Significant and Timely Ivory Trade Restrictions in Both China and the United States are Critical to Save Elephants

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Abstract

The United States and China have committed to enact “nearly complete bans” on the import and export of elephant ivory, including putting in place significant and timely restrictions on the import of ivory as hunting trophies, and taking swift steps to halt their domestic ivory trade. Unlike the United States, China has to move forward on its commitment to further restrict its domestic commercial trade. This is primarily due to China’s existing certificated ivory manufacturers and retailers who own huge legal ivory stockpiles. We propose that the Chinese government use its eco-compensation funds to purchase back all legal ivory from the market. This “decommodification” could help save the elephant population worldwide. Alternatively, China could enact a domestic ban with a short phase-in period (a similar approach has been adopted by several U.S. States) to allow legal ivory merchants to sell their stockpiles. A hybrid of these two approaches could also be considered.

Introduction

In September 2015, the Presidents of China and the United States committed to enact “nearly complete bans” on the import and export of elephant ivory, including significant and timely restrictions on the import of ivory as hunting trophies, and to take swift steps to halt the domestic ivory trade. They decided to further enhance mutual cooperation and cooperation with other nations to combat wildlife trafficking (The White House 2015).

African elephants currently face serious threats from poaching, illegal ivory trade, range reduction, and habitat loss. In just a decade, forest elephants in Central Africa suffered a population decline of 62% (at the rate of 9% annually) and a 30% reduction of its geographical range (Maisels et al. 2013). Data from the Monitoring of Illegal Killing of Elephants (MIKE) Program, implemented by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), indicate that approximately 25,000 and 22,000 elephants were poached continent-wide in 2011 and 2012 for their tusks (CITES 2013a). Another study concludes that illegal killing levels were unsustainable for both African forest and savannah elephants between 2010 and 2014, peaking at about 8% in 2011, which extrapolates to 40,000 elephants illegally killed and a probable species reduction of 3% that year (Wittemyer et al. 2014). These data suggest that, if these trends continue, the current wild elephant population could face extinction in the foreseeable future.

These population trends are driven by ivory consumption, much of it from Asia. The proportion of illegal killing of elephants (PIKE) was positively correlated to increases in China’s household consumption (CITES 2013b). Since 2002, 70 tons of illegal ivory has been seized by Chinese customs authorities. While these large seizures...
of illegal ivory reflect the efforts of Chinese enforcement agencies such as Customs and the forestry police, these achievements, even coupled with efforts to reduce consumer demand, will be inadequate unless coupled with strengthened wildlife trade policy and regulations.

For example, while the Chinese government destroyed 6.1 tons of confiscated ivory in Guangdong in 2014 (Huang & Weng 2014) and crushed another 662.43 kg of seized ivory in Beijing in 2015 (Wang & Liu 2015) in order to show China’s zero-tolerance policy for the illegal ivory trade, there are currently 34 officially designated ivory manufacturers and 130 licensed dealers selling tons of ivory legally in China (China’s State Forestry Administration 2015a).

This system of legal ivory sales began in 2006, when traditional Beijing and Guangzhou ivory-carving was listed by China’s Ministry of Culture as part of the nation’s “intangible cultural heritage” (Gao & Clark 2014) under the Convention for the Safeguarding of Intangible Cultural Heritage. In 2008, following approval by CITES, China imported 62 tons of legal ivory stockpiles from southern African states. To regulate the domestic legal market, China’s State Forestry Administration (SFA) established an ivory registration and certification system. In theory, this system requires each ivory-carving product to be associated with an identification card that contains its photograph, details of the product’s weight, origin, and the name of the carving company. Each ivory product is required to be kept with its own identification card (China’s State Forestry Administration 2013).

The implementation of this system correlated both with an increase in the consumption of ivory products in China and an increase in illegal ivory markets. According to a wildlife consumption attitudinal survey conducted in five major Chinese cities in 2012, among the 20 categories of luxury wildlife products, ivory rated third of the five most frequently purchased goods (Zhang & Yin 2014). In recent years, ivory products have been widely advertised as an investment, further stimulating demand, which corresponds to a growing interest in arts investments in China (Gao & Clark 2014). As a result, China saw an increase in illegal markets to meet the demand that officially designated ivory manufacturers and licensed dealers were unable to match. The “black market” and “white market” now exist side-by-side, which complicates market regulation and increases enforcement costs.

Inadequate regulations in the United States have also contributed to the global illegal wildlife trade. Porous national borders, widespread legal trade in older and antique ivory, and difficulties in law enforcement have made the United States a major market for illegal ivory (Allgood et al. 2013). In recent years, the United States has taken steps to crack down on this legal trade. Laws prohibiting most legal ivory trade have passed in New York, California and, most recently, Hawaii (New York State Legislature 2014; Legislative Counsel of California 2015; Hawaii Legislature 2016), which constitute the three biggest markets for ivory in the United States. The U.S. federal government has also finalized new ivory regulations, which prohibit the import, export, and interstate trade in most ivory products (U.S. Fish and Wildlife Service 2016). Collectively, these legal changes go far toward meeting the U.S. pledge to enact significant and timely restrictions on its domestic ivory trade.

We conducted an investigation to assess the current status of the legal and illegal ivory market in China and review recent changes to ivory trade laws and regulations in the United States. We also suggest ways, informed by our review of U.S. law that the Chinese government could move to quickly fulfill its pledge to enact a “nearly complete ban” on its domestic ivory market.

**Methods**

Our team investigated ivory-selling practices in licensed facilities, as well as unlicensed stores where we suspected ivory products were sold. The survey methodology was used in a similar research conducted by International Fund for Animal Welfare (IFAW) in 2011 (Gabriel et al. 2012). Our investigators were trained by IFAW investigators, who were involved in the previous study in order to ensure the consistency of questions and survey methods (to see supplementary document for details of information gathered during the field survey).

We used cross-tabulation and Pearson’s $\chi^2$ test (df = 1, Fisher’s exact test, two-tailed) to compare the difference of findings between a 2011 IFAW report and our 2014 survey. The date weighted with the number of SFA-certified retail stores in each survey. The IBM SPSS 20.0 (IBM SPSS Inc., Chicago, IL, USA) software was used to conduct the analysis.

For our analysis of regulatory approaches by the United States, we reviewed recent laws passed by the states of New York and California, which are publically available. We also reviewed existing regulatory requirements in New York for selling ivory (which had a licensing scheme in place), as well as the legislative history of the California statute. This legislative history was reviewed through utilizing a service provided by Westlaw (www.westlaw.com), a standard subscription-based legal research database. The review of the statutes, regulations, and legislative history was conducted by one of the authors, who is licensed to practice law in both New York and California. The authors also reviewed available statements and federal regulations, published by...
the United States Fish and Wildlife Service and the White House.

**Results of the China ivory market investigation**

Our investigators visited a total of 165 retail stores and two factories in 20 cities in China. Seventy-three of the retail stores and the two factories were authorized by the SFA to sell ivory in 2014. The remaining 92 facilities were not on the SFA-approved list, but were still found to be selling ivory products.

**Unlicensed shops illegally trading ivory products**

There were 101 unlicensed facilities found to be illegally selling ivory products in the 2011 IFAW survey. In this research, we identified 92 unlicensed facilities, which does not constitute a significant difference between these illegal ivory sales in unlicensed facilities (Pearson’s $\chi^2 = 2.238$, df = 1, Fisher’s exact test $P = 0.142$).

Unlicensed shops trading in ivory products share some common characteristics. First, most of the shops are located in places such as antique districts, gift shops, and flower and fish markets. Thus, their main businesses were based on other types of commodities including jade, jewelry, antiques, and mammoth products. Ivory products accounted for the lowest proportion, and were only used for display. In addition, the numbers of displayed ivory products varied in different cities. Shops in cities such as Beijing, Shanghai, and Guangzhou, where the supervision is consistently strict, generally did not openly exhibit (or exhibited few) ivory products.

In the 92 unlicensed facilities, 29 shops did not openly exhibit (or exhibited only one) ivory products. It was not until the merchants were convinced that the investigators were serious about making a purchase, that they would show ivory products. By contrast, 63 illegal shops openly displayed ivory products ($\geq 2$) in prominent places. Almost all of the illegal shops (89 of 92) only displayed or initially showed investigators small common ivory products such as bracelets, pendants, and ivory balls (good-luck knots). However, once the merchant’s trust was gained, 48 shops were willing to show additional larger and more expensive items, and six shops even offered to customize large ivory carvings.

**Illegal sale activities in registered facilities**

In IFAW’s 2011 survey, 34 registered stores (59.6%) among 57 visited were found to be engaging in illegal activities connected to the selling of ivory products. In 2014, we visited 73 certified retail stores among a total of 145 SFA-registered facilities, and found 25 facilities (34.2%) to be engaged in illegal activity. The proportion of illegal activities in certified facilities thus declined significantly over the past 3 years based on the following results: Pearson’s $\chi^2 = 8.333$, df = 1, Fisher’s exact test $P = 0.005$ (see Table 1 for details). These illegal activities included:

1. Ivory products did not match the identification cards: The main forms of violation of the ivory product registration system are the separation of ivory products from their identification cards. Eight stores were documented selling small ivory items without certificated identification cards. In addition, 15 stores, the number of the identification card did not match that of ivory products, or the photographs on identification cards did not match the objects sold.

2. Mammoth tusks were used as a cover: Forty-one of the visited licensed shops also sold mammoth tusks. We are not certain whether all of these shops were selling illegally sourced African ivory under the cover of mammoth tusks but after careful identification by our investigators, we are sure that there are at least three shops selling unlicensed African ivory products as mammoth tusks.

**Prices of ivory products**

Legal shops: Legitimate shops sold ivory products by the piece; none of the shops priced their sales by weight. The prices of large ivory carvings fluctuated widely between shops. The main factors affecting the price of ivory were found to be the size and location of the shops (Table 2), but different material quality (color, location, texture, and the presence of impurities) and carving processes (e.g., machine vs. manually carved) also had an impact on product price.

Illegal shops: Ivory prices in the illegal stores varied slightly in different cities, but all sold ivory at lower prices than legally registered shops. Investigators also found that some minimally processed or unprocessed ivory could be sold by weight. As with legal shops, the quoted prices also fluctuate with the quality of materials.

**Discussion**

Our investigation visited more than half of the licensed facilities listed by the SFA in 2014 (see Table 1). Of these, 15 had closed or no longer participated in ivory trade. In addition, at the time of our visit, nine facilities, while still selling ivory products, had not replenished their stock and had begun transitioning to selling substitute goods, such as gemstones and wood carvings. Our investigation thus indicates that the legal ivory market in China is shrinking. By contrast, our investigation did not reveal any
Table 1  Ivory trade retail stores visited in 2014

| Province | City                        | Licensed facilities | Licensed facilities with illegal activities | Unlicensed facilities | Total |
|----------|-----------------------------|---------------------|---------------------------------------------|-----------------------|-------|
| Beijing  | Beijing                     | 17                  | 5                                           | 4                     | 21    |
| Guangdong| Guangzhou, Shenzhen         | 10                  | 5                                           | 2                     | 12    |
| Shanghai | Shanghai                    | 15                  | 2                                           | 8                     | 23    |
| Tianjin  | Tianjin                     | 6                   | 1                                           | 3                     | 9     |
| Jiangsu  | Nanjing, Changzhou, Rugao, Suzhou | 10        | 4                                           | 14                    | 24    |
| Zhejiang | Hangzhou, Wenzhou, Yueqing, Yiwu, Ningbo | 8          | 4                                           | 41                    | 49    |
| Fujian   | Fuzhou                      | 1                   | 1                                           | 2                     | 3     |
| Hunan    | Changsha                    | 1                   | 0                                           | 15                    | 16    |
| Shandong | Qingdao, Weifang            | 2                   | 1                                           | 2                     | 4     |
| Chongqing| Chongqing                   | 1                   | 0                                           | 1                     | 2     |
| Yunnan   | Kunming                     | 2                   | 2                                           | 0                     | 2     |
| Total    | 73/145<sup>a</sup>          | 25 (34.2%)          | 92                                          | 165                   |

<sup>a</sup>Total number of registered retail stores in the year.

Table 2  The prices of ivory products in China’s domestic markets in our 2014 survey

| Type                  | Size            | Registered large retail stores/major cities | Registered small or medium-sized stores/small or middle cities | Black market |
|-----------------------|-----------------|---------------------------------------------|---------------------------------------------------------------|---------------|
| Raw ivory             |                 |                                             |                                                               |               |
| Trimmed whole tusk    | 623–1,847 g     | –                                           | 2.06–2.38                                                     | 1.71–2.60<sup>a</sup> |
| Tusk section          | 50–1,000 g      | –                                           | –                                                            | 4.76–6.35     |
| Worked ivory          |                 |                                             |                                                               |               |
| Buddha pendants       | 30–50 g         | 52.91–63.49                                 | 21.16–31.75                                                   | 7.94–9.52     |
| Bracelets             | 50–60 g         | 63.49–132.28                               | 25.40–39.68                                                   | 13.23–15.87   |
| Small balls           | 2–3 g           | 79.37                                       | 23.81                                                        | 7.94          |

<sup>a</sup> Gao & Clark (2014). Online black market, December 2013 to February 2014.

signs of decline in ivory trade conducted by unlicensed stores. This could be due to the fact that the prices in the “black market” are much cheaper, and therefore there is a larger market for these items, and the fact that the legal market still proves a “cover” for illegal sales (see Table 2).

In order to combat this issue, the Chinese government made three important announcements in 2015. First, it announced a 1-year ban on the import of all carved ivory items in February (China’s State Forestry Administration 2015b). Second, in May, China’s SFA announced that as part of a 10-point plan to reduce ivory trafficking, ivory manufacturing and trade must be strictly controlled (China’s State Forestry Administration 2015c). Third, on October 15, the SFA announced a 1-year ban on the import of trophy-hunting ivory from Africa (China’s State Forestry Administration 2015d).

As the second-largest market for ivory after China (Martin & Stiles 2008; Fisher 2013), the United States has also announced important new rules to restrict domestic trade in ivory. In July 2013, the Obama Administration issued an executive order on “Combating Wildlife Trafficking,” instructing federal agencies to enhance efforts to combat wildlife trafficking (The White House 2013). Responding to this directive, in February 2014, the Director of the United States Fish and Wildlife Service issued the Director’s Order 210, which bans all commercial imports of ivory including antiques, along with most commercial exports (United States Department of the Interior Fish and Wildlife Service 2014). Finally, the United States proposed regulations in August of 2015 to revise African elephant rules promulgated under the United States Endangered Species Act, which included reducing African elephant trophy imports, prohibiting the interstate trade of the vast majority of ivory products, and further restricting African elephant ivory exports (United States Department of the Interior Fish and Wildlife Service 2015).

These actions by the United States and China were reinforced recently, when the presidents of both countries issued a joint statement committing to enact
“nearly complete bans” on the export and import of ivory (The White House 2015). On June 2, 2016, the United States followed up on its commitment by finalizing its Endangered Species Act regulations, which it described as a “near total” ban on commercial import, export, and interstate ivory trade. (U.S. Fish and Wildlife Service 2016. Source: https://www.fws.gov/news/ShowNews.cfm?ID = 35686.) Finally, on June 8, 2016, as part of the eighth U.S.-China Strategic & Economic Dialogue, China committed to publish a timetable by the end of 2016 to halt its domestic commercial trade of ivory. (U.S. Department of State 2016. Source: http://www.state.gov/r/tp/rls/ps/2016/258146.htm.)

Despite this progress, implementing a domestic ivory ban faces challenges in both countries. In the United States, a hostile congress is attempting to pass legislation reversing the president’s policy changes and lawsuits may be filed challenging it. In China, the timetable for implementing a domestic ban may be slow, in part due to China’s huge legal stockpiles of ivory, as well as numerous concerns from various stakeholders. How to deal with these legal supplies of raw and finished ivory is a key question that must be answered in order to implement the presidents’ agreement in China. The “decommercialization” of ivory from the market could be a means to help halt China’s domestic ivory trade (Zhang 2015). According to Zhang (2015), an immediate ban that shut down all registered legal ivory manufacturers and retail stories in China would be legally questionable under Chinese laws and regulations. However, if compensation was offered to legal stockpile owners, an immediate shutdown would be more defensible.

Accordingly, we propose that the government consider using funds available through China’s ecological compensation (eco-compensation) program (Yang et al. 2013) to purchase back legal ivory stockpiles from those registered private sectors, at reasonable prices. The government could then transfer these stockpiles, as appropriate, to museums for educational purposes. An alternative approach, which could theoretically avoid the need to pay compensation to factory owners or retail outlets, would involve delaying the implementation of the ban in order to provide sellers an opportunity to clear their inventory. Two variations of the delayed implementation approach have recently been adopted in the United States. First, in August 2014, New York passed a nearly complete ban on the purchase and sale of ivory and rhino horn products (New York State Legislature 2014). Up until that time, New York was generally considered to be the largest domestic market for worked ivory in the United States (Martin & Stiles 2008). Permits for the sale of ivory were issued by the New York Department of Environmental Conservation (New York State Department of Environmental Conservation 2014). These permits were issued for 1 year and had to be renewed annually. New York’s ivory ban made specific allowances for existing permit holders, while it provided that “This act shall take effect immediately,” the law also specified that “any person who has been issued a license or permit allowing the sale of elephant ivory articles or rhinoceros horns prior to the effective date of this act may sell such articles listed on such license or permit until such license or permit has expired” (New York State Legislature 2014). Second, California recently passed a similar law banning the purchase and sale of ivory and rhino horn (Legislative Counsel of California 2015). Unlike New York, California did not have a permit system regulating ivory sales. However, as in New York, California lawmakers wanted to ensure that the ban did not constitute an impermissible “taking” of private property. To do so, and to allow merchants to sell any existing stock, they included in the statute a 1-year delay of its effective date (California Senate Committee on Natural Resources and Water 2015).

California and New York’s delayed implementation has disadvantages, chiefly that they would allow the continued sale of ivory products over a significant length of time despite evidence that the legal market for ivory is being used to facilitate illegal sales. We suggest that China could combine these two approaches by allowing a shorter period, such as 6 months, for merchants to sell their stockpiles and then purchase the remaining stock, if any, at a reduced price. Regardless, an immediate ban coupled with compensation to manufacturers would be preferable. However, given the cost of that approach, a delayed or staged implementation could also be considered.

After accomplishing the decommercialization of all legal ivory, either through a buy-back program or delayed implementation, the government of China could shut down China’s domestic market, making it illegal to offer any ivory items for sale. Such a ban would reduce both the demand for ivory and the cost to enforcement agencies, which would no longer have to distinguish between legal and illegal ivory.

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Ivory trade restrictions in the United States and China

References

Allgood, B., Ratchford, M. & LaFontaine, P. (2013). US ivory trade: can a crackdown of trafficking save the last titan. Animal L., 20, 27-76.

California Senate Committee on Natural Resources and Water. (2015). Animal parts and products: importation or sale of ivory and rhinoceros horn. https://leginfo.legislature.ca.gov/faces/billAnalysisClient.xhtml?bill_id=201520160AB96.

China’s State Forestry Administration. (2013). China’s State Forestry Administration announcement No.5 in 2013. http://www.forestry.gov.cn/portal/main/s/72/content-582308.html.

China’s State Forestry Administration. (2015a). China’s State Forestry Administration announcement No.9. http://www.forestry.gov.cn/main/444/content-764562.html.

China’s State Forestry Administration. (2015b). China’s State Forestry Administration announcement No.7. http://www.forestry.gov.cn/portal/zbh/s/1492/content-742548.html.

China’s State Forestry Administration. (2015c). The Chinese government crushed 660 kilos of illegal ivory again in public. http://www.forestry.gov.cn/portal/zbh/s/1471/content-771194.html.

China’s State Forestry Administration. (2015d). China’s State Forestry Administration announcement No.17. http://www.forestry.gov.cn/main/4818/content-807881.html.

CITES. (2013a). New figures reveal poaching for the illegal ivory trade could wipe out a fifth of Africa’s elephants over next decade. http://www.traffic.org/sites/default/files/eng/cop/16/doc/cITES.13b.html.

CITES. (2013b). Monitoring the illegal killing of elephants. http://cites.org/sites/default/files/eng/cop/16/doc/E-CoP16-53-01.pdf.

Fisher, M. (2013). An alarming map of the global ivory trade that killed 17,000 elephants in one year. http://www.washingtonpost.com/blogs/worldviews/wp/2013-03/15/an-alarming-map-of-the-global-ivory-trade-that-killed-17000-elephants-in-one-year.

Gabriel, G., Huang, N. & Wang, J. (2012). Making a killing: a 2011 survey of ivory markets in China. International Foundation of Animal Welfare. http://www.ifaw.org/usa/resources-center/making-killing.

Gao, Y.F. & Clark, S.G. (2014). Elephant ivory trade in China: trends and drivers. Biol. Cons., 180, 23-30.

Huang, S. & Weng, Q. (2014). China’s ivory market: the elephant in the room. Science, 343, 611.

Hawaii State Legislature. (2016). ACT125. http://capitol.hawaii.gov/measure_indiv.aspx?billtype=GM&billnumber=1226&year=2016.

Legislative Counsel of California. (2015). Assembly Bill No. 96. https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160AB96.

Maisels, F., Strindberg, S., Blake, S. et al. (2013). Devastating decline of forest elephants in Central Africa. PLoS ONE, 8(3), e59469.

Martin, E. & Stiles, D. (2008). Ivory markets in the USA. Kingfish, Care for the Wild International and London, Save the Elephants. 1-120.

New York State Department of Environmental Conservation. (2014). Sale of elephant and mammoth ivory or rhinoceros horn. http://www.dec.ny.gov/permits/99792.html.

New York State Legislature. (2014). Laws of New York. http://public.leginfo.state.ny.us/lawssrch.cgi?fNLWOD.

The White House. (2013). Executive order-combating wildlife trafficking. http://www.whitehouse.gov/the-press-office/2013/07/01/executive-order-combating-wildlife-trafficking.

The White House. (2015). Fact sheet: president Xi Jinping’s state visit to the United States. https://www.whitehouse.gov/the-press-office/2015/09/25/fact-sheet-president-xi-jinpings-state-visit-united-states.

United States Department of the Interior Fish and Wildlife Service. (2014). Director’s Order no. 210. http://www.fws.gov/policy/do210.html.

United States Department of the Interior Fish and Wildlife Service. (2015). Proposed revisions to the endangered species act (ESA) 4(d) rule for the African elephant, questions and answers. http://www.fws.gov/international/pdf/african-elephant-4d-proposed-changes.pdf.

United States Department of the Interior Fish and Wildlife Service. (2016). Administration takes bold step for african elephant conservation: Completes near-total elephant ivory ban to cut off opportunities for traffickers. https://www.fws.gov/news/ShowNews.cfm?rel=administrationtakes-bold-step-for-african-elephant-conservation:-&JD=35686.

United States Department of State. (2016). U.S.-China strategic & economic dialogue outcomes of the strategic track. http://www.state.gov/r/pa/prs/ps/2016/06/258146.htm.

Wang, X. & Liu, Y.Y. (2015). China destroys 662 kg of illegal ivory. http://news.xinhuanet.com/english/2015-05/29/c_134281509_2.htm.

Wittemyer, G., Northrup, J.M., Blanc, J. et al. (2014). Illegal killing for ivory drives global declines in African elephants. Proc. Natl. Acad. Sci. U.S.A., 111(36), 13117-13121.

Yang, B. et al. (2013). Eco-compensation for giant panda habitat. Science, 339, 521.

Zhang, L. (2015). China must act decisively to eradicate the ivory trade. Nature, 527, 135.

Zhang, L. & Yin, F. (2014). Wildlife consumption and conservation awareness in China: a long way to go. Biodiv. Cons., 23, 2371-2381.