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THE OFTEN

**OVERLOOKED
IVORY TRADE**

A RAPID ASSESSMENT OF THE INTERNATIONAL TRADE IN
HIPPO IVORY BETWEEN 2009 AND 2018

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TRAFFIC REPORT

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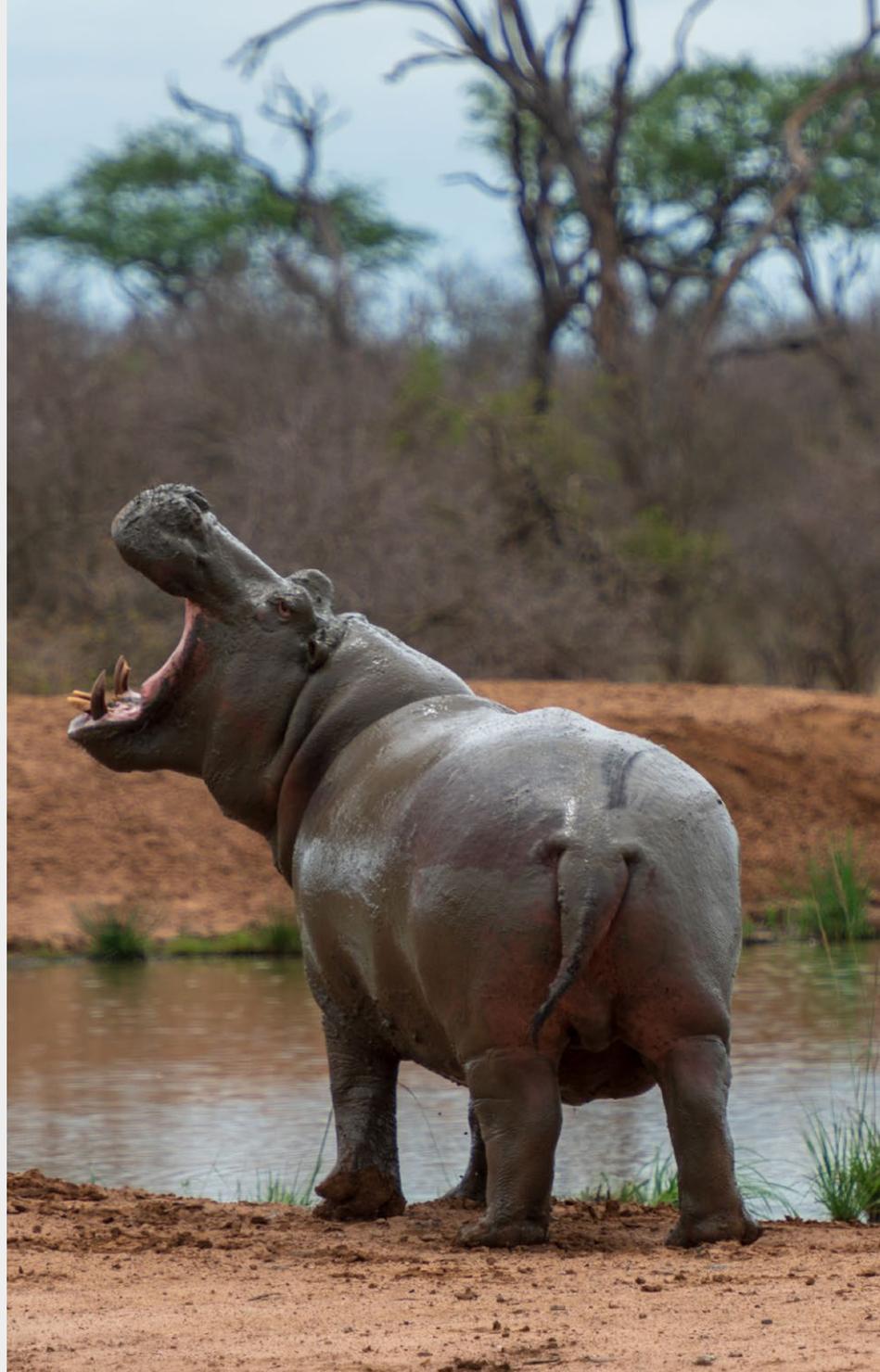
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EXECUTIVE SUMMARY

Following several developments – including an auction of hippo teeth and a proposed cull of hippos in Tanzania, the cancellation and reinstatement of a hippo cull in Zambia, and a call for evidence on hippo ivory trade by the United Kingdom – there has been increased interest in this often-overlooked ivory trade. There are additional concerns that the prohibition of domestic commercial trade in elephant ivory in numerous countries/territories globally may lead to an increase in trade of hippo ivory as a substitute. Given these concerns, some government authorities and non-governmental organisations have called for more information regarding the international trade in hippo ivory.



quantities of hippo ivory traded appeared to decrease between 2009 and 2018

This rapid assessment aimed to assess the international trade in hippo ivory by analysing data on legal and illegal trade between 2009 and 2018. The research sought to provide information on the commodities in which hippo ivory was traded, identify who the major exporters and importers were, and assess whether there had been notable changes in

volumes traded or exporting or importing countries/territories during the last decade. This research also sought to estimate the equivalent number of individuals or offtake from the hippo population based on the quantities of ivory traded internationally. This information may assist policymakers and other government authorities in their decisions about and management of the hippo ivory trade.

The research found that hippo ivory was mostly exported from east and southern African range States to Asia, Europe, and North America. Much of the hippo ivory was re-exported to countries/territories within the EU, Hong Kong SAR, Turkey, and the USA. This study also noted discrepancies within the reported trade data between exporters and importers. Trade in hippo ivory appeared to decrease during the period, seemingly contradicting concerns that it may increase as a substitute for elephant ivory. This research also found that the quantities of hippo ivory internationally traded between 2009 and 2018 resulted in an offtake or an equivalent number of approximately 1,349 hippos annually.

BASED ON THIS RESEARCH, THE FOLLOWING RECOMMENDATIONS ARE SUGGESTED



PRACTICE DUE DILIGENCE

CITES Management Authorities should ensure the relevant responsible personnel are familiar with and practice due diligence when submitting annual reports to CITES, particularly ensuring reporting is consistent in the use of terms and units and in line with the guidelines (see Guidelines for the preparation and submission of annual reports and of annual illegal trade reports).



INVESTIGATE DISCREPANCIES

CITES Management Authorities are encouraged to retrospectively investigate the discrepancies noted in this report in collaboration with their exporting or importing partners, and to identify interventions or strategies that may mitigate these discrepancies in future. These investigations may also reveal actionable information for relevant law enforcement agencies should some of the discrepancies be a result of trade in illegally harvested hippo ivory.



CONDUCT CENSUSES

Conduct up-to-date population estimates or censuses for hippo in order to establish an informed review of the sustainability of the hippo ivory trade and provide essential information for making non-detriment findings.



CLARIFICATION ON TYPES

Further clarification could be collected from CITES Parties' Management Authorities on the types of hippo teeth (e.g. incisors, canines, or molars) in international trade, their subsequent use of the relevant term codes (tusks or teeth), and if (and how) CITES Management Authorities' distinguish between the different teeth types when submitting their reports.



DEVELOPMENT OF A RELIABLE CONVERSION FACTOR

The development of a reliable conversion factor for hippo ivory – this means the average weight of a hippo's canine, incisor and molar – to provide for more accurate estimates of quantities traded (and subsequent offtake from the population) when analysing trade information.

ACRONYMS AND ABBREVIATIONS

CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
DEFRA	Department of Environment, Food and Rural Affairs (United Kingdom)
DNPW	Department of National Parks and Wildlife (Malawi and Zambia)
Hong Kong SAR	Hong Kong Special Administrative Region
IUCN	International Union for the Conservation of Nature
RST	Review of Significant Trade
SRG	Scientific Review Group
TAWA	Tanzania Wildlife Authority
TAWIRI	Tanzania Wildlife Research Institute

INTRODUCTION

FOLLOWING SEVERAL RECENT DEVELOPMENTS, THERE HAS BEEN INCREASED INTEREST IN THIS OFTEN-OVERLOOKED IVORY TRADE



CONTEXT AND BACKGROUND

Following several recent developments – including an auction of Hippopotamus Hippopotamidae teeth and a proposed cull of hippopotamuses in Tanzania, the cancellation and reinstatement of a hippopotamus cull in Zambia, and a call for evidence on hippopotamus ivory trade by the United Kingdom’s (UK) Department of Environment, Food and Rural Affairs (DEFRA) following the enactment of the Ivory Act 2018 (Chapter 30)¹ – there has been increased interest in this often-overlooked ivory trade (Andersson & Gibson, 2017; Anon., 2019; DEFRA, 2019a; Department of National Parks & Wildlife [DNPW], 2016; DNPW, 2019; Tanzania Wildlife Authority [TAWA], 2018a).

Ivory is most commonly sourced from the teeth of mammals such as African Elephant *Loxodonta* spp. and Asian Elephant *Elephas* spp., and to a lesser extent from mammoths *Mammuthus* spp., Walrus *Odobenus rosmarus*, whales (specifically the Sperm Whale *Physeter macrocephalus*, Narwhal *Monodon monoceros*, and Orca *Orcinus Orca*), Common Warthog *Phacochoerus africanus* and hippopotamuses, specifically the Common Hippopotamus *Hippopotamus amphibius* (hereafter the use of the word ‘hippo’ will be referring to this species, unless another species is explicitly referred to). Much of the international ivory trade is regulated under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) except for ivory derived from Common Warthog (and other non-CITES species). This international treaty has included the Common Hippopotamus in the Convention’s Appendix II since 1995, which requires the issuance of export permits when internationally trading any of the species’ specimens², including its ivory.

The Common Hippopotamus is currently listed as Vulnerable on the International Union for the Conservation of Nature (IUCN) Red List of Threatened Species, after a change of threat

category from Least Concern in 2008. It has remained in that threat category after a re-assessment in 2016 (Lewison & Pluháček, 2017). A shift to the higher threat category was warranted in 2008 based on estimates which suggested that there have been population declines (mainly as a result of unregulated hunting for meat and ivory, and habitat loss) during the mid-1990s and early 2000s in several key countries within its range (Lewison & Pluháček, 2017). Since then, populations have largely remained stable, estimated to be 130,000–145,000 across 38 African range States (CITES, 2017; Lewison & Pluháček, 2017; TAWIRI, 2019). The intrinsic rate of increase (population growth) of hippo populations ranges between eight and 11 per cent (CITES, 2017; Marshall & Sayer, 1976), but can also vary between zero per cent – in areas where populations have reached carrying capacity – and 18 per cent, where environmental conditions are favourable (Chomba, 2013; Kanga et al., 2011). East and southern African countries represent the stronghold for this species with the largest number of hippos occurring in Kenya, South Africa, Tanzania, Uganda, and Zambia (Figure 1).

Like most other ivories, hippo ivory can be carved into a variety of items including figurines, netsuke³ or knife handles, or it may be carved but maintain the structure of the tooth in the design (Baker et al., 2020; Espinoza & Mann, 1991; Fisher, 2016; Williamson, 2004). Hippo ivory, although denser and more prone to cracking, is cheaper than the more popular elephant ivory and may be one of the reasons it remains in demand amongst consumers (Fisher, 2016; Martin & Stiles, 2003; Martin & Vigne, 2015). Hunting of hippos is also a popular sport amongst trophy hunters and the subsequent export and retention of the hippo ivory as a trophy is common practice following a hunt (Anon., 2018a; Anon., 2018b; Barnett & Patterson, 2006; CITES, 2017).

¹ <https://www.legislation.gov.uk/ukpga/2018/30/data.pdf>

² Specimen refers to any whole plant or animal, live or dead, or recognisable part or derivative thereof.

³ A netsuke is a small carved object, usually made of ivory or wood, traditionally associated with Japanese culture and initially served both functional and aesthetic purposes

After recommendations were made to several range States (Botswana, Democratic Republic of Congo (DRC), Malawi, Mozambique, Rwanda, South Africa, Tanzania, Zambia, and Zimbabwe) subsequent to the first review, the Standing Committee recommended that no imports be accepted from DRC, Malawi, and Rwanda owing to their failure to respond adequately to the recommendations (CITES, 2012a). In the 2008 review, the Animals Committee provisionally selected Cameroon, Mali, Mozambique, South Africa, and Swaziland as countries of Possible Concern, with all countries except Cameroon and Mozambique being removed from the review after additional information was provided by range States. In 2011, recommendations were formulated to Cameroon and Mozambique to provide information on the basis of non-detriment findings and management (CITES, 2012a). In 2012, a notification to the CITES Parties recommended that trade in specimens of Common Hippo be suspended from Cameroon and Mozambique after the recommendations were not complied with by the two countries (CITES, 2012b).

There are additional concerns that the prohibition of domestic commercial trade in elephant ivory (with exemptions) in numerous countries/territories – such as Belgium, mainland China, France, Hong Kong Special Administrative Region (hereafter Hong Kong SAR), Netherlands, Singapore, Taiwan Province of China (hereafter Taiwan), United States of America (USA), and the UK – may lead to an increase in hippo ivory trade as a substitute (Andersson & Gibson, 2017; International Fund for Animal Welfare [IFAW], 2019; CITES, 2012c; Ministry of the Environment, Energy and the Sea, 2016; Musing *et al.*, 2018; Pieters, 2018; Singapore's National Parks Board, 2019; Taiwan's Forestry Bureau, 2018; United States Fish & Wildlife Service [USFWS], 2016; Weiler *et al.*, 1994; Williamson, 2004). Given these concerns, some government authorities and non-governmental organisations have called for more information regarding the international trade in hippo ivory (DEFRA, 2019b; IFAW, 2019).

AIMS AND OBJECTIVES

Given the context, this research aimed to assess the international trade in hippo ivory, both legal and illegal, by analysing data from the CITES trade database⁴ and TRAFFIC's Wildlife Trade Information System (WiTIS)⁵. The research sought to provide information on the hippo ivory parts and derivatives traded, who the major exporting and importing countries/territories have been, and assess whether there have been notable changes in volumes traded or in trading partners in the last decade. Finally, this research sought to estimate the equivalent number of individuals or offtake from the wild Common Hippopotamus population – based only on the quantities of hippo ivory internationally traded – to better inform and provide guidance to CITES Management Authorities on management of the hippo ivory trade.

⁴ The CITES trade database is a resource that holds records of trade in wildlife listed by CITES. Contracting Parties provide annual reports to the CITES Secretariat of all export and import permits issued during the previous year. Accessed from <https://trade.cites.org/>.

⁵ This system contains information on wildlife seizures and criminal cases from open sources as well as information collected by TRAFFIC when carrying out surveys.



METHODS



Information on the legal trade in ivory from Common Hippopotamus was collected from the CITES trade database on 20 August 2020 and subsequently analysed in Microsoft Excel. The parameters used for the download of data from CITES trade database were as follows:

- **Timeframe:** 2009–2018 (data for 2019 were not yet available; additionally, 16 out of 38 African range States had not yet submitted their 2018 annual reports)
- **Species:** Hippopotamus *amphibius* and Hippopotamus spp. (see Box 1 for information on the Pygmy Hippopotamus *Choeropsis liberiensis*)
- **Exporting Countries:** All
- **Importing Countries:** All
- **Source Codes:** All
- **Purpose Codes:** P (Personal), H (Hunting trophy), and T (Commercial)
- **Commodity / Term:** Carvings, carvings-ivory, jewellery, jewellery-ivory, skulls, teeth, trophies, tusks (it is assumed that these commodities / terms are or include hippo ivory)

Hippo ivory was either reported in terms of weight or number of individual specimens. Where the commodity unit was left blank, this assessment reported the unit as “number of specimens” as set out by CITES guidelines⁶. Due to the lack of information on the average weight of a hippo tooth, the analysis was conducted separately for hippo ivory recorded in terms of weight and the number of specimens. Furthermore, for the purposes of this report, carvings and ivory carvings were merged as “carvings”, jewellery and ivory jewellery were merged as “jewellery”, and tusks and teeth were merged as “teeth”.

Additionally, as trade data for 2018 had not yet been submitted by 16 African range States at the time of the download, but had been submitted by their importing partners, this research chose to present on importer reported quantities (unless otherwise stated). Re-exported quantities were also analysed separately to avoid duplication in

assessing trade volumes.

Information on illegal trade in hippo ivory was drawn from WiTIS. While seizure data may help understand the illegal trade in hippo ivory, there are limitations in the use of this information. These data are inherently biased due to differences in countries/territories’ ability to make and report on seizures i.e. not all illegal trade is seized, and not all enforcement actions are reported (Underwood *et al.*, 2013). The consequence of this bias is that countries/territories with stronger law enforcement capability became implicated in the illicit trade while others were not. Given this context, the quantities reported and countries/territories implicated do not reflect the full scale of the illegal trade in hippo ivory. Due to this bias, it was not possible to infer seizure trends over time and so this research focused on presenting the total quantities for hippo ivory traded illegally between 2009 and 2018.

Based on quantities of hippo ivory legally and illegally traded it was possible to derive an estimate of the equivalent number of individuals or offtake from the global wild hippo population. To determine the estimated equivalent number of individuals or offtake from the population, the following conversion factors were used:



**12 teeth =
1 animal**
8 incisors and 4
canines

⁶ <https://cites.org/eng/node/55474>

- **Twelve teeth:** (upper and lower incisors and canines) were used for trade in ivory, and represented one animal (CITES, 2007; Lafrenz, 2003) – this conversion factor could be considered conservative as it assumes both upper and lower incisors and canines of an individual hippo were traded.
- **One animal** equated to approximately 5.25 kilogrammes (kg) of ivory (Andersson & Gibson, 2017) – this conversion factor is conservative, compared to the 2.5 kg per hippo ratio deduced from figures listed by Lewison & Oliver (2008).
- **One trophy** represented one animal, as recommended by the CITES guidelines for the preparation and submission of annual reports⁷.



**offtakes
were
calculated**
using CITES
trade data

In estimating the quantity of hippo ivory traded from animals sourced from the wild, the CITES trade data were filtered to exclude specimens that were pre-convention specimens⁸, or specimens that were sourced from individuals born or bred in captivity⁹. In cases where hippo ivory carvings and jewellery were reported in terms of number of specimens, these items were excluded from the calculation due to the difficulty of ascertaining the quantity of teeth

contained in such a specimen. For example, one tooth could represent one or more carving or jewellery specimens.

Lastly, country-specific offtakes were also estimated using only the CITES legal trade data. Illegal trade data was excluded due to the difficulty of determining the country of origin of hippo ivory when seized by another country/territory.

⁷ https://cites.org/sites/default/files/notif/E-Notif-2017-006-A_0.pdf

⁸ <https://cites.org/eng/resources/terms/glossary.php#pcs>

⁹ <https://cites.org/eng/resources/terms/glossary.php#bc>



THE PYGMY HIPPOPOTAMUS

There are two extant species of hippopotamuses in Africa – the Common Hippopotamus and the Pygmy Hippopotamus *Choeropsis liberiensis*. The Pygmy Hippopotamus is listed as Endangered on the IUCN Red List of Threatened Species (Ransom *et al.*, 2015). While the total size of the wild population is unknown, it is widely considered to be declining (Ransom *et al.*, 2015). Previous estimates suggested that there were between 2,000 and 3,000 individuals occurring mainly in increasingly fragmented areas in four range States – Côte d'Ivoire, Guinea, Liberia, and Sierra Leone.

Deforestation represents the largest threat to the Pygmy Hippopotamus with forests within their historical range having been steadily logged, farmed and/or converted to plantations (Mallon *et al.*, 2011). Increasing fragmentation of their range has also heightened their susceptibility to hunters. Mallon *et al.* (2011) reported incidences of the Pygmy Hippopotamus being hunted opportunistically for meat, while their ivory was

considered to have little trade value.

Trade data for the Pygmy Hippopotamus downloaded from CITES between 2009 and 2018 found no reported international trade in its ivory from any of its range States or neighbouring countries. Re-exports of Pygmy Hippopotamus ivory (11 trophies and five teeth) were reported from two non-range States between 2009 and 2018 – South Africa and the USA.

The purpose of this trade was for scientific reasons and hunting trophies – sourced from wild-harvested individuals – as specified by the re-exporting countries. The original export of the ivory may not have been reported by the relevant exporting and importing countries/territories between 2009 and 2018, or the exports may have occurred prior to 2009. Given the lack of trade in Pygmy Hippopotamus ivory, it was not included in this research.



RESULTS



THE INTERNATIONAL TRADE IN HIPPO IVORY

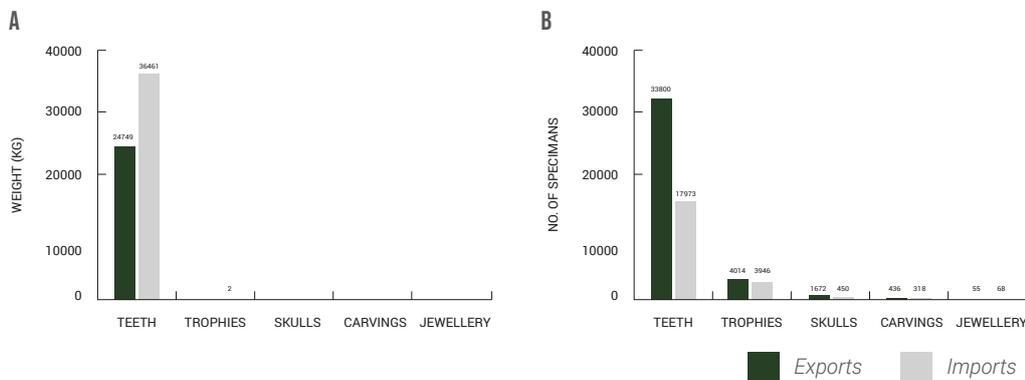
COMMODITIES AND QUANTITIES TRADED

Between 2009 and 2018, exporting countries reported trading 24,749 kg and 39,977 specimens of hippo ivory, while importing countries/territories reported trading 36,463 kg and 22,755 specimens. Teeth were the most

commonly traded commodity, accounting for 99.9% of trade in terms of weight and nearly 80% of trade in terms of number of specimens (Figure 2). Other traded hippo ivory specimens included trophies, skulls, carvings, and jewellery.

FIGURE 2

Quantities and commodities of hippo ivory reportedly exported (green) and imported (grey), 2009-2018 (CITES trade data). Quantities are shown by (a) weight (kg) and (b) number of specimens.

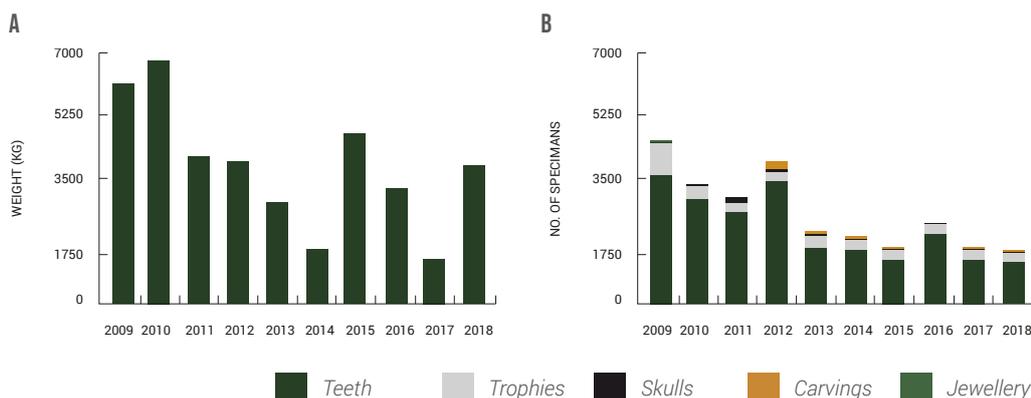


Annual reported trade quantities of hippo ivory, despite variation in some years, appeared to be decreasing (Figure 3). The largest quantity of ivory traded, in terms of weight and number of specimens, occurred in 2010 and 2009, respectively. The smallest quantity of ivory

traded occurred in 2017 (in terms of weight) and 2018 (in terms of number of specimens). Two notable increases in trade occurred in 2015 and 2018 when approximately 4.5 tonnes and 3.5 tonnes of hippo ivory was traded.

FIGURE 3

Annual quantities of hippo ivory traded, as reported by importers, 2009-2018 (CITES trade data). Quantities are shown by (a) weight (kg) and (b) number of specimens.





EXPORTING COUNTRIES OF HIPPO IVORY

A total of 17 African countries (and one country/territory reported as unknown) were reported to have exported hippo ivory between 2009 and 2018 (Table 1). Of these, five countries exported hippo ivory in terms of weight (kg). Uganda reportedly traded the highest quantity; accounting for more than 40% of total exports. Tanzania and Malawi exported more than 11 and seven tonnes of hippo ivory respectively, while South Africa and Zambia collectively accounted for approximately two tonnes (<6% of total weight traded).



Uganda
contributed
40% of total
exports

Following Uganda's voluntary restrictions on the export of hippo ivory in 2014, quantities of trade have decreased. The quantity of hippo ivory traded from Uganda was 11 tonnes and 156 specimens between 2009 and 2013, which decreased to 3.6 tonnes and 13 specimens between 2014 and 2018 (a decrease of 68% in weight). Quantities traded from Tanzania also decreased, except in 2018 where 3,570 kg was exported. There were no reported imports

of hippo ivory from Zambia or South Africa since 2012 and 2013 respectively. The only country which appeared to see an increase in the quantities traded was Malawi – which increased from 1,580 kg between 2009 and 2013, to 6,243 kg between 2014 and 2018.

Five countries (Mozambique, South Africa, Tanzania, Zambia, and Zimbabwe) reportedly exported 95% of the hippo ivory in terms of number. Cameroon, Namibia, and Uganda collectively exported less than 1,000 hippo ivory specimens (~4%) while ten other countries accounted for less than one per cent of the total. There were no reports of hippo ivory exports from Mozambique and Cameroon, between 2014 and 2017 and between 2014 and 2016 respectively. This is likely as a result of trade suspensions notified by CITES after concern around the lack of an adequate Non-Detriment Finding for hippos in these countries (CITES, 2012b).

TABLE 1

Exporting countries of hippo ivory, 2009-2018 (CITES trade data)

WEIGHT (KG)*											
COUNTRY	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	TOTAL
Uganda	3,220	2,702	3,092	1,381	970		2,191	1,500			15,056
Tanzania	2,974	2,891		2,126					1	3,570	11,562
Malawi		50		50	1,480	1,480	2,363	1,200	1,200		7,823
Zambia		1,000	550								1,550
South Africa	30		300	141							471
WEIGHT (KG)											
COUNTRY	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	TOTAL
Zimbabwe	625	594	753	1,861	531	549	455	318	243	194	6,123
Tanzania	2,675	562	501	526	377	275	380	413	241	125	6,075
Zambia	516	1,318	885	754	423	46	90	127	246	452	4,857
South Africa	301	200	308	296	210	519	144	1,059	265	220	3,522
Mozambique	140	313	165	430	6					1	1,055
Namibia	35	5	40	77	82	72	72	87	64	49	583
Cameroon	32	72	13	37	46				5		205
Uganda	37	24	48	33	14		12	1			169
Others**	8	27	2	13	31	24	1	34	26		166

*Excludes one kg of hippo ivory reportedly exported from Zimbabwe

**Benin, Burkino Faso, Central African Republic, DRC, Ethiopia, Kenya, Malawi, Nigeria, Togo, Unknown

IMPORTING COUNTRIES/TERRITORIES OF HIPPO IVORY



Hong Kong
imported more
than 25 tonnes
between 2009
and 2018

A total of 53 countries/territories reported importing hippo ivory between 2009 and 2018. Hong Kong SAR was the dominant importer of hippo ivory importing more than 25 tonnes (>70%) during this period (Table 2). Mainland China imported nearly eight tonnes (~21%) and South Africa imported approximately 1.6 tonnes (~5%). Austria, Italy, and USA accounted for the remaining three per cent. Notably, there were no reported imports of hippo ivory to Hong Kong SAR in 2014 and in 2017, and mainland China only reported imports between 2013 and 2017. Almost no imports were reported for Austria,

Italy, South Africa, and USA from 2013 onwards.

In terms of number of specimens, the European Union (EU) was the largest importer of hippo ivory, importing 8,001 specimens (~35% of total imports). The major EU countries importing hippo ivory included Austria, Denmark, France, Germany, Italy, and Spain. The USA was the second largest importer, accounting for approximately 34% of total imports. South Africa (~14%), Hong Kong SAR (~7%), and 28 other countries/territories (~9%) also imported hippo ivory.

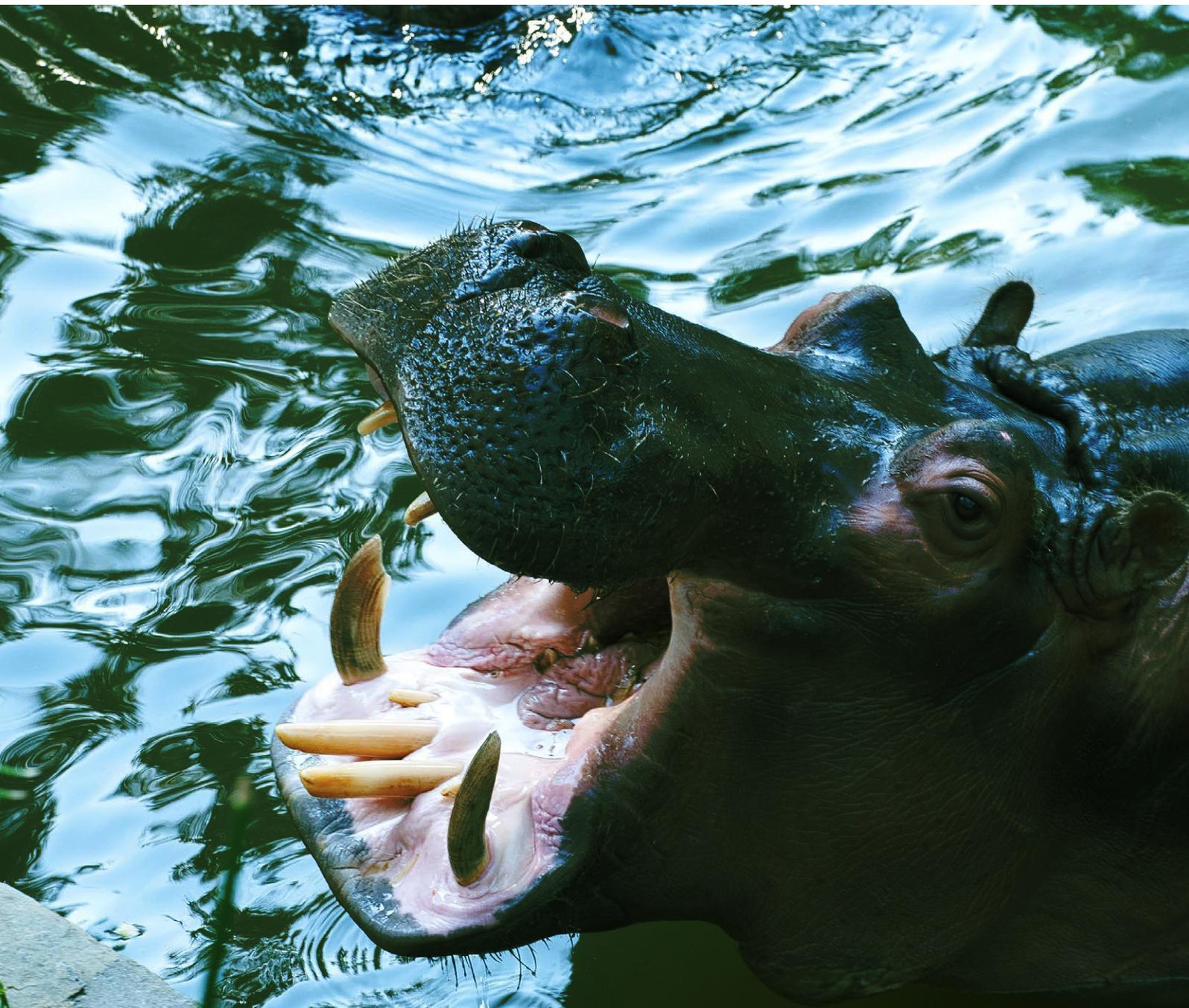


TABLE 2

Importing countries/territories of hippo ivory, 2009-2018 (CITES trade data)

WEIGHT (KG)											
COUNTRY	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	TOTAL
Hong Kong SAR	6,174	5,441	3,092	3,495	970		2,191	1,000		3,570	25,933
Mainland China					1,480	1,480	2,363	1,200	1,200		7,723
South Africa		1,050	550	50					2		1,652
Viet Nam		152						500			652
USA			300	141							441
Italy	50										50
Austria				12							12
WEIGHT (KG)											
COUNTRY	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	TOTAL
EU	1,493	942	1,272	1,024	744	430	396	907	318	475	8,001
Germany	281	292	403	345	321	162	66	75	52	101	2,098
Spain	407	236	412	175	91	72	23	158	95	85	1,754
France	35	77	62	116	70	29	98	501	32	32	1,052
Austria	100	128	38	203	170	100	77	63	44	44	967
Denmark	180	79	116	52	43	47	53	18	20	21	629
Other*	490	130	241	133	49	20	79	92	75	192	1,501
USA	871	683	807	1,966	636	634	527	781	461	466	7,832
South Africa	136	1,209	551	517	118	87	109	228	226	36	3,217
Hong Kong SAR	1,650		8								1,658
Others**	219	281	77	520	222	334	122	123	85	64	2,047

* Belgium, Bulgaria, Czech Republic, Estonia, Finland, Hungary, Italy, Latvia, Lithuania, Luxembourg, Poland, Portugal, Romania, Slovakia, Slovenia, Sweden, United Kingdom (United Kingdom withdrew from the EU on 31 January 2020).

** Argentina, Australia, Brazil, Canada, Chile, China, Iceland, Japan, Kenya, Mexico, Morocco, Namibia, New Zealand, Norway, Paraguay, Peru, Philippines, Qatar, Serbia, Singapore, Swaziland, Switzerland, Thailand, Turkey, Ukraine, United Arab Emirates, Viet Nam, Zimbabwe



RE-EXPORTS



France
imported
more than
21,000
specimens

A proportion of the hippo ivory traded was reported as re-exports by some countries/territories. More than 30,000 specimens (135% of total specimens originally imported between 2009 and 2018) and approximately 1,300 kg of hippo ivory (3% of total weight imported) were re-exported.

Turkey imported the most re-exported hippo ivory by weight, importing more than 560 kg, predominantly from mainland China and Hong Kong SAR (Figure 4). In terms of

number of specimens, France was the most common destination for re-exported hippo ivory, accounting for approximately 70%. France reported importing more than 21,000 specimens of hippo ivory, with its main trading partners being mainland China (74%) and Hong Kong SAR (25%). The majority (86%) of France's reported imports occurred between 2009 and 2012. Belgium, Spain, and USA were also destinations for approximately 8,000 specimens (26% of total re-exports) of hippo ivory.

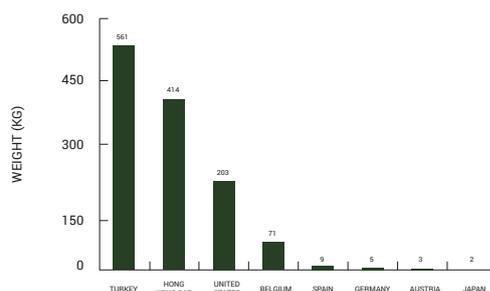
FIGURE 4

Quantities of hippo ivory re-exported by importers, 2009-2018 (CITES trade data). Quantities are shown by (a) weight (kg) and (b) number of specimens

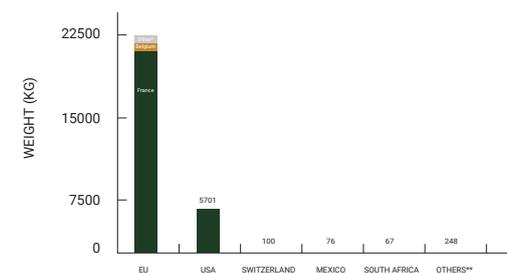
* Austria, Bulgaria, Czech Republic, Denmark, Germany, Italy, Netherlands, Poland, Portugal, Slovenia, Spain, Sweden, United Kingdom

** Australia, Bahamas, Canada, Chile, mainland China, Greenland, Guernsey, Hong Kong SAR, Japan, Kenya, Morocco, Namibia, New Zealand, Norway, Panama, Peru, Philippines, Qatar, Serbia, Singapore, Thailand, Turkey,

A



B



Turkey
imported more
than 560 kg

THE ILLEGAL TRADE IN HIPPO IVORY

COMMODITIES AND QUANTITIES SEIZED

The dataset analysed contained evidence of 163 incidents of illegal trade, with law enforcement authorities seizing an estimated 957 kg and 6,335 specimens of hippo ivory between 2009 and 2018 (Table 3). Hippo teeth were the most commonly seized specimen. Carvings and skulls were also seized, albeit in smaller quantities.

TABLE 3
Estimated quantities of hippo ivory specimens seized globally, 2009-2018 (WiTIS)

WEIGHT (KG)		
Commodity	No. seizures	Quantity
Carvings	8	164.6
Teeth	24	792.6
COUNTRY	32	957.2
NUMBER OF SPECIMENS		
Commodity	No. seizures	Quantity
Skull	6	14
Carvings	12	367
Teeth	113	5,954
COUNTRY	131	6,335

PRIORITY COUNTRIES/TERRITORIES

According to the data analysed, 48 countries/territories either seized or were implicated (in the trade route as the origin, exporter, transit, or importer) in the illegal trade in hippo ivory (Figure 5). Uganda was responsible for approximately 27% of the seizures, followed by Tanzania, mainland China and Hong Kong SAR

(collectively accounting for 31%). South Africa was implicated (as the country of export or as a transit country) in eight seizures of hippo ivory while being responsible for three seizures. Malawi, Cameroon, and Kenya also made between 5 and 10 seizures each.



48
**countries/
territories**
were implicated
in the illegal trade
in hippo ivory.

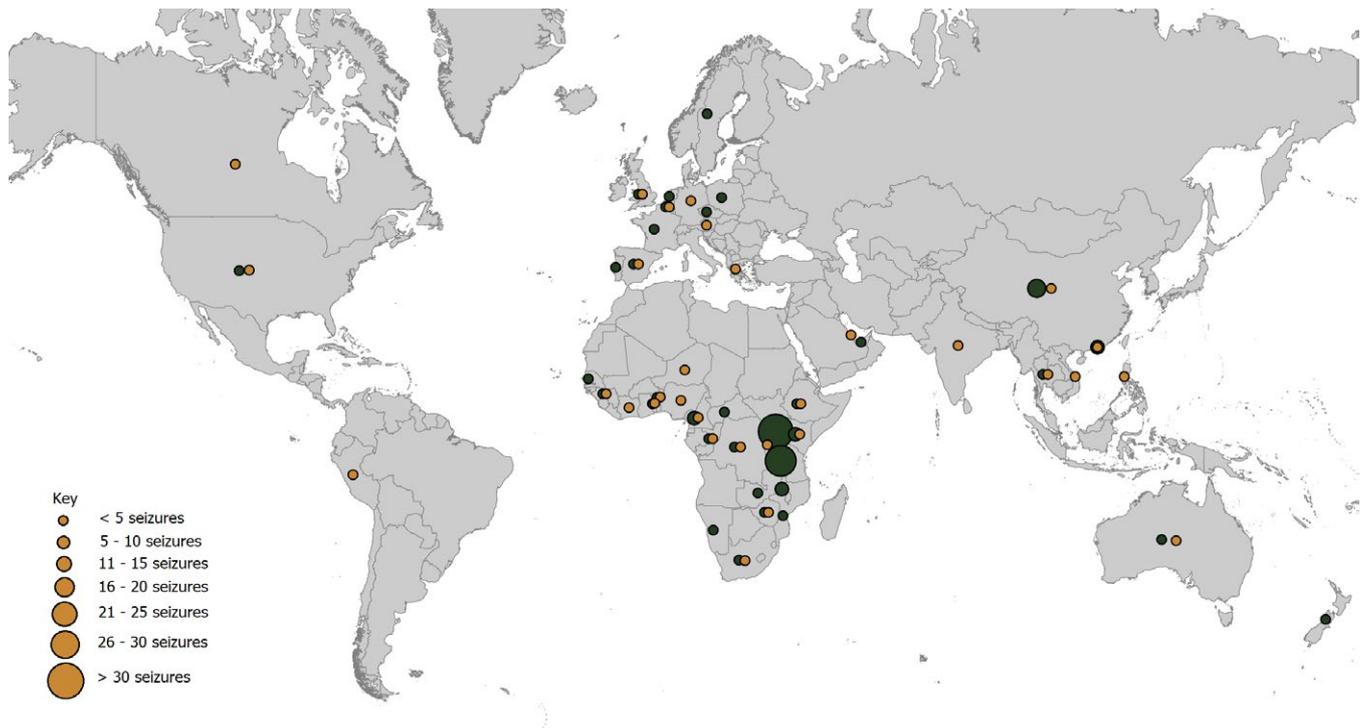


FIGURE 5
Countries/territories who made seizures of hippo ivory (in green), or were implicated in seizures of hippo ivory (in yellow), 2009-2018 (WiTIS)



ESTIMATION OF OFFTAKE FROM THE POPULATION FROM INTERNATIONAL TRADE IN HIPPO IVORY

Using the conversion factors as specified in the methods section, it was estimated that the offtake from the population was 13,491 hippos between 2009 and 2018 (Table 4). This equated to approximately 1,349 hippos

annually over the period. Based on the current population estimates of 130,000–145,000 hippos in African range States, this represented approximately one per cent of the population annually.

TABLE 4

Estimated offtake from the population, based on international trade (legal and illegal) in hippo ivory, 2009-2018 (CITES trade data and WiTIS)

WEIGHT (KG)		
Commodity	Quantity	Estimated no. of animals
Teeth	37,254	7,096
Carvings & jewellery	165	32
COUNTRY	32	957.2
NUMBER OF SPECIMENS		
Commodity	Quantity	Estimated no. of animals
Skulls	464	464
Teeth	23,869	1,989
Trophies	3,910	3,910
COUNTRY	131	6,335

The estimation of offtake was also calculated at a country level for legal trade in hippo ivory, with most countries' (n=9) offtakes estimated to be less than 0.5% of their total hippo populations (Table 5). The highest offtake was for Malawi,

estimated to be approximately 4% of their total hippo population. Estimated offtakes from five countries (Namibia, South Africa, Tanzania, Uganda, and Zimbabwe) were between one and three per cent of their hippo populations.



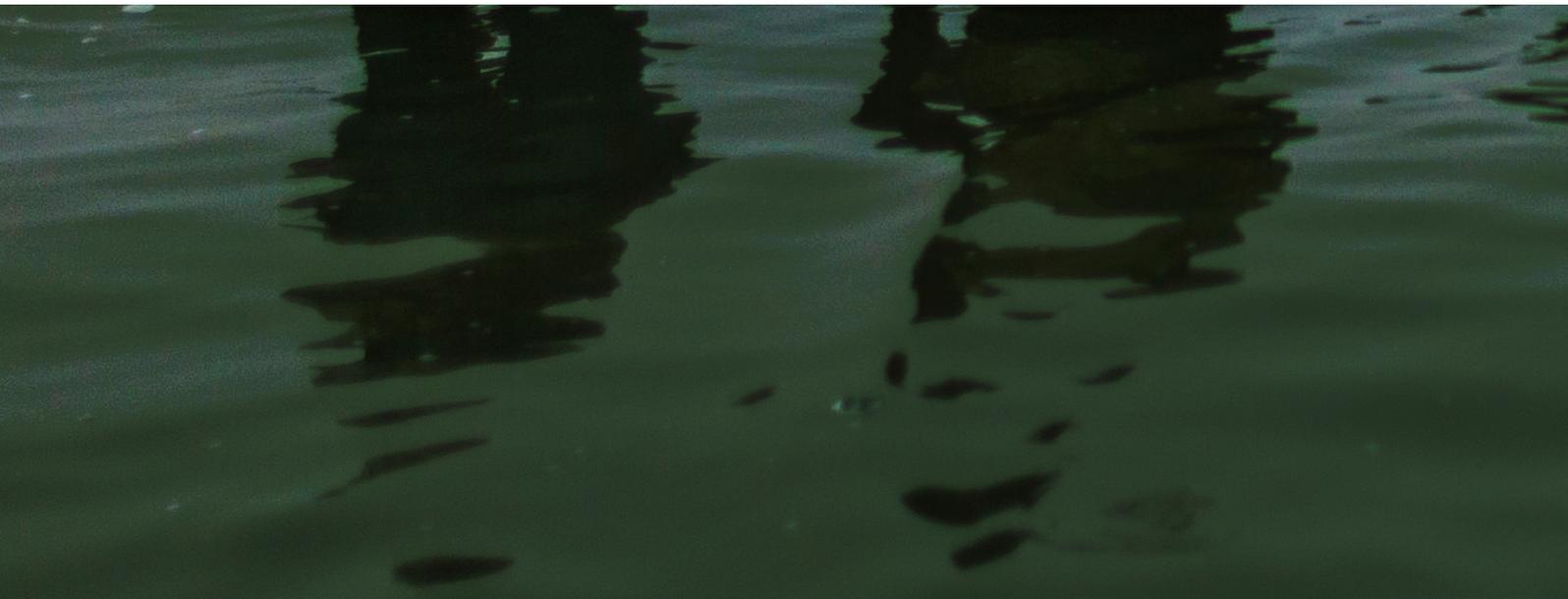
offtake is estimated at 1%

TABLE 5

Estimated equivalent number of individuals or offtake from hippo populations per country based on international legal trade in hippo ivory, 2009-2018 (CITES trade data)

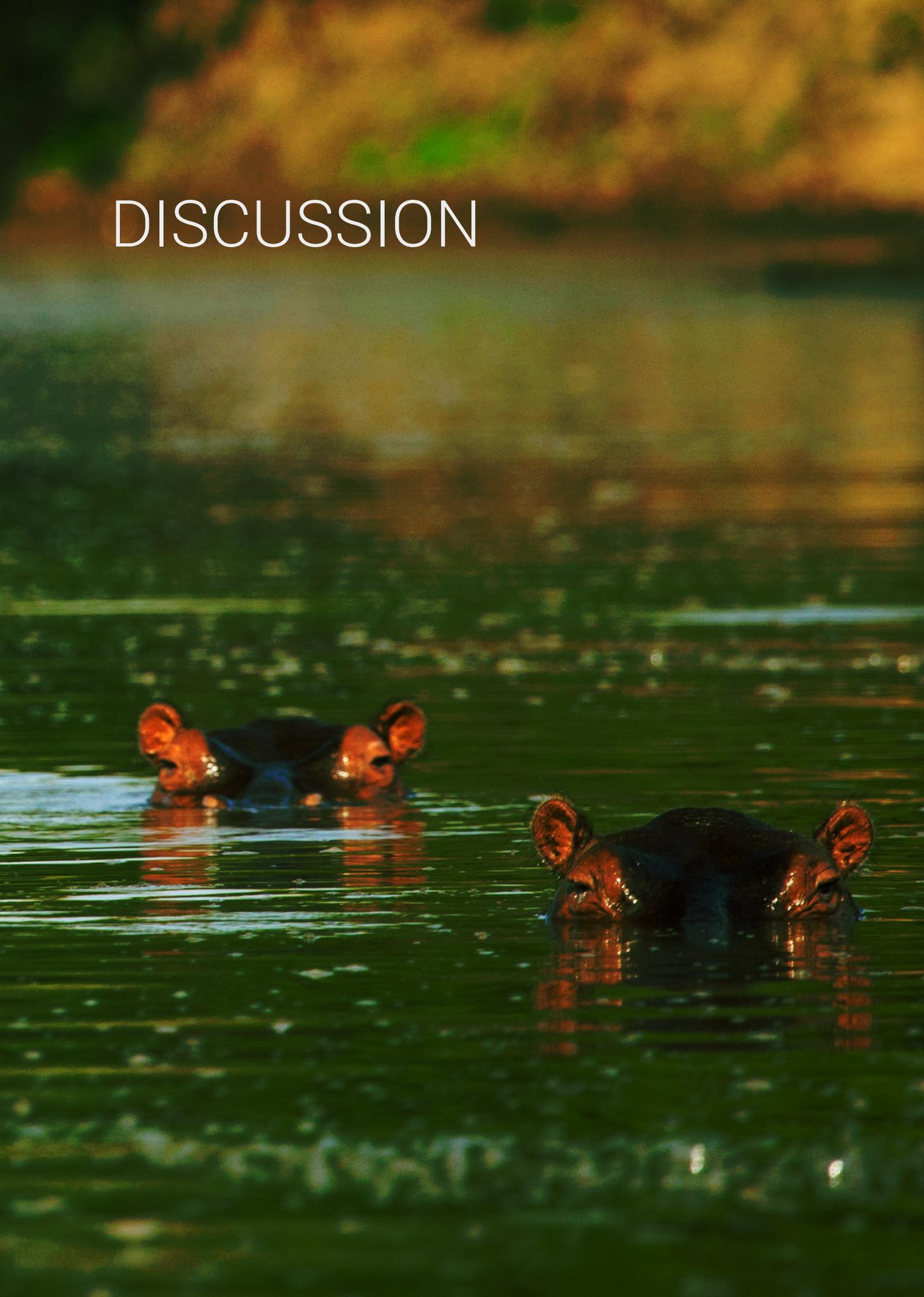
*excludes countries (Benin, Burkina Faso, Cameroon, Central African Republic, Ethiopia, Kenya, Mozambique, Nigeria, and Zambia) where the offtakes were estimated <0.4% of their hippo population, and 88 specimens (equivalent to approximately 12 animals) from country/countries specified as unknown.

COUNTRY*	QUANTITIES TRADED	EQUIVALENT NO. OF ANIMALS	PERCENTAGE OF POPULATION
Malawi	2 skulls 6,623 kg of teeth 24 teeth 2 trophies	1,268	4%
Namibia	17 skulls 336 teeth 229 trophies	274	1%
South Africa	93 skulls 471 kg of teeth 2,626 teeth 730 trophies	1,132	2%
Tanzania	73 skulls 11,561 kg of teeth 5,025 teeth 823 trophies	3,517	1%
Uganda	1 skull 15,056 kg of teeth 162 teeth 6 trophies	2,889	3%
Zimbabwe	97 skulls 4,942 teeth 1,035 trophies	1,543	3%





DISCUSSION



DISCREPANCIES IN REPORTED TRADE

Discrepancies in reported trade by exporting and importing countries/territories in the CITES trade database have been widely documented for hippos and many other species (Andersson & Gibson, 2017; CITES, 2017; Emslie *et al.*, 2016; UNEP-WCMC, 2014). These discrepancies may exist for several reasons including, but not limited to, the use of non-standard units, reporting on the quantity for which the permits were issued as opposed to quantity of specimens traded, incorrect reporting (e.g. specifying skulls instead of teeth), or incomplete reporting, i.e. not specifying a source or purpose (UNEP-WCMC, 2013).

Other causes for discrepancies may be due to importers reporting quantities of hippo ivory in terms of weight, while exporters reported in terms of number of specimens. The differing

use of units in this case (weight vs number of specimens) may contribute to the discordances seen in the data. This challenge may be overcome by ensuring the standardised use of units by countries/territories, or the use of a reliable conversion factor that could be used to convert teeth reported in weight to number of specimens or vice versa.

Furthermore, discrepancies could also be a result of trade in illegally harvested hippo ivory (Andersson & Gibson, 2017). This research found evidence of more than 160 incidences of illegal trade in hippo ivory, implicating many of the countries/territories that commonly imported or exported hippo ivory legally during the same period.



trade discrepancies
the differing use of units may have contributed to the discordances seen in the data

CONCERNS ABOUT THE POTENTIAL INCREASE IN HIPPO IVORY AS A SUBSTITUTE FOR ELEPHANT IVORY

This research assessed quantities of hippo ivory traded between 2009 and 2018 to determine whether an increase in hippo ivory occurred in response to or coinciding with numerous countries/territories' implementing stricter legislation and greater regulatory controls on the trade in elephant ivory. Contrary to these concerns, this research concluded that annual trade quantities of hippo ivory generally appeared to decrease (with stand-alone spikes observed in 2015 and 2018). It is difficult to ascertain whether this decreasing trend is a continuation of patterns that were identified following the RST in 1999, or if there are other reasons for this observation (CITES, 2012a).

The notable increase in hippo ivory traded in 2018 appears to coincide with the auction in Tanzania where 12,467 hippo teeth weighing 3,580 kg were sold in January 2018 (TAWA, 2018a; TAWA, 2018b). These teeth were reportedly taken from government stockpiles collected over several years (TAWA, 2018b). The spike noted in 2015 appears to be a result of an increase in hippo ivory traded from Malawi. This one-off increase may also be as a result of stockpiled ivory sales (DNPW, *in litt.* to S. Moneron, August 2018); however, further investigation would be needed, especially since Malawi's reported exports were lower than the reported imports.



quantities of hippo ivory internationally traded
appear to be decreasing

POPULATION OFFTAKE FROM INTERNATIONAL TRADE IN HIPPO IVORY

Based on this analysis, much of the hippo ivory was exported from countries with relatively high populations of hippos. This included Malawi, Mozambique, Namibia, South Africa, Tanzania, Uganda, Zambia, and Zimbabwe. Overall offtake estimates for international trade in hippo ivory were calculated at approximately one per cent of the total population annually. An offtake of one per cent could be considered sustainable if growth rates for country-specific populations are aligned with the estimated intrinsic rate of increase for hippos, and other offtake factors (e.g. natural or man-made deaths and/or trade in other parts, derivatives or whole animals) are taken into account (CITES, 2017; Marshall & Sayer, 1976).

trade information has gone undetected or unreported, the exclusion of quantities of hippo ivory carvings and jewellery reported in terms of number, and the relatively conservative conversion factors this research used, these offtakes may be an underestimate.

Lastly, the offtake calculation also relied on population estimates that may be outdated or were under-or-overestimated at the time (Lewison & Pluháček, 2017). To assess the levels of offtake from the population for the international trade in hippo ivory more accurately, censuses could be conducted in range States where recent information of population status is lacking. These censuses should also be focused on those countries where hippo populations are not considered to be stable, or where there is concern about the conservation status of the species.



**offtake is
estimated
at 1%**

of the total hippo
population

Four countries exhibited offtakes that were higher than one per cent – Malawi (4%), South Africa (2%), Uganda (3%), and Zimbabwe (3%). Given the likelihood that additional





CONCLUSION



This rapid assessment has documented the quantities of hippo ivory traded between 2009 and 2018 and identified the major exporting and importing countries/territories for hippo ivory. It appeared that hippo ivory was mostly exported from east and southern African range States to Asia, Europe, and North America. Much of the hippo ivory was re-exported to countries/territories within the EU, Hong Kong SAR, Turkey, and USA. This study also found discrepancies within the reported trade data, potentially explained by numerous factors including differing use of units by exporters and importers, trade in illegally harvested

specimens, and incorrect or incomplete reporting.

Additionally, results from this research suggest that the quantity of hippo ivory traded has decreased between 2009 and 2018, contrary to concerns that the trade in hippo ivory may increase as a substitute for elephant ivory as countries/territories globally implement stricter legislation around the trading in elephant ivory. Lastly, this research conservatively estimated the offtake from the hippo population based on the quantities of ivory internationally traded.

RECOMMENDATIONS

BASED ON THE FINDINGS OF THIS RESEARCH, THE FOLLOWING RECOMMENDATIONS ARE SUGGESTED.

CITES Parties are encouraged to follow the guidelines for submitting annual reports to CITES.

CITES Parties' Management Authorities should ensure that the relevant responsible personnel are familiar with the CITES reporting guidelines for submission of annual reports (see Guidelines for the preparation and submission of annual reports and of annual illegal trade reports), particularly ensuring that reporting of hippo ivory items is consistent in the use of terms and units and in line with the guidance. Where there are concerns or clarifications the CITES Management Authorities can seek guidance from the CITES Secretariat. Due diligence in the submission of annual reports is paramount to ensure better standardisation and to reduce discrepancies in the data.

Further investigations into the discrepancies are warranted by CITES Parties' Management Authorities

CITES Management Authorities are encouraged to retrospectively investigate discrepancies found within the CITES trade database. This should be done in collaboration with exporting and importing partners. These investigations could facilitate the identification of interventions or strategies that may mitigate these discrepancies in future. Additionally, investigations into these discrepancies may reveal actionable information for relevant law enforcement agencies should some of the discrepancies be as a result of trade in illegally harvested hippo ivory.

Updated hippo population estimates, which will aid in the estimation of offtake

This assessment encourages countries to conduct updated population estimates or censuses for hippo in order for an informed review of the sustainability of the hippo ivory trade and provide essential information for making non-detriment findings. These activities could be focused in range states where hippo populations are thought to be changing (declining or increasing) or unknown, where there is concern around the conservation status of the species, where population estimates are lacking, limited, or outdated, and where there is an indication of legal or illegal trade (see Lewison & Pluháček [2017] and supplementary information).

Countries such as Angola, Burkina Faso, Central African Republic, Republic of Congo, Equatorial Guinea, Gambia, Guinea, Kenya, Senegal, Somalia, Sudan, Togo, and Uganda are range states that have reportedly exported hippo ivory between 2009 and 2018 and where population estimates are limited, lacking, or based on information collected prior to 2012 (Lewison & Pluháček, 2017). Given that many of these range states have hippo populations that are considered of conservation concern (Lewison & Pluháček, 2017), these countries are encouraged to conduct hippo counts. Funding for these activities could be done in collaboration with trading partners or other interested stakeholders.

A better understanding of the types of hippo ivory in trade and CITES Management Authorities' use of the relevant trade term codes

Further clarification could be collected from CITES Parties' Management Authorities on the types of hippo teeth (incisors, canines, etc.) in international trade, their subsequent use of the relevant term codes (tusks or teeth), and if (and how) CITES Management Authorities' distinguish between the different teeth types when submitting their reports. This information could provide clarification on the use of an appropriate conversion factor and provide for a more accurate estimation of levels of offtake.

The development of a reliable conversion factor for hippo ivory, to provide more accurate estimates of offtake

As has been conducted for rhinoceros' horn (see Pienaar et al., 1991), an average weight of a hippo's canine and incisor (hippo ivory that is mostly in trade) could assist countries/territories in more accurately assessing the potential reasons for discrepancies found in reporting data, by eliminating or ruling out of one possible reason – the differing use of units by CITES Parties when reporting. It could also assist in providing more accurate estimates of quantities traded (and subsequent offtake from the population) when analysing trade information.



IMAGE CREDITS

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