

Republic of Botswana

MINISTRY OF ENVIRONMENT AND TOURISM (MENT)



Non-detriment findings for *Loxodonta africana* (African Elephant) Controlled Hunting in Botswana.

ADDENDUM 2024



DEPARTMENT OF WILDLIFE & NATIONAL PARKS (DWNP)

Gaborone, Botswana. July 2024.

APPROVAL

This 2024 addendum to the 2021 non-detriment findings (NDF) for *Loxodonta africana* (African Elephant) Controlled Hunting in Botswana have been reviewed and approved by the Acting Director of the Department of Wildlife and National Parks under the Ministry of Environment and Tourism, Government of Botswana.



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Moemi R. Batshabang

Acting Director
Department of Wildlife and National Parks

11 July 2024

Date:

Summary

1. In 2021 the Elephant Management and Action Plan 2021-2026 (<https://cites.org/sites/default/files/documents/E-CoP19-Inf-102.pdf>) was approved
2. In June 2021, DWNP drafted and approved a robust, state-of-the-art Non-Detriment Finding (NDF) in accordance with Article IV of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The “Non-detriment findings for *Loxodonta africana* (African Elephant) Controlled Hunting in Botswana and its assessment against the IUCN SSC “Guiding principles on trophy hunting as a tool for creating conservation incentives. Ver. 1.0. IUCN SSC (2012)” documents, *inter alia*, the sustainability of safari hunting.
3. Both the Management Plan and the NDF reported the elephant population to be estimated at 120.000-160.000 countrywide with the large majority in Northern Botswana and an expanding population in the central and southern part of the country.
4. From August to October 2022 a major wildlife survey was flown in the Kavango-Zambezi Trans Frontier Conservation Area (KAZA TFCA) landscape during the dry season, when elephants can be more readily seen. The data captured was tracked and reviewed daily, and the full analysis was completed in early 2023 and published in a dedicated webpage: <https://www.kavangozambezi.org/kaza-elephant-survey/>.
5. The KAZA survey estimated the elephant population in Northern Botswana at approx. 132,000 with a lower Confidence limit of approx. 120,000 and an upper confidence limit of approx. 144,000 elephants.
6. Due to this major event and other data acquired since 2021, the present document updates the following parts and figures of the 2021 NDF:
 - Part 3 Dispersal Efficiency
 - Part 6 National abundance with a summary of the information contained in Bussière, E.M.S. and Potgieter, D. (2023) KAZA Elephant Survey 2022, Volumes I and II. KAZA TFCA Secretariat, Kasane, Botswana
 - Update of 2021 NDF Figure 10: Human wildlife conflict and Human elephant Conflict from FY 2013/2014 to FY 2023/2024 (Source: DWNP).
 - Update of 2021 NDF Figure 15: Elephants controlled as problem animals by DWNP 2012-2023 (Source: DWNP)
 - A new table was inserted: Elephants Killed as Problem Animal Control b District 2021-2023 (Source DWNP)

- *Update of 2021 NDF Table 4: People killed and injured by elephants in Botswana 2023-2010 (Source: DWNP).*
 - *Update of 2021 NDF Table 5: Data on illegal killings of elephants from the only MIKE site in Botswana – Chobe National Park (Source DWNP and CITES MIKE portal <https://cites.org/eng/prog/mike/index.php/portal>)*
 - *Update of 2021 NDF Table 6: Summary of elephant-related Law Enforcement efforts/activities of DWNP 2010-2023 (Source: DWNP).*
 - *Update of 2021 NDF Table 8: Trend of quotas, estimated population, offtakes and trophy weights from 1996 to 2023. (Source DWNP and Mochaba)*
7. *Finally, this updated NDF reiterates the advice made by the Scientific Authority in 2021: the Scientific Authority has considered the current threats to elephant, including human-elephant conflict (HEC), loss of habitat, illegal activities, and the potential of safari hunting to mitigate those threats. Safari hunting provides a net benefit to the species, it does not pose a threat to the species, and it is not a detriment to the survival of the species. Regulated and controlled safari hunting of elephant in Botswana enhances the survival of the species. The elephant is neither endangered nor threatened in Botswana. Upon considering all the factors illustrated in this document and in accordance with Article IV of CITES and CITES Resolution Conf.16.7, the Scientific Authority of Botswana has advised the Management Authority that the low level of off-take generated by safari hunting is not detrimental to the survival of the elephant in Botswana and enhances its survival and the amount of revenues generated by this low level of off-take are of crucial importance for the conservation of the species also because of the benefits it provides to rural communities.*
8. *The Scientific Authority does not have any current concerns relating to the export of elephant hunting trophies in accordance with Article IV of CITES.*
9. *This document should be read in conjunction with the 2021 “Non-detriment findings for *Loxodonta africana* (African Elephant) Controlled Hunting in Botswana and its assessment against the IUCN SSC “Guiding principles on trophy hunting as a tool for creating conservation incentives. Ver. 1.0. IUCN SSC (2012)”.*

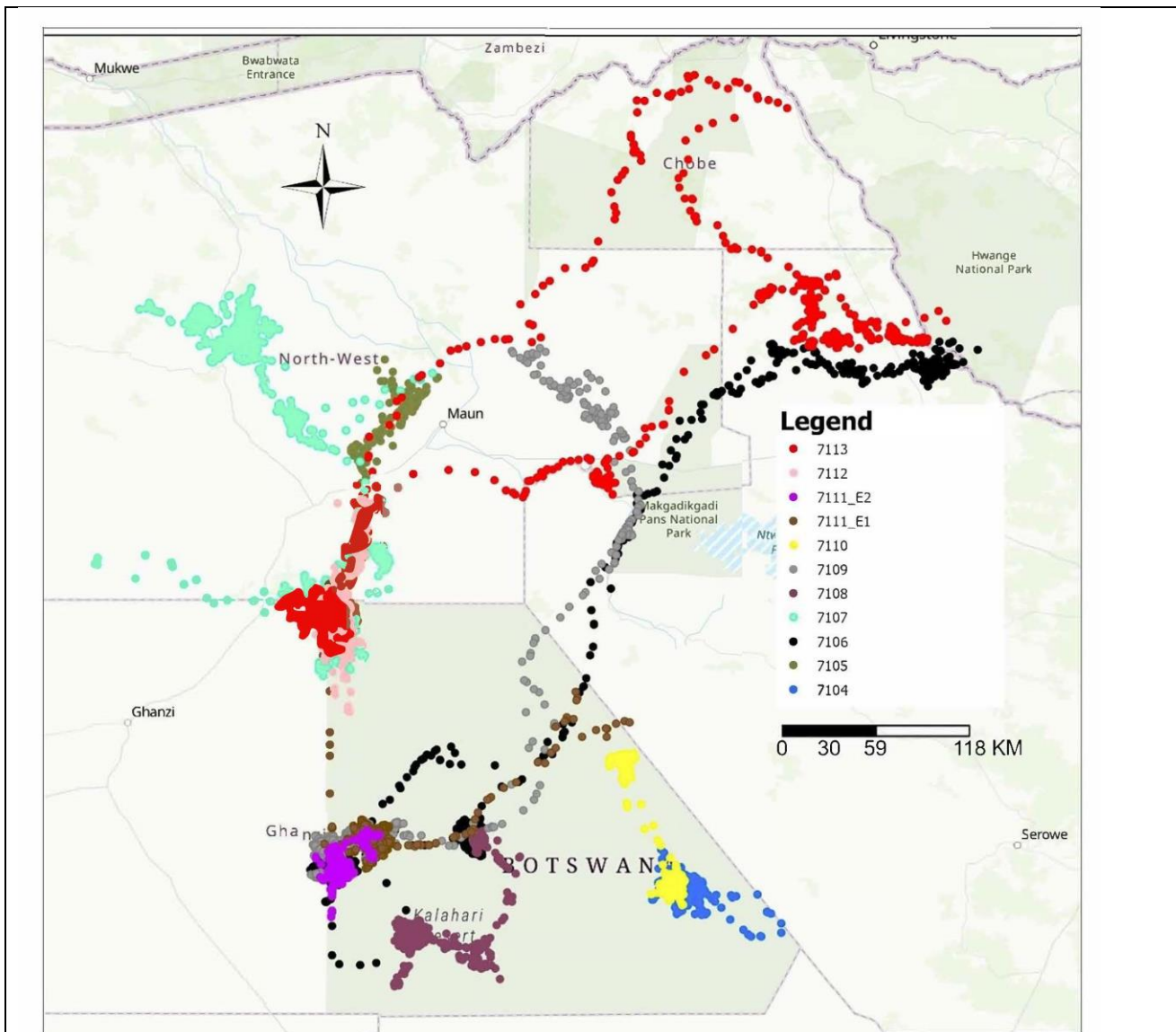
ADDENDUM TO THE 2021 NDF

3 Dispersal efficiency: How efficient is the species' dispersal mechanism at key life stages?	Very Good	1
	Good	2
	Medium	3
	Poor	4
	Uncertain	5

After the drafting of the NDF in 2021, KAZA Secretariat has published in 2023 the KAZA Policy Brief on Elephant Movements and Connectivity in the Kavango Zambezi Transfrontier Area (<https://www.kavangozambezi.org/download/78/kaza-publications-english/1527/kaza-policy-brief-on-elephant-movements-and-connectivity-in-the-kavango-zambezi-transfrontier-conservation-area.pdf>) consisting of overview maps of all available elephant movements over the last decade or so, with an interpretation of the most prevalent movement routes and likely corridors. Additional derived products include animations that highlight the scale of elephant movements, heat maps representing movement frequencies, and modelled representations of current and potential future movement corridors. A series of recommendations are included in the Policy Brief which are being implemented or discussed for implementation in the National Elephant Management Plan (NEMAP)

More recently, in May 2023, DWNP and Botswana University of Agriculture and Natural Resources (BUAN) started a joint three years research project titled: The ecology of Savanna elephants in their newfound habitat, the Central Kalahari Game Reserve (CKGR), Botswana, funded by the Botswana Conservation Trust Fund (CTF). Preliminary results are being published (Sianga et al, in press). Two cows and eight bulls from diverse herds were immobilized and equipped with GPS satellite collars to analyse their movement patterns and seasonal home ranges. Specifically, the objectives for this study were to, (i) to determine the seasonal movement patterns of elephant herds in the CKGR using GPS telemetry data, and (ii) analyse the spatial extent of seasonal home ranges of matriarchal and bachelor elephant herds in the CKGR (outside KAZA landscape) and surrounding areas (mostly within the KAZA landscape),

The collared elephants exhibited increased activity within the CKGR, as well as the western, southern, and eastern sectors of the Okavango Delta (OD), the Chobe region, and Hwange National Park (HNP) in Zimbabwe (Figure 1). Movement patterns varied among herds, with specific individuals (Adult females 7105 and 7112) primarily concentrating their activities between the Tsau DWNP gate in CKGR and the southern end of the OD, particularly around the Khoemacau Mine in Toteng. Similarly, elephant bull, 7107, exhibited a consistent ranging pattern, primarily the Tsau DWNP gate and the western boundary of the OD. In contrast, males 7104, 7108, 7110, 7111_E1, and 7111_E2 show evidence of year-round site sedentary, confining their movements to the CKGR (Figure 1). Three male elephants demonstrated extensive migratory behaviours across multiple conservation regions in Botswana. Specifically, individual 7109 migrated seasonally from the Old Xade region in the CKGR to the eastern OD and returned during the dry season (Figure 1). Similarly, individual 7113 traversed from the Tsau entrance of the CKGR, through the OD and Chobe regions, to the HNP during the wet season and retraced his path in the dry season. Additionally, individual 7106 migrated from Old Xade (CKGR) to HNP via the Makgadikgadi National Park (MNP) during the wet season, utilizing the same route for his return during the dry session (Figure 1)



extracted from Sianga et al. in press)

Figure 1: Annual movement patterns of collared elephants in the Central Kalahari Game Reserve, Botswana. *Notes:* 7104 – 7113 denotes the tag numbers, with 7111_E1 and 2 denoting the two different elephants tagged with the same collar over different time periods.

This study represents a significant contribution to the understanding of seasonal elephant migration patterns in Botswana. Our findings demonstrate that artificial water points have enabled elephants to establish permanent habitats within the CKGR. However, significant migrations between CKGR and other key areas within the KAZA, such as the Okavango Delta and Hwange National Parks in Zimbabwe, persist. This underscores the critical need for maintaining habitat connectivity between CKGR and the broader KAZA region for effective management of elephant populations and other herbivores.

6. National abundance: What is the abundance nationally?	Very abundant	1
	Common	2
	Uncommon	3
	Rare	4
	Uncertain	5

The KAZA Elephant Survey commenced on 23 August 2022, running until 28 October 2022. The Botswana part started on 10 September 2022 and ended on 11 October 2022.

The primary objective was to obtain a relatively precise and accurate estimate of the number of elephants in the Kavango Zambezi Transfrontier Conservation Area (KAZA TFCA), by synchronising data collection, particularly in areas of transboundary elephant movement. Secondary objectives included estimating populations of elephant carcasses and other large herbivores (both wild and domestic), as well as determining their spatial distribution.

The survey area covered 60% of the KAZA TFCA. It was divided into 179 strata, sampled during 195 flights using seven fixed-wing aircraft. Systematic transect sampling was the primary method used, while stratified block sampling was employed in two strata with rugged topography. Additionally, three reconnaissance flights were conducted in areas considered to have the potential to support elephants.

The overall sampling intensity was 6.9%, ranging from 2.6% to 56.0% between strata, with higher intensities where higher densities of elephants were expected (based on previous survey data). A total of 398 hours spread over 68 days were spent collecting data on 2404 transects, totaling 67,390 km in length. Overall, the mean height AGL on transect was 91.8 m (SD = 6.5) with a mean speed on transect of 171.5 km.hr⁻¹ (SD = 5.8), resulting in a search effort of 1.12 minutes.km⁻².

The survey met the precision target of a PRP ≤10% for the elephant population estimate and adhered well to the recommended CITES MIKE Aerial Survey Standards, with few deviations as documented in the report. The survey was effectively synchronized across international boundaries within a sufficiently narrow time frame, ensuring a sound assessment of this transboundary population.

The main results of the survey include:

- *A total estimated population of 227,900 (±16743) elephants in the KAZA TFCA, with a percentage of relative precision (PRP) of 7%.*
- *An estimated population in Botswana with a lower Confidence limit of 120,000 and an upper confidence limit of 144,000 elephants.*
- *A total estimate of 19,371 (±1473) elephant carcasses for the Botswana part, resulting in an overall carcass ratio of 12.80%. It suggests a high level of mortality although the majority (62%) was made of very old carcasses (category 4) and the CR12 percentage (i.e.the carcass ratio in the year preceding the survey) was extremely low (0,72%): the carcass ratio warrants further investigation as a potential warning sign for the health and stability of the population.*
- *Population estimates for other common wildlife species in the Botswana part of KAZA as follows: buffalo 37,006 (±13,557), giraffe 9,512 (±1527), red lechwe 105,155 (±16,468), hippopotamus 8469 (±1660), impala 58,007 (±8213), wildebeest 15,610 (±8288) and zebra 64,728 (±27,232).*
- *The size of the domestic livestock herd was estimated at 736,426 of which 73% were cattle 536,623 (±54,295) and 24% sheep and goats (173,746 (±22,940)), resulting in a ratio of 1.16 wild animals to 1 domestic animal in the KAZA TFCA survey area. In the Botswana part of the survey the domestic livestock herd was estimated at 289,942 of which cattle 155721 (±28714), donkey 14783 (±3692), horse 5116(±2430) and shoat 54322 (±18065).*

In particular the survey provided the following estimates for elephant within the surveyed part of the Botswana KAZA landscape.

Table extracted from Bussiere E.M.S. and Potgieter, D. (2023)

Table 3.8: Population estimates and associated statistics for all species in the Botswana portion of the KAZA TFCA.

Zone	Species	Population		95% Confidence Range			Nb Seen		Density	Variance
		Estimate	CI	Lower CL	Upper CL	PRP	In	Out	(km ⁻²)	
Elephant										
Botswana	all elephants	131909	±11831	120078 - 143740		9%	11944	20875	1,067	36136114
Botswana	elephant bulls	21167	±2361	18806 - 23528		11%	1741	3280	0,171	1437696
Botswana	elephant family	110742	±11261	99481 - 122003		10%	10203	17595	0,895	32713723
Botswana	all elephant carcasses	19371	±1473	17898 - 20844		8%	1430	564	0,157	558343
Botswana	C1-2 elephant carcasses	962	±275	687 - 1237		29%	79	29	0,008	18591
Botswana	C3-4 elephant carcasses	18409	±1421	16988 - 19830		8%	1351	535	0,149	519090
Botswana	elephant carcass one	228	±112	116 - 340		49%	22	13	0,002	3090
Botswana	elephant carcass two	734	±251	483 - 985		34%	57	16	0,006	15280
Botswana	elephant carcass three	6417	±853	5564 - 7270		13%	489	188	0,052	186436
Botswana	elephant carcass four	11992	±1055	10937 - 13047		9%	862	347	0,097	283322

The KAZA TFCA survey area has an all-carcass ratio (CR14) of 10.47%, calculated from the 26641 (±1645) elephant carcasses estimated. The Botswana all carcass ratio (CR14) was 12,80% and the fresh and recent carcass ratio (CR12) for Botswana has been estimated at 0.72%. The fresh and recent carcass ratio (CR12) serves as an index of recent mortality, since these carcass categories represent elephants that have died in the 12 months prior to the survey.

Elephant carcass estimates and associated statistics for the KAZA Botswana survey part . Table extracted from Bussiere E.M.S. and Potgieter, D. (2023)).

Zone	Species	Population Estimate	CI	95% Confidence Range		PRP	No Seen		Density (km ⁻²)	Variance
				Lower CL	Upper CL		In	Out		
Botswana	all elephant carcasses	19371	±1471	17900	- 20842	8%	1430	564	0.157	556989
	C1-2 elephant carcasses	962	±270	692	- 1232	28%	79	29	0.008	17924
	C3-4 elephant carcasses	18409	±1422	16987	- 19831	8%	1351	535	0.149	519720
	elephant carcass one	228	±105	123	- 333	46%	22	13	0.002	2696
	elephant carcass two	734	±250	484	- 984	34%	57	16	0.006	15075
	elephant carcass three	6417	±847	5570	- 7264	13%	489	188	0.052	183747
	elephant carcass four	11992	±1061	10931	- 13053	9%	862	347	0.097	286656

Importantly, the majority of carcasses in Botswana were of category 4 (i.e. carcasses up to 10 years old) and therefore with almost no possibility to ascertain the cause of mortality. The underlying reasons for high mortality rates could be diverse and are likely to be a combination of several factors such as of poaching, habitat loss (i.e., elephant population compression) and associated human-elephant conflict, disease, and other natural causes such as prolonged droughts.

By examining the spatial distribution and density of category 1 and 2 carcasses it has been possible to determine areas with the highest recent mortality. Generally, there was a concentration of fresh and recent carcasses in the border region between Botswana and Namibia along the Kwando-Linyanti-Chobe River system. The Botswana Department of Wildlife and National Parks was informed of the high number of fresh carcasses seen during the survey, and an investigation into the cause of death was immediately started: poaching has been ruled out as the principal cause as the tusks on the carcasses were found to be intact.

Further analysis of the data resulted from landmark KAZA aerial survey is in progress especially to determine management actions needed to improve the coexistence between elephants and people, to improve knowledge on the elephant range (at least in the dry season), and to determine areas of encroachment into natural habitat see especially figure 2

Figure 2 - Elephant, livestock and human footprint in the KAZA landscape (from Bussiere & Potgieter 2023)

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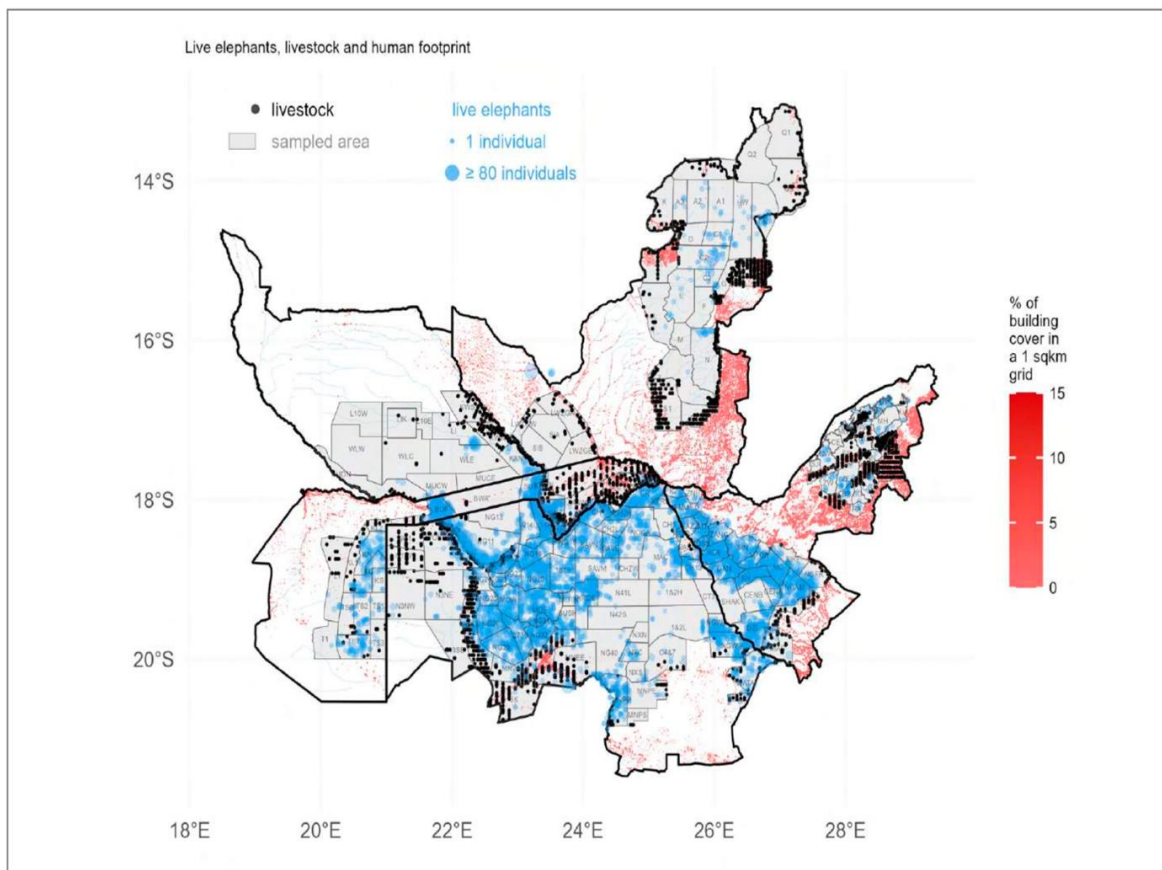


Figure 3.59: Spatial distribution of live elephants (bulls and family herds) and livestock observations in the KAZA TFCA survey area during the 2022 survey, overlaid on a human settlement density map created from the Open Buildings dataset (Sirko et al, 2021).

VOLUME 1 RESULTS AND TECHNICAL REPORT

References

KAZA Secretariat. 2023. KAZA Policy Brief on Elephant Movements and Connectivity in the KAZA TFCA. Kasane, Botswana

Sianga K., Makhabu, S., Muposhi V. K., Setlalekgomo M., Selebatso T. Matsikaa A., Selala K., Barungwi A. O., Molojwane E. Legwatagwata B., Losologolo M., Dingake O., Nkgowe C., (In press) Spatial Dynamics of African Elephants, *Loxodonta Africana* (Blumenbach) found in the Central Kalahari Game Reserve, Botswana. Available at SSRN: <https://ssrn.com/abstract=4833200> or <http://dx.doi.org/10.2139/ssrn.4833200>

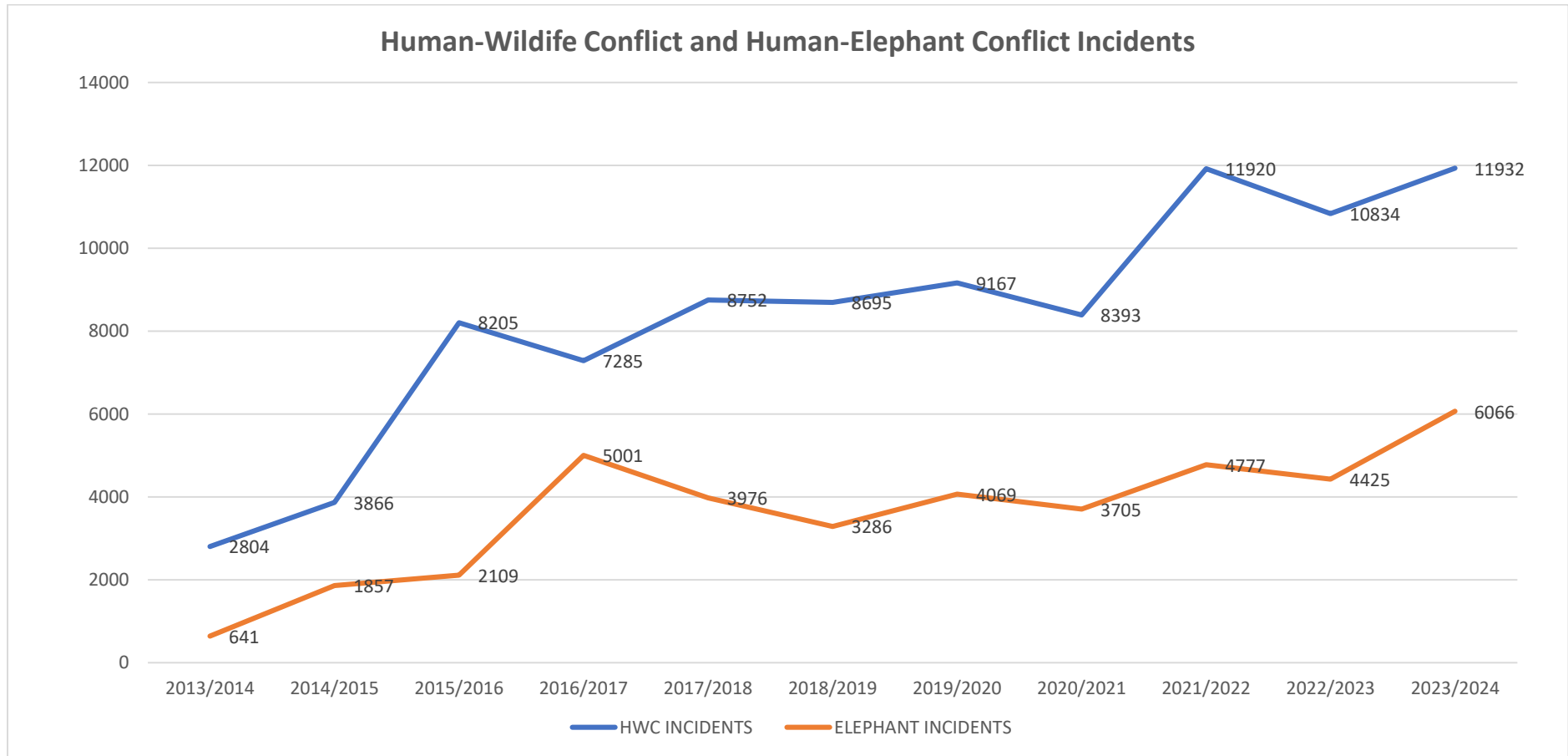
Bussi re, E.M.S. and Potgieter, D. (2023) KAZA Elephant Survey 2022, Volume I and II: Results and Technical Report, KAZA TFCA Secretariat, Kasane, Botswana.

Annexes

UPDATES TO SOME TABLES AND FIGURES OF THE 2021 NDF

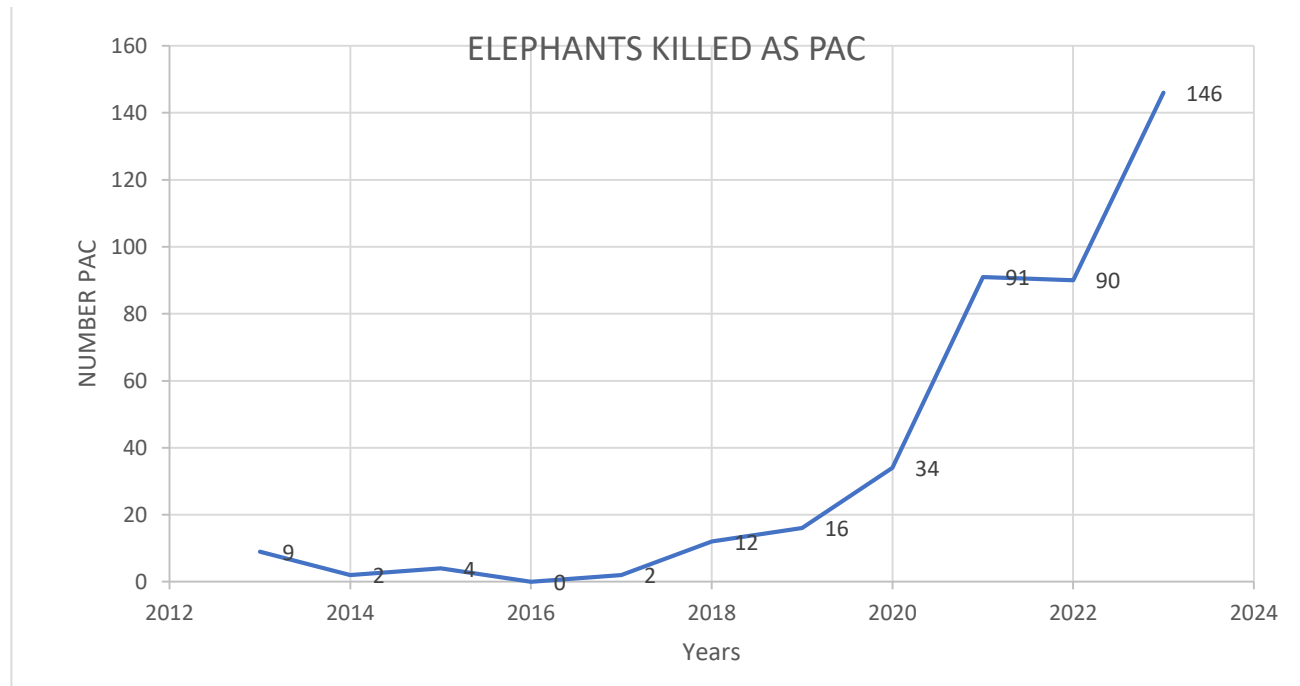
- *Update of 2021 NDF Figure 10: Human wildlife conflict and Human elephant Conflict from FY 2013/2014 to FY 2023/2024 (Source: DWNP).*
- *Update of 2021 NDF Figure 15: Elephants controlled as problem animals by DWNP 2012-2023 (Source: DWNP)*
- *A new table was inserted: Elephants Killed as Problem Animal Control by District 2021-2023 (Source DWNP)*
- *Update of 2021 NDF Table 4: People killed and injured by elephants in Botswana 2023-2010 (Source: DWNP).*
- *Update of 2021 NDF Table 5: Data on illegal killings of elephants from the only MIKE site in Botswana – Chobe National Park (Source DWNP and CITES MIKE portal <https://cites.org/eng/prog/mike/index.php/portal>)*
- *Update of 2021 NDF Table 6: Summary of elephant-related Law Enforcement efforts/activities of DWNP 2010-2023 (Source: DWNP).*
- *Update of 2021 NDF Table 8: Trend of quotas, estimated population, offtakes and trophy weights from 1996 to 2023. (Source DWNP and Mochaba)*

UPDATES TO SOME TABLES AND FIGURES OF THE 2021 NDF¹
Human-Wildlife Conflict and Human-Elephant Conflict Incidents



UPDATE OF NDF FIGURE 10: Human wildlife conflict and Human elephant Conflict from FY 2013/2014 to FY 2023/2024 (Source: DWNP).

¹ DWNP (2021) Non-detriment findings for *Loxodonta africana* (African Elephant) Controlled Hunting in Botswana, with enhancement findings, and its assessment against the IUCN SSC “Guiding principles on trophy hunting as a tool for creating conservation incentives. Ver. 1.0. IUCN SSC (2012)”. Department of Wildlife and National Parks. Gaborone.



UPDATE NDF FIGURE 15: Elephants controlled as problem animals by DWNP 2012-2023 (Source: DWNP)

NEW TABLE: ELEPHANTS KILLED AS PROBLEM ANIMAL CONTROL BY DISTRICT (Source DWNP)

DISTRICT	2021	2022	2023
Central	48	19	41
Chobe	3	7	38
Ghanzi	0	15	4
Kweneng	2	0	0
Ngamiland	29	49	63
TOTALS	91	90	146

UPDATE OF NDF TABLE 4: People killed and injured by elephants in Botswana 2010-2020 (Source: DWNP).

Year	Number of people killed by elephants	Number of people injured by elephants
2023	2	5
2022	4	12
2021	8	1
2020	5	4
2019	9	1
2018	14	0
2017	2	0
2016	8	0
2015	2	3
2014	4	0
2013	0	0
2012	0	1
2011	2	3
2010	2	0
TOTAL	62	30

UPDATE OF NDF TABLE 5: Data on illegal killings of elephants from the only MIKE site in Botswana – Chobe National Park (Source DWNP and CITES MIKE portal <https://cites.org/eng/prog/mike/index.php/portal>)

MIKE Site	Year	Total Carcasses	Illegal Carcasses
Chobe	2000	5	2
Chobe	2001	51	14
Chobe	2002	79	10
Chobe	2003	104	3
Chobe	2004	145	5
Chobe	2005	69	16
Chobe	2006	95	7
Chobe	2007	108	17
Chobe	2008	119	6
Chobe	2009	120	16
Chobe	2010	37	9
Chobe	2011	42	14
Chobe	2012	351	29
Chobe	2013	156	2
Chobe	2014	242	23
Chobe	2015	198	10
Chobe	2016	121	0
Chobe	2017	101	22
Chobe	2018	108	38
Chobe	2019	23	2
Chobe	2020	117	3
Chobe	2021	101	1
Chobe	2022	51	0
Chobe	2023	39	2

UPDATE OF NDF TABLE 6: Summary of elephant-related Law Enforcement efforts/activities of DWNP 2010-2023 (Source: DWNP).

Year	Patrol Effort /Man nights	Effective man-power on the ground	# Elephant poached	SEIZURES	ARRESTS		PROSECUTIONS**	LAW ENFORCEMENT TRASBOUNDARY OPERATIONS	
				Ivory*	Local	Foreign	Cases investigated	Transboundary meetings	Joint operations
2023	702,000	1,950	8	84	40	12	12	14	15
2022	702,000	1,950	0	45	36	14	17	4	5
2021	657,000	1,850	1	54	66	13	30	6	3
2020	12880	1296	6	8	26	3	7	1	2
2019	9600	1120	63	86	35	7	24	15	18
2018	11400	880	57	60	42	12	26	15	17
2017	9600	820	76	77	33	5	19	14	15
2016	10800	760	36	90	36	18	25	12	15
2015	9600	620	37	115	38	12	25	12	13
2014	8400	580	42	110	47	11	28	12	13
2013	9000	500	22	108	65	18	35	12	13
2012	8700	490	21	199	64	27	42	12	13
2011	9600	420	6	70	36	18	26	12	13
2010	9600	420	14	4	No data	3	No data	12	13

**Number of ivory recovered includes finished products such as pieces of bracelets, necklaces amongst others, as well as tusks seized all over Botswana most of which are not necessarily linked to poaching but rather picking from natural mortalities. ** Prosecutions are dealt with by the Directorate of Public Prosecutions (DPP)*

UPDATE OF NDF TABLE 8: Trend of quotas, estimated population, offtakes and trophy weights from 1996 to 2023. (Source DWNP and Mochaba)

Year	CITES Quota	BW Internal Quota	Estimated population within confidence limits	Total offtake (Citizen offtake)	Mean tusk weight (both tusks)
1996	80	77	100,538	33 (0)	53.0 kgs / 116.86 lbs.
1997	87	78		51 (0)	48.4 kgs / 106.72 lbs.
1998	168	168		99 (0)	47.6 kgs / 104.95 lbs.
1999	174	168	120,604	113 (0)	47.7 kgs / 105.39 lbs.
2000	180	168		155 (0)	47.6 kgs / 104.95 lbs.
2001	180	180	117,000	133 (0)	50.6 kgs / 111.57 lbs.
2002	210	192	123,152	132 (1)	48.3 kgs / 106.5 lbs.
2003	210	192	109,472	139 (2)	48.2 kgs / 106.3 lbs.
2004	210	192		147 (8)	48.8 kgs / 107.6 lbs.
2005	210	192	151,000	173 (9)	49.4 kgs / 108.9 lbs.
2006	270	270	154,658	252 (21)	48.7 kgs / 107 lbs.
2007	300	290		253 (21)	48.5 kgs / 107 lbs.
2008	330	307		269 (9)	47.2 kgs / 103 lbs.
2009	400	354		271 (2)	46.5 kgs / 103 lbs.
2010	400	341	128,430 (ambiguous)	308 (28)	44.2 kgs / 97 lbs.
2011	400	400		286 (0)	47.5 kgs / 104.8 lbs.
2012	400	388		298 (21)	46.1 kgs / 101.6 lbs.
2013	400	396	156,401	322 (14)	46.1 kgs / 101.7 lbs.
2014-2020	HUNTING SUSPENDED (REOPENED 2019 BUT EFFECTIVELY IN 2021 DUE TO COVID)				
2021	400	325	130,000 - 150,000	219 (49)	50.01 kgs / 110,35 lbs.
2022	400	281	130,000 - 150,000	197 (29)	51.59 kgs / 113,73 lbs.
2023	400	312	120,000-144,000 (KAZA)	167 (7)	50.60 kgs / 111,55 lbs.
2024	400	388	120,000-144,000 (KAZA)		