BEFORE THE SECRETARY OF THE INTERIOR
PETITION TO LIST
THE COMMON HIPPOPOTAMUS (*Hippopotamus amphibius*)
PURSUANT TO THE UNITED STATES ENDANGERED SPECIES ACT

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March 24, 2022

by

THE HUMANE SOCIETY OF THE UNITED STATES, HUMANE SOCIETY INTERNATIONAL, HUMANE SOCIETY LEGISLATIVE FUND, and CENTER FOR BIOLOGICAL DIVERSITY

Notice of Petition

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The Humane Society of the United States ("HSUS") is the nation's largest animal protection organization. Based in Washington, DC, HSUS works to protect all animals and combat cruelty through litigation, legislation, investigation, education, advocacy, grant-making, emergency rescue missions, field work, and direct care to tens of thousands of animals. HSUS has worked for decades to improve the plight of African wildlife, including increasing Endangered Species Act ("ESA") protection for imperiled species like common hippopotamus, giraffes, elephants, lions, and chimpanzees.

Humane Society International (HSI)
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Humane Society International is one of the only global animal protection organizations working to help all animals—including animals in laboratories, animals on farms, companion animals and wildlife—and our record of achievement demonstrates our dedication and effectiveness. HSI: Celebrating Animals, Confronting Cruelty.

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The Humane Society Legislative Fund was formed in 2004 as a separate lobbying affiliate of The Humane Society of the United States. HSLF works to pass animal protection laws at the state and federal levels, to educate the public about animal protection issues, and to support humane candidates for office. HSLF: Get Political for Animals.

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The Center is a non-profit, public interest environmental organization dedicated to the protection of native species and their habitats. The Center works through science, law, and creative media to secure a future for all species, great or small, hovering on the brink of extinction. The Center is supported by more than 1.7 million members and activists throughout the United States. The Center and its members are concerned with the conservation of endangered species and the effective implementation of the Endangered Species Act. The Center's International Program works to protect global biodiversity by using U.S. and international law to hold governments accountable for threatening imperiled species wherever they are found.

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Submitted this 24th Day of March, 2022

Pursuant to Section 4(b) of the Endangered Species Act (ESA), 16 U.S.C. § 1533(b), Section 553(e) of the Administrative Procedure Act, 5 U.S.C. § 553(e), and 50 C.F.R. § 424.14(a), Petitioners, The Humane Society of the United States, Humane Society International, Humane Society Legislative Fund, and The Center for Biological Diversity hereby Petition the Secretary of the Interior and the U.S. Fish and Wildlife Service (FWS or the Service) to protect the common hippopotamus (*Hippopotamus amphibius*) as an endangered species, or alternatively as a threatened species, under the Endangered Species Act, 16 U.S.C. §§ 1531-1544.[1]

This Petition presents substantial scientific and commercial information indicating that the common hippopotamus is in danger of extinction throughout all or a significant portion of its range. *See* 50 C.F.R. § 424.14(h)(1)(i) ("substantial scientific or commercial information" refers to credible scientific or commercial information in support of the Petition's claims such that a reasonable person conducting an impartial scientific review would conclude that the action proposed in the Petition may be warranted). Therefore, the Secretary of the Interior, through the Service, must make an initial finding "that the petitioned action *may be* warranted" within 90 days of receiving this Petition. 16 U.S.C. §1533(b)(3)(A) (emphasis added); *HSUS v. Pritzker*, 75 F. Supp. 3d 1 (D.D.C. 2014) (holding that conclusive evidence is not required to make a positive 90-day finding).

The common hippopotamus has suffered a major reduction in population size across its range primarily due to habitat loss and fragmentation, legal overutilization for commercial and recreational purposes, illegal hunting and trade, disease, and the inadequacy of current regulatory mechanisms, and such decline continues unabated. The Service has a duty to protect the iconic common hippopotamus by listing the species under the Endangered Species Act, which would meaningfully contribute to common hippopotamus conservation by strictly regulating the import, export, and interstate commerce in common hippopotamus parts and products. *See* 16 U.S.C. § 1531(b), (c) (providing that federal agencies "shall utilize their authorities in furtherance of" the conservation purpose of the ESA).

Respectfully submitted,

[1] If the Service determines that the common hippopotamus is not in danger of extinction throughout all of its range, Petitioners request that the agency determine whether the species is in danger of extinction throughout a significant portion of its range, thus warranting endangered listing range-wide on that basis. *See* 16 U.S.C. § 1532(6). If the Service determines that the species should not be listed as endangered range-wide, then we request that the species be listed as threatened, with qualifying distinct population segments or subspecies (should the scientific community reach consensus regarding subspecies) listed as endangered. If the Service lists the common hippopotamus as threatened, all the prohibitions in Section 9 should be extended to the species through a 4(d) rule given the threats these animals face. *See* 16 U.S.C. § 1533(d).

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EXECUTIVE SUMMARY

This Petition presents substantial information indicating that the common hippopotamus (*Hippopotamus amphibius*) is currently in danger of extinction throughout all or a significant portion of its range and meets the statutory criteria for an endangered listing under the Endangered Species Act (ESA), 16 U.S.C. §§ 1531-1544. The Petitioners—The Humane Society of the United States, Humane Society International, Humane Society Legislative Fund, and Center for Biological Diversity—therefore petition the Secretary of the Interior and the U.S. Fish and Wildlife Service (FWS or the Service) to protect the common hippopotamus as an endangered species, or alternatively at least as a threatened species, under the ESA.[2]

The ESA requires the Secretary to determine within 90 days of receiving a Petition whether the Petition "presents substantial scientific or commercial information indicating that the petitioned action may be warranted." 16 U.S.C. § 1533(b)(3)(A). Such determination must be made solely on the basis of the "best scientific and commercial data available." *Id.* § 1533(b)(1)(A). Following a positive 90-day finding, the Secretary must, within one year of receipt of the Petition, complete a review of the status of the species, publish a finding of whether the petitioned action is warranted and, if so, promptly propose a rule to list the species. *Id.* § 1533(b)(3)(B). Should a rule be proposed, the Secretary has an additional year to finalize regulations protecting the species. *Id.* § 1533(b)(6)(A).

Once foreign species are listed as endangered, protection under the ESA occurs by, inter alia, prohibiting import, export, and interstate commerce in live animals and derivatives, 16 U.S.C. § 1538(a)(1), (g), unless such activity enhances the propagation or survival of the species or is for conservation science purposes, *id.* § 1539(a)(1)(A). Furthermore, Section 8 of the ESA provides for "International Cooperation" in the conservation of foreign species, and listing foreign species heightens global awareness about the importance of conserving the species. *Id.* § 1537. This is essential for an animal like the common hippopotamus where the public is generally unaware of the unabated threats the species faces.

The Petition presents the natural history and biology of the common hippopotamus (hereafter "hippo"), its population trends and distribution, and the threats it faces, including habitat loss and fragmentation; legal overutilization for commercial and recreational purposes; illegal hunting and trade; disease; and the inadequacy of the current regulatory mechanisms. The combination of these threats puts the conservation status of the species at serious risk. Listing the hippo under the ESA is necessary to prevent the decline of the species and to promote its conservation both in the United States and in its range countries, as required by law.

Natural History and Biology

Hippos are highly susceptible to overexploitation due to their life history characteristics—long lifespans and inter-calf intervals, delayed sexual maturity and low reproductive potential—that result in long recovery times, especially if mortality rates are high. Ecologically, hippos are freshwater dependent species requiring shallow areas that permit them to stand fully submerged during the day but also provide access to suitable foraging habitat nearby.

[2] See supra footnote 1.

Hippos are a keystone species that support the structure and functionality of their ecosystems (Dudley et al., 2016; Kanga et al., 2013). They serve as ecosystem engineers as they alter the geomorphology, hydrology and ecosystem connectivity between their aquatic and terrestrial habitats (Mosepele et al., 2009).

Status and Distribution

Accurate global hippo population estimates are lacking, but available information suggests many populations are declining. Hippos were assessed as Vulnerable on the IUCN Red List in 2016 and were estimated to have a global population size of 115,000-130,000. However, among 29 hippo range States where population trends are known, 15 are experiencing declines in hippo populations. Additionally, while populations were expected to be increasing in four range States in 2016, more recent evidence indicates that they may not be increasing today. Finally, hippo populations in South Africa and Zimbabwe, which were expected to be stable in 2016, may no longer be stable due to increasing anthropogenic pressures.

The hippo once occupied much of sub-Saharan Africa; today, it inhabits much of its historical range, but many populations are small and fragmented. Eastern and Southern Africa are hippo population strongholds with nearly all hippos residing in these regions, the largest populations residing in Zambia and Tanzania. In Western Africa, hippos face the highest risk of extinction due to small population sizes and fragmented habitat.

Threats

The present or threatened destruction, modification, or curtailment of its habitat or range

Loss and degradation of habitat caused by humans is currently a major threat to the survival of the hippo (Lewison & Pluháček, 2017a). Like their close relatives, the cetaceans, hippos are highly adapted to an aquatic lifestyle and depend on freshwater habitats. Life processes that rely on the availability of suitable aquatic habitat include, but are not limited to, thermoregulation and skin health, hydration, and reproduction. Loss and degradation of freshwater habitat has compounding impacts on hippo mortality and reproduction, increasing disease spread and human-hippo conflict as hippos search out new habitat. This is especially concerning as droughts in sub-Saharan Africa are projected to increase in severity and frequency due to climate change. Conversion of hippos' terrestrial habitat and diversion of water for agricultural and human settlements have played a role in the loss, degradation, and fragmentation of hippo habitat. Pressures from human activities, such as fishing, water extraction for agricultural operations, and gold mining, have displaced hippos and increased human-hippo conflict. War and civil unrest continue to pose significant risks to hippos and their habitat. Today, hippos have access to only a fraction of their former aquatic and terrestrial habitats which, in combination with other environmental and anthropogenic pressures, have caused populations to decline and even collapse in some areas.

Overutilization for commercial, recreational, scientific, or educational purposes

There is significant legal international trade in hippo parts and products, and the United States is a leading importer. According to the CITES Trade Database between 2009-2018, 75,397 wild-sourced hippo specimens (parts and products) were traded internationally for commercial purposes, hunting purposes, and personal purposes. Hippo specimens in trade over the decade

studied equates to at least 13,496 wild hippos that originated mainly from Tanzania, Uganda, Zambia, and Zimbabwe. Combined, ivory and skin products made up 92% of globally imported specimens.

The United States was the top importer of all globally imported hippo parts and products, including teeth, ivory carvings, leather products, trophies, and genitalia. Despite global imports decreasing over the course of the decade studied, the number of U.S. imports remained relatively stable. Therefore, the United States has become responsible for a greater portion of global trade in hippo specimens in the most recent years studied.

The United States was the main importing country of hippos for trophy hunting purposes. Trophy hunting has deleterious consequences for hippo populations as the species faces a high probability of substantial population decline when habitat loss is combined with even a moderate level of hunting (1% offtake of adult hippo population). For six range countries, the annual trophy hunt offtakes averaged over 10 years exceeded 1% per year of the national hippo population size and is likely to be detrimental.

In addition, a very large and biologically significant amount of hippo poaching, trafficking, and illegal trade is occurring. Seizures and arrests related to hippo ivory were reported in 20 countries between 2016 and 2020, representing the illegal killing of a minimum of 6,755 hippos. Seizures of hippo meat and arrests related to possession of hippo meat are not as common as arrests and seizures related to possession, trade, and transport of hippo teeth and ivory; although, seizures of hippo meat continue to present day. Further, hippo parts and products in international trade in some instances originated in countries where such exports are illegal under national law. We documented 1,392 hippos being unaccounted for in trade during the decade studied.

In sum, it is not possible to compare the global estimated population of hippos to the global estimated offtake of hippos and conclude that the percentage offtake is low. Given the concentration of hippo offtake in certain countries—primarily Tanzania, Uganda, Zambia, Zimbabwe, Malawi, and South Africa—overutilization is particularly troubling in certain regions. Overall hippos are overutilized for commercial, recreational trophy hunting, and personal purposes.

Disease or predation

Disease and predation are not major threats to hippo populations (Lewison & Pluháček, 2017a) but can have additive effects to other threats. Hippos are susceptible to several infectious diseases; most notably anthrax which can cause a mortality rate of as high as 55.5% of affected hippo populations (Eltringham, 1999, p. 113; Turnbull et al., 1991). The hippo has few natural predators, they include lions, crocodiles, and hyenas, and predation typically occurs on infant and juvenile hippos (Eltringham, 1999, pp. 117-118; Estes, 1991; Kingdon, 1979; Owen-Smith & Mills, 2008). Hippos have been observed on numerous occasions to exhibit infanticide and are the only ungulates that exhibit this behavior in the wild (Lewison & Oliver, 2008; Mysterud et al., 2002).

Inadequacy of Existing Regulatory Mechanisms
International laws and agreements have failed to provide adequate protections for hippos or their habitat as evidenced by the continuing deterioration of the conservation status of the species.

The hippo is listed on Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), but the Convention is not currently adequately protecting the species. The international trade in hippos has increased in most range States since the hippo was listed on CITES Appendix II and the conservation status of the species continues to deteriorate.

Few range States appear to have adequate national regulatory mechanisms, or effective measures to implement and enforce such mechanisms should they exist, to address hippo population declines. Despite total protection under some national laws, hippo parts and products still appear to be exported out of these countries under the guise of legal international trade. As stated above, there was evidence of discrepancies in legal global trade during this decade resulting in 1,392 hippos being unaccounted for in trade. The hippo is not a protected species in two of the top six exporting range States (2009-2018). The threats to hippos are exacerbated by insufficient regulatory mechanisms throughout their range.

Other natural or manmade factors affecting its continued existence
Hippo skin, meat, gallbladder, teeth, blood, and fat have been historically used for traditional and medicinal purposes in parts of Africa, and some uses continue in present day (CITES, 1994, pp. 171-172; 2002; Haule et al., 2002; Kamatenesi-Mugisha & Oryem-Origa, 2007; Moreto & Lemieux, 2015; Osborn & Helmy, 1980, p. 479; Vats & Thomas, 2015).

Conclusion
Hippos are threatened by habitat loss and fragmentation; legal overutilization for commercial and recreational purposes; illegal hunting and trade; disease; and the inadequacy of the current regulatory mechanisms. The combination of these threats puts the conservation status of the species at serious risk. The United States is a leader in conservation, but also a significant consumer of hippo products, and thus conservation of these iconic mammals can and should start here. This Petition shows that the best available science and data confirms that the hippo meets the statutory requirements for listing under the ESA. The United States can end its role in the international trade of hippo parts and products, while bringing further awareness to one of the most well-recognized and celebrated icons of African biodiversity.

I. INTRODUCTION

The common hippopotamus (*Hippopotamus amphibius;* hereafter referred to as "hippo") is the third heaviest land mammal (after the African savanna elephant and white rhino) and is easily recognizable even by children for its barrel-shape, huge teeth, and jaws that seem able to open to 180 degrees. These herbivores are ecological engineers and keystone species that are irreplaceable to the terrestrial and aquatic ecosystems they inhabit. Some of their contributions to their ecosystems include flood mitigation, ecosystem connectivity, nutrient dynamics, vegetation structure, and maintenance of biodiversity. Despite being such an iconic and ecologically vital species, very little is known about hippo behavior, ecology, or regional population sizes, and the future of the hippo is uncertain.

The hippo is threatened by factors that act synergistically to drive population declines and put the species in danger of extinction. These amphibious animals have evolved to be dependent on aquatic habitat. They suffer high rates of mortality and low reproductive rates when environmental conditions are unfavorable, such as periods of below-average rainfall and increased land temperatures which are projected to increase in severity and frequency due to climate change. Furthermore, when resources are scarce, competition between humans and hippos increases and results in increased conflict, retaliatory killing, and culling. Conversion of hippos' terrestrial habitat and diversion of water for agricultural and human settlements largely contribute to the loss, degradation, and fragmentation of suitable habitat which are expected to continue unabated as human population expands and climate change-induced pressures persist.

Legal and illegal trade in hippo parts and products is expansive and demonstrates that the hippo is overutilized for commercial, recreational trophy hunting, and personal purposes. Over the course of the most recent decade (2009-2018), this Petition documented a total of 75,397 wild-sourced specimens legally traded internationally which contributed to the take of at least 13,496 wild hippos. Concerningly, this Petition documents that parts and products in legal international trade originated in countries where such exports are illegal under national law. During this decade, the United States has allowed the import of such illegal hippo specimens as well as hippo specimens from countries where hippo offtake is unsustainable. Global demand for hippo parts and products decreased over the decade and in the most recent years studied, the United States has become responsible for a greater portion of global trade in hippo specimens. Now more than ever, the United States has a vital role to play in hippo protection. As a global leader in conservation, and the top importer of hippo parts and products, the United States can make a profound and positive impact on the international trade of the species.

Current regulatory mechanisms in place are inadequate and fail to protect hippos as evidenced by ongoing population declines, habitat loss, and persistent poaching. Immediate action, such as protection under the ESA, is necessary to help protect and conserve hippos.

Listing hippos under the ESA will help the species in several ways. It will limit U.S. imports and exports of hippo parts, products (e.g., carvings, teeth, skins, leather products, feet), and trophies to only imports and exports that the Service determines are for scientific purposes or that

enhance the propagation or survival of the species.[3] The ESA's enhancement finding is more stringent and comprehensive than the Convention on International Trade in Endangered Species of Wild Fauna and Flora non-detriment finding. This non-detriment finding is currently only required from hippo-exporting countries, and not a single one of the main exporting countries has made the scientific basis for its non-detriment finding publicly available. Strict regulation of U.S. imports is especially important given that U.S. imports of hippo trophies and skin products (skins, skin pieces, leather products) have increased in the latter part of the last decade. ESA listing would also require a scientific purpose or enhancement finding for interstate commerce in hippo parts and products. Such domestic trade is currently not regulated at the federal level and, as this Petition demonstrates, sale of hippo parts and products is widespread in the United States. A successful ESA listing will also benefit hippos by increasing awareness of the species' threats and generating potential funding for scientific research and in-situ conservation of the species in range States.

[3] As explained above, if the Service lists the species as threatened rather than endangered, all the prohibitions in Section 9 should be extended to the species through a 4(d) rule. See supra footnote 1.

II. NATURAL HISTORY AND BIOLOGY

A. Taxonomy

Kingdom	Phylum	Class	Order	Family	Genus	Species
Animalia	Chordata	Mammalia	Artiodactyla	Hippopotamidae	Hippopotamus	amphibius

The hippo belongs to the class Mammalia, order Artiodactyla, suborder Whippomorpha, family Hippopotamidae, the only extant member of the genus Hippopotamus, species *Hippopotamus amphibius* Linnaeus, 1758. Lydekker (1915) proposed five subspecies of common hippopotamus based on cranial anatomy and geographical distribution: the nominate subspecies *H. a. amphibius* (Gambia to South Sudan, Sudan to Democratic Republic of Congo, Tanzania, Mozambique; extinct in Egypt), *H. a. tschadensis* (Chad, Cameroon, Nigeria), *H. a. kiboko* (Kenya, Somalia), *H. a. constrictus* (Angola, South of Democratic Republic of Congo, Botswana), and *H. a. capensis* (Zambia to South Africa) (IUCN SSN Hippo Specialist Group, n.d.). However, genetic diversity in hippos has not been well documented and the distinction between subspecies has been questioned (Eltringham, 1999, pp. 2-3). Okello et al. (2005) found low but significant genetic differentiation to support three subspecies: *H. a. kiboko*, *H. a. capensis*, and *H. a. amphibius*. The most recent study found differences within local populations but could not confirm subspecies or subspecific geographical differences (Stoffel et al., 2015). Future research is needed to determine whether subspecies of hippos exist; for this reason, this Petition examines the hippo at the species level and requests that the Service evaluate the hippo at the species level in making its finding.

B. Physical characteristics

Hippos and cetaceans are related at the suborder level (*Whippomorpha*) and cetaceans are the closest living relatives to the hippo. Extant Whippomorphs have similar physiological traits: a dense layer of subcutaneous fat, thick bones, minimal hair, no sweat glands, auditory structures that allow them to hear under water, single-lobed lungs which are an adaptation that allows them to stay under water longer, and a large larynx that enables cetaceans and hippos to communicate under water.

The hippo is the third heaviest land mammal after the African savanna elephant and the white rhinoceros and one of the largest amphibious mammals (Timbuka, 2012). Its name derives from the Greek terms: “hippo,” meaning horse, and “potamus,” meaning water.

The hippo typically reaches a shoulder height of 140 to 160 cm (4.6 to 5.2 ft) (Estes, 1991). Hippos exhibit slight sexual dimorphism—males are approximately 10% heavier than females (Eltringham, 1999, pp. 9-12; Kingdon, 1979) although the main difference is the jaws and canines (Eltringham, 1999, p. 14; Shannon et al., 2021). Among young hippos, however, females are slightly larger than males (Shannon et al., 2021). Males have a head and body length of 300 to 505 cm (9.8 to 16.6 ft), girth of 157 to 315 cm (5.1 to 10.3 ft), and weigh between 506 to 3,200 kg (1,116 to 7,055 lbs) (Eltringham, 1999, pp. 9-13; Kingdon, 1979). Females have a body and head length of 290 to 430 cm (9.6 to 14ft), girth of 152 to 335 cm (5 to 11 ft), and weigh between 655 to 2,344 kg (1,444 to 5,168 lbs) (Eltringham, 1999, pp. 9-13; Kingdon, 1979).

However, measurements vary depending on region (Kingdon, 1979). It has been suggested that males continue to grow throughout their life; whereas females stop growing around age 24 (Kingdon, 1979; Marshall & Sayer, 1976).

Hippos have an enormous head and a jaw that is hinged very far back, permitting almost a 180° mouth gape (Dudley et al., 2016; Eltringham, 1999, p. 17). They exhibit sexual dimorphism in the curved canine teeth—female canine teeth weigh less than half of those of males (Laws, 1968). Males have jaws that are 44% heavier than females and canines that are 81% heavier than females (Shannon et al., 2021). Male canines can grow up to 50 cm (1.64 ft) and 30 to 40 cm (0.98 to 1.31 ft) in incisor teeth (Estes, 1991). Canine and the peg-like incisor teeth continue to grow in both males and females, but growth rates slowly decline and/or plateau around age 25 for males and 20 to 25 for females (Laws, 1968). Tooth size and weight decline due to use, breakage, and/or resorption of bone (Laws, 1968). Some sexual differences are visible in the first incisor tooth. No sexual dimorphism is exhibited in molar teeth; however, those of females tend to be larger (Laws, 1968).

The hippo has evolved for a semi-aquatic lifestyle. Their eyes, ears, and nostrils are positioned on top of the head, which allows the hippo to be almost completely submerged in water and still be able to see, hear, breathe, and smell (Eltringham, 1999, p. 3). Their skin, which makes up about 18% of total body weight (Luck & Wright, 1964), is very sensitive and is prone to drying and cracking in excessive sun (Eltringham, 1999, pp. 4, 38).

C. Feeding

Hippos are generally considered obligate herbivores and short-grass specialists (Dudley et al., 2016; Eltringham, 1999, pp. 78-82). They swing their head side by side while their muzzles are close to the ground and use their lips to crop short grass (Eltringham, 1999, pp. 77-78). Molar teeth are used for mastication, but canines and incisors play no role in feeding (Eltringham, 1993, p. 51; Eltringham, 1999, pp. 14-15, 77-78; Estes, 1991; Laws, 1968). They are selective grazers, and primarily consume short green grasses but also consume some dicotyledons (Eltringham, 1999, pp. 78-82; Scotcher et al., 1978). Typically, hippos do not feed on aquatic plants but may feed on them during the dry season when availability of terrestrial plants is limited (Michez et al., 2013; Mugangu & Hunter Jr., 1992). It is estimated that hippos mostly travel 0.5 to 2 km from water sources each night to forage (Stears et al., 2019); when conditions are not favorable and food is scarce, hippos may travel up to 7 or 10 km from permanent water in search of food (Buruso, 2017; Eltringham, 1999, p. 53). Their average daily intake of dry matter is 0.5% to 1.5% of body mass, which is relatively low compared to other mammals of their size (Arman & Field, 1973; Field, 1970).

Although hippos are primarily herbivores, they may also exhibit facultative carnivorous and scavenging behavior (Dudley et al., 2016). Hippos may consume carcasses of impala, elephant, wildebeest, or even other hippos found in water (Dudley et al., 2016). Attacks on other animals are facilitated by their territorial behavior and consumption is a communal event (Dudley et al., 2016). This behavior has been observed in several hippo populations across their range and may contribute to anthrax outbreaks, which can be fatal (Dudley et al., 2016).

Hippos are central place foragers, meaning they may roam on land to forage, but are restricted by distance from their water source (Lewison & Carter, 2004; Stears et al., 2019). Therefore, they are constrained by the distance they can travel in search of foraging opportunities. This also reduces the amount of seemingly suitable hippo foraging habitat, given that they are limited in the distance they can travel (Buruso, 2017). They may also be in competition with livestock foraging on vegetation along rivers, especially during the dry season when hippos must range further to find food (Kanga et al., 2013).

D. Behavior and ecology

Hippo distribution is determined by availability of water, food, resting places, and proximity to humans (Field, 1970). Hippos forage on land at night and spend their day in the water for thermoregulation and greater mobility (Eltringham, 1999, p. 3; Estes, 1991; Wright, 1987). When foraging, hippos are solitary except for adult females and their calves (Dudley et al., 2016). Hippos return to the same body of water by dawn and remain either submerged in water or take short breaks to bask in the sun during the day (Eltringham, 1999, pp. 3-4; Kingdon, 1979). It is unique to other megaherbivores as it spends most its time in water, up to 18 to 20 hours a day (Feldhake, 2005, p. 17). Despite this, hippos are poor swimmers (Eltringham, 1999, p. 3).

Hippos have adapted a unique behavioral strategy to thermoregulate in the sub-Saharan heat. Their body core temperature is remarkably stable even without sebaceous glands (Cena, 1964; Luck & Wright, 1959; Wright, 1987). Submersion in water during the dry season is necessary to maintain a stable core body temperature (Eltringham, 1999, pp. 31-33; Estes, 1991; Luck & Wright, 1959). Their extremely sensitive epidermis remains moist while underwater, preventing it from cracking. Sunbathing plays a crucial part in thermoregulation during the colder winter months (Noirard et al., 2008). During this season, hippos can be found sunbathing during the hottest hours of the day, unlike the warmer months when they remain submerged (Noirard et al., 2008). To permit prolonged sun exposure, hippos secrete a viscous reddish substance from the subdermal glands that lubricate the skin (Eltringham, 1999, p. 21; Estes, 1991; Kingdon, 1979). This substance is believed to block the effects of harmful UV rays and prevent infection (Hashimoto et al., 2007).

1. Social behavior

Although very little is known about hippo social behavior in the wild, they are social animals that tolerate close contact with conspecifics (Eltringham, 1999, p. 49; Michez, 2006). A basic social unit consists of a female and of her offspring (Karstad & Hudson, 1986; Kingdon, 1979). A school is predominantly comprised of adult females, their calves and subadults (Karstad & Hudson, 1986). Hippos school in groups of approximately 10 adult females and offspring, but schools have been reported to be as large as 107 (Field, 1970; Laws & Clough, 1996).

There are three social groups in a school: territorial males which make up 10% of the total population, non-territorial males, and females with their calves (Eltringham, 1999, p. 49). Karstad and Hudson (1986) studied a hippo population on the Mara River, in southwestern Kenya, and found it was comprised of 8% males, 36% adult females, 27% subadults (unsexed),

and 29% young. The low proportion of males may be due to voluntary emigration or rival exclusion (Karstad & Hudson, 1986). Social interactions are largely territory-based and may change based on habitat changes (Eltringham, 1999, pp. 49-51). Due to the difficulty of studying hippo behavior in the wild and identifying individuals, there are very few studies that detail their social relationships. However, a study on female hippos in captivity identified non-random associations which suggested individual social preferences between females, especially kin (Blowers et al., 2010).

Dominant males maintain linear territories for the purpose of defending mating rights with females within their territory (Eltringham, 1999, pp. 49-51). These territories consist of the shoreline and narrow strip of the bank (Eltringham, 1999, p. 49); they are measured in length, rather than area, and can be between 50 to 500 m based on location (Feldhake, 2005, p. 19; Klingel, 1991). Non-territorial males, or bachelors, are typically young bulls that reside in those territories, since dominant males tolerate the presence of small sub-adult males in their social groups (Stears et al., 2019) but may be found more towards the boundaries between territories (Eltringham, 1999, p. 49). Hippos choose their territories based on habitat quality and may temporarily move territories depending on water conditions (Eltringham, 1999, pp. 49-51; Karstad & Hudson, 1986). However, moving territories is uncommon for dominant males as they would have to compete to establish new territories and exhibit strong site attachment (Eltringham, 1999, pp. 49-51; Karstad & Hudson, 1986). Males gain mating access to females within their territory which makes those territories attractive to other males (Eltringham, 1999, p. 50). Dominant males will defend their territories against male challengers; however, males are not territorial away from the water (Eltringham, 1999, pp. 49-51). Hippos use their enlarged canine teeth and incisor teeth as a warning display and for fighting other males (Eltringham, 1999, pp. 49-50). Challenges by young males may result in serious injury or death, while confrontations between territorial males tend to be more ritualistic unless the territory is truly at stake (Eltringham, 1999, pp. 49-50). Despite this, serious fights are rare and relationships between hippos are generally categorized as friendly (Eltringham, 1999, p. 50).

Periods of low rainfall and reduced water availability contribute to additional social stress. Under dry conditions, hippo densities increase due to the limited availability of water sources (Stears et al., 2018; Stears et al., 2019; Stommel et al., 2016). The levels of aggression increase during the dry season when hippos are concentrated in available waters, especially towards subadult males who are expelled from groups when space is limited (Karstad & Hudson, 1986). In addition, when water availability is low, hippos must gamble and decide whether to abandon their territories or remain in a territory of deteriorating quality (Eltringham, 1999, p. 51).

Few long-term studies have been conducted on hippo cow-calf dynamics the wild, although they are believed to have a close relationship (Estes, 1991). In addition, female hippos in captivity exhibit kin-based social preferences (Blowers et al., 2010). Females are protective of their calves and will separate from the group immediately after birth (Eltringham, 1999, pp. 63-64). Young calves may be left in small crèches supervised by one or a few hippos while mothers are foraging (Estes, 1991). Calves are weaned at around eight months old (Estes, 1991; Laws, 1984) and remain with their mothers until six to eight years (Eltringham, 1999, p. 52). However, little is known about cow-calf dynamics post calf maturation. There is a recent observation of epimeletic behavior towards a deceased juvenile from an adult female (believed to be the mother), as well

as members of the pod (Inman & Leggett, 2019). The suspected mother defended the carcass from predators and moved the carcass to shallow waters; the pod also delayed their arrival to the river which allowed time for the mother to interact with the carcass (Inman & Leggett, 2019). This type of behavior is consistent with other highly social animals, such as elephants, great apes, orcas, and other species and may indicate attempts to resuscitate the individual or possible grieving behavior (Anderson, 2020; Bercovitch, 2020).

Hippos communicate with each other through defecation and acoustic signals. Defecation serves as an identification mechanism, where hippos can identify each other by smelling defecation/urine or by smelling the anus of others (Eltringham, 1999, pp. 51-52). In addition, dominant males may be able to identify the reproductive status of females by smelling the female's defecation, anus, or urine (Eltringham, 1999, p. 52). Hippos also produce a variety of sounds in-air and underwater, that include nine to 11 different signal types such as clicks, chuffs, snorts, grunts, and groans (Barklow, 2004; Maust-Mohl et al., 2015). Most often after an individual gives a call, other hippos respond in chorus (Barklow, 2004). There is also evidence of dominant males counter-calling across territories (Barklow, 2004). Aerial calls can be heard over long distances which may also function to intimidate predators or share information about the location or density of hippos in an area (Barklow, 2004). A recent study suggests that hippos may be able to recognize individual calls from familiar neighbors and respond more strongly to vocalizations from strangers (Thévenet et al., 2022).

2. Keystone species

Hippos are a keystone species that modify both the terrestrial and aquatic ecosystems they inhabit (Kanga et al., 2013; McCauley et al., 2018; Mosepele et al., 2009; Schoelynck et al., 2019; Subalusky et al., 2015). A feature story in *Science* referred to hippos as "the nutrient kingpins of Africa's waterways" and highlighted their complex role in their ecosystem (Pennisi, 2014). They are considered ecosystem engineers because they alter the geomorphology, hydrology, and ecosystem connectivity between their aquatic and terrestrial habitats (Mosepele et al., 2009). Hippo grazing also increases habitat diversity, making these areas more favorable for other herbivores (Kanga et al., 2013). During the wet season, their movement between the grassland and water body creates vegetation-free channels that improve water flow and minimize flooding (Mosepele et al., 2009). These channels create habitats for fish and connect to lagoons which are created in part by hippos (Mosepele et al., 2009). Hippos' movements prevent oxygen depletion in lagoons, which are important for many fish species and aquatic plants (Wolanski & Gereta, 1999).

Hippos also influence nutrient dynamics and soil chemistry (McCauley et al., 2018; Subalusky et al., 2015). Since most of their day is spent in water, their defecation plays an important role in exchanging nutrients between their terrestrial and aquatic ecosystems (McCauley et al., 2018). Specifically, hippos bring additional nutrients to aquatic ecosystems (Subalusky et al., 2015). Nutrients in their feces (carbon, nitrogen, phosphorus, and silicon) serve as a fertilizer for aquatic plants and promote fish production (McCauley et al., 2018; Schoelynck et al., 2019; Subalusky et al., 2015).

Hippos also alter the vegetation structure in their terrestrial ecosystem through foraging (McCauley et al., 2018). Hippo presence improves habitat and forage quality for other herbivores (McCauley et al., 2018). Their foraging behavior alters some grasses to be shorter, leafier, and have less woody plant biomass (McCauley et al., 2018). They help prevent grasslands from being invaded by woody plants; encroachment by woody plants can lead to conversion of grassland to shrubland (McCauley et al., 2018). Loss of hippos could cause significant ecological change (McCauley et al., 2018).

However, under certain conditions, when water resources are reduced, hippos may also contribute to reduced water quality. Low rainfall and habitat loss can lead to high concentrations of hippos and large nutrient inputs, which can result in reduction of fish abundance and impaired ecosystem functioning (Dawson et al., 2016; Dutton et al., 2018; Stears et al., 2018). These negative impacts may depend on location, season, organism type, abiotic factors, and the metrics that are evaluated (Dawson et al., 2020; Dawson et al., 2016; Stears et al., 2018). These effects are greater where water sources are experiencing strong anthropogenic impacts, such as high rates of water abstraction and damming (Stears et al., 2018; Stommel et al., 2016).

E. Reproduction

The hippo is a K-selected species with a long lifespan, long inter-calf intervals, delayed sexual maturity, and low reproductive potential (Smuts & Whyte, 1981). These factors make it difficult for hippo populations to recover from losses due to natural or human-caused factors. In the wild, hippos live up to 35 to 50 years (Estes, 1991). Female hippos, on average, reach sexual maturity between nine and 10 years old and first conceive on average between seven and 15 years old (Smuts & Whyte, 1981). However, some females have been reported to reach maturity as early as five years old or have their first conception as late as 20 years old, which may be influenced by habitat quality (Sayer & Rakha, 1974; Smuts & Whyte, 1981). Males reach sexual maturity between six and eight years old (Dittrich, 1976; Sayer & Rakha, 1974; Skinner et al., 1975; Smuts & Whyte, 1981), but in favorable environmental conditions maturity can be reached earlier (Smuts & Whyte, 1981). Although males reach sexual maturity at a relatively young age, they may not breed until they are about 20 years old (Smuts & Whyte, 1981). This may also be related to hippo social dynamics where males must hold territories to gain mating access to females. A slight decline in reproduction is reported in older females though there is no evidence of reproductive senescence (Laws & Clough, 1966; Marshall & Sayer, 1976; Smuts & Whyte, 1981); pregnancy has been observed in the oldest females in a wild population (43 years old) (Smuts & Whyte, 1981). Eltringham (1999, p. 67) also posits that males are likely fertile throughout their lives.

Hippos are polygamous and monotocous, producing only one offspring per conception (Eltringham, 1999, pp. 60-61). Although they can also produce twins, this is not common (Eltringham, 1999, pp. 61, 64). Gestation is nearly eight months (Eltringham, 1999, p. 63) and the average calving interval is nearly 22 months (Smuts & Whyte, 1981). Compared to other large herbivores with similar breeding cycles, hippos have a low calf birth rate (percentage of calves born each year from mature females) of about 20% to 36.75% (Eltringham, 1999, p. 63). Higher calving rates are likely due to favorable habitat conditions (Smuts & Whyte, 1981).

Similarly, during periods of drought, this rate can drop to 5% (Smuts & Whyte, 1981), further discussed in Section IV.A.1.

Births are largely seasonal and peak in the wet season (Smuts & Whyte, 1981). The sex ratio at birth is estimated to be 1:1 (Eltringham, 1999, p. 65; Smuts & Whyte, 1981). Mating occurs in the water, but birthing and suckling take place either in water or on land (Eltringham, 1999, pp. 63-64). Between 15% and 40% of calves die during their first year; this number is halved during the second year (Feldhake, 2005, p. 24). There is also evidence that male hippos may commit infanticide to increase mating opportunities with females (Lewison, 1998).

F. Habitat requirements

Hippos have two essential habitat requirements: adequate and nearby grasslands or open woodlands and a permanent water body that is large enough for territorial males to spread out (Eltringham, 1993, pp. 47, 51). Recent research suggests that they may also use woody habitats, especially those near water sources that hippos inhabit (Stears et al., 2019). Their thick skin and lack of sweat glands make them susceptible to overheating and rapid dehydration in hot weather (Estes, 1991). Bodies of water, like rivers or lakes, play an important role in their thermoregulation as well as in their mobility and reproduction. Open green areas with short grass are vital to their feeding. They select aquatic habitats that have shallow water depth and a gentle slope (Buruso, 2017). They are usually found within easy to reach water and prefer gently shelving beaches (Field, 1970). Unfortunately, these areas are also highly disturbed by humans and livestock which makes them unsuitable for hippos (Buruso, 2017). In addition, human settlements also block hippos from accessing favorable habitats (Buruso, 2017).

Male hippos have an average home range size of approximately 8 km^2, which is much smaller than other large herbivores, and may be due to their aquatic habitat (Stears et al., 2019). Habitat selection is highly dependent on seasonal drying and water availability (Stears et al., 2019). However, during the dry season, hippos move from dry riverbeds to places with water (Stommel et al., 2016). In addition, large sub-adult males may be forced to migrate (~15 km) due to both river flow and social dynamics with dominant males, especially where resources are scarce and competition is high (Stears et al., 2019). Hippos are vulnerable to human extraction of freshwater which can contribute to changes in the distribution of hippo populations under dry conditions (Stommel et al., 2016), further discussed in Sections IV.A.2., IV.A.3. For example, in Ruaha National Park in Tanzania, water has been extracted from the Great Ruaha River for agriculture, so that only small pools remain; this has altered hippo movement and ecology (Stears et al., 2019). Therefore, proper habitat and water management are critical for the future survival of hippos.

G. Mortality

Humans largely contribute to the mortality of hippos. Hippos are killed to reduce human-hippo conflict, to manage their population sizes, for human consumption, and for legal and illegal trade in their parts and products. Other common causes of death in hippos are drought, starvation, disease, parasites, and attacks from other hippos (Eltringham, 1999, pp. 110-118; Estes, 1991).

The hippo has few natural predators, they include lions, crocodiles, and hyenas. Further discussed in Sections IV.A-C.

III. POPULATION STATUS AND DISTRIBUTION

Unless otherwise noted, accounts in Section III, are from the International Union for the Conservation of Nature (IUCN) Red List of Threatened Species' detailed summary of the status and distribution of the hippo (Lewison & Pluháček, 2017a, 2017b).[4]

A. Status

The IUCN classifies the hippo as Vulnerable, indicating that this species is considered to be facing a high risk of extinction in the wild. The Vulnerable classification was first applied to the hippo in 2008 when the species experienced a population decline of 7% to 20% between 1996 and 2008 (Lewison & Oliver, 2008). In 2016, the IUCN estimated the population to be approximately 115,000-130,000.

In 2008, the IUCN stated, "A country-by-country assessment conducted in 1993–1994 found that there were approximately 160,000 Common Hippos across their range, although this was considered to be an overestimate" (Lewison & Oliver, 2008). Thus, taken at face value, recognizing that these figures were the best available at the time they were published, the global hippo population may have undergone a decline of as much as 22% in approximately 22 years (from 160,000 in 1994 to 115,000 in 2016). Unfortunately, population estimates are limited as hippos are a data deficient species and only recently new survey methods are becoming available to aid in affordable and accurate estimates. In addition, hippo densities are highly variable and dependent on local environmental factors, so accurately estimating populations sizes can be difficult. The IUCN assessments from 2008 and 2016 point to overestimates in previous assessments, which makes accurately tracking long-term population trends difficult. This also raises concern that accurate population estimates are lacking, and that management decisions have been based on overestimated population sizes.

Although the 2016 IUCN assessment concludes that the continent-wide hippo population is stable, the assessment also notes that there are clear regional differences in population size and distribution. Many local populations are declining or fragmented, while several countries are lacking formal population surveys. Hippo populations are decreasing in the majority (15) of the 29 hippo range States where population trends are known; trends are stable in nine and increasing in only four. The population trends are unknown in nine range States (see Table 1 below). The assessment states "[t]he conservation status of Hippos remains precarious and the need for direct conservation action to protect Hippos and Hippo habitat across their range is a priority."

[4] Note that this Petition does not provide further information regarding distribution or status of subspecies since hippo subspecies are not confirmed, and this Petition considers hippos at the species level and asks the Service to do the same.

Recent developments demonstrate that the four range States with increasing hippo populations in 2016 may not be increasing today:

- Democratic Republic of the Congo: Although hippos are totally protected in DRC since 2006, making it illegal to detain, give, sell, exchange, or transport any of parts or products derived from hippos, poaching of their meat and ivory continue to present day: two people were arrested for poaching three hippos in 2020, three hippos were poached for their meat by militia in 2019, and 215 hippo teeth that originated from DRC were seized in Uganda in 2017. See Section IV.B.3. Moreover, it was reported by the CITES Trade Database that 3 kg of hippo ivory was exported from DRC in 2014, despite legal protections. See Section IV.B.1. and Section IV.B.3.b)(3). DRC's Virunga National Park served as a hippo population stronghold in the region; however due to the impact of deforestation and hunting from civil wars, hippos are now threatened with extinction in this park (Udahogora et al., 2020). The presence of 14 fishing villages in Virunga National Park caused significant conversion of hippo habitats to cropland, leading to habitat fragmentation (Udahogora et al., 2020). See Section IV.A.4.
- Uganda: Since Uganda's hippo ivory ban, trade likely continues and has moved underground. Uganda had the largest number of seizures between 2016 and 2020 and accounted for most of the hippo teeth seized: 1,269 teeth (from about 106 hippos) and 490.5 kg of teeth (from about 94 hippos) were seized in Uganda in 2016, 2017, and 2018; reports of seizures in Uganda abruptly stopped in 2019 and there were no reported seizures in Uganda in 2019 and 2020. See Section IV.B.3.b)(1). Andersson and Gibson (2018) found over 14,000 kg of hippo teeth (equivalent to approximately 2,700 hippos) unaccounted for in legal trade between Uganda and Hong Kong in analyzing the CITES Trade Database. They expressed serious concern that these discrepancies may indicate that ivory obtained by poaching may be laundered into the legal market.
- Namibia: In 2017, a sudden die-off of 155 hippos (roughly 26.4% of the regional population) in the Bwabwata National Park in Namibia was determined to have been caused by anthrax (Cossaboom et al., 2019). Further discussed in Section IV.C. Poaching of hippos in Namibia continue in present day: a hippo was poached in 2016 on the Namibian bank of the Okavango River and in 2020, seven hippo teeth were seized from poachers. Further discussed in Section IV.B.3.a).
- Burkina Faso: Although hippos are totally protected from hunting for recreational or commercial purposes since 1996, one trophy that originated from Burkina Faso was imported by the United States in 2017. Trade and poaching continue to affect hippos in Burkina Faso despite legal protection. Further discussed in Section IV.B.1. and Section IV.B.3.b)(3).

Recent developments also demonstrate that at least two range States with stable hippo populations in 2016, South Africa and Zimbabwe, may not be stable today:

- South Africa:
    - Fritsch et al. (2021) studied hippo population trends in Ndumo Game Reserve (NGR), South Africa, from 1951 to 2021. NGR has been a hippo sanctuary since 1924 and was recognized as wetland of international importance in 1997 (RAMSAR site No. 887). The NGR hippo population is the third largest in South

Africa after Kruger National Park and iSimangaliso Wetland Park. Anthropogenic pressures have increased recently, including those related to climate change. Between 1971 and 2021 the hippo population of NGR ranged from 80 to 448 with a mean of 266±70. The population increased from 1951 to 1980 and then declined from 1980 to 2021. The population reached its highest point in 1980, 448 animals, and its lowest point, 80 animals, in 2019; this is a loss of 82% of the population in 40 years.

  - Prinsloo et al. (2020) studied hippo distribution in the St. Lucia Estuary, South Africa. Approximately 986 hippos live in the Estuary, which is Africa's largest estuarine ecosystem. The Estuary is in iSimangaliso Wetlands Park, a World Heritage Site, and is also a RAMSAR Wetland of International Importance. Among the findings is that there is a negative association between hippo distribution and distance to human settlements. Human activities including recreation, subsistence hunting and fishing, agricultural activities (including cattle grazing where hippos would normally graze), and human water use and diversion, explain the negative association. The authors expressed concerns about increasing anthropogenic pressures that may impact the Estuary and hippos.

- Zimbabwe: Utete (2020) conducted a desktop study of research articles on hippos in Zimbabwe and found that, although IUCN regards the population as stable, studies indicate there are concerns about the hippo conservation status in the country. He concluded that the IUCN assertions may be "far off the mark" due to accelerated human encroachment into hippo habitat, and human diversion of water and damming of major rivers.

Table 1. Current population status of the hippo by regional area and country (from Lewison & Pluháček, 2017b).

	Country	Status[5]	Trend	Estimated Population Size
West Africa	Benin	RD-LA	Decreasing	500
	Burkina Faso	RD-LD	Increasing	1,500-2,000
	Cameroon	RD-LD	Decreasing	1,500-2,000
	Central African Republic	RD-LD	Decreasing	200-500
	Chad	RD-LD	Stable	500
	Congo	RD-LD	Decreasing	50
	Equatorial Guinea	RD-LD	Unknown	50-100
	Gabon	RD-LD	Decreasing	200-300
	Gambia	RD-LD	Unknown	40
	Ghana	RD-LD	Unknown	150-200
	Guinea	RD-LA	Decreasing	500
	Guinea Bissau	RD-LD	Decreasing	200-500
	Côte d'Ivoire	RD-LD	Decreasing	500-600
	Mali	RD-LD	Unknown	100
	Niger	RD-LA	Unknown	150-200
	Nigeria	RD-LD	Decreasing	100-200
	Senegal	RD-LA	Unknown	500
	Sierra Leone	RD-LD	Unknown	100-200

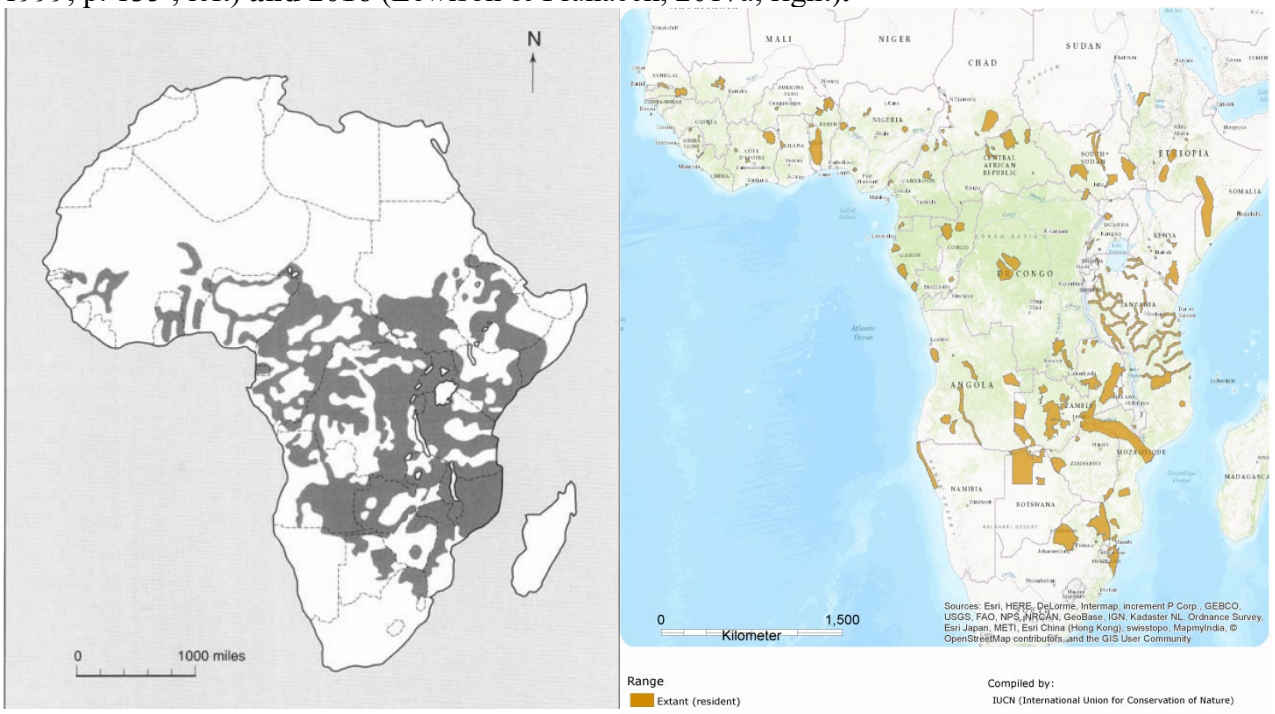
[5] Status: W = widespread; RD = restricted distribution; LD = low density; HD = high density; LA = locally abundant

	Togo	RD-LD	Unknown	250-500
			TOTAL	**7,090 – 9,490**
East Africa	**Country**	**Status**	**Trend**	**Estimated Population Size**
	Burundi	RD-LD	Unknown	500-1,000
	Democratic Republic of Congo	RD-HD	Increasing	5,000
	Ethiopia	W-LD	Decreasing	2,500
	Kenya	W-LA	Stable	5,000-7,000
	Rwanda	RD-LA	Stable	1,000
	Somalia	RD-LD	Decreasing	50
	South Sudan	RD-LD	Decreasing	2,000-3,000
	Sudan	RD-LD	Decreasing	Unknown
	Tanzania	W-LA	Stable	20,000
	Uganda	W-LA	Increasing	7,000-10,000
			TOTAL	**43,050 – 49,550**
Southern Africa	**Country**	**Status**	**Trend**	**Estimated Population Size**
	Angola	RD-LD	Decreasing	500
	Botswana	RD-LD	Decreasing	2,000-4,000
	Malawi	RD-LD	Stable	3,000
	Mozambique	RD-LD	Decreasing	3,000
	Namibia	RD-LA	Increasing	3,500
	South Africa	RD-LA	Stable	7,000
	Eswatini (Swaziland)	RD-LD	Stable	150
	Zambia	W-LA	Stable	40,000-45,000
	Zimbabwe	RD-LA	Stable	5,000
			TOTAL	**64,150 – 71,150**
			GRAND TOTAL	**114,290-130,190**

B. Distribution

Historically, the hippo occurred throughout sub-Saharan Africa, where its habitat requirements were met, i.e., grasslands with rivers or lakes (Eltringham, 1999, pp. 134-135; IUCN SSN Hippo Specialist Group, n.d.). Earlier maps show hippos inhabiting unlikely ecosystems, such as forested areas (see Map 1, left below). Today, hippos are still present in much of their historical range, but their geographical range has shrunk substantially, due mainly from habitat loss and degradation. See Map 1 below.

Map 1. Distribution of *Hippopotamus amphibius* around 1959 (Sidney, 1965 in Eltringham, 1999, p. 135 ; left) **and 2016** (Lewison & Pluháček, 2017a; right)**.**



Hippos can presently be found in 38 countries: Angola; Benin; Botswana; Burkina Faso; Burundi; Cameroon; Central African Republic; Chad; Congo; Democratic Republic of the Congo; Côte d'Ivoire; Equatorial Guinea; Ethiopia; Gabon; Gambia; Ghana; Guinea; Guinea-Bissau; Kenya; Malawi; Mali; Mozambique; Namibia; Niger; Nigeria; Rwanda; Senegal; Sierra Leone; Somalia; South Africa; South Sudan; Sudan; Eswatini (Swaziland); Tanzania; Togo; Uganda; Zambia; Zimbabwe. Hippos are regionally extinct from Algeria, Egypt, Liberia, and Mauritania. It is unknown if they still occur in Sudan. See Table 1.

Approximately 7,090 to 9,490 hippos reside in West Africa. Hippos in this region are highest at risk of extinction because of population fragmentation. Hippos are more populous in East and Southern Africa and occupy a larger area in these regions; these regions are considered conservation strongholds for the species. Approximately 43,050 to 49,550 hippos are found in Eastern Africa and 64,150 to 71,150 hippos are found in Southern Africa. Zambia and Tanzania are the countries with the largest number of hippos: 40,000 to 45,000 hippos and 20,000 hippos, respectively. See Table 1 and Map 1 above.

IV. THREATS

Under the ESA, the Service is required to list a species as "endangered" if it "is in danger of extinction throughout all or a significant portion of its range" or as "threatened" if it "is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range" based upon one or more threats or factors. 16 U.S.C. §§ 1532(6), (20), 1533(a)(1). There are five statutory listing factors that the Service must analyze for the species:

> (A) The present or threatened destruction, modification, or curtailment of its habitat or range;
> (B) Overutilization for commercial, recreational, scientific, or educational purposes;
> (C) Disease or predation;
> (D) The inadequacy of existing regulatory mechanisms; and
> (E) Other natural or manmade factors affecting its continued existence.

Id. § 1533(a)(1)(A)-(E); 50 C.F.R. § 424.11(c)(1)-(5).

Based upon an analysis of these factors, *Hippopotamus amphibius* should be protected under the ESA. 16 U.S.C. §§ 1532(6), 1533(a)(1).

A. The present or threatened destruction, modification, or curtailment of its habitat or range

Loss and degradation of habitat caused by humans is currently a major threat to the survival of the hippo (Lewison & Pluháček, 2017a) and warrants this species' listing under the ESA. *See* 16 U.S.C. § 1533(a)(1); *see also Sw. Ctr. for Biological Diversity v. Babbitt*, 215 F.3d 58, 60 (D.C. Cir. 2000) (listing required if "any of § 1533(a)(1)'s five factors are sufficiently implicated").

1. Biological impacts of aquatic habitat loss

The hippo has highly specific habitat requirements, as described in previous sections of this Petition. Hippos must have a permanent source of fresh water with shallow areas in which they can stand yet be nearly fully submerged during the day, that is large enough for several male territories, and that is adjacent to appropriate terrestrial areas for grazing at night.

Hippos are freshwater dependent species and loss of freshwater habitats has compounding effects on hippo survival. Examples include:

- Thermoregulation and skin health: Freshwater pools and aquatic habitats are especially vital to hippos as they depend on them for daytime refuge from the sun and heat; immersion in water is crucial to their thermoregulation and skin lubrication that prevents cracking (Eltringham, 1993, pp. 47, 51; Eltringham, 1999, pp. 4, 31-33, 38; Field, 1970; Luck & Wright, 1964; Noirard et al., 2008; Williams, 2017, p. 10).

- Hydration: Hippos have the highest water consumption of African ungulates (Kihwele et al., 2020). Due to their unique epidermis, hippos experience rapid water loss from evaporation and have far greater transepidermal water loss than other animals (Luck & Wright, 1964).
- Behavior: Aquatic habitats are also critically important for several aspects of hippo behavior including social interactions and mating which occur exclusively in water (Eltringham, 1999, p. 63), and important underwater communication (Barklow, 2004).
- Reproduction: Loss of freshwater habitat and reduced forage availability can lead to low reproductive rates in hippo populations (Smuts & Whyte, 1981; Utete, 2020). Smuts and Whyte (1981) demonstrated that hippo reproduction decreased significantly in years of low annual rainfall and drought. Specifically, when environmental conditions are unfavorable, hippos experience a substantial decrease in contraception rate from 36.7% to 5.6% (Smuts & Whyte, 1981). Other responses to drought include delayed age of maturity, extended period of lactation, and shared feeding of calves by multiple females (Smuts & Whyte, 1981). Reproduction and growth can be influenced when energy expenditure exceeds energy intake, such as when food is limited from drought or low rainfall years (Smuts & Whyte, 1981).
- Gene flow between populations: Genetic analyses suggest that there are low levels of gene flow between hippo populations; this appears to be due to human-driven habitat loss and this may lead to further population fragmentation (Okello et al., 2005).
- Aggression: During periods of low rainfall, hippos are forced to migrate and congregate in smaller and fewer water bodies (Smit & Bond, 2020; Smuts & Whyte, 1981; Stommel et al., 2016). Overcrowding can lead to higher occurrences of intra-specific aggression and death caused by fighting wounds (Kupika et al., 2017; Smuts & Whyte, 1981; Stommel et al., 2016).
- Foraging: Human-hippo conflict intensifies during the dry season and especially in seasons of drought when water is scarce and competition for natural resources increases (Ertiban, 2016; Kanga et al., 2012; Lewison & Pluháček, 2017a; Smit & Bond, 2020). During the 2015-2016 drought in Kruger National Park, hippos damaged more fences and gates of a neighboring village than any other animal to raid gardens and farms in search for food (Smit & Bond, 2020). Hippo fence damage was five times higher in eight months of drought than 59 non-drought months (Smit & Bond, 2020). A decade long study on human-hippo conflict in Kenya also found a significant increase in human-hippo conflict during periods of drought (Kanga et al., 2012).
- Disease: Depressed immunity from environmental stresses and high host density in water bodies increases hippo vulnerability to diseases (Acevedo-Whitehouse & Duffus, 2009; Kupika et al., 2017; Lewison, 2007; Stommel et al., 2016; Vuuren, 2016). Large groups of hippos, forced to congregate due to reduced freshwater availability, are thought to facilitate higher rates of disease transmission, resulting in, for example, large Anthrax outbreaks (Driciru et al., 2018; Munang'andu et al., 2012; Stears et al., 2021).
- Mortality: Below-average rainfall, especially during droughts, results in loss of freshwater habitat and limited forage availability which can lead to high mortality (Smuts & Whyte, 1981; Utete, 2020). Hippo population declines following droughts have been reported in Zimbabwe (Zisadza et al., 2010) and South Africa (Smit & Bond, 2020; Smit et al., 2020; Smuts & Whyte, 1981; Viljoen, 1995). During multiple droughts in South

Africa's Kruger National Park, hippo populations decreased substantially (SANParks, 2017; Smit & Bond, 2020). In the most recent drought (2015-2016), 50% of Kruger's resident hippo population died, which was significantly higher than previous droughts, and the death rate for hippos was among the highest of animals affected by the drought (1982-1983 and 1991-1992) (SANParks, 2017; Smit & Bond, 2020; Viljoen, 1995). Starvation is a primary reason for hippo mortality during droughts, as observed in the most recent 2015-2016 drought in Kruger National Park (Smit & Bond, 2020; Smit et al., 2020). In periods of food scarcity, hippos alter their natural grazing behavior of feeding primarily at night and on nearby open green areas by traveling further distances in search of food and feeding well into the day (Smit & Bond, 2020). Hippos are also forced to wander far from water sources in search of food, which can be futile as evidenced by high rates of morality and emaciated hippo carcasses (Smit & Bond, 2020).

2. Human activities that lead to hippo habitat loss and degradation

Human activities that have led to hippo habitat loss and degradation include diversion of water for human use, conversion of hippo grazing areas to agricultural use or for human settlements, construction of dams, fishing operations, and mining operations.

Hippo aquatic habitats are negatively affected by increased irrigation demands for agricultural and human settlements which drive construction in dams and diversion of water (Utete et al., 2017). These modifications in hippo's aquatic habitat reduce available water sources and alter hippo spatial ecology which has led to higher densities of hippos in smaller pools, disease spread, and negative impacts on the ecosystem (Stears et al., 2018; Stears et al., 2019; Stears et al., 2021; Stommel et al., 2016). Fishing nets entangle smaller hippos which may lead to death (Baker et al., 2020).

Hippo dependency on freshwater habitats makes them one of the species most severely affected by climate change[6] induced pressures (Magadza, 1994; Smit & Bond, 2020; Smit et al., 2020; Utete, 2020) and anthropogenic changes to their aquatic habitats (Stears et al., 2018; Stears et al., 2019; Stears et al., 2021; Stommel et al., 2016). Factors such as unpredictable rainfall, above average land temperature, and high evapotranspiration worsened by climate change are especially threatening for amphibious megafauna, like hippos. The world has already warmed by 1°C since pre-industrial times and if unchanged it is likely to exceed 1.5°C between 2026 and 2042 (Hausfather, 2020). Warming to 1.5°C is predicted to increase these threats, as well as the frequency and severity of droughts in semi-arid and arid parts of Africa (Hoegh-Guldberg et al., 2018, p. 197; Swemmer et al., 2018).

Conversion of hippo terrestrial habitats for anthropogenic activities, particularly farming, increases siltation of water bodies which impacts quality and depth of water, making these habitats less suitable for hippos (Dunham et al., 2010; Utete et al., 2017). Increased land

[6] The United Nations Framework Convention on Climate Change defines climate change as, "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods." UNFCC. (2011). *Fact sheet: Climate change science - the status of climate change science today* [Fact sheet]. https://unfccc.int/files/press/backgrounders/application/pdf/press_factsh_science.pdf

temperatures, variable rainfall influence, and anthropogenic activities reduce forage quality and quantity for herbivores, such as hippos (Smit & Bond, 2020; Smit et al., 2020; Veldhuis et al., 2019). As megaherbivores, hippos are required to consume an abundance of forage (~1% of their body weight/day) (Arman & Field, 1973; Field, 1970). During droughts and years of low rainfall, proximal foraging areas are quickly depleted, and food becomes limited (Kupika et al., 2017; Smit & Bond, 2020; Smit et al., 2020; Veldhuis et al., 2019).

Human populations in hippo range States are expected to continue to grow in the future, and this will most likely place increasing pressures on hippo habitat. Habitat loss and degradation will continue to be a major threat to hippo survival in the foreseeable future.

3. Habitat loss and degradation leads to human-hippo conflict

Human conflict with hippos mostly refers to crop-raids (crop damage or loss). A study in Kenya from 1997 to 2008 found that 62% of reports of conflict were crop damage, followed by 15% physical threat, 13% hippo mortality, 3% human injury or fatality, and 1% livestock mortality (Kanga et al., 2012).

Human-hippo conflicts have been reported in several countries including, but not limited to: Ethiopia (Admassu, 2007; Ertiban, 2016), Gambia (Clarke, 1953), Guinea-Bissau (González et al., 2017), Kenya (Kanga et al., 2012; Long et al., 2020; Post, 2017), Malawi (Eltringham, 1999, pp. 128-129), Mozambique (Anderson & Pariela, 2005; Dunham et al., 2010), Nigeria (Baker et al., 2020), Tanzania (Gillingham & Lee, 2003; Kendall, 2011; Timbuka, 2012), Zambia (Chomba et al., 2012; Lewison & Pluháček, 2017a), and Zimbabwe (Utete, 2020; Utete et al., 2017). Additionally, the human population in sub-Saharan Africa is projected to continue expanding and, by 2050, is expected to double (OECD/SWAC, 2020). Thus, human-hippo conflict is expected to increase.

Land-use and land-cover modifications due to agricultural development are the primary cause of human-hippo conflict (Ertiban, 2016; Kanga et al., 2012; Long et al., 2020). Conflicts are known to be particularly high where human settlements and agricultural operations are close to water bodies, like wetlands and rivers (Kanga et al., 2012). Expansion of farming, livestock grazing, fishing, gold mining, human settlements, and other anthropogenic disturbances on hippo habitat increase instances of human-hippo interaction and encourages hippo migration to more permeant water bodies (Dunham et al., 2010; Mackie et al., 2013; Scholte & Iyah, 2016; Utete, 2020; Utete et al., 2017). Displacement of hippos from protected areas increases probability of human-hippo interaction and therefore conflict (Lewison & Pluháček, 2017a). In recent years, human mortality from hippo interactions has increased, indicating acceleration of hippo habitat loss and higher density of human-hippo cohabitation (Kanga et al., 2012; Lewison & Pluháček, 2017a).

Conflict could be reduced by better land management and compensation schemes. Buffers around protected areas may be important for preventing human-hippo conflict (Lewison & Carter, 2004). Stears et al. (2019) suggested incorporating riparian buffer zones to reduce conflict and protect hippo populations. These buffer zones would work best near locations where hippos access rivers, since that is where rates of human-hippo conflict via crop raiding are highest (Kendall, 2011). A community-based program in Ghana, called The Wechiau

Community Hippo Sanctuary, has thrived while living in harmony with hippos (Sheppard et al., 2010). The project supports one of the two remaining hippo populations in Ghana. The Wala and Birifor people have hippo hunting taboos, so no hippos are killed in this community. Thoughtful land planning helped reduce conflict by splitting the Sanctuary into zones. Farms were moved away from the river to mitigate conflict with hippos, in addition fishing is regulated to protect hippo habitat. Notably, the people have prospered economically, successfully developed new infrastructure, while also supporting greater bird diversity within the sanctuary.

In contrast, people living in fishing camps around Lake Kariba, Zimbabwe were dissatisfied with the way that the Zimbabwe National Parks and Wildlife Authority handled hippo conflict which led to negative views of hippos (Marowa et al., 2021). The community received no compensation for damage caused by hippos (Marowa et al., 2021). Although locals in the community call for killing the "problem" hippo because they believe that "once an animal has tasted human blood…it may continue hunting humans on the same spot" (Marowa et al., 2021, p. 222), better relationships between authorities and community members, as well as preventative measures, could change this misconception that hippos are actively hunting humans. Inadequate responses to human-hippo conflict, and lack of preventative measures, only threaten hippos more as this incites people to seek retaliation. This threat will only continue to grow as hippo habitat is further reduced and fragmented.

Human-hippo conflict increases and incentivizes retaliatory killing and culling (Clarke, 1953; Gillingham & Lee, 2003; Kanga et al., 2012; Kendall, 2011). In Kenya between 2005 and 2016, conflict with hippos was relatively low; however, they were the third most common species killed as a result of human-wildlife conflict (Long et al., 2020). Between 2002 and 2008, 65 people were killed by hippos in Zambia and 106 hippos were killed as a response to control their population (Chomba et al., 2012). It is assumed that the disproportional number of hippos killed as a consequence of these human fatalities was influenced by the popularity of their meat (Chomba et al., 2012).

Large numbers of hippos have been culled during and after periods of drought to avoid habitat degradation and loss from overgrazing and to prevent competition with other herbivores (Pienaar et al., 1966; Smit & Archibald, 2019; Smit et al., 2020; Smuts & Whyte, 1981). After the 1970-1971 drought in Kruger National Park that killed at least 150 hippos, 225 additional hippos were shot at random between 1974 and 1975 to maintain their lower post-drought numbers (Smuts & Whyte, 1981). A similar cull was conducted in 1964 following the severe 1962-1964 drought where 100 hippos were killed at random (Pienaar et al., 1966). During the most recent drought in Kruger National Park, 72 hippos were killed as part of the drought response strategy (SANParks, 2017). Additional culls have occurred as a response to increased migration of hippos during drought to areas that they usually do not occur, like seasonal pans and artificially constructed dams, as they search for more suitable water and grazing conditions (Smit & Bond, 2020; Vuuren, 2016).

4. Impact of war on hippo habitat

War and civil unrest pose a significant risk to hippos and their habitat. Armed conflicts have occurred in 71% of all Afrotropical Protected Areas between 1946 and 2010 and nearly all global

armed conflicts between 1956 and 2000 occurred directly within biodiversity hotspots (Daskin & Pringle, 2018; Hanson et al., 2009).

Civil wars impact hippo habitat by diverting funds from anti-poaching patrols to military activities and leaving wildlife and their habitat vulnerable to poaching and over-exploitation (Gaynor et al., 2016; IUCN & UNEP-WCMC, 2017; Shoumatoff, 2001). Anti-poaching park guards are disarmed, often become unpaid, and many are even killed by soldiers and poachers during times of civil conflict (Gaynor et al., 2016; IUCN & UNEP-WCMC, 2017). Decreased enforcement from park guards in addition to local proliferation of arms, social unrest, and poverty, increases wildlife poaching particularly in large-bodied mammals because of the value of their meat and other body parts, such as ivory, for commercial and subsistence use (Gaynor et al., 2016).

Wars and civil unrest disturb ecosystems, cause the loss of biodiversity (Dudley et al., 2002; Hanson et al., 2009), and dramatically increase the rate of deforestation, furthering habitat loss and fragmentation. Dramatic deforestation occurs concurrently with civil wars as isolated areas are cleared for military bases and refugees are displaced, often into protected parks (Braga-Pereira et al., 2020; Gaynor et al., 2016; Lewison & Pluháček, 2017a). Clearings significantly alter habitat structure, leading to habitat degradation and fragmentation and make wildlife more vulnerable to hunting as they live in smaller areas and are easier to target by hunters (Nackoney et al., 2014). Influx of 1.5 to 2 million Rwandan refugees to DRC from 1994 caused massive deforestation and elimination of lowland forests in the Virunga National Park due to installation of camps and demand of fuelwood (Biswas & Tortajada-Quiroz, 1996; IUCN & UNEP-WCMC, 2017). During the second DRC war (1998-2003), the rate of deforestation of primary forest doubled during wartime due to clearing for human migration (Nackoney et al., 2014). The rate of deforestation decreased post-DRC war but forest loss from agricultural operations increased—indicating possible permanent community settlements within core wildlife habitat which perpetuate habitat loss and increase human-hippo interactions (Nackoney et al., 2014). The presence of 14 fishing villages in this park caused significant conversion of hippo habitats to cropland, leading to habitat fragmentation (Udahogora et al., 2020). DRC's Virunga National Park served as a hippo population stronghold in the region; however due to the impact of deforestation and hunting from civil wars, hippos are now threatened with extinction in this park (Udahogora et al., 2020).

B. Overutilization for commercial, recreational, scientific, or educational purposes

Commercial, personal, and recreational overutilization of hippos are a threat to their conservation. The legal trade in hippo specimens, products, and individuals is expansive. There is also a large and biologically significant amount of hippo poaching and trafficking that takes place. This evidence demonstrates that hippos are overutilized for commercial, recreational trophy hunting, and personal purposes.

This section is organized into four parts: 1) analysis of legal international trade in hippo parts and products for commercial, scientific, recreational trophy hunting, personal, and educational purposes, 2) evidence of online global and in-store U.S. sales of hippo parts and products, and

sales of hippo trophy hunts, 3) evidence of poaching of hippos and illegal trade in their parts and products, and 4) analysis and conclusions.

1. Analysis of legal international trade in hippo parts and products for commercial, scientific, recreational trophy hunting, personal, and educational purposes

For this trade analysis, we relied on the CITES Trade Database, which contains records of international trade submitted by CITES Parties. We analyzed the amount of global and U.S. trade between 2009 and 2018, the most recent decade for which complete data are available. The ultimate purpose of this analysis on the legal trade in hippo parts and products is to determine the impact of these uses on conservation of the species in the wild.

To quantify the impact of hippo use and demand on the conservation of wild hippo populations, we first analyzed hippo parts and products in trade stemming from wild hippos. Then we calculated the number of individual hippos based on a subset of hippo parts and products, focusing just on direct trade from countries where hippos are extant. This analysis paid particular attention to the role of the United States internationally as a consumer country that drives trade in hippo parts and products. For detailed methodology, see Appendix.

The results of the trade analysis are divided into two parts and organized in the following manner. First, this trade analysis a) calculated hippo specimens in trade and is divided into two subparts: (1) global imports, and (2) U.S. imports. Second, this analysis b) estimated the number of individual hippos imported from hippo range States, as calculated from hippo specimens, and is divided into three subparts: (1) global and U.S. imports from all range States, (2) country of origin of global and U.S. imports, and (3) country cases.

a) Hippo specimens in trade

This Petition estimates that between 2009 and 2018, a total of 77,579 hippo specimens without a measurable unit[7] were globally imported from all sources and for all purposes (Appendix Table 1). Of these, 98.6% were imported for commercial ("T"), hunting trophy ("H"), and personal ("P") purposes. See Table 2 below.

[7] These are numbers of specimens rather than numbers of kilograms, milliliters, square meters, etc.; entries that do not have a measurable unit appear blank in the unit column of the CITES Trade Database search output table.

Table 2. Terms[8] and purposes[9] of global imports of hippo specimens, 2009-2018.

Term	Purpose											Grand Total
	T	H	P	Q	S	(blank)	Z	B	E	N	L	
Carvings[10]	25,408	0	164	584	0	0	0	0	5	0	0	26,161
Teeth[11]	9,616	11,996	1,380	11	3	80	0	0	1	0	1	23,088
Skins	7,924	189	44	0	0	0	0	0	0	0	0	8,157
Skin pieces	6,550	549	70	23	0	9	0	0	0	0	0	7,201
Leather products (small)	5,453	241	199	9	0	3	0	0	1	0	0	5,906
Trophies	9	4,057	238	0	0	4	0	0	4	0	0	4,312
Feet	6	534	193	0	0	8	0	0	0	0	0	741
Skulls	109	337	24	4	0	4	0	0	0	0	0	478
Leather products (large)	200	104	95	0	0	15	0	0	0	0	0	414
Derivatives	200	15	5	0	0	0	0	0	0	0	0	220
Live	67	0	0	9	0	2	42	40	0	13	0	173
Specimens	7	3	13	0	143	0	0	0	6	0	0	172
Garments	159	0	0	0	0	0	0	0	0	0	0	159
Bones	121	18	0	2	2	0	0	0	0	0	0	143
Tails	13	56	33	0	0	0	0	0	0	0	0	102
Jewelry[12]	0	69	0	0	0	0	0	0	0	0	0	69
Bodies	1	6	2	2	1	19	0	0	2	0	0	33
Bone carvings	6	7	1	4	0	0	0	0	0	0	0	18
Sides	1	14	0	0	0	0	0	0	0	0	0	15
Ivory pieces	0	0	0	4	3	0	0	0	0	0	0	7
Genitalia	0	4	0	0	0	0	0	0	0	0	0	4
Skeletons	2	0	0	0	0	0	0	0	0	0	0	2
Hair	0	0	0	0	2	0	0	0	0	0	0	2
Unspecified	0	0	1	0	0	0	0	0	0	0	0	1
Bone pieces	0	1	0	0	0	0	0	0	0	0	0	1
Grand Total	**55,852**	**18,200**	**2,462**	**652**	**154**	**144**	**42**	**40**	**19**	**13**	**1**	**77,579**
% of Grand Total	72%	23%	3%	1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	

[8] "Term" is a column in a CITES Trade Database search output table. It means the type of specimen such as "trophy," "skin," and "tusk."

[9] "Purpose" is a column in a CITES Trade Database search output table. Purposes: "T" is commercial, "Z" is zoo, "G" is botanical garden, "Q" is circus or travelling exhibition, "S" is scientific, "H" is hunting trophy, "P" is personal, "M" is medical, "E" is educational, "N" is reintroduction or introduction into the wild, "B" is breeding in captivity or artificial propagation, and "L" is law enforcement/judicial/forensic.

[10] 'Carvings' combines both terms "carvings" and "ivory—carvings." For justification, see methodology in Appendix.

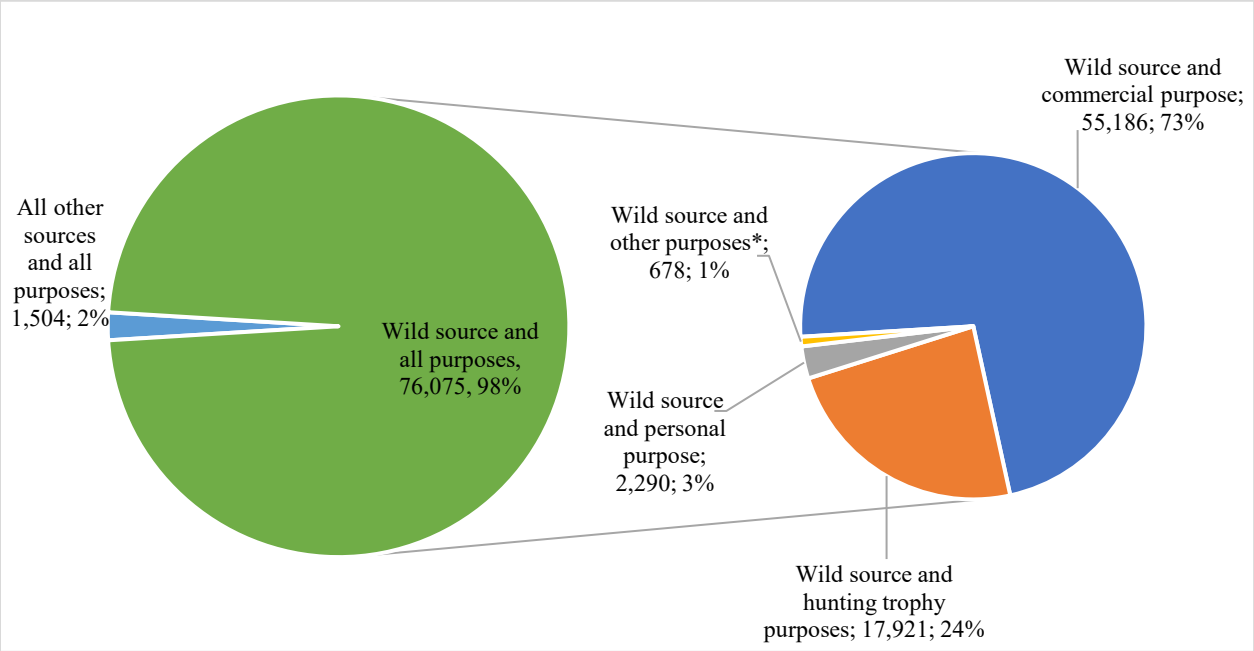
[11] 'Teeth' combines both terms "teeth" and "tusk." For justification, see methodology in Appendix.

[12] 'Jewelry' combines both terms "jewelry" and "jewelry—ivory." For justification, see methodology in Appendix.

Source: CITES Trade Database, search completed on February 18, 2021, using the following terms: *Hippopotamus amphibius*, year range: 2009-2018, all importing countries, all exporting countries, all sources, all purposes, and all terms. Search filtered for no unit (blank value). Totals were based on global imports and percentages were rounded to the nearest whole number.

Of the 77,579 hippo specimens in trade (all sources and all purposes), 98% were sourced from the wild (Appendix Table 1). Wild-sourced hippos were predominately (99%) imported for commercial, hunting trophy, and personal purposes. See Figure 1 below. To understand the impact of legal trade on wild hippo populations, this analysis includes only specimens sourced from the wild (W) and imported for three primary purposes: commercial, hunting trophy, and personal.

Figure 1. Sources and purposes of global imports of hippo specimens, 2009-2018 (no unit).[13]



Source: CITES Trade Database, search completed on February 18, 2021, using the following terms: *Hippopotamus amphibius*, year range: 2009-2018, all importing countries, all exporting countries, all sources, all purposes, and all terms. Search filtered for no unit (blank value). Totals were based on global imports and percentages were rounded to the nearest whole number. *Other purposes include circus or travelling exhibition ("Q"; 576 specimens), breeding in captivity or artificial propagation ("B"; 37 specimens), scientific ("S"; 33 specimens), reintroduction or introduction into the wild ("N"; 13 specimens), education ("E"; 10 specimens), zoo ("Z"; 5 specimens), and "blank" (4 specimens).

Summary of trade analysis on hippo specimens:

Global: During the decade, 75,397 wild-sourced hippo specimens were traded globally for commercial, hunting trophy, and personal purposes. Combined, ivory and skin products contributed to 92% of globally imported specimens. A shift in the type of specimens being imported occurred during mid-decade where ivory products decreased substantially—from 76% of total imported specimens in the first half of the decade to 34% in the second—and skin products increased—from 18% of total imported specimens in the first half of the decade to 54%

[13] See Appendix Tables 1 and 2.

in the second. Global imports decreased significantly during the course of the decade, averaging 10,720 specimens imported/year between 2009 and 2013 to 4,360 specimens imported/year between 2014 and 2018.

United States: The United States was the top importer of hippo specimens, and its imports represent approximately 34% of global imports. Of the 21 types of specimens globally imported during this decade; the United States was the top importer of 10 specimen types. Ivory and skin products were the top specimens imported by the United States; and combined, these two groups of specimens represented 90% of total U.S. imports. As with global imports, the United States also experienced a shift in the proportion of trade comprised of ivory products to skin products starting in 2013. Despite global imports decreasing over the course of the decade studied, the number of U.S. imports remained relatively stable. Therefore, the United States has become responsible for a greater portion of global trade in hippo specimens in the most recent years studied: on average, the United States consumed 29% of global imports per year between 2009 and 2013, which increased between 2014 and 2018 to 51% of global imports per year.

(1) Global Imports

Globally, 75,397 wild-sourced hippo specimens were imported for commercial, hunting trophy, and personal purposes (Appendix Table 3). Carvings (25,459) and teeth (22,657) were the top two specimens globally imported and combined represent approximately 64% of total global hippo specimen imports. The third most significant specimen in trade after carvings and teeth were skins (8,147), skin pieces (7,161), and small leather products (5,552). See Table 3 below.

Table 3. Total global imports of hippo specimens, wild source and commercial, hunting trophy, and personal purposes, 2009-2018.[14]

Term	Grand Total	% of Grand Total
Carvings	25,459	34%
Teeth	22,657	30%
Skins	8,147	11%
Skin pieces	7,161	9%
Leather products (small)	5,552	7%
Trophies	4,229	6%
Feet	724	1%
Skulls	462	1%
Leather products (large)	392	1%
Garments	159	<1%
Bones	138	<1%
Tails	101	<1%
Jewelry	69	<1%
Live	67	<1%
Specimens	23	<1%
Derivatives	19	<1%
Sides	15	<1%
Bodies	9	<1%

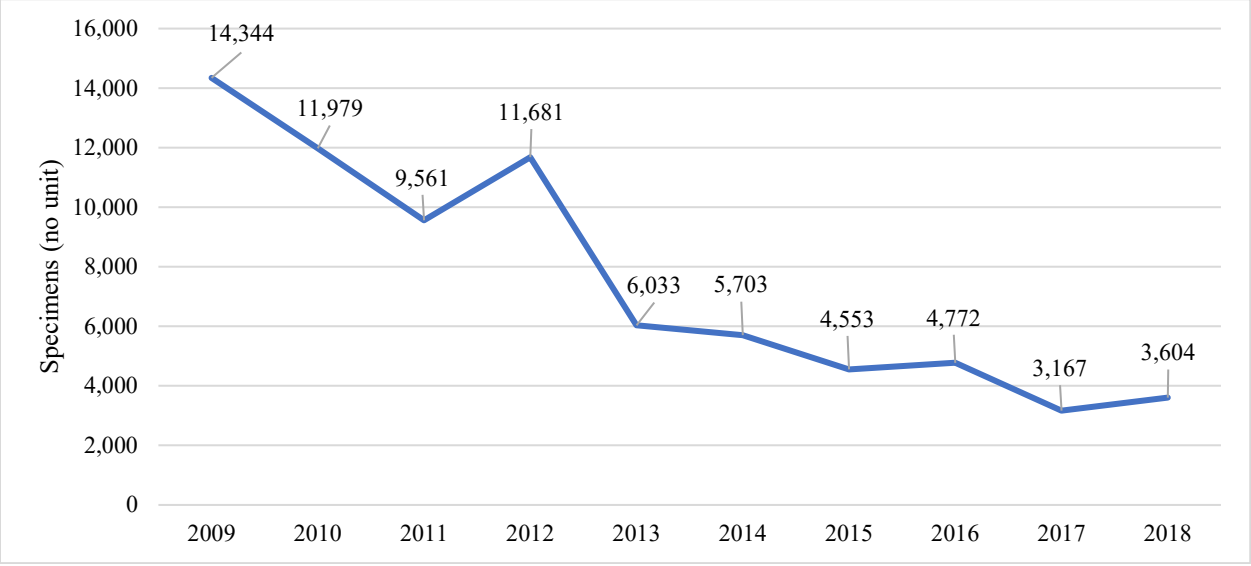
[14] See Appendix Table 3.

Term	Grand Total	% of Grand Total
Bone carvings	8	<1%
Genitalia	4	<1%
Skeletons	2	<1%
Grand Total	**75,397**	**100%**

Source: CITES Trade Database, search completed on February 18, 2021, using the following terms: *Hippopotamus amphibius*, year range: 2009-2018, all importing countries, all exporting countries, source: wild ("W"), purpose: commercial ("T"), hunting trophy ("H"), and personal ("P"), and all terms. Search filtered for no unit (blank value). Totals were based on global imports and percentages were rounded to the nearest whole number.

Based on numbers of specimens in trade, reported international trade in hippo specimens was highest in 2009 (14,344) and gradually decreased through the end of the decade studied (Figure 2). This decreasing trend may have resulted from a combination of factors. Importantly, starting in 2012, there was a significant increase in CITES hippo trade suspensions issued to hippo range States (UNEP, 2022). These suspensions varied in degree and differed across the species' African range; most countries that received suspensions were suspended from all hippo trade or specifically from commercial trade of hippo specimen (UNEP, 2022). For example, Mozambique, previously considered a population stronghold (Eltringham, 1999, pp. 168, 171; Lewison & Oliver, 2008), was issued a four-year suspension from 2012 to 2016 for all hippo exports (all purposes, all sources) (UNEP, 2022). Similarly, range countries also implemented domestic bans. For example, in July 2014, Uganda became the only range State to ban the trade in hippo teeth (Andersson & Gibson, 2018). These suspensions and bans could have helped curb the amount of hippo specimens being traded in the latter half of this decade. See Figure 2 below.

Figure 2. Global import trend of hippo specimens, wild source and commercial, hunting trophy, and personal purposes, 2009-2018.[15]

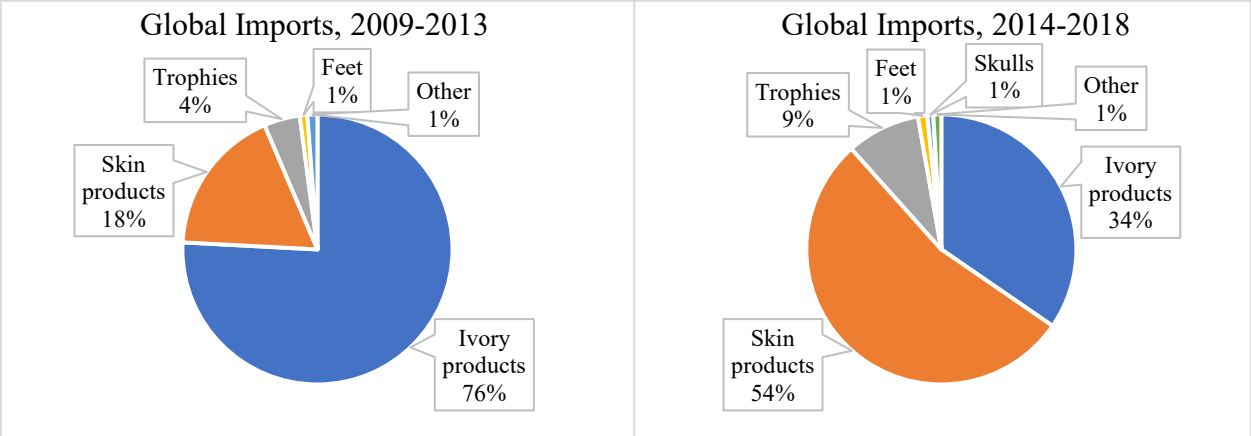


Source: CITES Trade Database, search completed on February 18, 2021, using the following terms: *Hippopotamus amphibius*, year range: 2009-2018, all importing countries, all exporting countries, source: wild ("W"), purpose: commercial ("T"), hunting trophy ("H"), and personal ("P"), and all terms. Search filtered for no unit (blank value). Totals were based on global imports.

[15] See Appendix Table 3.

Ivory products and skin products were the two most prominent types of specimens in global trade. Combined, these two categories made up 92% of all specimens globally imported. Ivory products (carvings, ivory pieces[16], jewelry, and teeth) comprised 64% of all hippo specimens in trade (48,185[17] ÷ 75,397). Skin products (skins, skin pieces, leather products (small), leather products (large)) comprised 28% of all hippo specimens trade (21,252[18] ÷ 75,397). During the first half of the decade studied (2009-2013), global imports of ivory products comprised 74% of total imports whereas global imports of skin products comprised 18% of global imports. A shift occurred in the latter part of the decade studied (2014-2018) where the proportion of ivory products decreased substantially, and the proportion of skin products increased compared to the first half of the decade—ivory product imports comprised 34% of global imports and skin product imports comprised 54% of global imports. See Figure 3 below.

Figure 3. Global imports of hippo specimens, wild source and commercial, hunting trophy, and personal purposes, 2009-2018.[19]



Source: CITES Trade Database, search completed on February 18, 2021, using the following terms: *Hippopotamus amphibius*, year range 2009-2018, all importing countries, all exporting countries, source: wild ("W"), and purpose: commercial ("T"), hunting trophy ("H"), and personal ("P"). Search filtered for 'ivory products' terms: "carvings," "ivory carvings," "ivory pieces," "jewelry," "jewelry—ivory," "teeth," and "tusk."; and 'skin products' terms: "skins," "skin pieces," "leather products (large)," "leather products (small)." Search filtered for no unit (blank value). Totals were based on global imports. Note: category 'other' combines all specimens <1% of total imports of hippo specimens.

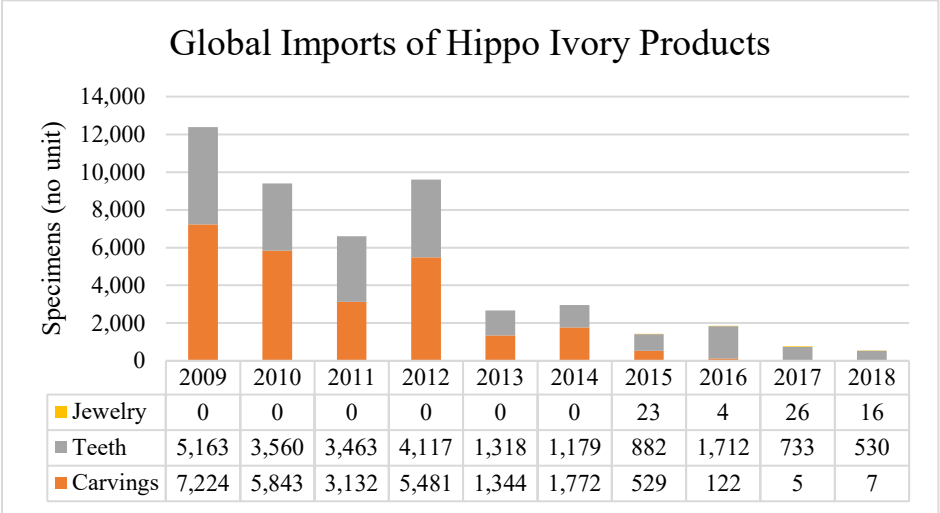
As stated above, carvings and teeth were the most imported specimens during the decade studied and the most significant ivory products in trade. Global imports of ivory products were highest between 2009 and 2012, averaging 9,496 specimens imported/year. Beginning in 2013 and through the end of the decade, imports of ivory products decreased dramatically and averaged 1,700 specimens/year. Starting in 2015, ivory carving imports decreased substantially, and the

[16] Note: no "ivory pieces" were globally imported from wild source and for commercial, hunting trophy, and personal purposes during the decade studied.
[17] See Appendix Table 6.
[18] See Appendix Table 7.
[19] See Appendix Tables 3, 6, and 7.

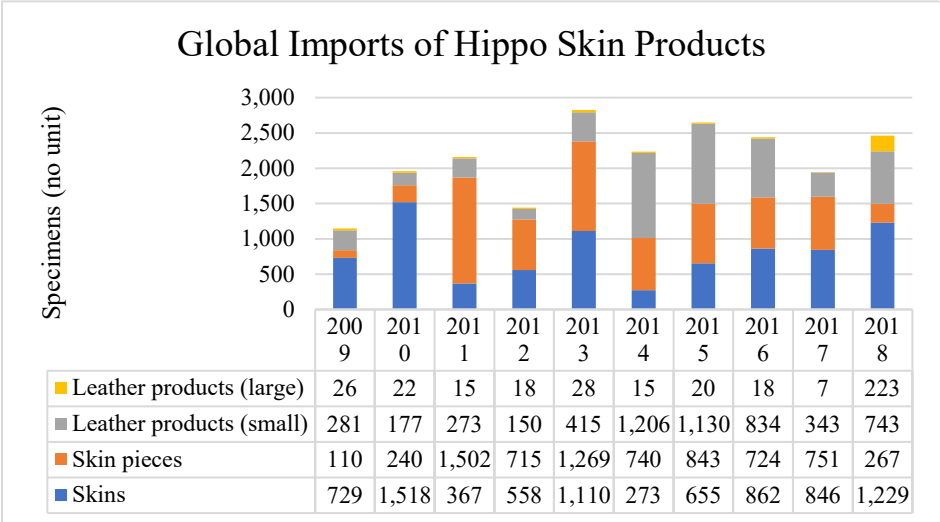
majority of all ivory imports thereafter were teeth. Jewelry was only globally imported starting in 2015. See Figure 4 below.

In the first half of the decade, imports of skins and skin pieces fluctuated, and the number of small leather products imported was low. Between 2013 and 2014, imports of skins and skin pieces dropped, and imports of small leather products significantly increased (415 imported in 2013 and 1,206 imported in 2014). Imports of small leather products remained high throughout the second part of the decade (2014 through 2018). Imports of skins showed a steady and continual increase throughout the second part of the decade. Large leather products were globally imported in few quantities (<30 specimens imported/year) throughout the decade, except for in 2018 when imports of these specimens increased significantly (223 specimens imported in 2018). See Figure 4 below.

Figure 4. Global imports of hippo ivory and skin products, wild source and commercial, hunting trophy, and personal purposes, 2009-2018.[20]



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Jewelry	0	0	0	0	0	0	23	4	26	16
Teeth	5,163	3,560	3,463	4,117	1,318	1,179	882	1,712	733	530
Carvings	7,224	5,843	3,132	5,481	1,344	1,772	529	122	5	7



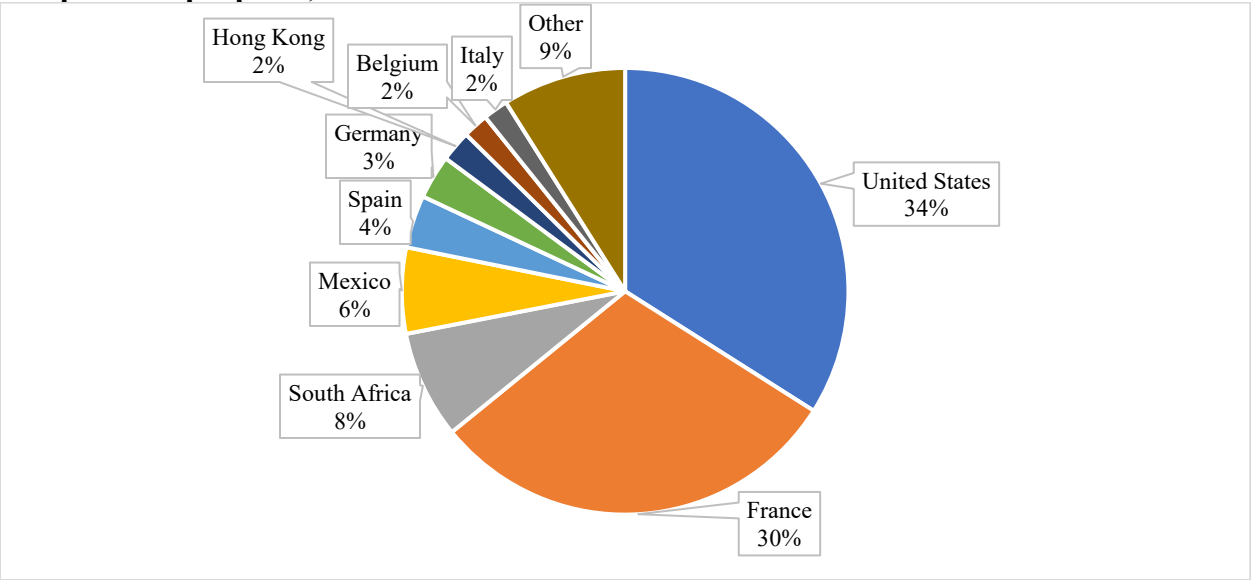
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Leather products (large)	26	22	15	18	28	15	20	18	7	223
Leather products (small)	281	177	273	150	415	1,206	1,130	834	343	743
Skin pieces	110	240	1,502	715	1,269	740	843	724	751	267
Skins	729	1,518	367	558	1,110	273	655	862	846	1,229

[20] See Appendix Tables 6 and 7.

Source: CITES Trade Database, search completed on February 18, 2021, using the following terms: *Hippopotamus amphibius*, year range: 2009-2018, all importing countries, all exporting countries, source: wild ("W"), and purpose: commercial ("T"), hunting trophy ("H"), and personal ("P"). Search filter for 'ivory products' terms: "carvings," "ivory carvings," "ivory pieces," "jewelry," "jewelry—ivory," "teeth," "tusk"; and 'skin products' terms: "skins," "skin pieces," "leather products (large)," "leather products (small)." Search filtered for no unit (blank value). Totals were based on global imports.

The United States was the top importer of hippo specimens during the decade studied. The United States imported 25,626 hippo specimens, representing 34% of globally imported hippo specimens (25,626[21] ÷ 75,397). The next largest importers of hippo specimens are France (30% of global imports of hippo specimens) and South Africa (8% of global imports of hippo specimens). See Figure 5 below.

Figure 5. Top importers of hippo specimens, wild source and commercial, hunting trophy, and personal purposes, 2009-2018.[22]



Source: CITES Trade Database, search completed on February 18, 2021, using the following terms: *Hippopotamus amphibius*, year range: 2009-2018, all importing countries, all exporting countries, all terms, source: wild ("W"), and purpose: commercial ("T"), hunting trophy ("H"), and personal ("P"). Search filtered for no unit (blank value). Totals were based on global imports and percentage numbers are rounded to the nearest whole number. Note: 'other' refers to countries who imported <1% of total global imports of specimens.

(1) U.S. Imports

As stated above, the United States imported more hippo specimens than any other country during the decade studied. While global imports of hippo specimens began to substantially decline starting in 2013, the United States' imports remained stable. Therefore, the United States has become responsible for a greater portion of the global market of hippo specimens in the most recent years studied. This indicates global trade in hippo parts and products is decreasing at a faster rate than U.S. trade. See Table 4 and Figure 6 below.

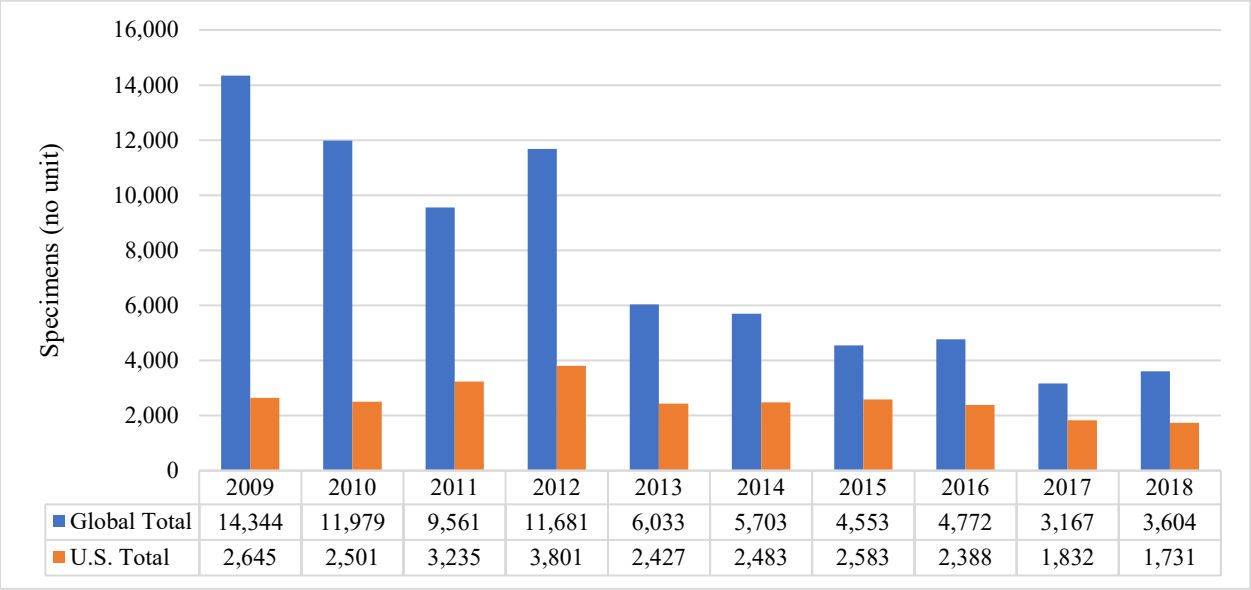
[21] See Appendix Table 4.
[22] See Appendix Table 4.

Table 4. U.S. share of globally imported hippo specimens, by year, wild source and commercial, hunting trophy, and personal purposes, 2009-2018.[23]

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Global Imports	14,344	11,979	9,561	11,681	6,033	5,703	4,553	4,772	3,167	3,604	**75,397**
U.S. Imports	2,645	2,501	3,235	3,801	2,427	2,483	2,583	2,388	1,832	1,731	**25,626**
U.S. Total Share	**18%**	**21%**	**34%**	**33%**	**40%**	**44%**	**57%**	**50%**	**58%**	**48%**	**34%**

Source: CITES Trade Database, search completed on February 18, 2021, using the following terms: *Hippopotamus amphibius*, year range: 2009-2018, all importing countries, all exporting countries, source: wild ("W"), purpose: commercial ("T"), hunting trophy ("H"), and personal ("P"), and all terms. Search filtered for no unit (blank value). Totals based on global imports and for the United States. Percentages are rounded to nearest whole number.

Figure 6. U.S. share of globally imported hippo specimens, wild source and commercial, hunting trophy, and personal purposes, 2009-2018.[24]



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Global Total	14,344	11,979	9,561	11,681	6,033	5,703	4,553	4,772	3,167	3,604
U.S. Total	2,645	2,501	3,235	3,801	2,427	2,483	2,583	2,388	1,832	1,731

Source: CITES Trade Database, search completed on February 18, 2021, using the following terms: *Hippopotamus amphibius*, year range: 2009-2018, all importing countries, all exporting countries, source: wild ("W"), purpose: commercial ("T"), hunting trophy ("H"), and personal ("P"), and all terms. Search filtered for no unit (blank value). Totals based on global imports and for the United States.

The top hippo specimen type imported by the United States between 2009 and 2018 was teeth (9,097) (Table 5). Imports of teeth alone comprise of 35% of total U.S. import of hippo specimens during this decade and 40% of global imports of teeth. The second largest specimen type imported by the United States was skin pieces (5,779); representing 23% of total U.S. imports of hippo specimens and 81% of global imports of skin pieces. See Table 5 below.

[23] See Appendix Table 4.
[24] See Appendix Table 4.

Of the 21 types of specimens globally imported during this decade, the United States was the top importer of the following: bone carvings, feet, genitalia, jewelry, leather products (large), leather products (small), skin pieces, tails, teeth, and trophies. See Table 5 below and Appendix Table 5.

Table 5. U.S. share of globally imported hippo specimens, by term, wild source and commercial, hunting trophy, and personal purposes, 2009-2018.

Term	U.S. Total[25]	% of U.S. Grand Total	Global Total[26]	U.S. Share of Global Grand Total
Teeth	9,097	35%	22,657	40%
Skin pieces	5,779	23%	7,161	81%
Leather products (small)	4,435	17%	5,552	80%
Trophies	2,074	8%	4,229	49%
Carvings	1,781	7%	25,459	34%
Skins	1,457	6%	8,147	18%
Leather products (large)	374	1%	392	95%
Feet	343	1%	724	47%
Skulls	127	<1%	462	27%
Jewelry	56	<1%	69	81%
Tails	46	<1%	101	46%
Garments	29	<1%	159	18%
Bones	10	<1%	138	7%
Bone carvings	7	<1%	8	88%
Sides	5	<1%	15	33%
Derivatives	4	<1%	19	21%
Genitalia[27]	2	<1%	4	50%
Live	0	0%	67	<1%
Specimens	0	0%	23	<1%
Bodies	0	0%	9	<1%
Skeletons	0	0%	2	<1%
Grand Total	**25,626**	**100%**	**75,397**	**34%**

Source: CITES Trade Database, search completed on February 18, 2021, using the following terms: *Hippopotamus amphibius*, year range: 2009-2018, all importing countries, all exporting countries, source: wild ("W"), purpose: commercial ("T"), hunting trophy ("H"), and personal ("P"), and all terms. Search filtered for no unit (blank value). Totals were based on global imports and for the United States. Percentages were rounded to the nearest whole number.

The United States played an important role in the global trade of hippo ivory products and skin products. U.S. imports of ivory products constituted approximately 23%[28] of global imports of ivory products. Of the three ivory products globally imported during the decade (carvings, teeth, jewelry), the United States was the top importer of jewelry and teeth. Although carvings were the largest type of specimen globally imported, the United States only imported 7% of this specimen.

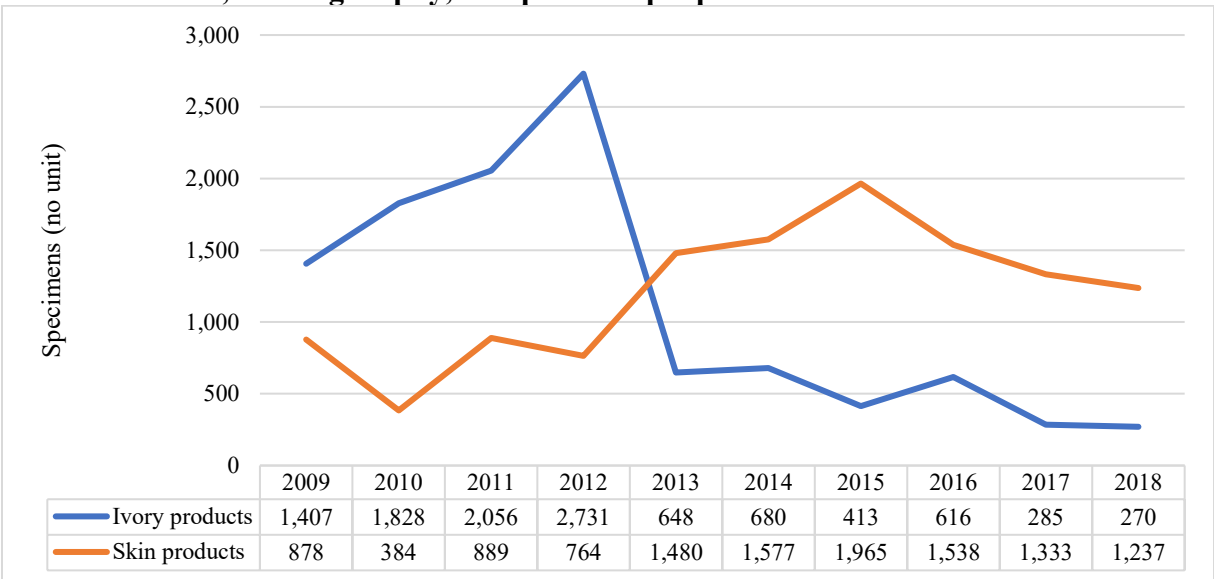
[25] See Appendix Table 8.
[26] See Appendix Table 3.
[27] The United States is tied with Spain as top importer of hippo genitalia.
[28] This percentage was calculated by dividing the number of ivory products imported by the United States (10,934; Appendix Table 9) by the total global imports of ivory products (48,185; Appendix Table 8) and multiplying this quotient by 100. This calculation is as follows: (10,934÷ 48,185)*100= 22.7%

U.S. imports of skin products constituted approximately 57%[29] of global imports of skin products. Of the four skin products globally imported during this decade (skins, skin pieces, leather products (small), leather products (large)), the United States imported about 95% of globally imported leather products (large), 81% of skin pieces, and 80% of leather products (small). See Table 5 above.

Nearly all specimens imported by the United States were ivory and skin products; combined these imports constituted 90% of total U.S. imports. Ivory products constituted approximately 43% of all U.S. imports of hippo specimens (10,934[30]÷ 25,626). Imports of skin products constituted approximately 47% of all U.S. imports of hippo specimens (12,045[31]÷ 25,626).

There is an apparent inverse relationship between U.S. imports of hippo ivory products and skin products. In the first half of the decade, between 2008 and 2012, ivory product imports were the highest of the decade, ranging between 1,407 and 2,731 products imported by the United States each year, whereas skin product imports were the lowest of the decade, ranging between 384 and 889 each year. Starting in 2013, there was a shift in specimens being imported by the United States, ivory product imports declined from 2,731 in 2012 to 648 in 2013 but skin product imports increased from 764 in 2012 to 1,480 in 2013. Through the end of the decade, U.S. imports of ivory products remained low while U.S. imports of skin products continued to increase. See Figure 7 below.

Figure 7. U.S. imports of hippo ivory products and skin products, 2009-2018, wild source and commercial, hunting trophy, and personal purposes.[32]



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Ivory products	1,407	1,828	2,056	2,731	648	680	413	616	285	270
Skin products	878	384	889	764	1,480	1,577	1,965	1,538	1,333	1,237

[29] This percentage was calculated by dividing the number of skin products imported by the United States (12,045; Appendix Table 10) by the total global imports of ivory products (21,252; Appendix Table 9) and multiplying this quotient by 100. This calculation is as follows: (12,045÷ 21,252)*100= 56.7%
[30] See Appendix Table 9.
[31] See Appendix Table 10.
[32] See Appendix Tables 9 and 10.

Source: CITES Trade Database, search completed on February 18, 2021, using the following terms: *Hippopotamus amphibius*, year range: 2009-2018, all importing countries, all exporting countries, source: wild ("W"), and purpose: commercial ("T"), hunting trophy ("H"), and personal ("P"). Search filtered for 'ivory products' terms: "carvings," "ivory carvings," "ivory pieces," "jewelry," "jewelry—ivory," "teeth," and "tusk"; and 'skin products' terms: "skins," "skin pieces," "leather products (large)," "leather products (small)." Search filtered for no unit (blank value). Totals are based on U.S. imports.

Many factors may contribute to this trend, like shifts in commercial interest, adjustment of CITES trade quotas and suspensions, and/or domestic measures implementing specimen trade bans. Few quotas have ever been placed on hippo skin exports from range countries. Only two range countries had brief quotas on hippo skin products—Malawi in 1998 and in 2000 and Tanzania from 2001 to 2002 (UNEP, 2022). Quotas on ivory product exports from range countries, however, have been in place since 2001 and show evidence of becoming more stringent. Ethiopia, for example, has had quotas placed on worked (35 kg) and raw ivory (40 kg) since 2004 but starting in 2012 these quotas have been limited to 20 kg each (UNEP, 2022). As stated previously, Uganda voluntarily implemented a ban on hippo teeth export starting in 2014 (Andersson & Gibson, 2018; Kazibwe, 2017). This combined with increased CITES suspensions on hippos and hippo specimen exports from range countries could be influencing the shift of U.S. trade from hippo ivory to hippo skin products in the most recent decade.

b) Estimated number of individual hippos traded internationally from hippo range States

In contrast to the previous section, which examined the total number of parts and products (i.e., total hippo specimen in trade) from all countries, this section quantified the number of individual hippos that have been traded only from hippo range States. For this analysis, we again relied on the CITES Trade Database for records of trade from 2009 and 2018. This analysis only included terms that could be used to calculate a single hippo, without double counting. Therefore, our calculations represent the minimum number of hippos traded during this time period. These terms included ivory measured in kilograms, and teeth, bodies, live, skulls, trophies without a measurable unit. We calculated the number of individual hippos based only on these types of specimens where one hippo was equal to 5.25 kg of ivory, twelve teeth, one body, one live hippo, one skull, and one trophy. In order to analyze the origins of hippo specimens and magnitude of trade from various range States, this section only included hippo specimens that originated from a hippo range State. For detailed methodology, see Appendix.

This section provides a summary of global and U.S. imports of individual hippos, quantified using certain hippo specimens from hippo range States (as detailed above). This section is divided into three subparts: (1) global and U.S. imports from all range States, (2) country of origin of global and U.S. imports, and (3) country cases.

Of the 13,909 total hippos imported based on our calculations of ivory (kg), teeth, trophies, bodies, live, and skulls; 97% (13,496 hippos) were wild-sourced and for commercial, hunting trophy, and personal purposes (Appendix Table 11). Therefore, this section only focuses on wild-sourced hippos that were imported for commercial, hunting trophy, and personal purposes.

Detailed summaries below on global and U.S. imports from hippo range States demonstrate that trade is occurring at levels contributing to overuse of the species. Listing the species as endangered will ensure that such imports only occur for purposes that promote the conservation of the species.

Summary of trade analysis of individual hippos from hippo range States:

Global: During the decade examined, approximately 13,496 wild-sourced hippos were globally imported for commercial, hunting trophy, and personal purposes. Ivory imported for commercial purposes comprised half of global imports, followed by trophies for hunting trophy purposes, and teeth for all purposes. Imports for commercial purposes largely declined over the ten-year period, while imports for hunting trophy and personal purposes remained relatively steady. The top global importer of hippos for all purposes combined was China's Special Administrative Region of Hong Kong (hereinafter Hong Kong) with 38% of global imports, followed by the United States with 23% of global imports from 2009 to 2018. The majority of global imports originated in Tanzania (28%) followed by Uganda (22%), Zambia (14%), and Zimbabwe (12%).

United States: The United States imported 3,081 hippos over the decade, making them the second largest global importer. Nearly 81% of U.S. imports were for hunting trophy purposes, specifically 67% of U.S. imports were hippo trophies for hunting trophy purposes. The United States was responsible for 47% of global imports of hippos for hunting trophy purposes from 2009 to 2018. U.S. imports for hunting trophy purposes have slightly decreased over the decade but remained relatively steady, while imports for commercial purposes have declined and imports for personal purposes have remained low. The majority of global imports originated in Zimbabwe (26%) followed by South Africa (21%), Zambia (21%), and Tanzania (19%). There were several instances where the United States imported hippos that originated in countries with full protections on hunting hippos. See analysis below.

(1) Global and U.S. imports from all range States

Global imports of wild-sourced hippos totaled 13,496 from hippo range States between 2009 and 2018 for commercial, hunting trophy, and personal purposes (Table 6). The majority of global imports were for commercial and hunting trophy purposes (Table 6). Global imports for commercial purposes declined from 2009 to 2018, while imports for hunting trophy and personal purposes remained steady (Figure 8).

Table 6. Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes, 2009-2018.[33]

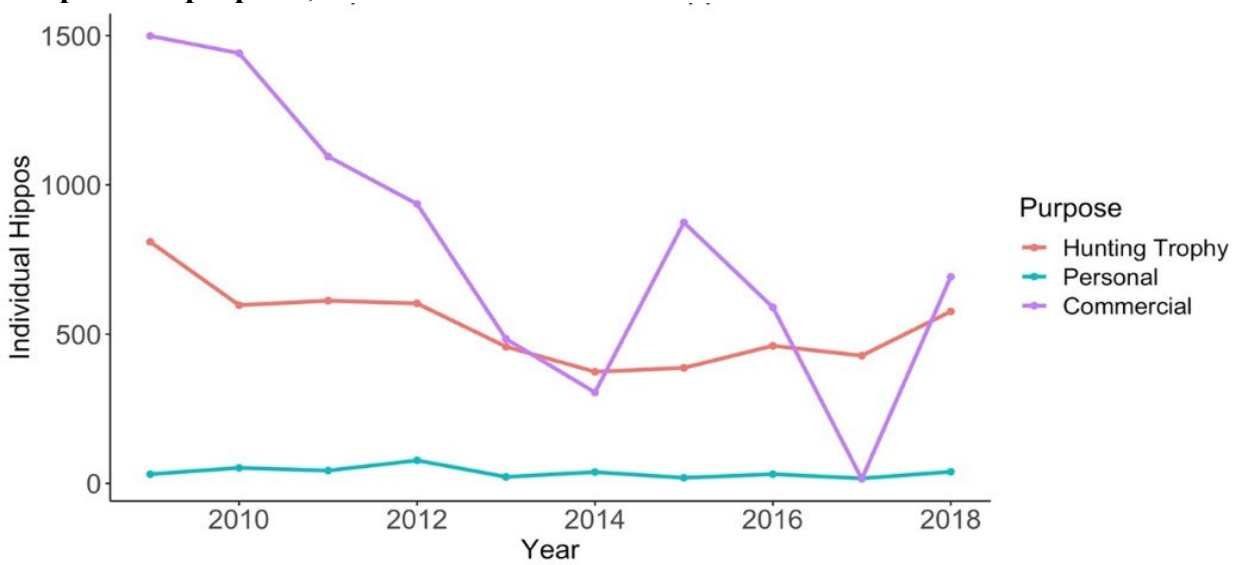
	Number of Hippos by Purpose			GRAND TOTAL
Terms	Commercial	Hunting trophy	Personal	Commercial, hunting trophy, personal purposes
Ivory (kg)	36,092.77 ÷ 5.25 = 6,874.8	12 ÷ 5.25 = 2.3	8.186 ÷ 5.25 = 1.6	36,112.96 ÷ 5.25 = 6,878.7

[33] See Appendix Tables 15, 16, 17 for annual totals.

Terms	Number of Hippos by Purpose			GRAND TOTAL
	Commercial	Hunting trophy	Personal	Commercial, hunting trophy, personal purposes
Teeth[34]	9,552 ÷ 12 = 796	11,712 ÷ 12 = 976	1,262 ÷ 12 = 105.2	22,526 ÷ 12 = 1,877.2
Bodies	1	6	2	9
Live	65	0	0	65
Skulls	108	328	20	456
Trophies	9	3,981	220	4,210
Total hippos	7,853.8 = 7,854	5,293.3 = 5,294	348.8 = 349	13,495.9 = 13,496

Source: CITES Trade Database, search completed on February 18, 2021, using the following terms: *Hippopotamus amphibius*, year range: 2009-2018, all importing countries, source: wild ("W"), and purpose: commercial ("T"), hunting trophy ("H"), and personal ("P"). Data were subset by country of origin to include only hippo range States. 'Ivory (kg)' terms: "carvings," "ivory carvings," "ivory pieces," "jewelry," "jewelry—ivory," "teeth," and "tusk" with weighted units; and terms: 'teeth' (terms "teeth" and "tusk"), "bodies," "live," "skulls," and "trophies" with no unit (blank value). Totals are based on global imports.

Figure 8. Annual global imports of hippos, wild source and commercial, hunting trophy, and personal purposes, 2009-2018.



Source: CITES Trade Database, search completed on February 18, 2021, using the following terms: *Hippopotamus amphibius*, year range: 2009-2018, all importing countries, source: wild ("W"), and purpose: commercial ("T"), hunting trophy ("H"), and personal ("P"). Data were subset by country of origin to include only hippo range States. 'Ivory (kg)' terms: "carvings," "ivory carvings," "ivory pieces," "jewelry," "jewelry—ivory," "teeth," and "tusk" with weighted units; and terms: 'teeth' (terms "teeth" and "tusk"), "bodies," "live," "skulls," and "trophies" with no unit (blank value). Totals are based on global imports.

The majority of U.S. imports of wild-sourced hippos were for hunting trophy purposes (Table 7). U.S. imports for hunting trophy purposes declined slightly, but largely remained steady from 2009 to 2018, while imports for commercial purposes declined (Figure 9). From 2009 to 2018, the United States imported 3,081 hippos from hippo range States, making the United States the

[34] 'Teeth' combines both terms "teeth" and "tusk." For justification, see methodology in Appendix.

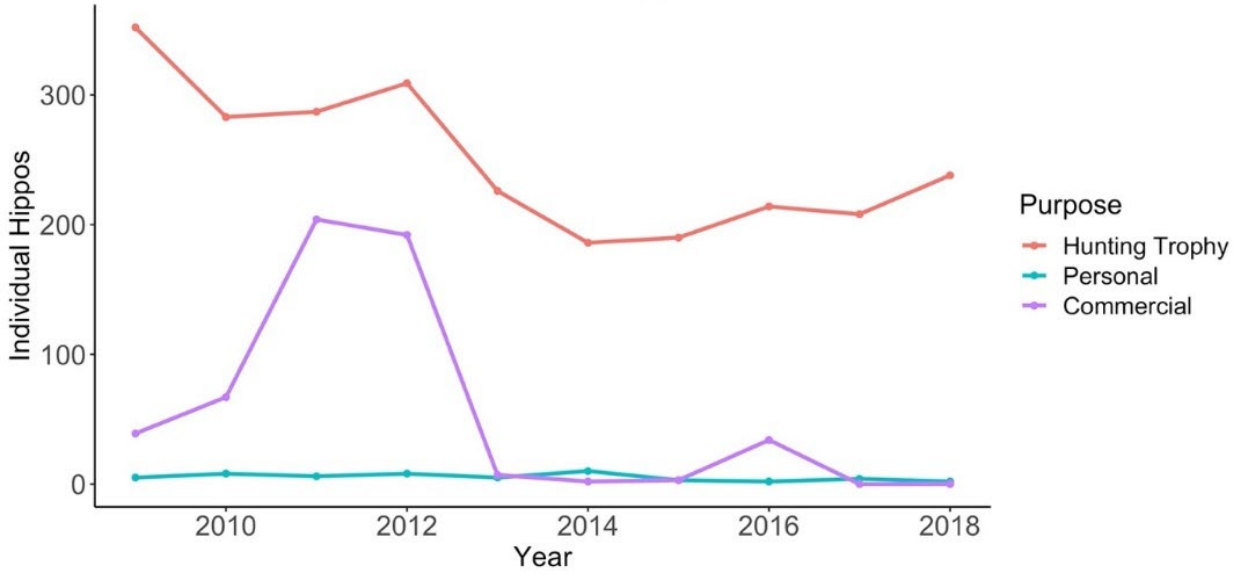
second largest importer of wild-sources hippos for commercial, hunting trophy, and personal purposes (Table 7 and Figure 10). The United States was responsible for nearly 23% of global imports between 2009 and 2018, second only to Hong Kong in terms of global imports (Figure 10).

Table 7. U.S. imports of hippos, wild source and commercial, hunting trophy, and personal purposes, 2009-2018. [35]

Terms	Number of Hippos by Purpose			GRAND TOTAL
	Commercial	Hunting trophy	Personal	Commercial, hunting trophy, personal purposes
Ivory (kg)	641 ÷ 5.25 = 122.1	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	641 ÷ 5.25 = 122.1
Teeth	5,030 ÷ 12 = 419.2	3,848 ÷ 12 = 320.7	215 ÷ 12 = 17.9	9,093 ÷ 12 = 757.8
Bodies	0	0	0	0
Live	0	0	0	0
Skulls	2	118	7	127
Trophies	1	2,050	23	2,074
Total hippos	544.3 = 545	2,488.7 = 2,489	47.9 = 48	3,080.9 = 3,081

Source: CITES Trade Database, search completed on February 18, 2021, using the following terms: *Hippopotamus amphibius*, year range: 2009-2018, source: wild ("W"), and purpose: commercial ("T"), hunting trophy ("H"), and personal ("P"). Data were subset by country of origin to include only hippo range States and United States as importer. 'Ivory (kg)' terms: "carvings," "ivory carvings," "ivory pieces," "jewelry," "jewelry—ivory," "teeth," and "tusk" with weighted units; and terms: 'teeth' (terms "teeth" and "tusk"), "bodies," "live," "skulls," and "trophies" with no unit (blank value). Totals are based on U.S. imports.

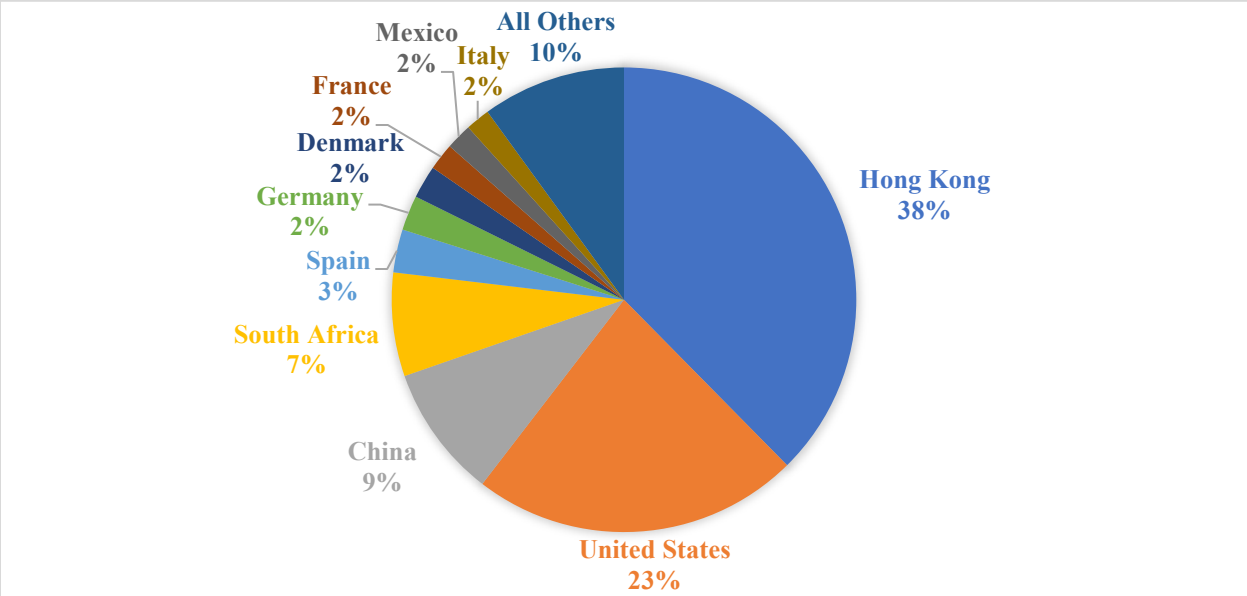
Figure 9. Annual U.S. imports of hippos, wild source and commercial, hunting trophy, and personal purposes, 2009-2018.



[35] See Appendix Tables 18, 19, 20 for annual totals.

Source: CITES Trade Database, search completed on February 18, 2021, using the following terms: *Hippopotamus amphibius*, year range: 2009-2018, source: wild ("W"), and purpose: commercial ("T"), hunting trophy ("H"), and personal ("P"). Data were subset by country of origin to include only hippo range States and United States as importer. Terms: "carvings," "ivory carvings," "ivory pieces," "jewelry," "jewelry—ivory," "teeth," and "tusk" with weighted units; and terms: "bodies," "live," "skulls," "teeth," "trophies," and "tusk" with no unit (blank value). Totals are based on U.S. imports.

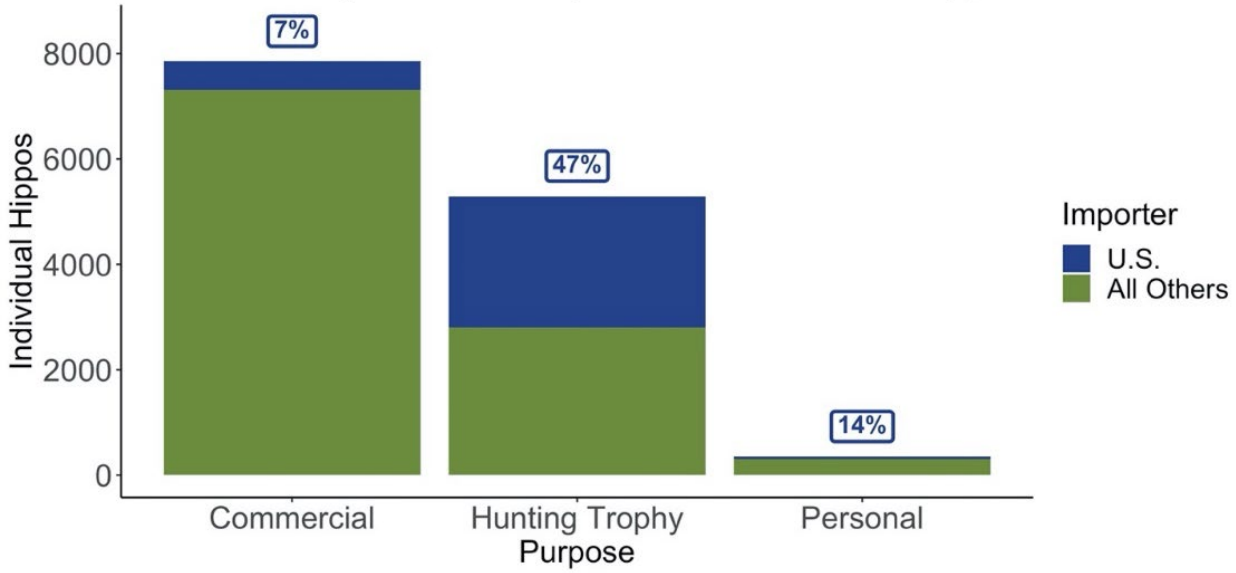
Figure 10. Top importers of hippos, wild source and commercial, hunting trophy, and personal purposes, 2009-2018.



Source: CITES Trade Database, search completed on February 18, 2021, using the following terms: *Hippopotamus amphibius*, year range: 2009-2018, all importing countries, source: wild ("W"), and purpose: commercial ("T"), hunting trophy ("H"), and personal ("P"). Data were subset by country of origin to include only hippo range States. Terms: "carvings," "ivory carvings," "ivory pieces," "jewelry," "jewelry—ivory," "teeth," and "tusk" with weighted units; and terms: "bodies," "live," "skulls," "teeth," "trophies," and "tusk" with no unit (blank value).

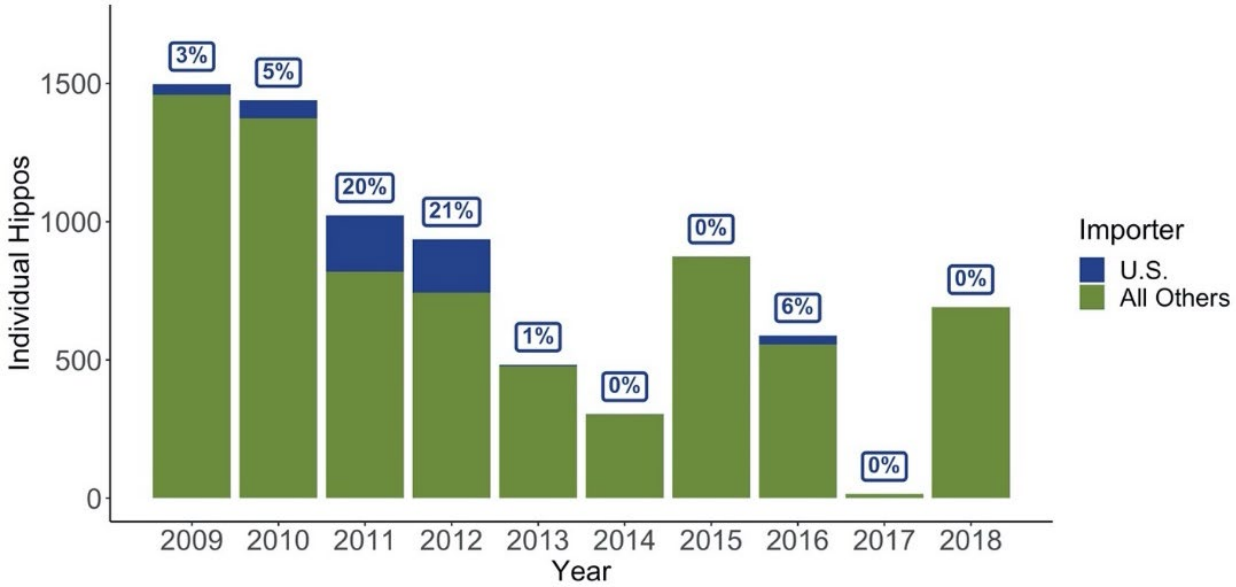
Nearly 81% of U.S. imports were for hunting trophy purposes, and the United States was responsible for 47% of global imports of hippos for hunting trophy purposes from 2009 to 2018 (Table 7 and Figure 11). The United States consistently imported nearly half of global imports of wild hippos for hunting trophy purposes between 2009 and 2018 (Figure 13). U.S. imports of wild-sourced hippos for personal purposes comprised 14% of global imports for personal purposes but has varied between 3% and 26% between 2009 and 2018 (Figures 11 and 14). U.S. imports of wild-sourced hippos for commercial purposes comprised 7% of global imports for commercial purposes and declined from 2009 to 2018 (Figures 11 and 12).

Figure 11. U.S. percentage of global imports of hippos, wild source, by purpose, 2009-2018.



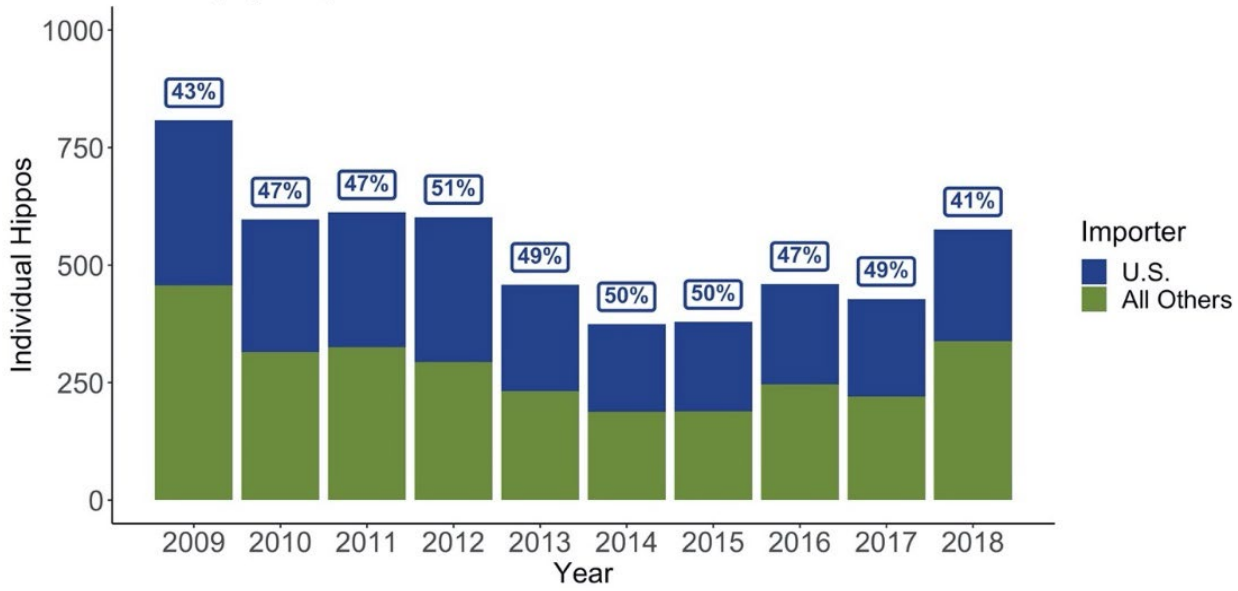
Source: CITES Trade Database, search completed on February 18, 2021, using the following terms: *Hippopotamus amphibius*, year range: 2009-2018, all importing countries, source: wild ("W"), and purpose: commercial ("T"), hunting trophy ("H"), and personal ("P"). Data were subset by country of origin to include only hippo range States. Terms: "carvings," "ivory carvings," "ivory pieces," "jewelry," "jewelry—ivory," "teeth," and "tusk" with weighted units; and terms: "bodies," "live," "skulls," "teeth," "trophies," and "tusk" with no unit (blank value). Totals are based on global and U.S. imports.

Figure 12. U.S. percentage of global imports of hippos, wild source, commercial purpose, 2009-2018.



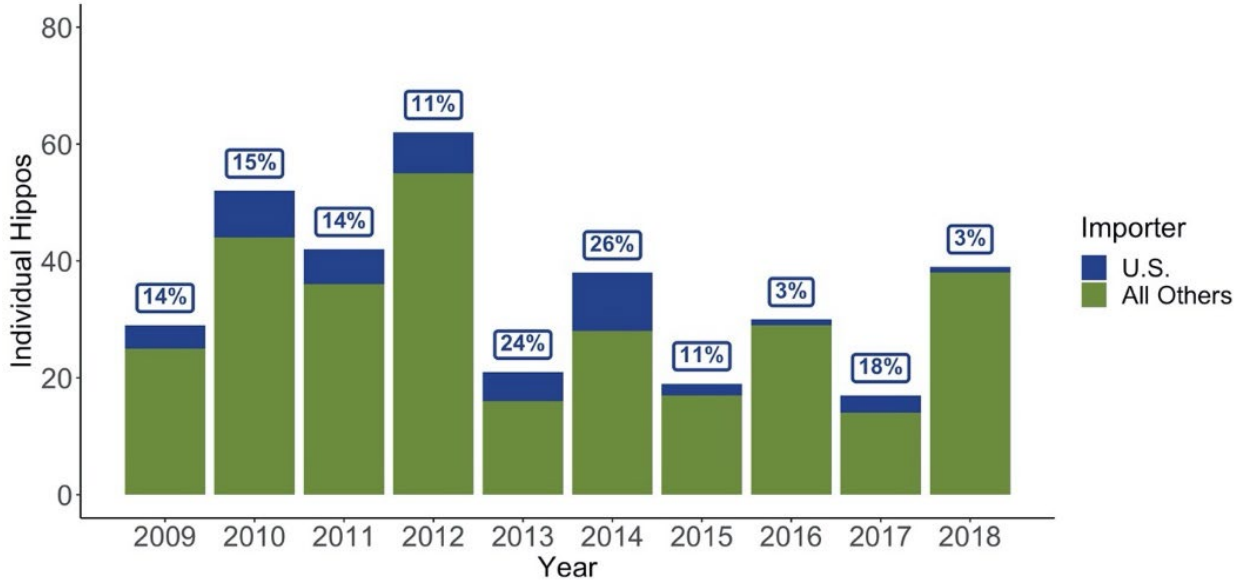
Source: CITES Trade Database, search completed on February 18, 2021, using the following terms: *Hippopotamus amphibius*, year range: 2009-2018, all importing countries, source: wild ("W"), and purpose: commercial ("T"), hunting trophy ("H"), and personal ("P"). Data were subset by country of origin to include only hippo range States. Terms: "carvings," "ivory carvings," "ivory pieces," "jewelry," "jewelry—ivory," "teeth," and "tusk" with weighted units; and terms: "bodies," "live," "skulls," "teeth," "trophies," and "tusk" with no unit (blank value). Totals are based on global and U.S. imports.

Figure 13. U.S. percentage of global imports of hippos, wild source, hunting trophy purpose, 2009-2018.



Source: CITES Trade Database, search completed on February 18, 2021, using the following terms: *Hippopotamus amphibius*, year range: 2009-2018, all importing countries, source: wild ("W"), and purpose: commercial ("T"), hunting trophy ("H"), and personal ("P"). Data were subset by country of origin to include only hippo range States. Terms: "carvings," "ivory carvings," "ivory pieces," "jewelry," "jewelry—ivory," "teeth," and "tusk" with weighted units; and terms: "bodies," "live," "skulls," "teeth," "trophies," and "tusk" with no unit (blank value). Totals are based on global and U.S. imports.

Figure 14. U.S. percentage of global imports of hippos, wild source, personal purpose, 2009-2018.



Source: CITES Trade Database, search completed on February 18, 2021, using the following terms: *Hippopotamus amphibius*, year range: 2009-2018, all importing countries, source: wild ("W"), and purpose: commercial ("T"), hunting trophy ("H"), and personal ("P"). Data were subset by country of origin to include only hippo range States. Terms: "carvings," "ivory carvings," "ivory pieces," "jewelry," "jewelry—ivory," "teeth," and "tusk" with weighted

units; and terms: “bodies,” “live,” “skulls,” “teeth,” “trophies,” and “tusk” with no unit (blank value). Totals are based on global and U.S. imports.

(2) Country of Origin of Global and U.S. Imports

In this section, we make a distinction between country of origin of hippos in trade and country of export of hippos in trade. The two are not always the same; hippos may be exported from a country other than where they originated. By studying the country of origin of hippos in trade, we can take a step toward determining the impact of trade on hippo populations on a national level.

Global imports of wild-sourced hippos and their parts, for commercial, personal, or hunting trophy purposes, originated from 17 of the 38 recognized hippo range States between 2009 and 2018 (in alphabetical order): Benin, Botswana, Burkina Faso, Cameroon, Central African Republic, Democratic Republic of the Congo, Ethiopia, Kenya, Malawi, Mozambique, Namibia, Nigeria, South Africa, Tanzania, Uganda, Zambia, and Zimbabwe (Table 8). The top five countries of origin of global imports, listed from the greatest number of hippos imported to smallest are Tanzania, Uganda, Zambia, Zimbabwe, and Malawi (Table 8). All hippo populations are on Appendix II of CITES.

Table 8. Global imports of individual hippos by range State country of origin, 2009-2018.

Country of Origin	Number of Hippos by Purpose			Total number of Individual Hippos Imported	% of Total Global Imports of Individual Hippos
	Commercial	Hunting Trophy	Personal		
Tanzania	2,548	1,140.8	125.8	3,814.6	28%
Uganda	2,991.7	20.5	2	3,014.2	22%
Zambia	635.2	1,203.9	57.5	1,896.6	14%
Zimbabwe	119.5	1,436.4	79.3	1,635.2	12%
Malawi	1,273	6	0	1,279	9%
South Africa	274	866.1	70.5	1,210.6	9%
Mozambique	1	310.1	1	312.1	2%
Namibia	11	269.4	10.1	290.5	2%
Cameroon	0	27.7	0	27.7	<1%
Ethiopia	0	7.5	0	7.5	<1%
Benin	0	3.1	1	4.1	<1%
Burkina Faso	0	1	0	1	<1%
Central African Republic	0	1	0	1	<1%
Kenya	0	0	1	1	<1%
Democratic Republic of the Congo	0	0	0.6	0.6	<1%
Botswana	0.5	0	0	0.5	<1%
Nigeria	0	0	0.1	0.1	<1%
TOTAL	**7,853.9**	**5,293.5**	**348.9**	**13,496.3 = 13,496**	**100%**

Source: CITES Trade Database, search completed on February 18, 2021, using the following terms: *Hippopotamus amphibius*, year range: 2009-2018, all importing countries, source: wild (“W”), and purpose: commercial (“T”), hunting trophy (“H”), and personal (“P”). Data were subset by country of origin to include only hippo range States.

Terms: “carvings,” “ivory carvings,” “ivory pieces,” “jewelry,” “jewelry—ivory,” “teeth,” and “tusk” with weighted units; and terms: “bodies,” “live,” “skulls,” “teeth,” “trophies,” and “tusk” with no unit (blank value).

U.S. imports of wild-sourced hippos and their parts, for commercial, personal, or hunting trophy purposes have been reported as having originated from 12 hippo range states between 2009 and 2018 (in alphabetical order): Benin, Burkina Faso, Cameroon, Ethiopia, Mozambique, Namibia, Nigeria, South Africa, Tanzania, Uganda, Zambia, and Zimbabwe (Table 9). The top five countries of origin of U.S. imports, listed from the greatest number of hippos imported to smallest are Zimbabwe, South Africa, Zambia, Tanzania, and Namibia (Table 9).

Table 9. U.S. imports of individual hippos by range State country of origin, 2009-2018.

Country of Origin	Number of Hippos per purpose			Number of Individual Hippos Imported	% of Total U.S. Imports of Individual Hippos
	Commercial	Hunting Trophy	Personal		
Zimbabwe	112.6	668.8	20.8	802.2	26%
South Africa	122.6	515.2	18.5	656.3	21%
Zambia	192.8	444.7	2.6	640.1	21%
Tanzania	36.2	545.2	4	585.4	19%
Namibia	0	156.9	2.1	159	5%
Mozambique	0	144.6	0	144.6	5%
Uganda	79.9	4	0	83.9	3%
Ethiopia	0	5.2	0	5.2	<1%
Cameroon	0	2	0	2.0	<1%
Benin	0	1	0	1.0	<1%
Burkina Faso	0	1	0	1.0	<1%
Nigeria	0	0	0.1	0.1	<1%
TOTAL	**544.1**	**2,488.6**	**48.1**	**3,080.8 = 3,081**	**100%**

Source: CITES Trade Database, search completed on February 18, 2021, using the following terms: *Hippopotamus amphibius*, year range: 2009-2018, source: wild (“W”), and purpose: commercial (“T”), hunting trophy (“H”), and personal (“P”). Data were subset by country of origin to include only hippo range States and United States as importer. Terms: “carvings,” “ivory carvings,” “ivory pieces,” “jewelry,” “jewelry—ivory,” “teeth,” and “tusk” with weighted units; and terms: “bodies,” “live,” “skulls,” “teeth,” “trophies,” and “tusk” with no unit (blank value). Totals are based on U.S. imports.

(3) Country Cases

The following section details global and U.S. imports of wild sourced hippos from hippo range States identified as the country of origin, for commercial, hunting trophy, and personal purposes between 2009 and 2018.

(a) Benin

Global imports of hippos that originated from Benin included two trophies and 25 teeth, which are equivalent to five hippos, between 2009 and 2018 (Appendix Table 21). This trade comprised less than 1% of the total global imports of hippos (Table 8). There were no obvious trends in global imports from 2009 to 2018 (Appendix Figure 1). Hippos were imported for hunting

trophy purposes in 2010, 2012, 2013, and one hippo was imported for personal purposes in 2015 (Appendix Figure 1).

U.S. imports of hippos that originated from Benin included 12 teeth, which is equivalent to one hippo, between 2009 and 2018 (Appendix Table 22). This amount comprised less than 1% of the total U.S. imports of hippos (Table 8). The single hippo was imported for hunting trophy purposes in 2012 (Appendix Figure 2).

(b) Botswana

Global imports of hippos that originated from Botswana included six teeth, which are equivalent to one hippo, between 2009 and 2018 (Appendix Table 23). This amount comprised less than 1% of the total global imports of hippos (Table 8). The single hippo was imported for commercial purposes in 2017 (Appendix Figure 3).

There were no hippos that originated in Botswana imported to the United States (Table 9).

(c) Burkina Faso

Global imports of hippos that originated from Burkina Faso included one trophy, which is equivalent to one hippo, between 2009 and 2018 (Appendix Table 24). This trade comprised less than 1% of the total global imports of hippos (Table 8). The single hippo was imported into the United States for hunting trophy purposes in 2017 (Appendix Figure 4).

U.S. imports of hippos that originated from Burkina Faso included one trophy, which is equivalent to one hippo, between 2009 and 2018 (Appendix Table 25). This trade comprised less than 1% of the total U.S. imports of hippos (Table 9). The single hippo was imported for hunting trophy purposes in 2017 (Appendix Figure 5).

U.S. imports made up the entirety of global imports of wild sourced hippos from Burkina Faso for commercial, hunting trophy, and personal purposes.

It is important to note that the hippo has been totally protected in Burkina Faso since 1996. The trophy was imported in 2017, after full protections were implemented for hippos. Hunting for recreational or commercial purposes is prohibited. See Table 28 in Section IV.D.2. for details.

(d) Cameroon

Global imports of hippos that originated from Cameroon included 11 trophies and 199 teeth, which are equivalent to 28 hippos, between 2009 and 2018 (Appendix Table 26). This trade comprised less than 1% of the total global imports of hippos (Table 8). Global imports generally decreased from 2009 to 2018, with increases in 2010, 2013, and 2017 (Appendix Figure 6).

U.S. imports of hippos that originated from Cameroon included two trophies, which are equivalent to two hippos, between 2009 and 2018 (Appendix Table 27). This amount comprised

less than 1% of the total U.S. imports of hippos (Table 9). The two hippos were imported for hunting trophy purposes in 2012 and 2016 (Appendix Figure 7).

U.S. imports made up less than 1% of global imports of wild sourced hippos from Cameroon for commercial, hunting trophy, and personal purposes.

It is important to note that the hippo has been totally protected in Cameroon since 2006. Both trophies were imported after full protections were implemented for hippos. Hunting for subsistence, recreational, or commercial purposes is prohibited. See Table 28 in Section IV.D.2. for details.

(e) Central African Republic

Global imports of hippos that originated from Central African Republic included one trophy, which is equivalent to one hippo, between 2009 and 2018 (Appendix Table 28). This trade comprised less than 1% of the total global imports of hippos (Table 8). The single hippo was imported for hunting trophy purposes in 2010 (Appendix Figure 8).

There were no U.S. imports of hippos that originated from Central African Republic (Table 9).

It is important to note that the hippo has been totally protected in Central African Republic since 1984. Hunting or capture is prohibited. See Table 28 in Section IV.D.2. for details.

(f) Democratic Republic of the Congo

Global imports of hippos that originated from the Democratic Republic of the Congo included 3 kg of ivory, which is equivalent to one hippo, between 2009 and 2018 (Appendix Table 29). This trade comprised approximately less than 1% of the total global imports of hippos (Table 8). The single hippo was imported for personal purposes in 2014 (Appendix Figure 9).

There were no U.S. imports of hippos that originated from the Democratic Republic of the Congo (Table 9).

It is important to note that the hippo has been totally protected in Democratic Republic of the Congo since 2006. Capture, hunting, harassing, and deliberate killing is prohibited. It is illegal to detain, give, sell, exchange, or transport any products represented as containing a product derived from hippos and it is illegal to publicly exhibit these specimens. See Table 28 in Section IV.D.2. for details.

(g) Ethiopia

Global imports of hippos that originated from Ethiopia included six trophies, one skull, and six teeth, which are equivalent to eight hippos, between 2009 and 2018 (Appendix Table 30). This trade comprised less than 1% of the total global imports of hippos (Table 8). All hippos imported

from Ethiopia were for hunting trophy purposes. Hippos were imported in 2009, 2010, and 2011 (Appendix Figure 10).

U.S. imports of hippos that originated from Ethiopia included five trophies and two teeth, which are equivalent to six hippos, between 2009 and 2018 (Appendix Table 31). This amount comprised less than 1% of the total U.S. imports of hippos (Table 9). U.S. imports declined from 2009 to 2018, with imports for hunting trophy purposes in 2009, 2010, and 2011 (Appendix Figure 11).

Six wild hippos that originated in Ethiopia were imported into the United States for hunting trophy purposes (Appendix Table 31). U.S. imports made up nearly three-quarters of global imports of wild sourced hippos from Ethiopia for commercial, hunting trophy, and personal purposes.

(h) Kenya

Global imports of hippos that originated from Kenya included 12 teeth, which are equivalent to one hippo, between 2009 and 2018 (Appendix Table 32). This amount comprised less than 1% of the total global imports of hippos (Table 8). The single hippo was imported for personal purposes in 2018 (Appendix Figure 12).

There were no U.S. imports of hippos that originated from Kenya (Table 9).

It is important to note that the hippo has been totally protected in Kenya since 2013. Hunting, killing, capturing, and wounding with intent to hurt a hippo is forbidden; and import/export of hippo prohibited. See Table 28 in Section IV.D.2. for details.

(i) Malawi

Global imports of hippos that originated from Malawi included two trophies, two skulls, 24 teeth, and 6,683 kg of ivory, which are equivalent to 1,279 hippos, between 2009 and 2018 (Appendix Table 33). This amount comprised approximately 9% of the total global imports of hippos (Table 8). Nearly all global imports were for commercial purposes, peaking in 2015 (Appendix Figure 13). Six hippos were imported for hunting trophy purposes in 2012, 2013, 2014 (Appendix Figure 13).

There were no U.S. imports of hippos that originated from Malawi (Table 9).

It is important to note that the hippo is totally protected in Malawi; hippos cannot be killed, hunted, captured, sold, wounded, or detained. See Table 28 in Section IV.D.2. for further details.

(j) Mozambique

Global imports of hippos that originated from Mozambique included 193 trophies, 34 skulls, 1,022 teeth, which are equivalent to 313 hippos, between 2009 and 2018 (Appendix Table 34).

This trade comprised approximately 2% of the total global imports of hippos (Table 8). Nearly all global imports were for hunting trophy purposes, peaking in 2010 and 2012, declining to 2018 (Appendix Figure 14). Two hippos were also imported for commercial and personal purposes (Appendix Table 34).

U.S. imports of hippos that originated from Mozambique included 114 trophies, six skulls, and 295 teeth, which are equivalent to 145 hippos, between 2009 and 2018 (Appendix Table 35). This trade comprised approximately 5% of the total U.S. imports of hippos (Table 9). All U.S. imports were for hunting trophy purposes, peaking in 2010 and 2012, declining to 2018 (Appendix Figure 15).

One hundred and forty-five (145) wild hippos that originated in Mozambique were imported into the United States for hunting trophy purposes (Appendix Table 35). U.S. imports made up nearly half of the global imports of wild sourced hippos from Mozambique for commercial, hunting trophy, and personal purposes.

(k) Namibia

Global imports of hippos that originated from Namibia included 237 trophies, 16 skulls, 10 live hippos, and 329 teeth, which are equivalent to 291 hippos, between 2009 and 2018 (Appendix Table 36). This trade comprised approximately 2% of the total global imports of hippos (Table 8). Nearly all global imports were for hunting trophy purposes, peaking in 2012, 2016, 2018, and increasing from 2009 to 2018 (Appendix Figure 16). Eleven hippos were also imported for commercial purposes, and eleven hippos for personal purposes (Appendix Table 36).

U.S. imports of hippos that originated from Namibia included 145 trophies, four skulls, and 119 teeth, which are equivalent to 159 hippos, between 2009 and 2018 (Appendix Table 37). This trade comprised approximately 5% of the total U.S. imports of hippos (Table 9). Nearly all U.S. imports were for hunting trophy purposes, peaking in 2016 and 2018, and increasing from 2009 to 2018 (Appendix Figure 17). Three hippos were also imported for commercial and personal purposes (Appendix Table 37).

One hundred and fifty-seven (157) wild hippos that originated in Namibia were imported to the United States for hunting trophy purposes and three hippos for personal purposes. (Appendix Table 37). U.S. imports made up more than half of the global imports of wild sourced hippos from Namibia for commercial, hunting trophy, and personal purposes.

(l) Nigeria

Global imports of hippos that originated from Nigeria included one tooth, which is equivalent to one hippo since there must have been at least one hippo killed for this tooth[36], between 2009 and 2018 (Appendix Table 38). This amount comprised less than 1% of the total global imports of

[36] For detailed methodology, see Appendix.

hippos (Table 8). The single hippo was imported into the United States for personal purposes in 2011 (Appendix Figure 18).

U.S. imports of hippos that originated from Nigeria included one tooth, which is equivalent to one hippo, between 2009 and 2018 (Appendix Table 39). This trade comprised less than 1% of the total U.S. imports of hippos (Table 9). The single hippo was imported for personal purposes in 2011 (Appendix Figure 19).

The one hippo imported by the United States was the only wild-sourced hippo from Nigeria that was imported globally for commercial, hunting trophy, or personal purposes during the decade.

(m) South Africa

Global imports of hippos that originated from South Africa included 759 trophies, 94 skulls, 55 live hippos, six bodies, 2,602 teeth, and 471 kg of ivory, which are equivalent to 1,211 hippos, between 2009 and 2018 (Appendix Table 40). This trade comprised approximately 9% of the total global imports of hippos (Table 8). The majority of global imports were for hunting trophy purposes, peaking in 2016, 2017, 2018 (Appendix Figure 20). Two hundred and seventy-four (274) hippos were also imported for commercial purposes, peaking in 2011 and 2016, and 71 hippos for personal purposes (Appendix Table 40; Appendix Figure 20).

U.S. imports of hippos that originated from South Africa included 450 trophies, 27 skulls, 1,143 teeth, and 441 kg of ivory, which are equivalent to 657 hippos, between 2009 and 2018 (Appendix Table 41). This trade comprised approximately 21% of the total U.S. imports of hippos (Table 9). The majority of U.S. imports were for hunting trophy purposes, peaking in 2011, 2016, 2017, 2018 (Appendix Figure 21). One hundred and twenty-three (123) hippos were also imported for commercial purposes, peaking in 2011 and 2016 (Appendix Table 41; Appendix Figure 21).

Five hundred and sixteen (516) wild hippos that originated in South Africa were imported into the Unites States for hunting trophy purposes, 19 for personal purposes, and 123 for commercial purposes (Appendix Table 41). U.S. imports made up more than half of global imports of wild sourced hippos from South Africa for commercial, hunting trophy, and personal purposes.

(n) Tanzania

Global imports of hippos that originated from Tanzania included 923 trophies, 73 skulls, 6,584 teeth, and 11,918 kg of ivory, which are equivalent to 3,815 hippos, between 2009 and 2018 (Appendix Table 42). This trade comprised approximately 28% of the total global imports of hippos (Table 8). Most global imports were for commercial purposes, peaking in 2009, 2012, 2018 (Appendix Figure 22). One thousand one hundred and forty-one (1,141) hippos were also imported for hunting trophy purposes and 126 hippos for personal purposes, both with a steady trend throughout the period examined (Appendix Table 42; Appendix Figure 22).

U.S. imports of hippos that originated from Tanzania included 447 trophies, 23 skulls, and 1,386 teeth, which are equivalent to 586 hippos, between 2009 and 2018 (Appendix Table 43). This trade comprised approximately 19% of the total U.S. imports of hippos (Table 9). Nearly all U.S. imports were for hunting trophy purposes, peaking in 2009 and steadily declining to 2018 (Appendix Figure 23). Hippos were also imported for commercial purposes and personal purposes, with a peak in 2009 and 2012 for commercial imports (Appendix Table 43; Appendix Figure 23).

Five hundred and forty-six (546) wild hippos that originated in Tanzania were imported into the United States for hunting trophy purposes, four for personal purposes, and 37 for commercial purposes (Appendix Table 43). U.S. imports made up approximately 15% of global imports of wild sourced hippos from Tanzania for commercial, hunting trophy, and personal purposes.

(o) Uganda

Global imports of hippos that originated from Uganda included seven trophies, one skull, 1,134 teeth, and 15,286 kg of ivory, which are equivalent to 3,015 hippos, between 2009 and 2018 (Appendix Table 44). This trade comprised approximately 22% of the total global imports of hippos (Table 8). Nearly all global imports were for commercial purposes, peaking in 2009, 2011, and 2015 (Appendix Figure 24). Hippos were also imported for hunting trophy purposes and personal purposes, both with a steady trend throughout the period examined (Appendix Table 44; Appendix Figure 24).

U.S. imports of hippos that originated from Uganda included four trophies and 960 teeth, which are equivalent to 84 hippos, between 2009 and 2018 (Appendix Table 45). Imports originating in Uganda comprised approximately 3% of the total U.S. imports of hippos (Table 9). Nearly all U.S. imports were for commercial purposes, peaking in 2012 and 2009 (Appendix Figure 25).

Four wild hippos that originated in Uganda were imported into the United States for hunting trophy purposes and 80 for commercial purposes (Appendix Table 45). U.S. imports made up nearly 3% of global imports of wild sourced hippos from Uganda for commercial, hunting trophy, and personal purposes.

(p) Zambia

Global imports that originated from Zambia included 962 trophies, 137 skulls, two bodies, 5,541 teeth, and 1,752 kg of ivory, which are equivalent to 1,897 hippos, between 2009 and 2018 (Appendix Table 46). This trade comprised approximately 14% of the total global imports of hippos (Table 8). The majority of global imports were for hunting trophy purposes, peaking in 2009, 2011, and 2018 (Appendix Figure 26). Global imports for hunting trophy purposes declined from 2009 to 2014 and increased from 2014 to 2018 (Appendix Figure 26). Six hundred and thirty-six (636) hippos were also imported for commercial purposes, peaking in 2010 and 2011 (Appendix Table 46; Appendix Figure 26). Fifty-eight (58) hippos were also imported for personal purposes (Appendix Table 46).

U.S. imports of hippos that originated from Zambia included 362 trophies, 25 skulls, 2,580 teeth, and 200 kg of ivory, which are equivalent to 641 hippos, between 2009 and 2018 (Appendix Table 47). This trade comprised approximately 21% of the total U.S. imports of hippos (Table 9). The majority of U.S. imports were for hunting trophy purposes, peaking in 2009, 2012, and 2018 (Appendix Figure 27). U.S. imports for hunting trophy purposes declined from 2012 to 2014 and increased from 2014 to 2018 (Appendix Figure 27).

Four hundred and forty-five (445) wild hippos that originated in Zambia imported into the United States for hunting trophy purposes, three for personal purposes, and 193 for commercial purposes (Appendix Table 47). U.S. imports made up approximately 34% of global imports of wild sourced hippos from Zambia for commercial, hunting trophy, and personal purposes.

(q) Zimbabwe

Global imports of hippos that originated from Zimbabwe included 1,116 trophies, 98 skulls, one body, and 5,041 teeth, which are equivalent to 1,636 hippos, between 2009 and 2018 (Appendix Table 48). This trade comprised approximately 12% of the total global imports of hippos (Table 8). The majority of global imports were for hunting trophy purposes, peaking in 2009, 2010, 2014, and 2015 (Appendix Figure 28). Global imports for hunting trophy purposes declined from 2015 to 2017 and increased from 2017 to 2018 (Appendix Figure 28). One hundred and twenty (120) hippos were also imported for commercial purposes, peaking in 2012, and 80 hippos were also imported for personal purposes (Appendix Table 48; Appendix Figure 28).

U.S. imports of hippos that originated from Zimbabwe included 544 trophies, 42 skulls, and 2,595 teeth, which are equivalent to 803 hippos, between 2009 and 2018 (Appendix Table 49). This trade comprised approximately 26% of the total U.S. imports of hippos (Table 9). The majority of U.S. imports were for hunting trophy purposes, peaking in 2009 and 2015 (Appendix Figure 29). U.S. imports for hunting trophy purposes have slowly declined from 2009 to 2018 (Appendix Figure 29).

Six hundred and sixty-nine (669) wild hippos that originated in Zimbabwe were imported into the United States for hunting trophy purposes, 21 for personal purposes, and 113 for commercial purposes (Appendix Table 49). U.S. imports made up nearly half of global imports of wild sourced hippos from Zimbabwe for commercial, hunting trophy, and personal purposes.

2. Evidence of online global and in-store U.S. sales of hippo parts and products, and hippo trophy hunt offers

a) Online global sales of hippo parts and products

To further analyze trade in hippo parts and products, four researchers based in the United States, France, the United States, and China, respectively, conducted searches online for hippo products in English, Japanese, French, Spanish and Mandarin Chinese. Each researcher spent a maximum of eight hours searching over 2-3 days between March and July 2021 in each language, using search engines and major online retailer sites (e.g., Amazon, eBay, Rakuten, Yahoo! Shopping,

etc.) to search for terms like “hippopotamus tusk,” “hippopotamus ivory,” “hippopotamus leather,” and “hippopotamus skin” in each respective language. Each researcher aimed, to the best of their ability, to only include products that claimed to be authentic hippo parts and products. A summary of the findings can be found in Table 10 below.

Table 10. Hippo products found for sale online in various languages.

Product for Sale	English	French	Japanese	Mandarin Chinese	Spanish	Total
Foot	0	1	0	0	0	1
Ivory carvings	27	18	168	1	3	217
Jewelry	4	3	0	3	0	10
Leather products	73	9	50	0	15	147
Skulls	1	1	0	0	1	3
Teeth	0	8	8	0	0	16
Tusks	0	0	19	0	2	21
Total	**105**	**40**	**245**	**4**	**21**	**415**

On English websites, 105 hippo parts and products were documented, including four ivory jewelry pieces, 27 ivory carvings and statues, one full hippo skull mount, and 73 leather products, including wallets, belts and hiking shoes, western boots, and purses. Prices for these hippo products ranged from approximately USD 14.00 to over USD 4,000.00 per part or product. Sellers of hippo parts and products on U.S. websites were physically located in the United States, China, France, and Belgium and offered shipping to the United States.

On French websites, a total of 40 hippo parts and products were documented, including eight teeth, 18 ivory carvings and statues, three pieces of jewelry, nine leather products including leather wallets, handbags, boots, and more, one foot, and one skull. Prices for these hippo parts or products ranged from approximately EUR 1.00 (~USD 1.22) to over EUR 1,850 (~USD 2,250) per part or product. Sellers of hippopotamus products on French websites were physically located in France, Belgium, China, Hungary, Germany, and Italy.

On Japanese websites, a total of 245 hippo parts and products were documented, including 74 ivory name seals, eight teeth, 19 tusks, 94 ivory carvings, statues and figurines, and 50 leather products, ranging from key holders and wallets to shoulder bags and briefcases. Prices for these hippo parts and products ranged from approximately JPY 1,000 (~USD 9.22) to over JPY 479,000 (~USD 4,414.00) per part or product. Sellers of hippo parts and products on Japanese websites were all located in Japan. It is worth noting that eight of the listings for hippo ivory carvings promoted them as an alternative for elephant ivory, suggesting a substitute market possibly emerging as elephant ivory regulations are becoming stricter and domestic markets are being closed.

On Mandarin Chinese websites, a total of four hippo products were documented, including three bracelets made from hippo teeth and one figurine carved from hippo tusk. The products ranged in price from CHY 5 (~USD 0.79) to CHY 90 (~USD 14.15). One seller listed the source of the hippo ivory as “Southwest Africa.” All the sellers were located in China.

On Spanish websites, a total of 21 hippo parts and products were documented, including one hippo skull, two sets of hippo tusks, two carved hippo tusks, one carved hippo ivory statue, five hippo leather wallets, two hippo leather belts, three hippo leather purses, four pairs of hippo leather boots, and one set of hippo leather revolver holsters. The sellers of hippo products on Spanish websites were physically located in the United States, Italy, Spain, and Mexico.

The 415 total items found in this research are likely to be only a very small fraction of online sale of hippo parts and products, as the research only captured a limited number of parts and products in select languages. The global scale of online trade is likely much larger.

b) In-store (brick and mortar) U.S. sales of hippo parts and products

To determine the extent of hippo parts and products offered for sale in stores across the United States, an undercover investigator visited stores in states where video and audio recording were legal. Investigations were conducted from 2018 through 2022. The following table outlines the types of products found for sale in U.S. stores, the name of the stores, their locations, and when available, the price, quantity, and photo of hippo items for sale. Products found included leather products (purses, belts, and western boots, hides), raw ivory (molar teeth, tusks, full skulls), worked ivory (carvings, scrimshawed tusk, painted tusk, ivory-handled bottle openers and knives, figurines), and trophies (full shoulder mounts, mounted teeth).

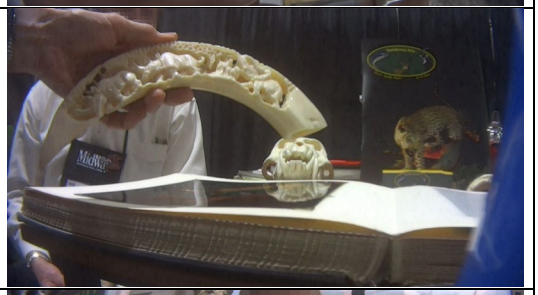
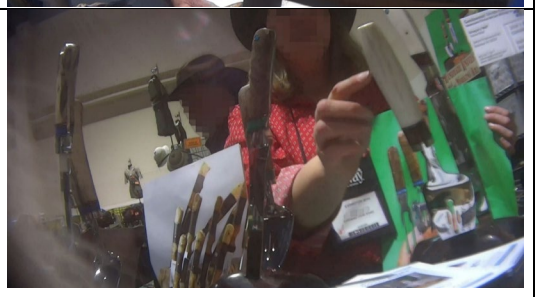
Included in this table are hippo parts and products that were discovered at Safari Club International hunting conventions between 2019 and 2022. All three of these conventions were held in Nevada where, as of January 1, 2018, it is unlawful, with limited exceptions, for any person within the state to "purchase, sell, offer for sale or possess with intent to sell any item that is, wholly, or partially, made of an animal part or byproduct derived from a . . . hippopotamus."[37] Nev. Rev. Stat. § 597.905(1). The hippo parts and products that appear to have been offered for sale illegally are denoted in the table below by a red asterisk (*).[38]

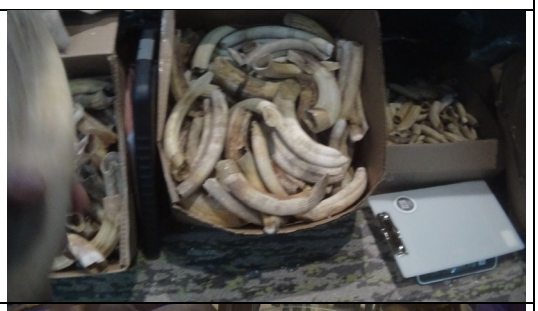
Please note: this research only uncovers a small portion of hippo products in stores across the United States and the purpose of Table 11 is to demonstrate the wide array of hippo items that are readily available for purchase, some potentially in violation of state law.

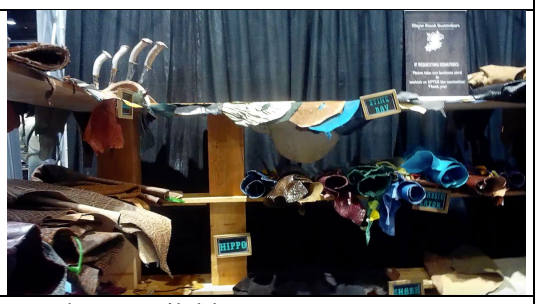
[37] Under the law, "sale" or "sell" is defined as "any act of selling, trading or bartering, for monetary or nonmonetary consideration, and includes any transfer of ownership that occurs in the course of a commercial transaction, but does not include a nonmonetary transfer of ownership to a legal beneficiary of a trust or to a person by way of gift, donation, inheritance or bequest." Nev. Rev. Stat. § 597.905(5)(b).

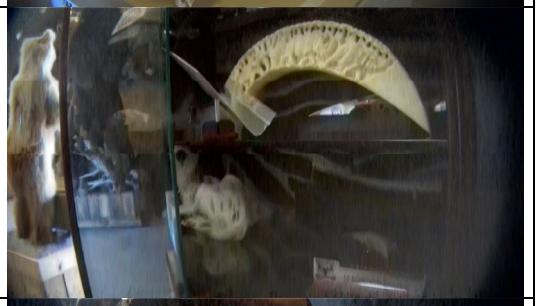
[38] The Nevada law provides limited exceptions, including a narrow exception for verified antiques that contain de minimis quantities of animal parts or byproducts from regulated species. Nev. Rev. Stat. § 597.905(2).

Table 11. Hippo parts and products found for sale in U.S. stores.

Store Name and Location	Item	Photo
Trophy Care International Inc.; (at the DSC Convention in Dallas, Texas)	• **Description**: Purse • **Price (USD)**: $350 • **Date**: 1/4/2018-1/7/2018 • **Quantity:** 1	
Taxidermy Arts; Cape Coral, Florida (at the SCI Convention in Reno, Nevada)	• **Description**: Carved tusk* • **Price (USD)**: $240 • **Date**: 1/9/2019-1/12/2019 • **Quantity:** 1	
Taxidermy Arts; Cape Coral, Florida (at the SCI Convention in Reno, Nevada)	• **Description**: Molar tooth* • **Price (USD)**: No information • **Date**: 1/9/2019-1/12/2019 • **Quantity:** 1	
Continental Divide Knives; Buckeye, Arizona (at the SCI Convention in Reno, Nevada)	• **Description**: Ivory handled knife • **Price (USD)**: No information • **Date**: 1/9/2019-1/12/2019 • **Quantity:** 2 • **Note:** Nevada's law provides an exception for the sale of knives that contain animal parts or byproducts of the regulated species if certain requirements are met. Nev. Rev. Stat. § 597.905(2)(d). If these requirements were not met in this instance, the sale would likely be illegal.	

Store Name and Location	Item	Photo
The African Market Trophy Room Collection; Sarasota, Florida (at the SCI Convention in Reno, Nevada)	• **Description**: Tusk* • **Price (USD)**: $56/lb • **Date**: 1/9/2019-1/12/2019 • **Quantity:** Large box, over 50 tusks.	
Legends Taxidermy; Scottville, Michigan (at the SCI Convention in Reno, Nevada)	• **Description**: Table made from hippo skull • **Price (USD)**: No information • **Date**: 1/9/2019-1/12/2019 • **Quantity:** 1 • **Note:** seller stated that this item was not for sale	
TAG Outdoor Clothing; Meridian Charter Township, Michigan (at the SCI Convention in Reno, Nevada)	• **Description**: Belt* • **Price (USD)**: No information • **Date**: 1/9/2019-1/12/2019 • **Quantity:** At least one	No photo available
African Sporting Creations; Mansfield, Ohio (at the SCI Convention in Reno, Nevada)	• **Description**: Western boots* • **Price (USD)**: No information • **Date**: 1/9/2019-1/12/2019 • **Quantity:** At least one	No photo available
J. B. Hill Boots; El Paso, Texas (at the SCI Convention in Reno, Nevada)	• **Description**: Western boots* • **Price (USD)**: No information • **Date**: 1/9/2019-1/12/2019 • **Quantity:** At least one	No photo available
TAG Outdoor Clothing; Meridian Charter Township, Michigan (at the SCI Convention in Reno, Nevada)	• **Description**: Belt* • **Price (USD)**: No information • **Date**: 2/5/2020-2/9/2020 • **Quantity:** 2	

Store Name and Location	Item	Photo
Meyer Ranch Bootmakers; Tomball, Texas (at the SCI Convention in Reno, Nevada)	• **Description**: Western boots* • **Price (USD)**: No information • **Date**: 2/5/2020-2/9/2020 • **Quantity:** No information • **Note**: Boots are made to order, though customers pay for the products at the convention	
Clint Orms; Ingram, Texas (at the SCI Convention in Reno, Nevada)	• **Description**: Belt • **Price (USD)**: No information • **Date**: 2/5/2020-2/9/2020 • **Quantity:** 1 • **Note:** Hippo belt was not for sale at convention due to NV law, but seller was actively taking orders for out of state shipments.	No photo available
Continental Divide Knives; Buckeye, Arizona (at the SCI Convention in Reno, Nevada)	• **Description**: Ivory handled knife • **Price (USD)**: No information • **Date**: 2/5/2020-2/9/2020 • **Quantity:** 1 • **Note:** Nevada's law provides an exception for the sale of knives that contain animal parts or byproducts of the regulated species if certain requirements are met. Nev. Rev. Stat. § 597.905(2)(d). If these requirements were not met in this instance, the sale would likely be illegal.	
Pinto Ranch; Dallas, Texas	• **Description**: Western boots • **Price (USD)**: No information • **Date**: 5/01/2021 • **Quantity:** 2 • **Note from seller:** "we sell a lot of hippo boots, when they come, they sell fast"	

Store Name and Location	Item	Photo
Pinto Ranch; Dallas, Texas	• **Description**: Belt • **Price (USD)**: $225 • **Date**: 5/01/2021 • **Quantity:** "Few"	
The Taxidermy Store; Amherst, Wisconsin	• **Description**: Painted scrimshawed tusk • **Price (USD)**: $2,395/pair • **Date**: 8/23/2021 • **Quantity:** 1	
The Taxidermy Store; Amherst, Wisconsin	• **Description**: Scrimshawed tusk • **Price (USD)**: No information • **Date**: 8/23/2021 • **Quantity:** 2	
The Taxidermy Store; Amherst, Wisconsin	• **Description**: Carved tusk • **Price (USD)**: $995/pair • **Date**: 8/23/2021 • **Note from seller:** Minimum of an additional 150 carved tusks on online store	
The Taxidermy Store; Amherst, Wisconsin	• **Description**: Ivory handled bottle opener • **Price (USD)**: No information • **Date**: 8/23/2021 • **Quantity:** "Few"	No photo available

Store Name and Location	Item	Photo
The Taxidermy Store; Amherst, Wisconsin	• **Description**: Skull • **Price (USD)**: $6,000 • **Date**: 8/23/2021 • **Quantity:** 2	
The Taxidermy Store; Amherst, Wisconsin	• **Description**: Reproduction shoulder mounts • **Price (USD)**: $4,000 (faux skin and real teeth) and $7,100 (real tusk and real skin) • **Date**: 8/23/2021 • **Quantity:** 2 (one of each type of shoulder mount)	No photo available
The Leather Guy; St. Charles, Minnesota	• **Description**: Leather hides • **Price (USD)**: $137.50-$200/ 5-6 oz • **Date**: 8/24/2021 • **Quantity:** 3	
Safari Works Décor; Council Bluffs, Iowa	• **Description**: Carved tusk • **Price (USD)**: $450-$575 • **Date**: 8/25/2021 • **Quantity:** 2	
Larson Leather Co.; El Paso, Texas	• **Description**: Leather hides • **Price (USD)**: $45/sq ft • **Date**: 8/26/2021 • **Quantity:** many boxes of hides • **Note from seller:** Receives hippo leather twice a year	

Store Name and Location	Item	Photo
Lucchese Boot Company Factory Store; El Paso, Texas	• **Description**: Western boots • **Price (USD)**: No information • **Date**: 8/26/2021 • **Quantity:** 2	
Metropolitan Fine Arts & Antiques; New York City, New York	• **Description**: Huge collection of worked hippo ivory, from tiny netsuke to large intricate pieces. • **Price (USD)**: $8,400 for a large frog figuring • **Date**: 8/27/2021 • **Quantity:** Hundreds; filled up a whole room	 
Circle M Auction; Maquoketa, Iowa	• **Description**: Reproduction shoulder mount (real skin and faux teeth) • **Price (USD)**: No information • **Date**: 10/8/2021-10/9/2021 • **Quantity:** 1	
Circle M Auction; Maquoketa, Iowa	• **Description**: Mounted teeth (full set; total of 12 teeth) • **Price (USD)**: No information • **Date**: 10/8/2021-10/9/2021 • **Quantity:** 1	

Store Name and Location	Item	Photo
Circle M Auction; Maquoketa, Iowa	• **Description**: Skull • **Price (USD)**: No information • **Date**: 10/8/2021-10/9/2021 • **Quantity:** 1	
Circle M Auction; Maquoketa, Iowa	• **Description**: Mounted teeth (set of lower large incisors and lower canines; total of four teeth) • **Price (USD)**: No information • **Date**: 10/8/2021-10/9/2021 • **Quantity:** 1	No photo available
True-Life Taxidermy Safari Specialists; Middletown, NY (at the SCI Convention in Las Vegas, Nevada)	• **Description:** Table made from hippo skull* • **Price (USD):** $4,500 • **Date:** 01/20/2022 • **Quantity:** 1	No photo available

c) Hippo trophy hunt offers

Increasingly, hippos are being promoted by hunting outfitters as one of Africa's dangerous game species as they are included in the "Dangerous Game of Africa Grand Slam" (i.e., killing of the "Big Five" plus at least one hippo or Nile crocodile). Their reputation as one of the deadliest animals has perpetuated hunters' interest in hippo trophies.

Hippo hunts are regularly sold by outfitters that exhibit at the Safari Club International and Dallas Safari Club conventions (HSUS & HSI, 2020, 2021). Outfitters exhibiting at these conventions explained to HSUS undercover investigators that the "easy" way to hunt hippos is to shoot them while they are in the water (HSUS & HSI, 2020). After shooting a hippo in the water, the shooter must wait until gases in the dead hippo's body cause it to rise to the surface so it can be dragged out of the water.[39] At the date of access, Book Your Hunt offered at least 177 hippo hunts by 51 outfitters in eight countries.[40] Prices for these hunts range, depending on outfitters and countries, and start at USD 7,200. Countries offering hunts on this website include Cameroon, Tanzania, Mozambique, Namibia, Zambia, Zimbabwe, South Africa, and Uganda. Book Your Hunt advises its prospective clients that, in Central African Republic, while hippos occur, they are nationally protected, and may not be hunted.

[39] Video footage of the conversations available upon request.
[40] See Annex.

In addition, the trophy hunting industry promotes hippo hunting to trophy hunters by issuing awards in dozens of categories every year. Hunted hippos must be of a specific size to be eligible for awards and entered into SCI's record books. Past winners of SCI's World Hunting Award, SCI's highest honor, have shot multiple hippos.

A trophy of a hippo is a set of hippo teeth mounted on piece of wood, see Image 1 below. SCI publishes a measurement manual of trophies for members who wish to enter their kills into its "Record Book." For hippo trophies, it is the measurement of the tusks that is entered. As noted earlier, the tusks of male hippos are significantly larger than those of females, and for this reason larger males are typically targeted by trophy hunters.

Image 1. Example of hippo trophy for purchase.

Source: HSUS/HSI. Complete set of hippo tusks (eight incisors and four canines) mounted on wood for sale at the Circle M's fall auction, October 2021.

However, other parts of hippos are referred to as trophies, though less common. Analyzing the CITES trade data between 2009 and 2018 revealed that in addition to teeth (representing 66% of all specimens imported for hunting trophy purpose), trophies (22%), skin pieces (3%), feet (3%), and skulls (2%) are also globally imported for hunting trophy purpose (see Table 12 below). The United States is the top global importer of wild-sourced hippo specimens imported for the purpose of hunting trophies, contributing to 37% of all globally imported specimens (see Tale 12 below).

Table 12. Top Importers of hippo specimens, wild source and hunting trophy purpose, 2009-2018.

Importing Country	Type of Specimen (Term)						Grand Total	Percent of Grand Total
	Teeth	Trophies	Skin pieces	Feet	Skulls	Other		
United States	3,848	2,050	207	196	118	287	**6,706**	37%
South Africa	1,911	290	128	108	77	95	**2,609**	15%
Germany	1,948	109	89	46	48	90	**2,330**	13%
Spain	1,351	258	18	27	5	65	**1,724**	10%
Austria	728	51	12	32	11	27	**861**	5%
Denmark	334	278	2	0	4	4	**622**	3%
Mexico	170	228	2	48	2	15	**465**	3%
Switzerland	176	57	8	4	3	4	**252**	1%
Zimbabwe	179	5	10	4	3	5	**206**	1%
Poland	123	14	6	10	19	22	**194**	1%
Italy	12	144	0	0	0	0	**156**	1%
Sweden	122	26	0	4	2	2	**156**	1%
Norway	90	39	0	6	4	7	**146**	1%
United Kingdom	70	23	4	6	5	23	**131**	1%
Czechia	79	41	3	1	3	0	**127**	1%
France	95	18	9	0	1	0	**123**	1%
Chile	35	34	0	10	1	15	**95**	1%
Canada	76	0	2	4	5	4	**91**	1%
Other (29 countries)	476	320	46	24	23	38	**927**	5%
Grand Total	**11,823**	**3,985**	**546**	**530**	**334**	**703**	**17,921**	
Percent of Grand Total	66%	22%	3%	3%	2%	4%		

Source: CITES Trade Database, search completed on February 18, 2021 using the following terms: *Hippopotamus amphibius*, year range: 2009-2018, all importing countries, all exporting countries, all terms. Search filtered for source: wild ("W"), and purpose: hunting trophy ("H"). Search filtered for no unit (blank value). Percentages were rounded to the nearest whole number. Importing countries with <1% of grand total were collapsed into 'Other'. Type of specimen ordered from greatest to least with remaining terms collapsed into 'other', which include: "bodies," "bone carvings," "bones," "derivatives," "genitalia," "jewelry," "leather products (large)," "leather products (small)," "sides," "skins," "specimens," and "tails."

3. Evidence of poaching of hippos and illegal trade in their parts and products

The most recent IUCN Red List assessment states that "illegal and unregulated hunting for meat and ivory (found in the canine teeth)" is a primary threat to hippos (Lewison & Pluháček, 2017a, p. 11). Although the very nature of illicit trade means that we may never know the full extent of hippo ivory and bushmeat in trade, this section of the Petition documents a very large and biologically significant amount of hippo poaching and trafficking, which is also negatively impacting hippo populations.

d) Poaching

Like many megafauna species, hippos are not confined to nature reserves and protected areas. While protection of hippos within these areas can be good to excellent, illegal hunting for bushmeat and teeth is common for hippos that occur outside of national parks and natural reserves. Concerningly, illegal hunters are increasingly poaching within protected areas as wildlife in unprotected areas are rapidly disappearing (CITES, 1994; Lindsey et al., 2013; Newmark, 2008).

Hippos are snared, hunted with spears and rifles, or otherwise illegally pursued, either on land or in the water, primarily for their ivory and meat (Gossmann, 2009; Hofer et al., 1996; K24 TV, 2017; Lewison & Pluháček, 2017a; Wildlife Protection Solutions, 2019). Animals are known to endure painful and prolonged deaths when snared or speared and often rot in snares before being retrieved by the hunters, making their meat unfit for human consumption (Lindsey et al., 2011; Noss, 1998). It is possible for hippos to escape some snares, however, the injuries sustained are often fatal (Robin des Bois, 2018c, p. 74).

Poaching of hippos has been reported in many countries even where they have legal protection. Relying solely on law enforcement to control illegal poaching requires a level of funding and patrolling that is often unattainable in many countries and protected areas (Nielsen et al., 2014).

Poaching has been widely documented in Côte d'Ivoire where, in the Comoé National Park, poaching for bushmeat caused the near extinction of the resident hippo population (Lindsey et al., 2013).

In South Africa, hippos are poached for their fat (used as muthi) and hides (used for making sjamboks); poaching levels were considered by the South African government to be low in 2011, but were increasing in at least one province, KwaZulu-Natal (KZN) (Scientific Authority of South Africa, 2011). By 2016, The Red List of Mammals of South Africa, based on Goodman and Craigie (2014), recognized that hippo poaching in KZN had increased by 21% per year between 2004 and 2013 and was an emerging threat to the species in South Africa (Eksteen et al., 2016). Goodman and Craigie (2014) said the increase in hippo poaching in KZN had caused the hippo population in KZN to decline and this was cause for concern. Eksteen et al. (2016) noted that increased poaching is related to increased conflict with hippos. Conflicts are increasing due to the increased frequency of drought due to climate change which, in turn, has reduced natural hippo grazing areas and forced hippos onto adjacent agricultural land.

A 2017 TRAFFIC report (Ondoua Ondoua et al., 2017) assessed poaching and wildlife trafficking in parts of southeast Central African Republic and northeast Democratic Republic of Congo, in the Garamba-Bili-Chinko landscape, which includes Garamba National Park and several reserves. The area has weak governance and insecurity, and large-scale poaching and trafficking by armed groups, militia, and militarized poachers is threatening the survival of vulnerable species in the region. The large mammals, including hippos, are targeted by these poachers, armed with semi-automatic rifles, who sell the meat locally, but transport ivory and skins to larger towns and cities.

For this Petition, we complied evidence of hippo poaching between 2016 and 2020 in Table 13 below. Poaching has been reported in recent years in Burkina Faso, Burundi, Democratic Republic of the Congo, Kenya, Namibia, Niger, South Africa, South Sudan, Tanzania, Togo, Zambia, and Zimbabwe (Lehman et al., 2017; Lewison & Pluháček, 2017a; Nielsen et al., 2014; Table 13).

Table 13. Evidence of hippo poaching, 2016-2020.

Hippo Poaching, 2016-2020 (Country, description, incident report date in reverse chronological order, reference, page)
2020
Democratic Republic of the Congo: Two people were arrested for killing three hippos in the Kalume Ngongo River (8 August 2020) (Robin des Bois, 2021b, p. 82).
Zimbabwe: A hippo injured by a trap was rescued (location not specified) (26 July 2020) (Robin des Bois, 2021b, p. 82).
Kenya: Two poachers were arrested after a patrol discovered them drying the meat from a hippo they killed in Nyumba, Masai Mara National Reserve, Narok County (5 June 2020) (Robin des Bois, 2021a, p. 108).
Kenya: People in Matayos, Busia County, killed, butchered, and distributed the parts of a hippo who was found on a doorstep in a village (11 January 2020) (Robin des Bois, 2020d, p. 93).
2018
South Africa: A hippo in iSimangaliso Wetland Parkhippo died after being spotted with a wire trap around its neck (6 September 2018) (Robin des Bois, 2018c, p. 74).
Togo: Two people from **Benin** were arrested after attempting to poach a hippo in Canton of Tométy–Kondji, Maritime Region, Togo which is on the border with Benin (8-9 March 2018) (Robin des Bois, 2018a, p. 78).
Kenya: Several people were arrested for transporting hippo meat in Maasai Mara National Reserve (17-19 March 2018) (Robin des Bois, 2018a, p. 78).
Kenya: Seven poachers were arrested as they cut up a hippo in Maasai Mara National Reserve (11 February 2018) (Robin des Bois, 2018a, p. 78).
2017
Zimbabwe: Four hippo carcasses "dismembered to the bone" and cartridges were discovered by a patrol in Sibilobilo, Kariba District, Mashonaland West Province (September 2017) (Robin des Bois, 2017d, p. 67).
Niger: 28 hippos were poached in Ayérou, Region of Tillabéri, and 11 people were arrested (10 July 2017) (Robin des Bois, 2017d, p. 66).
2016
Kenya: Eight poachers from Tanzania were arrested after being found butchering a hippo in Maasai Mara National Reserve (23 June 2016) (Robin des Bois, 2016b, p. 67).
Namibia: In the Kabango Zambezi Transfrontier Conservation Area, poachers on the **Zambia** bank of the Okavango River shot a hippo on the Namibia bank (3 May 2016) (Robin des Bois, 2016b, p. 67).
Kenya: 10 poachers from **Tanzania** were arrested after killing a hippo in Massai Mara National Reserve (23 January 2016) (Robin des Bois, 2016a, p. 98).

(1) Poaching intensifies under conditions of political instability

Hippos are susceptible to increased poaching, for bushmeat and ivory, during times of civil unrest; and illegal and unregulated hunting of hippos is particularly high in areas of conflicts (Lewison & Pluháček, 2017a; Shoumatoff, 2001). Hippo ivory, which is already extremely

valuable, becomes an even more prized resource because it can generate revenue for acquisition of weapons, ammunition, and supplies (Beyers et al., 2011; Gaynor et al., 2016). In isolated parts of warzones, large mammals are considered to be an important source of food for militia and local people (Dudley et al., 2002; Gaynor et al., 2016; Nackoney et al., 2014).

Overhunting increases during these periods which can lead to local, regional, or national collapse of wildlife populations (Braga-Pereira et al., 2021; Hatton et al., 2001). Hippo populations have suffered significantly due to unregulated and uncontrollable poaching in countries with war and civil unrest, driven primarily by food insecurity and need for income (Lewison & Pluháček, 2017a). The Mozambique civil war (1980-1992) caused the complete eradication of hippos in the Gorongosa National Park as wildlife were heavily poached for food and ivory to finance the civil war (Hatton et al., 2001; Stalmans et al., 2019); hippo populations were reduced from 4,800 in 1979 to zero in 1994 (Hatton et al., 2001). During the Rwandan Civil War (1990-1994), 9,000 hippos were killed in the Democratic Republic of Congo's (DRC) Virunga National Park which once held the highest concentration of hippos across Africa (estimated at 30,000 hippos in 1974) (IUCN & UNEP-WCMC, 2017; IUCN National Committee of The Netherlands, 2019; Kujirakwinja, 2010; Udahogora et al., 2020). Between 1996 and 2003, DRC underwent two civil wars that caused a decline of more than 95% of hippos in the Virunga National Park (Hillman Smith et al., 2003; Kendall, 2011; Kujirakwinja, 2010; Lewison & Pluháček, 2017a). In 2006, a rebel militia group killed the largest remaining pod of hippos in the Virunga National Park in a matter of days; the approximately 400 hippos were killed for human consumption as well as for trade in their ivory (Gossmann, 2009; UNESCO, 2006). Large numbers of hippos were killed during times of civil unrest in Côte d'Ivoire (Lewison & Pluháček, 2017a). Population of hippos have disappeared from the Dinder National Park, Sudan, due to human encroachment and activities, and by armed commercial poachers (Van Hoven & Nimir, 2004).

Braga-Pereira et al. (2021) interviewed hunters in a post-war zone to determine their motivations for targeting certain species, including hippos, during and after the 27-year Angolan civil war. Although only a small number of hunters (16.5%) took hippos, hippos were reported to have been hunted throughout the war period and after. Hunters' main motivation for hunting hippos was for the bushmeat trade as they were reported to have the second largest monetary value in local markets after elephants.

As civil wars continue to affect parts of Africa, poaching of wildlife, especially large-bodied mammals such as hippos, is an ongoing threat to their survival.

e) Illegal trade in hippo ivory

Like most other ivories, hippo ivory can be carved into a variety of items such as figurines, sculptures, trinkets, and knife handles, or it may be carved while maintaining the structure of the tooth in the design (Baker et al., 2020; Espinoza & Mann, 1992; Fisher, 2016; Williamson, 2004). Hippo ivory, although denser and more prone to cracking, is a cheaper alternative to elephant ivory and may be one of the reasons it remains in demand amongst consumers (Fisher, 2016; Martin & Vigne, 2015). There are concerns that the bans on commercial trade in elephant ivory globally as well as domestic bans in numerous countries could lead to increased trade in

hippo ivory as a substitute for elephant ivory (Eltringham, 1999, pp. 120, 122-124; Moneron & Drinkwater, 2021; Weiler et al., 1994).

(2) Hippo ivory seizures

Illegal trade in hippo ivory increased sharply immediately following the international elephant ivory trade ban adopted by CITES in 1989; a total of 27,000 kg of hippo teeth were exported between 1991 and 1992, representing an increase of 15,000 kg from previous years (Weiler et al., 1994). The ban on domestic commercial trade in elephant ivory in numerous countries—including Belgium, mainland China, France, Hong Kong, the Netherlands, Singapore, Taiwan, the United States, and the United Kingdom—could likely increase legally and illegally obtained hippo ivory in trade (Andersson & Gibson, 2018; CITES, 2012a; Moneron & Drinkwater, 2021; Musing et al., 2018; Williamson, 2004).

In a rapid assessment on hippo ivory trade conducted by Moneron and Drinkwater (2021), based on information in the CITES Trade Database as well as that contained in an internal TRAFFIC database, 957 kg and 6,335 specimens of hippo ivory were cumulatively seized between 2009 and 2018, representing a minimum of 693 hippos[1]. Teeth were the most commonly seized ivory product followed by smaller quantities of carvings and skulls. During the decade studied, 48 countries were involved in illegal trade of hippo ivory. Uganda was the most implicated country, accounting for 27% of all 163 recorded seizures. Considering Uganda's ban on hippo ivory trade since 2014, it is unsurprising that seizures involved Uganda as it has been suggested that trade has moved underground (Fisher, 2016); further discussed in the following paragraph. After Uganda, the countries most implicated in illegal hippo ivory trade were Tanzania, China, Hong Kong, and South Africa.

According to Fisher (2016), Ugandan authorities seized 880 pounds (approximately 399 kg) of teeth in 2016, a minimum of 76 hippos[41] and likely only a fraction of the trade. Despite the trade ban, the Ugandan Wildlife Authority claims that hippo ivory sourced from Uganda still widely exists in international markets, namely in Hong Kong (Andersson & Gibson, 2018). Prior to the ban, hippo could not be hunted for ivory but teeth from dead hippos (due to natural mortality or those hunted for bushmeat) were allowed to be traded. Even with these restrictions, ivory in trade was significant enough to lead the Ugandan Wildlife Authority to suspect that hippos were being sourced from other countries, likely poached in neighboring countries that lacked adequate enforcement and exported using falsified permits. Fisher (2016) stated that due to "corruption, lack of resources, and few prosecutions of top traders," it is not possible to fully understand and quantify the scale of illegal trade in hippo teeth. Fisher (2016) concluded that scrutiny over Africa's hippo teeth trade and its toll on the species has intensified, "with claims that thousands of hippos have been slaughtered over the past 10 years to provide ivory for the general ivory trade, and that the legal trade has been a machine that has mined African wildlife species without any proper controls."

[41] For details on calculating number of hippos from weighted ivory, see methodology in Appendix.

Moneron and Drinkwater (2021, p. 27) reported a "notable increase in hippo ivory traded in 2018" that coincided with a January 2018 auction in Tanzania where 12,467 hippo teeth (from approximately, 1,039 hippos) were sold. Furthermore, a spike in 2015 was said to be related to trade in ivory from Malawi, although the quantity reportedly exported was lower than reported imports. The report also noted discrepancies between the quantity of ivory reported by exporting countries and the quantity reported by importing countries and stated that this may be the "result of trade in illegally harvested hippo ivory" (p. 27). For additional information, see the following section on discrepancies in reported hippo ivory trade.

A 2018 report on wildlife trafficking in the air transport sector noted hippo teeth trafficking from Africa via air transport (Utermohlen & Baine, 2018). Global Initiative Against Transnational Organized Crime (2021a, p. 3) states, "there is a close trafficking relationship between South Africa and Asia, predominantly pertaining to the illicit trade of lion, hippo and rhino products." Tessema et al. (2021) studied illegal wildlife trafficking in and through Ethiopia during 2011-2019. The most common item seized was elephant ivory (94%) followed by leopard skins and claws, and hippo tusks. During the period studied, there were 10 seizures of hippo tusks (raw and worked) totaling 58 items. The study found that China was the top destination for seized wildlife (94% of seizures), and traffickers were mostly Chinese (79% of seizures). The United States was the destination for 2% of seizures and Americans were traffickers in 2% of seizures. The top countries of origin for wildlife trafficked in Ethiopia were Nigeria (16% of seizures), Angola (15%), Ethiopia (12%), Equatorial Guinea (9%), Democratic Republic of the Congo (5%), and Ghana (5%).

For this Petition, we complied evidence of hippo ivory seizures and arrests between 2016 and 2021 with valuable assistance from Robin des Bois (Table 14).

Table 14. Evidence of hippo teeth seizures and arrests, 2016-2021.

Hippo Teeth Seizures and Arrests, 2016-2021 (Country, description, incident report date in reverse chronological order, reference, page)
2021
Côte d'Ivoire: Five traffickers were arrested with four hippo teeth in a hippo (10 December 2021) (Drori, 2021).
Netherlands: A man was found guilty of illegally purchasing a variety of wildlife parts including hippo teeth (6 December 2021) (de Rechtspraak, 2021).
China: Customs seized 3.82 kg of ivory and hippo teeth at an inbound travel inspection channel at an airport (24 November 2021) (China Customs, 2021).
South Africa: Two people arrested and charged with possession and dealing in elephant tusks and ivory of other species including two hippo teeth (18 November 2021) (Ngema, 2021).
Kenya: Rangers confiscated two hippo teeth, 256 kg ivory, six leopard skins, and many other wildlife products and arrested 101 suspects in August through October 2021 (1 November 2021) (Big Life Foundation, 2021).
Argentina: Two people were arrested, and protected wildlife parts and products were seized, including from hippo (23 September 2021) (Infobae, 2021).
United Kingdom: A man from **Malaysia** living in the United Kingdom pleaded guilty of 18 counts of illegal wildlife trade linked to packages of ivory, including hippo ivory, he sent to China (25 August 2021) (Leoi Leoi, 2021).

Hippo Teeth Seizures and Arrests, 2016-2021 (Country, description, incident report date in reverse chronological order, reference, page)
Uganda: Special Wildlife Crime Unit arrested two people and seized 34 hippo teeth and 10 kg ivory (24 July 2021) (Focused Conservation, 2021a).
Uganda: Special Wildlife Crime Unit arrested two people for wildlife trafficking and seized 32 kg of hippo teeth (17 July 2021) (Focused Conservation, 2021b).
China: A passenger arrived on a flight with 50 hippo tooth products weighing 775.9 g, elephant ivory products, and mammal bones (2 June 2021) (Lingwei, 2021).
Kenya: A lieutenant from the **Uganda** People's Defense Forces was arrested in Kenya with one hippo tooth and 9 kg of elephant tusks that he brought from Uganda to sell (7 May 2021) (Wanja, 2021).
Uganda: A retired diplomat from **Italy** was arrested when he was found in possession of a carved hippo tooth and 56 cut worked elephant ivory pieces (13 April 2021) (Musaasizi, 2021).
Senegal: Two people were arrested with 17 hippo teeth, three leopard skins and a hyena skin; the two people were sentenced to six months in prison (March 2021) (EAGLE Network, 2021, p. 8).
Namibia: Two Namibians were arrested for the possession of two hippo teeth and two elephant tusks (8 March 2021) (Smit, 2021).
Senegal: Two people were arrested with 14 hippo teeth, a leopard skin, and an AK-47 (January 2021) (EAGLE Network, 2021, p. 5).
2020
Namibia: A person in possession of five hippo teeth was arrested (30 September 2020) (Robin des Bois, 2021b, p. 11).
France: Raw and worked hippo and elephant ivory were seized at an auction sale (11 September 2020) (Robin des Bois, 2021b, p. 179).
India: Nine hippo teeth being passed off as elephant ivory to buyers on WhatsApp were seized (24 & 28 August 2020) (Robin des Bois, 2021b, p. 82).
Malawi: People in possession of four hippo teeth weighing 3 kg were arrested (16 August 2020) (Robin des Bois, 2021b, p. 82).
Malawi: A person in possession of hippo teeth arrested (2 August 2020) (Robin des Bois, 2021b, p. 82).
Zambia: People in possession of two hippo teeth and 25 elephant tusk sections (early August 2020) (Robin des Bois, 2021b, p. 27).
Gabon: Two people caught in the act of attempting to sell 16 hippo teeth and four elephant tusks were arrested; one of the traffickers was from **Benin** (July 2020) (EAGLE Network, 2020, p. 11).
Malawi: A "Sino-Malawian" gang of 10 people that specialized in poaching and trafficking of hippo teeth and other wildlife were sentenced to between 18 months and 11 years in prison (end of June 2020) (Robin des Bois, 2021a, p. 20).
Senegal (near border with **Gambia**)**:** Four people were arrested for possession and marketing of 20 kg of hippo teeth and skulls; they were carrying five packs of ammunition (March 2020) (EAGLE Network, 2020, p. 17).
China: A parcel from **France** containing two hippo teeth weighing 1,398.3 g, was seized (26 & 30 January 2020) (Robin des Bois, 2020d, p. 107).
Namibia: Two people, one Namibian and one from **Angola**, carrying two hippo teeth and four elephant tusks, were arrested (2 January 2020) (Robin des Bois, 2020d, p. 102).
Spain: An object made of hippo ivory being offered for sale on the internet without documentation attesting to their legal origin was seized, and three people were arrested (early January 2020) (Robin des Bois, 2020d, p. 115).
Spain: Two sculptures made of hippo ivory offered for sale for EUR 550 and that lacked certificates of origin were seized (end of January 2020) (Robin des Bois, 2020d, p. 115).
2019

Hippo Teeth Seizures and Arrests, 2016-2021 (Country, description, incident report date in reverse chronological order, reference, page)
Tanzania: A person was sentenced to 20 years in prison for illegal possession and commercialization of two hippo teeth and four elephant tusks (13 December 2019) (Robin des Bois, 2020c, p. 95).
China (on border with **Hong Kong):** Seizure of 32,690 kg of raw and semi-raw hippo ivory in postal parcels declared as containing "personal belongings" (4 November 2019) (Robin des Bois, 2020c, p. 114).
Tanzania: Two hippo teeth and 413 elephant tusks or parts of tusks were seized and six people were arrested (3 September 2019) (Robin des Bois, 2020b, p. 83).
Côte d'Ivoire: A person was sentenced to six months in prison for trafficking in wildlife products including hippo parts (July 2019) (Robin des Bois, 2020b, p. 101).
China (on border with **Macau):** Seizure of 1,660 kg of hippo teeth from a workshop (May 2019) (Robin des Bois, 2020a, p. 101).
Malawi: Seven people from **China** and one person from Malawi found in possession of hippo teeth, rhino horn, pangolin scales and illegal weapons were arrested (early May 2019) (Robin des Bois, 2020a, p. 104).
Spain: More than 200 wildlife specimens, including hippo, were seized from a warehouse; six people were charged with offering the specimens for sale on the internet and trading them via WhatsApp (early February 2019) (Robin des Bois, 2019b, p. 90).
Cameroon: Five hippo teeth that originated in **Chad** were seized and four traffickers were arrested (January 2019) (EAGLE Network, 2019, p. 16).
Uganda: A Uganda Wildlife Authority agent was sentenced to three years in prison for possessing seven hippo teeth and two elephant tusks (end of January 2019) (Robin des Bois, 2019a, p. 145).
2018
United States: Agents seized over 300 items made of elephant ivory and hippo teeth from a high-end antique shop (late November 2018) (Robin des Bois, 2019a, p. 150).
Spain: Numerous wildlife trophies, including an ashtray made from a hippo foot, were seized at a private individual's garage (August 2018) (Robin des Bois, 2018c, p. 123).
France: Seized hippo teeth and other wildlife contraband from exhibitors at flea markets (August 2018) (Robin des Bois, 2018c, p. 124).
Portugal: One hippo tooth sold online was seized (July 2018) (Robin des Bois, 2018c, p. 102).
Spain (on border with **Portugal):** More than 150 wildlife parts, including hippo feet, that were offered for sale on the internet, were seized from a warehouse (early July 2018) (Robin des Bois, 2018c, p. 123).
Cameroon: Seven hippo teeth or sections thereof were seized, and one person was arrested (end of May 2018) (Robin des Bois, 2018b, p. 72).
Congo: A trafficker was arrested with hippo teeth, elephant tusks and other contraband (May 2018) (EAGLE Network, 2018, p. 14).
United States: Nearly three dozen carved ivory tusks and daggers made from hippo, elephant, and warthog were seized from a couple that arrived on a flight from the **Philippines** (May 2018) (Robin des Bois, 2018b, p. 92).
France: A hippo tooth and other wildlife contraband were seized from a garage sale (28 April 2018) (Robin des Bois, 2018b, p. 101).
Spain: Ninety-four carvings made from hippo and elephant ivory were seized from an antique shop (23 March 2018) (Robin des Bois, 2018a, p. 78).
Uganda: Two people found with 29 kg of hippo teeth that may have come from hippos poached in nearby Queen Elizabeth National Park were arrested (March 2018) (Robin des Bois, 2018a, p. 78).
Cameroon: A bar owner with connections to Chinese traffickers was arrested with six hippo teeth, 40 kg of pangolin scales, and two boa skins (February 2018) (EAGLE Network, 2018, p. 19).

Hippo Teeth Seizures and Arrests, 2016-2021 (Country, description, incident report date in reverse chronological order, reference, page)
Uganda: Three traffickers were arrested with 100 hippo teeth weighing 50 kg, 25 kg of raw ivory and pangolin scales; the traffickers lived in Congo and obtained the contraband from **Congo** or nearby Murchison Falls National Park (January 2018) (EAGLE Network, 2018, p. 12).
Uganda: A trafficker was arrested with three tusks and 124 pieces of hippo ivory (January 2018) (EAGLE Network, 2018, p. 12).
2017
Uganda: A Uganda Wildlife Authority ranger was arrested for trafficking hippo teeth stolen from UWA storage (October 2017) (EAGLE Network, 2017, p. 11).
Uganda: A trafficker was arrested with 102 hippo teeth (from about 10 hippos); the teeth came from hippos poached in Murchison Falls National Park (September 2017) (EAGLE Network, 2017, p. 28).
Uganda: Two traffickers were arrested with 127 hippo teeth, weighing 56 kg (from about 15 hippos); the teeth came from hippos poached in Queen Elizabeth National Park (September 2017) (EAGLE Network, 2017, p. 28).
Senegal: Two international traffickers were arrested, and 780 ivory carvings were seized along with hippo teeth; the traffickers were said to be active in **Mali**, **Burkina Faso**, **Nigeria**, and **Burundi** and dealt directly with nationals of **China** (August 2017) (EAGLE Network, 2017, p. 17).
Uganda: Hippo teeth, totaling 73.7 kg, was seized and one person was arrested (21 August 2017) (Robin des Bois, 2017d, p. 66).
Uganda: A trafficker was arrested with 215 hippo teeth (from at least 20 hippos) trafficked from **Democratic Republic of the Congo** (August 2017) (EAGLE Network, 2017, p. 28).
Malawi: A person from the **United States** was fined and sentenced to 12 months in prison for unlawful possession of 1 kg of hippo teeth (17 August 2017) (Robin des Bois, 2017d, p. 66).
South Africa Three men were arrested for offering to sell four hippo teeth to an undercover police officer (July 2017) (Robin des Bois, 2017d, p. 66).
Uganda: Two traffickers were arrested while attempting to sell 140 hippo teeth weighing 56 kg they had brought across the border from Congo (July 2017) (EAGLE Network, 2017, p. 28).
Uganda: A trafficker was arrested with 38 hippo teeth from hippos killed in Queen Elizabeth National Park (July 2017) (EAGLE Network, 2017, p. 28).
Uganda: Three traffickers were arrested with two hippo teeth, 34 kg ivory, and counterfeit money (June 2017) (EAGLE Network, 2017, p. 16).
Uganda: Four people were arrested with 13 kg of hippo teeth and 8 kg ivory (end of April 2017) (Robin des Bois, 2017c, p. 71).
United Kingdom: A person was charged with offering to sell four hippo teeth and other wildlife contraband (5 April 2017) (Robin des Bois, 2017c, p. 87).
Uganda: Two people were arrested and six hippo teeth and three elephant tusks were seized (14 March 2017) (Robin des Bois, 2017b, p. 64).
Spain: Seizure of 190 trophies, including hippo, from a man who offered them for sale on the internet (14 March 2017) (Robin des Bois, 2017b, p. 105).
Uganda: Elephant ivory and hippo teeth, totaling 16 kg, and an AK47 were seized and four people were arrested; the poachers admitted killing elephants in Murchison Falls National Park and were sentenced to 18 months to five years in prison (March 2017) (Robin des Bois, 2017b, p. 76).
Benin: Ten hippo teeth seized, and two people arrested (28 February 2017) (Robin des Bois, 2017b, p. 64).
Uganda: Hippo teeth, totaling 183 kg, was seized and three people were arrested (one of which was a Senior Presidential Advisor) (February 2017) (EAGLE Network, 2017, p. 9).
Uganda: Sixty-eight hippo teeth were seized, and two people arrested (31 January 2017) (Robin des Bois, 2017b, p. 64).

Hippo Teeth Seizures and Arrests, 2016-2021 (Country, description, incident report date in reverse chronological order, reference, page)
Uganda: Twenty-four hippo teeth were seized, and one person arrested (27 January 2017) (Robin des Bois, 2017b, p. 64).
Malawi: A man was arrested and hippo teeth he was attempting to sell to an "Asian client" were seized (15 January 2017) (Robin des Bois, 2017b, p. 64).
2016
Uganda: Hippo teeth, totaling 135 kg, and two elephant tusks were seized, and two people arrested (22 December 2016) (Robin des Bois, 2017a, p. 74).
Zambia: Two hippo teeth and 3 kg of hippo meat, and other wildlife contraband and firearms were seized (end of November) (Robin des Bois, 2017a, p. 111).
Uganda: Hippo teeth, totaling 15 kg, said to have originated in **Democratic Republic of the Congo,** were seized, and one person arrested (8 November 2016) (Robin des Bois, 2017a, p. 74).
Uganda: Two people were sentenced to two years in prison for trafficking 234 hippo teeth weighing 100 kg (8 November 2016) (Robin des Bois, 2017a, p. 74).
Uganda: Thirty-two hippo teeth seized (22 October 2016) (Robin des Bois, 2017a, p. 74).
Portugal: Two hippo teeth, 41 ivory objects and three turtles were seized in a commercial area (18 October 2016) (Robin des Bois, 2017a, p. 74).
Uganda: Hippo teeth, totaling 11 kg, and a leopard skin were seized (28 September 2016) (Robin des Bois, 2016c, p. 103).
Togo: Twelve teeth, four skulls, and 15 bones of hippos were seized and two people arrested (23 September 2016) (Robin des Bois, 2016c, p. 59).
Uganda: One person, who was travelling between Uganda and **Tanzania** and carrying 13 kg of hippo teeth, was arrested (mid-September 2016) (Robin des Bois, 2016c, p. 59).
Uganda: Three people with 57 hippo teeth were arrested (end of July 2016) (Robin des Bois, 2016c, p. 59).
Uganda: Three people were arrested, and 52 hippo teeth (weighing 25 kg, from at least 15 hippos), 4 kg pangolin scales and two python skins were seized (8 July 2016) (Robin des Bois, 2016c, p. 103).
Uganda: Hippo ivory, totaling 50 kg, was seized, and three people arrested (14 June 2016) (Robin des Bois, 2016b, p. 67).
United States: A man was convicted of wildlife trafficking including a hippo ivory carving he sold for USD 1,400 (19 May 2016) (U.S. Department of Justice, 2016).
Uganda: Hippo ivory, totaling 49 kg, was seized and one person, with known connections to wildlife traffickers in the **Democratic Republic of the Congo**, was arrested (4 May 2016) (Robin des Bois, 2016b, p. 67).
Uganda: Hippo teeth, totaling 89 kg, was seized, and one person arrested (16 January 2016) (Robin des Bois, 2016a, p. 98).

Between 2016 and 2020, seizures and arrests were reported in twenty countries: Benin, Cameroon, China, Congo, Côte d'Ivoire, France, Gabon, India, Malawi, Namibia, Portugal, Senegal, South Africa, Spain, Tanzania, Togo, Uganda, the United Kingdom, the United States, and Zambia. At least 1,370 hippo teeth and 34859.7 kg of hippo teeth were seized. At 12 teeth/hippo and 5.25 kg teeth/hippo, this equates to at least 6,755 hippos. The largest seizures of hippo ivory by weight were two seizures by China in 2019 that totaled 34,350 kg of hippo ivory of approximately 6,605 hippos. Uganda had the largest number of seizures over the period and accounted for most of the hippo teeth seized: 1,269 teeth (from about 106 hippos) and 490.5 kg of teeth (from about 94 hippos) were seized in Uganda in 2016, 2017 and 2018; reports of seizures in Uganda abruptly stopped in 2019 and there were no reported seizures in Uganda in

2019 and 2020. At least 120 people were arrested for hippo ivory trafficking between 2016 and 2020.

The hippo ivory seizures and arrests in Table 14 demonstrate that illegal trade in hippo ivory is often associated with illegal trade in elephant ivory, and to a lesser extent, other wildlife contraband (such as pangolin scales and leopard skins), weapons and ammunition, and counterfeit money, indicating the involvement of organized crime syndicates.

Also demonstrated by the information in Table 14 is the international nature of hippo ivory trafficking: traffickers arrested being from countries different from the country where the arrest occurred (Gabon/Benin, Namibia/Angola, Malawi/China, Uganda/Congo, Uganda/Democratic Republic of the Congo, Malawi/U.S.); arrests and seizures on or near national borders (Senegal/Gambia, Spain/Portugal) and China's border with its Special Administrative Regions of Hong Kong and Macau; seizures upon import from another country (China/France, U.S./Philippines); seizures in one country of teeth that originated in another (Cameroon/Chad, Uganda/Congo); and seizures in non-range States of hippo (France, India, Portugal, Spain, the United Kingdom, and the United States). In what was called "Senegal's Biggest Ivory Haul" (Farge, 2017), Senegal arrested two international traffickers with 780 ivory carvings and hippo teeth in August 2017; the traffickers were said to be active in Mali, Burkina Faso, Nigeria, and Burundi and dealt directly with nationals of China.

(3) Discrepancies in reported hippo ivory trade

Discrepancies in hippo ivory trade reporting are also a concern. A recent study by Andersson and Gibson (2018) examined data from the CITES Trade Database and found discrepancies in reported trade in hippo teeth from Uganda and Tanzania to Hong Kong from 1995 to 2013, with Hong Kong reporting having received far more hippo teeth than the two African countries reported exporting. They found that over 14,000 kg of hippo teeth (equivalent to approximately 2,700 hippos) were unaccounted for between Hong Kong and Uganda. They also found that Hong Kong reported receiving 3,176 kg more hippo teeth (equal to nearly 605 hippos) than reported by Tanzania. Despite attempts to contact the relevant parties to confirm the reasons for the differences in trade, definitive explanations were not obtained. They expressed serious concern that these discrepancies may indicate that ivory obtained by poaching may be laundered into the legal market (Andersson & Gibson, 2018).

Considering the trade discrepancies identified by Andersson and Gibson (2018), the Trade Analysis section in this Petition also examined quantities reported by importers compared to exporters over the 10-year time period from 2009 to 2018. This section of the analysis focused on identifying substantial discrepancies in the CITES Trade Database where quantities reported by importers exceeded those reported by exporters. In contrast to Andersson and Gibson (2018), which only examined commercial trade in hippo ivory and teeth, this analysis included the trade of wild-sourced hippo ivory, teeth, trophies, skulls, bodies, and live hippos for commercial, personal, and hunting trophy purposes to be consistent with the other analyses in this section.

The following section details discrepancies identified in the global trade of wild sourced hippos from hippo range States identified as the country of origin for commercial, hunting trophy, and

personal purposes between 2009 and 2018. Methods were the same as other analyses in Section IV.B.1.b)[42]; however, in this analysis, importer reported quantities were compared to exporter reported quantities aggregated by importer, exporter/origin, and term.

There was evidence of discrepancies in the global trade of wild-sourced hippos for commercial purposes in which quantities reported by importers exceeded those reported by exporters by 1,392 hippos over 10 years (Table 15). The items reported by importers included 6,875 hippos in the form of ivory (kg), 795 hippos in the form of teeth, 108 hippos in the form of skulls, 65 live hippos, nine hippos in the form of trophies, and one hippo body. The items reported by exporter included 4,565 hippos in the form of ivory (kg), 1,234 hippos in the form of teeth, 344 hippos in the form of trophies, 288 hippos in the form of skulls, 29 live hippos, and one hippo body.

Table 15. Differences in global hippo trade for commercial purposes as reported by importers and exporters, 2009-2018.

Year	No. of hippos reported by importer	No. of hippos reported by exporter	Difference (positive indicates importer reported exceeds exporter reported)
2009	1,498	474	1,024
2010	1,440	1,730	-290
2011	1,023	1,697	-674
2012	936	396	540
2013	483	218	265
2014	304	289	15
2015	874	437	437
2016	589	461	128
2017	15	31	-16
2018	691	728	-37
Total	**7,853**	**6,461**	**1,392**

These differences in reporting were highest for the trade of hippos that originated in Tanzania (Table 16) and Malawi (Table 17). Quantities reported by importers included 1,730 more hippos than reported as exported by Tanzania and 918 more hippos than reported as exported by Malawi for commercial purposes between 2009 and 2018.

Table 16. Differences in global hippo trade, where hippos originated in Tanzania, for commercial purposes reported by importers and exporters, 2009-2018.

Year	No. of hippos reported by importer	No. of hippos reported by exporter	Difference (positive indicates importer reported exceeds exporter reported)
2009	823	14	809
2010	552	0	552
2011	3	16	-13
2012	484	56	428
2013	3	5	-2
2014	0	1	-1
2015	1	4	-3
2016	1	7	-6

[42] For detailed methodology, see Appendix.

Year	No. of hippos reported by importer	No. of hippos reported by exporter	Difference (positive indicates importer reported exceeds exporter reported)
2017	1	1	0
2018	680	714	-34
Total	**2,548**	**818**	**1,730**

Table 17. Differences in global hippo trade, where hippos originated in Malawi, for commercial purposes as reported by importers and exporters, 2009-2018.

Year	No. of hippos reported by importer	No. of hippos reported by exporter	Difference (positive indicates importer reported exceeds exporter reported)
2009	0	0	0
2010	21	11	10
2011	0	0	0
2012	10	2	8
2013	282	1	281
2014	282	132	150
2015	450	0	450
2016	229	210	19
2017	0	0	0
2018	0	0	0
Total	**1,274**	**356**	**918**

Trade discrepancies for Tanzania pertained largely to commercial trade of teeth with Hong Kong (Table 18). Due to the differences in measurements (weight versus number), Table 18 includes trade values for both weighted ivory (kilograms) and individual teeth. Hong Kong reported importing 11,549 kg of teeth and 1,650 teeth between 2009 and 2018 which is equivalent to 2,338 hippos. In contrast, Tanzania reported exporting 0 kg of teeth and 8,750 teeth, which is equivalent to 715 hippos. This means that Hong Kong reported importing 1,623 hippos more than Tanzania reported exporting in the form of ivory and teeth (Table 18). A discrepancy of 1,623 hippos indicates that approximately 162 hippos, on average, per year were underreported per year by Tanzania over the 10-year period. Underreporting of this magnitude could threaten the future survival of hippos in Tanzania, especially in light of other recent threats (e.g., Stears et al., 2021; Stommel et al., 2016). The impact could be even greater if the teeth originated from hippos in one of Tanzania's populations rather than from hippos evenly distributed throughout Tanzania's hippo populations.

Table 18. Differences in the trade of hippo teeth, where hippos originated in Tanzania, for commercial purposes as reported by Hong Kong (importer) and Tanzania (exporter), 2009-2018.[43]

	Reported by importer (HK)		Reported by exporter (TZ)		Difference
Year	Teeth (kg)	Teeth (no.)	Teeth (kg)	Teeth (no.)	No. of hippos (positive indicates importer reported exceeds exporter reported)
2009	2,974 kg =	1,650 teeth =	0	0	704 hippos

[43] Ivory reported in kilograms as well as number of teeth are included in this tables due to differences in reporting between the two countries).

Year	Reported by importer (HK)		Reported by exporter (TZ)		Difference
	Teeth (kg)	Teeth (no.)	Teeth (kg)	Teeth (no.)	No. of hippos (positive indicates importer reported exceeds exporter reported)
	566 hippos	138 hippos			
2010	2,891 kg = 551 hippos	0	0	0	551 hippos
2011	0	0	0	0	0 hippos
2012	2,114 kg = 403 hippos	0	0	0	403 hippos
2013	0	0	0	0	0 hippos
2014	0	0	0	0	0 hippos
2015	0	0	0	0	0 hippos
2016	0	0	0	0	0 hippos
2017	0	0	0	0	0 hippos
2018	3,570 kg = 680 hippos	0	0	8,570 teeth = 715 hippos	-35 hippos
Total	**11,549 kg = 2,200 hippos**	**1,650 teeth = 138 hippos**	**0**	**8,570 teeth = 715 hippos**	**1,623 hippos**

There were also discrepancies in the reporting of the global trade in hunting trophies from Tanzania. Global importers reported 829 hunting trophies, while Tanzania only reported exporting 378 hunting trophies (Table 19). This is a difference of 451 hippos from 2009 to 2018 (Table 19). The majority of hunting trophy reporting discrepancies were between Tanzania and the United States (Table 20). The United States reported importing 421 hunting trophies between 2009 and 2018, while Tanzania reported exporting 165 hunting trophies for a difference of 256 hippos (Table 20). This is also significant given that the majority of global imports originate in Tanzania, including 19% of U.S. hippo imports (Table 9). Differences in hunting trophies may also represent discrepancies in the trade of hippo teeth as twelve teeth often constitute a single hippo trophy.

Table 19. Differences in hippo hunting trophies, where hippos originated in Tanzania, as reported by global importers and Tanzania (exporter), 2009-2018.

Year	Trophies reported by importer	Trophies reported by exporter	Difference (positive indicates importer reported exceeds exporter reported)
2009	121	53	68
2010	77	23	54
2011	73	27	46
2012	80	9	71
2013	66	9	57
2014	90	76	14
2015	79	73	6
2016	90	46	44
2017	78	20	58
2018	75	42	33
Total	**829**	**378**	**451**

Table 20. Differences in hippo hunting trophies, where hippos originated in Tanzania, as reported by the United States (importer) and Tanzania (exporter), 2009-2018.

Year	Trophies reported by importer	Trophies reported by exporter	Difference (positive indicates importer reported exceeds exporter reported)
2009	81	15	66
2010	43	6	37
2011	47	23	24
2012	52	7	45
2013	39	3	36
2014	47	37	10
2015	33	32	1
2016	32	18	14
2017	28	12	16
2018	19	12	7
Total	**421**	**165**	**256**

Trade discrepancies for Malawi were largely due to under reporting of commercial trade in hippo ivory, measured in kilograms, with China (Table 21). China reported importing 6,523 kg of hippo ivory between 2009 and 2018, while Malawi only reported exporting 1,793 kg for a difference of 4,730 kg of hippo ivory (Table 21). Ivory measured in kilograms for this analysis included the terms teeth, carvings, ivory carving, ivory pieces, and jewelry. A discrepancy of 4,730 kg is equivalent to approximately 901 hippos, which is 30% of Malawi's estimated hippo population size (3,000) according to the most recent IUCN hippo assessment (Lewison & Pluháček, 2017a, 2017b). The trade in question occurred between 2013 and 2016 which means that 225 hippos per year, on average, were underreported by the exporter (Table 21). Over the 10-year period, approximately 90 hippos were underreported per year, on average, by the exporter, which is equivalent to 3% of Malawi's hippo population. An additional 3% offtake could have serious negative impacts on Malawi's population, especially if unaccounted for in management decisions.

Table 21. Differences in kilograms of hippo ivory, where hippos originated in Malawi, for commercial purposes as reported by China (importer) and Malawi (exporter), 2009-2018.

Year	Kilograms of ivory reported by importer	Kilograms of ivory reported by exporter	Difference (positive indicates importer reported exceeds exporter reported)
2009	0	0	0
2010	0	0	0
2011	0	0	0
2012	0	0	0
2013	1,480	0	1,480
2014	1,480	693	787
2015	2,363	0	2,363
2016	1,200	1,100	100
2017	0	0	0
2018	0	0	0
Total	**6,523**	**1,793**	**4,730**

These data indicate that export of hippo parts from Tanzania and Malawi may be underreported and that hippo populations there may be overexploited. As deduced by Andersson and Gibson (2018), these results demonstrate lapses in the monitoring of hippo trade. Such discrepancies in quantities reported by importers and exporters could also be indicative of illegal offtake and trade that has been disguised to fit within legal frameworks. This analysis, in combination with the study by Andersson and Gibson (2018), indicate that monitoring of trade in hippo products has been insufficient for decades.

(4) Trade in hippo ivory despite legal protections

According to information contained in the CITES Trade Database (see Section A.1.b)(3)) wild-source hippo ivory in global trade for commercial, hunting trophy, and personal purposes between 2009 and 2018 included trade that originated in range States with domestic measures that foreclose hunting or other killing of hippos (see Section D.2.c)(1)): Burkina Faso (one trophy which is equivalent to one hippo), Cameroon (11 trophies and 199 teeth which are equivalent to 28 hippos), Central African Republic (one trophy which is equivalent to one hippo), Democratic Republic of the Congo (3 kg of ivory which is equivalent to one hippo), Kenya (12 teeth which is equivalent to one hippo), Nigeria (one tooth, the equivalent of at least one hippo) and Uganda 2014-2018 only (21 teeth + 3,691 kg of ivory, the equivalent of 711 hippos). See Table 22. below.

Table 22. Countries of origin of hippo ivory in global trade 2009-2018 where the hippo was totally protected.

Range state	Protection status	Items traded	Hippo equivalent
Burkina Faso	Totally protected (since 1996); hunting for recreational or commercial purposes is prohibited.	1 trophy	1 hippo
Cameroon	Totally protected (since 2006); hunting for subsistence, recreational or commercial purposes prohibited.	11 trophies and 199 teeth	28 hippos
Central African Republic	Totally protected (since 1984); hunting or capture prohibited.	1 trophy	1 hippo
Democratic Republic of the Congo	Totally protected from capture, hunting, harassing, and deliberate killing (since 2006); illegal to detain, give, sell, exchange, transport any products reported to contain a product derived from hippos and illegal to publicly exhibit these specimens.	3 kg ivory	1 hippo
Kenya	Totally protected (since 2013); hunting, killing, capturing, wounding with intent to hurt a hippo is forbidden; import/export of hippo prohibited.	12 teeth	1 hippo
Nigeria	Totally protected (since 1991); cannot be killed, hunted or captured except under special license issued for scientific or administrative purposes in exceptional circumstances.	1 tooth	1 hippo

Range state	Protection status	Items traded	Hippo equivalent
Uganda (since 2014)	On 15 July 2013, hippo ivory trade and export were reportedly banned.	2014-2018 only: 21 teeth in 2015 + 3,691 kg of ivory in 2015-2018	615 hippos

U.S. imports of wild-source hippo ivory for commercial, hunting trophy, and personal purposes between 2009 and 2018 derived from the CITES Trade Database included those that originated in range States where hippos receive legal protections (see Section D.2.c)(1)): Burkina Faso (one trophy which is equivalent to one hippo), Cameroon (two trophies which is equivalent to two hippos), Nigeria (one tooth equivalent to at least one hippo) and Uganda 2014-2018 only (10 teeth, the equivalent of one hippo). See Table 23 below.

Table 23. Countries of origin of hippo ivory imported to the United States 2009-2018 where the hippo was totally protected.

Range state	Protection status	Items traded	Hippo equivalent
Burkina Faso	Totally protected (since 1996); hunting for recreational or commercial purposes is prohibited.	1 trophy	1 hippo
Cameroon	Totally protected (since 2006); hunting for subsistence, recreational or commercial purposes prohibited.	2 trophies	2 hippos
Nigeria	Totally protected (since 1991); cannot be killed, hunted or captured except under special license issued for scientific or administrative purposes in exceptional circumstances.	1 tooth	1 hippo
Uganda	On 15 July 2013, hippo ivory trade and export were reportedly banned.	2014-2018 only: 10 teeth in 2015	1 hippo

f) Demand for hippo meat

The hunting of wildlife for food or bushmeat is considered a major threat to many African species, including hippos (Lewison & Pluháček, 2017a; Ripple et al., 2016). Bushmeat hunting and trade are well-documented in forested ecosystems common in West and Central Africa as well as savanna ecosystems of East and Southern Africa where hippos are most populous (Lewison & Pluháček, 2017a; Lindsey et al., 2013; van Velden et al., 2018).

Generally, the frequency of illegal hunting and bushmeat consumption decreases as distance increases between human settlements and wildlife populations (Brashares et al., 2011; Lindsey et al., 2011). Recently, however, there is a growing demand for bushmeat in urban African cities, making them key areas for illegal bushmeat trade (Gluszek et al., 2021; Luiselli et al., 2018). Although consumption of bushmeat by urban citizens is small and comprises a small proportion of their protein intake, the large population in these areas generates significant demand, increasing the commercialization of illegal hunting (Wilkie et al., 2011). The human population

in sub-Saharan Africa is projected to continue expanding and, by 2050, it is expected to double with more than 60% of this growth occurring in urban African cities (OECD/SWAC, 2020). Consumption of bushmeat by urban citizens is driven by a multitude of factors, such as its cultural significance, social prestige (i.e., rarity/luxury item), and taste (Chausson et al., 2019; Wilkie et al., 2011). A recent study found that hippo meat was valued at USD 1,500/kg in a local Angolan market (Braga-Pereira et al., 2021).

Gluszek et al. (2021) assembled restauranteurs from two major African cities to study the consumption, perception, presence, and variety of wild meat being offered in urban restaurants. Although hippo meat was less commonly reported in restaurants and urban bushmeat trade, it was mentioned by over 30% of participants. The authors said that this might suggest that highly valued and protected species like hippos are particularly sought after, that their bushmeat trade is being pushed underground, and that the lack of effective law enforcement perpetuates illegal trade.

In rural areas, bushmeat is primarily an alternative protein source to combat food insecurity and to provide income and is also used in traditional practices. In 2011, at least 511 people in rural Zambia contracted anthrax from preparing and consuming infected hippo meat (Lehman et al., 2017). Of surveyed residents surrounding the outbreak, 84% claimed to have consumed hippo meat in the past and over 20% stated their willingness to continue consuming hippo carcasses due to food and protein insecurity albeit its associated risk (Lehman et al., 2017). Nielsen et al. (2014) demonstrated in hypothetical scenarios that when bushmeat consumers were provided with alternative income sources and donated meat, their involvement with illegal bushmeat would substantially decrease. Interestingly, wealthier households were most likely to continue being involved in bushmeat hunting and/or trading, demonstrating that a variety of socio-economic factors continue to drive this illicit trade (Nielsen et al., 2014).

For this Petition, we complied evidence of hippo meat seizures and arrests between 2016 and 2021 (no data were available for 2020 and 2021) (Table 24).

Table 24. Evidence of hippo meat seizures and arrests, 2016-2021.

Hippo Meat Seizures and Arrests, 2016-2021 (Country, description, incident report date in reverse chronological order, reference, page)
2019
Democratic Republic of Congo: Three hippos were killed by the army for the benefit of the military canteen (end of July 2019) (Robin des Bois, 2020b, p. 97).
2018
Tanzania: Two poachers were arrested after being caught transporting hippo meat in District of Namtumbo, Region of Ruvuma (early May 2018) (Robin des Bois, 2018b, p. 72).
2017
Tanzania: One person was arrested with hippo meat in Ruvuma Region (23 May 2017) (Robin des Bois, 2017c, p. 114).
Zambia: Four people were arrested with 412 kg of hippo meat and elephant ivory (7 March 2017) (Robin des Bois, 2017b, p. 64).
2016

Hippo Meat Seizures and Arrests, 2016-2021 (Country, description, incident report date in reverse chronological order, reference, page)
Zambia: Hippo meat, totaling 13 kg, and other wildlife contraband (leopard skins, live pangolins), traps and firearms were seized and 19 people were arrested (end of November 2016) (Robin des Bois, 2017a, p. 111).
Tanzania: Hippo meat, totaling 2 kg, ammunition and automatic weapons were seized by police after a shootout with three poachers in a village (5 May 2016) (Robin des Bois, 2016b, p. 67). (Robin des Bois 2016b, p. 67).

Seizures of hippo meat and arrests related to possession of hippo meat are not as common as arrests and seizures related to possession, trade, and transport of hippo teeth and ivory.

4. Analysis and conclusions

There is significant legal international trade in hippo parts and products and the United States is a leading importer (see Sections IV.B.1 and IV.B.2). This legal overuse of hippos is a concern. Additionally, the hippo continues to be affected by poaching and illegal trade (see Section IV.B.3) despite domestic legal protections in many range States. Given the evidence presented above as well as hippo biology and the leading threats these animals face, the species is overutilized for commercial, recreational trophy hunting and personal purposes. This criterion alone supports listing hippos under the ESA. See analysis below.

Hippos are highly susceptible to overexploitation due to their life history characteristics that result in long recovery times, especially if offtake is high. They are a K-selected species with long lifespans, long inter-calf intervals, delayed sexual maturity, and low reproductive potential (Eltringham, 1999, pp. 72-73; Smuts & Whyte, 1981). Compared to other large herbivores with similar breeding cycles, hippos have a low calf birth rate, which can drop severely during periods of drought (Smuts & Whyte, 1981), as discussed in Section IV.A.
Hippos are highly adapted to an aquatic lifestyle and these adaptations make it impossible for them to survive the loss and degradation of their aquatic habitat. Additionally, even small offtakes of adult hippos, in combination with other human impacts such as habitat loss, can lead to population declines. Lewison (2007) modeled hippo population sizes in response to varying levels of natural and human disturbances. The models demonstrated that hippo populations were most negatively affected by human disturbances (notably habitat loss) and that mild to moderate human-mediated disturbances (habitat loss and hunting 1% of adults) in conjunction with natural disturbances (specifically rainfall variation) can lead to substantial population declines (Lewison, 2007). The author emphasized the importance of incorporating realistic natural disturbances into population models to fully understand the threat of future human impacts.

There are virtually no scientific studies on the effects of trophy hunting on hippo populations. In other mammal species, trophy hunting is known to have direct impacts, such as high mortality rates and population declines, as well as indirect impacts such as disrupted social structure, reduced reproductive success, changes in population structure, genetic consequences, as well as changes in habitat use and behavior (e.g., Allendorf et al., 2008; Frank et al., 2017; Milner et al., 2007). Many of these impacts contribute to population declines and require long-term monitoring to elucidate the full effects of trophy hunting on individuals and populations.

Trophy hunters target animals with large secondary sexual traits, such as horns, antlers, and ivory, and these animals tend to be the most evolutionarily fit. In the case of hippos, this would be males with large canines. Male hippos have jaws and canines that are substantially larger than those of females (Shannon et al., 2021). Male jaws are 44% heavier than female jaws and male canines are 81% heavier than female canines (Shannon et al., 2021). Notably, hippo canines are made of ivory, which makes them highly sought by both legal and illegal hunters (Andersson & Gibson, 2018; Moneron & Drinkwater, 2021). These large jaws and canines are used as weapons during male-male competition and provide fitness benefits (Shannon et al., 2021). This results in intense selection for larger jaws and canines used to gain mating access to females (Shannon et al., 2021). Trophy hunters who target males with the largest and most impressive canines (i.e., ivory) are also removing the most dominant male hippos from the population. When well-ornamented male animals are selectively removed, the best genes are taken out of the populations and such removals could negatively affect the offspring and their survival when facing a changing environment. This type of selective offtake has been documented to alter genetic structure, physical traits (Coltman et al., 2003), life history (Van de Walle et al., 2018), and behavior (Leclerc et al., 2019). A recent study on African elephants (which are also targeted for their ivory) revealed that intensive poaching pressure resulted in strong selection for tuskless females, accompanied by a significant population decline (Campbell-Staton et al., 2021). The genetic changes identified in the study were fueled by poaching of elephants for their ivory tusks and occurred in only 15 years, showing that human selection pressure can result in rapid changes in wild populations.

Social disruption from trophy hunting targeting adult male hippos could negatively affect reproduction rates and population growth. The hippo's mating system is based on a social structure where dominant males maintain territories that provide them mating access to females within their territory. Targeted removal of dominant males could disrupt this structure. As younger males fight to obtain the vacated territory, mortalities would increase, and reproduction would be delayed. There is also evidence that hippos may exhibit sexually selected infanticide, where adult males who acquire new territories kill dependent young to bring females into estrous and increase mating opportunities (Lewison, 1998). Infanticidal species are especially vulnerable to offtake from hunting, even with moderate hunting pressure (Milner et al., 2007; Packer et al., 2009). In other infanticidal species, such as lions, leopards, brown bears, and cougars, offtake of adult males due to trophy hunting can destabilize the social structure, alter male territory use, increase the rate of infanticide, decrease reproductive output, and contribute to population declines (e.g., Balme et al., 2010; Creel et al., 2016; Frank et al., 2017; Gosselin et al., 2015; Leclerc et al., 2017; Loveridge et al., 2007; Whitman et al., 2004; Wielgus et al., 2013). Although no studies have been conducted to quantify similar impacts in hippos, caution should be taken to ensure that trophy hunting does not contribute to additive mortality as it does in other infanticidal species.

Decisions regarding the management of trophy hunting must be transparent and reflect the quality of available data. Hippos are one of the least-studied ungulates and there are many questions remaining about their reproduction and behavior. There are also many unknown variables surrounding hippo population trends and enforcement (Lewison & Pluháček, 2017b). In addition, there is a severe lack of long-term monitoring of hippo populations, especially at the

local level where trophies are taken. Information on local population sizes, demographics, and threats is necessary to ensure that trophy hunting does not negatively affect an already vulnerable species that is under pressure from many other human-caused threats.

Based on investigation done for this Petition, none of the range States involved in legal hippo trade, except Cameroon, have current hippo management plans. Without proper understanding and management of hippo populations, it is impossible to ensure that recreational trophy hunting is biologically sustainable and does not have an additive effect on mortality in combination with other threats. To allow trophy hunting of hippos, range States must develop and implement national management plans to minimize the impact of trophy hunting and other threats. In addition to direct impacts, such as population declines, management decisions must also consider impacts on the biology, ecology, and behavior of this species, especially if hippos are an infanticidal species. Species such as the hippo, that are slow to mature and breed with low reproductive rates, are especially susceptible to human offtake.

Other authors have implied or stated outright that the level of legal international trade in hippo parts and products is not problematic at the global level; in support of this contention, they compare the global estimated population of hippos to the global estimated offtake of hippos and conclude that the percentage offtake is low. This conclusion cannot be supported because the offtake of hippos for international trade is not evenly dispersed throughout hippo populations. Rather, hippo offtake is concentrated in certain countries, primarily Tanzania, Uganda, Zambia, Zimbabwe, Malawi, and South Africa (see Table 25 below). Nor is the offtake of hippos known given the significant illegal trade and poaching of hippos that is on-going as documented in this petition. Without a more complete picture of hippo mortality, the comparison fails.

To enable assessment of the conservation impact on populations in countries or origin of hippo parts and products in trade, this Petition has estimated the minimum number of hippos represented by those parts and products legally traded internationally (see Table 8 in Section IV.B.1). We note that this analysis would produce the most relevant results if it were conducted at the population level; however, we have no way of knowing from which populations in a country of origin the hippo parts and products originated, so this level of analysis is not possible.

Information at the country level reveals evidence that hippos are overutilized for legal international trade for commercial, hunting trophy, and personal purposes (see Table 25 below).

Table 25. Evidence of overutilization of hippos for legal commercial, hunting trophy and personal purposes.

Country of Origin	1% of Min. Pop. Size[44]	No. of Hippos Exported Each Year 2009-2018[45] (rounded)	Exports ≥1% of Min. Pop. Size Per Year on Average?	Exports Legal?	Pop. Trend	IUCN Concern?	Criminality Score for Fauna Crimes[46] (10 is the highest level of criminality)	Evidence of Poaching and Trafficking?
Tanzania	200	382	Yes	Yes	Stable	No	8.00	Yes
Uganda	70	302	Yes	Yes	Increasing	No	6.50	Yes
Zambia	400	190	No	Yes	Stable	Yes	4.50	Yes
Zimbabwe	50	164	Yes	Yes	Stable	No	7.50	Yes
Malawi	30	128	Yes	Yes	Stable	No	6.00	Yes
South Africa	70	122	Yes	Yes	Stable	No	7.50	Yes
Mozambique	30	32	Yes	Yes	Decreasing	Yes	8.00	Yes
Namibia	35	29	No	Yes	Increasing	Yes	4.50	Yes
Cameroon	15	3	No	No	Decreasing	Yes	7.50	Yes
Ethiopia	25	<1	No	Yes	Decreasing	Yes	5.50	Yes
Benin	5	<1	No	Yes	Decreasing	Yes	5.50	Yes
Burkina Faso	15	<1	No	No	Increasing	No	6.00	Yes
Central African Republic	2	<1	No	No	Decreasing	Yes	8.00	Yes
Kenya	50	<1	No	No	Stable	Yes	7.00	Yes
Democratic Republic of the Congo	50	<1	No	No	Increasing	Yes	8.00	Yes

For this analysis, we assume that all hippo populations are impacted by habitat loss and degradation, and that offtake of 1% will be detrimental, per Lewison (2007). Our findings are as follows:

- Hippo offtake for legal international trade in hippo parts and products for commercial, trophy hunting, and personal purposes is at a level that is likely to be detrimental in most countries where such offtakes occur: Tanzania, Uganda, Zimbabwe, Malawi, South Africa, and Mozambique. In these countries, annual offtake averaged over 10 years exceeds 1% per year of the national hippo population size.

- Additional factors that raise concerns about legal hippo exports:
    - The national population trend is decreasing in five of the 15 countries of origin of hippo parts and products in legal international trade: Mozambique, Cameroon, Ethiopia, Benin, and Central African Republic.

[44] See Table 1 in Section III.A. for population size.
[45] See Table 8 in Section IV.B.1 for details.
[46] See Global Initiative Against Transnational Organized Crime. (2021b). *Global Organized Crime Index 2021*. https://ocindex.net/. Globally, the highest fauna criminality scores are for China (9.0), Brazil (8.50), and Viet Nam (8.50). The following hippo range States have the next highest fauna criminality scores (8.0): Central African Republic, Democratic Republic of Congo, Mozambique, and Tanzania. Hippo range States with a fauna criminality score of 7.5 are: Botswana, Cameroon, South Africa, and Zimbabwe.

- The minimum national population size is small (less than 5,000 individuals), as defined by CITES (2016a, p. 11), in 11 of the 15 countries of origin of hippo parts and products in legal international trade: Zimbabwe, Malawi, Mozambique, Namibia, Cameroon, Ethiopia, Benin, Burkina Faso, Central African Republic, Kenya, and Democratic Republic of the Congo (Lewison & Pluháček, 2017b).
- The most recent IUCN assessment states that there are concerns about the conservation status of hippos in nine of the 15 countries of origin of hippo parts and products in legal international trade: Zambia, Mozambique, Namibia, Cameroon, Ethiopia, Benin, Central African Republic, Kenya, and Democratic Republic of the Congo (Lewison & Pluháček, 2017b).
- Except for Cameroon, none of the countries from which hippo parts and products were legally exported have a national hippo management plan, which is important not only to ensure that hippo offtake is not detrimental, but also to ensure that hippo habitats are protected.
- Criminality Scores for Wildlife Crimes indicate that wildlife law enforcement is poor to very poor in 13 of the 15 countries of origin of hippo parts and products in legal international trade, and this raises red flags about regulation of hippo offtake and trade in those countries.
    - Eight of the 15 countries of origin have high Criminality Scores for Fauna Crimes (scores ≥ 7.50): Tanzania, Zimbabwe, South Africa, Mozambique, Cameroon, Central African Republic, Kenya, and Democratic Republic of the Congo.
    - Another five have above average Criminality Scores (between 5.00 – 7.49): Uganda, Malawi, Ethiopia, Benin, Burkina Faso.
- Hippo parts and products in legal international trade originated in five countries where such exports are illegal: Cameroon, Burkina Faso, Central African Republic, Kenya, and Democratic Republic of the Congo.
- There is evidence of hippo poaching, trafficking, and related arrests and seizures in all 15 countries of origin of hippo parts and products in legal international trade.

This evidence clearly indicates that the hippo is overutilized for commercial, recreational trophy hunting and personal purposes. Therefore, the Service must list hippos under the ESA based on this criterion alone. *See* 16 U.S.C. § 1533(a)(1) (ESA listing must occur if "*any*" of Section 4(a)'s factors merit such listing (emphasis added)); *see also Sw. Ctr. for Biological Diversity v. Babbitt*, 215 F.3d 58, 60 (D.C. Cir. 2000) (listing required if "any of § 1533(a)(1)'s five factors are sufficiently implicated").

C. Disease or predation

Disease is not considered to be a major threat to hippo populations, according to the most recent IUCN assessment (Lewison & Pluháček, 2017a). Hippos are susceptible to several infectious diseases including viruses (Rift Valley Fever), bacteria (Anthrax, brucellosis, tetanus, salmonella, bovine tuberculosis), and parasites (trypanosomiasis, schistosomiasis, trichinosis, roundworms, blood and liver flukes, ticks) (Bekker et al., 2012; Bengis et al., 2002; Cowan et al., 1967; de Vos & de Klerk, 1980; Després et al., 1995; Dudley et al., 2016; Eltringham, 1999, pp.

11-14; Garnham, 1960; Heckel, 1879; Kerr et al., 2021). Hippos are immune to the viral foot-and-mouth disease and are thought to be resistant to rinderpest (Dudley et al., 2016; Eltringham, 1999, pp. 111-112; Plowrigh et al., 1964).

Anthrax is a fatal disease and probably the most serious disease affecting hippos; the mortality rate from anthrax in hippos reaches 55.5% of the affected resident population (Eltringham, 1999, pp. 112-113; Turnbull et al., 1991). Anthrax outbreaks among hippos happen periodically, and have been reported in Namibia, Tanzania, Uganda, Zambia, and Zimbabwe (Clegg et al., 2007; Cossaboom et al., 2019; Driciru et al., 2018; Dudley et al., 2016; Lehman et al., 2017; Stears et al., 2021; Turnbull et al., 1991; Wafula et al., 2008). A severe outbreak of anthrax was reported in Zambia in 1987, killing over 4,000 hippos, accounting for a population loss of approximately 21% (Turnbull et al., 1991). Combined, the 2004/2005 and 2010 anthrax outbreaks in the Queen Elizabeth Protected Area of Uganda killed 437 hippos (Driciru et al., 2018). The outbreak in 2004/2005 alone killed 15% of the resident hippo population and was notable from other outbreaks as it mostly affected hippos and few other species (Dudley et al., 2016; Wafula et al., 2008). It is suspected that an anthrax outbreak among hippos in this area also occurred in 1959, 1962, and 1991 (Wafula et al., 2008) et al., 2008). A sudden die-off of 155 hippos (roughly 26.4% of the regional population) in the Bwabwata National Park in Namibia was determined to have been caused by anthrax (Cossaboom et al., 2019). The hippo's tendency to feed on conspecific carcasses may provide reason for higher anthrax transmission among hippos and often exceed infection rates in any other anthrax-susceptible ungulate (Dudley et al., 2016).

Of note, hippos in zoological settings have contracted the Covid-19 virus (Daly, 2021; Mawad, 2021). While no hippo deaths have been reported from the virus, research and understanding of the effects of the SARS-CoV-2 virus' impacts on animals is still in its infancy. The virus may pose a disease risk to hippos in the wild and that risk is worth further investigation as our understanding of the virus improves.

Natural predation is not a major factor in hippo population declines, according to the most recent IUCN assessment (Lewison & Pluháček, 2017a). Lions and spotted hyenas can kill adult and juveniles, usually causing death through loss of blood (Eltringham, 1999, pp. 117-118; Estes, 1991; Owen-Smith & Mills, 2008). Although crocodiles typically co-exist with hippos in shared waters, crocodiles are known to attack infant hippos when unattended by the parent (Estes, 1991). Hippos have been observed on numerous occasions to exhibit infanticide among calves within 50 days post-parturition (Lewison, 1998). They are the only ungulates that exhibit this behavior in the wild (Lewison, 1998; Mysterud et al., 2002). This may be a strategy exhibited by males during the dry season to shorten the interbirth interval caused by lactation in order to increase reproductive success in newly dominant males (Lewison, 1998). As previously described, predation by people is a significant threat to hippos.

D. Inadequacy of existing regulatory mechanisms

1. International laws and agreements

International laws and agreements have failed to provide adequate protections for hippos or their habitat as evidenced by the continuing deterioration of the conservation status of the species.

Therefore, this criterion also requires that hippos be listed under the ESA. *See* 16 U.S.C. § 1533(a)(1); *see also Sw. Ctr. for Biological Diversity v. Babbitt*, 215 F.3d 58, 60 (D.C. Cir. 2000) (listing required if "any of § 1533(a)(1)'s five factors are sufficiently implicated").

a) Convention on International Trade in Endangered Species of Wild Fauna and Flora

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES or the Convention) is an international agreement designed to ensure that international trade in wild animals and plants does not threaten their survival. The Convention recognizes that "wild fauna and flora in their many beautiful and varied forms are an irreplaceable part of the natural systems of the earth which must be protected for this and the generations to come" (CITES, 1983, p. 1). Wild animal and plant species are protected under CITES by being listed on one of three appendices which affords them regulation of international trade under certain conditions that vary amongst the appendices.

(1) CITES Appendix II listing

The hippo was listed on CITES Appendix III in 1975 and was subsequently listed on CITES Appendix II in 1994 (effective in February 1995), where it remains today (CITES, 2021).

In accordance with Article IV, paragraph 2, of the Convention:

> The export of any specimen of a species included in Appendix II shall require the prior grant and presentation of an export permit. An export permit shall only be granted when the following conditions have been met:
> (a) a Scientific Authority of the State of export has advised that such export will not be detrimental to the survival of that species;
> (b) a Management Authority of the State of export is satisfied that the specimen was not obtained in contravention of the laws of that State for the protection of fauna and flora; and
> (c) a Management Authority of the State of export is satisfied that any living specimen will be so prepared and shipped as to minimize the risk of injury, damage to health or cruel treatment. (CITES, 1983, p. 3)

In 1994, Belgium, Benin, and France submitted the Appendix II proposal (hereafter, "proposal"; CITES, 1994), and cited a 1989 survey of hippo range States conducted by Eltringham (1993) which estimated a total hippo population of 160,000. Of the 34 countries consulted by Eltringham, hippo populations were said to be declining in 10, stable in six, and increasing in one (Zambia); the other countries did not report. Eltringham (1993) considered that most hippo populations were declining. Regionally, the hippo population of western Africa was estimated at 7,000; central and eastern Africa was estimated at 70,000; and southern Africa was estimated at 80,000. The proposal stated that a genetically viable hippo population requires approximately 500 individuals, so the small populations found throughout western Africa are extremely

vulnerable. The largest populations were found in Zambia (40,000), Mozambique (16,000 – 20,500), and Tanzania (20,000).

When the proposal was written, only a few years had passed since the African elephant was listed on CITES Appendix I (effective in January 1990) and an international elephant ivory trade ban had been in place; the Appendix II hippo proposal noted that "exports of hippopotamus ivory from Africa appear to have grown, but the trade figures for recent years (1992, 1993 and 1994) are incomplete at best" (CITES, 1994, p. 156). The proposal documented that a minimum of 13,700 kg of hippo ivory was exported from Africa in 1991, of which 7 tons were exported from Tanzania alone; other principal African exporting countries of unprocessed hippo teeth were Malawi, Zimbabwe, and Zambia. The proposal also documented the substantial increase in export of hippo trophies between 1985 (n=173) and 1991 (n=514 + 268 kg); most of these appeared to have originated in Tanzania, Zambia, and Zimbabwe. The proposal also noted the trade in hippo skins and skin pieces from South Africa, Botswana, Malawi, Mozambique, Tanzania, Zambia, and Zimbabwe, sometimes in significant quantities (i.e., in 1989, Zimbabwe exported 3,275 sq. ft. of skin).

Regarding illegal international trade, the proposal noted:

> On the international level, many of the transactions involving exports of hippopotamus teeth from African countries to Japan and Hong Kong reported in the customs statistics of these two countries (see Table 3) do not appear in the annual CITES reports; as a result, it is impossible to determine whether or not these shipments were covered by valid CITES documents (certificate of origin as required by the Convention) and hence whether or not the exchanges involved were legal. (CITES, 1994, p. 159)

The proposal states:

> Eltringham feels that hunting of the hippopotamus for meat, skin and trophies probably does not yet pose a serious threat to the survival of the species in the majority of its countries of origin but expresses concern that it may become seriously endangered if its teeth are marketed as a substitute for elephant ivory, a fact which he did not consider confirmed at the end of 1992 (Eltringham, 1993).
>
> Some interest appears to be developing, however, at least in part, in using hippopotamus ivory in place of elephant ivory. (CITES, 1994, p. 160)

(i) First Review of Significant Trade

Only a few years after listing the hippo on Appendix II, the CITES Parties expressed concern that international trade in hippo was not being conducted in accordance with the Convention. Consequently, the hippo was included in "Phase IV" of the Review of Significant Trade (RST), which took place between the tenth (June 1997) and eleventh (April 2000) meetings of the Conference of the Parties (CoP) to CITES (CITES, 2019b).

The purpose of the RST is to review the biological, trade and other relevant information on Appendix II species subject to significant levels of trade, to identify problems and solutions

concerning the implementation of, *inter alia*, Article IV, paragraph 2 (a), which requires that a Scientific Authority of the State of export has advised that the export will not be detrimental to the survival of the species concerned (hereinafter referred to as the NDF, or non-detriment finding). The RST process involves several steps undertaken by the CITES Animals Committee (hereinafter "AC," the scientific and technical committee pertaining to animals) including selection of species to be reviewed, analysis of trade and conservation data regarding species selected, and development of recommendations to the relevant Parties to address any problems with implementation of Article IV, paragraph 2 (a). The AC recommendations are provided to the CITES Standing Committee (hereinafter "SC," the governing body of CITES between the CoPs) and once approved, communicated to the relevant Parties by the CITES Secretariat. The Parties respond to the CITES Secretariat which decides if the Parties have complied with the recommendations and informs the SC of its recommendations accordingly. The SC decides to accept the CITES Secretariat's recommendations or act in another way.

The Phase IV RST resulted in recommendations to Botswana, Democratic Republic of Congo, Malawi, Mozambique, Rwanda, South Africa, Tanzania, Zambia, and Zimbabwe (other range States were removed from the process due to lack of evidence of international trade) (CITES, 2001c). The ultimate result of the RST review of hippo are presented in Table 26.

After the recommendations were communicated to each country, the CITES Secretariat stated it was satisfied with the responses it had received from Botswana, Zambia, and Zimbabwe and that no further action was required (CITES, 2001c; see Table 26). It must be noted that the details of the responses received by the Secretariat from these countries in response to the concerns raised are not publicly available; therefore, the scientific basis of the non-detriment findings made by these countries at the time, and to the present date, are not publicly known. Given that Zambia and Zimbabwe were at the time, and continue to be, major hippo exporting countries, the lack of transparency regarding the scientific basis of these countries' NDFs is of concern.

Mozambique, then and currently a major hippo exporting country, was also excused from further action based on a recommendation from the CITES Secretariat that stated, "The Secretariat believes that no further action is required provided that annual export quotas remain at the 2001 level" (CITES, 2001c, p. 29; see Table 26). However, Mozambique did not have a hippo CITES export quota in 2001, so the meaning of this is unclear; Mozambique did not have an export quota for hippo until 2018 (53 wild-taken trophies); no export quota was recorded for 2019; in 2020 the quota was 49 wild specimens for commercial purposes; and in 2021, the quota was 49 with no purpose specified (CITES, 2022). Given that Mozambique is a major hippo exporting country, it is of concern that the scientific basis of Mozambique's hippo NDFs remains unknown to date.

Democratic Republic of Congo, Malawi, Rwanda, and South Africa did not respond to the recommendations and consequently the Secretariat proposed that the SC recommend that Parties not allow imports of hippo specimens from these countries (CITES, 2001c); ultimately this recommendation was made to Parties in December 2001 except for South Africa (CITES, 2001b) for unknown reasons, possibly because they provided information to the CITES Secretariat and the Secretariat was satisfied with that information. Given that South Africa is a major hippo exporting country, it is of concern that the scientific basis of South Africa's hippo NDFs remains unknown to date.

The RST recommendation to Tanzania, another major hippo exporting country, stated:

> Management Authority of the United Republic of Tanzania, having regularly authorized exports of specimens of this species during the period 1991-1996, should provide the Secretariat with detailed information on management measures in place to monitor wild populations of the species and implement the requirements of Article IV.2 of the Convention when authorizing exports. (CITES, 2001c, pp. 48-49)

Tanzania reported to the Secretariat that "wet and dry season aerial surveys are used to monitor key populations. Recommended terms for specimens on export documents and annual reports will be used and all teeth will be marked before export" (CITES, 2001c, pp. 48-49).

The Secretariat proposed that the SC recommend to all Parties:

> …not to accept any imports of specimens of this species from the United Republic of Tanzania if by 20 July 2001 it has not done the following:
> a) established a cautious export quota agreed with the Secretariat; and
> b) provided further detail on population trends and the regulation of hunting of this species. (CITES, 2001c, p. 49)

At its June 2001 meeting, the SC accepted the hippo recommendations of the Secretariat except for: South Africa for which the SC decided no further action was required; and Tanzania, for which the SC decided:

> No further action is required provided that the United Republic of Tanzania establishes a cautious export quota agreed with the Secretariat before 30 June 2001, and provides further details on population trends and the regulation of hunting of the species before 31 January 2002. (CITES, 2001a, p. 11)

In 2001, Tanzania issued an annual export quota of 4,800 skins from 1,200 animals and 10,598 kg teeth; this was amended in 2003 to indicate that the 10,598 kg teeth was "teeth and hunting trophies from 1,200 animals" (TRAFFIC & IUCN/SSC Wildlife Trade Programme, 2004, p. 18). The scientific basis of this quota, which remains in place today, 20 years later, is unknown.

Thus, the result of inclusion of the hippo in RST Phase IV, which ended in 2004, was that the substantial and concerning international export of hippo specimens was allowed to continue for Botswana, Zambia, Zimbabwe, Mozambique, South Africa and Tanzania although the scientific basis of these Parties' non-detriment findings is not publicly known, and the decision was based on assurances provided by the CITES Secretariat to the SC, itself based on private conversations between the CITES Secretariat and the Parties concerned.

(ii) Second Review of Significant Trade

Only four years after conclusion of RST Phase IV, as evidence of the Parties' continuing concerns that the Convention was not being implemented with respect to international trade in hippo specimens, the hippo again was selected for the RST beginning in 2008 (CITES, 2009a),

this time "due to declining populations as well as considerable and increasing trade" (CITES, 2008, p. 13). All range States were contacted, and countries retained in the review were Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Côte d'Ivoire, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Mali, Mozambique, Niger, Nigeria, Senegal, Somalia, South Africa, Sudan, and Eswatini (Swaziland) (CITES, 2011b, p. 1). Most countries removed from the review did not trade in hippo specimens (CITES, 2009b, pp. 11-13). Mozambique and South Africa were the only major hippo exporting countries retained in the second review (CITES, 2009b, p. 12).

Tanzania was not retained in the review because, according to the summary record of AC24:

> The representative of the United Republic of Tanzania provided information on *Hippopotamus amphibius* in that country, stating that, in 2001 the population was over 10,000 and was stable or increasing and the export quota was less than 3% of the total population. (CITES, 2009b, p. 11)

However, it should be noted that, if Tanzania's hippo population was, indeed, 10,000, then the annual export quota of the parts of 1,200 hippos is 12% of the total population, not "less than 3%." Furthermore, the percent offtake from a country's total population should not be the only metric reviewed. Impact of offtake must be examined on a biological population basis (if all 1,200 hippos were taken from one or a few hippo populations, this could be of biological concern).

For South Africa, a major hippo exporting country, a report considered by AC25 stated:

> Restricted mainly to the north-east, where it occurs as a relatively stable population of 3,000-5,000 individuals. The major stronghold in the Kruger National Park is regularly monitored. Regionally classified within the South African Red Data Book as "Least Concern." Poaching and killing in retaliation for crop damage are the major threats. Reported international trade is high, with the main items traded trophies, teeth, carvings, skin, plus other derivatives. Reported exports appear to be an over-estimate because re-exports are thought to be included in direct exports. Importer data is also far higher than data reported by South Africa (e.g., for tusks). It is unclear how nondetrimental findings take place for specimens lacking origin details. On this basis, categorized as Possible Concern. (UNEP-WCMC, 2010, p. 5)

Despite these problems, South Africa was ultimately eliminated from the second hippo review and the scientific basis of South Africa's hippo NDFs remains unknown to date.
Of those remaining in the second hippo review, only Cameroon and Mozambique continued to be part of the review after 2011.

For Cameroon, a report considered by AC25 stated:

> Widespread in Cameroon, with estimated population size of around 500-1500 individuals occurring at low densities. Little information available on status, and reportedly of conservation concern in Cameroon. Human conflict as a result of crop-raiding appears

> the main threat. Moderate levels of trade, with teeth and trophies the main terms traded; with importers declaring over five times the numbers of teeth imported than Cameroon reported exported 1999-2008. Legally protected, but other management measures unknown. No information on the basis for non-detriment findings provided, and impact of trade levels unknown, therefore categorized as Possible Concern. (UNEP-WCMC, 2010, p. 2)

Cameroon was given several recommendations from the AC and, as these were not implemented, the SC recommended that Parties suspend trade in hippo specimens from Cameroon (CITES, 2012b). Cameroon complied with the recommendations by 2017—including by presenting a hippo management plan to the AC (CITES, 2015)—and by establishing an annual export quota of 10 trophies (CITES, 2017a).

For Mozambique, a report considered by AC25 stated:

> Widespread and locally abundant with an estimated population size of 18,000 individuals, however whilst stable/increasing in a few areas, thought to be declining overall. Poaching and drought are the main threats. High levels of trade, with consistent exports of 50-90 trophies annually in recent years. Occurs in a number of protected areas yet level of protection unknown and management measures including a detailed basis for non-detriment findings are unknown. On this basis, categorised as Possible Concern. (UNEP-WCMC, 2010, p. 4)

Mozambique was given several recommendations from the AC and, as these were not implemented, the SC recommended that Parties suspend trade in hippo specimens from Mozambique (CITES, 2012b). The Standing Committee withdrew this recommendation in 2017, having been informed that Mozambique had complied with the recommendations (CITES, 2018). Mozambique provided two documents to the Secretariat: "Status, management and Non-Detriment Finding for *Hippopotamus amphibius* (Common Hippopotamus) in Mozambique" and the results of an aerial survey of hippos (CITES, 2017b, Annex 4). The survey, conducted in 2016, resulted in a minimum population estimate of greater than 8,000 based on an extrapolation of numbers of hippos observed to existence of other areas of suitable habitat (CITES, 2017b, pp. 9-10). Mozambique proposed an export quota of 80 trophies per annum, limited to males, which is less than 1% of the population (CITES, 2017b, p. 10). The Secretariat noted:

> The NDF document presented lays out in much detail the current situation of the population and compares it with earlier estimates and survey results done. In particular, it addresses the concerns linked to the estimate by the International Union for Conservation of Nature (IUCN) of around 18,000 animals that indicates a strong decline of the population of hippos in Mozambique. There appears to be good reasons to doubt those figures and they may have been an overestimate of the actual numbers. (CITES, 2017b, p. 11)

Indeed, this calls into question the population figures for all hippo populations provided in the oft-cited IUCN estimate by Eltringham (1993).

For Ethiopia, which has a 2021 hippo CITES export quota (20 kg raw ivory, wild taken; 6 trophies, wild-taken; 20 kg worked ivory, wild-taken), the report considered by the AC25 stated:

> Mainly occurs within the west of the country, and is reported to be widespread. The population is thought to be stable at around 5,000 individuals. The major threats are poaching for ivory, hide and bushmeat. Illegal local trade in carvings exists. The species is protected in the country. International trade levels are fairly low and trade remains within published quotas. On this basis, categorized as Least Concern. (UNEP-WCMC, 2010, p. 3)

However, no recommendations were made for Ethiopia.

Information on the results of the first and second reviews of significant trade are detailed in the summary table below (see Table 26).

Table 26. Results of the Review of Significant Trade for the hippo.

Range State	RST Recommendations	Results	Scientific Basis of NDF
Botswana	"Provide the Secretariat with detailed information on management measures in place to monitor wild populations of the species and implement the requirements of Article IV.2 of the Convention when authorizing exports" (CITES, 2001c, p. 10).	"The Secretariat is satisfied that adequate measures are in place to monitor wild populations of the species and implement the requirements of Article IV.2" (CITES, 2001c, p. 10). "The Secretariat believes that no further action is warranted at present" (CITES, 2001c, p. 11).	Unknown "The Secretariat has been informed by the Management Authority of Botswana that this species is fully protected in Botswana" (CITES, 2001c, p. 10). "The Management Authority of Botswana has indicated that no hunting for domestic use or exports for commercial purposes are authorized" (CITES, 2001c, pp. 10-11).
Democratic Republic of Congo	"Provide the Secretariat with detailed information on management measures in place to monitor wild populations of the species and implement the requirements of Article IV.2 of the Convention when authorizing exports" (CITES, 2001c, p. 17).	No response. Recommendation to Parties to suspend imports of specimens of the species from the Democratic Republic of the Congo (CITES, 2001b; 2001c, p. 17).	Not applicable
Cameroon	"a) The Management Authority should clarify what legal protection is afforded to this species in Cameroon and provide an	No response. Recommendation to Parties to suspend imports of specimens of the species from	Unknown "Maintain an annual export quota of 10 trophies until Cameroon provides information substantiating a

Range State	RST Recommendations	Results	Scientific Basis of NDF
	explanation for the perceived discrepancies between reported Customs data (imports) and CITES data (exports) referred to in AC25 Doc 9.4; b) Provide available information to the Secretariat on the distribution, abundance and conservation status and any current management measures in place for *H. amphibius* in Cameroon; and c) Provide justification for, and details of, the scientific basis by which it has been established that the quantities of *H. amphibius* exported were not detrimental to the survival of the species and in compliance with Article IV, paragraphs 2 (a) and 3" (CITES, 2011a, p. 7).	Cameroon (CITES, 2012b). Submitted hippo management plan (CITES, 2015). Established an annual export quota of 10 trophies (CITES, 2017a).	revision of this quota in compliance with Article IV, paragraphs 2 (a) and 3, of the Convention, including information on the establishment of non-detriment findings for trade in *H. amphibius*, and population status information" (CITES, 2016b, p. 8).
Ethiopia	No recommendations.	No recommendations.	Unknown
Malawi	"Provide the Secretariat with detailed information on management measures in place to monitor wild populations of the species and implement the requirements of Article IV.2 of the Convention when authorizing exports" (CITES, 2001c, p. 27).	No response. Recommendation to Parties to suspend imports of specimens of the species from Malawi (CITES, 2001b; 2001c, p. 27).	Unknown
Mozambique	First RST: "Provide the Secretariat with detailed information on management measures in place to monitor wild populations of the species and implement the requirements of Article IV.2 of the Convention	"The Management Authority of Mozambique has provided the Secretariat with some information about the implementation of Article IV concerning this species. The Secretariat believes that	Unknown

Range State	RST Recommendations	Results	Scientific Basis of NDF
	when authorizing exports" (CITES, 2001c, p. 29).	no further action is required provided that annual export quotas remain at the 2001 level" (CITES, 2001c, p. 29). *Note: Mozambique did not establish a hippo export quota until 2018 (53 wild-taken trophies) (CITES, 2022).*	
	Second RST: recommendations were carried over from previous RST.	Mozambique did not respond to recommendations and there was a recommendation to Parties to suspend trade in hippo with Mozambique. This was withdrawn	Unknown Mozambique provided two documents to the Secretariat: "Status, management and Non-Detriment Finding for *Hippopotamus amphibius* (Common Hippopotamus) in Mozambique" and the results of an aerial survey of hippos (CITES, 2017b, Annex 4).
Rwanda	"Provide the Secretariat with detailed information on management measures in place to monitor wild populations of the species and implement the requirements of Article IV.2 of the Convention when authorizing exports" (CITES, 2001c, p. 41).	No response. Recommendation to Parties to suspend imports of specimens of the species from Rwanda (CITES, 2001b; 2001c, p. 41).	Not applicable
South Africa	"Provide the Secretariat with detailed information on management measures in place to monitor wild populations of the species and implement the requirements of Article IV.2 of the Convention when authorizing exports" (CITES, 2001c, p. 43).	"No response. The Secretariat proposes that the Standing Committee recommends to all Parties that no imports of specimens of this species be accepted from South Africa until the actions recommended have been implemented" (CITES, 2001c, pp. 42-43).	Unknown

Range State	RST Recommendations	Results	Scientific Basis of NDF
		Notification to the Parties No. 2001/084, 19 December 2001, did not include South Africa (CITES, 2001b).	
Tanzania	"Provide the Secretariat with detailed information on management measures in place to monitor wild populations of the species and implement the requirements of Article IV.2 of the Convention when authorizing exports" (CITES, 2001c, pp. 48-49).	"No further action is required provided that the United Republic of Tanzania establishes a cautious export quota agreed with the Secretariat before 30 June 2001, and provides further details on population trends and the regulation of hunting of the species before 31 January 2002" (CITES, 2001a, p. 11). In 2001, Tanzania issued an annual export quota of 4,800 skins from 1,200 animals and 10,598 kg teeth; this was amended in 2003 to indicate that the 10,598 kg teeth was "teeth and hunting trophies from 1,200 animals" (TRAFFIC & IUCN/SSC Wildlife Trade Programme, 2004, p. 18).	Unknown "The Management Authority of the United Republic of Tanzania has confirmed that wet and dry season aerial surveys are used to monitor key populations. "Recommended terms for specimens on export documents and annual reports will be used and all teeth will be marked before export" (CITES, 2001c, pp. 48-49).
Zambia	"Provide the Secretariat with detailed information on management measures in place to monitor wild populations of the species and implement the requirements of Article	"The Secretariat is satisfied that adequate measures are in place to monitor the major wild population of the species and implement the requirements of	Unknown "The Secretariat has been informed by the Management Authority of Zambia that this species is fully protected and

Range State	RST Recommendations	Results	Scientific Basis of NDF
	IV.2 of the Convention when authorizing exports" (CITES, 2001c, p. 53).	Article IV" (CITES, 2001c, p. 53).	that all offtakes are regulated" (CITES, 2001c, p. 53).
Zimbabwe	"Provide the Secretariat with detailed information on management measures in place to monitor wild populations of the species and implement the requirements of Article IV.2 of the Convention when authorizing exports" (CITES, 2001c, p. 54).	"The Secretariat is satisfied that adequate measures are in place to monitor the major wild populations of the species and implement the requirements of Article IV" (CITES, 2001c, p. 54).	Unknown "The Secretariat has been informed by the Management Authority of Zimbabwe that this species is fully protected and that all offtakes are regulated and monitored" (CITES, 2001c, p. 54).

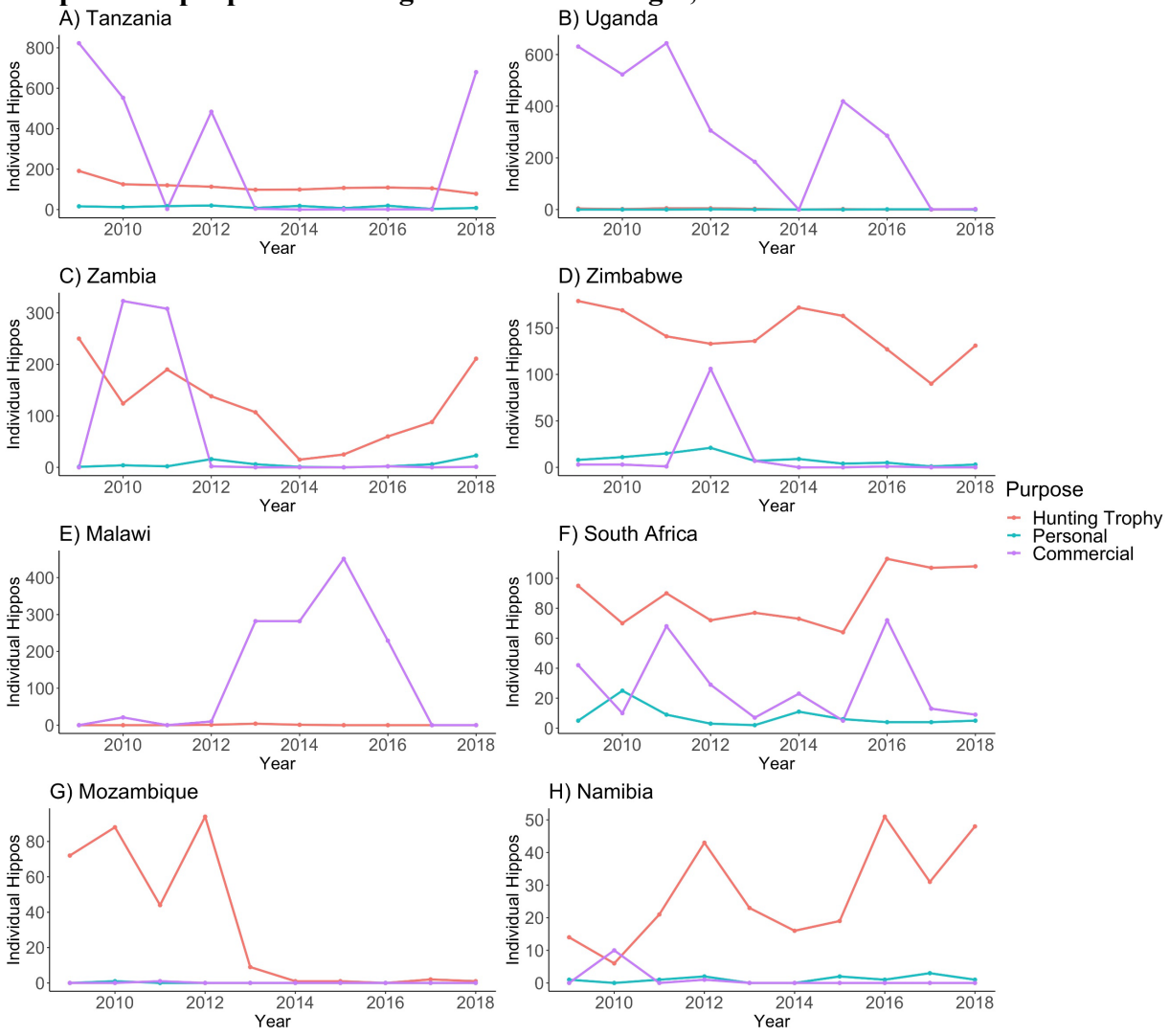
(2) Impact of CITES actions on hippo exports

As noted above, over the 24-year period, from 1994 to 2018, CITES took several actions to address trade in hippos. First, there was the Appendix II listing in 1994; this was followed by the first Review of Significant Trade (RST) that commenced in 1999; and this was followed by the second RST that commenced in 2004.

The impact of the Review of Significant Trade on the estimated number of hippos imported from range States is unclear and there are no discernable patterns (Figure 15). The top countries of origin of hippos in trade during 2009-2018 were: Tanzania, Uganda, Zambia, Zimbabwe, Malawi, South Africa, Mozambique, and Namibia (Table 8). For commercial purposes, numbers of hippos that originated in Tanzania initially fell, then rose, then fell, and ultimately ended the period at a level nearly as high as the period began. Uganda experienced two peaks in commercial trade over the period but ended the period with no commercial trade. Zambia, Zimbabwe, and Malawi each had one peak of commercial trade over the period (each country in a different year) but ended the period with no commercial trade. South Africa had two peaks of commercial trade and ended the period with low levels of commercial trade. Mozambique had no commercial trade over the period, while Namibia had one small blip of commercial trade in 2010 and then none thereafter.

Trade in hippos for trophy hunting purposes increased over the period for South Africa and Namibia; at first decreased then increased (in a U-shaped pattern) for Zambia; declined over the period for Tanzania, Uganda, and Mozambique; and was not a factor in Uganda and Malawi. Trade in hippos for personal purposes was low for all countries throughout the period.

Figure 15. Annual global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from eight countries of origin, 2009-2018.



Despite listing on CITES in 1994, and subsequent efforts to better control international trade in hippo specimens through the RST process, the conservation status of the hippo has continued to deteriorate over time and trade has continued (see Table 27).

Table 27. Deteriorating conservation status of the hippo.

Event	Year	IUCN Status
CITES Appendix III listing	1975	Not listed
CITES Appendix II listing	1994	Not listed
First RST	1999	Lower Risk / least concern (since 1996)
Second RST	2004	Lower Risk / least concern (since 1996)
Current IUCN Red List Assessment	2017	Vulnerable (since 2006)

(3) Conclusion

Despite listing on CITES Appendix III in 1975, and on CITES Appendix II in 1994, and two attempts to ensure that international trade in hippo specimens is in accordance with CITES and not detrimental to the species, the conservation status of the hippo has continued to decline. Substantial trade in hippo specimens continues from several range States. Although the hippo has been reviewed twice in the Review of Significant Trade process, the scientific basis of exports from the main exporting countries remains publicly unknown; the main exporting countries were excused from the process based on private discussions between the exporting countries, the CITES Secretariat and, on occasion, the chair of the CITES Animals Committee. The international trade in hippos has increased in most range States since the hippo was listed on CITES Appendix II and the conservation status of the species continues to deteriorate. Both legal and illegal trade in hippo ivory appears to continue despite these efforts. For all of these reasons, CITES actions to date have been inadequate to ensure that international trade is not detrimental to the survival of the species.

b) World Heritage Convention

The United Nations Educational, Scientific and Cultural Organization's (UNESCO) Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) was adopted in 1972 (UNESCO, 1972) and became effective in 1975. There were one hundred and ninety-three State Parties to the Convention as of 28 July 2021 (UNESCO, 2021a).

The World Heritage Convention establishes a World Heritage Committee, which selects World Heritage Sites nominated by State Parties (UNESCO, 1972). According to the Convention, these sites may include "geological and physiographical formations and precisely delineated areas which constitute the habitat of threatened species of animals and plants of outstanding universal value from the point of view of science or conservation" (UNESCO, 1972, p. 2). They may also include "natural sites or precisely delineated natural areas of outstanding universal value from the point of view of science, conservation or natural beauty" (UNESCO, 1972, p. 2).

Under the Convention, each State Party that is home to a World Heritage Site must endeavor to protect that Site through a variety of means (UNESCO, 1972). The State Parties also commit to assist in the protection of World Heritage Sites located in other states if such state requests assistance (UNESCO, 1972). State Parties also pledge not to take "any deliberate measures which might damage directly or indirectly the cultural and natural heritage" of a World Heritage Site in another state (UNESCO, 1972, p. 4).

Many World Heritage Sites provide habitat for wildlife, including hippo, and thus can contribute to hippo conservation. For example, Botswana's Okavango Delta, Tanzania's Selous Game Reserve, the Democratic Republic of Congo's Virunga National Park, and South Africa's Isimangaliso Wetland Park are all World Heritage Sites that provide hippos with critical habitat (UNESCO, 2021d). Of these sites, only one (the Selous Game Reserve) has an inscription that specifically references hippos (UNESCO, 2021c).

The World Heritage Convention offers many benefits. For example, it provides opportunities for State Parties in which World Heritage Sites are located to obtain funding to help protect such sites via the World Heritage Fund (UNESCO, 1972). However, the extent to which a World Heritage Site is protected is largely dependent on the home country's capacity and interest in conservation (UNESCO, 1972). Indeed, neither the World Heritage Committee, nor UNESCO, nor the United Nations has any power to force changes in World Heritage Site management upon governments, public agencies, or private parties in any country. Further, Selous Game Reserve and Virunga National Park, among other World Heritage Sites that provide hippo habitat, are on the list of "World Heritage in Danger," which includes sites that are in potential or ascertained danger, in this case because of rampant poaching and habitat degradation in those areas (UNESCO, 2021b). While providing important benefits for hippo conservation, the World Heritage Convention cannot be considered adequate to protect the species or reverse its current decline.

c) Convention on Migratory Species

As its name implies, the Convention on Migratory Species (CMS) is designed to protect species that migrate across or outside national boundaries. The Convention protects species that cyclically and predictably cross one or more boundaries, CMS, Art. I.a, by placing species on one or both appendices. Appendix I is for endangered species or those that "are endanger of extinction throughout all or a significant portion of their range." CMS, Art. I.1.e. Appendix II is for species that "have an unfavorable conservation status and require international agreements or would significantly benefit from international agreements." CMS, Art. IV.1. Range States are to prohibit take of Appendix I species and create agreements that protect habitat for Appendix II species. CMS, Art. III.5, Art. V. The hippo is not listed on the appendices and, therefore, is not protected by this Convention.

2. Regional agreements

a) African Union

The African Union (AU) is the organizational body created to provide an arena to discuss and develop Africa-wide resolutions and conventions (AU, 2021a). Formed in 1992 as the successor to the Organization of African Unity, which was created in 1963, the AU's member states include 55 African States (AU, 2021b).

The African Convention on the Conservation of Nature and Natural Resources, entered into force in 1969, is one such convention that requires contracting states to "adopt measures to ensure conservation, utilization, and development of soil, water, flora, and faunal resources in accordance with scientific principles and with due regard to the best interests of the people" (p. 5). The Convention lists the hippo as a "Class B" species which, according to the Convention, "shall be totally protected, but may be hunted, killed, captured or collected under special authorization granted by the competent authority" (African Convention on the Conservation of Nature and Natural Resources, 1968, p. 17). While 31 countries have ratified the Convention, many with hippo populations have not, including the major hippo exporting countries of South

Africa and Zimbabwe (African Convention on the Conservation of Nature and Natural Resources, 1968). Moreover, the Convention does not contain any enforcement mechanisms to address noncompliance and does not designate the role and frequency of meetings to update the agreement. While the Convention has the potential to aide hippo conservation in the future, its lack of adoption by key range states and ineffective implementation mechanisms currently make it inadequate to address the threats and precipitous decline hippos are experiencing throughout their range.

b) Southern Africa Development Community Protocol on Wildlife Conservation and Law Enforcement

The Southern Africa Development Community (SADC), an inter-governmental organization of Southern African states (SADC, 2021), developed the Protocol on Wildlife Conservation and Law Enforcement in 1999 (SADC, 1999). The Protocol, which entered into force in 2003, creates guidelines to foster international cooperation to ensure the "conservation and sustainable use of wildlife resources" under the jurisdiction of each member state (SADC, 1999, p. 3). Protocol mandates the development and enforcement of legal instruments necessary to conserve wildlife resources (SADC, 1999, Article 6), as well as the development and integration of conservation programs (SADC, 1999, Article 7). It also allows for sanctions if a state is not implementing conservation policies (SADC, 1999, Article 12).

The Protocol, however, also promotes "sustainable use" of wildlife, which can include commercial and recreational use of species, but goes no further in determining under what parameters sustainable use can occur for hippos or other species. Thus, hippo conservation has not benefited from the Protocol and it will not protect the species or aide in its recovery.

c) National laws

(1) Range countries

Hippo range States have various levels of legal protection for hippos (Table 28). Of the top six hippo exporting range States (2009-2018) identified in this Petition, the hippo is totally protected in one, Malawi. The hippo is partially protected in four: Tanzania, Uganda, Zambia, and Zimbabwe. The hippo is not a protected species in South Africa or Uganda.

Hippo range States also have varying levels of criminality pertaining to fauna (Table 28). The top five hippo exporters (removing Malawi where hippos are now protected), three have very high 2021 criminality scores for fauna (globally, the highest 2021 criminality score for fauna is China with a score of 9.50): Tanzania, 8.00; South Africa, 7.50; and Zimbabwe, 7.50. Uganda scored a 6.50 and Zambia a 4.50.

It is important to note that according to the CITES Trade Database, wild-source hippo specimens in trade for commercial, hunting trophy, and personal purposes between 2009 and 2018 included those that originated in range States where hippos are legally protected; see Section IV.B.1.b)(3). These countries are: Burkina Faso (one trophy which is equivalent to one hippo), Cameroon (11

trophies and 199 teeth which are equivalent to 28 hippos), Central African Republic (one trophy which is equivalent to one hippo), Democratic Republic of the Congo (3 kg of ivory which is equivalent to one hippo), Kenya (12 teeth which is equivalent to one hippo), and Malawi (two trophies, two skulls, 24 teeth, and 6,683 kg of ivory which are equivalent to 1,279 hippos).

Despite legal protection and enforcement efforts, illegal and unregulated hunting of hippos is a primary threat to the species indicating the inadequacy of these measures (Lewison & Pluháček, 2017a).

Table 28. Legal protection and criminality score of hippo range States.

Range State Top five hippo exporters in BOLD	Legal Protections as per IUCN Assessment[47]	Original Research for this Petition Legal Protection	2021 Criminality Score for Fauna Crimes[48] (10 is highest level of criminality)
Angola	Unknown	Hunting prohibited (since 2016).[49]	4.50
Benin	Unknown	Males are partially protected (since 2011); hunting and capture of males allowed by permit; females and young totally protected.[50]	5.50
Botswana	Total protection	Partially protected (since 2008); hunting, capture, utilization allowed by permit; no age or sex restrictions.[51]	7.50
Burkina Faso	Total protection	Totally protected (since 1996); hunting for recreational or commercial purposes prohibited.[52]	6.00
Burundi	Partial protection	Partially protected (since 1937); hunting allowed by permit; no age or sex restrictions.[53]	4.50
Cameroon	Total protection	Totally protected (since 2006); hunting for subsistence, recreational or commercial purposes prohibited.[54]	7.50

[47] See Lewison, R., & Pluháček, J. (2017b). *Supplementary Information: Common hippopotamus (Hippopotamus amphibius)* The IUCN Red List of Threatened Species. https://www.iucnredlist.org/species/10103/18567364
[48] See Global Initiative Against Transnational Organized Crime. (2021b). *Global Organized Crime Index 2021*. https://ocindex.net/. Globally, the highest fauna criminality scores are for China (9.0), Brazil (8.50), and Viet Nam (8.50). The following hippo range States have the next highest fauna criminality scores (8.0): Central African Republic, Democratic Republic of Congo, Mozambique, and Tanzania. Hippo range States with a fauna criminality score of 7.5 are: Botswana, Cameroon, South Africa, and Zimbabwe.
[49] Decreto Executivo Conjunto n.º 201/16 de 26 de Abril de 2016. http://extwprlegs1.fao.org/docs/pdf/ang155323.pdf .
[50] Guide on wildlife laws in Benin. https://www.laga-enforcement.org/media/legal_library/Benin/Legal_Benin_Book_Fr.pdf .
[51] FAO, FAOLEX Database, Botswana. http://www.fao.org/faolex/results/details/en/c/LEX-FAOC004728 .
[52] FAO, FAOLEX Database, Burkina Faso. http://www.fao.org/faolex/results/details/en/c/LEX-FAOC004885 .
[53] FAO, FAOLEX Database, Burundi. http://www.fao.org/faolex/results/details/en/c/LEX-FAOC004492 .
[54] FAO, FAOLEX Database, Cameroon. http://www.fao.org/faolex/results/details/en/c/LEX-FAOC195744.

Range State Top five hippo exporters in BOLD	Legal Protections as per IUCN Assessment[47]	Original Research for this Petition Legal Protection	2021 Criminality Score for Fauna Crimes[48] (10 is highest level of criminality)
Central African Republic	Unknown	Totally protected (since 1984); hunting or capture prohibited.[55]	8.00
Chad	Unknown	Partially protected for adult males (since 2008); only adult males may be hunted by permit; females and young totally protected.[56]	3.50
Congo	Unknown	Totally protected from hunting (since 2008).[57]	7.00
Côte d'Ivoire	Unknown	Partially protected for adult males; can be hunted or captured under a license or permit (since 1965); females and young totally protected.[58]	6.50
Democratic Republic of Congo	Unknown	Totally protected from capture, hunting, harassing, and deliberate killing (since 2006); illegal to detain, give, sell, exchange, transport any products announcing to contain a product derived from hippos and illegal to publicly exhibit these specimens.[59] However, reportedly, a decree[60] issued in July 2020 established a permit system for hunting of totally protected species including hippo.	8.00
Equatorial Guinea	Partial protection	Not protected.[61]	5.00

[55] Ordonnance N° 84.045 du 27 juillet 1984 portant protection de la faune sauvage et règlementant l'exercice de la chasse en République Centrafricaine. https://cf.chm-cbd.net/implementation/loisnation/legislation-faunique-et-cynegetique/codefaunerca84.pdf .

[56] Law n° 14/PR/2008 on forests, wildlife regime and fish resources and order n°14-63 du 23 mars 1963 regulating hunting and ensuring nature protection listing animals integrally and partially protected. https://docplayer.fr/55783446-Loi-n-14-pr-2008-portant-regime-des-forets-de-la-faune-et-des-ressources-halieutiques.html and http://extwprlegs1.fao.org/docs/pdf/cha4171.pdf.

[57] Law nº 37-2008 on fauna and protected areas and order n° 6075 of 9 April 2011 listing animals integrally and partially protected. http://www.fao.org/faolex/results/details/en/c/LEX-FAOC086726 and http://www.fao.org/faolex/results/details/en/c/LEX-FAOC105724.

[58] Law n° 65-225 related to fauna protection and hunting activities. https://www.eagle-ivorycoast.org/wp-content/uploads/2017/07/TEXTES-REGISSANT-LA-PROTECTION-DE-LA-FAUNE-RCI.pdf + http://www.fao.org/faolex/results/details/en/c/LEX-FAOC089113.

[59] Law n° 14/003 of 11 February 2014 related to nature conservation + order n° 020/CAB/MIN/ECN-EF/2006 listing protected species in DRC. http://www.fao.org/faolex/results/details/en/c/LEX-FAOC140376 + https://www.droitcongolais.info/7a-subdivision-n%C2%B0-rs-71-734.html.

[60] Decree n ° 006 / CAB / MIN / EDD / 2020 and n° CAB / MIN / FINANCES / 2020/069 of July 24, 2020. https://savevirunga.com/2021/08/09/environmental-civil-society-urges-dr-congo-to-reverse-pay-to-poach-decision/

[61] UNEP-WCMC. (2010). *Review of Significant Trade: Species selected by the CITES Animals Committee following CoP14.* (AC25 Doc. 9.4 Annex). https://cites.org/sites/default/files/eng/com/ac/25/E25-09-04A.pdf: "The CITES MA of Equatorial Guinea (Engonga Osono *pers. comm*. to UNEP-WCMC, 2010) reported that there were no specific regulations concerning the extraction *H. amphibius* from the wild." (p. 16).

Range State Top five hippo exporters in BOLD	Legal Protections as per IUCN Assessment[47]	Original Research for this Petition Legal Protection	2021 Criminality Score for Fauna Crimes[48] (10 is highest level of criminality)
Eswatini (Swaziland)	Total protection	Partially protected (since 1991);[62] can be hunted and traded under permit; possession of trophies or raw products allowed under permit; no age or sex restrictions.	2.00
Ethiopia	Total protection	Adult males partially protected (since 2009); hunting and export allowed under permit; females and juveniles totally protected.[63]	5.50
Gabon	Total protection	Totally protected (since 2011); hunting, capture, possession, commercialization or transport is prohibited.[64]	7.00
Gambia	Total protection	Partially protected (since 2003); except in protected areas, male and female adult hippos can be hunted with a valid license; immature animals and females with young are totally protected; export is allowed under permit; domestic sale is not allowed.[65]	3.5
Ghana	Total protection	Totally protected from hunting, capturing or destruction (since 1971).[66]	6.00
Guinea	Total protection	Partially protected (since 2018); can be hunted if authorized by the authority in charge of wildlife and protected areas.[67]	6.00
Guinea Bissau	Total protection	Totally protected (since 2004).[68]	5.50
Kenya	Total protection	Totally protected (since 2013); hunting, killing, capturing, wounding with intent to hurt a hippo is forbidden; import/export of hippo prohibited.[69]	7.00

[62] Game (Amendment) Act, 1991 (Act No. 4 of 1991). http://www.fao.org/faolex/results/details/en/c/LEX-FAOC019265.
[63] Wildlife Development, Conservation and Utilization Council of Ministers Regulations No. 163/2008. http://extwprlegs1.fao.org/docs/pdf/eth136632.pdf .
[64] Decree No. 0164/PR/MEF of January 19, 2011. http://extwprlegs1.fao.org/docs/pdf/gab143605.pdf.
[65] Biodiversity and Wildlife Act, 2003. http://www.fao.org/faolex/results/details/en/c/LEX-FAOC158129.
[66] Wildlife Conservation Regulations, 1971 (L.I. 685). http://www.fao.org/faolex/results/details/en/c/LEX-FAOC158129.
[67] Ordinary Law N° 2018/0049/AN codifying the protection of wild fauna and regulation hunting activities. https://www.fao.org/faolex/results/details/en/c/LEX-FAOC202413.
[68] Decree-Law No. 2/2004 establishing the basic norms for protection, promotion and exploitation of Wildlife. http://www.fao.org/faolex/results/details/en/c/LEX-FAOC119745.
[69] Wildlife Conservation and Management Act, 2013 (No. 47 of 2013) + Wildlife Conservation and Management (Protection of Endangered and Threatened Ecosystems, Habitats and Species) Regulations, 2017 (L.N. No. 242 of 2017). http://www.fao.org/faolex/results/details/en/c/LEX-FAOC134375 and http://www.fao.org/faolex/results/details/en/c/LEX-FAOC170719.

Range State Top five hippo exporters in BOLD	Legal Protections as per IUCN Assessment[47]	Original Research for this Petition Legal Protection	2021 Criminality Score for Fauna Crimes[48] (10 is highest level of criminality)
Malawi	Unknown	Adult males and females, partially protected (since 1994); hunting and taking are allowed under license; export allowed under permit; dependent young and females with dependent young are totally protected from hunting.[70]	6.00
Mali	Unknown	Partially protected from 1995 until 2019; now totally protected.[71]	5.50
Mozambique	Total protection	Partially protected (since 1999);[72] adults of either sex may be hunted, including for sport or commerce; as of 2017, young, pregnant females or females with their young are totally protected.[73]	8.00
Namibia	Partial protection	Partially protected (since 1975);[74] can be hunted under permit;[75] no age or sex restrictions.	4.50
Niger	Unknown	Totally protected (since 1998);[76] cannot be hunted for commercial purposes; law provides for sport hunting under Ministerial decree, but there is no such decree; Niger reportedly banned hunting, including hippos, in January 2001 (BBC News, 2001).	4.50
Nigeria	Partial protection	Totally protected (since 1991);[77] cannot be killed, hunted or captured except under special license issued for scientific or administrative	6.50

[70] National Parks and Wildlife (Protected Species) (Declaration) Order, 1994 (G.N. No. 89 of 1994), National Parks and Wildlife Act (Act No. 11 of 1992), and National Parks and Wildlife (Amendment) Act, 2017 (No. 11 of 2017). http://www.fao.org/faolex/results/details/en/c/LEX-FAOC004733, http://www.fao.org/faolex/results/details/en/c/LEX-FAOC006885, and http://www.fao.org/faolex/results/details/en/c/LEX-FAOC169263.

[71] Since 1995, the common hippo was partially protected (http://extwprlegs1.fao.org/docs/pdf/mli4015.pdf), and hunting and capture allowed under license. Since 2019, the common hippo has been integrally protected (Decree n°2019-0887/P-RM of 05 November 2019, p. 1612; https://sgg-mali.ml/JO/2019/mali-jo-2019-41.pdf). As such, hippos cannot be hunted and trade, sale, offering for sale of hippo products is forbidden. http://www.fao.org/faolex/results/details/en/c/LEX-FAOC180235.

[72] Law No. 16/2014 on Protection, Conservation and Sustainable Use of Biodiversity (http://www.fao.org/faolex/results/details/en/c/LEX-FAOC168082) and Law No. 10/99 on Forest and Wildlife Act (https://www.fao.org/faolex/results/details/en/c/LEX-FAOC020106).

[73] Decreto n. º 82/2017 de 29 de Dezembro approving the hunting regulation. https://www.fao.org/faolex/results/details/en/c/LEX-FAOC196855.

[74] Nature Conservation General Amendment Act, 1990. http://extwprlegs1.fao.org/docs/pdf/nam50360.pdf.

[75] Nature Conservation Ordinance, 1975 (No. 4 of 1975). http://www.fao.org/faolex/results/details/en/c/LEX-FAOC018007.

[76] Law nº 98-07 establishing hunting and wildlife protection regime. http://www.fao.org/faolex/results/details/en/c/LEX-FAOC080736.

[77] Wild Animals Preservation Law. http://www.fao.org/faolex/results/details/en/c/LEX-FAOC194026.

Range State Top five hippo exporters in BOLD	Legal Protections as per IUCN Assessment[47]	Original Research for this Petition Legal Protection	2021 Criminality Score for Fauna Crimes[48] (10 is highest level of criminality)
		purposes in exceptional circumstances; immature or female hippos accompanied by their young cannot be killed.	
Rwanda	Total protection	Totally protected (since 2008);[78] cannot be hunted, sold, injured, or killed.[79]	5.00
Senegal	Total protection	Totally protected (since 1986);[80] generally cannot be hunted or captured.	7.00
Sierra Leone	Unknown	Partially protected (since 1972);[81] classified as a "game animal" which allows hunting of adults under license; no age or sex restrictions.	6.50
Somalia	Unknown	Totally protected (since 1969);[82] generally cannot be hunted, killed, or captured.	4.50
South Africa	Total protection	Partially protected (since: unknown);[83] export requires permit issued by national authority; no other national-level management or protection (Kruger National Park culls hippos); some provincial and local management plans and policies exist especially for killing hippos as damage-causing animals (Scientific Authority of South Africa, 2011); killed for hunting trophies, population management and as damage-causing animals.	7.50
South Sudan	Partial protection	Partially protected (since 2003);[84] can be hunted or captured with license, permit or	7.00

[78] Ministerial Decree nº 007/2008 establishing the list of protected animal and plant species https://www.primature.gov.rw/index.php?id=42&no_cache=1&L=152&tx_drblob_pi1%5BdownloadUid%5D=580.
[79] Law N°48/2018 of 13/08/2018 on environment. http://www.fao.org/faolex/results/details/en/c/LEX-FAOC093799.
[80] Decree No. 86-844 on the Hunting and Wildlife Protection Code - Regulatory Part. https://www.fao.org/faolex/results/details/en/c/LEX-FAOC004473; Law No. 86-04 on Hunting and Nature Protection Code, https://www.fao.org/faolex/results/details/en/c/LEX-FAOC004472.
[81] Wildlife Conservation Act, 1972 (No. 27 of 1972). http://www.fao.org/faolex/results/details/en/c/LEX-FAOC041659
[82] Law on Fauna (Hunting) and Forest Conservation (No. 15 of 1969). http://www.somalilandlaw.com/Law_on_Fauna_Hunting_and_Forest_Conservation_1969.pdf.
[83] Not protected under the Threatened or Protected Species Regulations, 2015 (Notice No. 255 of 2015). http://extwprlegs1.fao.org/docs/pdf/saf146021.pdf ; not listed as "protected species" in terms of section 56(1)(d) of the Biodiversity Act; "hippo culling has been reinstated in the KNP, where a population of over 7,000 hippos was recently recorded." Eksteen J, Goodman P, Whyte I, Downs C, Taylor R. 2016. A conservation assessment of Hippopotamus amphibius. In Child MF, Roxburgh L, Do Linh San E, Raimondo D, Davies-Mostert HT, editors. The Red List of Mammals of South Africa, Swaziland and Lesotho. South African National Biodiversity Institute and Endangered Wildlife Trust, South Africa. https://www.ewt.org.za/wp-content/uploads/2019/02/11.-Hippopotamus-Hippopotamus-amphibius_LC.pdf.
[84] Wild Life Conservation and National Parks Act, 2003. http://www.fao.org/faolex/results/details/en/c/LEX-FAOC152460.

Range State Top five hippo exporters in BOLD	Legal Protections as per IUCN Assessment[47]	Original Research for this Petition Legal Protection	2021 Criminality Score for Fauna Crimes[48] (10 is highest level of criminality)
		written authorization; no restrictions based on age or sex.	
Sudan	Partial protection	Partially protected (since 1986);[85] can be hunted under license; purchase and sale of hippo parts is permissible.	5.50
Tanzania	Total protection	Partially protected (since 2009);[86] hippos may be hunted, captured, and exported under permit; killing of young animals, pregnant females, and females accompanied by young is prohibited.	8.00
Togo	Total protection	Partially protected (since 1968);[87] hunting of adult males for recreational purposes, and capture of any aged or sex, allowed under permit.	6.00
Uganda	Total protection	Partially protected (since 1996);[88] hunting, farming, ranching, trading, import, export, re-export allowed under permit; no hunting restrictions based on age or sex; on 15 July 2013, hippo ivory trade and export reportedly was banned (Kazibwe, 2017).	6.50
Zambia	Partial protection	Partially protected (since 2006);[89] can be hunted, captured, purchased, sold, imported, exported under license or permit; hunting of dependent young or females accompanied by dependent young prohibited.	4.50
Zimbabwe	Partial protection	Partially protected (since 1975);[90] prohibited to hunt, take, sell, import or export except under	7.50

[85] Wildlife and National Parks Protection Act of 1986. https://www.fao.org/faolex/results/details/en/c/LEX-FAOC197764.
[86] Wildlife Conservation Act (No. 5 of 2009). http://www.fao.org/faolex/results/details/en/c/LEX-FAOC097858.
[87] Ordonnance nº4 du 16 janvier 1968 réglementant la protection de la faune et l'exercice de la chasse au Togo, http://extwprlegs1.fao.org/docs/pdf/Tog4270.pdf.
[88] Uganda Wildlife Act,, 1996. https://www.fao.org/faolex/results/details/en/c/LEX-FAOC009000. Repealed and replaced by Uganda Wildlife Act, 2019. http://www.fao.org/faolex/results/details/en/c/LEX-FAOC192396.
[89] National Parks and Wildlife Act (Chapter 201), 2006. https://www.parliament.gov.zm/sites/default/files/documents/acts/National%20Parks%20and%20Wildlife%20Act.pdf; Zambia Wildlife Act, 2015 (No. 14 of 2015). http://www.fao.org/faolex/results/details/en/c/LEX-FAOC163735 ; Zambia Wildlife (Protected Animals) Order, 2016 (S.I. No. 42 of 2016). http://www.fao.org/faolex/results/details/en/c/LEX-FAOC191043.
[90] Parks and Wild Life Act [Chapter 20:14], 1975 (amended last in 1991). https://www.law.co.zw/download/parks-and-wild-life-act-chapter-2014/ ; Parks and Wild Life (General) Regulations, 1981. http://extwprlegs1.fao.org/docs/pdf/zim17711.pdf ; Parks and Wild Life (Payment for Hunting of Animals and Fish) Notice, 1987. http://extwprlegs1.fao.org/docs/pdf/zim17713.pdf.[91] As explained above, if the Service lists the

Range State Top five hippo exporters in BOLD	Legal Protections as per IUCN Assessment[47]	Original Research for this Petition Legal Protection	2021 Criminality Score for Fauna Crimes[48] (10 is highest level of criminality)
		permit; no hunting restrictions based on age or sex.	

(2) United States

(a) Endangered Species Act

The Endangered Species Act (ESA) (16 U.S.C. §§ 1531-1544) is one of the most comprehensive laws governing wildlife conservation in the United States. Under Section 4 of this law, the U.S. Fish and Wildlife Service must "list" species as either "endangered" or "threatened," depending on the extent of the threats to their existence. 16 U.S.C. § 1533. The term "species" includes "any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature." *Id*. § 1532(16). Once a species is listed as endangered, Section 9 of the ESA bans the species' import, export, and take, along with interstate commerce in the species, with limited exceptions. *Id.* § 1538(a). When a species is listed as threatened, the Service must issue regulations "to provide for the conservation of" the species. *Id.* § 1533(d). The ESA defines the term "conservation" as "the use all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to [the ESA] are no longer necessary." *Id*. § 1532(3).

Under Section 10 of the ESA, otherwise prohibited acts can be permitted if it will "enhance the propagation or survival of the affected species" or is for scientific research consistent with the conservation purpose of the ESA. 16 U.S.C. § 1539(a)(1)(A); 50 C.F.R. §17.22. As the plain language of the statute makes clear, enhancement permits may only be issued for activities that *positively benefit* the species in the wild. *See also* USFWS Handbook for Endangered and Threatened Species Permits (1996) (making clear that an enhancement activity "must go beyond having a neutral effect and actually have a positive effect").

The hippo is not currently listed under the ESA. Thus, the law currently does nothing to protect the species.

Listing hippos under the ESA would provide critical protections to this imperiled species, particularly because the United States is the top importer of hippo specimens, and the sale of hippo products is prevalent in the United Sates. See Sections IV.B.1, IV.B.2. If the Service grants Petitioners' request, U.S. imports and exports of hippo parts, products (e.g., carvings, teeth, skins, leather products, feet), and trophies would be limited to only those that the Service

species as threatened rather than endangered, all the prohibitions in Section 9 should be extended to the species through a 4(d) rule. See supra footnote 1.

determines are for scientific purposes or that enhance the propagation or survival of the species.[91] This is especially important given that hippos' inclusion on CITES Appendix II has failed to adequately protect the species. See Section IV.D.1.a). In addition, if the Service grants Petitioners' request, a scientific purpose or enhancement finding would be required for interstate commerce in hippo parts and products; this activity is not currently regulated at the federal level. An ESA listing will also benefit hippos by increasing awareness of the species' threats and generating funding for scientific research and in-situ conservation of the species in range States.

(b) Lacey Act

The Lacey Act, passed by Congress in 1900, has three primary purposes. First, it prohibits the import, export, transport, acquisition, receipt, sale, or purchase or attempt to engage in such acts of any fish or wildlife taken, possessed, transported, or sold in violation of any U.S. law, treaty, or regulation; state wildlife law or regulation; Indian tribal law; or foreign law. 16 U.S.C. § 3372(a). Second, the Act makes it illegal to import, export, or transport in interstate commerce, any container or package containing fish or wildlife unless it has been plainly marked, labeled, or tagged in accordance with FWS requirements. *Id.* § 3372(b). Third, the Lacey Act prohibits the falsification of information, records, or accounts regarding species that have been imported, exported, transported, sold, purchased, or received in interstate or foreign commerce. *Id.* § 3372(d). While the Act is among the most important wildlife trade laws in the United States, its prohibition on import/export/transport, etc. does not apply to a species unless such species is protected under U.S., foreign, or international law and the specimen was imported or sold in violation of those protections. The hippo is listed on CITES Appendix II and is specifically or fully protected by the legal regimes of some foreign countries, including many hippo range States. Thus, the Lacey Act might benefit hippos, but given the species continued decline and the absence of comprehensive protections for hippos under domestic state and federal law, it is not currently adequately protecting hippos. The analysis of the significant illegal trade in hippos and under reporting by range States demonstrates this point.

E. Other natural or manmade factors affecting its continued existence

In addition to the threats mentioned above, hippo skin, meat, gallbladder, teeth, blood, and fat have been historically used for traditional and medicinal purposes in parts of Africa, and some of these uses continue in present day (CITES, 1994, 2002; Haule et al., 2002; Kamatenesi-Mugisha & Oryem-Origa, 2007; Moreto & Lemieux, 2015; Osborn & Helmy, 1980, p. 479; Vats & Thomas, 2015). In Uganda, consumption of hippo meat is believed to increase a woman's fertility and chances of bearing a son (Moreto & Lemieux, 2015); meat and skin have also been reported to induce labor and to remove retained placenta (Kamatenesi-Mugisha & Oryem-Origa, 2007). In addition to reproductive medicinal uses of hippo meat, it has been used for sacrificial purposes and in exchange for labor (Haule et al., 2002). Skin is reported to have a variety of purposes, such as medicinal (cure for cancer and removal of swelling and inflammation), protective (Osborn & Helmy, 1980, p. 479), and for crafting ropes (CITES, 1994, pp. 171-172). Hippo gallbladder is said to cure a black eye (Osborn & Helmy, 1980, p. 479), and their blood is

[91] As explained above, if the Service lists the species as threatened rather than endangered, all the prohibitions in Section 9 should be extended to the species through a 4(d) rule. See supra footnote 1.

believed to treat HIV (Vats & Thomas, 2015). Teeth have been reported to be used for ornamental purposes (Haule et al., 2002) and medicinally to treat stomach aches (Osborn & Helmy, 1980, p. 479).

V. CONCLUSION

This Petition presents substantial scientific and commercial information indicating that the petitioned action – listing the *Hippopotamus amphibius* under the ESA – is warranted. *See* 50 C.F.R. § 424.14(h)(1)(i). Therefore, Petitioners expect that the Service will promptly issue a positive 90-day finding on this Petition. 16 U.S.C. § 1533(b)(3).

Despite being such an iconic species, very little is known about hippo behavior, ecology, or regional population sizes. The hippo is threatened by factors that act synergistically to drive population declines and put the species at risk of future extinction. These threats include habitat loss and fragmentation; legal overutilization for commercial and recreational purposes; pervasive poaching for illegal hunting and trade; and the inadequacy of existing regulatory mechanisms. Any one of these threats is sufficient to merit listing under the ESA. *See* 16 U.S.C. § 1533(a)(1); *see also Sw. Ctr. for Biological Diversity v. Babbitt*, 215 F.3d 58, 60 (D.C. Cir. 2000) (listing required if "any of § 1533(a)(1)'s five factors are sufficiently implicated"). The combination of these threats and others, such as disease, puts the conservation status of the species at significant risk. Immediate action is necessary to help protect and conserve the common hippopotamus. Listing the hippo under the ESA is imperative to prevent the decline of the species and to promote its conservation both in the United States and in its range countries, as required by law.

The United States is the top importer of hippo parts and products including hippo trophies, teeth, ivory carvings and skin products, and a world leader in conservation; and as such, the United States is uniquely positioned to take leadership in hippo conservation. As hippos face danger of extinction throughout all or a significant portion their range, a successful listing under the ESA would protect and preserve hippos in several ways. Namely, it would restrict the import into the United States, and interstate commerce within the United States, of hippo parts and products unless the activity enhances the propagation or survival of the species or is for scientific purposes. Protection under the ESA would also raise public and international awareness about the regional population declines of these unique species and allow the United States to provide hippo range states with assistance and support for the development and management of conservation programs for the species. It is imperative that the United States act now as a top consumer and take a leading role in saving the common hippopotamus from the threat of extinction.

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APPENDIX

Methodology and Preliminary Comments

CITES Trade Database

This Petition presents original analysis of data on the legal trade in hippos and their parts and products. Raw data were obtained from the CITES Trade Database on February 18th, 2021. The ultimate purpose of this analysis is to determine the impact of these uses on conservation of the species in the wild. Calculating the number of hippos in trade based on thousands of hippo specimens in trade, consisting of dozens of types, and the countries from which they originated, is key to understanding the impact of use on the conservation of wild hippo populations.

It must be noted that the CITES Trade Database has several limitations. First, the Database includes data reported by CITES member States (Parties) which, for various reasons, may not always be accurate. Second, the data cannot be used to determine the extent of the illegal trade because illegal trade is, by its very nature, not recorded; the exception is specimens that are seized, which may be recorded by Parties in their CITES Annual Report. Third, while the analysis presented below primarily focuses on the ten-year timespan between 2009 and 2018, inclusive, the hippo specimens traded during that time, as reflected in the CITES Database, may not have been sourced from hippos that died naturally or were killed in that same time period. Specimens in trade may have been sourced from stockpiles of these products that were taken from hippos killed or that died during different time periods. The CITES Database does not provide information on the age of the traded specimen.

In this Petition, comparative tabulations downloaded from the CITES Trade Database were used for all cases as it is the most comprehensive type of data output. It provides information on the reported specimens in trade which is not available in gross/net trade output types (source of specimen, purpose of transaction, specimen's origin country, specimen' exporting country) (CITES, 2013). For all cases in the data analysis conducted for this Petition, only importer reported quantities were used. This Petition investigated the role of the United States in the international trade of hippos and using the quantities that the United States reported will be the most relevant.

Finally, the Database presents trade data with and without units of measurement (i.e., kilograms, grams, feet squared, meters squared, milliliters, centimeters, etc.), complicating the calculation to estimate the number of hippos whose parts are in international trade. In the case where a specimen's importer reported quantity is reported with a decimal, but no unit is specified, the corresponding line of data is excluded from the study. There is no manner to accurately determine its corresponding unit or if it was an issue of reporting.

Below are two separate methodologies that correspond to the two sections of the Trade analysis: hippo specimens in trade (Section IV.B.1.a)) and international (legal) trade of individual hippos from hippo range States (Section IV.B.2.b)).

Methodology: hippo specimens in trade

The aim of this section is to evaluate trends in global and U.S. trade of hippo parts and products (referred to as "specimens" by CITES, 2019a). Specimens without a measurable unit from all origin countries were included in this analysis.

Specimens were analyzed individually, cumulatively, and within groups when appropriate. Two categories, 'ivory products' and 'skin products' were created by aggregating similar sub-categories of types of specimens:

1) 'Ivory products'—this category includes all types of ivory recorded in numbers without a measurable unit (such as weight). Terms included are: "carvings," "ivory carvings," "ivory pieces," "jewelry," "jewelry—ivory," "teeth," and "tusk." Note: ivory products with a measurable unit were excluded from this category.

- Hereafter, 'teeth' refers to both terms "teeth" and "tusk," as justified below.

  The most notable teeth in hippos are the lower pair of canines and the larger pair of the lower incisors (Espinoza & Mann, 1992). Unlike elephants whose tusks are easily distinguishable from their other teeth, the difference for hippos is not as clear. Literature presents conflicting definitions for hippo tusks. Some scientists refer to the upper incisors and lower canines as tusks (Berkovitz, 2013, pp. 21-22), others refer to the four canine teeth as tusks (Eltringham, 1999, p. 14; William et al., 2010) and some define tusks as the first lower incisors and lower canines (IUCN SSN Hippo Specialist Group, n.d.). Present online searches of trophy hunting forums and outfitters demonstrate that, colloquially, all incisors and canines are referred to as tusks and both canines and incisors have a trophy value (CITES, 2017b, p. 14; Eltringham, 1999; Moneron & Drinkwater, 2021). The CITES Database distinguishes between terms "teeth" and "tusk" but the distinction for hippos is unclear and is described as follows:

  > Tusk (TUS)— substantially whole tusks, whether or not worked. Includes tusks of elephant, *hippopotamus*, walrus, narwhal, but not other teeth. (CITES, 2019a, p. 11)
  >
  > Tooth (TEE)— e.g., of whale, lion, *hippopotamus*, crocodile, etc. (CITES, 2019a, p. 11)

  Since the difference between teeth and tusks in literature and the CITES Database is inexplicit, it is unlikely that those recordings hippo teeth specimens into the CITES Database can accurately distinguish hippo tusks from its other teeth. Following TRAFFIC's 2021 examination of global hippo ivory trade, this analysis combined terms "tooth" and "tusk" into a single term: 'teeth' (Moneron & Drinkwater, 2021, p. 11); and hereafter the term 'teeth' refers to both CITES terms "teeth" and "tusk." As stated by Espinoza and Mann (1992), incisors and canines are the most common source of ivory in hippos. These enlarged teeth are the typical choice for carvings and other ivory products (Krzyszkowska, 1988). There is no substantiated evidence, from in person and online investigations, to indicate the prevalence of hippo molars in trade. For these reasons, the

category ‘teeth’ includes canine and incisor teeth but does not include molar teeth (CITES, 2017b, Annex 4).

- The terms “carvings” and “jewelry” are included in this category (‘ivory products’); and hereafter, ‘carvings’ refers to both terms “carvings” and “ivory carvings” and ‘jewelry’ refers to both terms “jewelry” and “jewelry—ivory,” as justified below.

  Although the CITES definition of terms “carvings” and “jewelry” explicitly exclude products made of ivory, they are included in the weighted ivory calculations for the reasons further discussed below:

  > Carvings (CAR)—carved products *other than ivory*, bone or horn – for example coral and wood (including handicrafts). (CITES, 2019a, p. 7)
  >
  > Jewelry (JWL)— jewelry including bracelets, necklaces, and other items of jewelry from products *other than ivory* (e.g., wood, coral, etc.). (CITES, 2019a, p. 9)

  Present online searches and in person investigations determined that hippo carvings and jewelry are derived only from ivory. There was no evidence of hippo bones used for carving or jewelry products and there is no knowledge of widespread use of bones in hippo trade. Data are presumed to have been misreported and for this reason, terms “carvings” and “jewelry” are included in the analysis of ivory products. Terms “carvings” and “ivory carvings” are combined into a single category ‘carvings’; and terms “jewelry—ivory” and “jewelry” are combined into a single category ‘jewelry.’

2) ‘Skin products’—this category includes all types of skin products recorded in numbers without a measurable unit. Terms included are: “skin pieces,” “skins,” “leather products (small),” and “leather products (large).” Note: skin products with a measurable unit were excluded from this category.

<u>Methodology: international (legal) trade of individual hippos from hippo range States</u>
The aim of this section is to quantify the number of individual hippos imported globally and into the United States from hippo range States. Additional methodology was required to subset for only hippos that originated in hippo range States and estimate the number of individual hippos from hippo parts.

To subset trade data to include only records where the country of origin was also a hippo range State, the country of origin had to first be identified. The country of origin was determined by the “origin” column or by the “exporter” column, where there was no “origin” reported, of the comparative tabulation.

As defined by CITES:

> Country of origin (this column is blank if the country of export is the country of origin, or if the country of origin is not reported). (CITES, 2013, p. 7)

> The country of origin should only be used for re-exports. If the transaction represents a direct export either to or from the reporting country, the country of origin field should be left blank, where possible. If Parties use other ways of indicating direct trade versus re-exports, this is also acceptable as long as it is clear. (CITES, 2019a, p. 5)

For the purpose of this analysis and following the definitions provided by CITES, it is presumed that when a row of data specifies an exporter but not an origin that the exporter is the country of origin. Excluding imports where the country of origin was not one of the 37 hippo range States (Lewison & Pluháček, 2017a) resulted in the omission of 97 hippos: one hippo from Bahrain (Appendix Table 12) and 96 hippos from "unknown" origin (Appendix Tables 13, 14).

The terms used in this section of the analysis referred to individual hippos ("bodies," "live," "skulls," and "trophies") as well as hippo parts ('teeth' and 'ivory products'). Therefore, several calculations were made to quantify individual hippos from hippo parts reported in the raw data (described below). In addition, a new category 'ivory (kg)' was created to combine terms included in multiple sources of ivory from the terms "carvings," "ivory carvings," "ivory pieces," "jewelry," "jewelry—ivory," "teeth," and "tusk" with kilograms as the unit (specimens with grams as the unit were converted to kilograms).

1. Teeth:
   To calculate the number of individual hippos represented by teeth without a unit, the total number of teeth were divided by 12, which is the total number of incisor and canine teeth per hippo. Because any decimal value would represent a 'fraction' of a hippo, this number was then rounded up to the nearest whole number to account for the additional hippo. Note: 'teeth' includes both CITES terms "teeth" and "tusk," as justified above.

2. Weighted ivory ('Ivory (kg)')
   To calculate the number of individual hippos represented in the legal ivory trade, the following ivory products with a weighted unit of kilograms or grams were combined into a single ivory metric ('ivory (kg)'): "carvings," "ivory carvings," "ivory pieces," "jewelry," "jewelry—ivory," and 'teeth.' Note: 'teeth' includes both CITES terms "teeth" and "tusk," as justified above.

   The average weight of ivory is 5.25 kilograms per hippo; this means that every 5.25 kilograms of ivory in trade is approximately equal to one hippo (CITES, 2012a, p. 9). Therefore, this analysis divided the combined ivory metric – 'ivory (kg)' – by 5.25 kilograms. Numbers were rounded up to the nearest whole number, as described above for teeth.

3. Specimens equivalent to one hippo
   Four terms were included that required no calculation to quantify individual hippos: "trophies," "skulls," "bodies," and "live." These specimens were each equivalent to a single hippo. Although this may be obvious in the case of the body or a live hippo, trophies and skulls are also equivalent to one hippo. Trophies are identified as "TRO" in CITES trade terms and described as follows:

> Trophy (TRO)– all the trophy parts of one animal if they are exported together: e.g., horns (2), skull, cape, back skin, tail and feet (i.e., ten specimens) constitute one trophy. But if, for example, the skull and horns are the only specimens of an animal that are exported, then these items together should be recorded as one trophy. Otherwise, the items should be recorded separately. A whole stuffed body is recorded under 'BOD'. A skin alone is recorded under 'SKI'. Trade in 'full mount', 'shoulder mount' and 'half mount', along with any corresponding parts of the same animal exported together on the same permit, should be reported as '1 TRO'. (CITES, 2019a, p. 11)

Because one trophy generally consists of the parts of one dead hippo, this analysis equated one trophy to one hippo.

Skulls are identified as "SKU" in CITES trade terms and are explained as "skulls" (CITES, 2019a, p. 11). Although this definition is ambiguous, a skull was equated to one hippo in this analysis because we considered a skull specimen to be complete and unaltered (i.e., including all teeth and all bones) (Moneron & Drinkwater, 2021). Based on this, inclusion of skulls would not result in double counting by other tradable parts of hippos, such as teeth and trophies.

It must also be highlighted that there are many hippo items traded beyond ivory, teeth, skulls, trophies, bodies, and live animals. For example, this includes skins, and items made from skin, such as shoes and skin products, all of which currently are sold on the open market in the United States. However, it is much more difficult to estimate the number of hippos reflected by the trade in these items either because they lack a measurable unit, because the measurable units vary (length vs. weight of the skins), and/or because it is challenging to estimate the average size of a hippo's skin. Also, any hippo whose skin is in international trade may already be accounted for in this analysis by the other tradable parts of the hippo, such as ivory. Therefore, this analysis focuses on ivory weight, teeth, skulls, trophies, bodies, and live animals in its calculations, but does not include skins, and other skin items when calculating total hippos impacted by international trade.

Note: Grand totals were rounded up to the nearest whole number to represent entire hippos (since a fraction would represent the removal of an additional hippo). There may have been some minor mathematical discrepancies due to differences in rounding. For example, the grand total for all three sources combined was calculated independently from raw data, rather than being a simple addition of the individual purpose totals. This may have resulted in minor differences in the overall grand total or the grand totals by purpose.

Global Imports of Hippo Parts and Products (all sources and all purposes)

Table 1. Sources of global imports of hippo specimens, all sources and all purposes, 2009-2018.

Source	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Grand Total	% of Grand Total
Wild	14,355	11,986	9,579	11,695	6,580	5,736	4,568	4,776	3,192	3,608	76,075	98%
Confiscations/ seizures	296	47	28	48	98	39	12	17	26	14	625	1%
Captive-bred	121	14	7	51	1	16	5	19	200	89	523	1%
Pre-Convention	15	21	19	17	19	20	10	17	12	13	163	<1%
(blank)	2	4	114	21	12	0	0	0	0	0	153	<1%
Ranched	0	2	0	10	0	0	0	10	0	0	22	<1%
Born in captivity	0	0	0	0	0	0	0	0	12	0	12	<1%
Unknown	0	1	0	0	0	3	0	1	0	1	6	<1%
Grand Total	14,789	12,075	9,747	11,842	6,710	5,814	4,595	4,840	3,442	3,725	77,579	

Table 2. Purposes of global imports of hippo specimens, wild source and all purposes, 2009-2018.

Purpose	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**Grand Total**	**% of Grand Total**
Commercial	11,533	9,404	6,643	8,769	4,044	4,096	3,166	3,362	1,843	2,326	55,186	73%
Hunting trophy	2,470	2,215	2,637	2,596	1,597	1,316	1,298	1,308	1,269	1,215	17,921	24%
Personal	341	360	281	316	392	291	89	102	55	63	2,290	3%
Circus/ travelling exhibitions	0	5	0	1	539	0	5	4	21	1	576	1%
Bred in captivity	1	0	0	12	0	24	0	0	0	0	37	<1%
Scientific	0	0	16	0	4	0	6	0	4	3	33	<1%
(Re)introduction into the wild	10	0	0	0	3	0	0	0	0	0	13	<1%
Educational	0	1	0	1	1	5	2	0	0	0	10	<1%
Zoo	0	1	2	0	0	0	2	0	0	0	5	<1%
(blank)	0	0	0	0	0	4	0	0	0	0	4	<1%
Grand Total	**14,355**	**11,986**	**9,579**	**11,695**	**6,580**	**5,736**	**4,568**	**4,776**	**3,192**	**3,608**	**76,075**	

Global and U.S. Imports of Hippo Parts and Products (wild source and commercial, hunting trophy and personal purposes)

Table 3. Global imports of hippo specimens, wild source and commercial, hunting trophy, and personal purposes, 2009-2018.

Term	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Grand Total	% of Grand Total
Carvings	7,224	5,843	3,132	5,481	1,344	1,772	529	122	5	7	25,459	34%
Teeth	5,163	3,560	3,463	4,117	1,318	1,179	882	1,712	733	530	22,657	30%
Skins	729	1,518	367	558	1,110	273	655	862	846	1,229	8,147	11%
Skin pieces	110	240	1,502	715	1,269	740	843	724	751	267	7,161	9%
Leather products (small)	281	177	273	150	415	1,206	1,130	834	343	743	5,552	7%
Trophies	653	459	404	441	349	289	308	397	369	560	4,229	6%
Feet	80	81	110	108	102	79	58	61	39	6	724	1%
Skulls	32	34	143	61	37	45	29	27	34	20	462	1%
Leather products (large)	26	22	15	18	28	15	20	18	7	223	392	1%
Garments	0	0	0	0	0	97	62	0	0	0	159	<1%
Bones	0	0	120	5	13	0	0	0	0	0	138	<1%
Tails	7	9	14	15	32	6	13	5	0	0	101	<1%
Jewelry	0	0	0	0	0	0	23	4	26	16	69	<1%
Live	35	22	8	0	2	0	0	0	0	0	67	<1%
Specimens	0	0	0	0	12	0	0	2	9	0	23	<1%
Derivatives	0	10	4	5	0	0	0	0	0	0	19	<1%
Sides	3	0	5	1	0	0	0	1	5	0	15	<1%
Bodies	1	2	1	1	0	1	1	2	0	0	9	<1%
Bone Carvings	0	2	0	5	0	0	0	1	0	0	8	<1%
Genitalia	0	0	0	0	2	1	0	0	0	1	4	<1%
Skeletons	0	0	0	0	0	0	0	0	0	2	2	<1%
Grand Total	**14,344**	**11,979**	**9,561**	**11,681**	**6,033**	**5,703**	**4,553**	**4,772**	**3,167**	**3,604**	**75,397**	

Table 4. Importers of hippo specimens, wild source and commercial, hunting trophy, and personal purposes, 2009-2018.

Importer	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Grand Total	% of Grand Total
United States	2,645	2,501	3,235	3,801	2,427	2,483	2,583	2,388	1,832	1,731	25,626	34%
France	5,539	5,380	2,984	4,941	1,206	1,563	492	502	70	55	22,732	30%
South Africa	300	1,974	1,638	751	161	374	163	242	236	44	5,883	8%
Mexico	38	44	54	292	1,090	334	675	767	303	1,097	4,694	6%
Spain	920	349	499	395	95	81	144	164	136	91	2,874	4%
Germany	303	319	429	407	406	192	74	87	57	117	2,391	3%
Hong Kong	1,653	2	12	3	0	0	0	0	7	9	1,686	2%
Belgium	1,186	4	15	1	0	0	21	135	28	3	1,393	2%

Importer	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Grand Total	% of Grand Total
Italy	886	0	99	90	0	0	24	38	25	201	1,363	2%
Austria	108	129	46	226	186	119	99	64	44	48	1,069	1%
Zimbabwe	0	747	0	111	30	0	0	16	0	0	904	1%
Japan	87	47	186	245	108	24	0	12	57	7	773	1%
Denmark	180	84	118	53	53	47	69	18	22	22	666	1%
Switzerland	37	28	12	57	29	35	71	38	41	2	350	<1%
Viet Nam	0	0	0	0	0	202	0	0	89	0	291	<1%
Australia	76	57	3	18	33	49	7	3	1	0	247	<1%
Poland	1	43	82	59	1	1	7	2	0	2	198	<1%
China	0	0	0	4	0	8	52	75	33	1	173	<1%
Norway	12	46	1	1	0	27	12	20	40	1	160	<1%
Sweden	16	37	26	17	1	1	2	32	6	18	156	<1%
United Kingdom	0	0	0	51	15	4	0	49	18	14	151	<1%
Czechia	3	42	30	5	34	3	4	1	2	5	129	<1%
Canada	103	0	0	0	0	0	0	0	0	0	103	<1%
Chile	17	0	0	0	0	0	0	46	13	19	95	<1%
Ukraine	0	0	0	9	0	79	0	0	0	0	88	<1%
Turkey	12	0	0	0	26	28	0	12	4	0	82	<1%
Namibia	42	20	9	6	0	0	0	0	3	0	80	<1%
Brazil	13	4	2	13	0	0	0	0	14	34	80	<1%
Guatemala	0	0	0	0	53	0	0	0	23	0	76	<1%
Bulgaria	25	2	2	25	4	1	4	1	1	4	69	<1%
Portugal	41	5	17	1	0	0	1	0	0	0	65	<1%
Peru	0	0	0	30	30	0	0	0	0	4	64	<1%
New Zealand	5	22	0	0	22	0	0	0	0	14	63	<1%
United Arab Emirates	0	6	15	27	13	0	0	0	0	0	61	<1%
Slovakia	0	0	0	36	2	4	0	2	6	8	58	<1%
Hungary	0	0	0	0	0	0	26	13	13	6	58	<1%
Morocco	12	0	18	0	0	0	0	0	0	25	55	<1%
Philippines	0	28	0	0	0	0	18	0	0	0	46	<1%
Finland	18	3	13	3	0	2	1	3	1	2	46	<1%
Singapore	11	24	0	1	0	0	0	4	0	0	40	<1%
Qatar	0	26	2	0	1	0	0	0	0	1	30	<1%
Argentina	0	0	0	0	0	0	0	29	0	0	29	<1%
Panama	0	0	0	0	0	13	1	0	14	0	28	<1%
Slovenia	24	0	0	2	0	1	0	0	0	0	27	<1%
Kenya	0	0	0	0	0	0	0	0	12	13	25	<1%
Macao	0	0	0	0	0	25	0	0	0	0	25	<1%
Romania	12	0	2	0	0	1	0	5	0	0	20	<1%
Serbia	4	0	0	0	0	0	0	0	14	0	18	<1%
Lithuania	2	1	0	0	3	1	2	0	2	4	15	<1%
Luxembourg	0	0	12	0	0	0	0	0	0	1	13	<1%
Bahamas	12	0	0	0	0	0	0	0	0	0	12	<1%

Importer	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Grand Total	% of Grand Total
South Korea	0	4	0	0	0	0	0	0	0	0	4	<1%
Thailand	0	0	0	0	2	0	0	2	0	0	4	<1%
Kazakhstan	0	0	0	0	0	0	1	1	0	0	2	<1%
Malaysia	0	0	0	0	2	0	0	0	0	0	2	<1%
Eswatini	0	0	0	0	0	1	0	0	0	0	1	<1%
Guernsey	0	0	0	0	0	0	0	0	0	1	1	<1%
Estonia	0	1	0	0	0	0	0	0	0	0	1	<1%
Latvia	1	0	0	0	0	0	0	0	0	0	1	<1%
Iceland	0	0	0	0	0	0	0	1	0	0	1	<1%
Grand Total	**14,344**	**11,979**	**9,561**	**11,681**	**6,033**	**5,703**	**4,553**	**4,772**	**3,167**	**3,604**	**75,397**	

Table 5. Top five importers of globally imported hippo specimens, by term, wild source and commercial, hunting trophy, and personal purposes, 2009-2018.

Term/Importer	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Grand Total	% of Term Total
Carvings	**7,224**	**5,843**	**3,132**	**5,481**	**1,344**	**1,772**	**529**	**122**	**5**	**7**	**25,459**	
France	5,184	5,277	2,918	4,814	1,081	1,521	389	0	0	0	21,184	83%
United States	360	504	162	238	260	235	18	4	0	0	1,781	7%
Belgium	1,172	0	0	0	0	0	0	109	0	0	1,281	5%
Spain	508	62	52	215	0	0	121	0	0	0	958	4%
Japan	0	0	0	208	0	0	0	0	0	0	208	1%
Other	0	0	0	6	3	16	1	9	5	7	47	<1%
Teeth	**5,163**	**3,560**	**3,463**	**4,117**	**1,318**	**1,179**	**882**	**1,712**	**733**	**530**	**22,657**	
United States	1,047	1,324	1,894	2,493	388	445	372	611	259	264	9,097	40%
South Africa	96	1,179	441	460	63	54	109	207	196	12	2,817	12%
Germany	270	273	383	333	321	165	52	59	24	84	1,964	9%
Hong Kong	1,650	0	8	0	0	0	0	0	0	0	1,658	7%
Spain	342	222	360	152	72	62	14	144	85	58	1,511	7%
Other	1,758	562	377	679	474	453	335	691	169	112	5,610	25%
Skins	**729**	**1,518**	**367**	**558**	**1,110**	**273**	**655**	**862**	**846**	**1,229**	**8,147**	
Mexico	0	0	0	236	1,033	252	621	742	287	1,056	4,227	52%
United States	694	214	60	7	7	0	0	1	408	66	1,457	18%
South Africa	6	679	141	200	7	8	3	5	10	0	1,059	13%
Zimbabwe	0	577	0	0	6	0	0	0	0	0	583	7%
Italy	0	0	99	86	0	0	7	31	20	74	317	4%
Other	29	48	67	29	57	13	24	83	121	33	504	6%
Skin pieces	**110**	**240**	**1,502**	**715**	**1,269**	**740**	**843**	**724**	**751**	**267**	**7,161**	
United States	64	47	694	667	1,213	685	818	716	639	236	5,779	81%
South Africa	34	52	780	16	7	7	16	1	0	0	913	13%
Zimbabwe	0	118	0	5	0	0	0	4	0	0	127	2%
Germany	5	10	13	16	33	8	1	0	0	4	90	1%
Viet Nam	0	0	0	0	0	0	0	0	89	0	89	1%
Other	7	13	15	11	16	40	8	3	23	27	163	2%

Term/Importer	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Grand Total	% of Term Total
Leather products (small)	**281**	**177**	**273**	**150**	**415**	**1,206**	**1,130**	**834**	**343**	**743**	**5,552**	
United States	94	107	120	77	232	877	1,127	808	279	714	4,435	80%
South Africa	94	0	0	0	30	272	0	0	0	8	404	7%
Japan	87	6	145	22	48	24	0	12	0	3	347	6%
France	0	26	4	10	39	13	2	0	0	0	94	2%
Guatemala	0	0	0	0	53	0	0	0	0	0	53	1%
Other	6	38	4	41	13	20	1	14	64	18	219	4%
Trophies	**653**	**459**	**404**	**441**	**349**	**289**	**308**	**397**	**369**	**560**	**4,229**	
United States	298	235	223	258	190	141	151	189	179	210	2,074	49%
South Africa	56	14	24	34	49	31	25	12	26	23	294	7%
Denmark	128	29	28	6	15	6	6	18	20	22	278	7%
Spain	66	47	52	23	20	15	9	13	8	16	269	6%
Mexico	25	18	21	17	17	56	14	13	16	32	229	5%
Other	80	116	56	103	58	40	103	152	120	257	1,085	26%
Feet	**80**	**81**	**110**	**108**	**102**	**79**	**58**	**61**	**39**	**6**	**724**	
United States	50	36	36	24	59	44	30	33	25	6	343	47%
South Africa	8	28	35	19	4	0	6	8	0	0	108	15%
Mexico	0	2	4	14	12	12	4	0	0	0	48	7%
Germany	2	0	6	7	19	10	2	0	0	0	46	6%
Spain	4	7	19	4	0	4	0	4	0	0	42	6%
Other	16	8	10	40	8	9	16	16	14	0	137	19%
Skulls	**32**	**34**	**143**	**61**	**37**	**45**	**29**	**27**	**34**	**20**	**462**	
South Africa	5	16	89	19	1	2	4	6	4	1	147	32%
United States	9	11	20	15	15	19	12	9	10	7	127	27%
Germany	8	1	14	8	9	7	1	0	1	1	50	11%
Poland	0	1	14	4	0	0	0	0	0	0	19	4%
United Kingdom	0	0	0	1	5	4	0	4	1	1	16	3%
Other	10	5	6	14	7	13	12	8	18	10	103	22%
Leather products (large)	**26**	**22**	**15**	**18**	**28**	**15**	**20**	**18**	**7**	**223**	**392**	
United States	26	16	15	13	28	15	20	13	7	221	374	95%
Chile	0	0	0	0	0	0	0	5	0	0	5	1%
Germany	0	5	0	0	0	0	0	0	0	0	5	1%
South Africa	0	0	0	3	0	0	0	0	0	0	3	1%
Mexico	0	0	0	2	0	0	0	0	0	0	2	1%
Other	0	1	0	0	0	0	0	0	0	2	3	1%
Garments	**0**	**0**	**0**	**0**	**0**	**97**	**62**	**0**	**0**	**0**	**159**	
China	0	0	0	0	0	8	51	0	0	0	59	37%
United States	0	0	0	0	0	18	11	0	0	0	29	18%
Macao	0	0	0	0	0	25	0	0	0	0	25	16%
Turkey	0	0	0	0	0	23	0	0	0	0	23	14%
Switzerland	0	0	0	0	0	23	0	0	0	0	23	14%
Bones	**0**	**0**	**120**	**5**	**13**	**0**	**0**	**0**	**0**	**0**	**138**	

Term/Importer	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Grand Total	% of Term Total
South Africa	0	0	120	0	0	0	0	0	0	0	120	87%
United States	0	0	0	0	10	0	0	0	0	0	10	7%
United Kingdom	0	0	0	2	0	0	0	0	0	0	2	1%
Germany	0	0	0	0	2	0	0	0	0	0	2	1%
France	0	0	0	1	0	0	0	0	0	0	1	1%
Other	0	0	0	2	1	0	0	0	0	0	3	2%
Tails	**7**	**9**	**14**	**15**	**32**	**6**	**13**	**5**	**0**	**0**	**101**	
United States	3	5	2	4	25	3	1	3	0	0	46	46%
Austria	1	0	0	3	1	0	12	0	0	0	17	17%
Germany	2	0	3	4	6	1	0	0	0	0	16	16%
South Africa	1	3	8	0	0	0	0	0	0	0	12	12%
Ukraine	0	0	0	1	0	1	0	0	0	0	2	2%
Other	0	1	1	3	0	1	0	2	0	0	8	8%
Jewelry	**0**	**0**	**0**	**0**	**0**	**0**	**23**	**4**	**26**	**16**	**69**	
United States	0	0	0	0	0	0	23	1	26	6	56	81%
Spain	0	0	0	0	0	0	0	0	0	10	10	14%
South Africa	0	0	0	0	0	0	0	3	0	0	3	4%
Live	**35**	**22**	**8**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**67**	
Namibia	35	20	8	0	0	0	0	0	0	0	63	94%
South Africa	0	2	0	0	0	0	0	0	0	0	2	3%
Malaysia	0	0	0	0	2	0	0	0	0	0	2	3%
Specimens	**0**	**0**	**0**	**0**	**12**	**0**	**0**	**2**	**9**	**0**	**23**	
United Arab Emirates	0	0	0	0	12	0	0	0	0	0	12	52%
China	0	0	0	0	0	0	0	0	9	0	9	39%
Singapore	0	0	0	0	0	0	0	2	0	0	2	9%
Derivatives	**0**	**10**	**4**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**19**	
Germany	0	9	0	5	0	0	0	0	0	0	14	74%
United States	0	0	4	0	0	0	0	0	0	0	4	21%
South Africa	0	1	0	0	0	0	0	0	0	0	1	5%
Sides	**3**	**0**	**5**	**1**	**0**	**0**	**0**	**1**	**5**	**0**	**15**	
Norway	0	0	0	0	0	0	0	1	5	0	6	40%
United States	0	0	5	0	0	0	0	0	0	0	5	33%
Germany	3	0	0	0	0	0	0	0	0	0	3	20%
Brazil	0	0	0	1	0	0	0	0	0	0	1	7%
Bodies	**1**	**2**	**1**	**1**	**0**	**1**	**1**	**2**	**0**	**0**	**9**	
Spain	0	2	1	0	0	0	0	0	0	0	3	33%
Thailand	0	0	0	0	0	0	0	2	0	0	2	22%
Singapore	0	0	0	1	0	0	0	0	0	0	1	11%
Canada	1	0	0	0	0	0	0	0	0	0	1	11%
Australia	0	0	0	0	0	1	0	0	0	0	1	11%
Other	0	0	0	0	0	0	1	0	0	0	1	11%
Bone carvings	**0**	**2**	**0**	**5**	**0**	**0**	**0**	**1**	**0**	**0**	**8**	
United States	0	2	0	5	0	0	0	0	0	0	7	88%

Term/Importer	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Grand Total	% of Term Total
Norway	0	0	0	0	0	0	0	1	0	0	1	13%
Genitalia	**0**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**1**	**4**	
United States	0	0	0	0	0	1	0	0	0	1	2	50%
Spain	0	0	0	0	2	0	0	0	0	0	2	50%
Skeletons	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**2**	
Mexico	0	0	0	0	0	0	0	0	0	1	1	50%
Germany	0	0	0	0	0	0	0	0	0	1	1	50%
Grand Total	**14,344**	**11,979**	**9,561**	**11,681**	**6,033**	**5,703**	**4,553**	**4,772**	**3,167**	**3,604**	**75,397**	

Table 6. Global imports of 'ivory products,' wild sources and commercial, hunting trophy, and personal purposes, 2009-2018.

Term	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Grand Total	% Grand Total
Carvings	7,224	5,843	3,132	5,481	1,344	1,772	529	122	5	7	25,459	53%
Teeth	5,163	3,560	3,463	4,117	1,318	1,179	882	1,712	733	530	22,657	47%
Jewelry	0	0	0	0	0	0	23	4	26	16	69	<1%
Grand Total	**12,387**	**9,403**	**6,595**	**9,598**	**2,662**	**2,951**	**1,434**	**1,838**	**764**	**553**	**48,185**	

Table 7. Global imports of 'skin products,' all sources and all purposes, 2009-2018.

Term	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Grand Total	% of Grand Total
Skins	729	1,518	367	558	1,110	273	655	862	846	1,229	8,147	38%
Skin pieces	110	240	1,502	715	1,269	740	843	724	751	267	7,161	34%
Leather products (small)	281	177	273	150	415	1,206	1,130	834	343	743	5,552	26%
Leather products (large)	26	22	15	18	28	15	20	18	7	223	392	2%
Grand Total	**1,146**	**1,957**	**2,157**	**1,441**	**2,822**	**2,234**	**2,648**	**2,438**	**1,947**	**2,462**	**21,252**	

Table 8. U.S. Imports of hippo specimens, wild source and commercial, hunting trophy, and all purposes, 2009-2018.

Term	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Grand Total	% of Grand Total
Teeth	1,047	1,324	1,894	2,493	388	445	372	611	259	264	9,097	35%
Skin pieces	64	47	694	667	1,213	685	818	716	639	236	5,779	23%
Leather products (small)	94	107	120	77	232	877	1127	808	279	714	4,435	17%
Trophies	298	235	223	258	190	141	151	189	179	210	2,074	8%
Carvings	360	504	162	238	260	235	18	4	0	0	1,781	7%

Term	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Grand Total	% of Grand Total
Skins	694	214	60	7	7	0	0	1	408	66	1,457	6%
Leather products (large)	26	16	15	13	28	15	20	13	7	221	374	1%
Feet	50	36	36	24	59	44	30	33	25	6	343	1%
Skulls	9	11	20	15	15	19	12	9	10	7	127	<1%
Jewelry	0	0	0	0	0	0	23	1	26	6	56	<1%
Tails	3	5	2	4	25	3	1	3	0	0	46	<1%
Garments	0	0	0	0	0	18	11	0	0	0	29	<1%
Bones	0	0	0	0	10	0	0	0	0	0	10	<1%
Bone carvings	0	2	0	5	0	0	0	0	0	0	7	<1%
Sides	0	0	5	0	0	0	0	0	0	0	5	<1%
Derivatives	0	0	4	0	0	0	0	0	0	0	4	<1%
Genitalia	0	0	0	0	0	1	0	0	0	1	2	<1%
Grand Total	**2,645**	**2,501**	**3,235**	**3,801**	**2,427**	**2,483**	**2,583**	**2,388**	**1,832**	**1,731**	**25,626**	

Table 9. U.S. imports of hippo 'ivory products,' wild source and commercial, hunting trophy, and personal purposes, 2009-2018.

Term	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Grand Total	% of Grand Total
Teeth	1,047	1,324	1,894	2,493	388	445	372	611	259	264	9,097	83%
Carvings	360	504	162	238	260	235	18	4	0	0	1,781	16%
Jewelry	0	0	0	0	0	0	23	1	26	6	56	1%
Grand Total	**1,407**	**1,828**	**2,056**	**2,731**	**648**	**680**	**413**	**616**	**285**	**270**	**10,934**	

Table 10. U.S. imports of hippo 'skin products,' wild source and commercial, hunting trophy, and personal purposes, 2009-2018.

Term	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Grand Total	% of Grand Total
Skin pieces	64	47	694	667	1,213	685	818	716	639	236	5,779	48%
Leather products (small)	94	107	120	77	232	877	1,127	808	279	714	4,435	37%
Skins	694	214	60	7	7	0	0	1	408	66	1,457	12%
Leather products (large)	26	16	15	13	28	15	20	13	7	221	374	3%
Grand Total	**878**	**384**	**889**	**764**	**1,480**	**1,577**	**1,965**	**1,538**	**1,333**	**1,237**	**12,045**	

Global and U.S. Imports of Individual Hippos from Hippo Range States (wild source and commercial, hunting trophy and personal purposes)

Table 11. Global imports of hippos, various sources and purposes, 2009-2018.

Global imports of hippos, 2009-2018, *all* sources and *all* purposes						
Ivory (kg)	**Teeth**	**Trophies**	**Bodies**	**Live**	**Skulls**	**Total Hippos**
37,316 ÷ 5.25kg (average weight per hippo) = 7,107.8 = 7,108 hippos	22,864 (no unit) ÷ 12 (number of teeth per hippo) = 1,905.3 = 1,906 hippos	4,289 trophies = 4,289 hippos	17 bodies = 17 hippos	124 live = 124 hippos	465 skulls = 465 hippos	=13,909 =13,909 hippos
Global imports of hippos, 2009-2018, *wild* source and *commercial, hunting trophy, and personal* purposes						
Ivory (kg)	**Teeth**	**Trophies**	**Bodies**	**Live**	**Skulls**	**Total Hippos**
36,113 ÷ 5.25kg (average weight per hippo) = 6,878.7 = 6,879 hippos	22,526 (no unit) ÷ 12 (number of teeth per hippo) = 1,877.2 =1,877 hippos	4,210 trophies = 4,210 hippos	9 bodies = 9 hippos	65 live = 65 hippos	456 skulls = 456 hippos	=13,495.9 =13,496 hippos

Table 12. U.S. imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Bahrain, 2009-2018.

	Number of Hippos by Purpose			**GRAND TOTAL**
Terms	**Commercial**	**Hunting trophy**	**Personal**	**Commercial, hunting trophy, personal purposes**
Ivory (kg)	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0
Teeth	0 ÷ 12 = 0	0 ÷ 12 = 0	0 ÷ 12 = 0	0 ÷ 12 = 0
Bodies	0	0	0	0
Live	0	0	0	0
Skulls	0	0	0	0
Trophies	0	0	1	1
Total hippos	0	0	1	1

Table 13. Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from an unknown country of origin, 2009-2018.

	Number of Hippos by Purpose			GRAND TOTAL
Terms	**Commercial**	**Hunting trophy**	**Personal**	**Commercial, hunting trophy, personal purposes**
Ivory (kg)	378 ÷ 5.25 = 72	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	378 ÷ 5.25 = 72
Teeth	0 ÷ 12 = 0	31 ÷ 12 = 2.6	20÷ 12 = 1.7	51 ÷ 12 = 4.2
Bodies	0	0	0	0
Live	0	0	0	0
Skulls	0	3	0	3
Trophies	0	2	14	16
Total hippos	72	7.6 = 8	15.7 = 16	95.2 = 96

Table 14. U.S. imports of hippos, wild source and commercial, hunting trophy, and personal purposes from an unknown country of origin, 2009-2018.

	Number of Hippos by Purpose			GRAND TOTAL
Terms	**Commercial**	**Hunting trophy**	**Personal**	**Commercial, hunting trophy, personal purposes**
Ivory (kg)	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0
Teeth	0 ÷ 12 = 0	0 ÷ 12 = 0	4 ÷ 12 = 0.3	4 ÷ 12 = 0.3
Bodies	0	0	0	0
Live	0	0	0	0
Skulls	0	0	0	0
Trophies	0	0	0	0
Total hippos	0	0	0.3 = 1	0.3 = 1

Table 15. Global imports of hippos, wild source and commercial purpose, 2009-2018.

Term	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Grand Total
Ivory (kg)	6,224	6,707	4,363.4	4,019	2,467	1,480	4,554	2,700	1	3,577.3	36,092.7
Grand Total (kg)	**6,224**	**6,707**	**4,363.4**	**4,019**	**2,467**	**1,480**	**4,554**	**2,700**	**1**	**3,577.3**	**36,092.7**
Teeth	3,309	1,703	1,317	2,028	78	219	38	854	6	0	9,552
Grand Total (Teeth)	**3,309**	**1,703**	**1,317**	**2,028**	**78**	**219**	**38**	**854**	**6**	**0**	**9,552**
Bodies	0	0	0	0	0	0	1	0	0	0	1
Live	35	20	8	0	2	0	0	0	0	0	65
Skulls	1	0	73	1	4	4	1	4	12	8	108
Trophies	1	1	1	0	1	0	1	0	2	2	9
Grand Total	**37**	**21**	**82**	**1**	**7**	**4**	**3**	**4**	**14**	**10**	**183**

Table 16. Global imports of hippos, wild source and hunting trophy purpose, 2009-2018.

Term	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Grand Total
Ivory (kg)	0	0	0	12	0	0	0	0	0	0	12
Grand Total (kg)	**0**	**0**	**0**	**12**	**0**	**0**	**0**	**0**	**0**	**0**	**12**
Teeth	1,685	1,617	1,988	1,901	1,007	800	761	770	672	511	11,712
Grand Total (Teeth)	**1,685**	**1,617**	**1,988**	**1,901**	**1,007**	**800**	**761**	**770**	**672**	**511**	**11,712**
Bodies	1	2	1	1	0	1	0	0	0	0	6
Live	0	0	0	0	0	0	0	0	0	0	0
Skulls	28	33	68	59	29	40	20	22	18	11	328
Trophies	639	427	377	381	345	266	296	374	354	522	3,981
Grand Total	**668**	**462**	**446**	**441**	**374**	**307**	**316**	**396**	**372**	**533**	**4,315**

Table 17. Global imports of hippos, wild source and personal purpose, 2009-2018.

Term	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Grand Total
Ivory (kg)	0	0	5.1	0	0	3	0	0	0.1	0	8.2
Grand Total (kg)	**0**	**0**	**5.1**	**0**	**0**	**3**	**0**	**0**	**0.1**	**0**	**8.2**
Teeth	168	238	158	168	209	160	58	51	33	19	1,262
Grand Total (Teeth)	**168**	**238**	**158**	**168**	**209**	**160**	**58**	**51**	**33**	**19**	**1,262**
Bodies	0	0	0	0	0	0	0	2	0	0	2
Live	0	0	0	0	0	0	0	0	0	0	0
Skulls	3	1	2	1	3	1	5	1	2	1	20
Trophies	12	31	26	47	1	23	9	23	12	36	220
Grand Total	15	32	28	48	4	24	14	26	14	37	242

Table 18. U.S. imports of hippos, wild source and commercial purpose, 2009-2018.

Term	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Grand Total
Ivory (kg)	0	0	500	141	0	0	0	0	0	0	641
Grand Total (kg)	**0**	**0**	**500**	**141**	**0**	**0**	**0**	**0**	**0**	**0**	**641**
Teeth	441	795	1,300	1,981	66	17	26	404	0	0	5,030
Grand Total (Teeth)	**441**	**795**	**1,300**	**1,981**	**66**	**17**	**26**	**404**	**0**	**0**	**5,030**
Bodies	0	0	0	0	0	0	0	0	0	0	0
Live	0	0	0	0	0	0	0	0	0	0	0
Skulls	1	0	0	0	1	0	0	0	0	0	2
Trophies	1	0	0	0	0	0	0	0	0	0	1
Grand Total	2	0	0	0	1	0	0	0	0	0	3

Table 19. U.S. imports of hippos, wild source and hunting trophy purpose, 2009-2018.

Term	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Grand Total
Ivory (kg)	0	0	0	0	0	0	0	0	0	0	0
Grand Total (kg)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Teeth	603	495	572	496	286	332	345	200	258	261	3,848
Grand Total (Teeth)	**603**	**495**	**572**	**496**	**286**	**332**	**345**	**200**	**258**	**261**	**3,848**
Bodies	0	0	0	0	0	0	0	0	0	0	0
Live	0	0	0	0	0	0	0	0	0	0	0
Skulls	8	11	18	15	12	19	11	9	8	7	118
Trophies	293	230	221	252	190	139	150	188	178	209	2,050
Grand Total	**301**	**241**	**239**	**267**	**202**	**158**	**161**	**197**	**186**	**216**	**2,168**

Table 20. U.S. imports of hippos, wild source and personal purpose, 2009-2018.

Term	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Grand Total
Ivory (kg)	0	0	0	0	0	0	0	0	0	0	0
Grand Total (kg)	0	0	0	0	0	0	0	0	0	0	0
Teeth	2	34	22	16	36	96	1	4	1	3	215
Grand Total (Teeth)	**2**	**34**	**22**	**16**	**36**	**96**	**1**	**4**	**1**	**3**	**215**
Bodies	0	0	0	0	0	0	0	0	0	0	0
Live	0	0	0	0	0	0	0	0	0	0	0
Skulls	0	0	2	0	2	0	1	0	2	0	7
Trophies	4	5	2	6	0	2	1	1	1	1	23
Grand Total	4	5	4	6	2	2	2	1	3	1	30

Hippo Range State Country Cases: Global and U.S. Imports of Individual Hippos (wild source and commercial, hunting trophy and personal purposes)

Benin

Table 21. Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Benin, 2009-2018.

Terms	Number of Hippos by Purpose			GRAND TOTAL
	Commercial	Hunting trophy	Personal	Commercial, hunting trophy, personal purposes
Ivory (kg)	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0
Teeth	0 ÷ 12 = 0	25 ÷ 12 = 2.1	0 ÷ 12 = 0	25 ÷ 12 = 2.1
Bodies	0	0	0	0
Live	0	0	0	0
Skulls	0	0	0	0
Trophies	0	1	1	2
Total hippos	0	3.1 = 4	1	4.1 = 5

Figure 1. Annual Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Benin, 2009-2018.

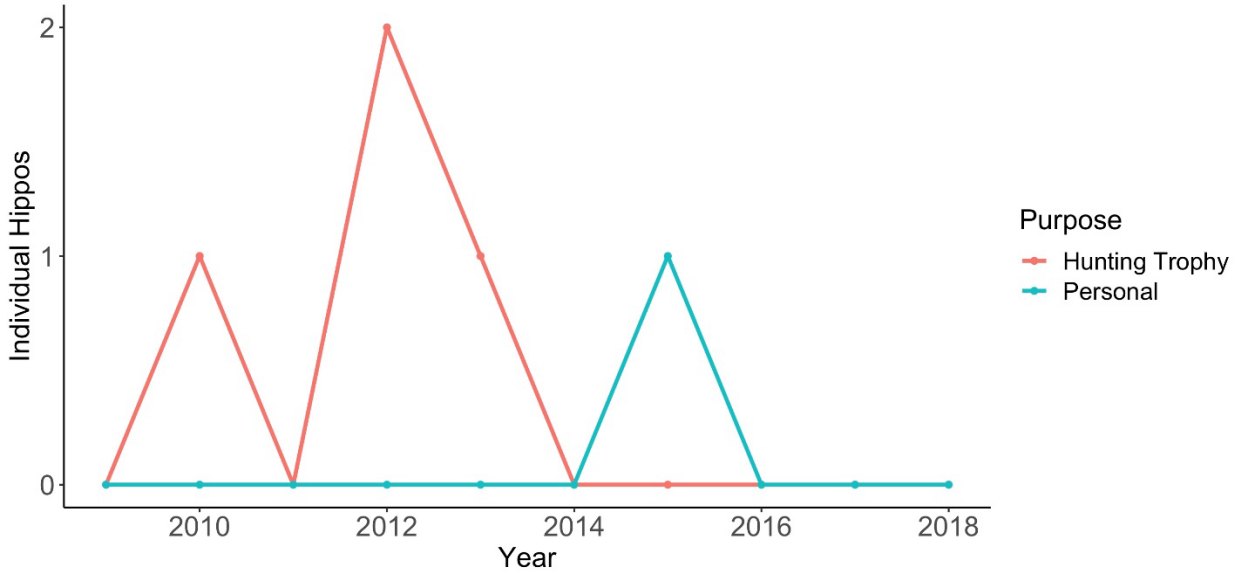
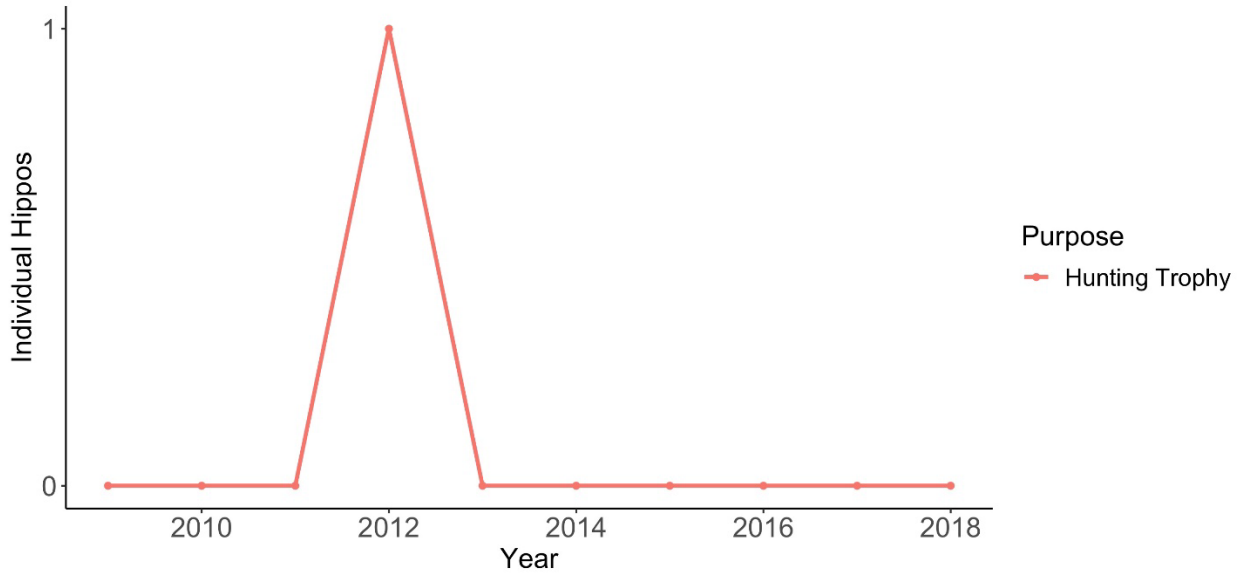


Table 22. U.S. imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Benin, 2009-2018.

Terms	Number of Hippos by Purpose			GRAND TOTAL
	Commercial	Hunting trophy	Personal	Commercial, hunting trophy, personal purposes
Ivory (kg)	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0
Teeth	0 ÷ 12 = 0	12 ÷ 12 = 1	0 ÷ 12 = 0	12 ÷ 12 = 1
Bodies	0	0	0	0
Live	0	0	0	0
Skulls	0	0	0	0
Trophies	0	0	0	0
Total hippos	0	1	0	1

Figure 2. Annual U.S. imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Benin, 2009-2018.

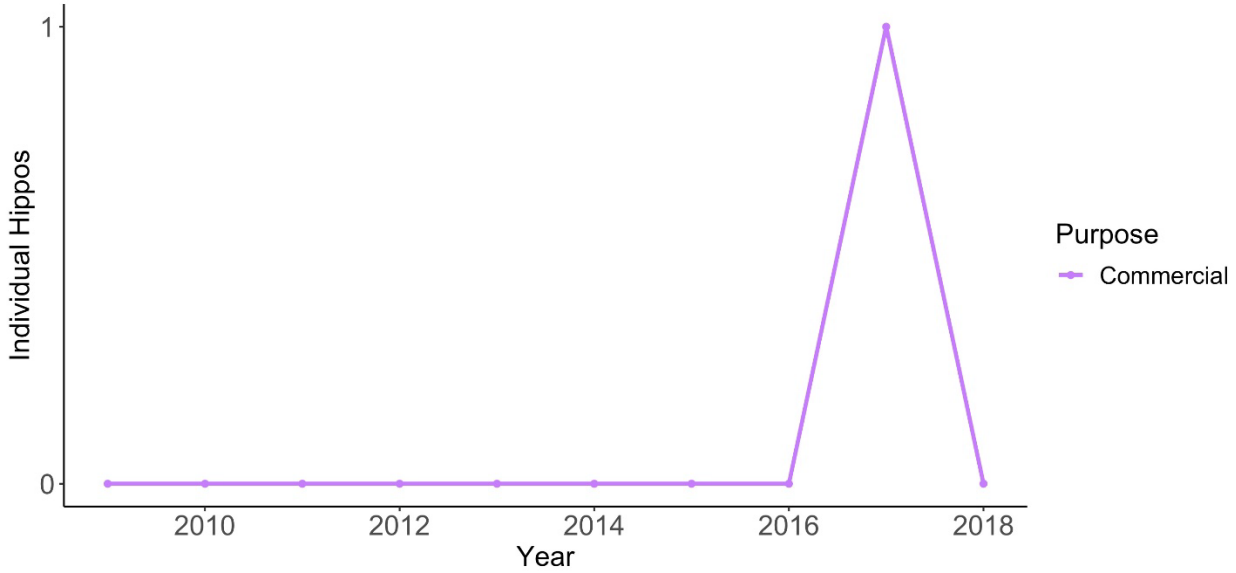


Botswana

Table 23. Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Botswana, 2009-2018.

Terms	Number of Hippos by Purpose			GRAND TOTAL
	Commercial	Hunting trophy	Personal	Commercial, hunting trophy, personal purposes
Ivory (kg)	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0
Teeth	6 ÷ 12 = 0.5	0 ÷ 12 = 0	0 ÷ 12 = 0	6 ÷ 12 = 0.5
Bodies	0	0	0	0
Live	0	0	0	0
Skulls	0	0	0	0
Trophies	0	0	0	0
Total hippos	0.5 = 1	0	0	0.5 = 1

Figure 3. Annual Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Botswana, 2009-2018.



Burkina Faso

Table 24. Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Burkina Faso, 2009-2018.

Terms	Number of Hippos by Purpose			GRAND TOTAL
	Commercial	Hunting trophy	Personal	Commercial, hunting trophy, personal purposes
Ivory (kg)	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0
Teeth	0 ÷ 12 = 0	0 ÷ 12 = 0	0 ÷ 12 = 0	0 ÷ 12 = 0
Bodies	0	0	0	0

Terms	Number of Hippos by Purpose			GRAND TOTAL
	Commercial	Hunting trophy	Personal	Commercial, hunting trophy, personal purposes
Live	0	0	0	0
Skulls	0	0	0	0
Trophies	0	1	0	1
Total hippos	0	1	0	1

Figure 4. Annual Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Burkina Faso, 2009-2018.

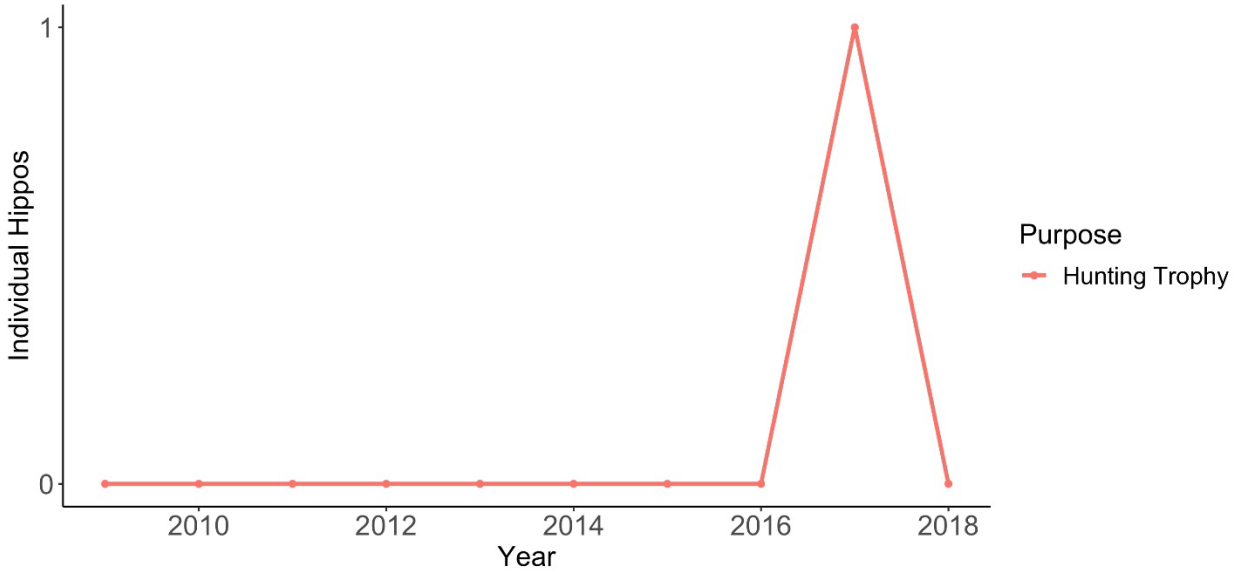
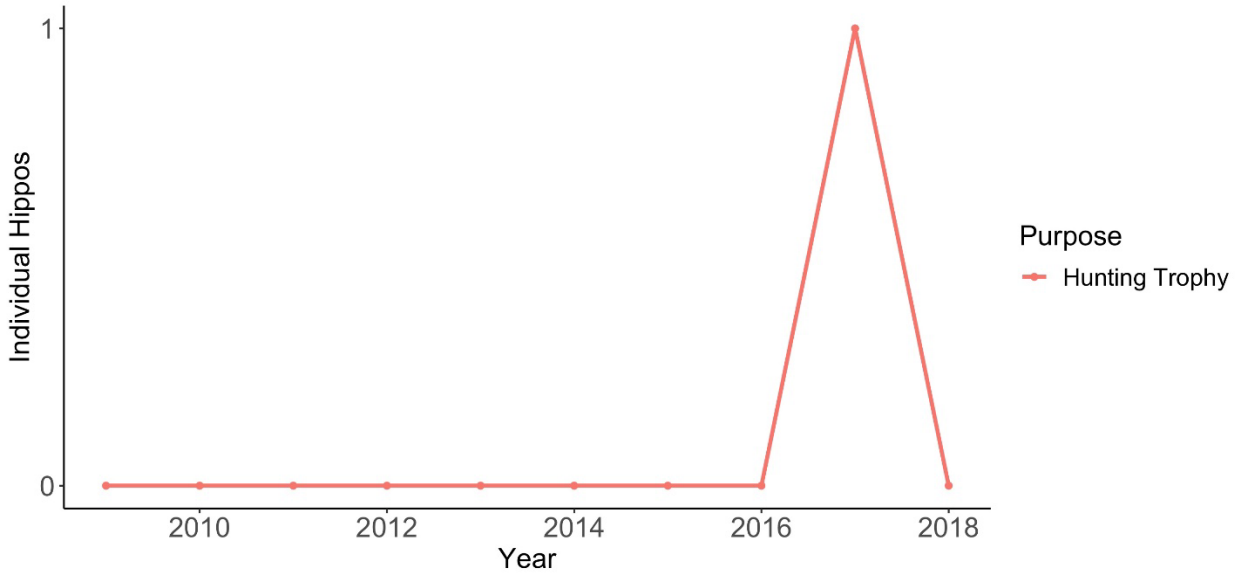


Table 25. U.S. imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Burkina Faso, 2009-2018.

Terms	Number of Hippos by Purpose			GRAND TOTAL
	Commercial	Hunting trophy	Personal	Commercial, hunting trophy, personal purposes
Ivory (kg)	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0
Teeth	0 ÷ 12 = 0	0 ÷ 12 = 0	0 ÷ 12 = 0	0 ÷ 12 = 0
Bodies	0	0	0	0
Live	0	0	0	0
Skulls	0	0	0	0
Trophies	0	1	0	1
Total hippos	0	1	0	1

Figure 5. Annual U.S. imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Burkina Faso, 2009-2018.



Cameroon

Table 26. Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Cameroon, 2009-2018.

Terms	Number of Hippos by Purpose			GRAND TOTAL
	Commercial	Hunting trophy	Personal	Commercial, hunting trophy, personal purposes
Ivory (kg)	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0
Teeth	0 ÷ 12 = 0	199 ÷ 12 = 16.6	0 ÷ 12 = 0	199 ÷ 12 = 16.6
Bodies	0	0	0	0
Live	0	0	0	0
Skulls	0	0	0	0
Trophies	0	11	0	11
Total hippos	0	27.6 = 28	0	27.6 = 28

Figure 6. Annual Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Cameroon, 2009-2018.

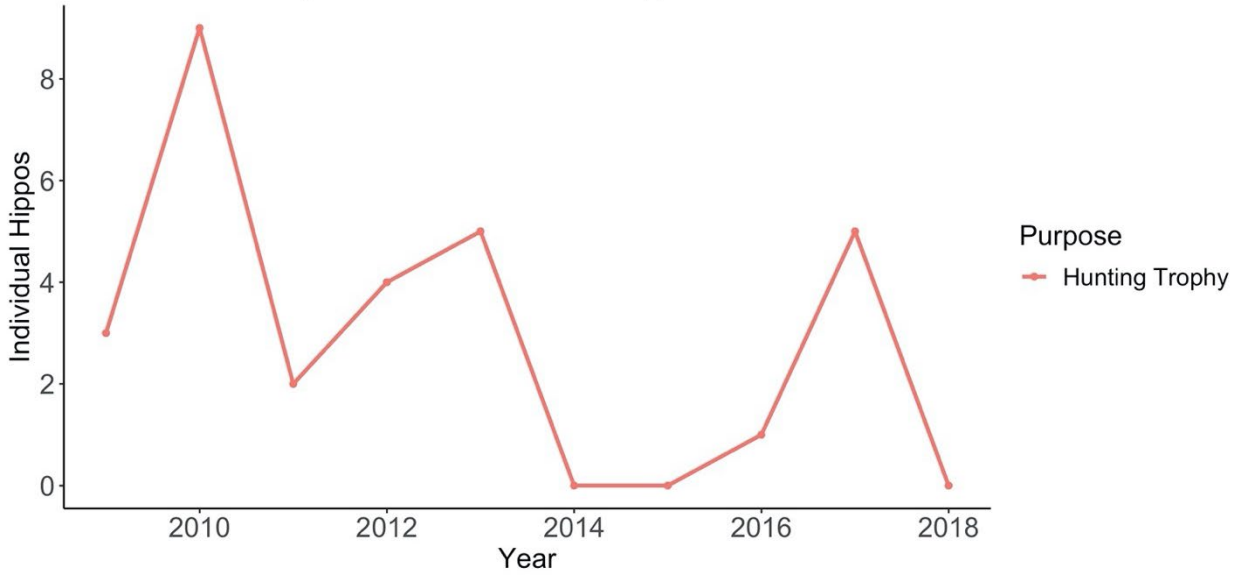
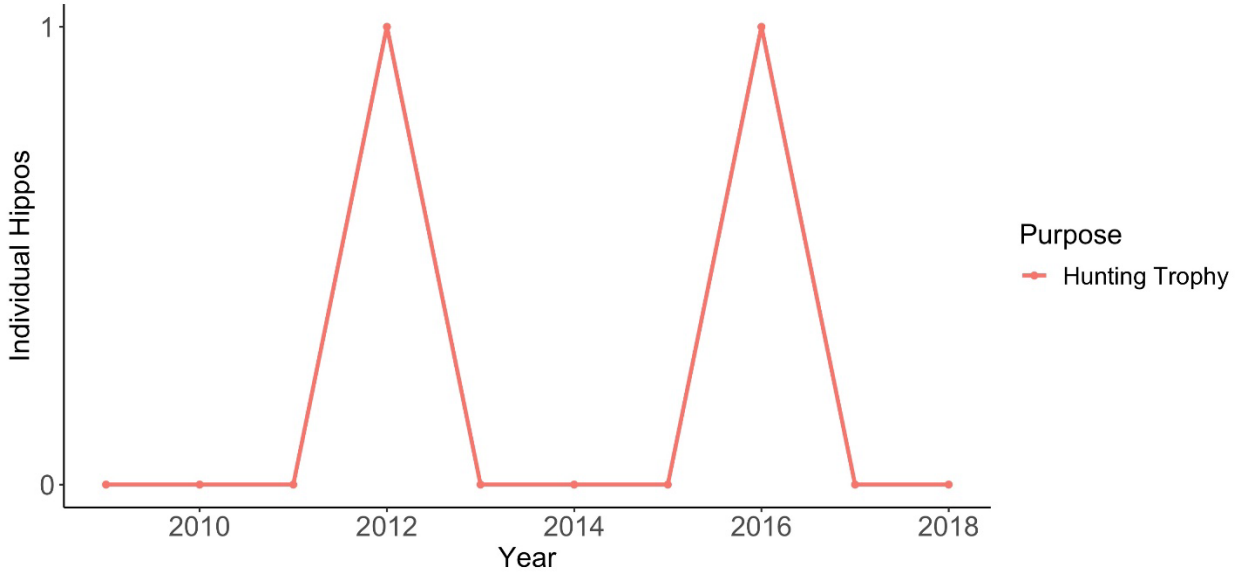


Table 27. U.S. imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Cameroon, 2009-2018.

	Number of Hippos by Purpose			GRAND TOTAL
Terms	**Commercial**	**Hunting trophy**	**Personal**	**Commercial, hunting trophy, personal purposes**
Ivory (kg)	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0
Teeth	0 ÷ 12 = 0	0 ÷ 12 = 0	0 ÷ 12 = 0	0 ÷ 12 = 0
Bodies	0	0	0	0
Live	0	0	0	0
Skulls	0	0	0	0
Trophies	0	2	0	2
Total hippos	0	2	0	2

Figure 7. Annual U.S. imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Cameroon, 2009-2018.

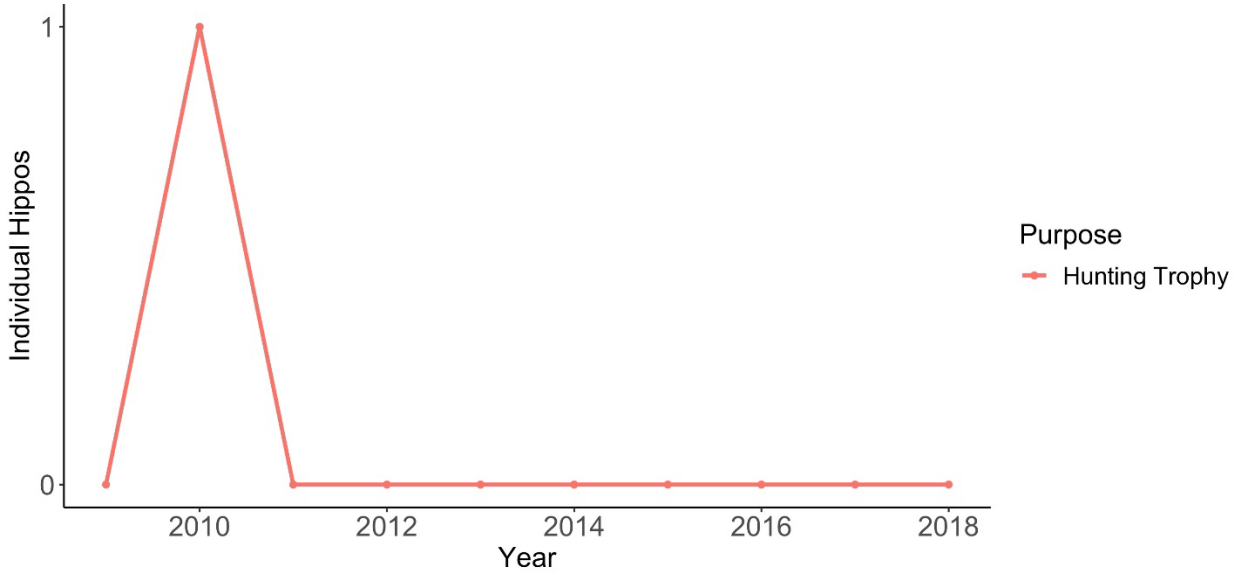


Central African Republic

Table 28. Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Central African Republic, 2009-2018.

	Number of Hippos by Purpose			GRAND TOTAL
Terms	**Commercial**	**Hunting trophy**	**Personal**	**Commercial, hunting trophy, personal purposes**
Ivory (kg)	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0
Teeth	0 ÷ 12 = 0	0 ÷ 12 = 0	0 ÷ 12 = 0	0 ÷ 12 = 0
Bodies	0	0	0	0
Live	0	0	0	0
Skulls	0	0	0	0
Trophies	0	1	0	1
Total hippos	0	1	0	1

Figure 8. Annual Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Central African Republic, 2009-2018

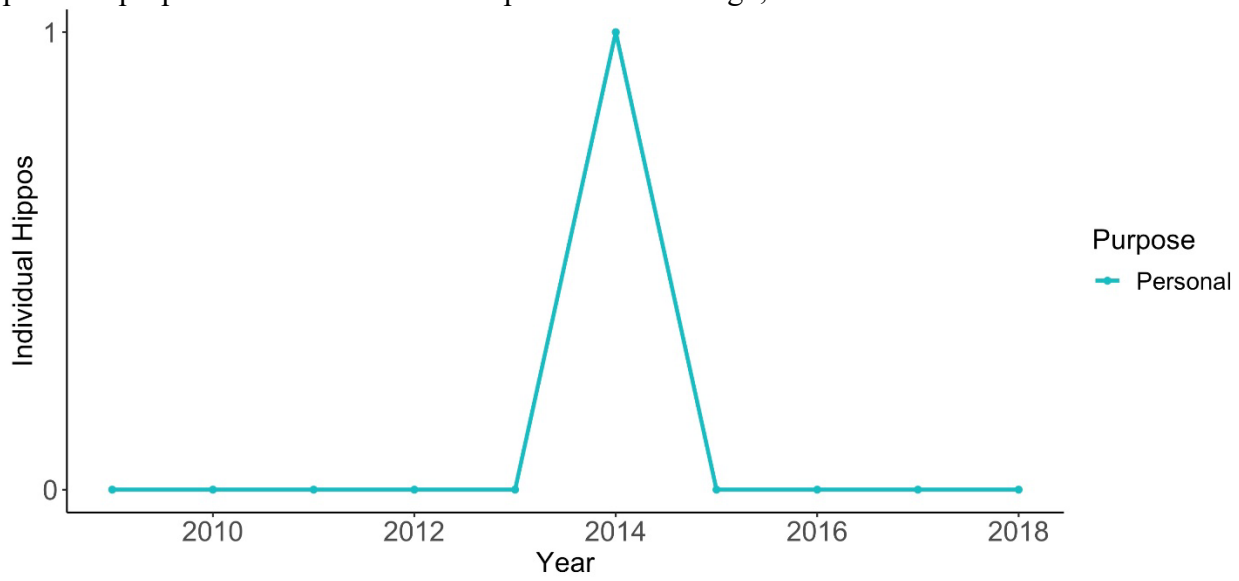


Democratic Republic of the Congo

Table 29. Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from the Democratic Republic of the Congo, 2009-2018.

	Number of Hippos by Purpose			GRAND TOTAL
Terms	**Commercial**	**Hunting trophy**	**Personal**	**Commercial, hunting trophy, personal purposes**
Ivory (kg)	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	3 ÷ 5.25 = 0.6	3 ÷ 5.25 = 0.6
Teeth	0 ÷ 12 = 0	0 ÷ 12 = 0	0 ÷ 12 = 0	0 ÷ 12 = 0
Bodies	0	0	0	0
Live	0	0	0	0
Skulls	0	0	0	0
Trophies	0	0	0	0
Total hippos	0	0	0.6 = 1	0.6 = 1

Figure 9. Annual Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Democratic Republic of the Congo, 2009-2018



Ethiopia

Table 30. Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Ethiopia, 2009-2018.

Terms	Number of Hippos by Purpose			GRAND TOTAL
	Commercial	Hunting trophy	Personal	Commercial, hunting trophy, personal purposes
Ivory (kg)	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0
Teeth	0 ÷ 12 = 0	6 ÷ 12 = 0.5	0 ÷ 12 = 0	6 ÷ 12 = 0.5
Bodies	0	0	0	0
Live	0	0	0	0
Skulls	0	1	0	1
Trophies	0	6	0	6
Total hippos	0	7.5 = 8	0	7.5 = 8

Figure 10. Annual Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Ethiopia, 2009-2018.

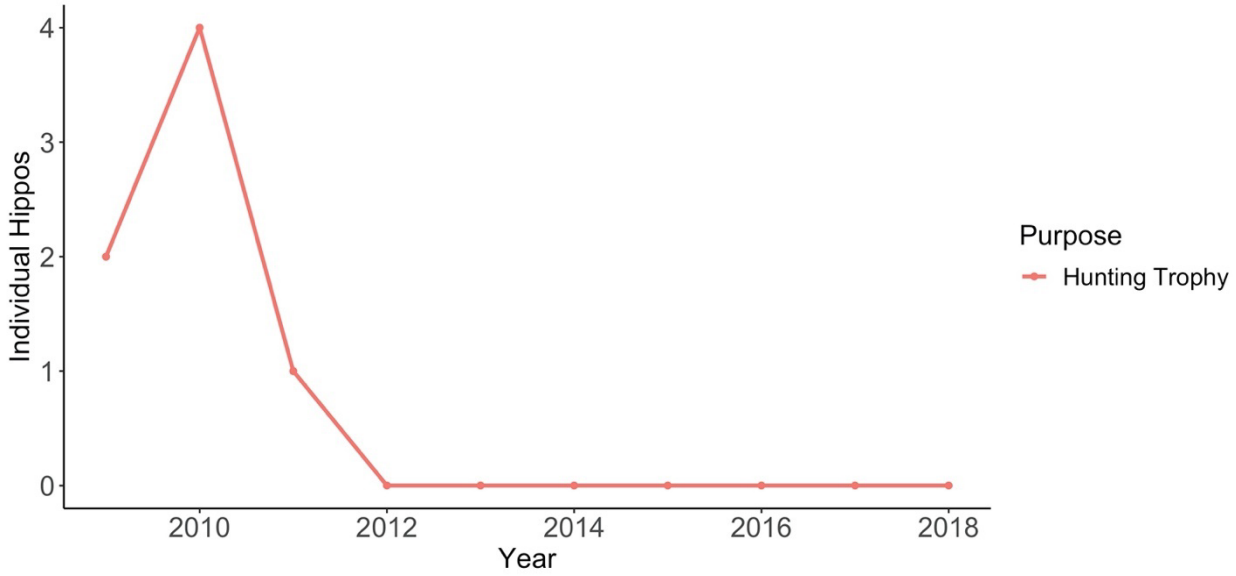
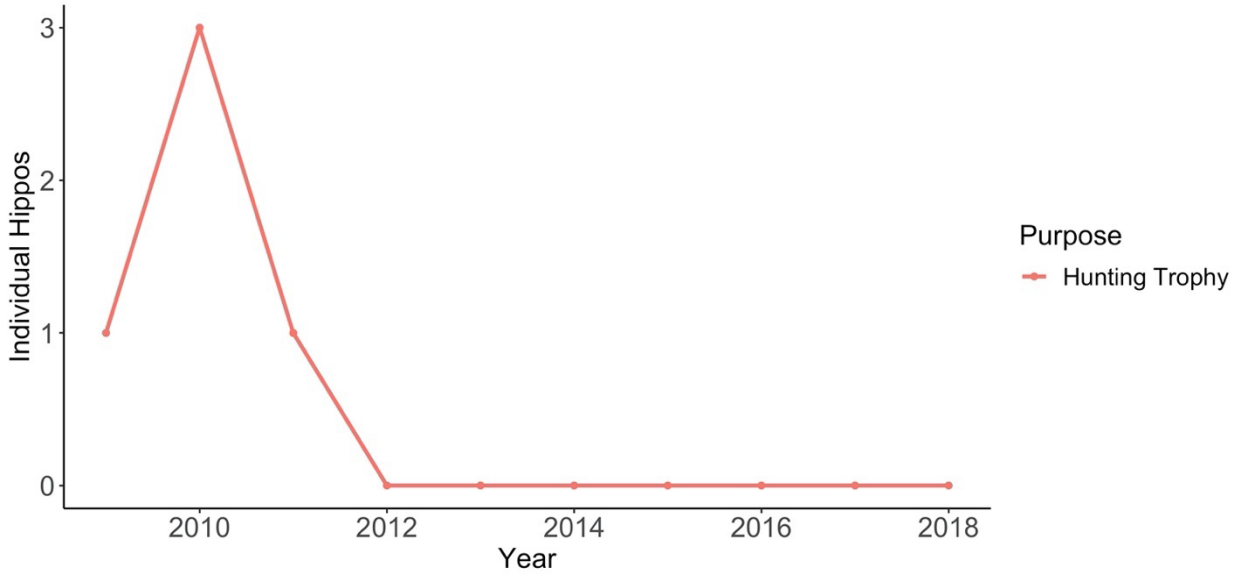


Table 31. U.S. imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Ethiopia, 2009-2018.

	Number of Hippos by Purpose			GRAND TOTAL
Terms	**Commercial**	**Hunting trophy**	**Personal**	**Commercial, hunting trophy, personal purposes**
Ivory (kg)	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0
Teeth	0 ÷ 12 = 0	2 ÷ 12 = 0.2	0 ÷ 12 = 0	2 ÷ 12 = 0.2
Bodies	0	0	0	0
Live	0	0	0	0
Skulls	0	0	0	0
Trophies	0	5	0	5
Total hippos	0	5.2 = 6	0	5.2 = 6

Figure 11. Annual U.S. imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Ethiopia, 2009-2018.

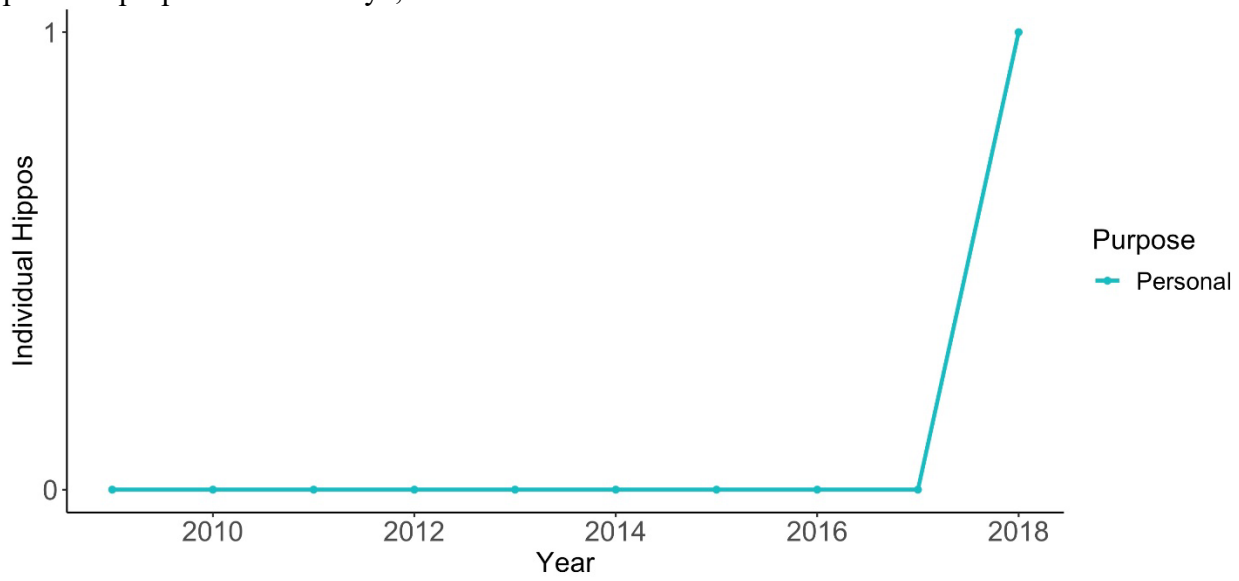


Kenya

Table 32. Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Kenya, 2009-2018.

	Number of Hippos by Purpose			GRAND TOTAL
Terms	**Commercial**	**Hunting trophy**	**Personal**	**Commercial, hunting trophy, personal purposes**
Ivory (kg)	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0
Teeth	0 ÷ 12 = 0	0 ÷ 12 = 0	12 ÷ 12 = 1	12 ÷ 12 = 1
Bodies	0	0	0	0
Live	0	0	0	0
Skulls	0	0	0	0
Trophies	0	0	0	0
Total hippos	0	0	1	1

Figure 12. Annual Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Kenya, 2009-2018.

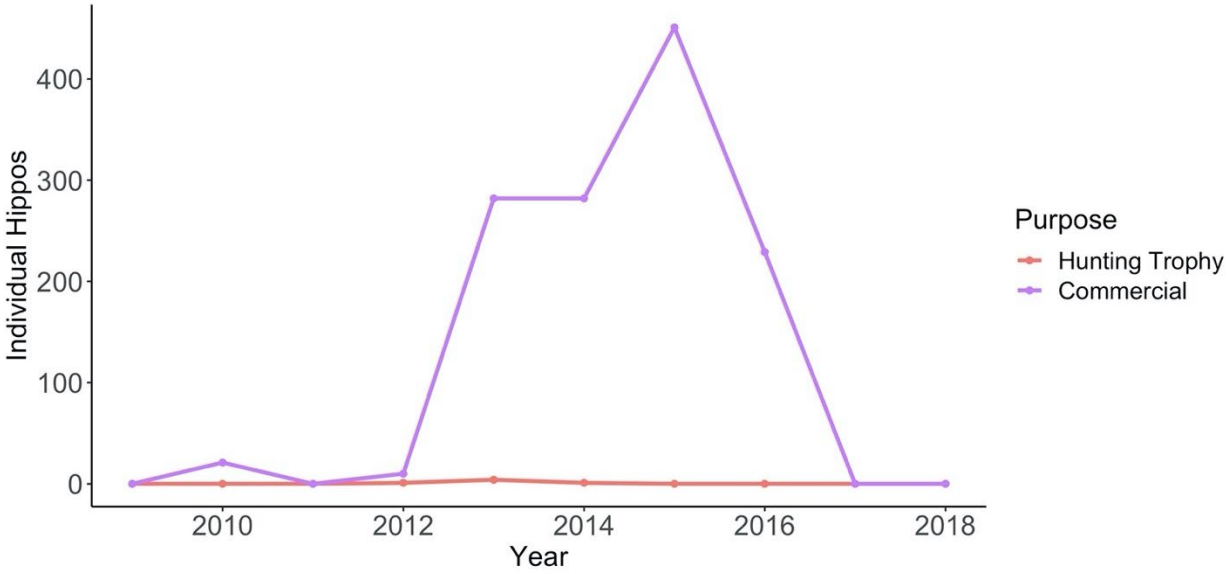


Malawi

Table 33. Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Malawi, 2009-2018.

	Number of Hippos by Purpose			GRAND TOTAL
Terms	**Commercial**	**Hunting trophy**	**Personal**	**Commercial, hunting trophy, personal purposes**
Ivory (kg)	6,683 ÷ 5.25 = 1273	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	6,683 ÷ 5.25 = 1273
Teeth	0 ÷ 12 = 0	24 ÷ 12 = 2	0 ÷ 12 = 0	24 ÷ 12 = 2
Bodies	0	0	0	0
Live	0	0	0	0
Skulls	0	2	0	2
Trophies	0	2	0	2
Total hippos	1,273	6	0	1,279

Figure 13. Annual Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Malawi, 2009-2018.



Mozambique

Table 34. Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Mozambique, 2009-2018.

Terms	Number of Hippos by Purpose			GRAND TOTAL
	Commercial	Hunting trophy	Personal	Commercial, hunting trophy, personal purposes
Ivory (kg)	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0
Teeth	0 ÷ 12 = 0	1,010 ÷ 12 = 84.2	12 ÷ 12 = 1	1,022 ÷ 12 = 85.2
Bodies	0	0	0	0
Live	0	0	0	0
Skulls	1	33	0	34
Trophies	0	193	0	193
Total hippos	1	310.2 = 311	1	312.2 = 313

Figure 14. Annual Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Mozambique, 2009-2018.

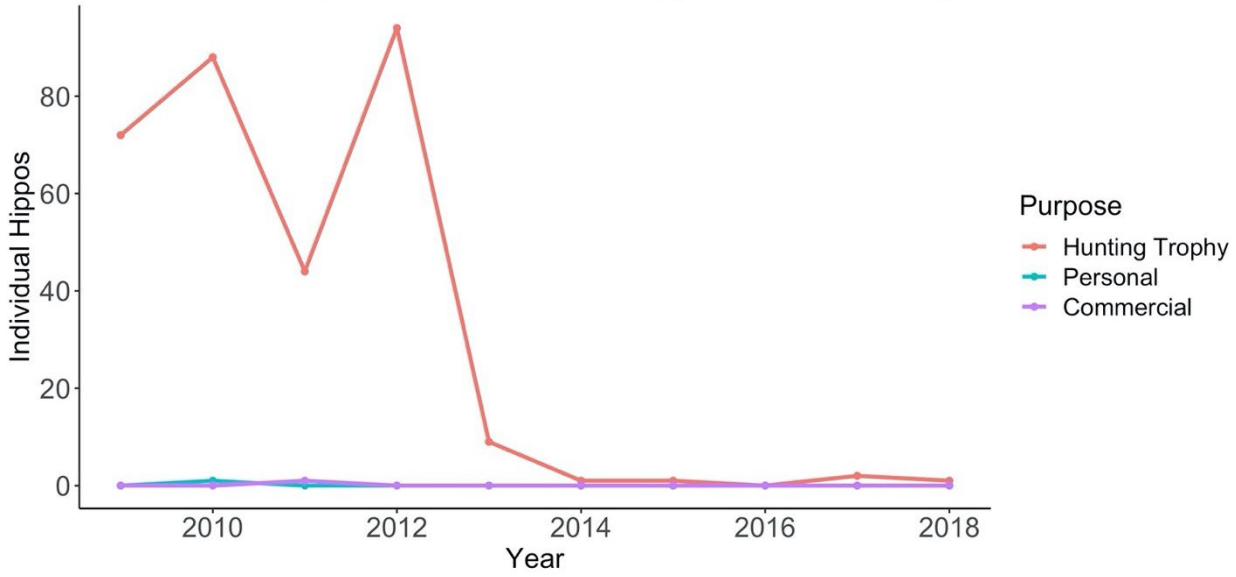
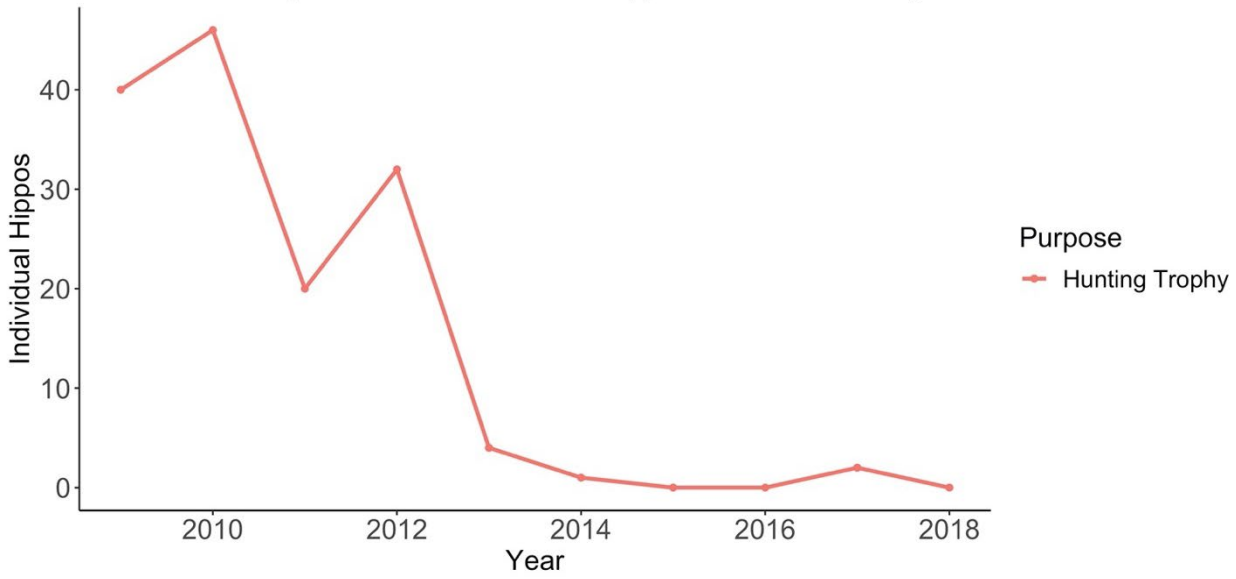


Table 35. U.S. imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Mozambique, 2009-2018.

	Number of Hippos by Purpose			GRAND TOTAL
Terms	**Commercial**	**Hunting trophy**	**Personal**	**Commercial, hunting trophy, personal purposes**
Ivory (kg)	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0
Teeth	0 ÷ 12 = 0	295 ÷ 12 = 24.6	0 ÷ 12 = 0	295 ÷ 12 = 24.6
Bodies	0	0	0	0
Live	0	0	0	0
Skulls	0	6	0	6
Trophies	0	114	0	114
Total hippos	0	144.6 = 145	0	144.6 = 145

Figure 15. Annual U.S. imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Mozambique, 2009-2018.



Namibia

Table 36. Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Namibia, 2009-2018.

	Number of Hippos by Purpose			GRAND TOTAL
Terms	**Commercial**	**Hunting trophy**	**Personal**	**Commercial, hunting trophy, personal purposes**
Ivory (kg)	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0
Teeth	12 ÷ 12 = 1	292 ÷ 12 = 24.3	25 ÷ 12 = 2.1	329 ÷ 12 = 27.4
Bodies	0	0	0	0
Live	10	0	0	10
Skulls	0	14	2	16
Trophies	0	231	6	237
Total hippos	11	269.3 = 270	10.1 = 11	290.4 = 291

Figure 16. Annual Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Namibia, 2009-2018.

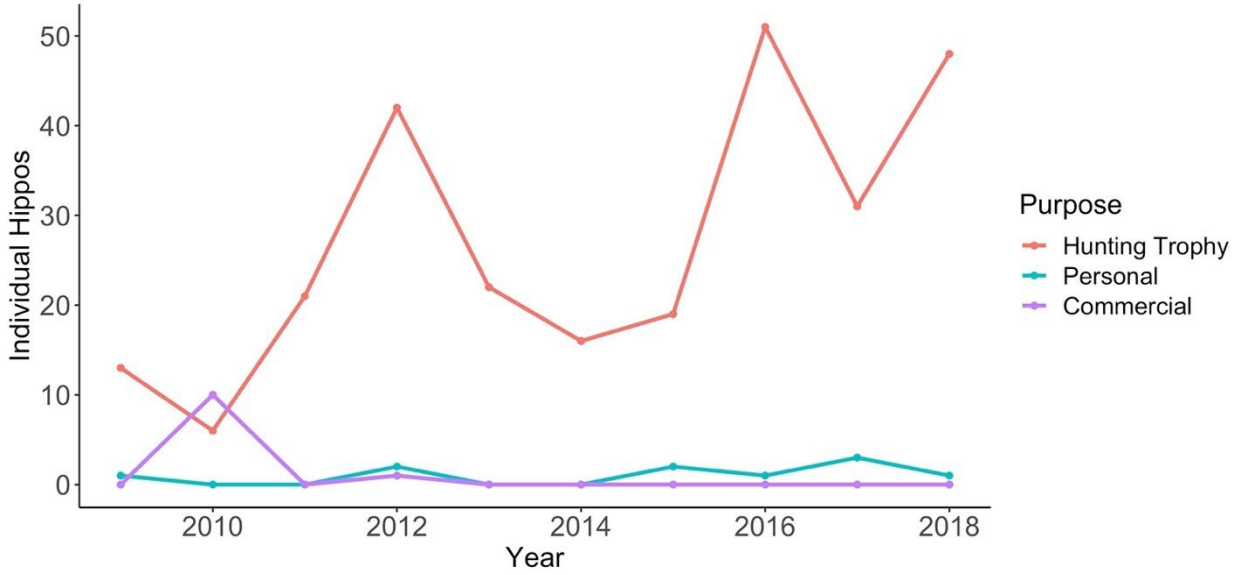
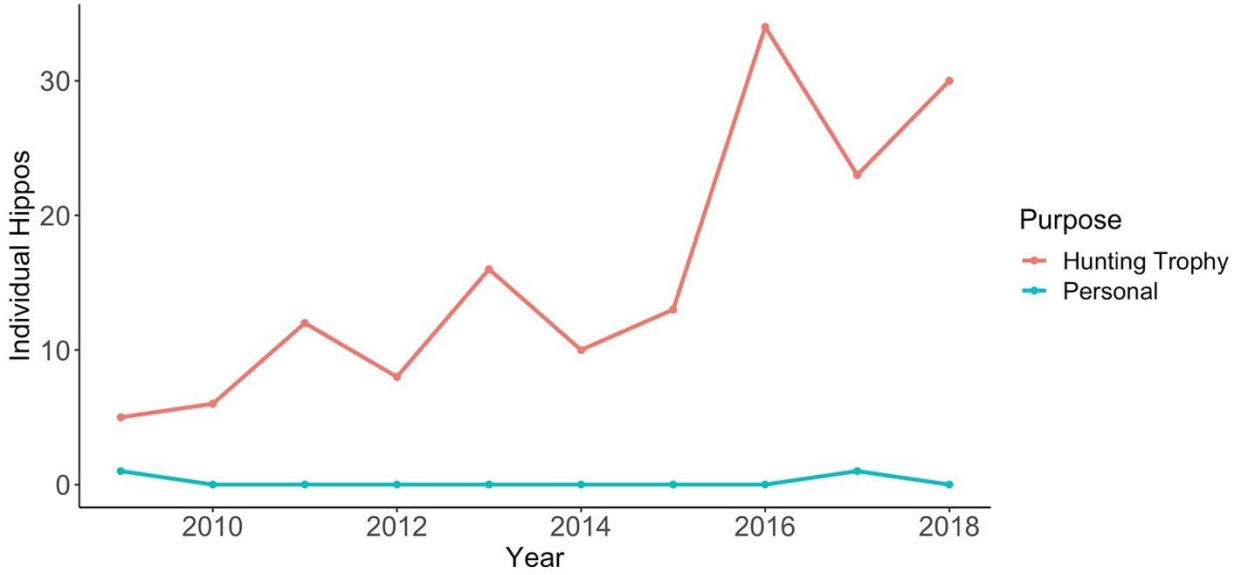


Table 37. U.S. imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Namibia, 2009-2018.

	Number of Hippos by Purpose			GRAND TOTAL
Terms	**Commercial**	**Hunting trophy**	**Personal**	**Commercial, hunting trophy, personal purposes**
Ivory (kg)	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0
Teeth	0 ÷ 12 = 0	118 ÷ 12 = 9.8	1 ÷ 12 = 0.1	119 ÷ 12 = 9.9
Bodies	0	0	0	0
Live	0	0	0	0
Skulls	0	3	1	4
Trophies	0	144	1	145
Total hippos	0	156.8 = 157	2.1 = 3	158.9 = 159

Figure 17. Annual U.S. imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Namibia, 2009-2018.



Nigeria

Table 38. Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Nigeria, 2009-2018.

	Number of Hippos by Purpose			GRAND TOTAL
Terms	**Commercial**	**Hunting trophy**	**Personal**	**Commercial, hunting trophy, personal purposes**
Ivory (kg)	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0
Teeth	0 ÷ 12 = 0	0 ÷ 12 = 0	1 ÷ 12 = 0.1	1 ÷ 12 = 0.1
Bodies	0	0	0	0
Live	0	0	0	0
Skulls	0	0	0	0
Trophies	0	0	0	0
Total hippos	0	0	0.1 = 1	0.1 = 1

Figure 18. Annual Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Nigeria, 2009-2018.

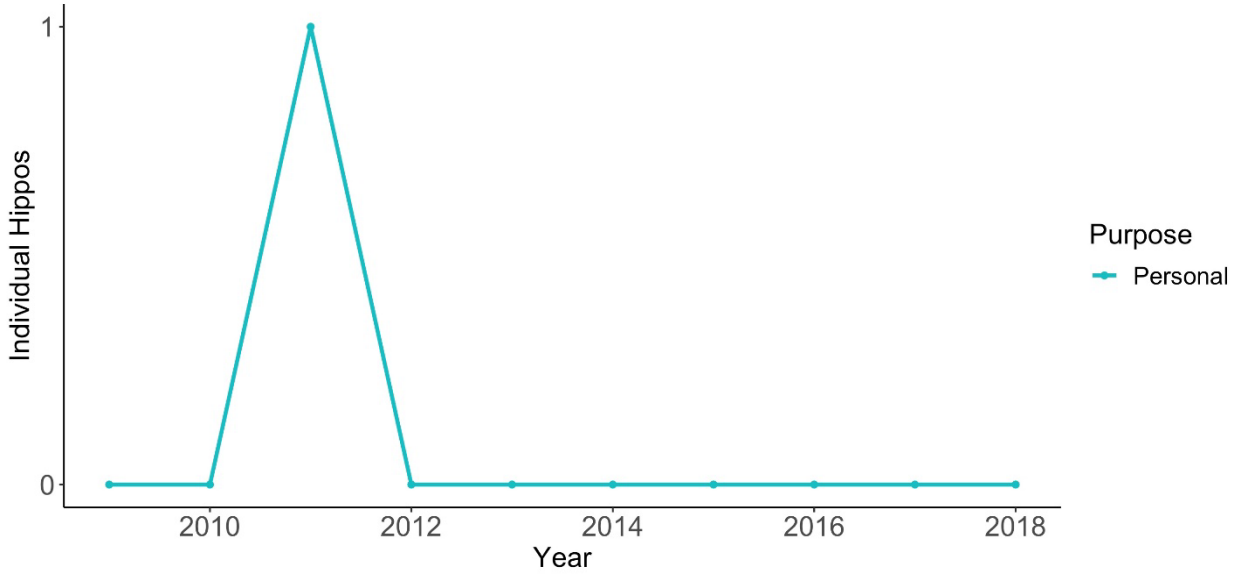
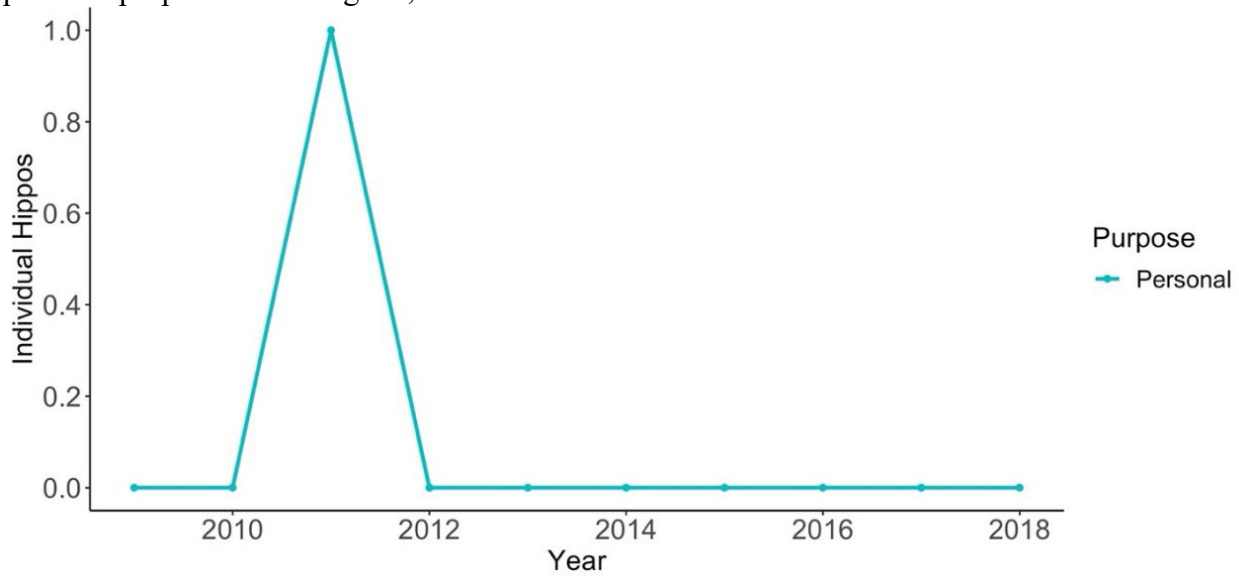


Table 39. U.S. imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Nigeria, 2009-2018.

	Number of Hippos by Purpose			GRAND TOTAL
Terms	**Commercial**	**Hunting trophy**	**Personal**	**Commercial, hunting trophy, personal purposes**
Ivory (kg)	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0
Teeth	0 ÷ 12 = 0	0 ÷ 12 = 0	1 ÷ 12 = 0.1	1 ÷ 12 = 0.1
Bodies	0	0	0	0
Live	0	0	0	0
Skulls	0	0	0	0
Trophies	0	0	0	0
Total hippos	0	0	0.1 = 1	0.1 = 1

Figure 19. Annual U.S. imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Nigeria, 2009-2018.



South Africa

Table 40. Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from South Africa, 2009-2018.

	Number of Hippos by Purpose			GRAND TOTAL
Terms	**Commercial**	**Hunting trophy**	**Personal**	**Commercial, hunting trophy, personal purposes**
Ivory (kg)	471 ÷ 5.25 = 89.7	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	471 ÷ 5.25 = 89.7
Teeth	1,096 ÷ 12 = 91.3	1,310 ÷ 12 = 109.2	196 ÷ 12 = 16.3	2,602 ÷ 12 = 216.8
Bodies	1	3	2	6
Live	55	0	0	55
Skulls	34	49	11	94
Trophies	3	705	41	749
Total hippos	274	866.2 = 867	70.3 = 71	1,210.5 = 1,211

Figure 20. Annual Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from South Africa, 2009-2018.

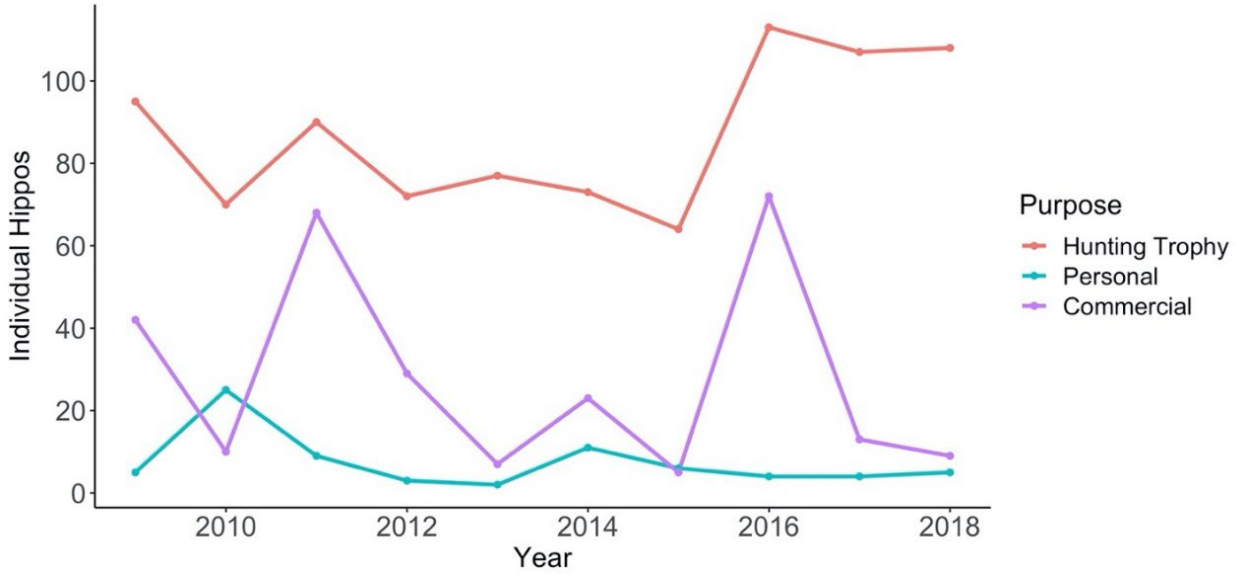
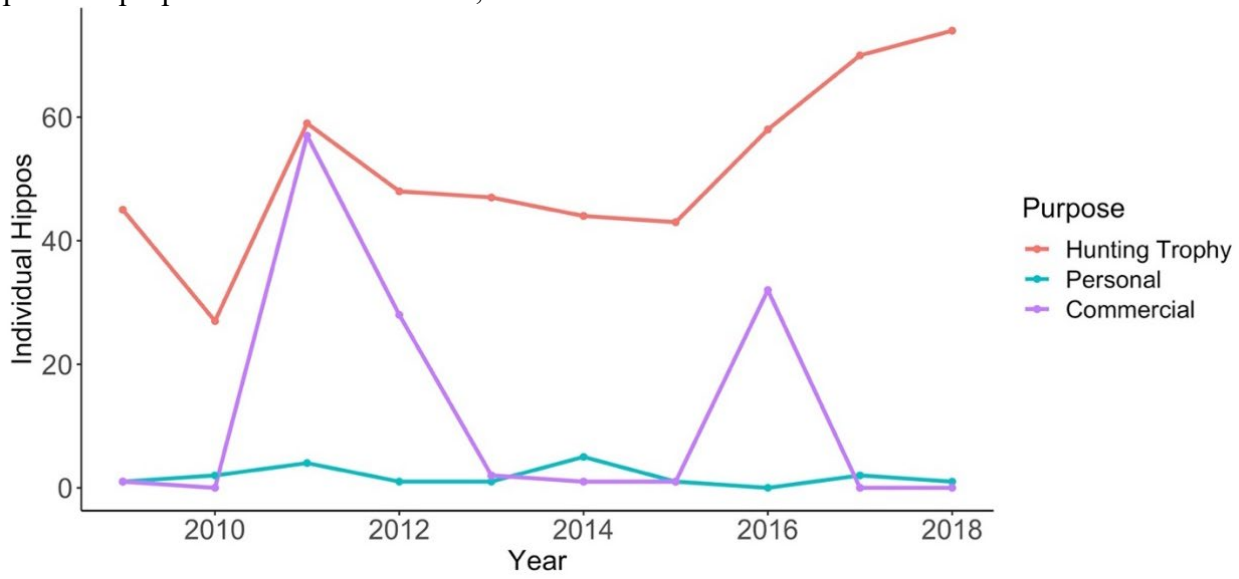


Table 41. U.S. imports of hippos, wild source and commercial, hunting trophy, and personal purposes from South Africa, 2009-2018.

	Number of Hippos by Purpose			GRAND TOTAL
Terms	**Commercial**	**Hunting trophy**	**Personal**	**Commercial, hunting trophy, personal purposes**
Ivory (kg)	441 ÷ 5.25 = 84	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	441 ÷ 5.25 = 84
Teeth	464 ÷ 12 = 38.7	615 ÷ 12 = 51.2	64 ÷ 12 = 5.3	1,143 ÷ 12 = 95.2
Bodies	0	0	0	0
Live	0	0	0	0
Skulls	0	23	4	27
Trophies	0	441	9	450
Total hippos	122.7 = 123	515.2 = 516	18.3 = 19	656.2 = 657

Figure 21. Annual U.S. imports of hippos, wild source and commercial, hunting trophy, and personal purposes from South Africa, 2009-2018.



Tanzania

Table 42. Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Tanzania, 2009-2018.

Terms	Number of Hippos by Purpose			GRAND TOTAL
	Commercial	Hunting trophy	Personal	Commercial, hunting trophy, personal purposes
Ivory (kg)	11,903.1 ÷ 5.25 = 2,267.2	12 ÷ 5.25 = 2.3	3.1 ÷ 5.25 = 0.6	11,918.2 ÷ 5.25 = 2,270.1
Teeth	3,334 ÷ 12 = 277.8	2,706 ÷ 12 = 225.5	544 ÷ 12 = 45.3	6,584 ÷ 12 = 548.7
Bodies	0	0	0	0
Live	0	0	0	0
Skulls	1	69	3	73
Trophies	2	844	77	923
Total hippos	2,548	1,140.8 = 1,141	125.9 = 126	3,814.8 = 3,815

Figure 22. Annual Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Tanzania, 2009-2018.

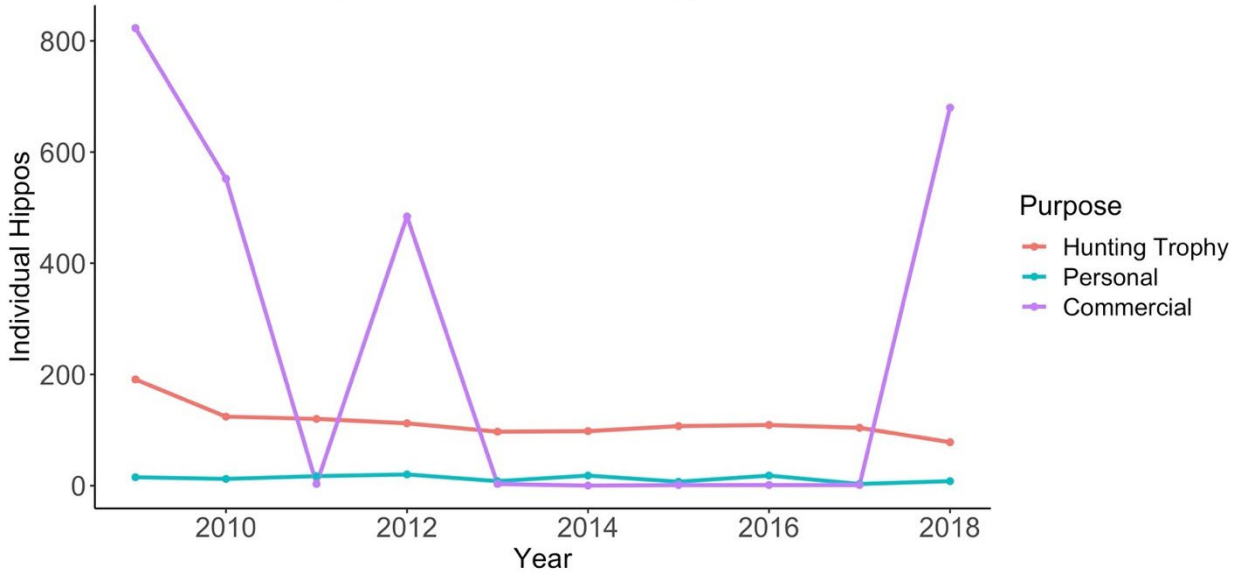
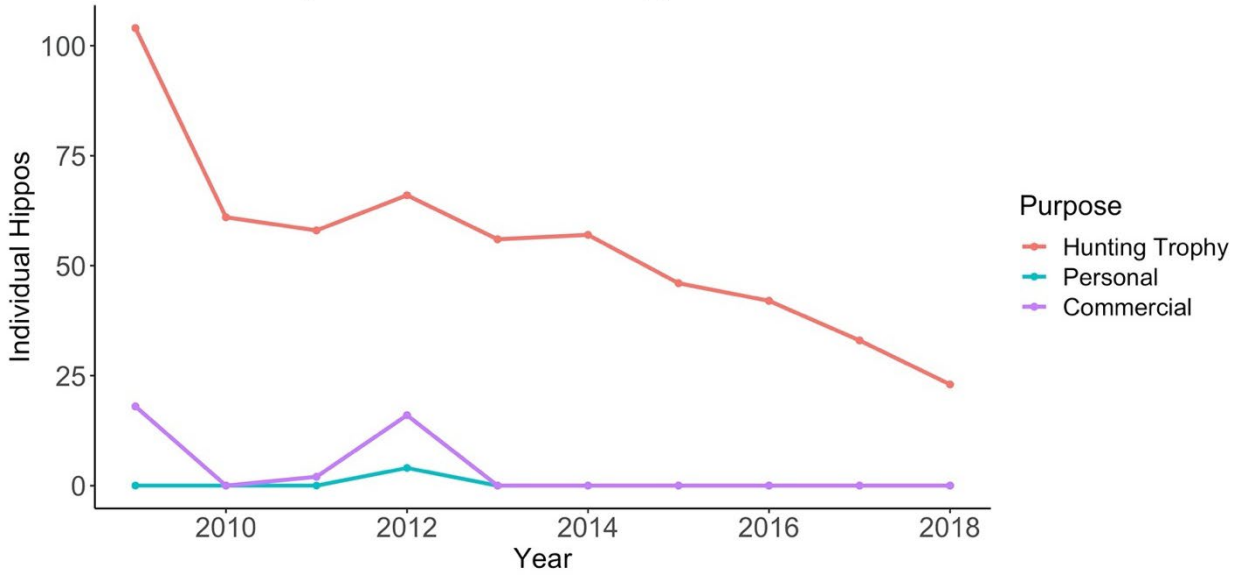


Table 43. U.S. imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Tanzania, 2009-2018.

	Number of Hippos by Purpose			GRAND TOTAL
Terms	**Commercial**	**Hunting trophy**	**Personal**	**Commercial, hunting trophy, personal purposes**
Ivory (kg)	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0
Teeth	434 ÷ 12 = 36.2	940 ÷ 12 = 78.3	12 ÷ 12 = 1	1,386 ÷ 12 = 115.5
Bodies	0	0	0	0
Live	0	0	0	0
Skulls	0	23	0	23
Trophies	0	444	3	447
Total hippos	36.2 = 37	545.3 = 546	4	585.5 = 586

Figure 23. Annual U.S. imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Tanzania, 2009-2018.



Uganda

Table 44. Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Uganda, 2009-2018.

	Number of Hippos by Purpose			GRAND TOTAL
Terms	**Commercial**	**Hunting trophy**	**Personal**	**Commercial, hunting trophy, personal purposes**
Ivory (kg)	15,285.7 ÷ 5.25 = 2,911.6	0 ÷ 5.25 = 0	0.1 ÷ 5.25 = 0	15,285.8 ÷ 5.25 = 2,911.6
Teeth	960 ÷ 12 = 80	162 ÷ 12 = 13.5	12 ÷ 12 = 1	1,134 ÷ 12 = 94.5
Bodies	0	0	0	0
Live	0	0	0	0
Skulls	0	1	0	1
Trophies	0	6	1	7
Total hippos	2,991.6 = 2,992	20.5 = 21	2	3,014.1 = 3,015

Figure 24. Annual Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Uganda, 2009-2018.

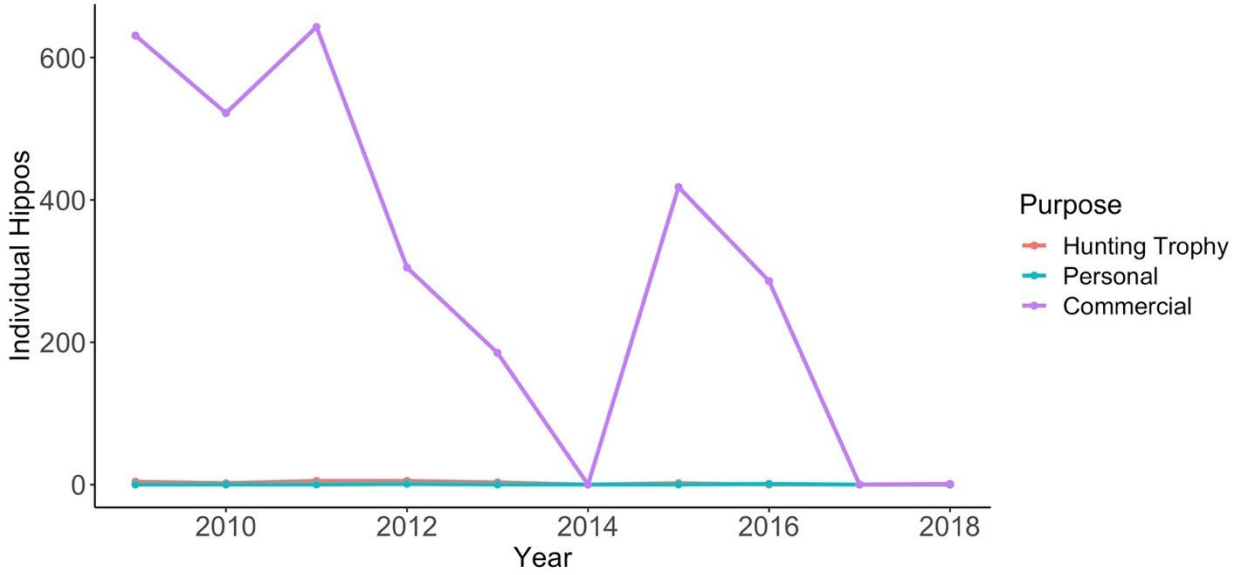
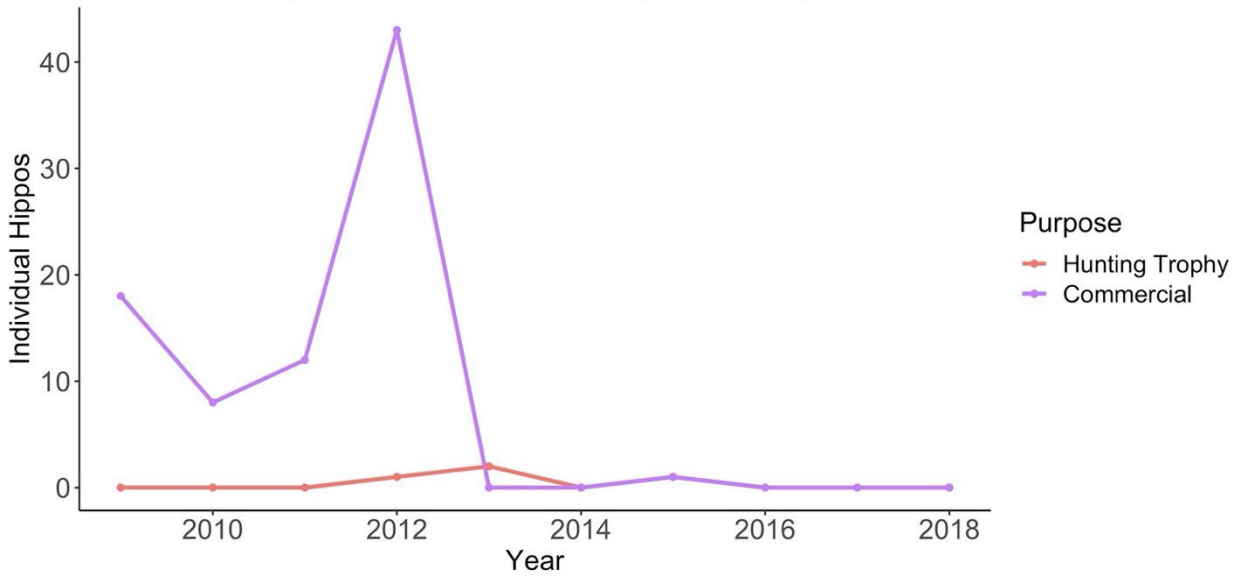


Table 45. U.S. imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Uganda, 2009-2018.

	Number of Hippos by Purpose			GRAND TOTAL
Terms	**Commercial**	**Hunting trophy**	**Personal**	**Commercial, hunting trophy, personal purposes**
Ivory (kg)	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0
Teeth	960 ÷ 12 = 80	0 ÷ 12 = 0	0 ÷ 12 = 0	960 ÷ 12 = 80
Bodies	0	0	0	0
Live	0	0	0	0
Skulls	0	0	0	0
Trophies	0	4	0	4
Total hippos	80	4	0	84

Figure 25. Annual U.S. imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Uganda, 2009-2018.



Zambia

Table 46. Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Zambia, 2009-2018.

	Number of Hippos by Purpose			GRAND TOTAL
Terms	**Commercial**	**Hunting trophy**	**Personal**	**Commercial, hunting trophy, personal purposes**
Ivory (kg)	1,750 ÷ 5.25 = 333.3	0 ÷ 5.25 = 0	2 ÷ 5.25 = 0.4	1,752 ÷ 5.25 = 333.7
Teeth	2,758 ÷ 12 = 229.8	2,675 ÷ 12 = 222.9	108 ÷ 12 = 9	5,541 ÷ 12 = 461.8
Bodies	0	2	0	2
Live	0	0	0	0
Skulls	70	66	1	137
Trophies	2	913	47	962
Total hippos	635.1 = 636	1,203.9 = 1,204	57.4 = 58	1,896.5 = 1,897

Figure 26. Annual Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Zambia, 2009-2018.

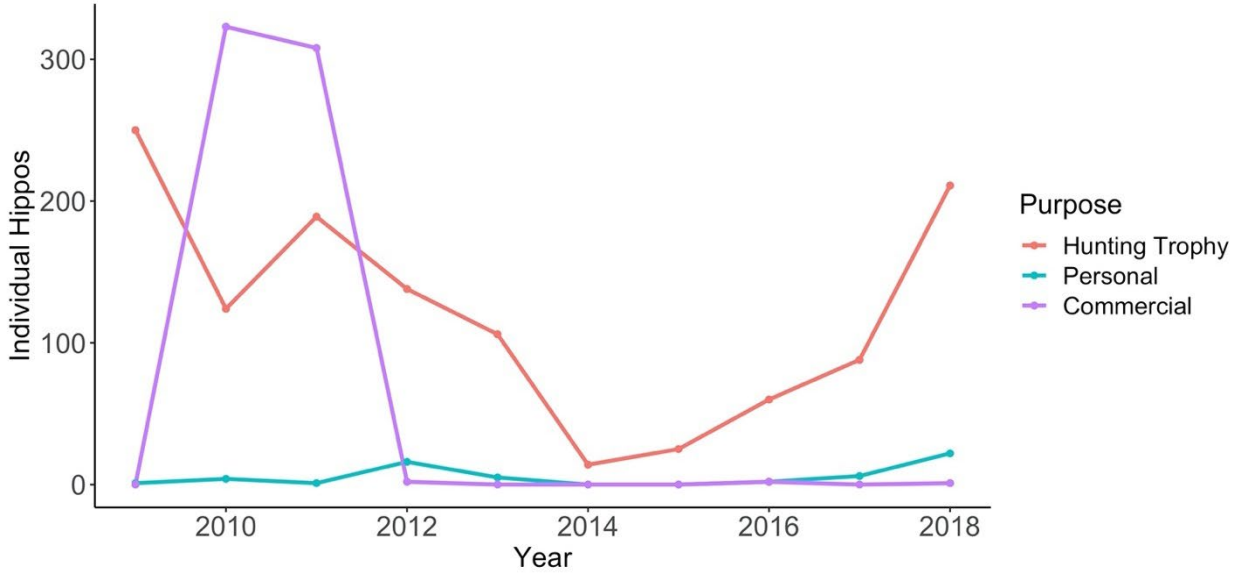
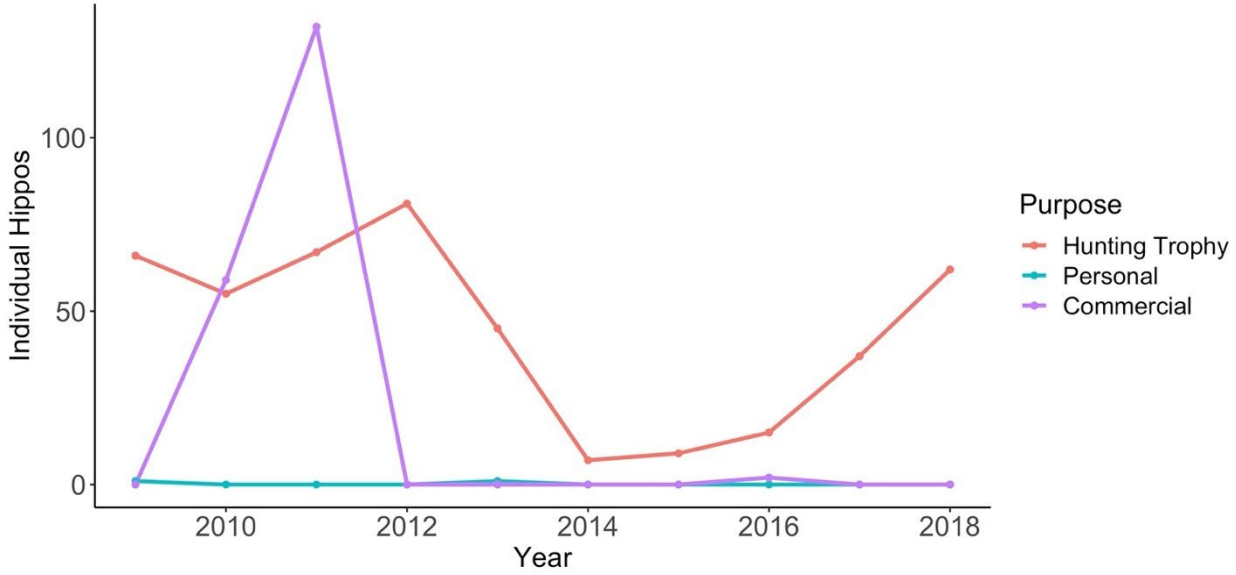


Table 47. U.S. imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Zambia, 2009-2018.

	Number of Hippos by Purpose			GRAND TOTAL
Terms	**Commercial**	**Hunting trophy**	**Personal**	**Commercial, hunting trophy, personal purposes**
Ivory (kg)	200 ÷ 5.25 = 38.1	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	200 ÷ 5.25 = 38.1
Teeth	1,856 ÷ 12 = 154.7	717 ÷ 12 = 59.8	7 ÷ 12 = 0.6	2,580 ÷ 12 = 215
Bodies	0	0	0	0
Live	0	0	0	0
Skulls	0	24	1	25
Trophies	0	361	1	362
Total hippos	192.8 = 193	444.8 = 445	2.6 = 3	640.1 = 641

Figure 27. Annual U.S. imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Zambia, 2009-2018.



Zimbabwe

Table 48. Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Zimbabwe, 2009-2018.

Terms	Number of Hippos by Purpose			GRAND TOTAL
	Commercial	Hunting trophy	Personal	Commercial, hunting trophy, personal purposes
Ivory (kg)	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0
Teeth	1,386 ÷ 12 = 115.5	3,303 ÷ 12 = 275.2	352 ÷ 12 = 29.3	5,041 ÷ 12 = 420.1
Bodies	0	1	0	1
Live	0	0	0	0
Skulls	2	93	3	98
Trophies	2	1,067	47	1,116
Total hippos	119.5 = 120	1,436.2 = 1,437	79.3 = 80	1,635.1 = 1,636

Figure 28. Annual Global imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Zimbabwe, 2009-2018.

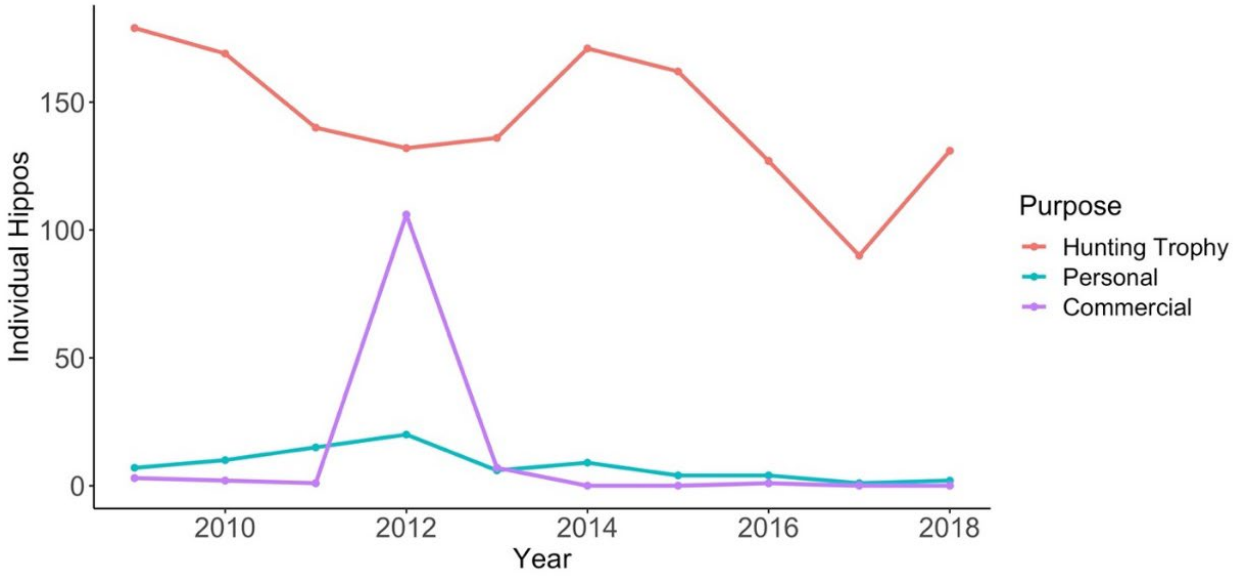
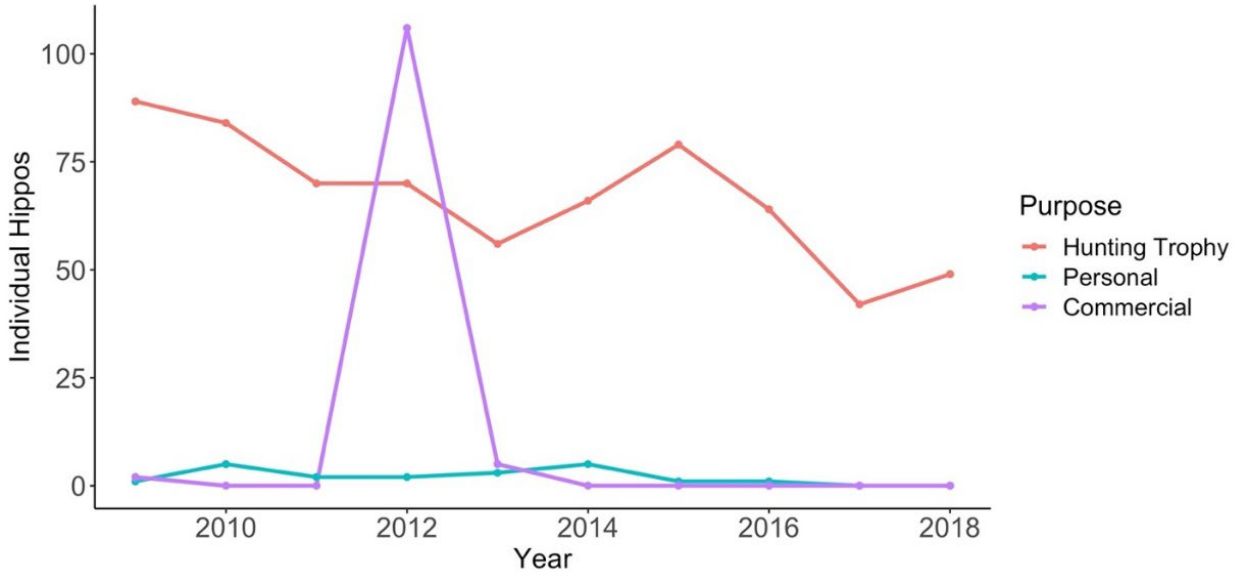


Table 49. U.S. imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Zimbabwe, 2009-2018.

	Number of Hippos by Purpose			GRAND TOTAL
Terms	**Commercial**	**Hunting trophy**	**Personal**	**Commercial, hunting trophy, personal purposes**
Ivory (kg)	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0	0 ÷ 5.25 = 0
Teeth	1,316 ÷ 12 = 109.7	1,149 ÷ 12 = 95.8	130 ÷ 12 = 10.8	2,595 ÷ 12 = 216.2
Bodies	0	0	0	0
Live	0	0	0	0
Skulls	2	39	1	42
Trophies	1	534	9	544
Total hippos	112.7 = 113	668.8 = 669	20.8 = 21	802.2 = 803

Figure 29. Annual U.S. imports of hippos, wild source and commercial, hunting trophy, and personal purposes from Zimbabwe, 2009-2018.



ANNEX

Book Your Hunt's Hippo Hunting Webpage. Accessed on May 3rd, 2021 from https://www.bookyourhunt.com/en/hippo-hunting