely broken off tusks should be selected). The quota for own use or for traditional authorities of cultural festivals should specify that old elephants with both tusks severely broken off should be selected for this purpose.

### General

29. MEFT should maintain the current prohibition on the conservation hunting of female elephants. It is practically not possible to hunt female elephants without creating significant disturbance to the remainder of the family group. No female elephants should be hunted under a conservation hunting or management hunting quota to prevent social and behavioural impacts. Note that the culling of a small herd will involve females but is not considered as hunting and the efficient removal of an entire small herd will result in minimal disturbance.

30. No male elephant should be hunted in a breeding herd, for any purpose.

31. No elephant should be hunted within 1km of a river or other perennial or seasonal water point, 1km from a protected area boundary, 1km from of a public road or 5km from a tourism facility.

32. Examinations of professional hunters should include a stringent component on the age estimation of elephants in the field.

33. MEFT should recover the hide from all elephants hunted except where the hunting client decides to keep the hide. MEFT therefore needs to provide training to field staff on the recovery, preparation and preservation of hide.

**Table 23** summarizes one option how the quotas henceforth should be applied based on the recommendations above, from 2023. New aerial survey estimates obtained before 2023 should be used as the basis for calculations, thus Table 23 would need to be updated accordingly. Note that the regional population estimates used in Table 23 and thus the national total of 24,091 is higher than given in

Table 5 because here the latest (2019) estimates for the two parts of the North East were used as the baseline.

The reduction in quotas resulting from the application of 0.3% as a cropping percentage is, however, not sufficient to bring the combined quota (and not taking into account problem animal control or illegal killing) to the 0.5% level in the North East (Khaudum NP and conservancies) or to the 0.3% level in the North East (Zambezi Region and Bwabwata NP) or to the 0.5% level nationally.

If quota utilization rates remain as low as in Table 20, the offtake will be below the level of 0.5% and thus acceptable, however, this cannot be guaranteed.

73 None of the neighbouring countries has removed the option of culling in their national elephant management planning but g

**Table 23** Revised quotas from 2023 onwards (Option A)

| | North West conservancies | Etosha NP and North Central conservancies[74] | North east (Khaudum NP, and conservancies[75]) | North east (Zambezi Region and Bwabwata NP) | Total (national) |
|---|---|---|---|---|---|
| **Population estimate (2016-2019) as baseline** | 1,173 | 2,911 | 7,999 | 12,008 | 24,091 |
| **% of population guideline** | 0.3 | 0.5 | 0.5 | 0.3 for the next 10 years | 0.5 |
| **Hunting quota (number of elephants annually) A** | 3.5 | 14.6 | 40.0 | 36.0 | 94.1 |
| **Management quota (number of elephants annually) B** | 0 | 0 | 7.0 until replaced by small scale culling of family herds | 36.0 until replaced by small scale culling of family herds | 41.0 |
| **Combined quota A+B** | 3.5 | 14.6 | 47.0 | 72.0 | 135.2 |
| **Combined quota as % of population (2016-2019 baseline** | 0.3 | 0.5 | **0.6** | **6.0** | **0.6** |

Table 24 presents a second option for how the quotas henceforth should be applied based on the recommendations above, applied from 2023, without management quotas. The omission of management quotas in this instance and reduction in conservation hunting quotas resulting from the application of 0.3% as a cropping percentage in two regions brings the combined quota to the 0.5% level nationally. In essence, if a percentage guideline of 0.3% or 0.5% is applied for conservation hunting quotas no additional management quota can be sustained.

Table 23 and Table 24 do not include a quota for the Kamanjab, Omatjete, or Mangetti-Grootfontein areas because these areas are not routinely surveyed and either have non-resident elephants or populations that are too small to sustain a regular quota.

74 Uukwaluudhi, Sheya Shuushona, Uukolonkadhi, Iipumbu ya Tshilongo

75 Muduva Nyangana, George Mukoya, N≠a Jaqna, Nyae Nyae, Ondjou, Eiseb, Otjombinde, Omuramba Ua Mbinda

**Table 24** Revised quotas from 2023 onwards (Option B)

| | North West conservancies | Etosha NP and North Central conservancies[76] | North east (Khaudum NP, and conservancies[77]) | North east (Zambezi Region and Bwabwata NP) | Total (national) |
|---|---|---|---|---|---|
| **Population estimate (2016-2019) as baseline** | 1,173 | 2,911 | 7,999 | 12,008 | 24,091 |
| **% of population guideline** | 0.3 | 0.5 | 0.5 but to be reduced to 0.3 if trophy quality declines in 2021 and 2022 | 0.3 for the next 10 years | 0.5 |
| **Hunting quota** | 3.5 | 14.6 | 40.0 | 36.0 | 94.1 |
| **Management quota** | 0 | 0 | 0 - replaced by small scale culling of family herds | 0 - replaced by small scale culling of family herds | 0 |
| **Hunting quota** | 3.5 | 14.6 | 40.0 | 36.0 | 94.1 |
| **Combined quota as % of population (2016-2019 baseline** | 0.3 | 0.5 | 0.5 | 0.3 | 0.4 |

76 Uukwaluudhi, Sheya Shuushona, Uukolonkadhi, Iipumbu ya Tshilongo

77 Muduva Nyangana, George Mukoya, N≠a Jaqna, Nyae Nyae, Ondjou, Eiseb, Otjombinde, Omuramba Ua Mbinda

# CHAPTER 8: Elephants in private ownership

## 8.1 History of elephants in private ownership

Table 25 provides a chronology of elephants on private land in Namibia, as far as could be reconstructed from MEFT records and interviews. The first elephants that were intentionally placed on private land in Namibia was in 1985, when 42 young elephants were captured in Etosha National Park during the elephant cull. Six of these were taken to Mt Etjo (farm Okonjati) (L. Geldenhuys, pers. comm.). The animals ranged in shoulder height from about 1.8 m, with the tallest (a young male) measuring around 2.45 m. The balance seems to have been bought by two game dealers at the time, and it was not possible to trace where they went subsequently.

In 1990 and 1991, elephant calves originating from the Kruger National Park (from an elephant cull there) were imported into Namibia by a game dealer, the late Mr Delfs, for the purpose of re-export. Although most of the elephants were re-exported over a period of four years, four were sold within Namibia to two farms, Kuzikus and Ongombeanavista. The Kuzikus elephants were subsequently sold to Du Preez Wild (and placed on farm Tweekoppies), and then in 2010 permission was granted by the MEFT to destroy them, as they could not be contained within the farm. One of the elephants on Kuzikus died in 1993, and the other was re-exported to The Elephant Sanctuary in South Africa.

In 1993, 1994 and 1995, MET sold elephants on auction:

- In 1993, two lots (originating from western Etosha NP) were bought by Epako Lodge (1M:4F) and Ongava Lodge (2M:4F). The elephants on Epako Lodge were sold to Erindi in 1993, when they became difficult to contain within the farm. They had one calf. Of the Ongava elephants, two died on the farm in 1996/97, and the other four broke through the Etosha NP fence into the park in December 1999 and did not return.
- In 1994, four lots (originating from Buffalo West) were offered and were bought by Mt Etjo (2M:2F), Okosongoro (3M:2F), RPV Developers – one lot for Omaruru Game Lodge (2M:2F) and one for Okutala Etosha Lodge (3M:1F). Okosongoro subsequently sold all elephants to Erindi because they were negatively impacting the big trees. Omaruru Game Lodge gave two bulls to Erindi, keeping the pregnant cows.
- In 1995, four lots (originating from western Etosha NP) were auctioned and bought by Erindi (4M:8F), Kuzikus (3M:3F), Okambara Elephant Lodge (3M:3F), and Waldeck (3M:3F). Of these, Kuzikus and Waldeck have since got rid of all their elephants, although it has not been possible to determine where all the elephant went to.

In 1996, Eden received nine elephants (4M:5F) originating from Etosha NP, in exchange for 100 eland.

In 2006, Mount Etjo got permission to cull six elephant bulls that had killed several black and white rhinoceros, and in 2010, the five bulls on farm Tweekoppies (Du Preez Wild) were also hunted as they kept breaking out and causing problems.

Apart from the elephants obtained on auction, Erindi absorbed several of the elephants that other owners no longer wanted. In 2013, Erindi also entered into an agreement for the lease of elephants in terms of which it would lease 200 of the "Khaudum elephants" from the MEFT. Under this agreement, 85 elephants from Khaudum NP were subsequently translocated to Erindi.

Since 2013, a few orphan or injured elephant calves have been taken up by Okutala Etosha Lodge, and Naankuse, on farm Frauenstein, has taken two young bulls originating from Eden (part of an ongoing dispute between Eden and MEFT), and in 2020, also received a bull elephant that was translocated by MEFT from the Swakopmund area ("Christmas" elephant referred to in Section 1.3).

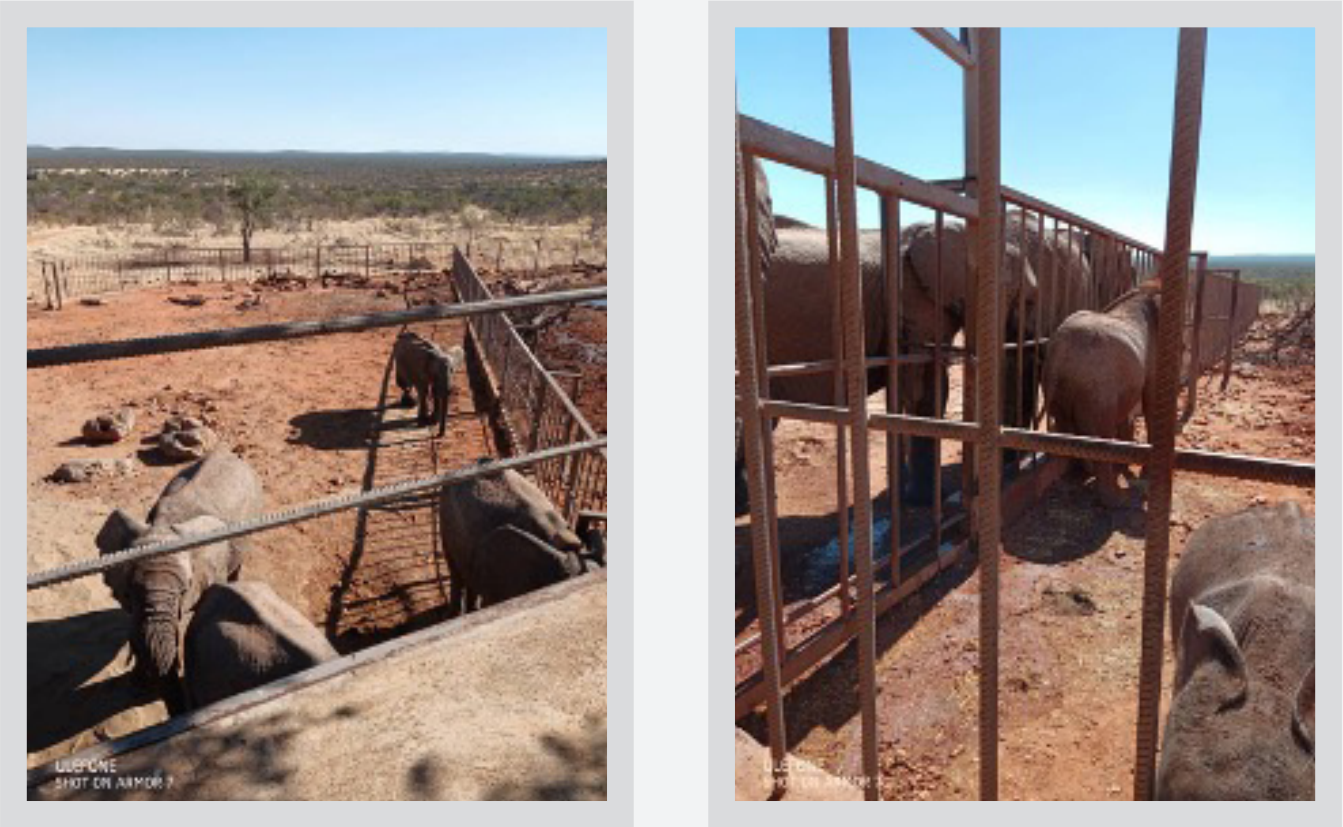


**Figure 108** Elephant calves at Okutala Etosha Lodge (source: Dr Simone Herzog, Okutala Etosha Lodge)

**Table 25** Chronology of elephants on private land in Namibia, as far as could be reconstructed from MEFT records and interviews.

| Year | Action | Who | Origin | Destination | Number (herd structure) | Comment |
|---|---|---|---|---|---|---|
| 1985 | Captured during cull | MEFT | Etosha NP | Mount Etjo (Okonjati), Namibia | 9 (4M:5F) | Young animals caught during the elephant cull in Etosha. Varied in size from around 1.8m – 2.4m shoulder height.[78] |
| 1985 | Captured during cull | MEFT | Etosha NP | Delfs | 15 | No record of where these elephants went |
| 1985 | Captured during cull | MEFT | Etosha NP | Uwe Shultz, Game dealer? | 17 | No record of where these elephants went |
| 1991 | Import | Delfs, Namibia (Game Dealer) | Kruger NP, South Africa | Delfs, Namibia | 23 | Imported on 28th May 1991 |
| 1991 | Re-export | Delfs, Namibia (Game Dealer) | Delfs, Namibia | South Africa | 2 | |
| 1992 | Re-export | Delfs, Namibia (Game Dealer) | Delfs, Namibia | Japan | 6 | |
| 1992 | Died | Delfs, Namibia (Game Dealer) | Delfs, Namibia | | 1 | Died in captivity |
| 1993 | Re-export | Delfs, Namibia (Game Dealer) | Delfs, Namibia | Argentina | 2 | |
| 1993 | Auctioned | MEFT | Otjovasandu, Etosha NP, Namibia | Epako Lodge, Namibia | 5 (1M:4F) | Became difficult to contain, and were sold to Erindi in 2012, with one calf |
| 1993 | Re-export | Delfs, Namibia (Game Dealer) | Delfs, Namibia | Germany | 2 | |
| 1993 | Sold and translocated | Delfs, Namibia (Game Dealer) | Delfs, Namibia | Kuzikus, Namibia | 2 (2M) | Subsequently sold to Du Preez Wild in 2001 |
| 1993 | Auctioned | MEFT | Otjovasandu, Etosha NP, Namibia | Ongava, Namibia | 6 (2M:4F) | Two of these elephants died on Ongava in 1996/97. The remaining four broke through the Etosha fence into Etosha in December 1999 and are no longer distinct from Etosha elephants.<br>Ongava currently has a semi-permanent herd of about 10 bulls from Etosha NP. |

78 Pers. comm. Louis Geldenhuys to P. Lindeque

| Year | Action | Who | Origin | Destination | Number (herd structure) | Comment |
|---|---|---|---|---|---|---|
| 1993 | Sold and translocated | Delfs, Namibia (Game Dealer) | Delfs, Namibia | Ongombeanavista, Nebe, Namibia | 2 | Sold to Nesnidal for elephant back safaris - one died, one re-exported to South Africa in 2004 |
| 1994 | Re-export | Delfs, Namibia (Game Dealer) | Delfs, Namibia | United Kingdom | 4 | |
| 1994 | Auctioned | MEFT | Buffalo West, Namibia | Mount Etjo (Okonjati), Namibia | 4 (2M:2F) | |
| 1994 | Auctioned | MEFT | Buffalo West, Namibia | Okosongoro, Namibia | 5 (3M:2F) | Became a problem on farm, sold to Erindi |
| 1994 | Auctioned | MEFT | Buffalo West, Namibia | Okutala Etosha Lodge, Namibia | 4 (3M:1F) | Then under R.P.V. Developers for Omaruru Game lodge |
| 1994 | Auctioned | MEFT | Buffalo West, Namibia | Omaruru Game Lodge | 4 (2M:2F) | 2 bulls given to Erindi after cows became pregnant - in 2012 |
| 1995 | Auctioned | MEFT | Namutoni, Etosha NP, Namibia | Erindi, Namibia | 12 (4M:8F) | |
| 1995 | Re-export | Delfs, Namibia (Game Dealer) | Delfs, Namibia | Germany | 1 | |
| 1995 | Auctioned | MEFT | Namutoni, Etosha NP, Namibia | Kuzikus, Namibia | 6 (3M:3F) | Subsequently 5 bulls were sold to Du Preez Wild in 2001 |
| 1995 | Auctioned | MEFT | Namutoni, Etosha NP, Namibia | Mount Etjo (Okonjati), Namibia | 1 (1F) | Replacement from 1994 auction |
| 1995 | Auctioned | MEFT | Namutoni, Etosha NP, Namibia | Okambara Elephant Lodge, Namibia | 6 (3M:3F) | |
| 1995 | Auctioned | MEFT | Namutoni, Etosha NP, Namibia | Waldeck, Namibia | 6 (3M:3F) | |
| 1996 | Exchange | MEFT | Namutoni/Otjovasandu, Etosha NP, Namibia | Eden, Namibia | 9 (4M:5F) | Exchanged for 100 Eland |
| 2001 | Sold and translocated | Du Preez Wild (Game Dealer) | Kuzikus, Namibia | Tweekoppies, Namibia | 5 (5M) | Subsequently (2010) approval was granted by MEFT to destroy them all as they kept breaking out. |
| 2003 | Destroyed | Nebe | Ongombeanavista, Nebe, Namibia | | 1 (1M) | Destroyed as problem animal |

| Year | Action | Who | Origin | Destination | Number (herd structure) | Comment |
|---|---|---|---|---|---|---|
| 2004 | Re-export | African Wildlife Services (Game Dealer) | Ongombeanavista, Nebe, Namibia | The Elephant Sanctuary, South Africa | 1 (1M) | Origin Kruger NP, South Africa |
| 2006 | Hunted, non-trophy | Mount Etjo, Namibia | Mount Etjo (Okonjati), Namibia | | 6 (6M) | 6 bulls were culled as they killed a number of black and white rhinoceros |
| 2008 | Export | Eden, Namibia | Eden, Namibia | Not recorded | 6 (6F) | Not recorded |
| 2010 | Hunted, non-trophy | | Tweekoppies, Namibia | | 5 (5M) | Kept breaking out and causing problems so permit issued to hunt all of them |
| 2012 | Sold and translocated | Epako Lodge, Namibia | Epako Lodge, Namibia | Erindi, Namibia | 6 (1M:6F + calf) | Elephants moving in an out causing havoc and damage of fence |
| 2012 | Translocated | Omaruru Game Lodge, Namibia | Omaruru Game Lodge, Namibia | Erindi, Namibia | 1 (1M) | Became a danger to staff and visitors |
| | Sold and translocated | | Okosongoro, Namibia | Erindi, Namibia | 2 (2M) | Too selective and destructive on the big old trees, e.g. *Boscia albitrunca*, *Acacia erioloba* and *A. karroo* |
| | Sold and translocated | | Okosongoro, Namibia | Erindi, Namibia | 3 (1M:2F) | |
| 2013 | Injured | MEFT | Khaudum NP, Namibia | Okutala Etosha Lodge, Namibia | 1 (1F – 1.5 yrs) | Injured during capture for Erindi |
| 2013 | Lease | MEFT | Khaudum, Namibia | Erindi, Namibia | 85 | |
| 2015 | Orphan | MEFT | Huab | Okutala Etosha Lodge, Namibia | 1 (1M – 5 months) | Via EHRA |
| 2016 | Orphan | MEFT | Aba Huab | Okutala Etosha Lodge, Namibia | 1 (1M – 5 days old) | Via EHRA |
| 2016 | Orphan | MEFT | #Khoadi /Hoas | Okutala Etosha Lodge, Namibia | 1 (1M – 8 months) | Via EHRA |
| 2016 | Export | Eden, Namibia | Eden, Namibia | China | 6 | |
| 2019 | Exported | Mount Etjo, Namibia | Mount Etjo (Okonjati), Namibia | Democratic Republic of Congo | 5 (1M (4 yr): 4F (15, 5, 4, 3 yrs) | |
| 2019 | Sold and translocated | Erindi | Erindi, Namibia | Marula Game Ranch | | Not yet received from Erindi, but permit was approved for 15 elephants |
| 2019 | Orphaned | MEFT | Puros | Okutala Etosha Lodge, Namibia | 1 (1F – 2.5 yrs) | |
| 2019 | Orphaned, translocated | MEFT | Hoanib River | Okutala Etosha Lodge, Namibia | 1 (8 month old male calf) | |
| 2020 | Translocated | MEFT | Golden Game, Geluksburg | Naankuse, Frauenstein | 2 (2M 12 & 15 yrs) | |
| 2020 | Translocated | MEFT | Swakopmund | Naankuse, Frauenstein | 1 (1M) | The 'Christmas elephant' |

## 8.2 Status of elephant in private ownership

There are currently approximately 160 elephants in private ownership, as well as the 85 elephants on lease, on private land, bringing the total to 245. Table 26 provides the details.

Table 26 Current status of elephants in private ownership (May/June 2020)

| Property | Size (ha) | Origin | Number | $Km^2$ per elephant | Herd composition |
|---|---|---|---|---|---|
| Eden | 27,800 | MEFT – exchanged for eland | 32 | 8.7 | Not available |
| Erindi | 65,000 | MEFT auction<br>Purchased from other owners<br>Lease | ±150 (of which 85 are on lease) | 4.3 | |
| Frauenstein (Naankuse) | 7,500 | MEFT – 2 young bulls from Eden, and one bull from Swakopmund | 3 | 25.0 | All bulls (12 & 15 yrs, and one adult) |
| Okambara Elephant Lodge | 13,600 | Ministry wildlife auction (1995) | 11 | 12.4 | 3 – cows (30 yrs)<br>1 – cow (15 yrs)<br>5 – bulls (14,13,12,11,10 yrs)<br>1 male calf 1 yr<br>1 calf 4 months |
| Okonjati (Mt Etjo) | 33,000 | MEFT – auction (calves from Etosha culls) (1985)<br>MEFT wildlife auctions (1994 & 1995) | 36 | 9.2 | 3 - old bulls<br>1 - young bull<br>3 - subadult bulls<br>9 - cows<br>2 - subadult cows<br>9 - weaned calves (6F:3M)<br>9 - 1yr calves (unknown sex) |
| Okutala Nature Heritage / Okutala Etosha Lodge | 24,000 | Ministry wildlife auction (1994) | 8 | 30 | 1 – cow (31yr) - collared<br>5 – subadults (4F:1M) |
| Omaruru Game Lodge | 3,400 | Ministry wildlife auction (1994) | 5 | 6.8 | 2 adult cows (28 yrs)<br>3 calves (2F: 10 & 7 yrs, 1M 7 yrs) |
| | | **Total** | **160** | | |
| Marula Game Ranch | 27,800 | Not yet acquired, but approval granted to receive 15 elephants from Erindi | | | |

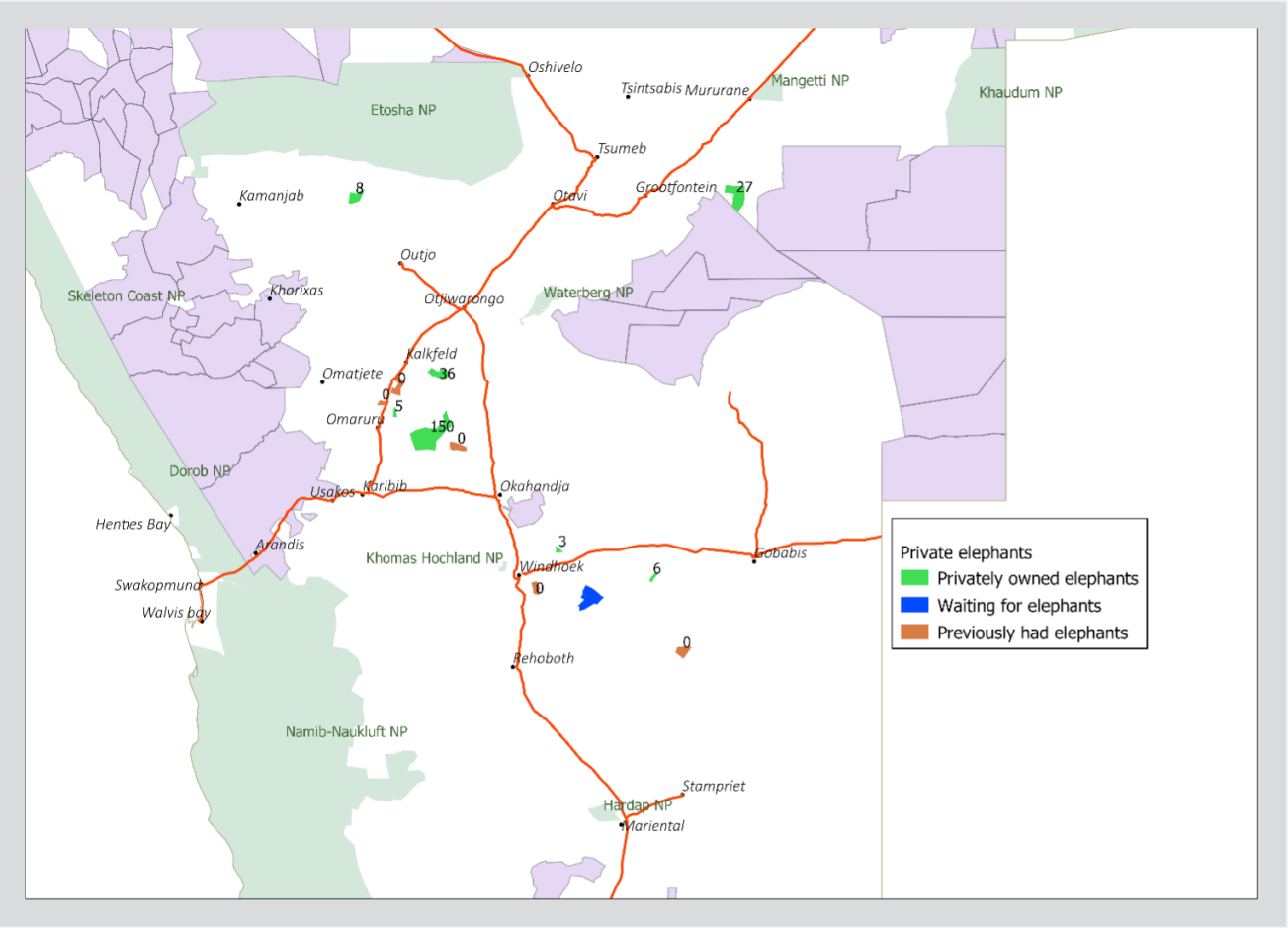



**Figure 109** Map showing farms that have, or previously had, privately owned elephants.

Figure 109 shows a map of the farms that have had privately owned elephants, and those that still have privately owned elephants. The most common reasons for getting rid of elephants have been the inability to contain the elephants within the property, followed by becoming a threat to valuable species such as rhinos, or aggressive towards humans, and therefore a danger. Only in one instance was destruction to big trees given as a reason, although negative impacts on large trees has been identified as a challenge by most of those currently having elephants.

Most private owners indicated that the main reason for keeping elephants is for tourism. Okutala Etosha Lodge and Naankuse expressed providing opportunities for orphans or problem animals as a primary reason, but also indicated that the elephants provide tourism value. Except for Naankuse, all other current owners of elephants purchased elephants at the 1994 or 1995 auctions. Prior to those auctions, Mount Etjo had elephants captured during the 1985 elephant cull in Etosha NP. In all these cases, breeding has taken place. No breeding control measures have been used by any of the owners, but Omaruru Game Lodge got rid of the two bulls once the cows were pregnant.

In most cases, owners indicate that should they reach a maximum preferred number of elephants, then their preference will be to sell or translocate elephants to other suitable land (within or outside Namibia). Okutala Etosha Lodge would wish the elephants (orphans) ultimately to be returned to where they came from.

Only Mount Etjo has trophy hunted an elephant, but other bulls have been destroyed as problems on Mount Etjo (one) and in Okutala Etosha Lodge (three), apart from those destroyed on other properties that no longer have elephants. Where problems were reported, they mostly related to young bulls, and

interspecific conflict was primarily between elephant bulls and rhinoceros. A recommendation was made to avoid having more than one bull at a time, and not to introduce a lot of young males.

In most cases, the elephants can satisfy their food requirements from the available vegetation, although Erindi, Mount Etjo and Okutala Etosha Lodge indicated that they supplemented feed during the 2019 drought. Only Omaruru Game Lodge feeds the elephants lucerne (alfalfa) daily, and "pods as treats" on a regular basis. These elephants were habituated to people from the beginning, and this has become part of the tourism appeal. The elephant calves on Okutala Etosha Lodge are fed, but they also have elephants that roam freely on the farm, including four young females (10,9,8 and 7 years old) that were released from the bomas in March 2019. In addition, they report having one non-permanent young adult bull (approximately 25 years) that frequents the area and joins up with the cow/calf group from time to time.

### Fencing

All farms with elephants have high game-proof fences, with four out of seven having electric fencing in addition. Omaruru Game Lodge does not have electric fencing, and has not had elephants leaving the farm, attributed to the daily feeding and habituation. Okutala Etosha Lodge and Eden also do not have electric fencing.

The lack of maintenance of fences and potential non-compliance with the permit conditions for keeping elephants on freehold land came up in the public consultation process in the Grootfontein district.

### Leased elephants

In 2013, the Ministry of Environment, Forestry and Tourism entered into a lease agreement with Erindi Private Game Reserve. This agreement followed a request by Erindi to acquire additional elephants to increase the number of elephants to "*inter alia*, attract more tourists and fight bush encroachment". The MEFT was against the alienation of wild elephants at that time, hence the lease agreement. The agreement runs for fifteen years, and the lease amount is given at *"N$ 70 000 per year for 200 elephants, and charged pro-rata based on the number of elephant released on the Game Reserve"*, and "*shall increase by 5% per annum*". The number of elephants eventually translocated (captured within Khaudum NP) and released was 85, meaning that the accumulative revenue to MEFT over the 15-year period will be in the region of N$ 640,000.

The mixing of privately-owned elephants with leased elephants has created some complications in dealing with applications for utilisation by Erindi, due to uncertainty regarding the ownership of individual elephants. In addition, it would seem from the lease agreement that offspring from these animals becomes the property of the lessee (or at least, they do not incur lease fees).

In 2018, Erindi made a proposal to the MEFT to purchase these elephants, which was not granted. It is Eden's opinion that owning the elephants will make it easier to take decisions and make applications to the MEFT more straight-forward.

### Regulatory framework

There has been little consistency in how elephants in private ownership are treated by MEFT. There is no standard guideline available, and no central recording system, so determining which farms had elephants in private ownership required following different leads and depended to some extent on individuals' knowledge. The information is only available in the hard copy files for farms in the MEFT permit office, and some of the earlier records are archived and not accessible. The original list of farms with elephants provided by MEFT only listed four of the seven properties.

Some owners claim to have permits, whilst others do not. Initially, prior to being able to purchase elephants on auction, properties were inspected and approved by the Ministry. Game fences now need to be re-registered every two years, meaning that farms are regularly inspected, and this occasion could potentially be used for re-registration of elephants. Until the MEFT has an online or digital permitting system, the challenge of information retrieval will remain.

An issue that came up in the public consultation process is the conditions attached to permits granted to private owners to have elephants and compliance monitoring with such conditions. Elephants on the farm Eden in the Grootfontein District in particular are alleged by the neighbours to regularly break out of the farm and cause conflict on neighbouring properties and/or attract elephants from neighbouring conservancies which end up on other properties.

## 8.3 Recommendations

MEFT should accordingly do the following:

- Create a standardized register for elephants in private ownership.
- Prevent the further mixing of elephants of wild origin in Namibia in State ownership with privately owned elephants, i.e. MEFT should dispose of the elephants leased to Erindi.
- Private landowners with elephants but without permits should be issued with such permits if all statutory requirements (essentially fencing) are met. Permits are not routinely issued it seems – and records are not kept up to date. Registration of private elephants can be done together with the bi-annual registration of game proof fences and include an update of the elephant population.
- Re-issue permits for the keeping of elephants with standardized conditions pertaining to fencing requirements. MEFT may need to revisit the fencing requirements for keeping elephants as ordinary game-proof fencing is generally not sufficient. Elephant fences may need to be electrified.
- Do annual compliance monitoring to see if conditions are adhered to.
- Establish a clear policy on the allocation of rescued elephants (mainly calves) to registered facilities. Elephants reared under conditions which involves close contact with people and other species including livestock may not be reintroduced into the wild unless a comprehensive assessment is made of the health status of the elephant concerned (the introduction of tuberculosis into the wild population is of particular concern). Permits to keep elephants should prohibit the intentional habituation of elephants.
- MEFT must supervise all captures, translocations and keeping of elephants in bomas, and vehicles used for translocation and bomas must be inspected and approved in advance of any use.
- Only grant permits for the keeping of elephants in cases where sufficient habitat is available, meaning that the size of the property will vary according to the average annual rainfall in different areas but in any event, a minimum size of 1,000 ha should generally be required per elephant, taking into account that introduced elephants will increase. Permits should therefore also state which maximum number of elephants can be kept on that property.
- Prevent further imports of elephants from other countries, at least until the genetic variability of the Namibian elephant population is established.
- All elephants to be introduced onto private land in future should be microchipped and preferably be equipped with a type of RFID transponder that can be read at waterpoints by a data logger, should disputes arise about the identity and ownership of elephants that cause conflict on other land.

Photo: P. Erb

# Glossary

| *Et al.* | Et alia or "and others" |
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| Ibidem or idem | From the same source |

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# Acknowledgements

The authors of this management plan gratefully acknowledge the following persons for their assistance and inputs and where applicable the use of their information and graphics without which this plan could not have been done in the time available:

C. Sikopo, Deputy Executive Director of Natural Resource Management, E. Hamunyela, Director of Scientific Services and K. /Uiseb, Deputy Director for Wildlife Monitoring and Research

C. Munwela, A. Kannyinga, R. Erckie, J. Ndokosho and M. Kasaona, Deputy Directors for the Kunene and Erongo Regions, North East regions, north central regions, Otjozondjupa, Omaheke, Hardap and Khomas Regions and Etosha NP respectively, as well as their control wardens and chief wardens A. Burger, Evaristo Nghilai, C. Nkonkwena, E. Tjikua, L. Muyoba, S. Gawiseb, R. Haufiku, L. Shiweda, and their wardens and rangers

R. Fryer, Control Warden and B. Kõtting, Control Warden Support Services, respectively; T. Iifo and J. Shapi and A. Amutenya, Chief Conservation Scientists and their staff responsible for CITES; W. Kilian, P. Beytell and H. Kolberg, Chief Conservation Scientists and J. Sharpe, veterinarian Directorate of Scientific Services

All the interviewees and participants in the public consultation meetings, there are too many to mention by name.

All providers of elephant movement data and other information: K. /Uiseb, W. Kilian and P. Beytell (MEFT), R. Naidoo and A. Brennan (WWF US), M. Hauptfleisch (NUST), K. Leggett, M. Sparrow (Naankuse), A. Songhurst, Ecoexist Trust, Botswana, R. Harris (EHRA)

R. Ramey and L. Brown (Desert Elephant Conservation, R. Taylor, C. Weaver, R. Diggle and G. Stuart-Hill (WWF in Namibia), R. Harris (EHRA), J. Kasaona, W. Boonzaaier, B. Shivute, R. Vinjevold and R. Collinson (IRDNC), L. Dietz and B. Jones (Nyae Nyae Development Foundation), M. Louis (NACSO), R. van Aarde and R. Guldemond (CERU, University of Pretoria), J. Kinahan, K.-U. Denker, T. Dahl and H. van Heerden (NAPHA), C. Brown (Namibia Chamber of Environment), J. Tagg (Rooikat Trust), R. Dempers (Namibia Development Trust), J. and S. Fennessy (Giraffe Conservation Trust), A. Songhurst, D. Peake, A. Cilliers, P. du Preez, S. Crawford, A. Nel, W. Versfeld, V. Booth, R. Martin, R. White, J. Wahl, J. Heita, R. Harris, (EHRA), S. Jacobs, P. Tarr, P. Stander (Desert Lion Conservation), P. Erb (NNF), A. Koch and R. White for all their valuable insights and information and the use of their photos where applicable

L. Geldenhuys for information on elephants in private ownership

The late G. Owen-Smith for many valuable insights

and especially to Kenneth /Uiseb and Heinrich Pielok and André Baumgarten of NamParks IV for their guidance and assistance throughout the process.

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

# Annexes

## Annex 1 Methods used to describe elephant distribution

Distributions of elephants in Namibia were described by density contour maps constructed using a combination of dry season aerial survey results and radio telemetry locations.

Densities were calculated from aerial survey results as follows:

- In the case of the North-eastern populations, each sighting from the surveys between 2014 and 2020 was weighted by the number seen and the sampling intensity. Weights were adjusted so that the sum of the weights was equal to the 2019 survey estimates (see Section 1.2.3). Using the locations of the sightings, they were summarised into a geographic grid with 30 x 30 cells per degree square. That is, the weight of each sightings was added into the value of the cell which contained its position. The Etosha population was treated similarly using the 2015 estimate and 2011, 2000 and 1998 sightings.
- Cell values were filtered using a nine-cell moving average frame. The filter was constrained to include only filled cells and was repeated three times on each grid. A second round of smoothing was done by creating Voronoi polygons centred on each filled cell and filling the cells of each polygon with the number in the master cell shared out among all cells in the polygon. This step is constrained to only include the cells within a mask representing the outer limits of all available sightings.

The radio telemetry locations were used as follows:

- The data set for each individual was simplified to contain only one sighting for each day of tracking. Sightings for all individuals were combined into one file. The range was divided up into polygons to which estimates of numbers could be allocated based on the most recent survey data.
- Sighting locations were overlaid on the polygons so that a determination could be made for the polygon in which it occurred. The points were then allocated weights so that the sum of the weights in a polygon equalled the estimate of elephants within the polygon.
- Points were added to a grid and filtered in the same way as for the aerial survey sightings.

The survey grid and telemetry grid were combined by addition, then division to reduce the number in the resultant grid to the correct population size. For Etosha NP and the North East, information was combined 2:1 in favour of survey sightings. For the North West, the Mangetti area and northern Kavango West Region, the distributions depended on tracking locations alone.

The final steps involved taking the grid, which still had a resolution of 1/30 degrees, and expanding it to 1/480 degrees by doubling the number of cells four times and filtering by a simple moving average at each step. This removes the patchiness from the original low-resolution grid.

Finally, the cell values were converted to density and the density to log base 4 density, to give contours where the higher contour represents 4 times the one below.

The elephant distribution separates into six main components. From west to east these are the North West, Etosha NP, the Mangetti area of Kavango West Region, Northern Kavango West Region, Khaudum NP-Nyae Nyae Conservancy and the Zambezi Region and Bwabwata NP as shown in the Table A1-1 and Figure A1-1.

**Table A1-1** Namibian elephant populations, numbers and average densities

| Population | Number (approximate) | Area km² | Density n/km² |
|---|---|---|---|
| 1 North West | 1,200 | 50,000 | 0.024 |
| 2 Etosha NP | 2,900 | 19,000 | 0.153 |
| 3 Mangetti | 90 | 4,000 | 0.025 |
| 4 Northern Kavango West Region | 50 | 1,500 | 0.033 |
| 5 Khaudum NP- Nyae Nyae Conservancy | 8,000 | 13,000 | 0.615 |
| 6 Zambezi Region-Bwabwata NP | 12,000 | 10,000 | 1.200 |

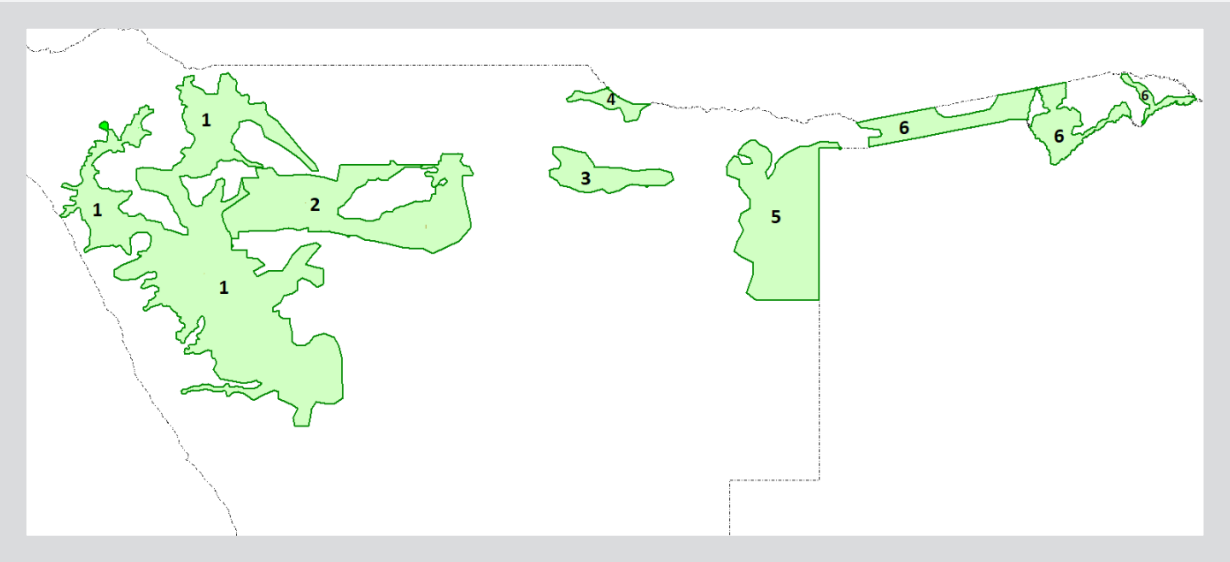


**Figure A1-1** Components of elephant population distributions (see Table A1-1))

Values are rounded to reflect uncertainty. Crude densities (number over total area) are given to emphasize the differences between populations. Finer scale densities vary widely within areas; the range of densities illustrated in Figure 10 is 0.0005 to over 2 per km$^2$ - four orders of magnitude. It was necessary to calculate density as low as 0.0005 km$^{-2}$ in order to represent the full extent of the distribution. Low densities at the edge of the range confirms the difficulties of detecting extremes of the range; low densities at the edge of the range imply even lower densities further afield.

## Annex 2 Methods used to describe elephant population trend

### Surveys

While elephants are often counted from the ground (e.g. water-hole counts, road strip counts, dung counts), the results can be unreliable or biased. Additionally, it is only possible to obtain a representative sample of Namibia's very large elephant by counting from the air.

Methods employed in Namibia to count elephants and other wildlife are various.

- Informal reconnaissance tend to concentrate on flights over areas favoured by elephants. Counts from these are not repeatable and while they provide a minimum number cannot be used for trends
- Total counts can provide acceptable numbers and are particularly useful for very small areas. Short-comings include inadequate search rates and distance between flight paths are seldom close enough to prevent animals from being missed. Additionally, total counts with appropriate search rates take considerable time and movements of animals in or out of the area during the survey can lead to incorrect counts.
- Sample counts conducted correctly are the most practical and economic way to estimate numbers of animals. While they, too, have shortcomings, they are currently the best option for obtaining comparable data. Sample counts are conducted in two ways: (i) by flying along "transects" spaced at distances determined by the required sampling intensity and counting everything seen between marker rods on the lift strut while flying at 300ft above ground level or (ii) by counting everything seen within small "blocks" spaced according to the required sampling intensity. It is necessary to divide the survey area into strata preferably according to known likely densities of animals in order to maximise the precision of the survey and to be able to sample an entire stratum within a day or less to reduce the chance of animals moving in or out of the area.

Determining the number of animals from a total count is a simple matter of adding up all the animals seen during the flight. For sample counts it is necessary to extrapolate from the sample to the total for the stratum and to calculate the range within which there is a 95% probability that the true number lies.

### Data collation

Because of inconsistencies in the application of the above methods, areas covered and/or apparent quality of surveys, data from surveys of elephants in Namibia have not been comparable, on the whole, until the 1990s when scientifically accepted methods were adopted (Norton-Griffiths 1978, Gasaway 1986) and applied. Standards for aerial surveys of elephants based on these have been summarised (Craig 2012).

Numerous survey reports evaluated according to comparability criteria and reported data were compiled. Criteria essential for inclusion in trend analyses were:

- Systematic reconnaissance transect or block counts method or total counts with acceptable search rates
- Survey method described
- Transect sample count transect spacing >1km
- Overall search rate <1.5 $km^2$/minute
- Total count flight-line spacing < 500m
- Slow flying aircraft PA18, C172, C182, C206, Maule or helicopter used
- Transect sample count strip width <250m per side
- Transect sample count strip width calibrated and reported

- Survey area completely covered (no areas omitted)
- Instrument available for height maintenance (transect sample counts)
- Height < 350 ft above ground level

All data except those that were obviously incorrectly reported were plotted with their 95% confidence limits (where available). Only those that fulfilled comparability criteria were used to calculate population trend information.

Some points are excluded from the analysis if they are obvious outliers from a trend or if the removal of that point removes a trend from the residuals.

### Trend analysis

The model used here to describe population change is that of exponential growth, where number ($y$) is described by $y = a.e^{rt}$ (e.g. see Caughley 1977). This is parsimonious: there are only two parameters, $a$ (the intercept) and $r$ (the intrinsic rate of change). It has biological meaning: it assumes constant per capita rate of change - often the case, which enables an annual rate of change to be stated and it works for both increasing and declining populations. The populations reported on here each appear a reasonable fit to such a model. While the real situation could be different, e.g. with per capita increase slowly declining or setbacks such as illegal killing disturbing the underlying trend, there is insufficient information to justify a less parsimonious approach for any population.

Regressions of the log values of numbers against time were generated with the p value for the F-ratio as shown in the following example (for the countrywide population). While the identical p value can be got from tabulated values of the regression coefficient, analysis of regression is preferred because it facilitates calculation of confidence limits on the line. Analysis of regression is a case of analysis of variance (ANOVA) (e.g. Crawley, 2005). MS Excel© Analysis tools were used to calculate this (Table A2-1). Table A2-2 shows the parameters for the regression.

Photo: A. Cilliers

**Table A2-1** Analysis of regression for the countrywide elephant population

| | *df* | *SS* | *MS* | *F* | *Significance p* |
|---|---|---|---|---|---|
| Regression | 1 | 0.803572 | 0.803572 | 225.2949 | 0.000642*** |
| Residual | 3 | 0.0107 | 0.003567 | | |
| **Total** | **4** | **0.814273** | | | |

**Table A2-2** Parameters of the regression of log estimate vs year

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
|---|---|---|---|---|---|---|---|---|
| Intercept | -95.074 | 6.969065 | -13.6423 | 0.000852 | -117.253 | -72.8953 | -117.253 | -72.8953 |
| Slope | 0.052174 | 0.003476 | 15.00983 | 0.000642 | 0.041112 | 0.063236 | 0.041112 | 0.063236 |

The important value is the slope of the regression, which is the constant r (the intrinsic rate of natural increase) in the exponential growth equation. The predicted annual rate of increase is ($e^r$ – 1). 100%

The regression is the regression of the natural log of the number of animals against the time in years. To represent the actual predicted numbers on the graph requires that the predicted log values for every point on the graph be converted back from logs to actual numbers, so while the regression is a straight line, the final graph is an exponential curve. This is plotted using the Excel© chart tool. The equation for the line in this case is $y = 5.10^{-42}\ e^{0.0522x.}$

The population trends are presented with lines above and below (coloured red in this report) to represent the 95% range within which the true number at any time would be.

The limits for each value of $y$ is: $y \pm t.s.((1/n)+(1/SS_T).(T-mnT)^2)^{0.5}$ (Campbell, 1967) where:

t is "Students" t,

T is date (in years),

$SS_T$ is the sum of squares of T,

MnT is average date and

s is the square root of the residual mean square from Table 3.

These calculations are, as before, worked out on the log values and converted to antilogs for representation on the graphs. As might be expected, precision of the prediction is best in the middle of the dataset. Imprecision in the slope of the trend causes the confidence limits to curve away from the line towards the limits of the data. This effect becomes more noticeable when the log data is converted back to numbers.

## Annex 3. Kavango Zambezi Transfrontier Conservation Area

The Kavango Zambezi Transfrontier Conservation Area (KAZA TFCA) was established to join fragmented wildlife habitats into an interconnected mosaic of protected areas and transboundary wildlife corridors, which will facilitate and enhance the free movement of animals across international boundaries. KAZA TFCA is one of the biggest and most important TFCAs in SADC. The area of this TFCA is approximately 540,000 $km^2$ and includes 36 formally proclaimed national parks, game reserves, forest reserves, fisheries reserves and a nature reserve[79] as well as conservancies, game management areas, conservation and tourism concession areas designated for the management and use of natural resources. In total, twelve categories of conservation area participate in the TFCA. The stakeholder groups are as diverse as the conservation areas.

The KAZA TFCA Treaty, signed by Partner States in August 2011, identifies 12 specific objectives of the TFCA as being to:

1. Maintain and manage the shared Natural and Cultural Heritage Resources and biodiversity of KAZA TFCA to support healthy and viable populations of wildlife species;
2. Promote and facilitate the development of a complementation network of Protected Areas within the KAZA TFCA linked through corridors to safeguard the welfare and continued existence of migratory wildlife species;
3. Provide opportunities, facilities and infrastructure that shall transform the KAZA TFCA into a premier tourism destination in Africa made up of a range of independent yet complementary and integrated sub-regional tourism development nodes;
4. Facilitate tourism across international borders in the KAZA TFCA;
5. Develop and implement programmes that shall enhance the sustainable use of Natural and Cultural Heritage Resources to improve the livelihoods of Local Communities within and around the KAZA TFCA and thus contribute towards poverty reduction;
6. Facilitate a healthy, competitive economic environment, which promotes and enables public-private-community partnerships, private investment and regional integration;
7. Share experiences and pool resources and expertise across international borders in the areas including indigenous knowledge, tourism management, border control, technology and renewable energy to facilitate development;
8. Promote and facilitate the harmonisation of relevant legislation, policies and approaches in Natural and Cultural Resources management across international borders and ensure compliance with international protocols and conventions related to the protection and sustainable use of species and ecosystems;
9. Build capacity for and within the KAZA TFCA through training, enterprise development and mentoring programmes thus increasing the skills and knowledge associated with the management of Natural and Cultural Heritage Resources and facilitate stakeholder participation in the KAZA TFCA planning and development processes;
10. Promote and facilitate the harmonisation of relevant legislation, policies and approaches in the area of transboundary animal disease prevention, surveillance and control within KAZA TFCA;
11. Promote fundamental and applied scientific and multi-disciplinary research in order to increase the knowledge base for the KAZA TFCA; and

79 Popa Falls Nature Reserve

12. Mainstream emerging environmental issues and social paradigms, such as climate change and HIV/AIDS, in the overall development of the KAZA TFCA.

Article 144 of the Namibian Constitution provides that "international agreements binding upon Namibia under this Constitution shall form part of the law of Namibia". Namibia is thus legally committed to the 12 objectives of the KAZA TFCA Treaty. Amongst these, numbers 1), 2), 5) and 8) are particularly relevant to this management plan.

Further, the Namibian conservation approach as described in the Namibian component of the KAZA TFCA Integrated Development Plan (2013-2017)[80] recognises that:

- Formally protected areas are too small to conserve all ecological processes and services adequately on their own;
- The effectiveness of conservation initiatives is dependent on size and scale so promoting compatibility between conservation activities, compatible land use practices, resource management and development initiatives is fundamental to success;
- Biodiversity conservation in protected areas cannot be successful without linkages between different habitats and the maintenance of migration routes of wildlife;
- While protected areas serve the purpose of conservation, natural resources within those areas may be used on a sustainable basis for economic and social gain;
- The development of synergies with cropping and livestock activities and the mitigation of conflicts between land uses, is important.

These provisions in the KAZA TFCA Treaty and the KAZA TFCA Integrated Development Plan primarily relate to Chapter 10, as well as the ensuing KAZA TFCA framework for elephant conservation and management that was adopted in 2019.

### KAZA TFCA framework for elephant conservation and management

The KAZA TFCA Committee of Ministers adopted in April 2019 a framework for elephant conservation and management which was endorsed by the Kasane Elephant Summit in May 2019. This framework is based on the premise that long term planning and monitoring of the KAZA elephant population are required, as well as identifying and mitigating threats and drivers inimical to integrated land use and landscape planning to ensure securing adequate space for the survival of elephants in KAZA TFCA. A contemporary and emerging threat is climate change to which elephants are already vulnerable in areas of limited water supply, which will likely exacerbate human-elephant conflict.

This framework explicitly recognizes (as paraphrased below), amongst others, that:

1. the KAZA TFCA holds approximately half of Africa's remaining savannah elephants, i.e. a combined population of at least 220,000. Of this number approximately 85% occurs in Botswana and Zimbabwe.
2. the outlook for the wellbeing of these populations hinges on maintaining their habitats and upon ensuring the spatial and temporal movement of elephants from more densely-populated areas in Botswana, Zimbabwe and Namibia, to areas in Angola and Zambia.

80 KAZA TFCA Integrated Development Plan (2013-2017)

3. a planning framework is needed to encompass strategies and plans with elephants as their primary focus has been to build an interconnected network of safe habitat for elephants and other species across KAZA TFCA, particularly during the current wildlife crime epidemic.

4. in places where elephant numbers are increasing in KAZA TFCA, they may pose a threat to diminishing riverine and woodland habitats and the species dependent upon such habitat.

5. increasing elephant populations, combined with human population growth and human settlements in existing wildlife dispersal areas, is leading to increases in human elephant conflict, of which increased illegal killings can be a symptom and problem animal control offtake becomes necessary. This may have a "push" effect on elephant movements. The KAZA portions of Angola and Zambia have large tracts of suitable elephant habitat, but with smaller populations of elephants and other wildlife (and concomitant lower human densities), which should provide a "pull" effect.

6. the long-term viability of KAZA elephants as a transboundary population depends upon securing and connecting or re-connecting of wildlife movement corridors. Once secure, this will also allow the movement from densely populated areas within the landscape, to areas with greatly reduced elephant numbers. Such corridors are under various stages of intactness and face the potential threat of permanent closure due to encroaching human settlements, agriculture, infrastructure developments (roads, rail, riparian), livestock disease control measures (veterinary cordon fences), and potential mining developments.

The framework set out a Vision for elephant conservation and management and four strategic objectives with explanatory notes, quoted verbatim as follows:

## VISION

"KAZA's elephants, the largest viable and contiguous population in Africa, are conserved to the benefit of people and nature within a diverse and productive landscape."

## STRATEGIC OBJECTIVES

### Objective 1: Facilitate the development of an integrated land use planning process to secure long-term ecosystem integrity and connectivity of KAZA's elephant population

The future of KAZA's elephants will depend on the bigger landscape in which they occur and the development needs with which they frequently compete. This means planning for the conservation and management of elephants must be part and parcel of planning for the larger landscape. The water, agriculture, livestock management, mining and other sectors must become a part of planning for elephants and vice versa – elephants must become a part of the broader land use planning efforts. New thinking, new partnerships and new tools are needed to better ensure that the stated Vision becomes a reality. Fortunately, a range of new technologies, new initiatives and funding opportunities are already in play. These must be sought out and put to work. As a starting place the objective adds to the elephant-specific data requirements by incorporating the often-repeated need to obtain and then to share the broader information and data that may impact the conservation and management of KAZA's elephants, including climate change impacts, the distribution and status of water resources and a number of other key data sets pertaining to development activities at a variety of scales across KAZA. New analysis of this information will be required to underpin and support planning and conservation action for KAZA's elephants.

### Objective 2: Maintain and manage KAZA's elephants as one contiguous population

In conserving KAZA's elephant population it must be fully understood - this means knowing as much as possible about its numbers, trends, seasonal distribution and movements. Conducting another overall and systematic survey across using a standardised and agreed methodology to allow future comparisons across countries is now long overdue. Connectivity in the landscape will be essential for the future of KAZA's elephants and this must be underpinned by capture and sharing of information on elephant in the existing Wildlife Dispersal Areas (WDAs) and beyond. In addition to understanding the living population it is also increasingly important to understand the timing, levels, distribution and patterns of poaching across all partner countries. The different countries' contributions such as MIKE (Monitoring Illegal Killing of Elephants) are critical to building this understanding, though improved harmonisation of methodologies used for capturing carcass data is essential. The KAZA elephant strategy must form an umbrella under which each of the partner country's national elephant action plans and strategies can sit. Formulation of this KAZA strategy framework is timely. New country elephant action plans have either recently been completed or are in process – Angola produced a NIAP (National Ivory Action Plan) in 2016 and their NEAP (National Elephant Action Plan) is currently being finalised, Botswana is currently consulting about the country's NEAP, Namibia's plan is undergoing review, the Zambian plan is being finalised and Zimbabwe's plan was approved in 2015.

### Objective 3: Promote and support co-existence of humans and elephants for ecological, social and economic benefits

The growing conflict between people and elephants (HEC) is a recurring theme throughout the KAZA landscape. For example Namibia cited the increased conflict as one of the main reasons for having to revise their management plan. This conflict was felt to reflect not only the growing human population but also the expanding elephant range in some countries. The link between the level of compensation offered and the amount of conflict reported was discussed. The need for communities to benefit from elephants was emphasised, with some stressing consumptive uses and others only non-consumptive, but all agreed communities have to be involved, as they are truly the first line of defence in an age of increasing illegal wildlife trade activity.

### Objective 4: Reduce the illegal killing and trade in elephants and elephant products

Current high levels of illegal killing and trade pose an imminent threat to KAZA's elephants and recent reports of poaching in the KAZA area suggest the need for greatly enhanced vigilance. Poaching and illegal wildlife trade has changed over time and is no longer driven simply by the short-term motivations of impoverished and beleaguered local communities. It has become part of the highly organised criminal syndicate networks; involving the same people engaged in illegal drugs and human trafficking and reflecting a clear change in the dynamics of this growing challenge. Large-scale shipments still move out of the region and some are seized along the supply chain between Africa and their final markets. Most recently small-scale local carving industries are being established across Africa, including countries in SADC, to produce beads, bangles and earrings for export to Asian markets. To this end, information on the pattern and nature of illegal trade in ivory must continue to be gathered and reported. With the growing value of this trade and the increasing number of species involved, it has become clear that there is a need to engage local communities in combatting the trade where its first impacts will be felt.

### Objective 5: Establish a high-level decision-making process on which to build the planning framework for conserving KAZA's elephants

In order to achieve the aspirations laid out in this strategic planning framework for KAZA's elephants between now and 2030, there will be a need for high level support in decision making and action.

Political will is of the essence. The current KAZA TFCA governance structures provide the bedrock needed to build the support needed for fully realising its aspirations.

In addition, the framework includes the following indicative short and medium term activities for each of the five strategic objectives:

## INDICATIVE SHORT AND MEDIUM TERM ACTIVITIES

Objective 1: Facilitate the development of an integrated land use planning process to secure long-term ecosystem integrity and connectivity of KAZA's elephant population

### Short term

- Undertake a single Strategic Environmental Assessment (SEA) for KAZA or several individual ones on key transboundary wildlife corridors to strengthen and secure governments' recognition to the importance of maintaining key KAZA corridors. This should be linked to large landscape planning in contrast to more traditional land use planning.
- Conservation and management of Angola water towers, to secure the long-term flow of the four river systems that form the basis of KAZA's wildlife and tourism assets.
- Create understanding and advocate for the need to integrate sectoral planning processes (water conservation, infrastructure development, agricultural expansion, mining, veterinary, etc.) with elephant conservation planning processes
- Create cross-sectoral understanding of infrastructural, water, conservation and rural development planning processes
- Review current databases from all relevant disciplines at all available scales and identify key gaps
- Prioritise and identify updated information to fill gaps
- Collect, collate and standardise current data on climate change, water resources, law enforcement, agricultural expansion, infrastructure development, etc.
- Continue to populate the KAZA GIS database with new geo-spatial information
- Undertake preliminary analyses of existing data and establish baselines
- Continue to undertake awareness raising of future scenarios across all sectors
- Improve stakeholder awareness to support WDAs and the establishment of corridors within these

### Medium term

- Establish a sound knowledge base across the conservation and development sectors using the best available information and technology
- Undertake continuous collection, updating and sharing of data
- Conduct further analyses to contribute to modelling and other approaches to support the development future scenarios
- Use this information for adaptive management
- Develop integrated KAZA landscape level plans which include WDAs and other key elephant movement corridors

- Where feasible undertake natural resources valuation assessments
- Raise awareness of these plans and pursue their implementation
- Harmonise legislation and policy to secure (formal, legal recognition) WDAs, elephant movement corridors and landscape-level land uses
- Support justification for the re-alignment and/or removal of veterinary and wildlife fences especially of crucial sections along country borders which can be informed by SEA.
- Secure WDAs and elephant corridors within and between these dispersal areas for the long term

**Objective 2: Maintain and manage KAZA's elephants as one contiguous population**

**Short term**

- Undertake KAZA-wide synchronised aerial surveys to determine numbers and seasonal distributions
- Further analyse existing movement data to identify knowledge gaps
- Collect local movement data using long term collared elephant data and ground surveys at different scales and in different places
- Improve understanding of how elephants occupy and use habitats and resources across the KAZA landscape
- Collate and use data sources on human distribution and land uses to better inform understanding of the present elephant distribution and future range
- Consolidate and report MIKE and other data on elephant poaching
- Undertake a review of the national elephant action plans in each of the five partner countries with a view towards their full integration under this KAZA strategic planning framework

**Medium term**

- Understand better elephant demographics and related population and habitat dynamics in the context of WDAs
- Establish trends in numbers, seasonal distribution and movements in relation to land cover and land use change
- Document historical knowledge of elephant range to highlight future land use conflicts

**Objective 3: Promote and support co-existence of humans and elephants for ecological, social and economic benefits**

**Short term**

- Support alternative livelihood initiatives among communities and exchange of best practices in mitigating conflict
- Monitor and evaluate socio-economic interventions
- Engage communities in undertaking and monitoring local level adaptive management interventions as a way of instilling ownership of resources

- Build capacity in communities for simple data collection methods
- Develop enabling policies and practices for communities to sustainably manage, utilise and benefit from elephants
- Build capacity of community-based coexistence management i.e. mitigation through local level land use planning and use of local knowledge
- Engage relevant stakeholders in co-existence and mitigation measures
- Support development and implementation of enabling policies to utilise, manage and benefit from elephants and other wildlife in a sustainable manner

**Medium term**

- Strengthen and expand organisational development support to community-based conservation structures e.g. transboundary natural resource management community forums
- Support sustainable alternative livelihood initiatives
- Expedite Commodity Based Trade (CBT) for beef within the region to enhance income generation for communities
- Support government implementing bodies or institutions responsible for wildlife management

**Objective 4: Reduce the illegal killing and trade in elephants and elephant products**

**Short term**

- Mobilise financial, human and material resources to undertake needed and urgent actions to combat wildlife crime through coordination of existing law enforcement interventions and anti-poaching strategies by several stakeholders.
- Improve human capacity and understanding across all sectors through awareness and training
- Develop and implement country specific strategies to reduce illegal killing and trade in elephants and elephant products with particular reference to the SADC LEAP strategy
- Coordinate transboundary ground-based patrols and air surveillance
- Increase understanding and sharing of information regarding the nature of organised crime across borders, including the reporting of seizures to CITES through TRAFFIC's Elephant Trade Information System (ETIS)
- Engage communities to help combat wildlife crime using inter alia transboundary natural resource management community forums and other new approaches such as First Line of Defence (FLoD)
- Create enabling conditions (national to local level policy) to allow for cross boundary pursuit of wildlife criminals
- Review existing extradition legislation to allow prosecution of wildlife criminals across the KAZA partner countries
- Collect and collate genetic information (from DNA analyses) centrally to better inform evidence-led prosecutions

### Medium term

- Align principles, policy and legislation across KAZA on combatting illegal wildlife trade
- Implement standardised protocols and procedures for wildlife intelligence, patrols, crime scene investigations, prosecutions and penalties
- Develop and implement standardised protocols and procedures for customs and immigration officials regarding recognition of the cross-border movement illicit wildlife goods and apprehension of suspects
- Provide training of customs and immigration officials on the above

### Objective 5: Establish a high-level decision-making process on which to build the planning framework for conserving KAZA's elephants

### Short term

- Continue the process of implementing the elephant conservation planning framework process
- Review current processes and identify gaps

### Medium term

- Undertake a 5-year progress review of the elephant strategic conservation planning framework
- Ensure partner countries allocate financial and other resources to implement the strategic planning framework
- Establish a reporting and feedback framework mechanism (which includes all levels of the KAZA structures)

# NOTES

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