

BOTSWANA ENVIRONMENT STATISTICS WILDLIFE DIGEST 2014

STATISTICS BOTSWANA

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BOTSWANA ENVIRONMENT STATISTICS:
WILDLIFE DIGEST 2014

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Preface

Statistics Botswana, through the Environment Statistics Unit, presents the third edition of the Botswana Environment Statistics: Wildlife Digest. The digest provides current statistics and trends analysis on fauna (animal life), with particular reference to mammals and birds. The population statistics provided on birds is only on ostriches, while mammals cover species of both herbivores and carnivores of various sizes. Secondary data were used in the production of this digest and were drawn mainly from the Department of Wildlife and National Parks.

The information provided in this digest is restricted to the following key indicators, at national and district levels for the years 2003 - 2014; population estimates; population densities; poaching; and fish harvest and production. Due to data limitations, the following key indicators could not be reported - problem animal control incidences, wildlife mortality, and hunting licences and quotas.

The Framework for Development of Environmental Statistics (FDES) developed by the United Nations Statistical Division was used in preparing this report. The statistical information provided in this digest is important for evidence-based decision making for the sustainability of both the animals and the resources upon which they depend.

I would like to thank the Department of Wildlife and National Parks for making this report possible by availing the required data and making invaluable comments on the draft report. The continued production of this report is dependent on strong collaboration with our key stakeholders.

For more information and further enquiries, contact the Directorate of Stakeholder Relations at 3671300. All Statistics Botswana outputs/publications are available on the website at www.cso.gov.bw and at the Statistics Botswana Library (Head-Office, Gaborone).

Thank you.



Anna Majelantle
Statistician General
April 2015

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EXECUTIVE SUMMARY

The purpose of the Botswana Environment Statistics: Wildlife Digest 2014 is to provide and discuss reliable statistics and trends on fauna (animal life), particularly mammals and birds for the period 2003 to 2014. The report is divided into four main sub-sections; i) Wildlife Population and Densities; ii) White Rhino Population; iii) Poaching; and iv) Fish Statistics. Just like the previous Reports, the production of this Report was guided by the United Nations Framework for the Development of Environment Statistics (UNFDES).

Wildlife population estimates and densities

Statistics on wildlife population and densities for the years 2003, 2004 and 2012 were countrywide, while those for the years 2005, 2006, 2007 and 2013 covered a few selected districts depending mainly on the environmental concerns in that period. These statistics were collected through aerial censuses and surveys conducted by the Department of Wildlife and National Parks. It should be noted that aerial censuses and surveys do not provide reliable estimates for predators' species because it is difficult to see them from the air (CSO, 2005). Predators' nocturnal habits (active during the night and sleeping during the day) causes undercounting due to the fact that surveys can only be effectively carried out during day time. The standard methodology for transect sampling developed by Norton-Griffith (1978) was used during the censuses and surveys. Two fixed wing aircrafts were used to fly transects at a height of 300 feet above ground and a minimum average strip width of 300 metres. The aerial censuses and surveys are usually conducted during the dry season to take advantage of the increased visibility. They are conducted as a response to numerous wildlife management challenges (e.g. increasing mortality due to recurring drought occurrences, rangeland degradation and increasing poaching incidences).

The report reveals that on average, the national population estimates and densities of some wildlife species (e.g. elephant, gemsbok, and lechwe) were high during the period 2003 to 2013, while those of white rhino and sitatunga were the lowest. Botswana is party to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the convention grants protection of elephants, hence their vast population estimates.

Generally, population trends of the majority of wildlife species counted during the combined countrywide surveys (of 2003, 2004 and 2012) fluctuated during the review period due to differences in stratum area (sampling intensity) covered during each aerial survey. As an exception, the population estimates and densities of elephant, zebra, roan, and hippo, followed an upward trend during the same period, while that of sable, lechwe, tsessebe were on the decline. The report further shows that the majority of wildlife are found in unprotected areas as compared to protected areas (national parks and game reserves). It is also evident from the report that the broadest diversity of wildlife species is found in Ngamiland District, Chobe District, Ghanzi District and Central District in that order.

White Rhino Population

The population of rhinos in Botswana experienced a historic decline since the 1890s to early 2000s due to escalating poaching incidences. Numerous re-introduction projects were initiated between 1967 and 1981, where among others a total of 94 white rhinos were introduced from South Africa. These translocation projects coupled with Government efforts to bring to an end commercial poaching have yielded commendable results thus far. It is evident from the results that the population of the southern white rhino followed an upward trend during the period 2005 to 2014. They experienced a fourfold increase from a count of 26 in 2005 to 153 in 2014, with the majority of them being adult females.

Poaching

Commercial poaching is common in Botswana and statistics in this report show that even though poaching might have led to a decline in the population of some wildlife species, some species have not seen any decline (e.g. elephant). This might be attributable to the fact that the rate at which they reproduce outweighs their mortality rate, though no data on wildlife mortality and fertility were available to verify this. The estimated national poaching incidences by species show in their descending order that, elephant, kudu, eland and impala were the most poached in the period 2009 to 2013. The highest national poaching incidences were recorded in the year 2012.

Fish Statistics

To ensure the sustainable utilisation of fish, the Government of Botswana introduced the Fish Protection Act of 1975. The sustainable utilisation of fish can only be achieved through documenting and monitoring fish

statistics including indicators such as fish capture production and value gross catch/harvest, among others. The report shows that fish capture production or volume of fish catches of Bream, Barbel, S/barbel, Tiger fish, Carp, Labeo has shown an erratic trend over the period 1996 to 2013. On average, Bream species (109,624.75 kilograms) experienced the highest annual catch followed by Barbel and Tiger Fish. The highest total capture production was recorded in 2013/14 with 430,777 kilograms while the lowest total capture of 45,331.90 kilograms was recorded in 2007/08.

On the other hand, the value of gross catch of fish followed an upward trend during the review period. It increased from 1,205,208 BWP in 2010 to 8,615,540 BWP in 2013. It is also evident from the results that Bream species contributed the highest in terms of value of gross catch followed by Barbel then S/Barbel.

1.0. WILDLIFE POPULATION ESTIMATES AND DENSITIES

1.1 Introduction

The purpose of this chapter is to present the population estimates and densities of wild animals counted in Botswana's administrative districts and Protected Areas. Also presented are the population trends and distribution patterns since the year 2003.

Information on wildlife population estimates and densities in Botswana is collected by the Department of Wildlife and National Parks (DWNP) through aerial surveys. The surveys are conducted as a response to numerous wildlife management challenges, for example, recurring drought occurrences, which lead to high wildlife mortalities, rangeland degradation and increasing poaching incidences. Recent concerns that some species in key wildlife areas were declining further underlined the need for monitoring data (DWNP, 2012: v). It is reported in the Daily News dated 19 August 2014 (No. 155) that more elephants in Africa are being killed by poachers than are born each year, and the problem may be worse than previously understood. The dwindling numbers of some of the wildlife species as a result of the aforesaid challenges has a negative effect on the economy of Botswana; as the tourism sector has a significant contribution to the country's Gross Domestic Product (GDP). Furthermore, the livelihoods of some of the communities are dependent on the use and management of wildlife. Therefore, there is a need to document and monitor the wildlife population estimates to meet the needs of the current and future generations. Wildlife is one of the country's attractive natural resources, and it serves as a cornerstone of Botswana's tourism industry and contributes to rural livelihoods (Statistics Botswana, 2013: 80).

According to the DWNP (2012) all the aerial surveys of animals used the standard methodology for transect sampling developed by Norton-Griffith (1978). Two fixed wing aircrafts were used to fly transects at a height of 300 feet above ground and a minimum average strip width of 300 metres. They are usually conducted during the dry season to take advantage of the increased visibility. Since aerial surveys do not provide reliable predator population estimates because of their nocturnal habits, reasonable estimates are sourced from specialised ground-count surveys or various observational techniques (e.g. spoor count) (CSO, 2005). Imprecise estimates of predator species is also caused by the fact that they are sparsely distributed. Nonetheless, aerial surveys give an indication of their distribution countrywide as well as their minimum numbers.

The censuses and surveys conducted from 2003 to 2013 include observations made on 33 animal species including baboon, bat eared fox, buffalo, carcass old, cheetah, crocodile, duiker, eland, elephant, gemsbok, giraffe, impala, hartebeest, hippo, spotted hyaena, brown hyaena, jackal, kudu, lechwe, lion, ostrich, reedbuck, rhino (white), roan, sable, sitatunga, steenbok, springbok, tsessebe, waterbuck, wild dog, warthog, wildebeest, and zebra.

Some of the aerial surveys of animals conducted during the period 2003–2013 were countrywide, while others covered selected districts as shown below:

- 2003: Aerial census: Kgalagadi, Ghanzi, Central, Kweneng, Ngamiland, Chobe, Southern and South east.
- 2004: Aerial census- Kgalagadi, Ghanzi, Central, Kweneng, Ngamiland, Chobe, and Southern.
- 2005: Aerial survey- Ngamiland, Kgalagadi, and Ghanzi.
- 2006: Aerial survey- Chobe, Ngamiland, Central, and Kgalagadi.
- 2007: Aerial survey- Kgalagadi, Ghanzi, Kweneng, and Southern.
- 2012: Aerial census: Kgalagadi, Ghanzi, Central, Kweneng, Ngamiland, Chobe, Southern and South east.
- 2013: Aerial survey- Northern Botswana (Ngamiland, Chobe & Central Districts).

It is worth mentioning that although the 2003, 2004 and 2012 surveys were countrywide, the Central District was not fully covered in 2004. Furthermore, aerial surveys used varying stratum area (sampling intensity), hence variances in population estimates between the years.

1.2 Overall Countrywide Population Estimates and Densities by Species

Displayed in Table 1.2 are overall statistics on some of the aerial surveys of animals conducted countrywide (2003, 2004 & 2012), as well as those that covered selected districts (2005, 2006, 2007 & 2013).

Generally, the elephant population had the highest population estimates and density during the period 2003 to 2013. The gemsbok population estimates and density was the second highest after elephant population estimates and density during the same period. Trailing behind all animal species was rhino (white) population

with only 24 sighted in 2004 and 32 in 2006. As an exception, rhino (white) had a high density (5.040 and 1.970 animals per square kilometer in 2004 and 2006 respectively) because the size of the sample area surveyed was small. According to the DWNP, rhino (white) are endangered species in Botswana and were almost extinct due to poaching. An erratic trend was observed in population estimates and densities of almost all species during the review period (Refer to Table 1.2).

Table 1.2a: Aerial Censuses of Wildlife Population Estimates & Densities of Selected Species- National Level (2003, 2004 & 2012)

Species	Wildlife Population Estimates			Population Densities		
	2003	2004	2012	2003	2004	2012
Elephant	109,471	151,000	207,545	0.189	0.317	0.45
Gemsbok	101,522	96,943	133,249	0.176	0.204	0.29
Impala	67,040	42,694	114,900	0.116	0.09	0.25
Zebra	39,308	52,162	99,077	0.068	0.11	0.21
Hartebeest	49,978	39,553	62,569	0.086	0.08	0.14
Buffalo	33,305	31,615	61,105	0.058	0.066	0.13
Ostrich	49,406	43,229	55,916	0.085	0.091	0.12
Wildebeest	45,858	35,088	53,159	0.079	0.074	0.12
Steenbok	36,368	26,617	41,531	0.063	0.056	0.09
Springbok	35,811	50,332	35,688	0.062	0.106	0.08
Eland	31,598	21,711	34,735	0.055	0.046	0.08
Lechwe	48,983	35,722	26,322	0.085	0.075	0.06
Kudu	27,440	28,075	23,038	0.047	0.059	0.05
Duiker	9,786	3,892	21,608	0.017	0.008	0.05
Giraffe	9,463	11,090	8,976	0.016	0.023	0.02
Warthog	4,154	2,919	7,026	0.007	0.006	0.02
Hippo	1,466	3,094	3,633	0.003	0.007	0.01
Carcass OL	-	17	3,426	-	3.57	0.01
Tsessebe	5,119	2,361	2,138	0.009	0.005	0
Waterbuck	950	944	2,048	0.002	0.002	0
Sable	2,877	2,249	1,989	0.005	0.005	0
Roan	188	391	615	0	0.001	0
Sitatunga	167	12	63	0	2.52	0
Crocodile	400	373	-	0.001	0.001	-
Rhino (W)	-	24	-	-	5.04	-
Reedbuck	67	-	-	0	-	-
Baboon	3,720	3,415	-	0.006	0.007	-
Jackal	1,985	1,319	-	0.003	0.003	-
Wilddog	-	-	-	-	-	-
Spotted Hyaena	119	15	-	0	3.15	-
Brown Hyaena	75	54	-	0	1.13	-
Lion	290	621	-	0.001	0.001	-
BE Fox	96	394	-	0	0.001	-
Cheetah	-	308	-	-	0.001	-

(-) Not covered by the survey
Source: DWNP

Table 1.2b: Aerial Surveys of Wildlife Population Estimates & Densities of Selected Species for some Districts (2005, 2006, 2007 & 2013)

Species	Wildlife Population Estimates				Population Densities			
	2005 (Ngamiland; Kgalagadi & Ghanzi)	2006 (Chobe; Ngamiland; Central & Kgalagadi)	2007 (Kgalagadi; Ghanzi; Kweneng & Southern)	2013 (Ngamiland; Chobe & Central)	2005 (Ngamiland; Kgalagadi & Ghanzi)	2006 (Chobe; Ngamiland; Central & Kgalagadi)	2007 (Kgalagadi; Ghanzi; Kweneng & Southern)	2013 (Ngamiland; Chobe & Central)
Elephant	88,626	154,658	-	156,401	0.286	0.951	-	1.280
Zebra	21,071	49,151	-	59,463	0.068	0.302	-	0.490
Impala	30,156	54,482	-	55,283	0.097	0.335	-	0.450
Lechwe	37,947	38,059	-	51,979	0.122	0.234	-	0.420
Wildebeest	23,825	15,251	13,200	9,689	0.077	0.094	0.027	0.080
Ostrich	32,749	13,055	20,689	8,940	0.106	0.080	0.123	0.070
Gemsbok	112,361	11,851	56,850	6,329	0.362	0.073	0.337	0.050
Hippo	2,434	3,680	-	5,743	0.008	0.023	-	0.050
Giraffe	6,779	10,871	1,183	5,440	0.022	0.067	0.007	0.040
Kudu	18,102	8,427	3,010	4,109	0.058	0.052	0.018	0.030
Springbok	22,863	6,426	-	3,437	0.074	0.040	0.078	0.030
Steenbok	23,992	4,185	10,702	2,993	0.077	0.026	0.063	0.020
Warthog	3,618	3,075	498	2,578	0.012	0.019	0.003	0.020
Sable	841	1,999	-	2,439	0.003	0.012	-	0.020
Tsessebe	3,109	3,209	-	1,478	0.010	0.020	-	0.010
Eland	43,976	4,700	6,820	1,345	0.142	0.029	0.040	0.010
Hartebeest	46,941	1,277	18,354	492	0.151	0.008	0.109	0.000
Roan	70	665	-	425	2.260	0.004	-	0.000
Duiker	4,753	560	3,361	322	0.015	0.003	0.020	-
Sitatunga	249	160	-	261	0.001	0.001	-	0.000
Crocodile	368	543	-	216	0.001	0.003	-	0.000
Carcass OL	18	-	-	-	5.810	-	-	-
Buffalo	48,802	59,396	-	-	0.157	0.365	0.000	-
Rhino (W)	-	32	-	-	-	1.970	-	-
Waterbuck	298	1,278	-	-	0.001	0.008	-	-
Reedbuck	18	208	-	-	5.810	0.001	-	-
Baboon	2,715	1,905	164	-	0.009	0.012	0.001	-
Jackal	2,541	159	915	-	0.008	0.001	0.005	-
Wilddog	289	64	82	-	9.330	3.940	4.940	-
Spotted Hyaena	35	-	-	-	1.130	-	-	-
Brown Hyaena	132	-	51	-	4.260	-	3.070	-
Lion	313	372	305	-	0.001	0.002	0.002	-
BE Fox	410	16	163	-	0.001	9.840	0.001	-
Cheetah	-	-	111	-	-	-	0.001	-

(-) Not covered by the survey

Source: Department of Wildlife and National Parks

1.3 Animal Estimates by District

This section presents trends of aerial censuses and surveys of animal population estimates and densities by district in Botswana for the years 2003 to 2013.

1.3.1 Ngamiland District

The broadest diversity of wildlife species is found in the Ngamiland district due to its advantage of encompassing the Okavango Delta. According to Central Statistics Office Wildlife Statistics (2009: 13), the Okavango Delta is a permanent source of water where many species of wildlife tend to concentrate during prolonged dry seasons. Nonetheless, some of the wildlife species in the district have suffered a decline during the 2003-2013 period, particularly in 2006 and 2013, with the exception of impala species which was on the increase from the years 2004-2012 (Table 1.3.1a).

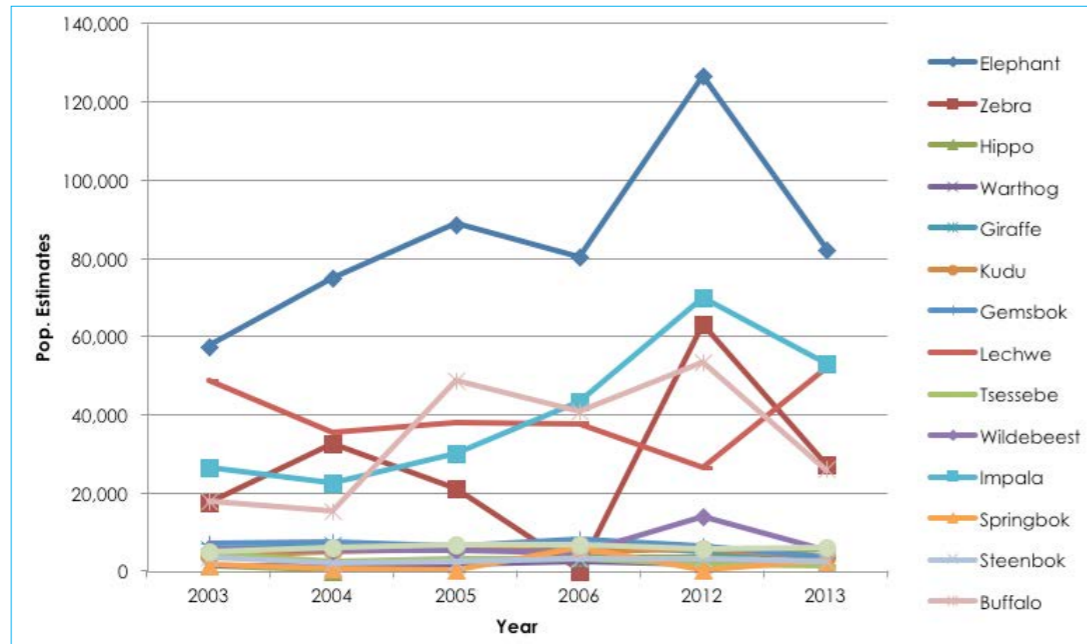
The population of elephant, buffalo, wildebeest, zebra, and springbok species fluctuated during the period 2003-2013 with the highest counts observed during the year 2012. During the review period, the elephant species had the highest population and density followed by lechwe, impala and buffalo.

Table 1.3.1a: Wildlife Population Estimates & Densities for Ngamiland District (Censuses- 2003, 2004 & 2012; Surveys- 2005, 2006 & 2013)

Species	Wildlife Population Estimates						Population Densities					
	2003	2004	2005	2006	2012	2013	2003	2004	2005	2006	2012	2013
Elephant	57,381	74,885	88,626	80,262	126,474	82,167	0.530	0.663	0.921	0.845	1.690	1.050
Impala	26,419	22,382	30,156	43,292	69,898	52,976	0.244	0.198	0.313	0.456	0.930	0.680
Lechwe	48,628	35,509	37,947	37,725	26,344	51,946	0.449	0.314	0.394	0.397	0.350	0.670
Zebra	17,447	32,514	21,042	25,137	62,956	27,222	0.161	0.288	0.219	0.265	0.840	0.350
Buffalo	17,697	15,457	48,802	40,832	53,424	25,937	0.164	0.137	0.507	0.430	0.710	0.330
Ostrich	4,868	5,887	6,644	6,716	5,485	5,931	0.045	0.052	0.069	0.070	0.070	0.080
Hippo	1,362	3,010	2,434	3,408	3,473	5,531	0.013	0.027	0.025	0.036	0.050	0.070
Wildebeest	5,765	5,359	5,367	4,663	13,876	5,239	0.053	0.047	0.056	0.049	0.190	0.070
Kudu	3,693	4,780	5,552	4,779	5,624	3,555	0.034	0.042	0.058	0.050	0.080	0.050
Giraffe	5,517	6,566	5,262	6,763	5,041	3,537	0.051	0.058	0.055	0.071	0.070	0.050
Gemsbok	7,191	7,487	6,494	8,110	6,192	3,499	0.066	0.066	0.067	0.085	0.080	0.040
Springbok	1,417	515	318	5,892	91	2,507	0.013	0.005	0.003	0.062	0.000	0.030
Steenbok	3,391	1,949	2,365	3,072	2,956	2,404	0.031	0.017	0.025	0.032	0.040	0.030
Warthog	1,148	1,008	1,529	2,167	1,558	2,222	0.011	0.009	0.016	0.023	0.020	0.030
Sable	949	975	841	1,264	592	1,436	0.009	0.009	0.009	0.013	0.010	0.020
Tsessebe	4,560	2,330	3,109	3,128	1,750	1,432	0.042	0.021	0.032	0.033	0.020	0.020
Eland	360	209	1,912	868	909	983	0.003	0.002	0.020	0.009	0.010	0.010
Waterbuck	590	446	298	555	18	464	0.005	0.004	0.003	0.006	0.000	0.010
Sitatunga	167	12	249	160	63	261	0.002	0.000	0.003	0.002	0.000	0.000
Crocodile	384	373	368	433	-	211	0.004	0.003	0.004	0.005	-	0.000
Duiker	973	434	467	379	771	210	0.009	0.004	0.005	0.004	0.010	0.000
Hartebeest	414	318	201	768	1,691	148	0.004	0.003	0.002	0.008	0.020	0.000
Roan	64	374	70	111	142	83	0.001	0.003	0.001	0.001	0.000	0.000
Reedbuck	67	-	18	208	-	-	0.001	-	0.000	0.002	-	-
Rhino (W)	-	24	-	16	-	-	-	2.120	-	1.680	-	-
Baboon	3,037	2,314	2,715	1,245	-	-	0.028	0.020	0.028	0.013	-	-
Jackal	13	96	59	32	-	-	0.000	0.001	0.001	0.000	-	-
SPT Hyaena	27	-	35	-	-	-	0.000	-	0.000	-	-	-
BE Fox	24	-	76	16	-	-	0.000	-	0.001	0.000	-	-
Lion	91	258	-	370	-	-	0.001	0.002	-	0.004	-	-

Source: Department of Wildlife & National Parks

Figure 1.3.1a: Wildlife Population Estimates of Selected Species for Ngamiland District, (Censuses- 2003, 2004 & 2012; Surveys- 2005, 2006 & 2013)



1.3.2 Ghanzi District

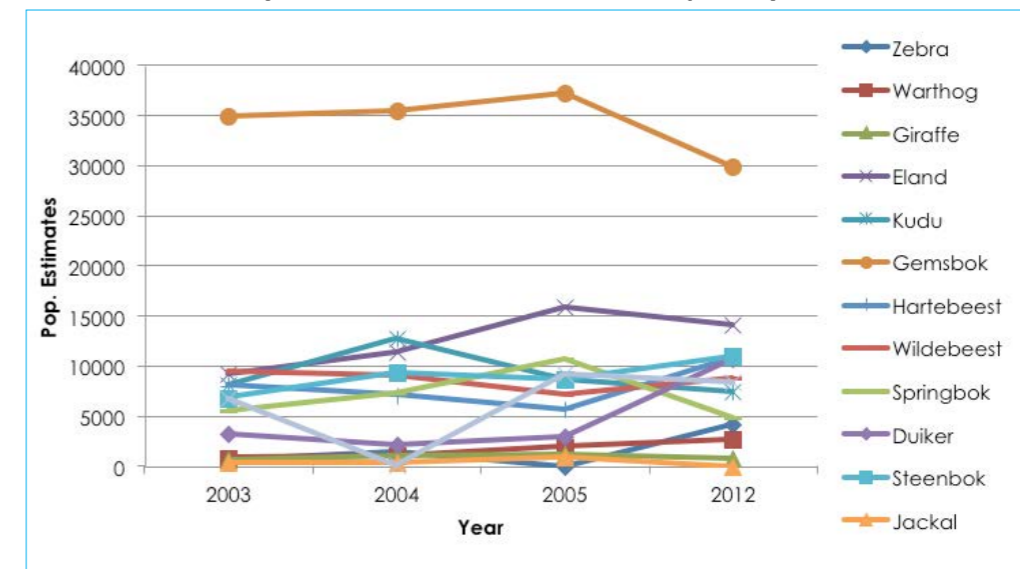
It is evident from Table 1.3.2a that gemsbok had a consistently high population during the period. The table further shows that gemsbok had the highest density (0.304 in 2003 and 2004, 0.325 in 2005, and 0.370 in 2012), followed by eland and kudu.

Table 1.3.2a: Wildlife Population Estimates and Densities of Selected Species in Ghanzi District, (Censuses- 2003, 2004, & 2012; Survey- 2005)

Species	Wildlife Population Estimates				Population Densities			
	2003	2004	2005	2012	2003	2004	2005	2012
Gemsbok	35,002	35,543	37,330	29,930	0.304	0.304	0.325	0.370
Eland	9,347	11,545	15,968	14,239	0.081	0.100	0.139	0.180
Steenbok	6,917	9,395	8,724	11,046	0.060	0.080	0.076	0.140
Hartebeest	8,141	7,179	5,782	10,906	0.071	0.060	0.050	0.130
Duiker	3,368	2,194	3,036	10,804	0.029	0.019	0.026	0.130
Wildebeest	9,583	9,176	7,295	8,931	0.083	0.080	0.064	0.110
Ostrich	6,797	202	9,300	8,537	0.059	0.002	0.081	0.110
Kudu	8,173	12,836	8,770	7,504	0.071	0.111	0.076	0.090
Springbok	5,681	7,459	10,809	4,923	0.049	0.064	0.094	0.060
Zebra	813	1,519	29	4,288	0.007	0.013	0.002	0.050
Warthog	938	1,095	1,988	2,723	0.008	0.009	0.017	0.030
Waterbuck	-	-	-	1,448	-	-	-	0.020
Giraffe	703	1,148	1,298	923	0.006	0.009	0.011	0.010
Lion	149	-	36	-	0.001	-	0.003	-
Wild dog	-	-	289	-	-	-	0.003	-
BE Fox	-	208	95	-	-	0.002	0.001	-
SPT Hyaena	-	54	-	-	-	4.620	-	-
Baboon	-	13,695	-	-	-	0.120	-	-
Jackal	444	503	1,040	-	0.004	0.004	0.009	-
Crocodile	-	10,918	-	-	-	0.090	-	-
B/Hyena	51	-	29	-	0.000	-	1.002	-

Source: Department of Wildlife & National Parks

Figure 1.3.2a: Population Estimates of Selected Wildlife Species in Ghanzi District, (Censuses- 2003, 2004, & 2012; Survey- 2005)



1.3.3 Kgalagadi District

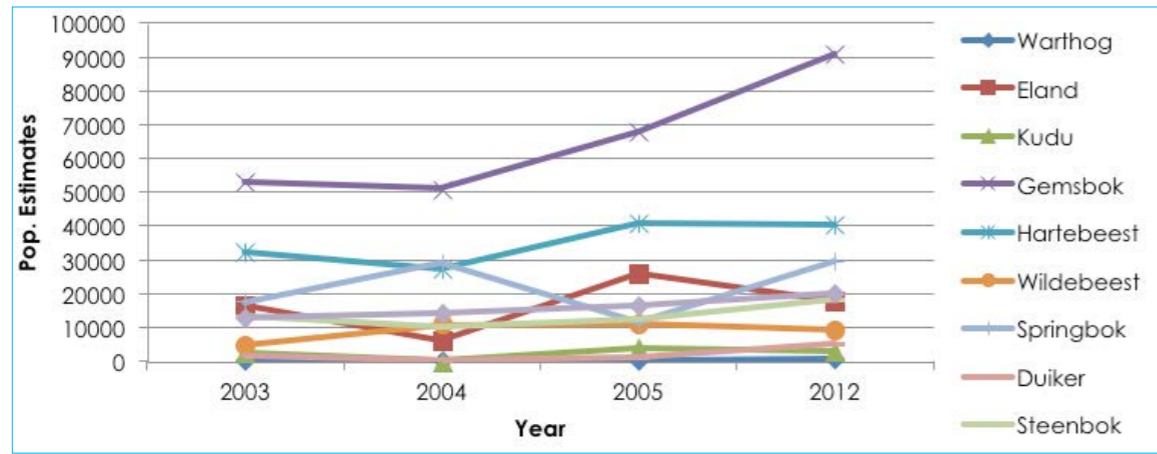
Table 1.3.3a shows that there was a general increase in most species population estimates in the years under review. Gemsbok had a particularly high population that increased by more than 70 percent in 2012. Similarly gemsbok had the highest density in all the years followed by hartebeest.

Table 1.3.3a: Wildlife Population Estimates and Densities of Selected Species for Kgalagadi District, (Censuses- 2003, 2004, & 2012; Survey- 2005)

Species	Wildlife Population Estimates				Population Densities			
	2003	2004	2005	2012	2003	2004	2005	2012
Gemsbok	52,953	50,919	67,880	90,777	0.510	0.590	0.670	1.020
Hartebeest	32,103	27,342	40,876	40,347	0.309	0.318	0.480	0.450
Springbok	17,697	29,286	11,544	29,704	0.171	0.341	0.110	0.330
Ostrich	12,751	14,085	16,696	20,136	0.123	0.160	0.170	0.230
Steenbok	13,571	10,362	12,793	18,537	0.131	0.120	0.127	0.210
Eland	16,619	6,265	25,959	18,041	0.160	0.073	0.260	0.200
Wildebeest	4,571	10,887	11,163	9,527	0.044	0.127	0.110	0.110
Duiker	1,724	356	1,222	5,272	0.017	0.004	0.012	0.060
Kudu	2,447	2,525	3,752	3,021	0.024	0.029	0.037	0.030
Warthog	146	258	101	812	0.001	0.003	0.001	0.010
Giraffe	-	-	-	272	-	-	-	0.000
Baboon	-	149	-	-	-	0.002	-	-
Jackal	799	593	1,443	-	0.008	0.007	0.014	-
BE Fox	48	394	239	-	0.000	0.005	0.002	-
Lion	50	56	277	-	0.000	0.001	0.003	-
B/Hyena	24	-	102	-	0.000	-	0.001	-
Cheetah	-	107	-	-	-	1.001	-	-

Source: Department of Wildlife & National Parks

Figure 1.3.3a: Wildlife Population Estimates of Selected Species for Kgalagadi District, (Censuses- 2003, 2004, & 2012; Survey- 2005)



1.3.4 Chobe District

Presented in Table 1.3.4a and Figure 1.3.4a are population estimates and densities of selected species for the years 2003, 2004, 2006 and 2012 in the Chobe District. It is evident from the table and figures that population trends of zebra, hippo, eland, lechwe, tsessebe, wildebeest, impala, elephant, giraffe, buffalo, gemsbok, kudu and ostrich fluctuated during the period under review. On average the elephant species had the highest population counts during all aerial surveys conducted since 2003. The second highest population estimates were that of the buffalo species followed by the zebra species.

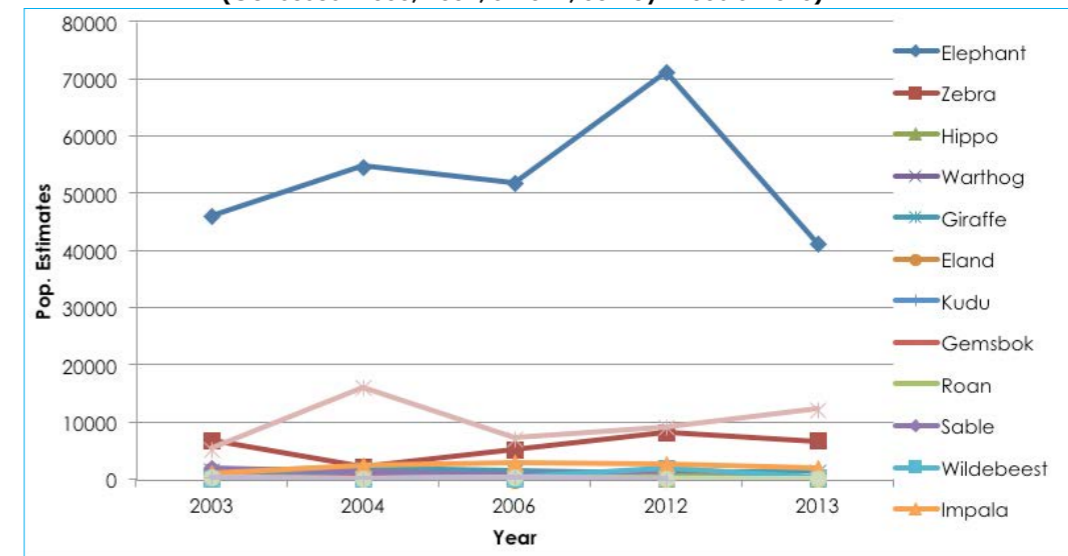
Consequently the density for the elephant species as shown in Table 1.5.4a was the highest compared to the rest of the wildlife species. The Zebra had the second highest densities after elephant (refer to Table 1.3.4a).

Table 1.3.4a: Wildlife Population Estimates & Densities of Selected Species for Chobe District, (Censuses- 2003, 2004, & 2012; Survey- 2006 & 2013)

Species	Wildlife Population Estimates					Population Densities				
	2003	2004	2006	2012	2013	2003	2004	2006	2012	2013
Elephant	46,144	54,744	51,799	71,227	41,288	2.173	2.606	2.478	6.410	3.950
Buffalo	5,304	15,976	7,153	9,111	12,219	0.250	0.760	0.342	0.820	1.170
Zebra	6,900	2,184	5,219	8,319	6,748	0.325	0.104	0.250	0.750	0.650
Impala	1,154	2,532	2,920	2,681	1,954	0.054	0.121	0.140	0.240	0.190
Giraffe	1,528	1,885	1,379	1,071	1,345	0.072	0.090	0.066	0.100	0.190
Wildebeest	109	152	237	1,952	382	0.005	0.007	0.011	0.180	0.040
Warthog	262	220	97	569	357	0.012	0.010	0.005	0.050	0.030
Roan	124	21	460	477	344	0.006	0.001	0.022	0.040	0.030
Eland	1,458	691	1,824	602	201	0.069	0.330	0.087	0.050	0.020
Hippo	103	85	272	186	195	0.005	0.004	0.013	0.020	0.020
Ostrich	492	200	485	239	182	0.023	0.010	0.023	0.020	0.020
Steenbok	54	166	223	75	99	0.003	0.008	0.011	0.010	0.010
Kudu	314	813	414	299	72	0.015	0.039	0.020	0.030	0.010
Waterbuck	27	197	-	-	58	0.001	0.009	-	-	0.010
Tsessebe	553	32	78	393	45	0.026	0.002	0.004	0.040	0.000
Gemsbok	265	321	203	201	32	0.012	0.015	0.010	0.020	0.000
Crocodile	4	-	26	-	5	0.000	-	0.001	-	0.000
Rhino (W)	-	-	16	-	-	-	-	0.001	-	-
Sable	1,920	1,327	731	1,413	-	0.090	0.063	0.035	0.130	-
Springbok	-	-	-	15	-	-	-	-	0.000	-
Lechwe	355	213	335	19	-	0.090	0.010	0.016	0.000	-
Reedbuck	-	32	-	-	-	-	0.010	-	-	-
Duiker	-	-	50	-	-	-	-	0.002	-	-
Carcass OL	-	17	-	-	-	-	0.001	-	-	-
Baboon	-	282	158	-	-	-	0.013	0.008	-	-
SPT Hyaena	28	15	-	-	-	0.001	0.001	-	-	-
Lion	-	46	-	-	-	-	0.002	-	-	-

Source: Department of Wildlife & National Parks

Figure 1.3.4a: Wildlife Population Estimates of Selected Species for Chobe District, (Censuses- 2003, 2004, & 2012; Survey- 2006 & 2013)



1.3.5 Central District

Table 1.3.5a and Figure 1.3.5a present information on population estimates and densities of wildlife for the years 2003, 2004, 2012 and 2013 in the Central District. There are concerns that population estimates for some species have significantly declined between 2003 and 2013 in the district. These include the buffalo (95.3 percent), kudu (94.2 percent), springbok (81.6 percent), duiker (95.2 percent), impala (99.1 percent), and steenbok (93.8 percent). This might be attributable to the fact that wild animals tend to change their habitat and become concentrated along water bodies more especially during dry seasons, hence a decline in population sizes in other areas. The other reason for the significant decline in the population of some wildlife species is the fact that the aerial surveys had varying stratum area (sampling intensity), hence huge variances in population estimates between the years.

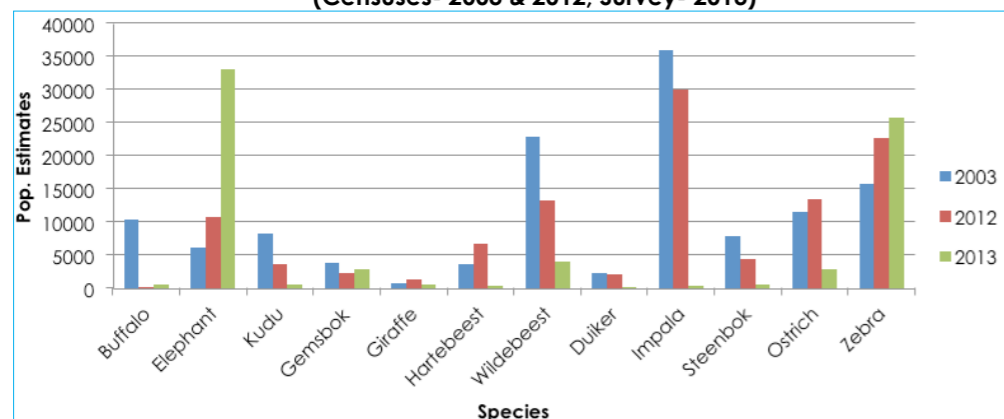
As expected, the elephant population has experienced a significant increase. It was estimated at 33,037 in 2013, with a four-fold increase between 2003 (6,235) and 2013. Table 1.3.5a further reveals that the elephant species had the highest population estimates and density during the review period, followed by impala and wildebeest.

Table 1.3.5a: Wildlife Population Estimates & Densities of Selected Species for Central District, (Censuses- 2003, 2004, & 2012; Survey- 2013)

Species	Wildlife Population Estimates				Population Densities			
	2003	2004*	2012	2013	2003	2004*	2012	2013
Elephant	6,235	17,625	10,697	33,037	0.049	0.270	0.080	0.990
Zebra	15,832	14,402	22,630	25,744	0.124	0.220	0.180	0.770
Wildebeest	22,839	3,757	13,321	4,054	0.179	0.060	0.100	0.120
Ostrich	11,435	4,209	13,427	2,821	0.090	0.070	0.100	0.080
Gemsbok	3,802	1,539	2,282	2,787	0.030	0.020	0.020	0.080
Springbok	5,042	6,202	-	929	0.040	0.100	-	0.030
Giraffe	821	991	1,285	562	0.006	0.020	0.010	0.020
Steenbok	7,856	940	4,425	490	0.062	0.010	0.030	0.010
Buffalo	10,304	117	222	487	0.081	0.000	0.000	0.010
Kudu	8,329	1,139	3,614	481	0.065	0.020	0.030	0.010
Hartebeest	3,551	126	6,767	342	0.028	0.000	0.050	0.010
Impala	35,954	3,574	29,995	336	0.282	0.060	0.230	0.010
Eland	-	-	-	161	-	-	-	0.000
Duiker	2,313	586	2,077	112	0.018	0.010	0.020	0.000
BE Fox	23	-	-	-	0.000	-	-	-
SPT/Hyaena	65	-	-	-	0.001	-	-	-
Warthog	1,473	120	728	-	0.012	0.000	0.010	-
Waterbuck	333	77	580	-	0.003	0.000	0.000	-
Baboon	584	24	-	-	0.005	0.000	-	-
Jackal	556	30	-	-	0.004	-	-	-

Source: Department of Wildlife & National Parks
*In 2004, Central District was not fully surveyed.

Figure 1.3.5a: Wildlife Population Estimates of Selected Species for Central District, (Censuses- 2003 & 2012; Survey- 2013)



1.3.6 Kweneng District

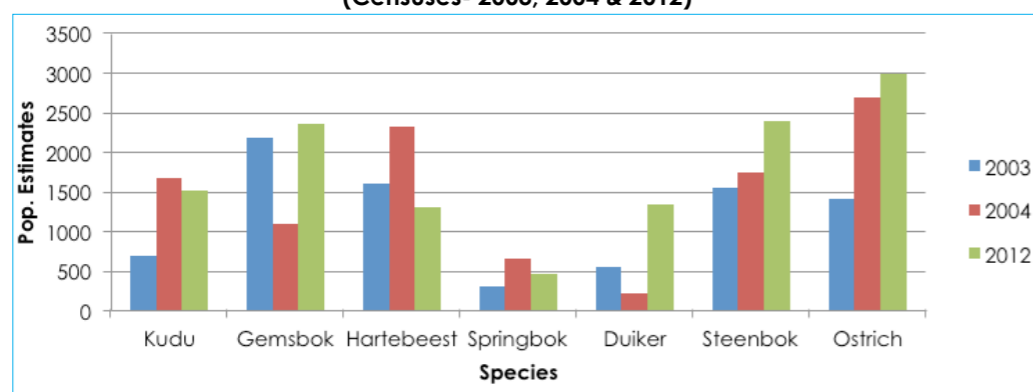
Table 1.3.6a shows that population estimates of the steenbok and ostrich followed an upward trend during the years 2003, 2004 and 2012, while those of the kudu, hartebeest, springbok and duiker fluctuated during the same period.

Table 1.3.6a: Wildlife Population Estimates & Densities of Selected Species for Kweneng District, (Censuses- 2003, 2004 & 2012)

Species	Population Estimates			Population Densities		
	2003	2004	2012	2003	2004	2012
Ostrich	1,408	2,697	2,999	0.046	0.076	0.090
Steenbok	1,559	1,755	2,403	0.051	0.049	0.070
Gemsbok	2,191	1,104	2,353	0.072	0.031	0.070
Kudu	692	1,675	1,516	0.023	0.047	0.040
Duiker	565	230	1,345	0.019	0.006	0.040
Hartebeest	1,614	2,321	1,314	0.053	0.065	0.040
Impala	230	-	638	0.008	-	0.020
Springbok	314	663	474	0.010	0.019	0.010
Wildebeest	-	370	376	-	0.010	0.010
Giraffe	-	154	348	-	0.004	0.010
Warthog	51	-	154	0.002	-	0.000
Eland	1,462	293	-	0.048	0.008	0.000
Jackal	26	73	-	0.001	0.002	-
Lion	-	51	-	-	0.001	-

Source: Department of Wildlife & National Parks

Figure 1.3.6a: Wildlife Population Estimates of Selected Species for Kweneng District, (Censuses- 2003, 2004 & 2012)



1.3.7 North East District

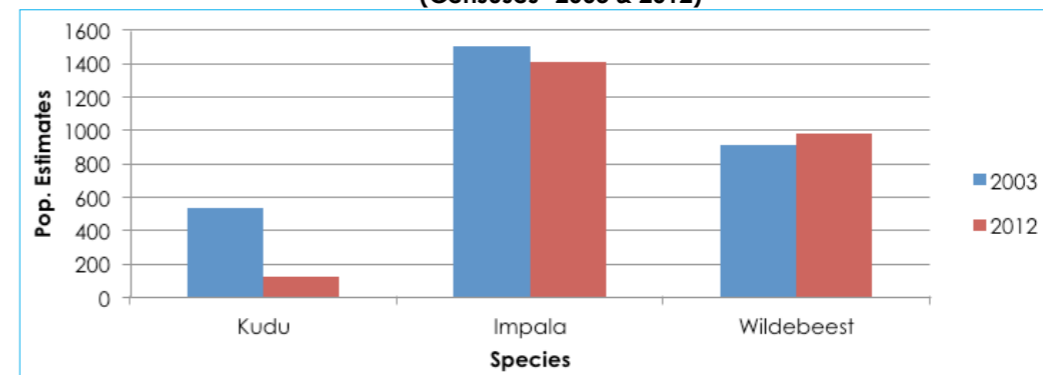
Table 1.3.7a presents a few species of animals that were sighted during the 2003 and 2012 aerial surveys. The population estimates of both kudu and impala declined between 2003 and 2012, while that of the wildebeest slightly increased. The kudu declined by 77.3 percent between 2003 and 2012 while impala declined by 6.3 percent in the same period. Impala had the highest density.

Table 1.3.7a: Wildlife Population Estimates & Densities of Selected Species for North East District, (Censuses- 2003 & 2012)

Species	Population Estimates		Population Densities	
	2003	2012	2003	2012
Impala	1,503	1,408	0.242	0.260
Wildebeest	912	986	0.147	0.190
Zebra	-	986	-	0.190
Kudu	537	122	0.087	0.020
Steenbok	-	47	-	0.010
Ostrich	-	47	-	0.010

Source: Department of Wildlife & National Parks

Figure 1.3.7a: Wildlife Population Estimates of Selected Species for North East District, (Censuses- 2003 & 2012)



1.3.8 Southern District

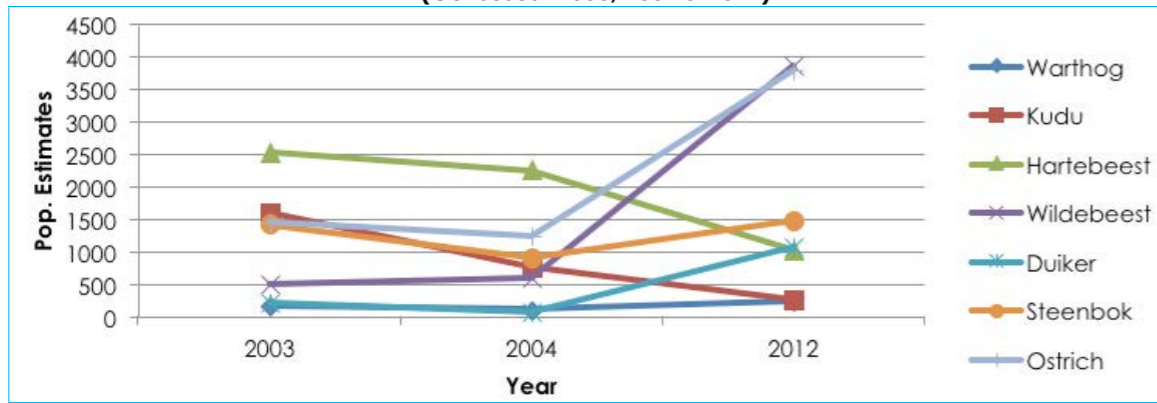
Table 1.3.8a shows that the population of kudu and hartebeest declined in the period 2003 to 2012. On the other hand, the population of wildebeest and duiker increased during the same period. Springbok had the highest population estimate and density.

Table 1.3.8a: Wildlife Population Estimates & Densities of Selected Species for Southern District, (Censuses- 2003, 2004 & 2012)

Species	Wildlife Population Estimates			Population Densities		
	2003	2004	2012	2003	2004	2012
Wildebeest	500	605	3,870	0.018	0.022	0.150
Ostrich	1,464	1,236	3,792	0.054	0.045	0.150
Steenbok	1,430	912	1,492	0.052	0.033	0.060
Duiker	223	75	1,083	0.008	0.003	0.040
Hartebeest	2,540	2,261	1,036	0.093	0.083	0.040
Gemsbok	-	-	450	-	-	0.020
Zebra	-	-	414	-	-	0.020
Kudu	1,599	770	262	0.058	0.042	0.010
Warthog	173	110	238	0.006	0.004	0.010
Impala	-	-	176	-	-	0.010
Springbok	5,497	6,683	-	0.201	0.243	-
Baboon	100	550	-	0.004	0.020	-
Jackal	123	55	-	0.004	0.000	-

Source: Department of Wildlife & National Parks

Figure 1.3.8a: Wildlife Population Estimates of Selected Species for Southern District, (Censuses- 2003, 2004 & 2012)



1.3.9 Kgatleng District

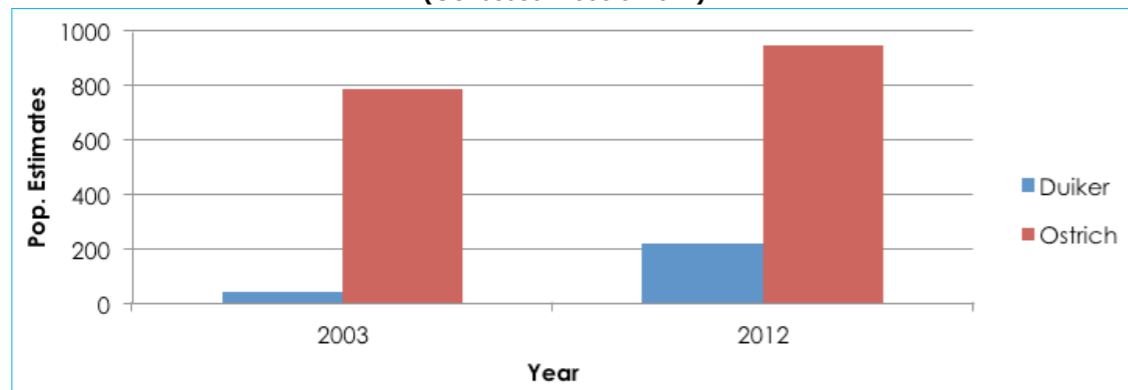
Kgatleng District has one of the lowest wildlife population sizes compared to the rest of the districts in Botswana. As a result only two surveys were conducted in that district between 2003 and 2012. The species sighted during the surveys were warthog, kudu, giraffe, impala, wildebeest, duiker, steenbok, and ostrich. It is evident from Table 1.3.9a that the population of both duiker and ostrich increased from 2003 to 2012. Ostrich, impala and kudu had the highest population density.

Table 1.3.9a: Wildlife Population Estimates & Densities of Selected Species for Kgatleng District, (Censuses- 2003 & 2012)

Species	Population Estimates		Population Densities	
	2003	2012	2003	2012
Impala	-	2,886	-	0.430
Kudu	-	998	-	0.150
Ostrich	790	946	0.114	0.140
Steenbok	-	350	-	0.050
Duiker	46	220	0.007	0.030
Warthog	-	190	-	0.030
Giraffe	-	59	-	0.000
Ostrich	790	946	0.114	0.140

Source: Department of Wildlife & National Parks

Figure 1.3.9a: Wildlife Population Estimates of Selected Species for Kgatleng District, (Censuses- 2003 & 2012)



1.4 Combined Countrywide Population Estimates and Densities by Species

This section presents information on countrywide population estimates and densities for the 2003, 2004 and 2012 dry seasons by individual species. It is worth noting that the Central District was not fully surveyed during the 2004 aerial survey, hence a slight decline in a few animal species' population estimates and densities. Densities are given as the number of animals per square kilometre. Each animal species is accompanied by a brief narrative and a graphical presentation of population estimates and densities.

1.4.1 Elephant

The bulk of the elephant population in Botswana are concentrated along the permanent river courses; the Okavango Delta, Nxai/Makgadikgadi Pans National Park, and the Chobe district; including Chobe National Park. During the period under review, the elephant population was on the increase. A total of 109,471 elephants were sighted in 2003, while the numbers increased to 151,000 in 2004 and subsequently to 207,545 in 2012.

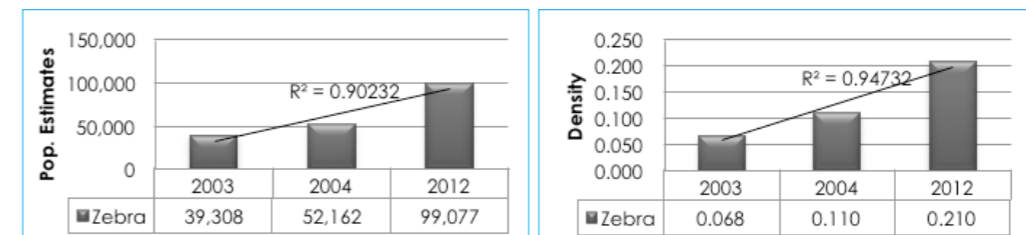
Figure 1.4a Elephant Population Estimates & Density



1.4.2 Zebra

Zebras in Botswana are mainly found in the northern part of the country, with the highest distribution stretching from the Okavango Delta towards Chobe District (DWNP, 2003). Some zebras are also found; in the Chobe district; towards the Zimbabwe border; Makgadikgadi Pans National Park; Tuli Block and a few in the North East and Southern Districts, and the Ghanzi ranches. The zebra population followed an upward trend during the years, 2003, 2004 and 2012. The zebra population density also followed the same trend during the review period.

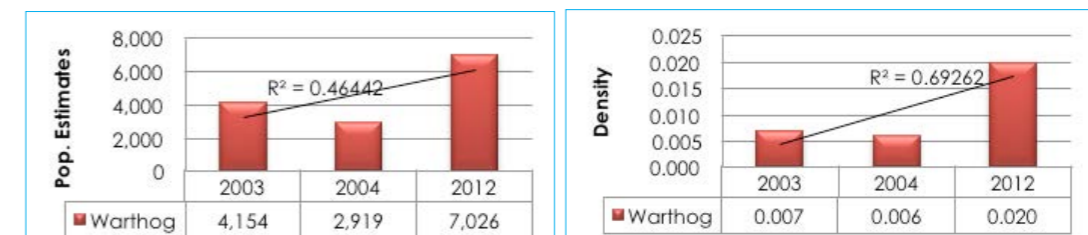
Figure 1.4b Zebra Population Estimates & Density



1.4.3 Warthog

The warthog is sparsely distributed in the following districts; Ngamiland, Kgalagadi, Ghanzi and South East Districts. Some are also found in the Tuli Block. During the 2012 Aerial survey, large numbers occurred in the Ghanzi District. The warthog population estimates dropped between 2003 and 2004, and eventually increased in 2012. Their densities also followed the same trend.

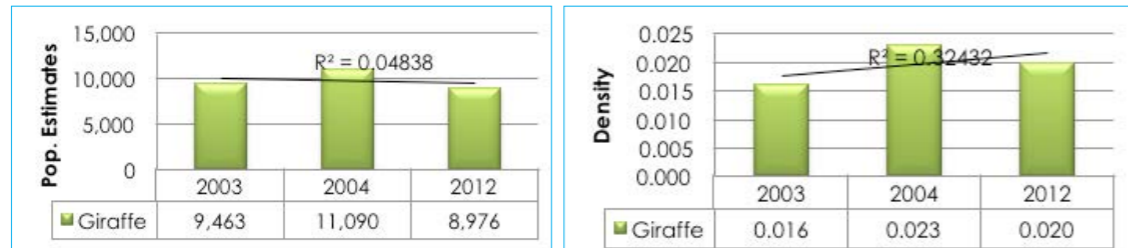
Figure 1.4c Warthog Population Estimates & Density



1.4.4 Giraffe

In Botswana giraffe are found in Ngamiland (Okavango Delta) spreading towards the east, Ghanzi (Central Kalahari Game Reserve), Kweneng and Southern Districts. They are also found around the Tuli Block and Khawa Wildlife Management Area (DWNP, 2013). The giraffe population estimates fluctuated during the review period, with the highest estimates (11,090) and density (0.023 Giraffes per square kilometre) recorded in the year 2004.

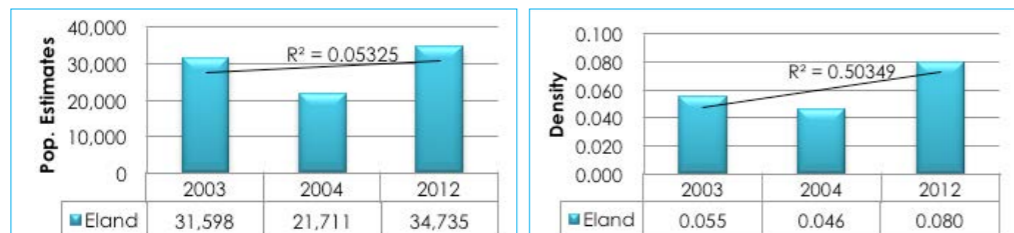
Figure 1.4d Giraffe Population Estimates & Density



1.4.5 Eland

Large numbers of eland are found in the Ghanzi District (around the Central Kalahari Game Reserve), and the Kgalagadi District (around the Gemsbok National Park). A small number of them are found in the Chobe, Ngamiland and Central Districts. The eland population estimates dropped between 2003 and 2004, and later increased in 2012. The population density reduced with the decrease in eland population and vice versa

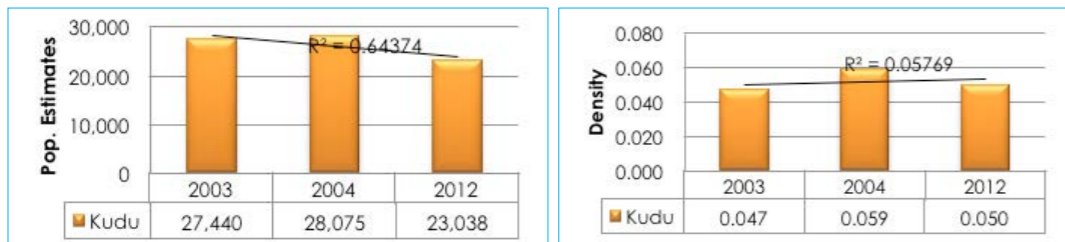
Figure 1.4e Eland Population Estimates & Density



1.4.6 Kudu

The kudu species is evenly distributed across Botswana. The National Kudu population estimates have generally remained over 20,000 during the three national aerial surveys conducted in 2003, 2004 and 2012. Nonetheless, the population estimates experienced a slight increase from the year 2003 to the year 2004, and then dropped in 2012. According to DWNP (2013), the species, however, tends to be under-estimated as it is cryptic and difficult to spot from the air (p. 37).

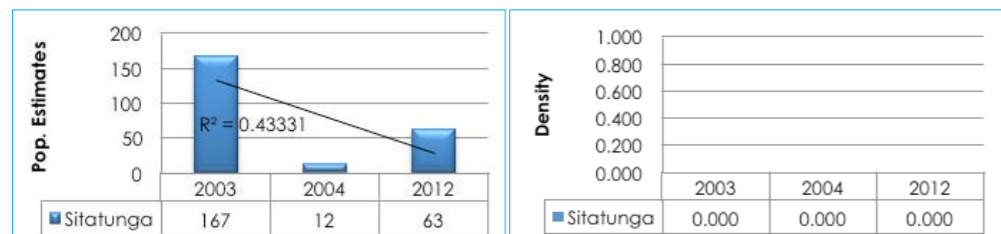
Figure 1.4f Kudu Population Estimates & Density



1.4.7 Sitatunga

The sitatunga species is mainly restricted to the Ngamiland District, specifically to the Okavango Delta and along the Panhandle. Sitatunga population estimates dropped drastically from 167 in 2003 to 12 in 2004 and then increased to 63 in 2012. The low counts might be attributable to the fact that it is difficult to count sitatunga from the air because of their cryptic behaviour and aquatic habitat. There is therefore a high likelihood that they were underestimated.

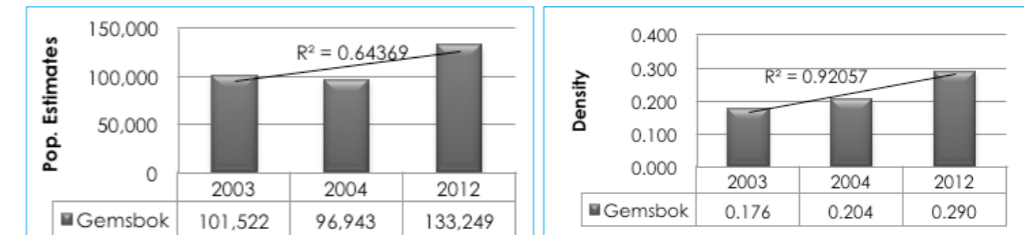
Figure 1.4g Sitatunga Population Estimates & Density



1.4.8 Gemsbok

The majority of gemsboks are found in the Central Kalahari Game Reserve and the Kalahari Trans-frontier National Park, with pockets of distribution evident in south-western Ngamiland. Generally, the national gemsbok population estimates remained over 95,000 during the review period. The population estimates slightly dropped between 2003 and 2004 and increased in 2012. The gemsbok population density on the other hand followed an upward trend with 0.176 per square kilometre recorded in 2003, 0.204 in 2004 and 0.290 in 2012.

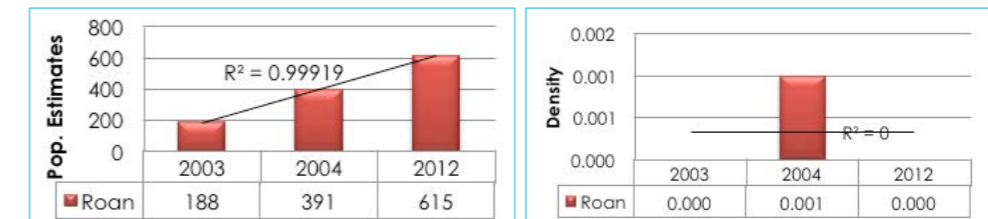
Figure 1.4h Gemsbok Population Estimates & Density



1.4.9 Roan

In Botswana roan is mainly found in the Chobe National Park, the Okavango Delta and along the Zimbabwe border. Even though it is difficult to count roan because of their habitat preference, their population estimates were on the increase during the review period. In the year 2003, 188 roans were counted, 391 were counted in 2004, while a count of 615 was recorded in 2012.

Figure 1.4i Roan Population Estimates & Density



1.4.10 Sable

The distribution of sable is largely restricted to the Chobe District, particularly within the Chobe National Park and along the Zimbabwe border, as well as some parts of Ngamiland District. The sable population in Botswana followed a decreasing trend from 2003 to 2012.

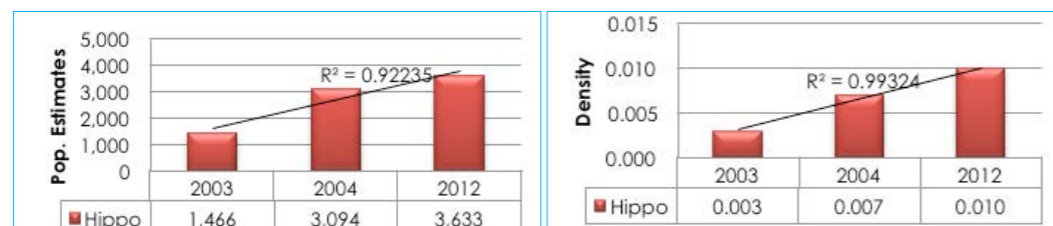
Figure 1.4j Sable Population Estimates & Density



1.4.11 Hippo

Although most hippos are found in the Okavango Delta, others are found in the Chobe-Linyanti-Kwando river system. Their aquatic habitat results in under-counting. Nonetheless, their population estimates followed an upward trend, with a count of 1,466 recorded in 2003, 3,094 in 2004 and 3,633 in 2012. The hippo population density was also on the increase, with 0.003 hippos per square kilometre in 2003, 0.007 in 2004, and 0.010 in 2012.

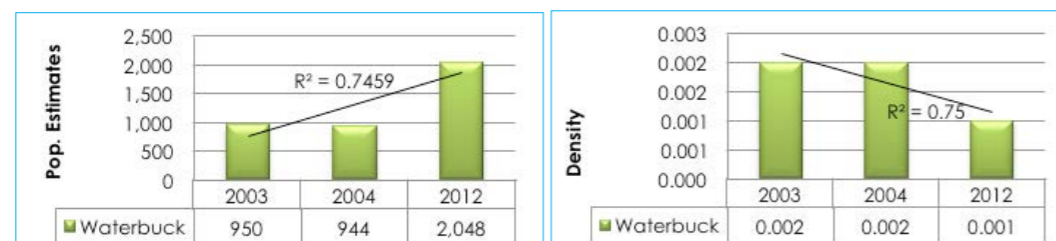
Figure 1.4k Hippo Population Estimates & Density



1.4.12 Water buck

The water buck species are found along the Chobe River, in the Okavango Delta and Tuli Block (along the Limpopo River), and some parts of Ghanzi farms. The water buck population remained fairly the same between the years 2003 (950) and 2004 (944), with a significant increase recorded in 2012 (2,048).

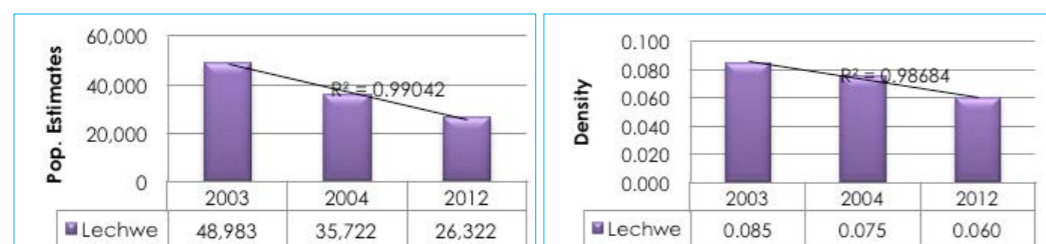
Figure 1.4l Water buck Population Estimates & Density



1.4.13 Lechwe

Lechwe are mainly found in the Okavango Delta, along the Chobe-Kwando-Linyanti river system and the Chobe Riverfront. Both population estimates and density followed a declining trend during the review period. The lechwe population declined between 2003 and 2004 by about 20 percent and then in 2012 it recorded a decrease of about 26 percent from a number registered in 2004.

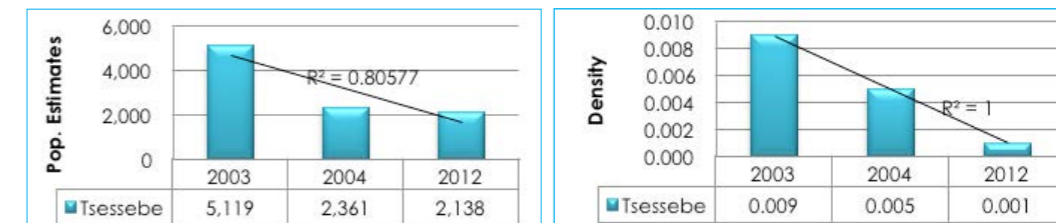
Figure 1.4m Lechwe Population Estimates & Density



1.4.14 Tsessebe

Most of the Tsessebe is found in and around the permanent water bodies in northern Botswana, particularly in the Linyanti-Kwando system, Okavango Delta, and Savuti area in the Chobe National Park. Some are concentrated inside Moremi Game Reserve and along the Zimbabwe border. Generally, the tsessebe population was on the decline during the aerial surveys under review. Their population density reduced in the period 2003, 2004 and 2012.

Figure 1.4n Tsessebe Population Estimates & Density



1.4.15 Hartebeest

The majority of Hartebeest is found throughout the Kalahari ecosystem and towards the Central District. Some animals are found in and around Moremi Game Reserve and next to Makgadikgadi/Nxai National parks. Their population estimates were over 39,000 during the review period. The hartebeest population fluctuated between the years, with the highest count recorded in 2012 (62,569) and the lowest in 2004 (39,553). The same trend was observed in their densities.

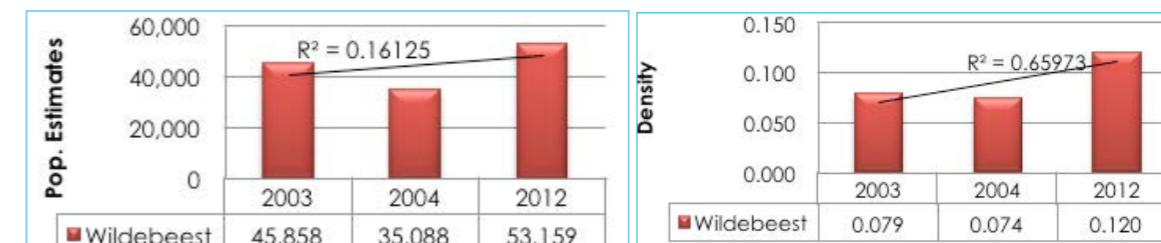
Figure 1.4o Hartebeest Population Estimates & Density



1.4.16 Wildebeest

The wildebeest is commonly found throughout the Kalahari ecosystem. They are also found in the Makgadikgadi Pans, North East, Central, Ngamiland and Chobe Districts. The wildebeest population estimates reduced from 45,858 in 2003 to 35,088 in 2004 then increased significantly to 53,159 in 2012. The same trend was observed in their densities.

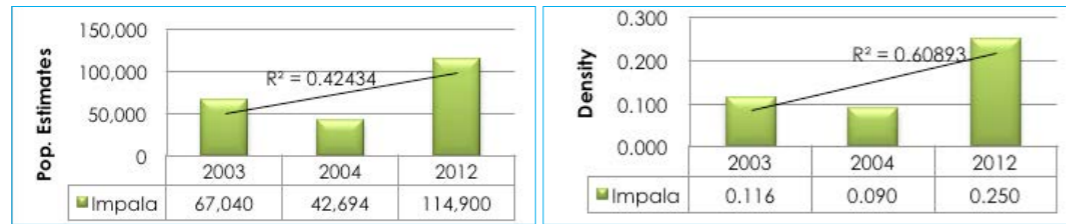
Figure 1.4p Wildebeest Population Estimates & Density



1.4.17 Impala

The impala is found mostly in the Ngamiland District (Okavango Delta) and in the Tuli Block and Mashatu. Other populations are distributed in the Central, North East, Kweneng, Kgatleng, Southern, and South east Districts. The impala population estimates fluctuated between the years under review, with the highest count recorded in 2012 (114,900) and the lowest count observed in 2004 (42,694). Impala density followed the same trend.

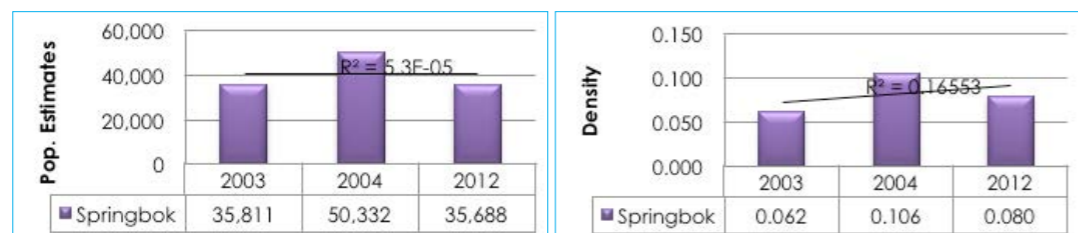
Figure 1.4q Impala Population Estimates & Density



1.4.18 Springbok

The largest springbok population is observed in the Ghanzi and Kgalegadi Districts. A few springboks are found in the Southern District, though it had the highest population of the species a decade ago (DWNP, 2004). The springbok population increased by about 41 percent from 2003 to 2004 and then dropped by about 29 percent from 2004 to 2012. The same trend is evident in their densities.

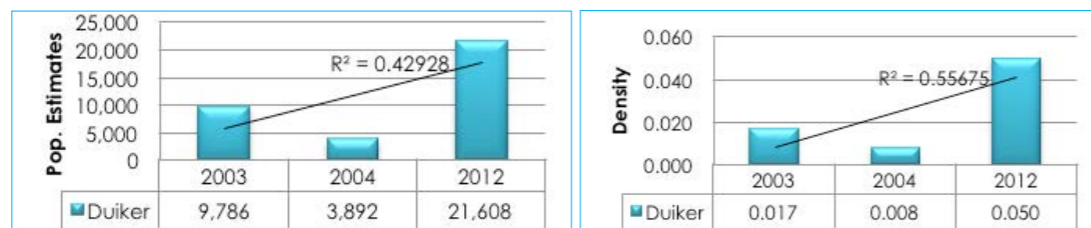
Figure 1.4r Springbok Population Estimates & Density



1.4.19 Duiker

The duiker is found throughout the country, with the Kalahari ecosystem in Ghanzi District having the having the largest population of the species. According to DWNP (2013: 29) it is difficult to observe duiker from the air as visibility of this species may be affected by variation in vegetation as well as consistency among observers (p. 29). This might have contributed to low population estimates. It is evident from Figure 1.4s that the Duiker population dropped between 2003 and 2004, then increased significantly in 2012.

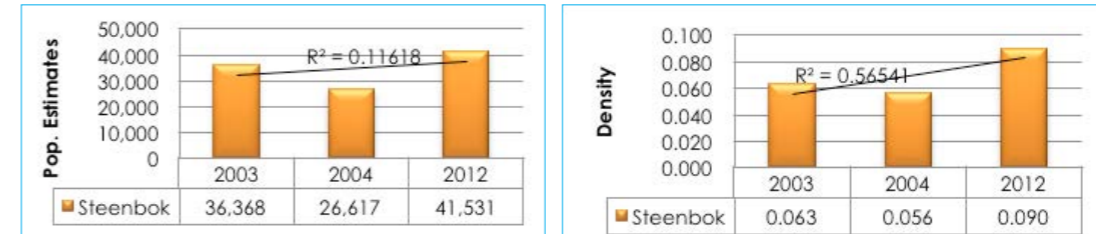
Figure 1.4s Duiker Population Estimates & Density



1.4.20 Steenbok

Steenbok is common throughout the country with the majority found in the Kalahari ecosystem. Just like the duiker species, steenbok species is also difficult to count from the air. According to DWNP (2013), the duiker is small in size and has a tendency of taking refuge in vegetation and burrows; as a result they might be underestimated. The national steenbok population decreased from 36,368 in 2003 to 26,617 in 2004. They then increased to 41,531 in 2012. The same pattern was observed in their density.

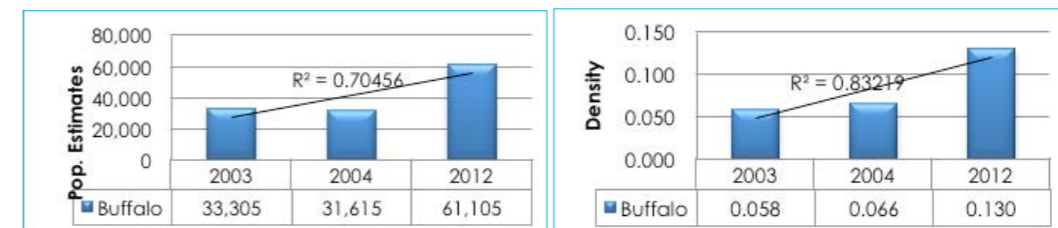
Figure 1.4t Steenbok Population Estimates & Density



1.4.21 Buffalo

The majority of buffalo occurs in the northern part of Botswana, particularly in the Okavango Delta (Ngamiland District) and towards the Chobe riverfront in the Chobe National Park (Chobe District). Some are found along the eastern border with Zimbabwe. Generally over 30,000 estimated counts of buffalo species were found during each of the surveys under review.

Figure 1.4u Buffalo Population Estimates & Density



1.5 Animal Estimates by Protected Area

The purpose of this section is to present trends on animal population estimates and densities by Protected Area in Botswana, for the period 2003 to 2013. It is worth mentioning that there are seeming inconsistencies in population densities of several animal species due to the difference in sizes of sample areas.

Elephant

District	Wildlife Population Estimates						Population Densities					
	2003	2004	2005	2006	2012	2013	2003	2004	2005	2006	2012	2013
Chobe National Park	30,348	32,263	-	39,404	26,134	26,592	2.960	3.196	-	3.949	4.730	4.370
Moremi Game Reserve	5,862	9,143	19,852	10,146	17,149	5,378	2.960	2.443	5.304	2.816	3.690	1.240
Nxai & Makgadikgadi	453	810	-	1,384	707	2,693	0.082	0.105	-	0.279	0.160	0.610

Note: (-) not covered by the survey
Source: Department of Wildlife & National Parks

Zebra

District	Wildlife Population Estimates					Population Densities				
	2003	2004	2006	2012	2013	2003	2004	2006	2012	2013
Nxai & Makgadikgadi	11,425	20,257	19,345	51,964	31,451	1.058	2.615	3.301	11.480	7.130
Chobe National Park	2,121	1,151	1,728	596	5,423	0.207	0.114	0.173	0.110	0.890
Moremi Game Reserve	1,500	810	992	3,668	1,600	0.416	0.216	0.275	0.790	0.370

Note: (-) not covered by the survey
Source: Department of Wildlife & National Parks

Hippo

District	Wildlife Population Estimates					Population Densities				
	2003	2004	2006	2012	2013	2003	2004	2006	2012	2013
Moremi Game Reserve	458	593	432	958	2,574	0.127	0.158	0.120	0.210	0.590
Chobe National Park	50	85	271	35	113	0.005	0.008	0.027	0.010	0.020

Note: (-) not covered by the survey
Source: Department of Wildlife & National Parks

Warthog

District	Wildlife Population Estimates							Population Densities						
	2003	2004	2005	2006	2007	2012	2013	2003	2004	2005	2006	2007	2012	2013
Moremi Game Reserve	208	206	36	192	-	194	430	0.058	0.055	0.010	0.053	-	0.040	0.100
Chobe National Park	170	167	-	16	-	91	-	0.017	0.017	-	0.002	-	0.020	-
Central Kalahari Game Reserve	23	89	84	-	332	171	-	0.001	0.002	0.002	-	0.006	0.010	-
Kalahari Transfontier park	-	-	67	-	-	-	-	-	-	0.003	-	-	-	-

Note: (-) not covered by the survey
Source: Department of Wildlife & National Parks

Giraffe

District	Wildlife Population Estimates							Population Densities						
	2003	2004	2005	2006	2007	2012	2013	2003	2004	2005	2006	2007	2012	2013
Chobe National Park	999	1,044	-	793	-	545	638	0.097	0.103	-	0.080	-	0.100	0.100
Moremi Game Reserve	958	1,101	1,629	1,088	-	1,047	584	0.266	0.294	0.435	0.302	-	0.230	0.130
Nxai & Makgadikgadi	327	867	-	129	-	92	62	0.044	0.122	-	0.026	-	0.020	0.010
Central Kalahari Game Reserve	703	1,148	1,210	-	1,183	923	-	0.013	0.022	0.023	-	0.023	0.030	-
Khutse Game Reserve	-	154	219	-	-	348	-	-	0.058	0.083	-	-	0.180	-

Note: (-) not covered by the survey
Source: Department of Wildlife & National Parks

Eland

District	Wildlife Population Estimates							Population Densities						
	2003	2004	2005	2006	2007	2012	2013	2003	2004	2005	2006	2007	2012	2013
Chobe National Park	115	218	-	240	-	234	13	0.011	0.022	-	0.024	-	0.040	0.000
Moremi Game Reserve	-	-	448	-	-	-	-	-	-	0.120	-	-	-	-
Central Kalahari Game Reserve	6,344	8,321	1,937	-	2,809	8,981	-	0.121	0.159	0.037	-	0.054	0.300	-
Nxai & Makgadikgadi	-	-	-	-	-	30	-	-	-	-	-	-	0.010	-
Kalahari Transfontier park	10,352	4,133	25,237	-	3,108	12,537	-	0.391	0.156	0.956	-	0.117	0.520	-
Khutse Game Reserve	943	51	137	-	-	-	-	0.356	0.019	0.052	-	-	-	-

Note: (-) not covered by the survey
Source: Department of Wildlife & National Parks

Kudu

District	Wildlife Population Estimates							Population Densities						
	2003	2004	2005	2006	2007	2012	2013	2003	2004	2005	2006	2007	2012	2013
Moremi Game Reserve	458	85	251	192	-	842	392	0.127	1.023	0.067	0.053	-	0.180	0.090
Nxai & Makgadikgadi	514	1,029	-	418	-	120	374	0.091	0.133	-	0.084	-	0.030	0.080
Chobe National Park	205	434	-	254	-	132	7	0.020	0.043	-	0.026	-	0.020	0.000
Central Kalahari Game Reserve	2,941	5,762	2,907	-	1,340	2,000	-	0.056	0.110	0.037	-	0.026	0.070	-
Kalahari Transfontier park	274	345	594	-	485	120	-	0.010	0.013	0.022	-	0.018	0.000	-
Khutse Game Reserve	288	-	27	-	-	104	-	0.109	-	0.010	-	-	0.050	-

Note: (-) not covered by the survey
Source: Department of Wildlife & National Parks

Gemsbok

District	Wildlife Population Estimates							Population Densities						
	2003	2004	2005	2006	2007	2012	2013	2003	2004	2005	2006	2007	2012	2013
Nxai & Makgadikgadi	1,717	2,326	-	1,963	-	1,324	2,957	0.305	0.300	-	0.396	-	0.290	0.670
Chobe National Park	55	-	16	-	-	-	-	0.005	-	0.002	-	-	-	-
Central Kalahari Game Reserve	29,609	30,601	29,196	-	21,985	22,650	-	0.565	0.584	0.561	-	0.420	0.770	-
Kalahari Transfontier park	27,926	30,262	47,307	-	22,582	62,396	-	1.054	0.300	1.791	-	0.852	2.590	-
Khutse Game Reserve	1,232	642	657	-	394	1,718	-	0.464	0.584	0.248	-	0.149	0.890	-

Note: (-) not covered by the survey
Source: Department of Wildlife & National Parks

Roan

District	Wildlife Population Estimates							Population Densities						
	2003	2004	2005	2006	2007	2012	2013	2003	2004	2005	2006	2007	2012	2013
Chobe National Park	68	20	-	421	-	161	91	0.007	0.002	-	0.042	-	0.030	0.020
Moremi Game Reserve	-	18	-	-	-	-	-	-	0.000	-	-	-	-	-

Note: (-) not covered by the survey
Source: Department of Wildlife & National Parks

Sable

District	Wildlife Population Estimates							Population Densities						
	2003	2004	2005	2006	2007	2012	2013	2003	2004	2005	2006	2007	2012	2013
Chobe National Park	1,117	116	-	427	-	939	104	0.109	0.011	-	0.003	-	0.17	0.02

Note: (-) not covered by the survey
Source: Department of Wildlife & National Parks

Waterbuck

District	Wildlife Population Estimates							Population Densities						
	2003	2004	2005	2006	2007	2012	2013	2003	2004	2005	2006	2007	2012	2013
Chobe National Park	27	175	-	-	-	-	15	0.003	0.017	-	-	-	-	0.000
Moremi Game Reserve	111	157	90	272	-	49	-	0.031	0.042	0.024	0.076	-	0.010	-

Note: (-) not covered by the survey
Source: Department of Wildlife & National Parks

Lechwe

District	Wildlife Population Estimates							Population Densities						
	2003	2004	2005	2006	2007	2012	2013	2003	2004	2005	2006	2007	2012	2013
Moremi Game Reserve	6,682	5,793	6,498	3,825	-	13,779	21,902	1.854	1.458	1.736	1.062	-	2.970	5.030
Chobe National Park	362	197	-	333	-	19	-	0.035	0.020	-	0.033	-	0.000	-

Note: (-) not covered by the survey
Source: Department of Wildlife & National Parks

Wildebeest

District	Wildlife Population Estimates							Population Densities						
	2003	2004	2005	2006	2007	2012	2013	2003	2004	2005	2006	2007	2012	2013
Chobe National Park	-	145	-	236	-	1,951	382	-	0.014	0.024	-	0.350	0.060	
Moremi Game Reserve	236	980	1,736	848	-	194	609	0.066	0.262	0.464	0.235	-	0.040	0.140
Central Kalahari Game Reserve	989	1,521	446	-	1,431	997	-	0.019	0.029	0.009	-	0.027	0.030	-
Nxai & Makgadikgadi	4,609	1,371	-	6,242	-	10,727	2,738	0.818	0.177	-	1.261	-	2.370	0.620
Kalahari Transfontier park	202	2,523	4,385	-	1,326	6,114	-	0.008	0.095	0.166	-	0.050	0.250	-

Note: (-) not covered by the survey
Source: Department of Wildlife & National Parks

Impala

District	Wildlife Population Estimates							Population Densities						
	2003	2004	2005	2006	2007	2012	2013	2003	2004	2005	2006	2007	2012	2013
Moremi Game Reserve	10,071	7,341	12,029	13,747	-	39,298	33,102	2.795	1.961	3.214	3.815	-	8.460	7.600
Chobe National Park	-	1,645	-	2,024	-	2,303	1,880	-	0.163	-	0.203	-	0.420	0.310

Note: (-) not covered by the survey
Source: Department of Wildlife & National Parks

Duiker

District	Wildlife Population Estimates							Population Densities						
	2003	2004	2005	2006	2007	2012	2013	2003	2004	2005	2006	2007	2012	2013
Central Kalahari Game Reserve	571	506	557	-	1,909	2,202	-	0.011	0.010	0.011	-	0.036	0.070	-
Khutse Game Reserve	79	51	27	-	53	170	-	0.030	0.019	0.010	-	0.030	0.090	-
Kalahari Transfontier park	-	68	-	-	-	105	-	-	0.009	-	-	-	0.020	-
Chobe National Park	-	-	-	35	-	-	-	-	-	-	0.003	-	-	-

Note: (-) not covered by the survey
Source: Department of Wildlife & National Parks

Steenbok

District	Wildlife Population Estimates							Population Densities						
	2003	2004	2005	2006	2007	2012	2013	2003	2004	2005	2006	2007	2012	2013
Nxai & Makgadikgadi	352	199	-	-	-	363	187	0.035	0.026	-	-	-	0.080	0.040
Moremi Game Reserve	-	12	-	-	-	19	89	-	0.003	-	-	-	0.000	0.020
Chobe National Park	42	93	-	16	-	-	69	0.004	0.009	-	0.002	-	-	0.010
Central Kalahari Game Reserve	2,940	3,590	2,970	-	4,672	2,536	-	0.056	0.069	0.057	-	0.089	0.090	-
Kalahari Transfontier park	4,418	4,242	5,226	-	1,891	7,894	-	0.167	0.160	0.198	-	0.071	0.330	-
Khutse Game Reserve	367	51	110	-	79	163	-	0.138	0.019	0.041	-	0.030	0.080	-

Note: (-) not covered by the survey
Source: Department of Wildlife & National Parks

Buffalo

District	Wildlife Population Estimates							Population Densities						
	2003	2004	2005	2006	2012	2013	2003	2004	2005	2006	2012	2013		
Chobe National Park	3,773	10,603	-	6,922	5,830	3,486	-	0.368	1.050	-	0.694	1.060	0.570	
Moremi Game Reserve	597	1,089	4,296	176	4,178	2,687	-	0.368	0.291	1.148	0.049	0.900	0.620	

Note: (-) not covered by the survey
Source: Department of Wildlife & National Parks

Baboon

District	Wildlife Population Estimates				Population Densities			
	2003	2004	2005	2006	2003	2004	2005	2006
Moremi Game Reserve	667	629	591	272	0.185	0.168	0.158	0.076
Chobe National Park	-	282	-	-	-	0.028	-	-

Note: (-) not covered by the survey
Source: Department of Wildlife & National Parks

Tsessebe

District	Wildlife Population Estimates							Population Densities						
	2003	2004	2005	2006	2007	2012	2013	2003	2004	2005	2006	2007	2012	2013
Moremi Game Reserve	778	665	1,128	1,200	-	713	634	0.216	0.178	0.301	0.333	-	0.150	0.150
Chobe National Park	77	-	-	-	-	41	30	0.008	-	-	-	-	0.010	0.000

Note: (-) not covered by the survey
Source: Department of Wildlife & National Parks

Ostrich

District	Wildlife Population Estimates							Population Densities						
	2003	2004	2005	2006	2007	2012	2013	2003	2004	2005	2006	2007	2012	2013
Nxai & Makgadikgadi	1,165	530	-	-	1,062	1,216	1,173	0.119	0.068	-	0.071	-	0.270	0.270
Chobe National Park	369	78	-	-	362	-	128	0.036	0.008	-	1.036	-	0.020	0.030
Moremi Game Reserve	125	-	107	32	-	31	107	0.035	-	0.029	0.009	-	0.010	0.020
Central Kalahari Game Reserve	3,807	4,527	4,264	-	2,811	2,618	-	0.073	0.086	0.082	-	0.054	0.090	-
Kalahari Transfontier park	2,779	2,889	5,015	-	5,364	6,451	-	0.105	0.109	0.190	-	0.202	0.270	-
Khutse Game Reserve	157	205	110	-	368	290	-	0.059	0.077	0.041	-	0.139	0.150	-

Note: (-) not covered by the survey
Source: Department of Wildlife & National Parks

2.0 WHITE RHINO POPULATION

Historically the population of rhinos in Botswana has been on the decline, that is, since the 1980s to early 2000s. They were almost near extinction. The Black Rhinoceros (*Diceros bicornis minor*) and White Rhinoceros (*Ceratotherium simum*) were both historically found in Botswana. The white rhino was more widespread and occurred in the northern part of Botswana in the 1970s to the early 1990s as compared to the black rhino (Joubert, 1996). According to Emslie & Brook (1999) the decline in the population of white rhino was attributable to the fact that during the late 19th and early 20th centuries, there was unrestricted trophy hunting. Furthermore, high rhino poaching incidences has been an eyesore to the Government's effort of managing biodiversity. By 1984 the white rhino population had reached 190, but in 1992 numbers had drastically dropped as a result of poaching and only 27 animals were thought to survive (Emslie & Brooks, 1999). This led to near-extinction of the white rhino.

As a response to the plummeting number of rhinoceros in Botswana, an ambitious re-introduction project was initiated between 1967 and 1981 where a total of 94 white rhinos were introduced from South Africa. The majority of the introduced rhinos were released into the Chobe National Park and some were released into the Moremi Game Reserve (Myers et al. 2004).

The Botswana Defence Force (BDF) was given a challenging mandate to bring to a halt commercial poaching. They worked hand in hand with the Department of Wildlife National Parks. Some of the remaining white rhinos were trans-located to secure sanctuaries in Botswana (Mokolodi Nature Reserve, and the Khama II Rhino Sanctuary).

Other initiatives that have been put in place to increase the dwindling numbers of rhinos in Botswana include among others, the 1999 Management Plan submitted by safari company Wilderness Safaris in the tender process for the Mombo concession. It included a formal proposal to undertake the re-introduction of rhinos into the area. The specific objective of the rhino re-introduction project was to return the white rhino to the Okavango Delta.

Presented in Table 2.1 and Figures 2.1a – 2.1d is information on the Southern White Rhino in Botswana from the year 2005 to 2014. The change in population is accounted for by new births, newly acquired, deaths, relocations and removals. The population of the southern white rhino followed an upward trend during the review period. They significantly increased in four fold (488.5 percent) from 26 in 2005 to 153 in 2014. A total of 100 births and 43 deaths were recorded during the period 2005 to 2014. There were newly acquired rhinos in 2005 (9), 2006 (7), 2008 (8), 2009 (11), 2010 (12), and 2014 (10). The increase in white rhino population is attributable to the Government's management efforts which include translocation to secure sanctuaries, and engaging the Botswana Defence Force in combating the escalating poaching incidences.

Table 2.1: Botswana Southern White Rhino, 2005 – 2014

Year	Male			Female			Unknown			New Births	Newly Acquired	Deaths	Relocations	Removals	Total*
	Adult	Sub-Adult	Juvenile	Adult	Sub-Adult	Juvenile	Adult	Sub-Adult	Juvenile						
2005	3	2	3	10	6	2	-	-	0	-	9	2	-	-	26
2006	5	3	5	12	6	2	-	-	1	7	7	-	7	-	41
2007	6	4	6	12	6	2	-	-	2	6	2	2	2	-	44
2008	7	5	6	12	6	2	-	-	1	8	8	4	6	1	47
2009	12	2	9	20	3	2	-	-	4	11	10	4	8	-	63
2010	12	4	15	25	2	1	-	1	2	12	4	1	1	-	74
2011	16	6	17	39	6	11	-	1	7	13	4	8	1	1	116
2012	20	10	18	43	10	8	-	-	6	16	18	8	14	-	131
2013	17	11	20	46	13	7	-	-	7	12	-	10	4	5	133
2014	19	10	13	48	10	14	-	-	24	15	10	4	-	-	153

Source: Department of Wildlife & National Parks
Note: (*) Total is the sum of male, female, unknown & new births.

Figure 2.1a: Botswana Southern White Rhino (Males), 2005 – 2014

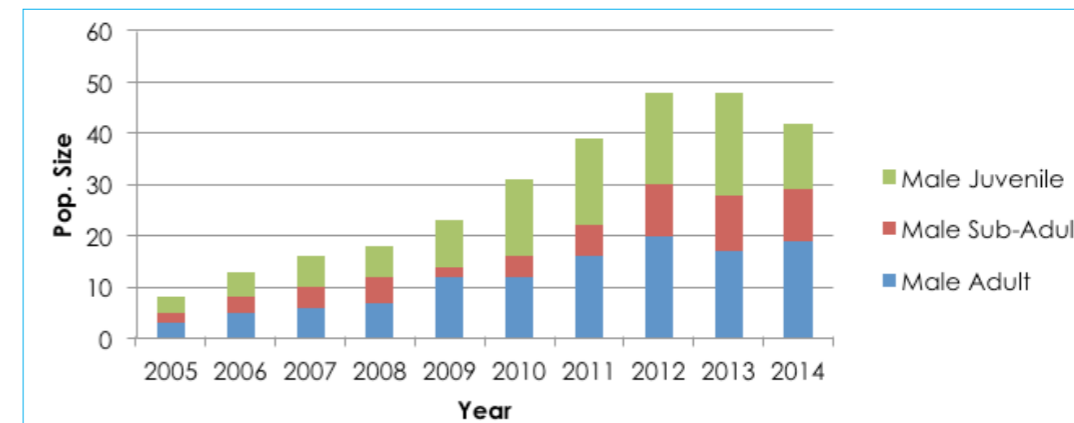


Figure 2.1b: Botswana Southern White Rhino (Females), 2005 – 2014

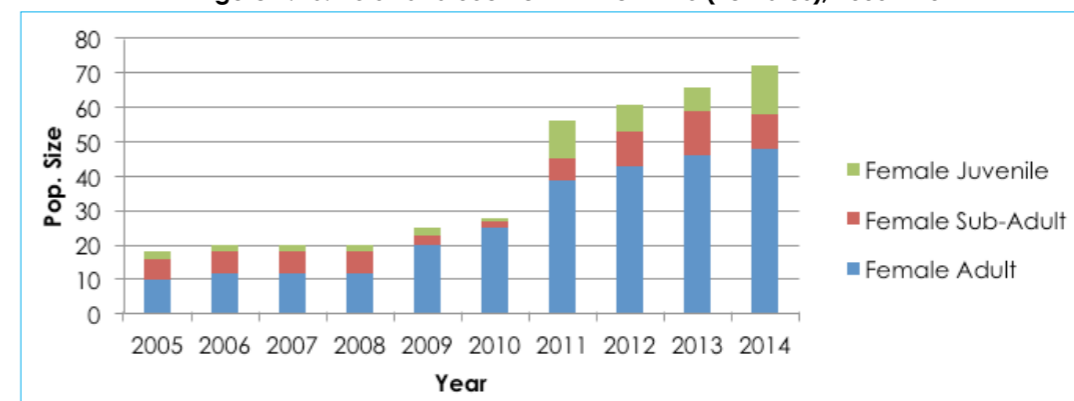


Figure 2.1c: Births, Deaths & Newly Acquired Southern White Rhino, 2005 – 2014

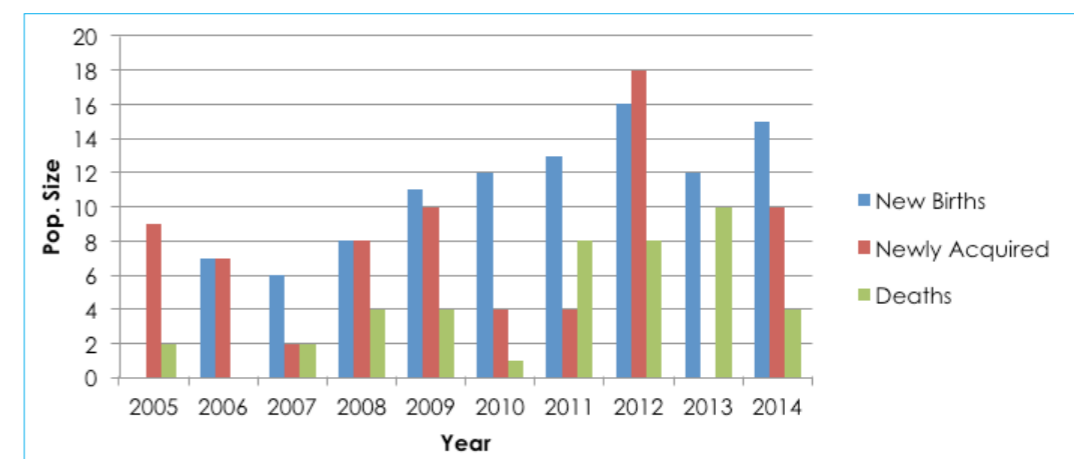
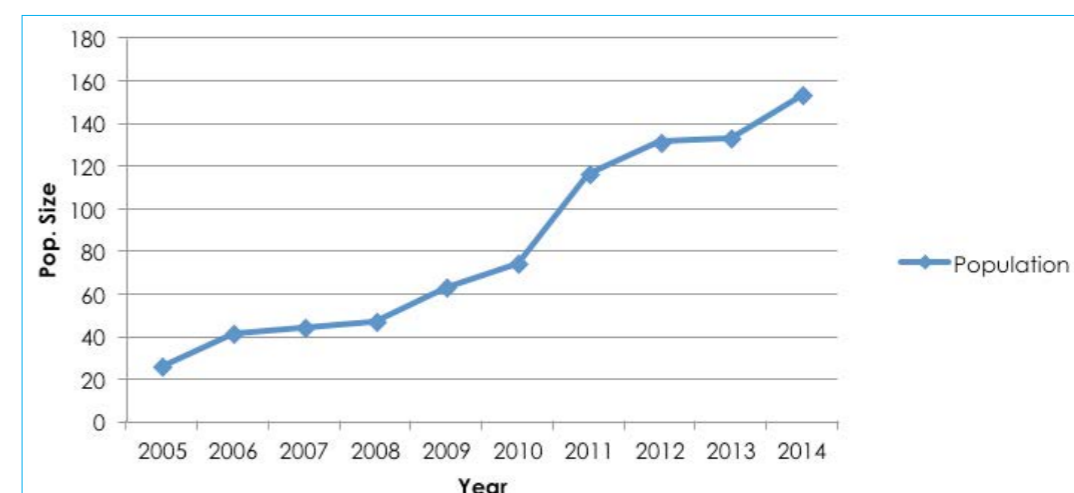


Figure 2.1d: Total Southern White Rhino Population, 2005 – 2014



3.0 POACHING

Poaching involves killing of wildlife without a hunting license, killing with prohibited weapons and killing outside regulated hunting season. All these activities are illegal and are not tolerated by local and international law. Poaching has contributed to the reduction in numbers of certain wildlife species and this has exacerbated the already existing problem of loss of biodiversity in Botswana.

In Botswana, poaching is twofold; commercial and subsistence. The commercial poaching is commonly international and involves high value species like rhino, lion and elephant while the subsistence is for purposes of sustaining community livelihoods. Kajevu & Disang (2013) assert that the most problematic poaching in Botswana is commercial poaching because it is unsustainable. As a result elephant poaching levels are currently at their worst in a decade, and seizures of illegal ivory are at their highest level in years.

In light of the above challenges, the Government of Botswana tasked both the Department of Wildlife and National Parks (DWNP) through the Anti-Poaching Unit and the Botswana Defence Force (BDF) with the responsibility of fighting and controlling this menace.

In spite of the Government's efforts in curbing the escalating poaching incidences, poaching is still rampant. Therefore the purpose of this section is to present levels and trends of poaching incidences in Botswana by district for the period 2009 to 2013. The intended effort in presenting the trends is to inform policies, more especially those related to management of natural resources.

3.1 Poaching Incidences

Incidences of poaching at both national and district levels in the period 2009 to 2013 are presented in Table 3.1 to Table 3.9 and Figure 3.1 to Figure 3.9.

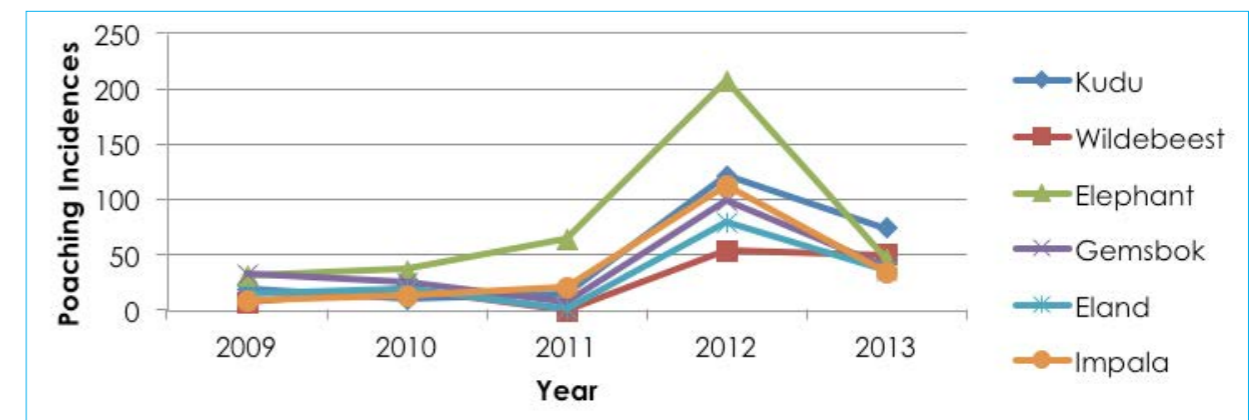
Nationwide poaching incidences shows that over the review period elephant (19.7 percent), kudu (12.3 percent), gemsbok (10.4 percent) and eland (7.6 percent) incurred the highest number of poaching incidences in their descending order. Poaching incidences for all species followed an erratic trend during the period 2009 to 2013, with the highest incidences reported in 2012. (Table 3.1 and Figure 3.1)

Table 3.1: National Poaching Statistics (2009 - 2013)

Species	2009	2010	2011	2012	2013
Kudu	19	10	15	122	74
Wildebess	7	19	0	54	50
Elephant	31	36	64	207	46
Gemsbok	33	25	7	99	39
Eland	14	19	1	79	35
Impala	9	13	21	113	34
Warthog	3	5	3	39	30
Ostrich	2	2	2	28	20
Zebra	3	0	1	25	18
Leopard	3	0	1	17	16
Buffalo	7	5	3	31	15
Tsessebe	0	0	1	10	12
Hartebeest	13	4	0	20	12
Cheetah	5	5	1	5	9
Springbok	5	4	0	34	9
Duiker	1	2	0	17	9
Lion	4	0	0	7	8
Giraffe	11	5	0	13	8
Crocodile	0	0	0	5	8
Blessbok	0	0	0	10	8
Hippo	0	1	1	4	6
Bat Eared Fox	3	0	0	2	5
Python	1	1	0	2	4
Waterbuck	0	0	0	3	4
Brown Hyaena	1	0	2	4	4
Steenbok	3	6	2	17	3
Sitatunga	0	0	0	1	2
Lechwe	0	4	0	9	2
White Rhino	0	0	0	1	1
Reedbuck	0	0	0	1	1
Black-Backed Jackal	0	6	0	1	1
Kori Bastard	0	0	0	0	1

Source: Department of Wildlife & National Parks

Figure 3.1: National Poaching Statistics of Selected Species (2009 - 2013)



3.1.1 Poaching Incidences in Chobe

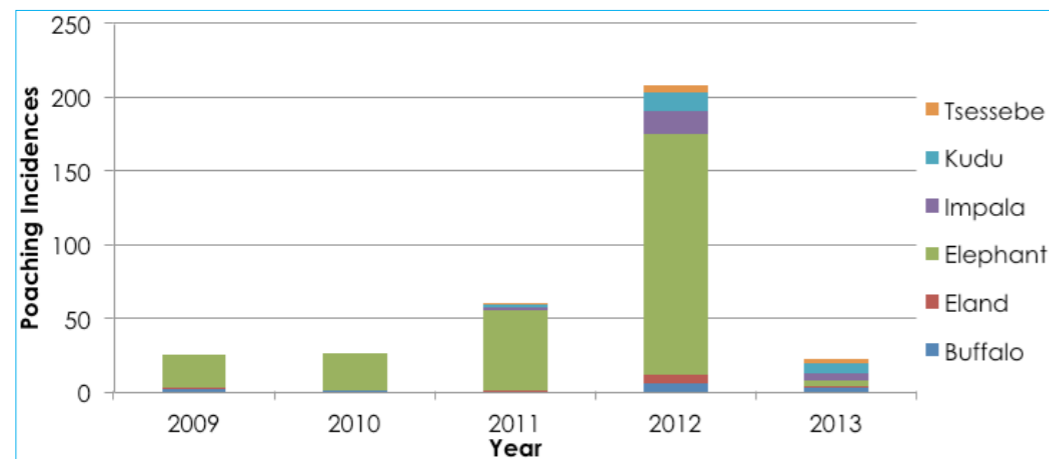
Table 3.2 and Figure 3.2 show that during the years 2009 to 2013, elephant poaching recorded the highest number compared to other species in the Chobe District (268 incidences, 68 percent). According to CSO (2009) high elephant poaching might be attributable to the fact that the district attracts poachers since it holds the world's largest concentration of African Elephants, especially along the Chobe River in the dry season. Elephant poaching followed an increasing trend from 2009 to 2012 and dropped in 2013. Other species with significant recordings were impala, kudu and warthog.

Table 3.2: Poaching Statistics – Chobe (2009-2013)

Species	2009	2010	2011	2012	2013
Kudu	0	0	2	12	6
Impala	0	0	2	16	5
Warthog	0	1	0	9	5
Elephant	22	25	54	163	4
Crocodile	0	0	0	3	4
Buffalo	2	1	0	6	3
Lion	0	0	0	2	3
Tsessebe	0	0	1	5	3
Zebra	0	0	0	3	3
Eland	1	0	1	6	1
Duiker	0	0	1	5	0
Jackal	0	1	0	2	0
Sable	0	0	0	2	0
Steenbok	0	0	2	3	0
Waterbuck	0	0	0	3	0

Source: Department of Wildlife & National Parks

Figure 3.2: Poaching Statistics of Selected Species in Chobe (2009 - 2013)



3.1.2 Poaching Incidences in Ghanzi

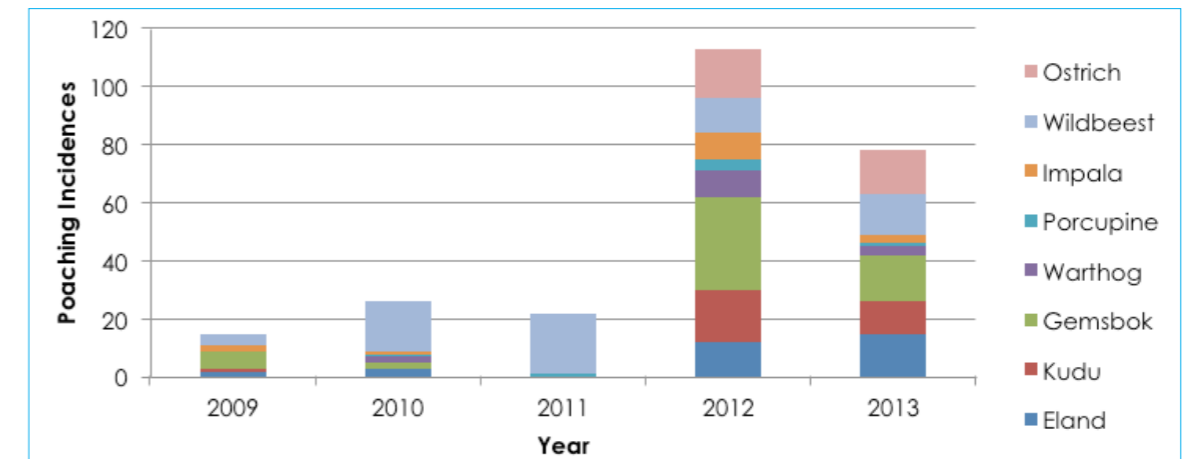
This subsection presents poaching incidences recorded in the Ghanzi district for the years 2009 to 2013. It is evident from Table 3.3 that during the review period wildebeest experienced the highest poaching incidences with 68 (27 percent) followed by gemsbok with 56 (22 percent), then eland and ostrich with 32 (13 percent) each. Generally, all species followed an erratic trend but the years 2012 and 2013 recorded the highest incidences.

Table 3.3: Poaching Statistics - Ghanzi (2009-2014)

Species	2009	2010	2011	2012	2013
Gemsbok	6	2	0	32	16
Eland	2	3	0	12	15
Ostrich	0	0	0	17	15
Wildebeest	4	17	21	12	14
Kudu	1	0	0	18	11
Warthog	0	2	0	9	3
Impala	2	1	0	9	3
Porcupine	0	1	1	4	1

Source: Department of Wildlife & National Parks

Figure 3.3: Poaching Statistics of Selected Species in Ghanzi (2009 - 2014)



3.1.3 Poaching Incidences in Kgalagadi

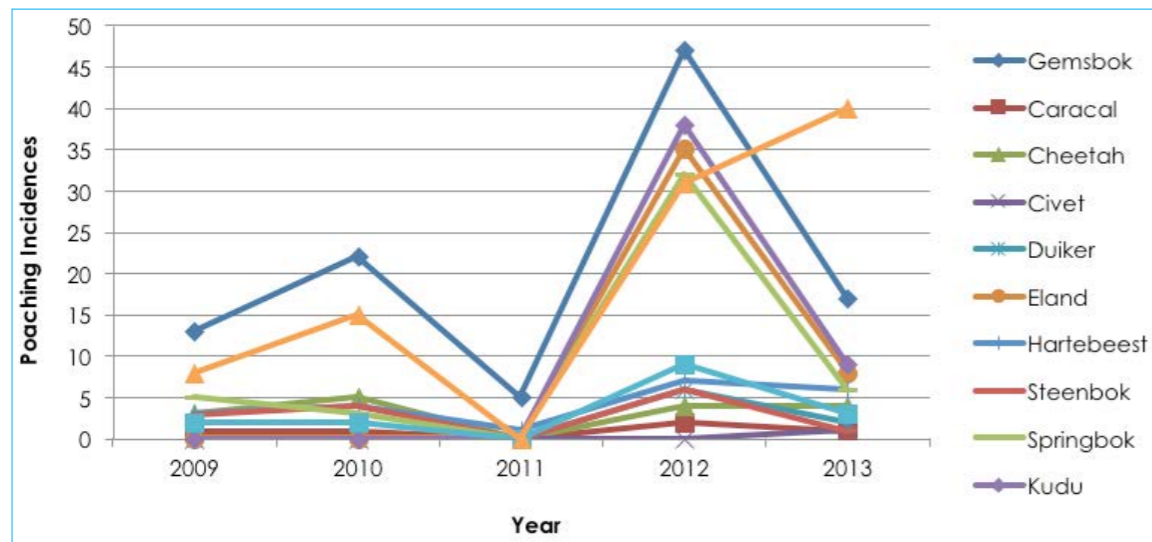
Table 3.4 and Figure 3.4 reveal that over the period under review gemsbok (19.3 percent), eland (17.4 percent), kudu (8.7 percent) and springbok (8.5 percent) experienced the highest number of poaching incidences in their descending order. The lowest number of poaching incidences reported in the Kgalagadi district involved kori bustard and pole cat, each with one case. Most poaching incidences were recorded in the years 2012 and 2013 with totals of 261 and 165 cases, respectively. Generally, all species followed an erratic trend.

Table 3.4: Poaching Statistics - Kgalagadi (2009 - 2014)

Species	2009	2010	2011	2012	2013
Wildebeest	0	0	0	10	23
Impala	0	0	0	12	20
Gemsbok	13	22	5	47	17
Kudu	0	0	0	38	9
Eland	0	0	0	35	8
Blessbok	0	0	0	10	8
Springbok	5	3	0	32	6
Hartebeest	3	4	1	7	6
Bat Eared Fox	3	0	0	2	5
Cheetah	3	5	0	4	4
Ostrich	2	2	0	9	3
Zebra	0	0	0	2	3
Duiker	0	0	0	6	2
Lion	4	0	0	4	2
Honey burger	0	0	0	0	2
Steenbok	3	4	0	6	1
Caracal	1	1	0	2	1
Jackal (Black Backed)	0	6	0	1	1
Genet	1	0	0	0	1
Civet	0	0	0	0	1
Kori Bustard	0	0	0	0	1
Pole cat	0	0	0	0	1
leopard	0	0	0	3	0

Source: Department of Wildlife & National Parks

Figure 3.4: Poaching Statistics of Selected Species in Kgalagadi (2009 - 2014)



3.1.4 Poaching Incidences in Kgatleng

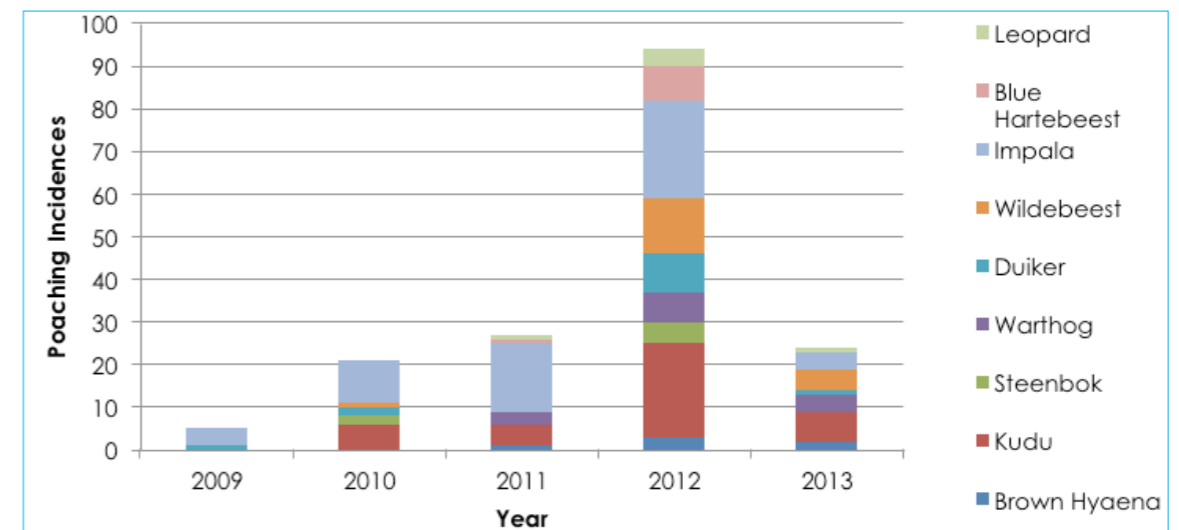
Table 3.5 and Figure 3.5 show that during the years 2009 to 2013, impala, kudu and wildebeest poaching recorded sizable numbers compared to other species in the Kgatleng District with 57, 40 and 19, respectively. Most poaching incidences were recorded in 2012 with a total of 94 cases. The lowest number of poaching incidences was reported in 2009 (5).

Table 3.5: Poaching Statistics - Kgatleng (2009-2014)

Species	2009	2010	2011	2012	2013
Kudu	0	6	5	22	7
Wildebeest	0	1	0	13	5
Warthog	0	0	3	7	4
Impala	4	10	16	23	4
Brown Hyaena	0	0	1	3	2
Duiker	1	2	0	9	1
Leopard	0	0	1	4	1
Steenbok	0	2	0	5	0
Blue Hartebeest	0	0	1	8	0

Source: Department of Wildlife & National Parks

Figure 3.5: Poaching Statistics of Selected Species in Kgatleng (2009 - 2014)



3.1.5 Poaching Incidences in Kweneng

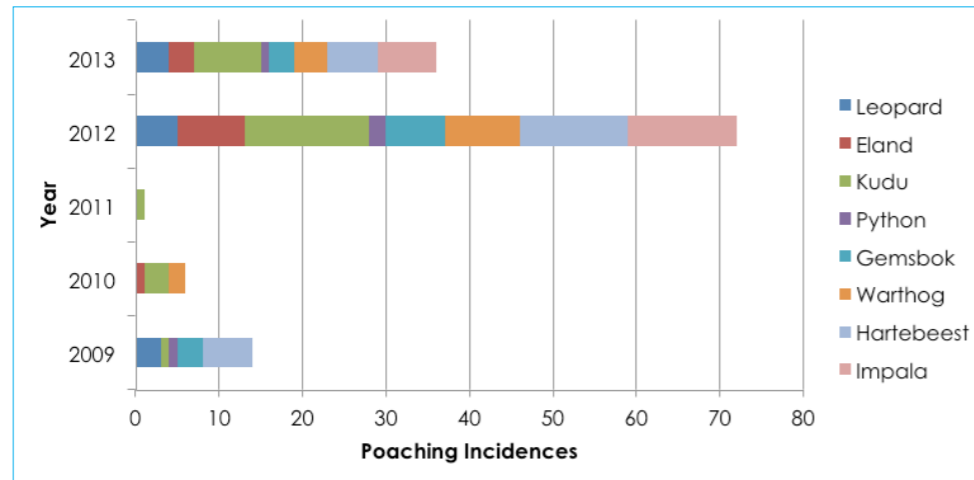
Presented in Table 3.6 and Figure 3.6 are poaching incidences for Kweneng District during the period 2009 to 2013. The table and figure reveal that species which experienced the highest poaching incidences during the review period were the kudu, hartebeest and impala with counts of 28, 25 and 20 respectively. The python had the least poaching incidences with a total of three (3) cases for the entire period. Most poaching incidences in Kweneng were recorded in 2012 with a total of 72 cases.

Table 3.6: Poaching Statistics - Kweneng (2009-2013)

Species	2009	2010	2011	2012	2013
Kudu	1	3	1	15	8
Impala	0	0	0	13	7
Hartebeest	6	0	0	13	6
Leopard	3	0	0	5	4
Warthog	0	2	0	9	4
Eland	0	1	0	8	3
Gemsbok	3	0	0	7	3
Python	1	0	0	2	1

Source: Department of Wildlife & National Parks

Figure 3.6: Poaching Statistics of Selected Species in Kweneng (2009 - 2014)



3.1.6 Poaching Incidences in Ngamiland

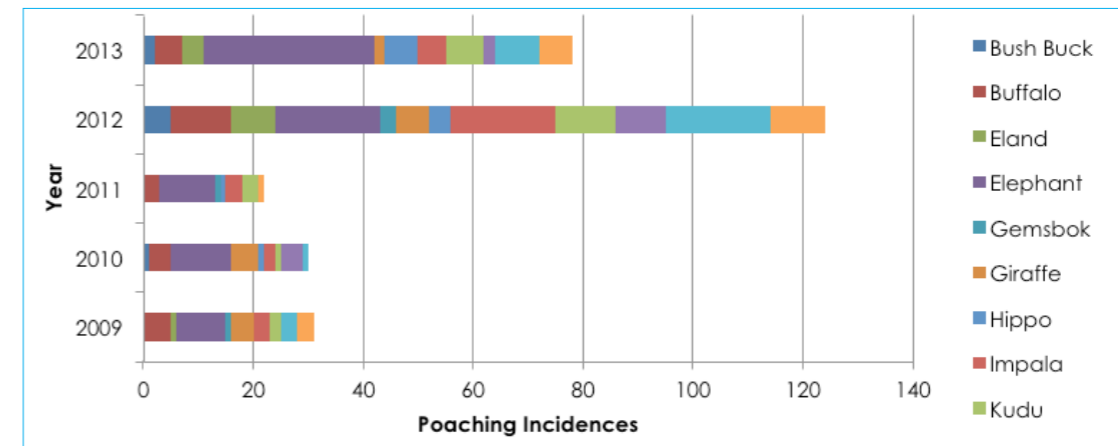
Table 3.7 and Figure 3.7 show poaching incidences for Ngamiland District during the period 2009 to 2013. It is evident from both the table and figure that elephant (80) experienced the highest poaching incidences, followed by impala (32) then wildebeest with 31 cases. In 2013 one (1) rhino was poached. The majority of poaching incidences in Ngamiland were recorded in 2012 with a total of 146 cases.

Table 3.7: Poaching Statistics – Ngamiland (2009-2013)

Species	2009	2010	2011	2012	2013
Elephant	9	11	10	19	31
Wildebeest	3	1	0	19	8
Kudu	2	1	3	11	7
Hippo	0	1	1	4	6
Warthog	0	0	0	2	6
Zebra	3	0	1	10	6
Buffalo	5	4	3	11	5
Impala	3	2	3	19	5
Leopard	0	0	0	5	5
Eland	1	0	0	8	4
Python	1	0	0	0	3
Springbok	0	0	0	2	3
Waterbuck	0	0	0	6	3
Bush Buck	0	1	0	5	2
Giraffe	4	5	0	6	2
Lechwe	0	4	0	9	2
Sitatunga	0	0	0	3	2
Hyaena	0	0	0	1	1
Puff Adder	0	0	0	3	1
Reedbuck	0	0	0	0	1
Rhino	0	0	0	0	1
Gemsbok	1	0	1	3	0
Lizard	0	0	0	0	0

Source: Department of Wildlife & National Parks

Figure 3.7: Poaching Statistics of Selected Species in Ngamiland (2009 - 2014)



3.1.7 Poaching Incidences in the Southern District

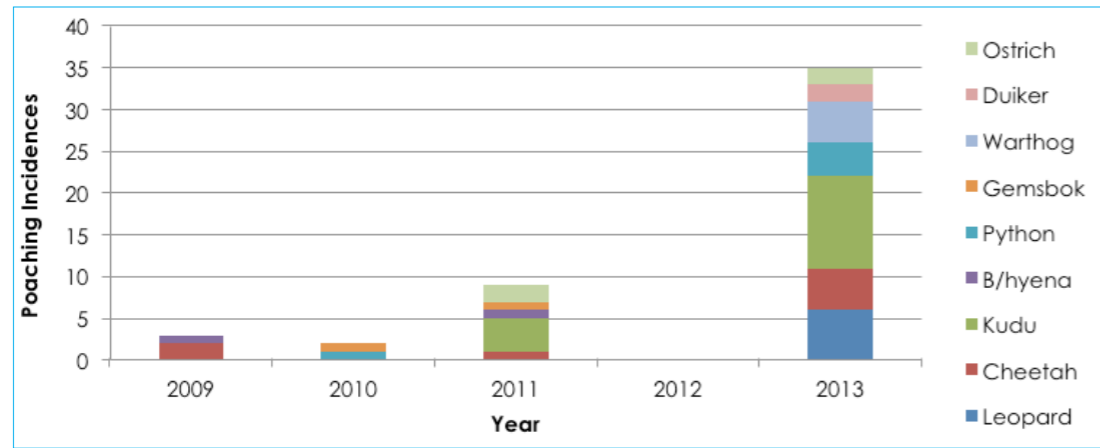
It is observed from Table 3.8 that poaching incidences for the listed species in the Southern District generally followed an erratic trend with the highest number of cases recorded in 2013 (41). Table 3.8 also shows that during the review period kudu poaching recorded substantial numbers compared to other species in the Southern District with 15 incidences.

Table 3.8: Poaching Statistics - Southern (2009, 2010, 2011 & 2013)

Species	2009	2010	2011	2013
Kudu	0	0	4	11
Leopard	0	0	0	6
Cheetah	2	0	1	5
Warthog	0	0	0	5
Python	0	1	0	4
Duiker	0	0	0	2
Pangolin	0	0	0	2
Ostrich	0	0	2	2
Aardwolf	0	0	0	1
Civet	0	0	0	1
Spotted Genet	0	0	0	1
Silver Fox	0	0	0	1
B/hyena	1	0	1	0
Gemsbok	0	1	1	0
Springbok	0	1	0	0
Turtle	0	1	0	0

Source: Department of Wildlife & National Parks

Figure 3.8: Poaching Statistics of Selected Species in Southern (2009 - 2013)



3.1.8 Poaching Incidences in Central District

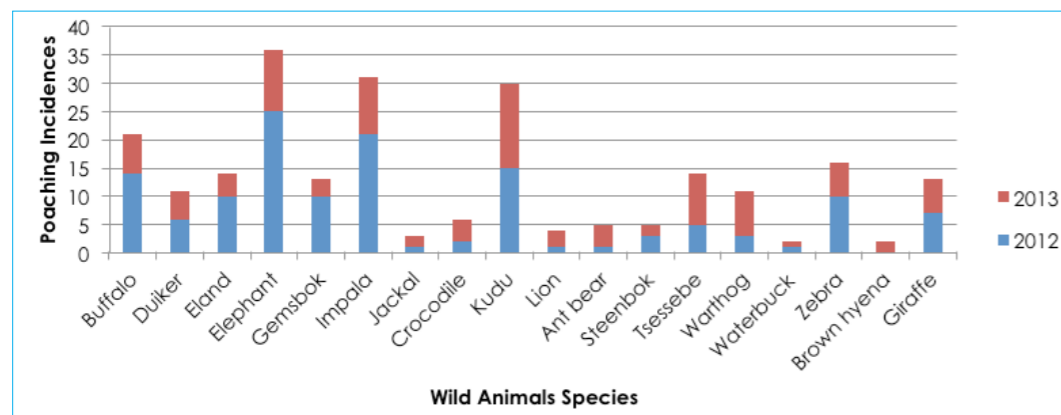
Table 3.9 and Figure 3.9 reveal that over the years 2012 and 2013 the elephant (15.2 percent), impala (13.1 percent), and kudu (12.7 percent) experienced the highest number of poaching incidences. The least number of poaching incidences reported in the Central District during the period under review involved jackal (3), waterbuck (2) and brown hyaena (2) species.

Table 3.9: Poaching Statistics – Central (2012-2013)

Species	2012	2013
Kudu	15	15
Elephant	25	11
Impala	21	10
Tsessebe	5	9
Warthog	3	8
Buffalo	14	7
Zebra	10	6
Giraffe	7	6
Duiker	6	5
Eland	10	4
Crocodile	2	4
Ant bear	1	4
Gemsbok	10	3
Lion	1	3
Jackal	1	2
Steenbok	3	2
Brown hyena	0	2
Waterbuck	1	1

Source: Department of Wildlife & National Parks

Figure 3.9: Poaching Statistics of Selected Species in Central (2009 - 2014)



4.0 FISH STATISTICS

Fishing in Botswana is governed by the Fish Protection Act of 1975. The Act ensures management, conservation and sustainable utilization of fish resources and it is supported by regulations such as to; license fishing (commercial and sport) and prescribe fees; confine commercial fishing to Botswana citizens only; control the import of fishing gear; and set minimum mesh sizes in accordance with the target species, among others.

According to DWNP, the fish import bill in 2002/03 was high (BWP 19 million) reflecting a total quantity of 2,800 tons. During the same period, the national fish yield was 139 tons, which is 20 times lesser than the quantity imported. This situation is a cause for concern as it exacerbates the already existing problem of food insecurity. It is therefore important to monitor and document fish resources statistics in order to sustainably reduce food insecurity without depleting the existing resources.

In Botswana, commercial fishing is practised along the aquatic systems of the Okavango, Chobe/Linyanti and Limpopo. Some commercial fishing also takes place in man-made water bodies (dams) and it is regulated by the Water Utilities Corporation. These are Gaborone, Bokaa, Shashe, Letsibogo and Nnywane dams.

This chapter elicits information on fish capture production (1996 to 2003) and value of gross catch/harvest of fishery (2010 to 2013) in Botswana.

4.1 Fish capture production by species in Botswana, 1996-2013

Fish capture production or volume of fish catches of Bream, Barbel, S/barbel, Tiger fish, Carp, and Labeo have shown erratic trends over the period 1996 to 2013. On average, Bream species (109,624.75 kilograms) experienced the highest annual catch followed by Barbel and Tiger Fish with 37,740.05 and 4,577.44 kilograms respectively. The least captured fish species was Carp, averaging a catch of 565.16 Kilograms per year. The highest total capture production was recorded in 2013/14 with 430,777 kilograms while the lowest total capture of 45,331.90 kilograms was recorded in 2007/08.

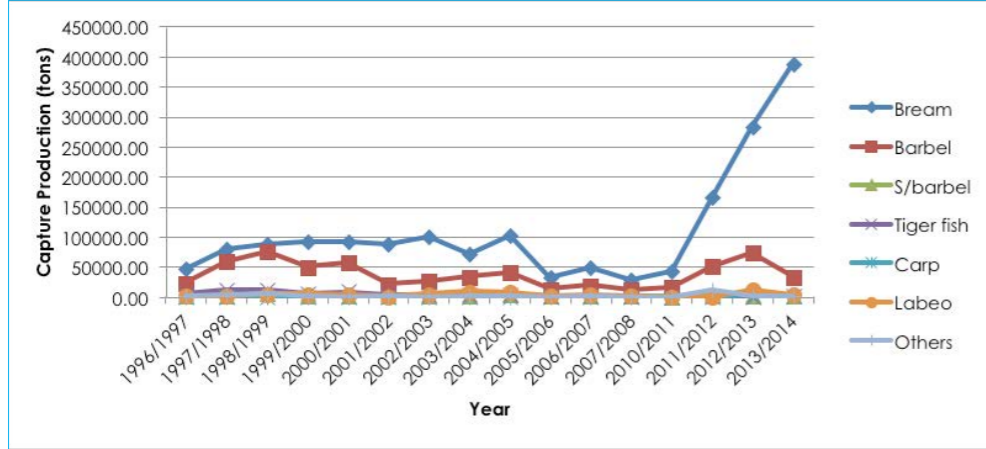
Generally, total fish capture increased from 81,269.30 kilograms in 1996 to 430,777.00 kilograms in 2013 (a fourfold increase). This result does not imply that fish resources are getting depleted. An in-depth study which looks at capture production in relation to reproduction rate would have to be conducted to determine that fish resources are being depleted. According to Government of Botswana (2012: 48), a significant change for any one variable does not, on its own, mean that the population of this species is being over-exploited; rather other factors need to be taken into account before a conclusive assessment can be made about the status of any fish stocks.

Table 4.1: Fish capture production by species in Botswana, 1996-2013 (Kilograms)

Year	Bream	Barbel	S/barbel	Tiger fish	Carp	Labeo	Others	Total
1996/1997	47,741.40	22,823.60	1,495.00	5,633.30	96.10	1,438.70	2,041.20	81,269.30
1997/1998	80,012.90	59,446.20	2,175.00	12,222.10	274.10	1,866.40	4,357.20	160,353.90
1998/1999	88,397.10	75,139.00	5,186.50	12,725.40	74.60	4,518.50	5,724.90	191,766.00
1999/2000	92,915.40	50,219.50	1,116.90	5,718.60	-	4,935.20	2,191.30	157,096.90
2000/2001	92,067.50	57,001.40	2,209.10	9,378.00	105.00	3,584.60	-	166,456.50
2001/2002	87,841.70	21,086.50	1,883.20	5,345.00	18.00	895.50	883.40	117,953.20
2002/2003	100,775.36	26,662.70	1,521.30	3,851.60	2.00	5,033.50	757.90	138,604.36
2003/2004	72,065.00	33,643.60	1,286.24	4,214.70	-	8,640.90	1,801.50	121,651.94
2004/2005	102,288.60	40,302.40	3,835.40	4,824.20	226.90	7,250.00	2,095.90	160,823.40
2005/2006	32,596.42	12,843.21	1,222.23	1,537.33	72.31	2,310.37	667.90	51,249.77
2006/2007	48,603.68	19,150.18	1,822.44	2,292.28	107.81	3,444.93	995.89	76,417.20
2007/2008	28,832.47	11,360.19	1,081.10	1,359.82	63.96	2,043.58	590.78	45,331.90
2010/2011	42,731.97	16,442.37	729.40	24.70	-	-	331.60	60,260.40
2011/2012	166,200.90	50,758.61	3,986.00	1,305.70	0.04	1.39	12,142.50	237,803.00
2012/2013	282,981.25	73,861.30	2,331.56	628.30	4,558.80	11,599.30	1,721.10	377,681.61
2013/2014	387,944.40	33,100.00	1,281.90	2,178.00	1,747.40	3,240.90	1,284.40	430,777.00

Source: Department of Wildlife & National Parks

Figure 4.1: Fish capture production by species in Botswana, 1996-2013 (kilograms)



4.2 Value of Gross Catch/Harvest of Fish in Botswana, 2010 – 2013

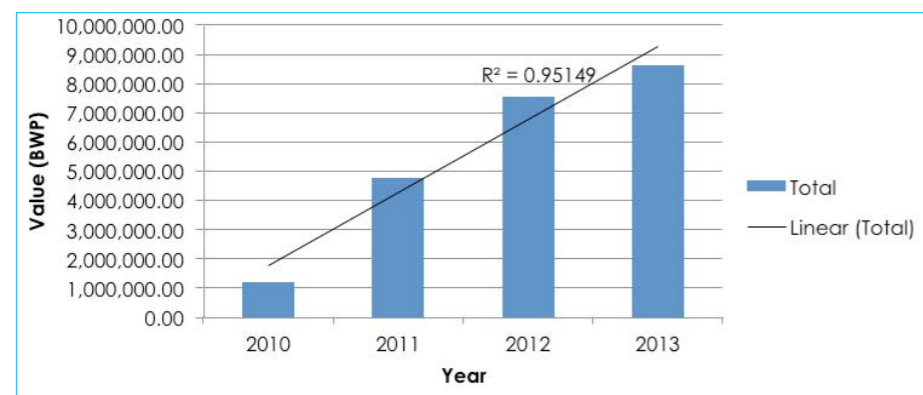
Table 4.2 and Figure 4.2 show the value of gross catch/harvest of fish in Botswana during the years 2010 to 2013. The value of gross catch can also be referred to as gross income from fishing derived from catching or harvesting, calculated as 1 kilogram: 20 BWP. The value of gross catch of fish followed an upward trend during the review period. It increased from 1,205,208 BWP in 2010 to 8,615,540 BWP in 2013 (a six fold increase). It is evident from the table that the bream species contributed the highest in terms of value of gross catch followed by Barbel and then S/Barbel. The total catch production of fish also followed an increasing trend during this period.

Table 4.2: Value of Gross Catch/Harvest of Fish in Botswana, 2010 – 2013

Species	2010		2011		2012		2013	
	Catch (Kg)	Value (BWP)	Catch (Kg)	Value (BWP)	Catch (Kg)	Value (BWP)	Catch (Kg)	Value (BWP)
Bream	42,731.97	854,639.40	166,200.90	3,324,018.00	282,981.25	5,659,625.00	387,944.40	7,758,888.00
Barbel	16,442.37	328,847.40	50,758.61	1,015,172.20	73,861.30	1,477,226.00	33,100.00	662,000.00
Labeo	-	-	1.39	27.80	11,599.30	231,986.00	3,240.90	64,818.00
Tiger fish	24.70	494.00	1,305.70	26,114.00	628.30	12,566.00	2,178.00	43,560.00
Carp	-	-	0.04	0.80	4,558.80	91,176.00	1,747.40	34,948.00
Others	331.60	6,632.00	12,142.50	242,850.00	1,721.10	34,422.00	1,284.40	25,688.00
S/barbel	729.40	14,588.00	3,986.00	79,720.00	2,331.56	46,631.20	1,281.90	25,638.00
Total	60,260.40	1,205,208.00	237,803.00	4,756,060.00	377,681.61	7,553,632.20	430,777.00	8,615,540.00

Source: Department of Wildlife & National Parks
1 Kilogram: 20 BWP

Figure 4.2: Value of Gross Catch/Harvest of Fish in Botswana, 2010 – 2013



Reference:

- Central Statistics Office (2005). **Wildlife Statistics Report**. Published by Statistics Botswana (www.cso.gov.bw), Pages 1- 64.
- Daily News (2014). **Elephant Killings Outpace Births**, No. 155, Pages 1- 24.
- Department of Wildlife and National Parks (2003). **Aerial Census of Animals in Botswana; 2003 Dry Season**. Published by Government Printing, Pages 1 – 70.
- Department of Wildlife and National Parks (2004). **Aerial Census of Animals in Botswana; 2004 Dry Season**. Published by Government Printing, Pages 1 – 60.
- Department of Wildlife and National Parks (2006). **Aerial Census of Animals in Botswana; 2006 Dry Season**. Published by Government Printing, Pages 1 – 50.
- Department of Wildlife and National Parks (2007). **Aerial Census of Animals in Botswana; 2007 Dry Season**. Published by Government Printing, Pages 1 – 63.
- Department of Wildlife and National Parks (2012). **Aerial Census of Animals in Botswana; 2012 Dry Season**. Published by Government Printing, Pages 1 – 84.
- Department of Wildlife and National Parks (2013). **Aerial Census of Animals in Botswana; 2013 Dry Season**. Published by Government Printing, Pages 1 – 63.
- Emslie, R. & Brooks, M. (1999). **African Rhino. Status Survey and Conservation Action Plan**. IUCN/SSC African Rhino Specialist Group. IUCN, Gland, Switzerland and Cambridge, UK. ix Pages 92.
- Government of Botswana, (2012), **Selected Botswana Biodiversity Indicators 2011**, Published by Ministry of Environment, Wildlife and Tourism, Department of Environmental Affairs, Pages 1 – 62.
- Joubert, E., (1996). **On the clover trail: the plight of the world rhinos**. Windhoek, Namibia, Gamsberg MacMillan, Pages. i-xii, 1-180
- Kajevu, Z. & Disang, L., (2013). **Growing Concern over Poaching in Botswana**. Published by Sunday Standard (<http://www.sundaystandard.info/article.php?NewsID=16817>)
- Statistics Botswana (2013). **Botswana Environment Statistics 2012**. Published by Statistics Botswana (www.cso.gov.bw), Pages 1- 164.

