



Status of African elephant populations and levels of illegal killing and the illegal trade in ivory:

A report to the African Elephant Summit

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IUCN / SSC African Elephant Specialist Group
TRAFFIC International



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Introduction

The IUCN/SSC African Elephant Specialist Group (AfESG) works with the two CITES-mandated elephant monitoring systems: the programme for Monitoring the Illegal Killing of Elephants (MIKE), managed by the CITES Secretariat, and the Elephant Trade Information System (ETIS), managed by TRAFFIC, to bring together updated and critical information and data on elephants, poaching and the illegal ivory trade in an integrated manner. Consolidated reports, including inputs on Asian elephants from the IUCN/SSC Asian Elephant Specialist Group, on legal ivory trade by UNEP-WCMC, and implementation of the African Elephant Action Plan, have been provided to the 61st and 62nd meeting of the Standing Committee to CITES. These updates, along with the 2013 report, "Elephants in the Dust" have provided comprehensive and up to date information to elephant conservationists, managers, and policy makers.

This update includes data from 2012 on elephant populations, levels of illegal killing, and levels of illegal trade in ivory.

Executive Summary

The results of this analysis show that levels of poaching and the illegal ivory trade started to increase again in the mid-2000s, following an easing in the 1990s, the rate of increase jumping dramatically from 2009. The overall trend appears to be leveling off in 2012 compared to 2011, but at an unsustainably high level.

The MIKE analysis suggests that 15,000 elephants were illegally killed at the 42 monitored MIKE sites in 2012. The estimated poaching rate of 7.4% in 2012 remains at an unsustainably high level, as it exceeds natural population growth rates (usually no more than 5%). Likewise, the ETIS analysis shows a slight leveling off in the bias-adjusted trend for illegal ivory in 2012. However, a number of countries have not yet reported their 2012 seizures.

The overall weight and number of large-scale ivory seizures (more than 500kg) in 2013 exceeds any previous year in the ETIS data. These data have not been bias-adjusted, and the increase may reflect enhancement of law enforcement effort, or could signify an increase in overall levels of illegal trade. With the high levels of poaching being observed through the MIKE programme, the amount of illegal ivory in trade should be expected to remain high.

Poverty and weak governance in elephant range States, together with demand for illegal ivory in consuming nations, are the three key factors identified by repeated MIKE analyses, including this one, as being most strongly associated with observed poaching trends.

Monitoring of elephant populations, apart from at a few well-monitored sites, is sporadic and inconsistent. The low precision of most estimates makes it difficult to detect any immediate repercussion on elephant numbers in the short-term but this does not mean there are no changes.

While it remains to be seen whether the situation is stabilizing, it is clear that international cooperation on law enforcement and public awareness is vital. Improved monitoring is also essential to allow informed decision-making. There is a need for continued and improved reporting to the MIKE and ETIS programmes, as well as improved and more frequent monitoring of elephant populations, including carcass counts wherever possible. The new annual reporting requirement for CITES Parties to provide information on national ivory stockpiles will also provide much-needed information.

African elephant population status

Introduction

The IUCN/SSC African Elephant Specialist Group maintains the African Elephant Database, available online at the African and Asian Elephant Database¹. Five comprehensive updates have been published in 1995, 1998, 2002, 2007 and provisionally in 2013 (<http://elephantdatabase.org>). All populations of African elephant have been listed on CITES Appendix I since 1989, except for four national populations that were transferred to Appendix II (Botswana, Namibia and Zimbabwe in 1997, and South Africa in 2000). The African elephant is currently listed as Vulnerable (A2a; Ver 3.1; Blanc, 2008) on the IUCN Red List.

African elephants are assumed to have been widely distributed south of the Sahara prior to colonial times. Today, African elephants are believed to occur in 35-38 range States. Their continued presence in Senegal, Somalia, and Sudan remains uncertain. The distribution of elephants varies considerably across the four regions, with small fragmented populations in West Africa and large tracts of range remaining in Southern Africa. While this document outlines the serious threat posed to African elephants from poaching and the illegal ivory trade, range and habitat loss remain a significant long-term threat to the species' survival.

Population trends

It is very difficult to track trends at the continental level, let alone at the national level. Elephant surveys are seldom conducted at regular intervals, and never systematically across the range or even across a particular country. Surveys of the same site are sometimes conducted using different techniques, making comparability even at the site level challenging. Additional challenges come with the time lag between the survey being conducted and the reporting of the results of that work. Despite these difficulties, the AfESG hopes to begin exploration of different options for discerning and analysing trends in elephant populations.

Continental overview

The status and reliability of information on elephant populations varies dramatically across African elephant range. In the most recent update, the quality and reliability of data for Central Africa has improved, while there has been a reduction in the overall reliability of data in Southern Africa and in parts of Eastern Africa. Southern Africa continues to hold the lion's share of Africa's elephants, holding close to 55% of the known elephants on the continent. Eastern Africa holds 28% and Central Africa 16%. In West Africa, less than 2% of the continent's known elephants are spread out over the remaining 13 elephant range States. The subregional breakdown of numbers is available in Figure 1.

Subregional summaries

In Central Africa, Congo, the Democratic Republic of Congo, and Gabon hold the majority of the subregion's known elephants. Comparable surveys have only been conducted in a few sites in Central Africa. Declines have been observed in a number of Parks in Central Africa, in particular Bayang-Mbo Wildlife Sanctuary in Cameroon, Zakouma National Park in Chad, and Odzala Kokoua National Park in Congo. A recent modeling exercise suggested that there could have been a greater than 60% decline in elephant numbers across Central Africa in the last 10 years (Maisels et al, 2013).

The majority of Eastern Africa's known elephants are in Tanzania and Kenya. Across the subregion, there have been a number of comparable surveys, but at an aggregated level, no statistically significant differences have been observed. In Southern Africa, Botswana holds by far the largest population in the subregion and on the continent. Mozambique, Namibia, South Africa, Zambia and Zimbabwe still hold large elephant populations. Data is scanty in Angola and smaller populations persist in Swaziland (where elephants were reintroduced in the 1980s) and Malawi. A small number of comparable surveys were

¹ <http://elephantdatabase.org>.

conducted in Southern Africa. While numbers appear to be increasing in Namibia and South Africa, there appear to be some initial declines in some of the populations in Zimbabwe and Zambia.

Finally in West Africa, there are very few new surveys to report. The largest elephant population can be found in the transboundary WAPOK complex in Benin, Burkina Faso, Niger and Togo. Only three comparable surveys were conducted in the past 5 years, and these surveys do not show any change in numbers in those sites.

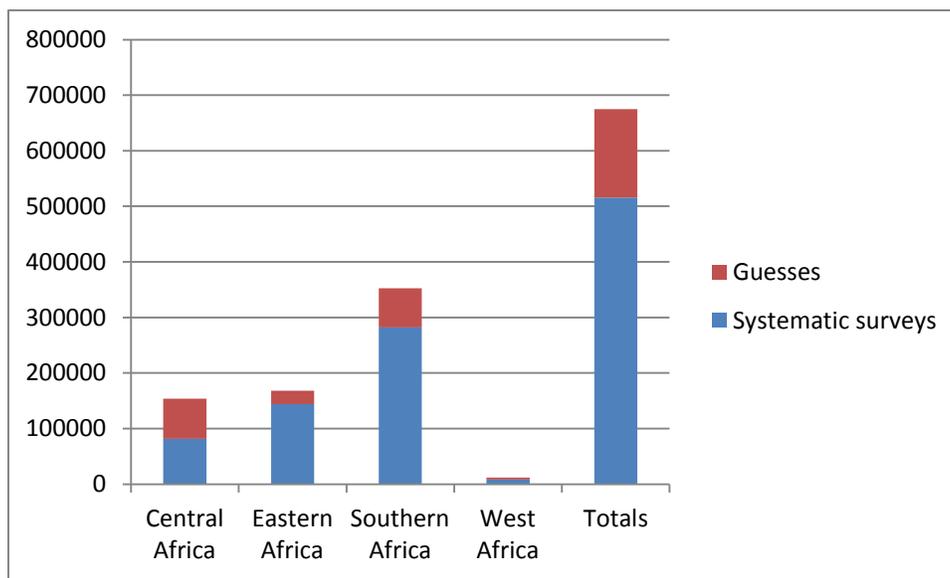


Figure 1. Subregional summary of elephant numbers (www.elephantdatabase.org)

Elephant conservation action plans and strategies

In 2010, the African Elephant Action Plan (AEAP) was adopted by a consensus of all the African elephant range States. An African Elephant Fund has been put in place to help fund the implementation of the AEAP and has given a number of grants through two funding rounds. At the subregional level, regional action plans are in place in Central, Southern, and West Africa. National action plans and strategies have been adopted by 15 countries in the last ten years. The list of strategies is available in Table 1.

Table 1. Strategies & management plans

African Elephant Action Plan (2010)			
Central Africa	East Africa	Southern Africa	West Africa
<ul style="list-style-type: none"> • Strategy for the Conservation of Elephants in Central Africa (2005) • Cameroon (2010) 	<ul style="list-style-type: none"> • Kenya (2012) • Tanzania (2012) 	<ul style="list-style-type: none"> • Southern Africa Regional Elephant Conservation and Management Strategy (2005) • Botswana (2003) • Mozambique (2010) • Namibia (2007) • Zambia (2003) 	<ul style="list-style-type: none"> • Strategy for the Conservation of West African Elephants (2005) • Convention on Migratory Species West African Elephant Memorandum of Understanding (2005) • Benin (2005) • Burkina Faso (2003)

			<ul style="list-style-type: none"> • Cote d'Ivoire (2004) • Ghana (2000) • Guinea (2008) • Guinea-Bissau (2000) • Niger (2010) • Togo (2005)
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Trends in the illegal killing of elephants and its impact on elephant populations

Introduction

The CITES programme for Monitoring the Illegal Killing of Elephants, commonly known as MIKE, was established by the Conference of the Parties (CoP) at its 10th Meeting (Harare, 1997) in accordance with the provisions in Resolution Conf. 10.10 (Rev. CoP16) on *Trade in elephant specimens*. The MIKE programme is managed by the CITES Secretariat under the supervision of the CITES Standing Committee and implemented in collaboration with IUCN. Since implementation began in 2001, MIKE has benefitted from the generous financial support of the European Union.

MIKE aims to inform and improve decision-making on elephants by measuring trends in levels of illegal killing of elephants, identifying factors associated with those trends, and by building capacity for elephant management in range States. MIKE operates in a large sample of sites spread across elephant range in 30 countries in Africa and 13 countries in Asia. There are some 60 designated MIKE sites in Africa, which include many of the continent's prime National Parks—such as Chobe, Etosha, Kruger, Ruaha, South Luangwa and Tsavo—as well as some of its most famous Game Reserves, such as Selous and Niassa. Taken together, the elephant population at MIKE sites is estimated to represent 30 to 40% of the continental elephant population.

MIKE data comes from the information received from ranger patrols and other sources in designated MIKE sites. When an elephant carcass is found, rangers identify the cause of death and other details and fill in standardized carcass forms that are then submitted to the MIKE programme. A database of more than 11,000 carcass records has been assembled so far, providing a substantial information base for statistical analysis.

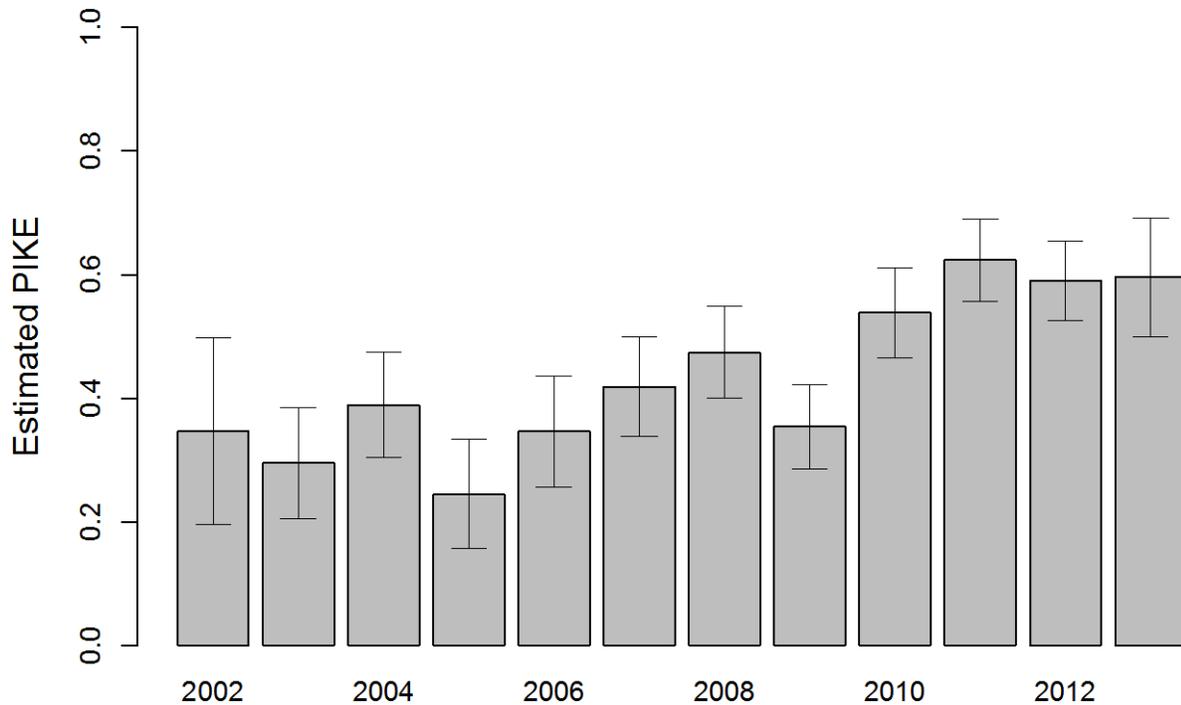
MIKE evaluates relative poaching levels based on the Proportion of Illegally Killed Elephants (PIKE), which is calculated as the number of illegally killed elephants found divided by the total number of elephant carcasses encountered by patrols or other means, aggregated by year for each site. Coupled with estimates of population size and natural mortality rates, PIKE can be used to estimate numbers of elephants killed and absolute poaching rates.

While PIKE provides a sensitive measure of poaching trends, it may be affected by a number of potential biases related to data quality, carcass detection probabilities and other factors, and hence results need to be interpreted with caution. However, the fact that the quantitative results presented below are in good agreement with quantitative information available from the Elephant Trade Information System (ETIS), as well as with qualitative information from the IUCN/SSC African elephant Specialist Group, gives confidence as to the robustness of the results.

Trends and levels of illegal killing and impact on elephant populations

Figure 2 shows empirically derived time trends in PIKE at the continental level for African MIKE sites, with error bars (95 % confidence intervals). The data show a steady increase in levels of illegal killing of elephants starting in 2006, with 2011 displaying the highest levels of poaching since MIKE records began in 2002. In 2012 and the first six months of 2013, the trend seems to flatten out at levels close to those recorded in 2011. PIKE levels have been above 0.5 in 2011, meaning more than half of elephants found dead were deemed to have been illegally killed.

Africa



11310 carcasses

*Figure 2. PIKE trends in Africa with 95 % confidence intervals.
The number of carcasses on which the chart is based is shown at the bottom of the figure.*

Differences in poaching levels between the different African subregions are evident in Figure 3, with Central Africa consistently showing the highest overall poaching levels, in contrast with Southern Africa, which shows the lowest overall levels. In Eastern Africa, which has contributed the largest number of carcass records, the trend is very similar to the continental one. West Africa has the smallest elephant population and has submitted the smallest number of records. As a result, there is a high level of uncertainty around PIKE estimates in that subregion, which makes it difficult to determine the trend. Nevertheless, increases in PIKE levels are apparent in all four African subregions in the second half of the period. PIKE levels in 2012 are mapped in Figure 4.

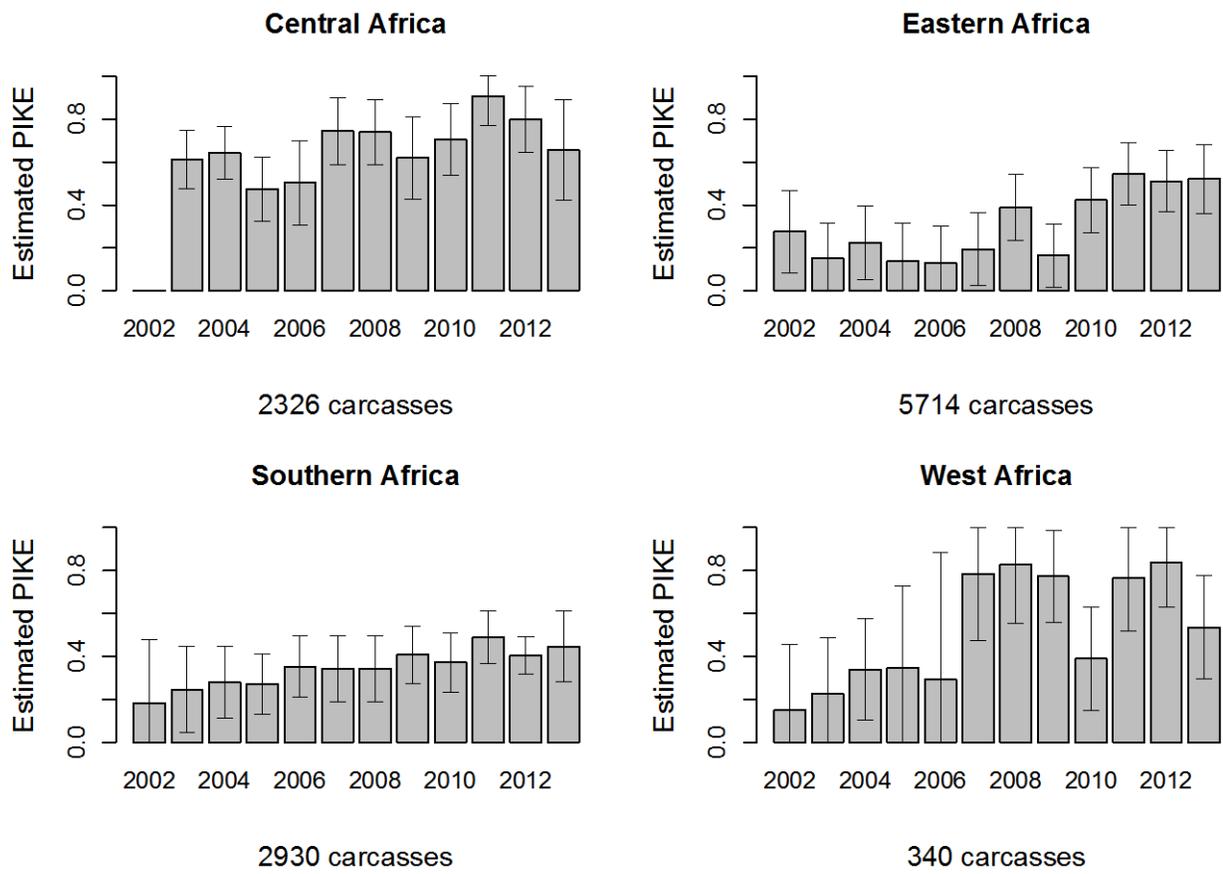


Figure 3. Subregional PIKE trends with 95 % confidence intervals. The numbers of carcasses on which the graphs are based are shown at the bottom of each graph.

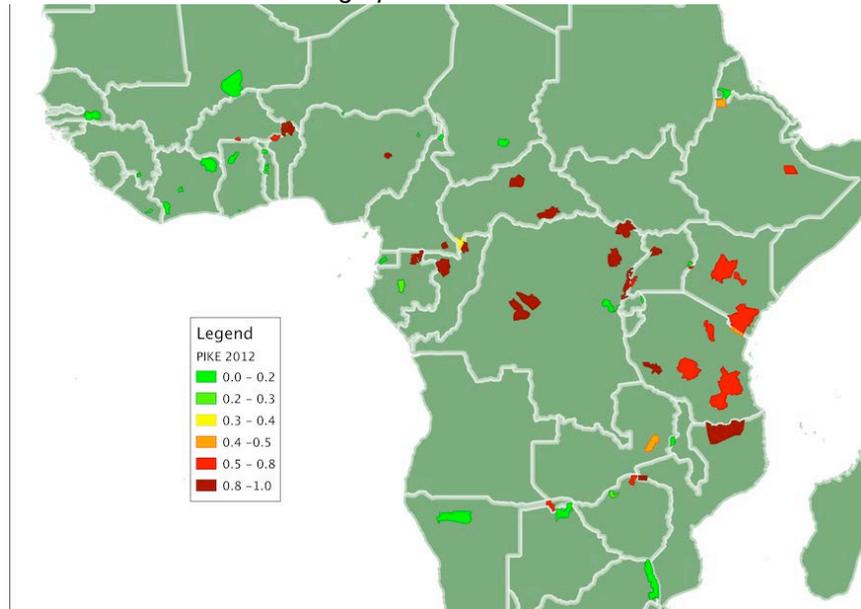


Figure 4. PIKE levels by MIKE site in 2012.

Factors associated with levels of illegal killing

The MIKE programme has statistically evaluated relationships between PIKE levels and a wide range of ecological, biophysical and socio-economic factors at the site, national and global levels. Three such factors consistently emerge as very strong predictors of poaching levels and trends: poverty at the site level, governance at the national level and demand for illegal ivory at the global level. The quantitative relationships between PIKE and these factors are illustrated in Figure 5.

Human infant mortality in and around MIKE sites, which is interpreted as a proxy for poverty at the site level, is the single strongest site-level correlate of PIKE, with sites suffering from higher levels of poverty experiencing higher levels of elephant poaching. This suggests that there may be a greater incentive to facilitate or participate in the illegal killing of elephants in areas where human livelihoods are insecure. Furthermore, this relationship highlights a close linkage between the well being of people and that of the elephant populations with which they coexist.

At the national level, the strongest correlate of PIKE is governance, as measured by Transparency International's Corruption Perceptions Index (CPI). High poaching levels are more prevalent in countries where governance is weaker, and vice versa. This is likely to be a causal relationship, with poor governance facilitating the illegal killing of elephants and movement of illegal ivory, be it through ineffective law enforcement or active aiding and abetting by unscrupulous officials.

Ultimately, the illegal killing of elephants for ivory is driven and sustained by demand from consumers who are willing to pay for illegal ivory, as measured by household consumption in China. ETIS analyses indicate that, in recent years, China has become the world's largest consumer of illegal ivory. This is corroborated by the fact that that temporal PIKE trends are strongly related to patterns in consumer spending in that country. This relationship does not hold for other traditional destination markets for ivory (Europe, USA or Japan) or for countries known to be important transit points in the ivory trade chain (Malaysia, Philippines, Thailand or Viet Nam). Temporal PIKE trends are also strongly correlated with another demand-related variable, namely trends in large-scale ivory seizures as reported by ETIS.

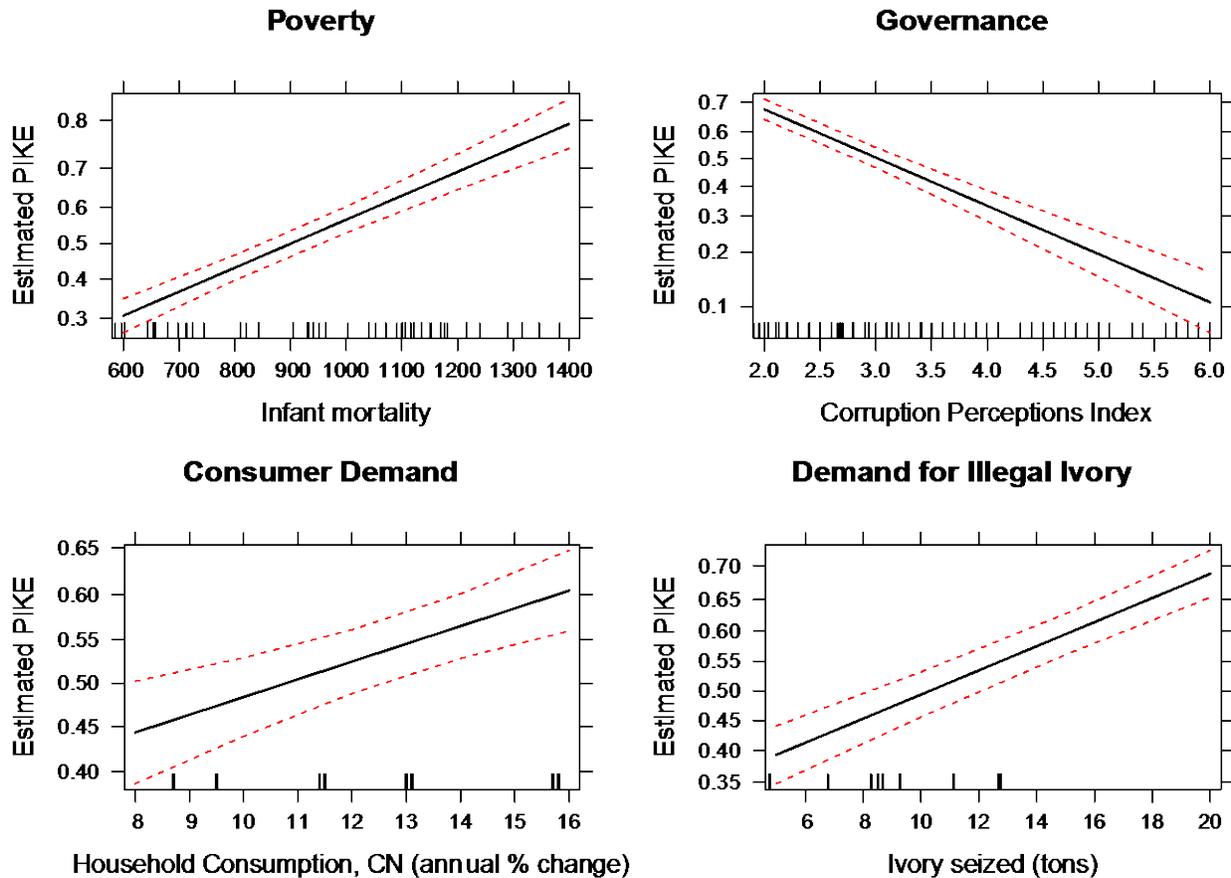


Figure 5. Relationships between PIKE and poverty, governance and demand covariates. For each graph, all other covariates are held constant at their means. Dotted lines represent confidence bands.

These three factors — poverty, governance and demand — explain nearly two thirds of the variation observed in PIKE levels across African sites. Poverty and governance explain spatial patterns in poaching levels, while demand accounts for the temporal trend. Whilst the empirical relationships demonstrated by the MIKE analyses are not necessarily directly causal, they do provide a good basis from which to investigate causation. At the very least, the factors identified in the MIKE analysis are likely to facilitate or to provide incentives for the illegal killing of elephants and the illegal trade in ivory.

The impact of poaching on elephant populations

A statistical model based on the variables discussed above can be used to estimate absolute poaching rates, as well as the number of elephants killed in a given year. Modelled PIKE levels for 2012 translate to an estimated 15,000 elephants illegally killed across all African MIKE sites in that year alone, or about 7.4% of the total elephant population in those sites. As elephant populations seldom grow at more than 5% *per annum*, the model suggests that this level of offtake would imply that the overall population in MIKE sites is likely to have declined by around 2.4% in 2012.

As Figure 6 shows, the model estimates that the threshold of sustainability was crossed in 2010, with poaching rates remaining above the population growth rate threshold ever since. It is therefore likely that populations at MIKE sites may be in net decline since 2010. However, this does not mean declines at every site, merely a decline on average. No attempt has been made to extrapolate these estimates beyond MIKE sites; data from additional sites would be needed to calibrate the model.

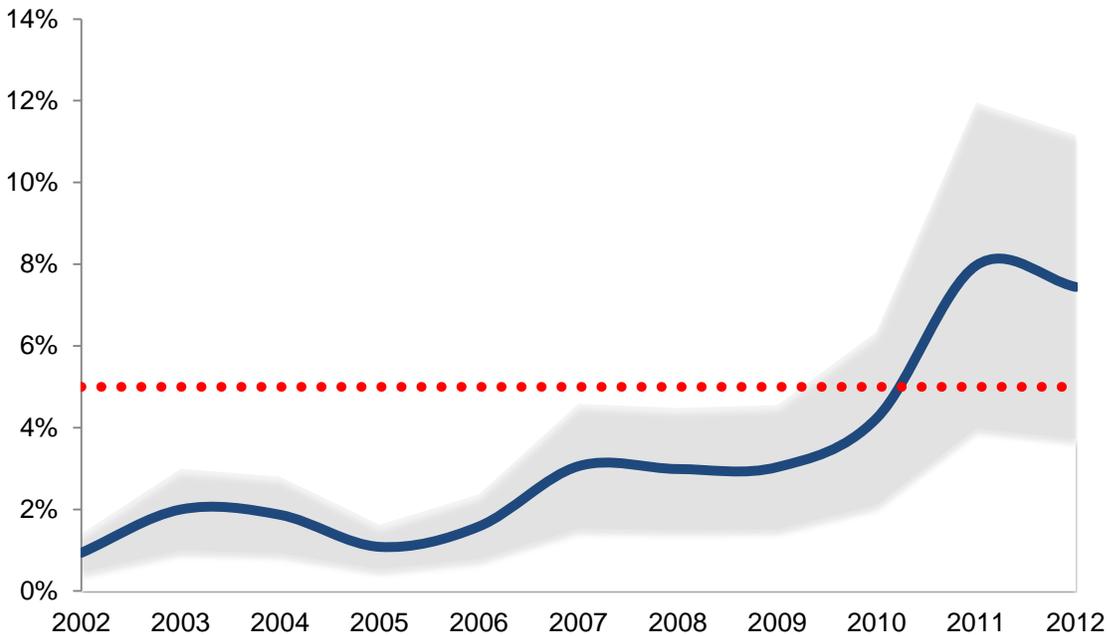


Figure 6. Estimated absolute poaching rates as predicted by the model. The dotted line denotes the annual growth rate of healthy populations (5%). Poaching rates exceeding this growth rate imply net population declines.

Trends and Developments in the Illegal Trade in Ivory

Introduction

The Elephant Trade Information System (ETIS) holds the world's largest collection of elephant product seizure records from 1989 to the present. Of the 20,708 records in ETIS, 14,070 separate raw or worked ivory seizures in 72 countries or territories were used for this trend analysis covering the period 1996-2012. 1996 is the last full year in which all African Elephant populations were listed in CITES Appendix I. The data used in this analysis comprise 2,437 more records than the trend analysis presented at CITES CoP16 in March 2013 (see Milliken *et al.*, 2012).

Figure 7 depicts the raw data in ETIS, showing the number of seizure cases and the estimated weight of ivory seized in each year since 1989. Because of inherent bias in the raw data, this figure should not be interpreted as a trend, nor is it suggestive of absolute trade quantities over time. With only 206 records, 2013 was data deficit and does not feature in this trend analysis, but will be discussed separately as these data already constitute a considerable quantity of ivory.

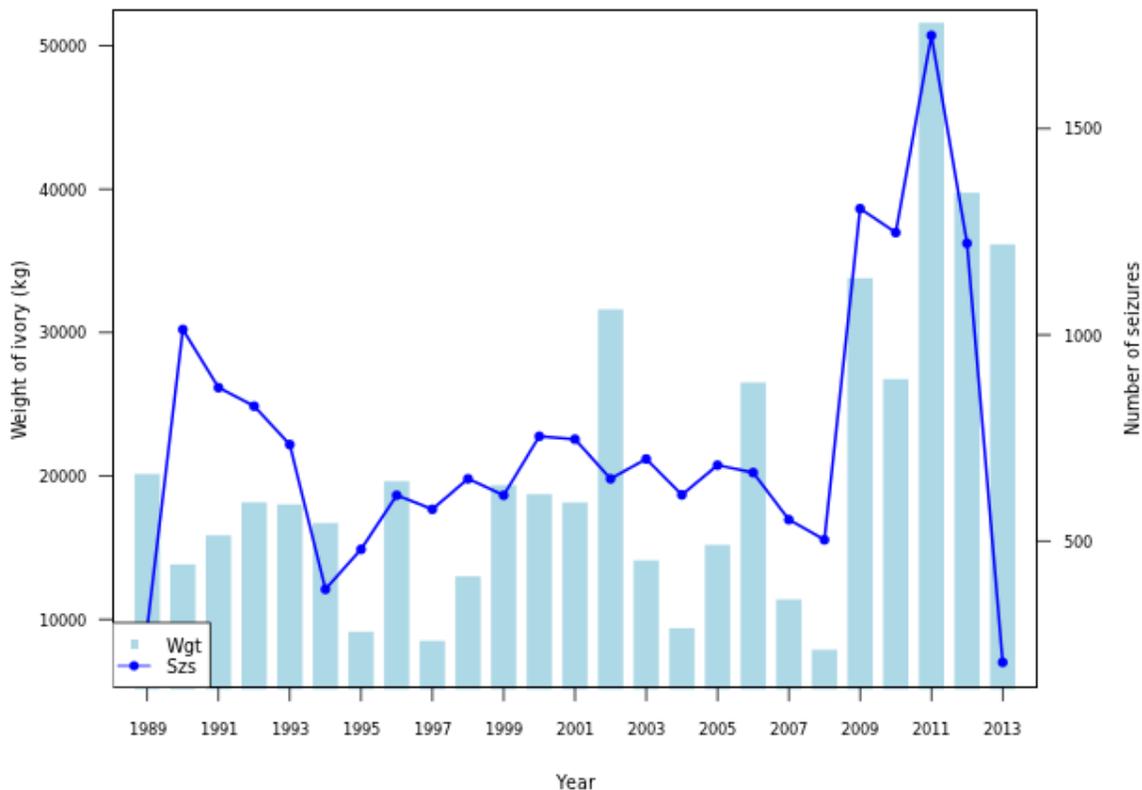


Figure 7. Estimated weight of ivory and number of seizure cases by year, 1989 - 2013 (ETIS 14 October 2013)

The trend analysis

Methods:

The methodology used for the trend analysis is described in Underwood *et al.*, 2013 which was also used to produce the ETIS trends presented at CITES CoP16. In this regard, the data were assessed according to ivory type, raw or worked, in three separate weight classes: less than 10 kg; between 10 kg and less than 100 kg; and greater or equal to 100 kg. The data were then adjusted for bias using a statistical estimation of relative 'seizure rates' and 'reporting rates' for each country/territory for each year, and then smoothed to reduce anomalies not indicative of overall patterns.

The Transaction Index – assessing the frequency of illegal trade in ivory:

The Transaction Index in Figure 8 is a relative measure of global illegal ivory trade activity over the last 17 years. In this representation, 1998, the year before the first one-off sale under CITES, is the baseline and has been set to 100. The best estimate of the trade in each year is indicated by the bold dot, while the vertical lines depict 90% confidence limits. Overall, the confidence limits remain tight, with the exception of the 2011 and 2012 results, but it is worth noting that for both 2010 and 2011 the degree of uncertainty is now less than the estimate for those years presented in the CITES CoP16 analysis. Whilst the data for 2011 are now more complete, and there is an additional year to help "fix" these results more confidently, 2012 still represents a somewhat incomplete data set and is the last year in this sequence, which characteristically gives rise to a more uncertain status.

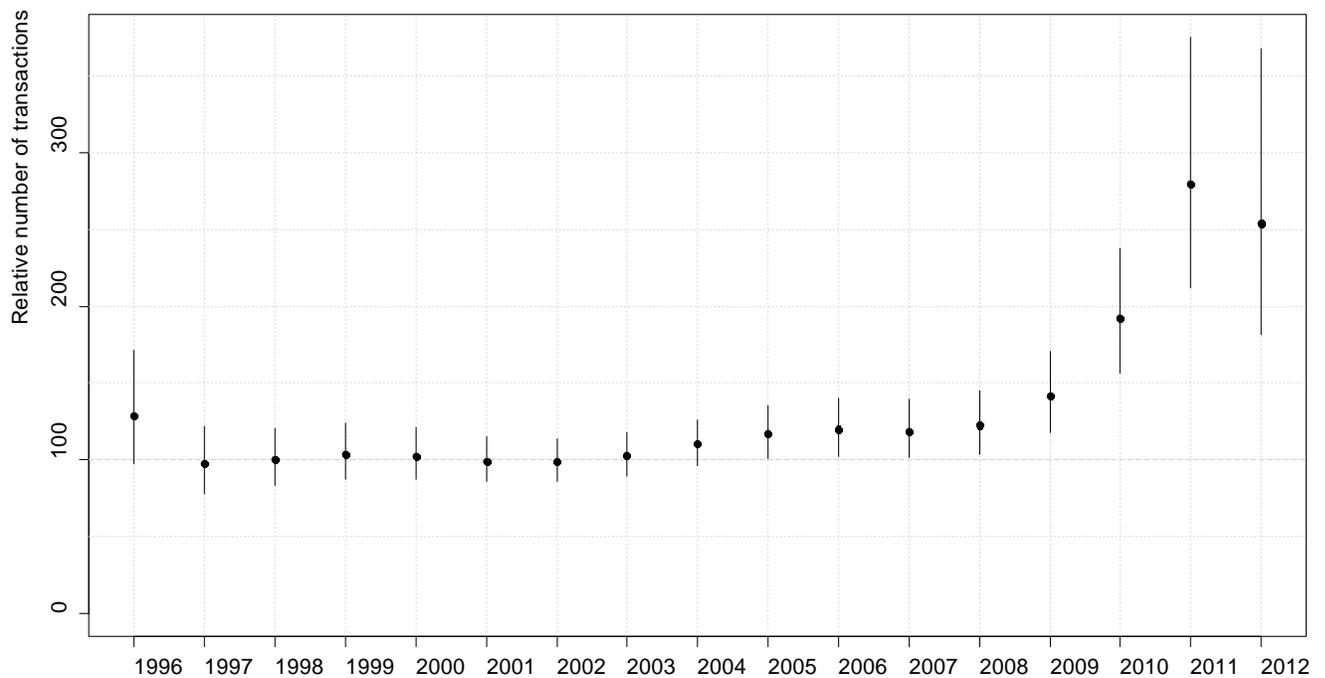


Figure 8. Estimate of illegal ivory trade activity, 1996 - 2012, showing 90% confidence intervals (ETIS Transaction Index, 14 October 2013)

The overall trend is remarkably consistent with the CITES CoP16 results, with 2011 representing nearly three times as much illegal ivory trade as 1998, and 2010 almost twice as much activity. Illegal ivory trade activity in 2012 is two and a half times greater than 1998 levels even though a slight decrease since 2011 is suggested. However, as the 90% confidence intervals for these last two years mostly overlap, trade activity in 2012 is believed to have remained remarkably stable at a high level. This interpretation is further buttressed by the fact that the 2012 data represent 30% fewer seizure records than 2011, but the mean Transaction Index value for 2012 is only 10% less than that for 2011. Illegal ivory trade activity has remained robust, and thus worrisome, throughout 2012.

Looking more precisely at what has changed since 2011, Figure 9 presents the patterns of trade activity found for each of the ivory weight classes. In general terms, the raw ivory trade is associated with the movement of ivory between, through and from African elephant range States to transit countries/territories and then on to centres of processing which are most often in Asia. Worked ivory trade transactions relate to the consumption of ivory in markets in Africa, Asia and other parts of the planet, including the tourist curio trade whereby worked ivory items are transported all over the world. In terms of raw ivory transactions, continuation of the decline in small raw ivory transactions that first appeared in 2011 is evident, whilst the increasing pattern of the medium raw ivory class shows further growth which suggests greater aggregation of ivory in trade and probably accounts for the decline in small raw ivory transactions to some extent. There is evidence of a decline in large raw ivory transactions in 2012, compared with 2011. This decrease might be explained by time lags in terms of assembling large consignments of ivory as the average weight of seizures over 500 kg increased by some 15% during this period from the previous year, according to available data (Table 2). The 2012 drop in the small worked ivory class, which makes the greatest contribution to illegal ivory trade activity in each year, is probably less of a factor when the confidence interval is considered as it generally overlaps with that for 2011. The medium worked ivory class, however, seems to represent a greater actual decline, whilst the large worked ivory class indicates some level of increase although, again, the confidence interval is very large so there is less certainty about the trend in this ivory class.

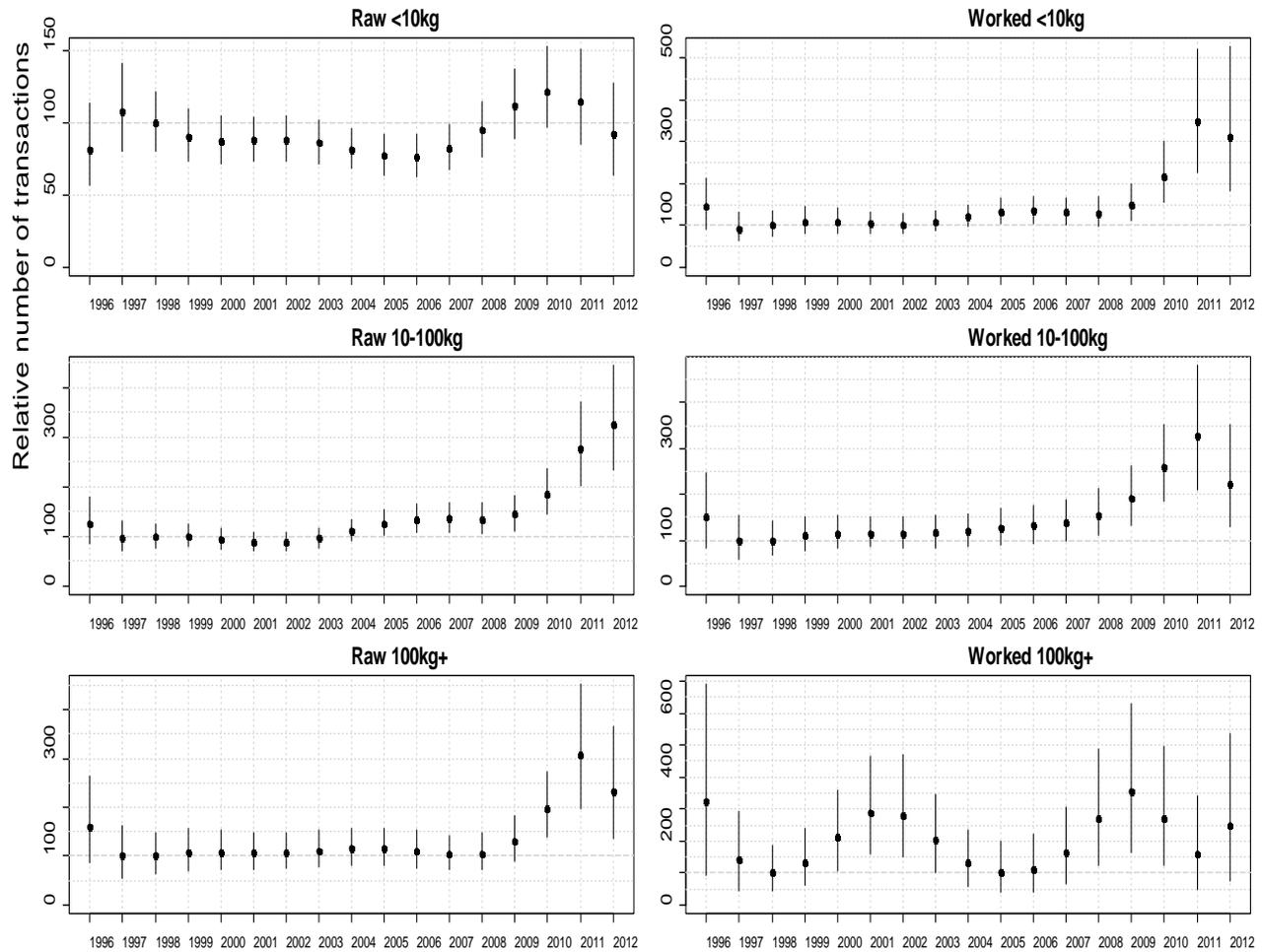


Figure 9: Estimate of illegal ivory trade activity for each ivory class, 1996 - 2012, showing 90% confidence intervals (ETIS Transaction Index, 14 October 2013)

The Weight Index – assessing the scale of illegal trade in ivory

Figure 10 presents an estimate of the mean weight for all ivory classes by year with 1998 set to 100. This figure represents relative (not absolute) values for the quantity of ivory being traded illegally so the pattern, more than the relative weights, is what is noteworthy. Overall the Weight Index and the Transaction Index are very similar. There is relative stability in the quantity of ivory in illegal trade through 2007, but thereafter a fairly sharp upward climb is seen, although a drop is indicated in 2012. Again, confidence limits for the latter two years are considerable (not depicted in the figure) and there is less certainty regarding the mean estimates, suggesting that the decrease may not be significant and the trade actually remains fairly stable at a high level. The large raw ivory class contributes the most to the Weight Index, which is consistent with CITES CoP16 results whereby large-scale ivory seizures were noted as driving the upward ivory trade trend. Again, the quantity of illegal ivory in trade in 2011 is estimated to be nearly three times the level that was going into trade in 1998, whilst 2012 represents about two and a half times more.

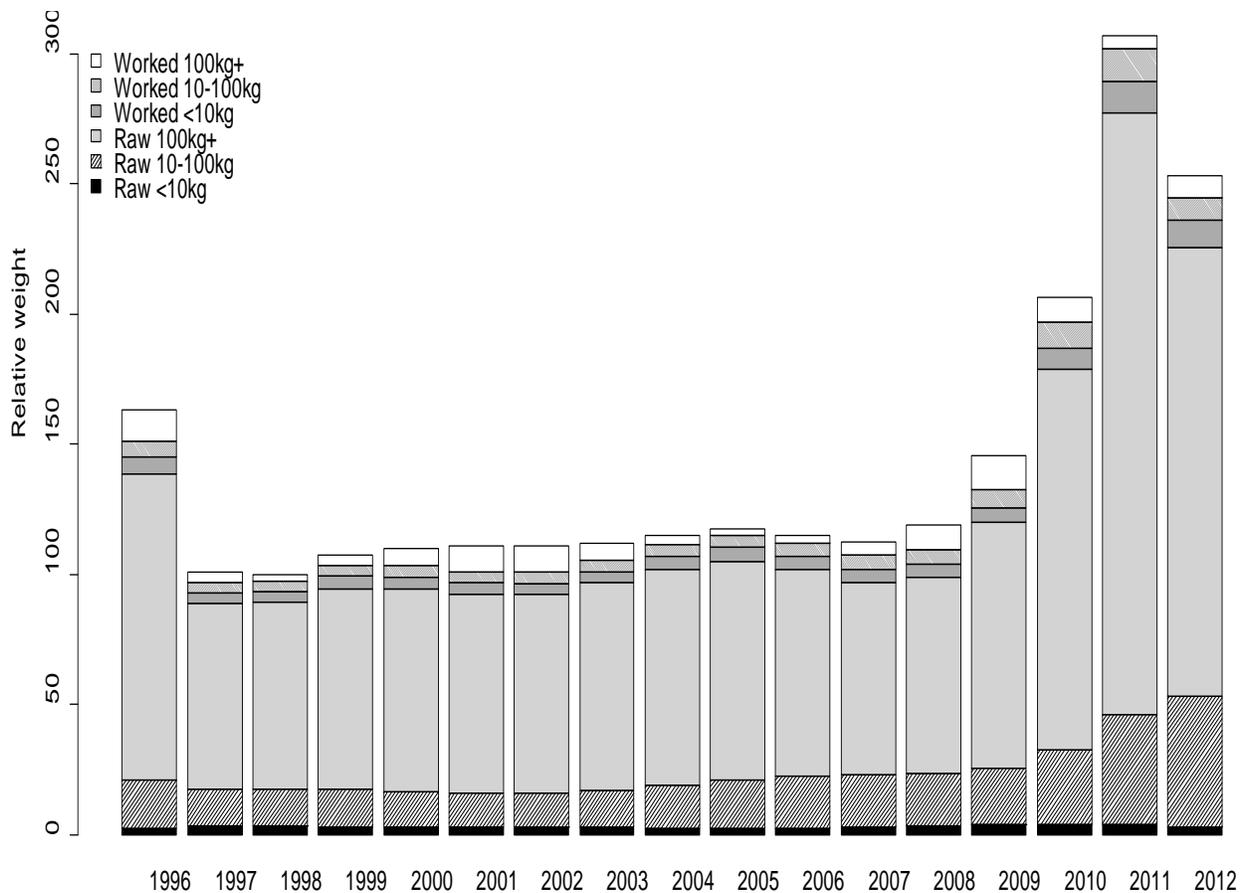


Figure 10. Mean estimate of the weight of illegal ivory trade combining all weight classes by ivory types, 1996 - 2012 (ETIS Weight Index, 14 October 2013)

Assessment of large-scale ivory seizures and trade routes

The frequency of large-scale ivory seizures, in which 500 kg or more of raw or worked ivory (in raw ivory equivalent terms²) is seized through a single law enforcement intervention, has increased greatly since 2000. Prior to 2009, an average of five and never more than seven such events occurred each year but, from 2009 onwards, an average of 15 and as many as 21 large-scale ivory seizures have taken place each year, according to the ETIS data (Figure 11). Table 2 presents summarised data on the 76 large-scale ivory seizures which occurred from 2009 through 15 November 2013. Although 2013 is still data deficient and not included in the trends analysis, already 18 large seizures have yielded a greater quantity of ivory than any other previous year going back to 1989. Whether this constitutes an increase in actual illegal trade volumes or reflects improved law enforcement in particular countries/territories is best ascertained using bias adjusted data in a future trends analysis using the methodology described in Underwood *et al.*, 2013. We do know, however, from using bias adjusted data to estimate trends, that the upward surge in terms of the weight of ivory seized from 2009 through 2011, does represent increased illegal activity that is being driven by seizures in the large ivory weight class. Further, as previously described (Milliken *et al.*, 2012), such seizures are indicative of the presence of organised crime in the illicit ivory trade and often involve Asian-run, Africa-based sourcing of ivory. In this regard, the raw data on large-scale ivory seizures represent the salient evidence of ivory trade crime orchestrated by transnational criminal operatives. Because large-scale seizures of ivory typically generate media

² Raw ivory equivalent values result from converting worked ivory products into raw ivory values to account for the loss of ivory during processing so that the weights of raw and worked ivory can be meaningfully combined for analytical purposes.

coverage and become known soon after they occur, tracking them serves as a kind of crude early indicator of the illicit ivory trade as a whole. For this reason, the 2013 data are regarded with considerable alarm and could be an indication that the illegal trade in ivory is continuing to increase. A more definitive assessment of this issue will be possible at a future time when the trends analysis is extended to include 2013.

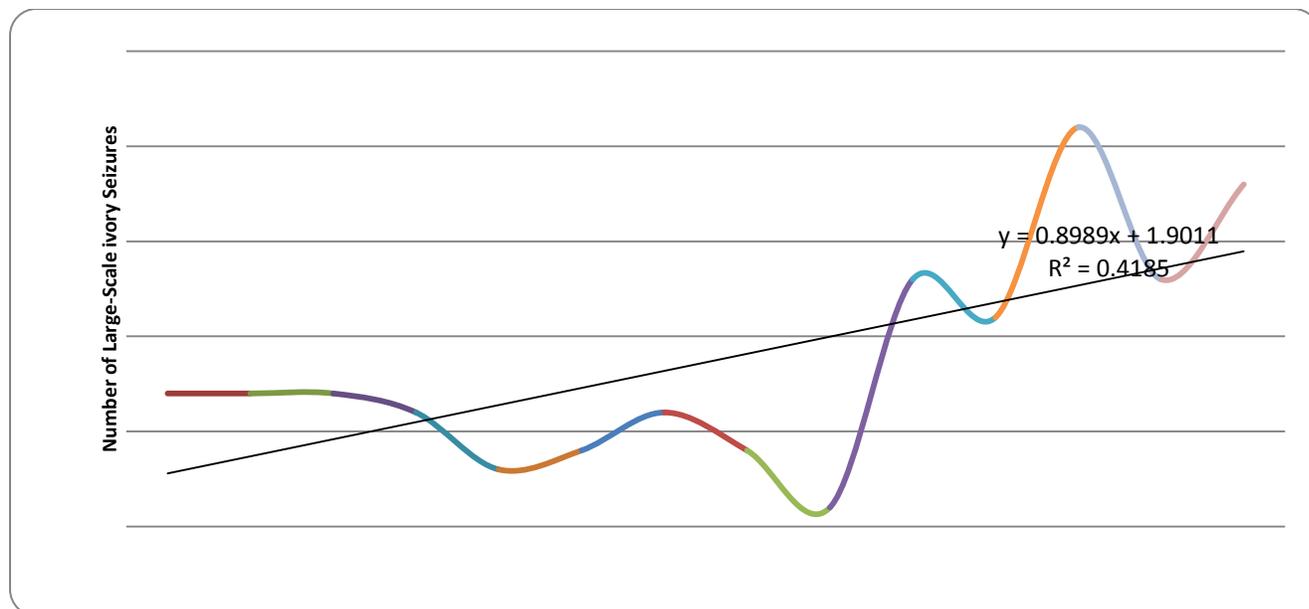


Figure 11. Number of large-scale (>500 kg) ivory seizures by year, 2000 - 2013 (ETIS 15 November 2013)

Table 2. Number and weight of large-scale (>500 kg) ivory seizures by year and mode of transport, 2009 - 2013 (ETIS, 15 November 2013)

Year	Air		Sea		Land		Total	
	Number	Weight	Number	Weight	Number	Weight	Number	Weight
2009	3	2,364	7	15,915	3	3,898	13	22,177
2010	4	6,390	6	8,035	1	616	11	15,041
2011	3	3,808	16	27,939	2	3,084	21	34,831
2012	1	601	9	17,683	3	6565	13	24,849
2013	1	797	11	31,069	6	9,808	18	41,674
Total	12	13,960	49	100,641	15	23,971	76	138,572
%	0.16	0.10	0.64	0.73	0.20	0.17		

Note: The data presented in this table cover a different time period to that depicted in Figure 11 above, with the 2013 data here representing additional seizures that occurred between 14 October and 15 November 2013.

About two-thirds of the large ivory seizures by number, and three-quarters by weight, are transpiring as containerised shipping through seaports. This presents a major challenge to effective law enforcement as only a small percentage (less than 5%) of the containers in trade are actually inspected and methods for detecting contraband ivory, such as risk assessment, profiling, targeting and sniffer dog techniques, are not routinely used. It is disappointing to note that, until very recently, almost none of the large-scale ivory

seizures resulted in successful investigations of the criminals behind these transactions. A number of recent high-profile cases in China, Tanzania and Uganda, however, have resulted in the arrests of suspects. Large-scale ivory seizures represent the most important ivory trade crime to solve.

Trade routes

The available information regarding the trade route of individual shipments that have been seized can vary considerably. In some cases only the country in which the seizure was made is known, in others the route from where the shipment was put together to its final destination is provided thus implicating several countries. It is important to understand that the absence of a particular trade route does not necessarily mean that there were no large-scale ivory movements along such a route, but rather that such trade was not detected by law enforcement agencies, or that a part of the trade route was not recorded in the data at hand. The appearance of new trade routes may be because law enforcement agencies have improved their ability to detect seizures along these routes. Unfortunately, it is not possible to produce bias-adjusted trade routes which would be required to provide a full interpretation. Nonetheless it is still useful to examine the trade routes inherent in the seizures data whilst recognising their limitations.

It appears that trade routes used for large movements of ivory have changed markedly since 2000. In the earlier part of the decade (Figure 12), there was considerable activity emanating from Atlantic Ocean seaports in Central and West Africa, particularly Douala, Cameroon, Lagos, Nigeria and Accra, Ghana, and from the Democratic Republic of the Congo to Belgium but by air. Movements of ivory within Africa involved a number of countries and trafficking between Sudan and Egypt, a major unregulated ivory market, was also noted. On Africa's east coast, Tanzania, Kenya and Mozambique also emerge in this period as exporters of ivory from the African continent. South Africa, however, is the most prominent country owing to one exceptional 7.1 tonne movement of ivory from Malawi through the port of Durban to Singapore, and then reportedly for onward shipment to Japan. Japan also seized ivory transiting from South Korea. Comparatively speaking, trade to China is modest at this time, however the final destination for about 40% of the seizures made during this period remain unknown. Interestingly, some of the ivory consignments going to China transited through Europe, probably owing to the fact that direct trade routes from Africa were less developed at the time.

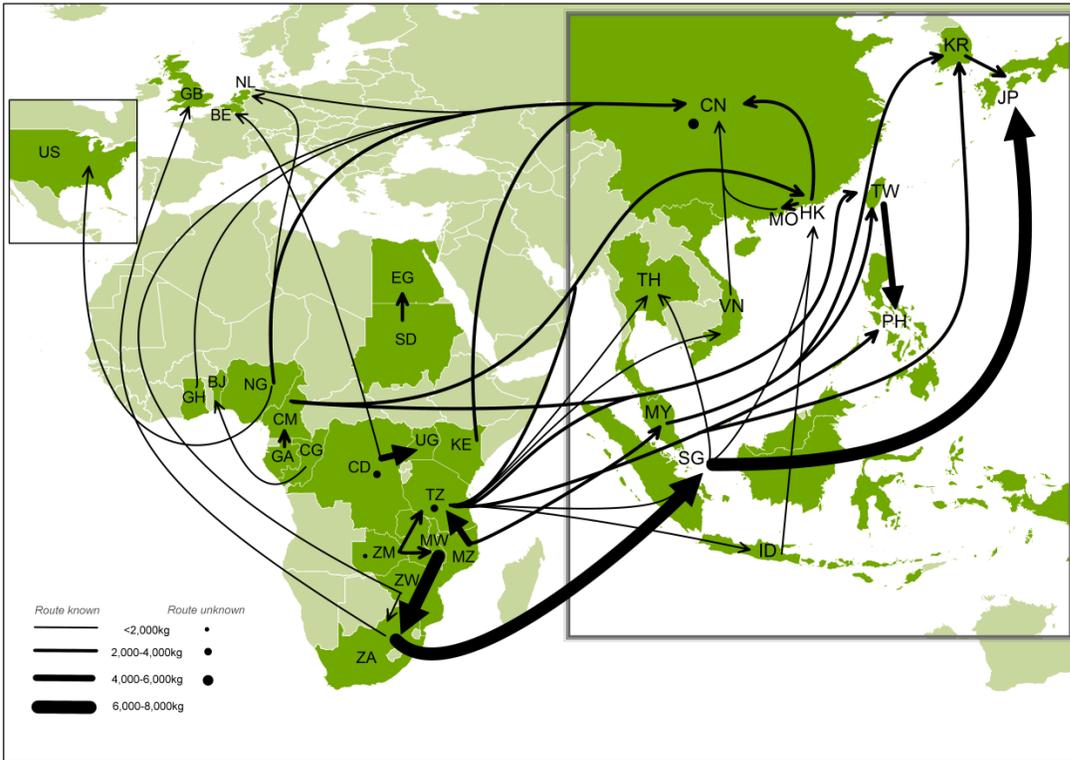


Figure 12. Trade routes for large-scale (>500kg) seizures of ivory, 2000 - 2008 (ETIS, 03 November 2013)

Note: The insert map of Asia is at a larger scale than the rest of the map; most trade from CG, CM, GH, KE, MZ, NG, TZ and ZA is by sea even if directional arrows cross landmasses.

In the period 2009-2011 (Figure 13), there is a profound shift to the Indian Ocean ports of Dar es Salaam and Zanzibar in Tanzania, with most of the Tanzanian trade initially directed to Malaysia as the principal transit country, but some shipments also go to the Philippines, another transit country, whilst other consignments are sent directly to China. Trade out of Mombasa, Kenya develops during this period with multiple shipments transiting Malaysia, Viet Nam, Cambodia and the United Arab Emirates, whilst direct trade to end-use markets in Thailand and China is also noted. There is evidence of Cape Town, South Africa sending ivory to Malaysia too. Indeed, Malaysia is the paramount transit country and from there most ivory is redirected to Viet Nam or Hong Kong before reaching China. For the most part, shipments from West and Central Africa have greatly diminished, but East and Southern Africa countries are active in the trade through a variety of internal ivory movements. In terms of end-use markets, Japan drops out completely, but China becomes more important, with a lesser, secondary flow of ivory into Thailand, another end-use market. The cross-border trade between China and Viet Nam, in particular, surges during this period.



Figure 13. Trade routes for large-scale (>500kg) seizures of ivory, 2009 - 2011 (ETIS, 03 November 2013)

Note: The insert map of Asia is at a larger scale than the rest of the map; most trade from KE, NG, TZ and ZA is by sea even if directional arrows cross landmasses.

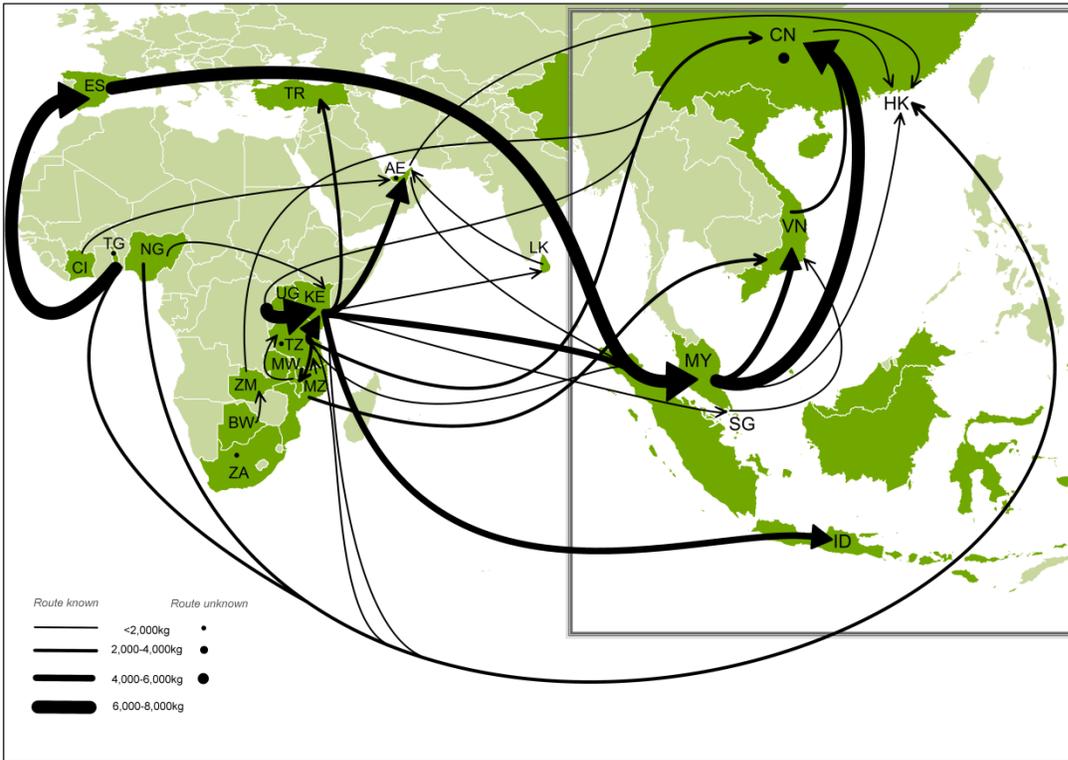


Figure 14: Trade routes for large-scale (>500kg) seizures of ivory, 2012 - 2013 (ETIS, 03 November 2013)

Note: The insert map of Asia is at a larger scale than the rest of the map; most trade from CI, KE, MZ, NG, TG, TZ and ZA is by sea even if directional arrows cross landmasses.

In the period 2012-2013 (Figure 14), Tanzania is still heavily involved in the trade, but Kenya's port of Mombasa becomes the leading conduit through which major flows of ivory exit Africa. Malaysia continues to be the major transit country in Asia, with the onward traffic going directly to China or, less so, to China via Viet Nam. But new transit players, Indonesia and Sri Lanka, emerge, possibly as alternatives to Malaysia. At the same time, trade through the Middle East, which started to develop in the period 2009-2011, grows further, with the United Arab Emirates featuring prominently. Hong Kong also functions as an important transit point for ivory to reach China, which is indisputably the major end-use destination. Within Africa, the criminal syndicates responsible for this illegal trade appear to be adapting with exploratory shifts to new countries like Togo and Côte d'Ivoire as exit points within Africa, and Spain and Turkey as transit countries to mask the fact that shipments originated in Africa. Various countries in East and Southern Africa are continuing to be very active in terms of internal ivory movements, and could reflect shifts in poaching patterns.

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