CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA

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Elephant conservation, illegal killing and ivory trade

SUPPLEMENTARY INFORMATION ON DOCUMENT SC62 DOC 46.1

This document has been jointly prepared by the Secretariat, IUCN, UNEP-WCMC and TRAFFIC in relation to agenda item 46.1 on Elephant conservation, illegal killing and ivory trade.

A. Asian Elephants (*Elephas maximus):* status threats and conservation actions

CITES listing status and IUCN Red List status

CITES listing status remain unchanged since the preparation of SC61 Doc 44.2 (Rev.1); however, while the global status of Asian Elephants in the IUCN Red List remains Endangered (A2c; ver 3.1; Choudhury *et al.,* 2008), the AsESG listed Sumatran Elephants (*E. m. sumatranus*) as Critically Endangered (A2c; ver 3.1) in November 2011 (Gopala *et al*., 2011). The primary reason for the Critically Endangered listing was the scale and rate of habitat loss: taking ca. 25 years as a single generation (*sensu* IUCN, 2001) for Asian elephants, then over 69% of potential Sumatran elephant habitat has been lost within just one generation (Figure A.1) and the driving forces that are causing the habitat loss are still continuing. Moreover, there is clear direct evidence from two Sumatran Provinces (Riau and Lampung) to show that entire elephant populations have disappeared as a result of the habitat loss over the past 25 years: 9 populations have been lost since the mid-1980s in Lampung (Hedges *et al*., 2005) and a 2009 survey of nine forest blocks in Riau that had elephant herds in 2007 revealed that six herds had gone extinct (Desai, 2007). That this pattern will continue seems certain.

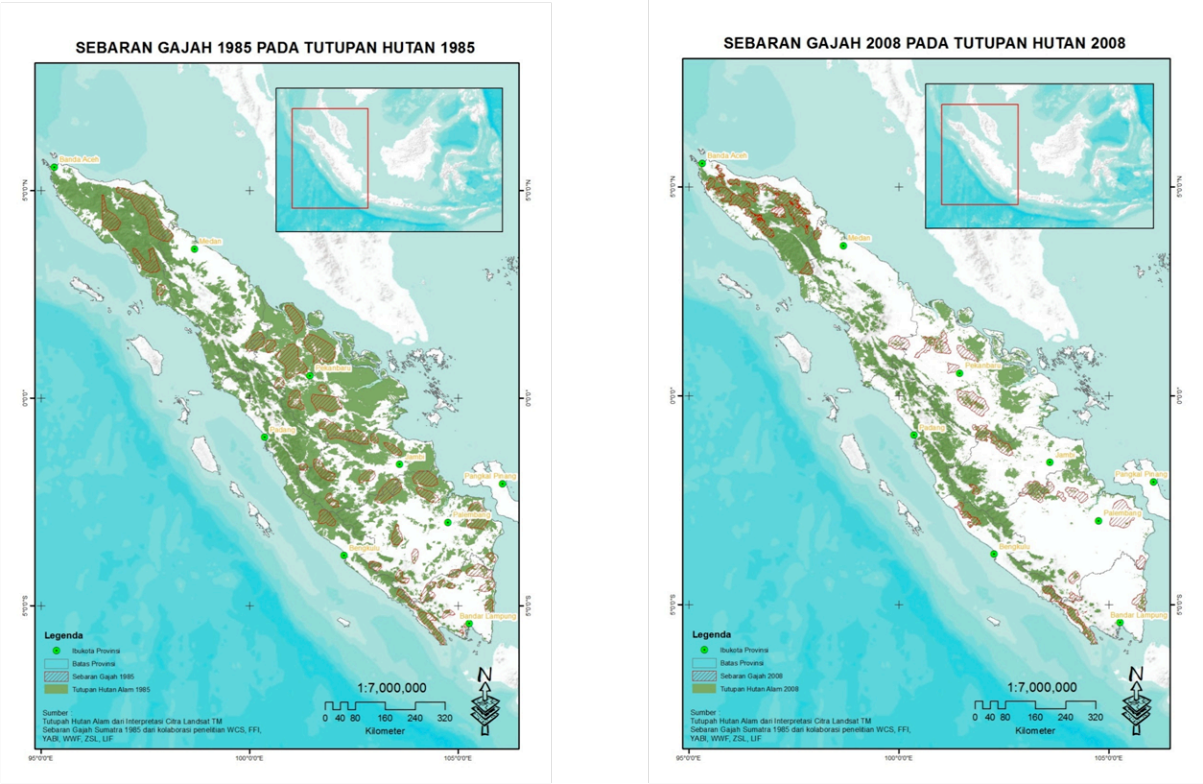
Geographic range

The range map provided in SC61 Doc 44.2 (Rev 1) remains the most up to date. The current range data are, however, now also available at the African and Asian Elephant Database web interface (http://elephantdatabase.org).

Population size and trend

The most recent published source on the status of Asian elephants in the 13 range States remains that summarized by the AsESG in 2008 (Choudhury *et al.,* 2008) and updated for SC61 Doc 44.2 (Rev.1). However, the Asian elephant population data are now being added to the African and Asian Elephant Database and those population data will go 'live' at the World Conservation Congress in September 2012.

Figure B1. Maps depicting elephant habitat loss in the Island of Sumatra (Indonesia) between 1985 and 2008. Forest habitat is shown in green, while elephant range is depicted in red hatching.



Since the preparation of SC61 Doc 44.2 (Rev.1), a number of new surveys have been conducted or are underway, including in Cambodia, India, Indonesia, the Lao PDR, and Thailand. In almost all cases these new surveys used fecal DNA based capture–mark–recapture methods and while the fieldwork components are complete, laboratory and statistical analyses are ongoing. Several of these new surveys (Way Kambas National Park and Bukit Barisan Selatan National Park in Indonesia and Seima Protection Forest in Cambodia) represent the first repeat surveys using standardized peer-reviewed methods for these areas (all of which are MIKE sites) and will allow inferences to be made about population trend. Analysis of the available population data utilizing the AsESG's analytical framework is ongoing.

New population surveys are planned for 2012 or 2013 for a number of sites, including Xishuangbanna (China), the Northern Plains (Cambodia), and the Nakai Plateau (Lao PDR).

Conservation strategies and action plans

Since the preparation of SC61 Doc 44.2 (Rev.1), the Indonesian Government has begun the process of updating its National Elephant Action Plan and the Malaysian Government has begun preparing a National Elephant Conservation Action Plan, working with NGO partners. The AsESG is also in the process of compiling an Asian-wide Elephant Conservation Strategy, working with representatives of range States, NGOs, and other stakeholders: it is expected that this Strategy will be published in 2013.

B. African Elephants (*Loxodonta africana):* status threats and conservation actions

This section presents a list of African elephant population survey reports obtained since SC61 (Table B1), a list of national and regional elephant conservation strategies produced to date or in development (Table B2), and updated estimates of elephant numbers at MIKE sites as at the end of 2011 (subsequent text and tables in this section).

Table B1: Reports collected by MIKE and AfESG between June 2011 and May 2012. Survey methods are coded as follows: GS – ground sample count; AT – aerial total count; AS – Aerial sample count; DC – dung count; GD – dung DNA-based mark-recapture; O – other; RC – reconnaissance (no population estimate);

Country	Site name	Survey year	Survey method	Reference
CENTRAL AFRICA				
Central African Republic	Northern Ecosystem	2010	GS	Bouché, 2010
Democratic Republic of Congo	Parcs Nationaux de l'Upemba & des Kundelungu	2009	RC	Vanleeuwe *et al*., 2009
Equatorial Guinea	National	2010	RC	Martínez Martí, 2011
Gabon	Waka National Park	2006	RC	Abitsi *et al*., 2006
Gabon	Park National des Plateaux Bateke	2006	RC	Bout, 2006
Gabon	Delta de la Ogooué	2005	RC	Latour, 2005
Gabon	Parc National de Pongara	2006	RC	Latour, 2006
Gabon	Mwagne National Park	2004	RC	Maisels *et al*., 2004
Gabon	Parc National de Mayumba	2010	RC	Makaya, 2010
Gabon	Parc National des Monts Birougou	2007	DC	Rostand & Anicet, 2007
Gabon	Parc National des Monts de Cristal	2005	RC	WCS Gabon, 2005
Gabon	Loango National Park	2008	DC	WCS Gabon, 2008
Congo	Conkouati Douli National Park	2010	DC	Vanleeuwe, 2011
EASTERN AFRICA				
Kenya	Nasolot, South Turkana, Rimoi and Kamnarok	2010	AT	Edebe *et al*., 2010
Kenya	Masai Mara National Reserve and adjacent community areas	2010	AT	Kiambi *et al*., 2010
Kenya	North Narok	2011	AT	Mijele *et al*., 2011
Kenya	Tsavo Ecosystem	2011	AT	Ngene *et al*., 2011
Tanzania	Mkomazi Ecosystem	2011	AT	Ngene *et al*., 2011
Uganda	Kidepo Valley and Murchison Falls National Parks	2010	AS	Rwetsiba & Wanyama, 2010
Uganda	Kidepo Valley, Lipan Controlled Hunting Area and Madi Corridor	2008	AS & AT	WCS Flight Programme, 2008
SOUTHERN AFRICA				
Botswana	Northern Botswana	2010	AS	Chase, 2011
Malawi	Liwonde National Park	2011	AT	Macpherson, 2011

Country	Site name	Survey year	Survey method	Reference
Mozambique	Limpopo National Park	2010	AT	Bassair Aviation, 2010
Mozambique	South of Lake Cabora Bassa	2010	AS	Dunham, 2010
Mozambique	Limpopo National Park	2010	AS	Stephenson, 2010
Mozambique	Maputo Special Reserve, Machungulo and Marine Periphery	2009	RC	WCS, 2009
South Africa	Garden Route National Park	2003	GD	Eggert *et al*., 2007
South Africa	All National Parks	2011	AT & IR	SANParks, 2011
Zambia	Kafue Ecosystem	2011	AS	Frederick, 2011
Zambia	North Luangwa National Park	2007	AS	WCS Flight Programme, 2007
Zambia	Luangwa Valley	2009	AS	WCS Flight Programme, 2009
WEST AFRICA				
Nigeria	Yankari Game Reserve	2011	O	Bergl *et al*., 2011

Table B2: National elephant conservation strategies in Africa

Country	Year	Status
CENTRAL AFRICA		
Cameroon	2010	Completed
EASTERN AFRICA		
Kenya	2012	Completed
Tanzania	2012	Completed
Uganda		In development
SOUTHERN AFRICA		
Botswana	2003	Completed
Mozambique	2010	Completed, awaiting ministerial approval
Namibia	2007	Completed
Zambia	2003	Completed
WEST AFRICA		
Benin	2005	Completed
Burkina Faso	2003	Completed
Cote d'Ivoire	2004	Completed
Guinea-Bissau	2000	Completed
Guinea	2008	Completed
Mali		In development
Niger	2010	Completed
Senegal		In development
Togo	2005	Completed

Elephant population numbers in MIKE sites in 2011

As noted in SC62 Doc 46.1, the IUCN/SSC African Elephant Specialist Group (AfESG) secured funding in March 2012 to allow curation of data collected since 2007. While updated estimates are not available for the entire African elephant range, we have prepared pooled estimates for MIKE sites in Africa at the regional and continental level, and these are presented here.

The AfESG's analytical approach is outlined in detail in pages 3-18 of the 2007 African Elephant Status Report (Blanc *et al.*, 2007). While estimates for 2011 are presented, it should be noted that results from a number of important MIKE sites surveyed in 2010 and 2011, such as the Selous Ecosystem in the United Republic of Tanzania, Niassa Ecosystem in Mozambique, Chewore MIKE site in Zimbabwe, Luangwa Valley in Zambia, and Ndoki-Likouala Landscape in the Congo are not yet available. The AfESG hopes to have updated numbers for Africa this year, which will include these surveys if the reports have been released.

All survey information is available at http://elephantdatabase.org

Summary Totals Table

The summary totals tables present pooled estimates at the national, regional and continental levels, separated into four groups, DEFINITE, PROBABLE, POSSIBLE and SPECULATIVE numbers of elephants, based on the survey reliability categories (A-E) described on page 12 of the 2007 African Elephant Status Report or at http://elephantdatabase.org/reliability. It is worth repeating that the totals presented for each country's MIKE sites are not necessarily complete estimates of the MIKE sites, and depend on the amount of range that is covered by estimates.

Interpretation of Changes in Elephant Estimates from 2007 to 2011

These tables show the breakdown and net changes in the four categories of elephant estimates, grouped by the ostensible reason for change, as described on page 15 of the 2007 African Elephant Status Report. Reasons for change are coded as follows: DA: Different Area; DD: Data Degraded; DT: Different Technique; NA: New Analysis; NG: New Guess; NP: New population; PL: Population Lost; RS: Repeat Survey; ——: No Change.

Survey Types

Methods of estimating elephant numbers are elaborated on pages 8-12 of the 2007 African Elephant Status Report. Survey types are coded as follows: AS: Aerial Sample Count; AT: Aerial Total Count; DC: Dung Count; GD: Genetic Dung Count; GS: Ground Sample Count; GT: Ground Total Count; IR: Individual Registration; O: Other.

Africa MIKE sites

Africa MIKE sites: 2011 Summary Totals

Data Category	Definite	Probable	Possible	Speculative
Aerial or Ground Total Counts	47,485	0	0	0
Direct Sample Counts and Reliable Dung Counts	107,293	46,608	48,195	0
Other Dung Counts	0	39,422	15,749	0
Informed Guesses	1,201	0	610	278
Other Guesses	0	0	0	800
Totals 2011	**155,979**	**86,030**	**64,554**	**1,078**
Totals 2007	*167,367*	*108,158*	*80,906*	*1,834*

Africa MIKE sites: 2011 Regional Totals and Data Quality

Region	Definite	Probable	Possible	Speculative
Central Africa	8,378	42,366	19,742	1,010
Eastern Africa	76,048	25,498	26,378	0
Southern Africa	68,779	17,688	18,049	0
West Africa	2,775	477	385	68
Totals	**155,979**	**86,030**	**64,554**	**1,078**

Africa MIKE sites: Interpretation of Changes in Estimates from 2007 to 2011

Cause of Change	Definite	Probable	Possible	Speculative
Repeat Survey	+13,079	+456	+2,499	0
Different Technique	-26,910	-20,373	-19,074	-443
Different Area	+2,192	-2,348	+206	-313
Totals	**-11,639**	**-22,265**	**-16,370**	**-756**

Note

Detailed explanations for the changes in numbers are outlined in each subregional summary below.

Central Africa MIKE sites

Central Africa MIKE sites: 2011 Summary Totals

Data Category	Definite	Probable	Possible	Speculative
Aerial or Ground Total Counts	3,914	0	0	0
Direct Sample Counts and Reliable Dung Counts	3,464	3,322	3,727	0
Other Dung Counts	0	39,044	15,634	0
Informed Guesses	1,000	0	381	210
Other Guesses	0	0	0	800
Totals 2011	**8,378**	**42,366**	**19,742**	**1,010**
Totals 2007	*8,381*	*47,389*	*20,168*	*1,360*

Central Africa MIKE sites: 2011 Country Totals and Data Quality

Country	Definite	Probable	Possible	Speculative
Cameroon	246	0	318	0
Central African Republic	1,000	122	135	700
Chad	454	0	0	0
Congo	1,489	14,086	6,336	0
Democratic Republic of Congo	3,214	4,221	2,842	10
Equatorial Guinea	0	700	0	300
Gabon	1,975	23,237	10,109	0
Totals	**8,378**	**42,366**	**19,742**	**1,010**

Central Africa MIKE sites: Interpretation of Changes in Estimates from 2007 to 2011

Cause of Change	Definite	Probable	Possible	Speculative
Repeat Survey	+1,416	+72	+1,771	0
Different Technique	+1,071	-869	-516	-350
Different Area	-2,490	-4,226	-1,681	0
Totals	**-3**	**-5,023**	**-427**	**-350**

Notes

There were a number of new surveys in MIKE sites in Central Africa. In Cameroon, the 2007 aerial total count of Waza National Park replaced the existing 2002 estimate (informed guess). The estimate for the Dzangha Ndoki site in Central African Republic comes from an individual registration count, replacing the 2005 dung count for that National Park.

A number of sites were surveyed with a repeated survey methodology, but covering significantly different survey areas. This was the case for Zakouma National Park in Chad (aerial total count in 2011), Garamba National Park in the Democratic Republic of Congo (aerial total count in 2006) and Odzala-Kokoua National Park in the Congo (dung count in 2008).

There were three repeated surveys, utilizing the same methodology and coverage area. These were Nouabale-Ndoki National Park in Congo, Virunga National Park in the Democratic Republic of the Congo, and Lope National Park in Gabon.

Central Africa MIKE site input zones

		Survey details			Number of elephants				
MIKE site	Input Zone	Cause of change	Type	Reliab.	Year	Est.	95% C.L.	Source	Area (km²)
	Cameroon								
BBK	Boumba-Bek	-	O	D	2004	318	318*	Blake, 2005	2,383
WAZ	Waza Blocks 1, 2, 3	DT	AT	A	2007	246		Omondi, *et al*., 2007	1970
	Central African Republic								
SGB	Sangba / Triangle de rhinos	-	AS	B	2005	122	135	Renaud *et al*., 2005	2,700
BGS	Bangassou	-	O	E	2004	500	500*	Blake, 2005	12,011
DZA	Dzangha Ndoki	DT	IR	D	2010	1,000	1200*	Turkalo, 2011	2,554
	Chad								
ZAK	Zakouma National Park	DA	AT	A	2011	454		Potgieter, *et al*., 2011	3,326
	Congo								
NDK	Nouabale-Ndoki National Park	RS	DC	B	2006	2,175	686	Stokes, *et al*., 2010	4,190
ODZ	Odzala-Kokoua National Park - South	DA	DC	C	2008	13,400	5,650	WCS-Congo Program, 2008	7,444
	Democratic Republic of Congo								
GAR	Garamba National Park (southern sector)	DA	AT	A	2006	3,214		Emslie, *et al*., 2006	2,127
KHB	Kahuzi-Biega (Upland)	-	O	D	2005	20	30*	Hart, 2006	154
OKP	Okapi (Central)	-	DC	C	2006	2,688	1,348	Grossmann *et al*., 2006	5,600
SAL	Salonga	-	DC	C	2004	1,186	692	Blake, 2005	22,100
VIR	Virunga / Central (South of Lake Edward)	RS	AS	B	2010	296	631	Plumptre, *et al*., 2010	2,597
VIR	Virunga / North (North of Lake Edward)	RS	AS	B	2010	51	108	Plumptre, *et al*., 2010	1,550
VIR	Virunga (Mikeno) / Virunga (Mikeno)	-	O	D	2003	43	43*	Gray, quest. reply, 2005	256
	Equatorial Guinea								
ALE	Monte Alén	-	O	E	2002	300	300*	S. Engonga, pers. comm., 2002	800
ALE	Montes Mitra Sector, Monte Alén	-	DC	C	2004	700		Puit & Ghiurghi, 2007	1,200
	Gabon								
LOP	Lope National Park	RS	DC	B	2009	4,142	2,167	Maisels, 2010	4,486
MKB	Minkébé	-	DC	C	2004	21,070	7,942	Blake, 2005	7,338

East Africa MIKE sites

East Africa MIKE sites: 2011 Summary Totals

Data Category	Definite	Probable	Possible	Speculative
Aerial or Ground Total Counts	24,448	0	0	0
Direct Sample Counts and Reliable Dung Counts	51,415	25,498	26,320	0
Informed Guesses	185	0	58	0
Totals 2011	**76,048**	**25,498**	**26,378**	**0**
Totals 2007	*91,506*	*40,859*	*41,036*	*12*

East Africa MIKE sites: 2011 Country Totals and Data Quality

Country	Definite	Probable	Possible	Speculative
Eritrea	96	0	8	0
Kenya	20,406	0	50	0
Rwanda	11	17	17	0
Tanzania	53,714	24,828	25,651	0
Uganda	1,821	653	653	0
Totals	**76,048**	**25,498**	**26,378**	**0**

East Africa MIKE sites: Interpretation of Changes in Estimates from 2007 to 2011

Cause of Change	Definite	Probable	Possible	Speculative
Repeat Survey	2,133	0	0	0
Different Technique	-19,810	-15,498	-14,675	-12
Different Area	1,968	0	0	0
Totals	**-15,709**	**-15,498**	**-14,675**	**-12**

Notes

All MIKE sites in Eastern Africa, except for Gash-Setit in Eritrea and Mt. Elgon in Kenya, were surveyed since 2007.

Repeat surveys, using the same methodology and extent of coverage, were conducted in Meru and Tsavo MIKE sites in Kenya. The area of the 2008 Laikipia-Samburu survey was more than 10% greater than in the previous survey conducted in 2002.

In Uganda, the aerial sample count conducted in Murchison Falls Conservation Area in 2010 covered a much larger area than the previous aerial sample count in 2005, while the aerial total count of Queen Elizabeth National Park in 2010 was a shift in technique from the aerial sample count conducted in 2006.

The major reason for change in East African MIKE sites was due to the surveys conducted in Tanzania in 2006 and 2009. Due to methodological issues, the 2006 survey is believed to have yielded an overestimate (H. Maliti, pers.comm. 2011). As such, the reason for change for the Tanzania input zones has been noted as "Different Technique." The Tanzania estimates included in this analysis come from the national survey conducted in 2009, and it should be noted that although a survey was conducted in 2011, the final survey report is not yet available.

East Africa MIKE site input zones

		Survey details			Number of elephants				
MIKE site	Input Zone	Cause of change	Type	Reliab.	Year	Est.	95% C.L.	Source	Area (km²)
	Eritrea								
GSH	Gash-Setit	-	O	D	2003	104	104*	Shoshani *et al*., 2004	5,275
	Kenya								
SBR	Samburu-Laikipia Ecosystem	DA	AT	A	2008	7,415		Litoroh, *et al*., 2010	37,360
MRU	Meru / MIKE site blocks	RS	AT	A	2007	720		Mwangi, *et al*., 2007	
EGK	Mt Elgon	-	O	D	2002	139	139*	Bitok, 2002	1,083
TSV	Tsavo / MIKE site blocks	RS	AT	A	2011	12182		Ngene, *et al*., 2011	
	Rwanda								
AKG	Akagera / Highland	DT	DC	B	2006	0		Parker, 2006	
AKG	Akagera / Lakeside	DT	DC	B	2006	28	17	Parker, 2006	
	Tanzania								
KTV	Katavi-Rukwa / Katavi National Park	DT	AS	B	2009	3,235	2,438	TAWIRI, 2009	-
KTV	Katavi-Rukwa / Rukwa Game Reserve	DT	AS	B	2009	2,124	1,435	TAWIRI, 2009	-
RHR	Ruaha - Rungwa / Itigi thickets	DT	AS	B	2009	634	504	TAWIRI, 2009	-
RHR	Ruaha - Rungwa / Kizigo Game Reserve	DT	AS	B	2009	5,117	2,544	TAWIRI, 2009	-
RHR	Ruaha - Rungwa / Muhesi Game Reserve	DT	AS	B	2009	1,643	1,637	TAWIRI, 2009	-
RHR	Ruaha - Rungwa / Outside South West of Ruaha	DT	AS	B	2009	477	390	TAWIRI, 2009	-
RHR	Ruaha - Rungwa / Ruaha National Park	DT	AS	B	2009	9,885	2,666	TAWIRI, 2009	-
RHR	Ruaha - Rungwa / Rungwa Game Reserve	DT	AS	B	2009	13,869	3,928	TAWIRI, 2009	-
SEL	Selous-Mikumi / Kilombero Game Controlled Area	DT	AS	B	2009	1,077	1,352	TAWIRI, 2009	-
SEL	Selous-Mikumi / Mikumi National Park	DT	AS	B	2009	1,570	1,188	TAWIRI, 2009	-
SEL	Selous-Mikumi / North East of Selous (Outside)	DT	AS	B	2009	67	118	TAWIRI, 2009	-
SEL	Selous-Mikumi / North of Mikumi (Outside)	DT	AS	B	2009	81	110	TAWIRI, 2009	-
SEL	Selous-Mikumi / Selous East (Outside)	DT	AS	B	2009	4,941	1,688	TAWIRI, 2009	-
SEL	Selous-Mikumi / Selous Game Reserve	DT	AS	B	2009	30,088	4,504	TAWIRI, 2009	-

		Survey details			Number of elephants				
MIKE site	Input Zone	Cause of change	Type	Reliab.	Year	Est.	95% C.L.	Source	Area (km²)
SEL	Selous-Mikumi / Selous South (Outside)	DT	AS	B	2009	249	284	TAWIRI, 2009	-
SEL	Selous-Mikumi / Selous South West (Outside)	DT	AS	B	2009	717	466	TAWIRI, 2009	-
SEL	Selous-Mikumi / Selous west (Outside)	DT	AS	B	2009	207	400	TAWIRI, 2009	-
TGR	Tarangire-Manyara / MIKE blocks	DT	AT	A	2009	2561		TAWIRI, 2009	
	Uganda								
MCH	Murchison Falls Conservation Area	DA	AS	B	2010	904	653	Rwetsiba & Wanyama, 2010	5,044
QEZ	Queen Elizabeth National Park	DT	AT	A	2010	1,570		Plumptre, *et al*., 2010	2,148

Southern Africa MIKE sites

Southern Africa MIKE sites: 2011 Summary Totals

Data Category	Definite	Probable	Possible	Speculative
Aerial or Ground Total Counts	16,389	0	0	0
Direct Sample Counts and Reliable Dung Counts	52,390	17,688	18,049	0
Totals 2011	**68,779**	**17,688**	**18,049**	**0**
Totals 2007	*63,944*	*19,532*	*19,560*	*0*

Southern Africa MIKE sites: 2007 Country Totals and Data Quality

Country	Definite	Probable	Possible	Speculative
Botswana	23,291	6,248	6,228	0
Mozambique	17,804	3,779	3,779	0
Namibia	4,956	2,753	3,124	0
South Africa	14,454	0	0	0
Zambia	2,657	1,762	1,762	0
Zimbabwe	5,617	3,146	3,156	0
Totals	**68,779**	**17,688**	**18,049**	**0**

Southern Africa MIKE sites: Interpretation of Changes in Estimates from 2007 to 2011

Cause of Change	Definite	Probable	Possible	Speculative
Repeat Survey	+9,530	+384	+727	0
Different Technique	-7,385	-4,006	-4,026	0
Different Area	+2,690	+1,778	+1,788	0
Totals	**+4,834**	**-1,843**	**-1,511**	**0**

Notes

Almost all MIKE sites, except for Nyami Nyami in Zimbabwe, were surveyed since 2007. Namibia's Etosha National Park was surveyed in 2011, but the survey report is not yet available. One major reason for change in Southern Africa comes from the repeated aerial sample count in Niassa Game Reserve, which recorded an increase of 7,641 elephants. The other major reason for change was the new count for Chobe National Park, which recorded a lower estimate than the 2006 survey. The reason for change has been recorded as Different Technique (DT) because the 2010 survey was conducted in a different season to the 2006 count.

Southern Africa input zones

		Survey details			Number of elephants				
MIKE site	Input Zone	Cause of change	Type	Reliab.	Year	Est.	95% C.L.	Source	Area (km²)
	Botswana								
CHO	Chobe National Park	DT	AS	B	2010	29,539	6,228	Chase, 2011	11,675
	Mozambique								
NIA	Niassa National Reserve	RS	AS	B	2009	20,118	2,701	Craig, 2009	42,300
MAG	South of Lake Cabora Bassa / West of Musengezi River	DT	AS	B	2010	1,465	1,078	Dunham, 2010	2,621
	Namibia								
CAP	East Caprivi / Mudumu National Park	RS	AS	B	2007	2,113	1,534	Chase, 2007	-
CAP	East Caprivi / Northern Conservancies	RS	AS	B	2007	68	8	Chase, 2007	-
CAP	East Caprivi / South Conservancies	RS	AS	B	2007	349	119	Chase, 2007	-
CAP	Mamili National Park	RS	AT	A	2007	1,935		Chase, 2007	-
CAP	North East / Susuwe	RS	AS	B	2007	1,187	865	Chase, 2007	-
ETO	Etosha	-	AS	B	2004	2,057	598	Kilian & Kolberg, 2004	-
	South Africa								
KRU	Kruger National Park	RS	AT	A	2011	14,454		SANParks, 2011	19,624
	Zambia								
SLW	South Luangwa National Park	RS	AS	B	2009	4,419	1,762	WCS Flight Programme, 2009	8,079
	Zimbabwe								
CHE	Chewore / Chewore 1	DA	AS	B	2010	1,488	468	Kuvango & Gandiwa, 2011	840
CHE	Chewore / Chewore 2 (North)	DA	AS	B	2010	1,360	665	Kuvango & Gandiwa, 2011	1,054
CHE	Chewore / Chewore 3	DA	AS	B	2010	1,974	695	Kuvango & Gandiwa, 2011	897
CHE	Chewore / Chewore 4 (South)	DA	AS	B	2010	226	294	Kuvango & Gandiwa, 2011	610
NYA	Kariba	-	AS	B	2006	3,715	1,033	Dunham *et al.*, 2006a	3,224

West Africa MIKE sites

West Africa MIKE sites: 2011 Summary Totals

Data Category	Definite	Probable	Possible	Speculative
Aerial or Ground Total Counts	2,734	0	0	0
Direct Sample Counts and Reliable Dung Counts	25	99	99	0
Other Dung Counts	0	378	115	0
Informed Guesses	16	0	171	68
Totals 2011	**2,775**	**477**	**385**	**68**
Totals 2007	*3,536*	*378*	*142*	*462*

West Africa MIKE sites: 2011 Country Totals and Data Quality

Country	Definite	Probable	Possible	Speculative
Benin	71	0	144	60
Burkina Faso	1,288	0	0	0
Côte d'Ivoire	212	0	10	0
Ghana	401	164	36	0
Guinea	0	214	79	0
Liberia	25	99	99	0
Mali	344	0	0	0
Niger	85	0	17	0
Nigeria	348	0	0	0
Senegal	1	0	0	8
Togo	0	0	0	0
Totals	**2,775**	**477**	**385**	**68**

West Africa MIKE sites: Interpretation of Changes in Estimates from 2007 to 2011

Cause of Change	Definite	Probable	Possible	Speculative
Different Technique	-786	0	+144	-81
Different Area	+25	+99	+99	-313
Totals	**-761**	**+99**	**+243**	**-394**

Notes

There are new estimates for only three MIKE sites in West Africa. In Benin, an aerial sample count in 2008 of the Pendjari MIKE site has replaced the previous 2003 aerial total count. In Liberia, a dung count in 2009 has replaced the previous estimate from a 1989 dung count. In Mali, the estimate from a 2007 aerial total count has replaced the previous guess from 2006.

West Africa input zones

		Survey details			Number of elephants				
MIKE site	Input Zone	Cause of change	Type	Reliab.	Year	Est.	95% C.L.	Source	Area (km²)
	Benin								
PDJ	Zone Cynegetique de la Pendjari	DT	AS	D	2008	159	189*	Sinsin, *et al*., 2008	
WBJ	W du Benin	-	AT	A	2003	56		Bouché *et al*., 2004b	5,872
	Burkina Faso								
NAZ	Nazinga Ranch	-	AT	A	2003	548		Bouché *et al*., 2004a	940
WBF	W du Burkina	-	AT	A	2003	740		Bouché *et al*., 2004b	2,412
	Côte d'Ivoire								
COM	Comoé	-	O	D	2002	10	10*	Fischer, 2005	11,500
MAR	Marahoué	-	GD	A	2002	159	54	Eggert, 2004b	1,010
TAI	Taï	-	GD	A	2002	53	26	Eggert, 2004a	6,410
	Ghana								
KAK	Kakum	-	DC	C	2004	164	36	Danquah, 2004	366
MOL	Mole	-	AT	A	2006	401		Bouché, 2006	4,504
	Guinea								
ZIA	Ziama	-	DC	C	2004	214	79	Barnes & Nandjui, 2005	455
	Liberia								
SAP	Sapo National Park	DA	DC	B	2009	124	99	Boafo, 2010	630
	Mali								
GOU	Gourma Ecosystem	DT	AT	A	2007	344		Bouche, 2007	
	Niger								
BBR	Babban Rafi	-	O	D	2005	17	17*	A.M. Issa, pers. comm., 2005	430
WNE	W du Niger	-	AT	A	2003	85		Bouché *et al*., 2004b	2,294
	Nigeria								
TKR	Yankari	-	AT	A	2006	348		Omondi *et al*., 2006b	3,224
	Senegal								
NKK	Niokolo-Koba	-	O	D	2006	1	9*	Renaud *et al*., 2006	8,282
	Togo								
KER	Kéran	-	AT	A	2003	0		Bouché *et al*., 2004b	1,402

C. Monitoring the Illegal Killing of Elephants (MIKE)

This section provides technical details on the analysis that forms the basis of the MIKE section in document SC62 Doc. 46.1. The data on proportions of illegally killed elephants (PIKE) used in the analysis are shown in Table C1 at the end of this section.

Trends and levels of illegal killing

Trends presented in Figures 1 and 2 of the annex to document SC62 46.1 were calculated using estimated marginal means weighted for sample size. The continental trend was derived using two effects, namely subregion and year, while the subregional trends were estimated using country and year.

A comparison of PIKE values in 2010 and 2011 for sites reporting on both years (34 pairs, 24 positive, 7 negative, 3 ties at zero or one) reveals a "significant" increase in PIKE in 2011 with respect to 2010 (exact binomial test for equality of proportions, χ^2 = 10.9234, df = 1, p < 0.0001; t-test from a linear model weighted for sample size with site:year interaction, t= 3.4799, df=33, p=0.0014; weighted paired t-test p=0.0036).

Spatial and temporal patterns of variation in PIKE were further explored through a simple logistic model with PIKE as the response and factors for subregion, country, site and year as predictors. The model corrects for over-dispersion in the data (variance inflation factor = 3.42) and takes various interactions into account (countries within subregions and sites within countries). The deviance explained by the various terms in this simple model is shown below.

Factor	df	Deviance	Residual df	Residual Deviance	Deviance explained	Cumulative Deviance explained
NULL	347	4383.3				
subregion	3	1120.68	344	3262.6	25.57%	25.57%
year	9	801.29	335	2461.3	18.28%	43.85%
subregion:country	23	1048.66	312	1412.7	23.92%	67.77%
country:site	22	401.25	290	1011.4	9.15%	76.93%

This model explains 76.93% of the variation (deviance) in PIKE. Most of the explained deviance (58.65%) is accounted for by spatial factors (subregion, country and site), while time accounts for 18.28 % of the deviance. The amount of variation accounted for by time has more than doubled with respect to the previous analysis, reflecting perhaps the considerable increase in PIKE across the continent in 2011. The only two years with a significant coefficient in the above model were 2005 (p=0.0045) and 2011 (p=0.000165).

The upward trend in PIKE is confirmed by another simple logistic model with site, year and their interaction. The positive coefficient of year in this model is highly significant (using the mean error square from the site:year interaction, the F value for the year term is 97.278/2.136 = 45.542 (*df* 1, 46) giving p<2.17E-08).

Covariate data

Details of covariates identified as important in previous analyses are not reproduced here, and can be found in the reports of those analyses (COP15 Inf. 41 and SC61 Inf. 7). A number of new, time-dependent site-level covariates were explored for this analysis. As described below, some of these were obtained using standard Protected Area Management effectiveness (PAME) assessment methodologies, while two others were obtained using a questionnaire described in Tranquilli *et al* (2011).

PAME Covariates

In 2009, the MIKE programme obtained from UNEP-WCMC a data set with results of 801 protected area management assessment results conducted in 35 MIKE-participating countries. The data contained assessments for both MIKE and non-MIKE sites, and in fact only 31 MIKE sites had been assessed. Thus the dataset was not suitable for use in modelling PIKE across all sites. The patterns of variation in the various indicators were assessed, and it was established that most of the variables in the data set varied at least as much between sites in the same country as they did between sites in different countries. It was therefore concluded that these indicators could not be easily replaced by country-level measures of governance or development.

The subset of 31 assessments of MIKE sites, accounting for just over a third of all MIKE sites was used to explore which, if any, PAME indicators displayed important relationships with PIKE. To this end, PIKE values averaged over all years were calculated for each site. Four PAME variables emerged as significant predictors of PIKE in the subset of data: law enforcement capacity adequacy, human resource management adequacy, research and monitoring and funding security.

A questionnaire was then put together, with questions covering these four variables taken from the standard Management Effectiveness Tracking Tool (METT) and Rapid Assessment and Prioritization of Protected Area Management (RAPPAM) methodologies. The table below shows the questions, variable to which they contribute, and source.

Question	Variable	Source
Was the regular budget for the site secure?	Security/reliability of funding	METT
Were the site staff sufficiently well managed?	Adequacy of human resource policies and procedures	METT
Were staff able to enforce site rules well enough?	Adequacy of law enforcement capacity	METT
Were inappropriate land uses and activities (e.g. poaching) effectively controlled?	Adequacy of law enforcement capacity	METT
Were the impacts of legal and illegal uses of the site accurately monitored and recorded?	Research and Monitoring	RAPPAM
Were critical monitoring needs identified and prioritized by site managers?	Research and Monitoring	RAPPAM

The questionnaire was completed by the MIKE Subregional Support Officers (SSOs), who are familiar with the situation at MIKE sites but are external to them. SSOs were asked to answer

questions for each of their sites, and for every year between 2002 and 2011, on a four-point scale, ranging from zero (definitely not) to 3 (definitely yes).

Answers were converted to the common reporting format used by UNEP-WCMC (see Leverington *et al*. 2008). Where a variable was composed of two questions, the relevant responses were averaged with equal weights.

Law Enforcement Presence and NGO Presence

Tranquilli *et al*. (2011) present evidence of a deterrent effect on illegal activity associated with the presence of non-governmental organizations and the presence of law enforcement at sites with great apes. In order to test whether these findings also hold for the wider sample of MIKE sites in relation to PIKE levels, the two relevant questions in the questionnaire used by Tranquilli *et al* were included in the questionnaire given to the MIKE SSOs. The questions were "Was there law enforcement presence at the site?" and "Were any NGOs working on law enforcement monitoring at the site?" While in the case of Tranquilli *et al* these were yes/no questions, in the MIKE questionnaire, and for the sake of consistency with the PAME questions detailed above, answers to these two questions were also provided on a four-point scale ranging from zero to three.

Modelling approach

A large set of covariates at the site, country and global levels has been assembled over the course of the last few years, many of which have been shown to be significantly related to PIKE. However, where predictors are correlated, as is the case here, there can be no unique best model to explain spatial and temporal variation in PIKE. A model-averaging approach (Burnham and Adnderson 2002) could be considered, particularly if there is interest in predicting PIKE levels in non-MIKE sites, given that covariate data for non-MIKE sites could be assembled. In the present exercise, however, the objective was to find a readily interpretable model, with as few parameters as possible, that would account for most of the variation in the data.

In order to find a model to meet these criteria, the model selection method described below was followed. Only covariates with no missing values were considered. All possible models using all or subsets of those covariates were computed assuming a binomial distribution. The list of the 22 covariates considered is shown below.

Variable	Name	Level	Time-dep.	Source
Household consumption in China (annual % growth)	hhcons	Global	Y	International Monetary Fund
Corruption perceptions index (governance)	cpi	Country	Y	Transparency International
Elephant density	dens	Site	N	IUCN/SSC/AfESG /AED
Precision of most recent elephant survey	pf	Site	N	IUCN/SSC/AfESG /AED
Distance to international border	dist2border	Site	N	MIKE

Variable	Name	Level	Time-dep.	Source
Infant mortality	infant_mort	Site	N	FAO
Human population density	people	Site	N	Landscan
Human Footprint	hm_ftprnt	Site	N	WCS/CIESIN
Net primary productivity (vegetation cover)	npp	Site	N	CIESIN
Land degradation	land_degrad	Site	N	FAO
Land cover heterogeneity	lc_het_menhinick	Site	N	FAO (derived)
Rainfall anomaly	anomaly	Site	Y	NOAA/NCEP
Funding security	funding_security	Site	Y	MIKE (PAME)
Adequacy of human resource management	hr_adequacy	Site	Y	MIKE (PAME)
Law enforcement presence	le_presence	Site	Y	MIKE (Tranquilli *et al*)
Adequacy of law enforcement capacity	le_capacity_adequacy	Site	Y	MIKE (PAME)
Research and Monitoring	res_mon	Site	Y	MIKE (PAME)
NGO presence	ngo_pres	Site	Y	MIKE (Tranquilli *et al*)
Elephant population size (log)	logest	Site	Y	IUCN/SSC/AfESG /AED
Site area (log)	logarea	Site	Y	MIKE

The “best” model from the exhaustive search was treated as the global model. This ‘best’ model included the following 16 covariates:

Site-level	Country-level	Global-level
dens dist2border infant_mort people hm_ftprnt npp anomaly le_capacity_adequacy res_mon ngo_pres logest logarea farming lc_het_menhinick	cpi	hhcons

In order to obtain a more parsimonious model and to reduce the probability of spurious results caused by the dredging approach, all possible models nested within the global model were computed, this time accounting for over-dispersion in the data. The variable importance weight for each covariate was then calculated from that set of models as the sum of the Akaike weights over all models that included that covariate. The final model selected was that which contained covariates whose variable importance weights were above 0.5, namely variables with ranks 1-7 in the table below. The result of this procedure is shown in the table below. The usual approach of using a variable importance weight threshold of 0.5 yields the same result.

Covariate	Variable importance weight	rank
Private consumption in China (% annual growth)	1.000	1
Corruption Perceptions Index (governance)	1.000	1
Infant Mortality	1.000	1
Law enforcement capacity	0.997	4
Area of site (log)	0.997	5
Research and Monitoring	0.979	6
Elephant density	0.813	*
Farming	0.810	7
Net Primary Production (vegetation cover)	0.477	8
Distance to international border	0.477	9
Elephant population estimate (log)	0.472	10
Rainfall anomaly	0.393	11
Human Footprint	0.335	12
Human population	0.329	13
Land cover heterogeneity	0.289	14
NGO presence	0.277	15

* Elephant density was excluded because it is a function of site area, which had a higher variable importance weight.

These covariates were then fitted in a flat logistic model to which a variance inflation factor was applied to correct for over-dispersion. Powers of (centered) year were added sequentially to this model so as to absorb any temporal variation not accounted for by the covariates. Only the quadratic term for year was significant, but the linear coefficient was retained in the model to ensure the residual time trend was correctly centered. The resulting model is shown below.

	Estimate	Std Error	t value	Pr(>|t|)
(Intercept)	2.534	0.787	3.221	0.001
infant_mort	0.003	2.47E-4	10.936	2.00E-16
farming	-0.015	0.004	-3.583	3.89E-04
logarea	-0.456	0.061	-7.438	8.51E-13
le_capacity_adequacy	-2.233	0.445	-5.014	8.63E-07
res_mon	0.901	0.237	3.806	1.67E-04
cpi	-0.703	0.075	-9.326	2.00E-16
hhcons	0.120	0.024	5.093	5.88E-07
cyear	0.039	0.027	1.468	0.143
cyear²	0.047	0.009	5.46	9.23E-08

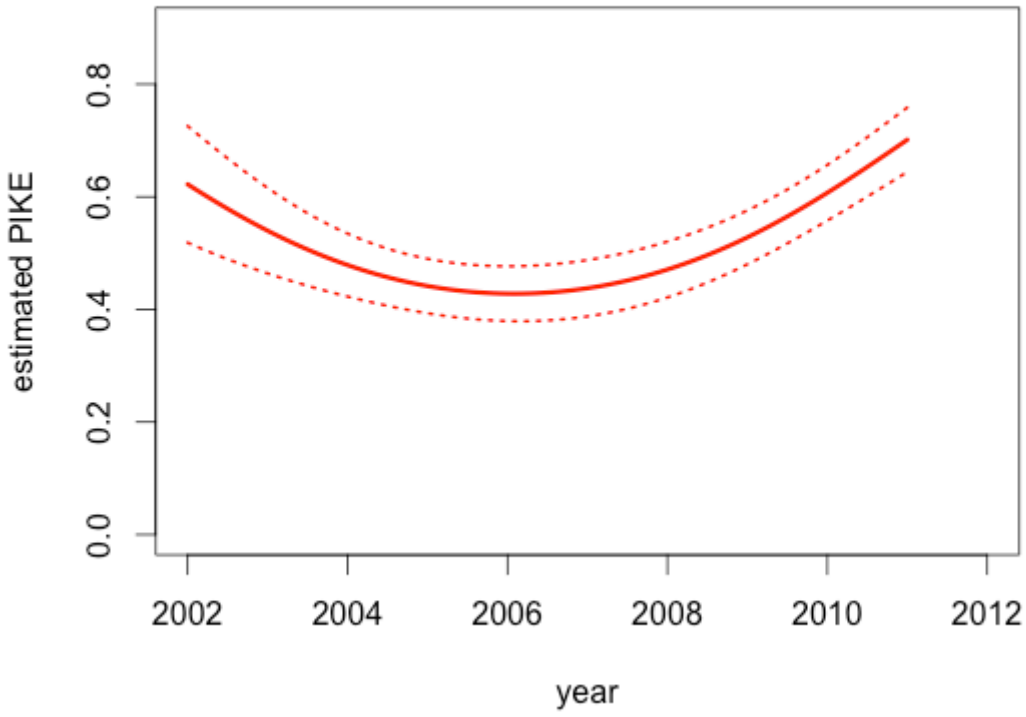
An analysis of deviance table for the above model is shown below. The model explains 63.87% of the variation in PIKE with only 10 parameters, which is a good proportion of the total deviance that can be explained by covariates (in this case about 77% as per the factor-

based model above). Furthermore, the model is readily interpretable and provides a good ratio of cases to predictors (>38:1).

Covariate	df	Deviance	Resid. df	Residual Deviance	Deviance explained	Cumulative deviance explained
NULL	347	4394.8				
infant_mort	1	967.43	346	3427.3	22.01%	22.01%
farming	1	65.55	345	3361.8	1.49%	23.51%
logarea	1	75.11	344	3286.7	1.71%	25.21%
le_capacity_adequacy	1	392.71	343	2894	8.94%	34.15%
res_mon	1	277.12	342	2616.8	6.31%	40.46%
cpi	1	524.19	341	2092.6	11.93%	52.38%
hhcons	1	285.37	340	1807.3	6.49%	58.88%
cyear	1	82.91	339	1724.4	1.89%	60.76%
cyear2	1	136.64	338	1587.7	3.11%	63.87%

Note that the cumulative variance explained depends on the order in which covariates are entered into the model. In this model they were entered starting from the site to the global level, with fixed-time covariates preceding time-dependent ones.

The residual temporal trend remaining, after accounting for all covariates by holding them constant at their means (and only varying year) is shown in the graph below.



This trend is strikingly similar to the trend in large-scale ivory seizures shown in Figure 5 of document SC62 Doc. 46.1. In view of this, the seized weight of ivory seizures was used as a covariate (etislssz) to replace linear and quadratic year, under the rationale that high levels of

elephant poaching would correlate with high weights of ivory seized in transit. The results of that model are shown below.

	Estimate	Std. Error	t value	Pr(>|t|)	% deviance explained
(Intercept)	1.933	0.794	2.437	0.0153	
infant_mort	0.003	0.000	10.903	2.00E-16	22.01%
farming	-0.015	0.004	-3.62	3.4E-04	23.51%
logarea	-0.439	0.063	-7.017	1.24E-11	25.21%
le_capacity_adequacy	-2.167	0.455	-4.763	2.83E-06	34.15%
res_mon	0.927	0.242	3.833	1.5E-04	40.46%
cpi	-0.732	0.077	-9.488	2.00E-16	52.38%
hhcons	0.159	0.020	7.965	2.53E-14	58.88%
etislssz	0.031	0.006	4.851	1.87E-06	61.54%

While the addition of large scale seizure weights resulted in a slightly lower proportion of explained deviance (61.54%), it reduced the number of parameters and explained virtually all the remaining temporal variation, as the model did not accept the inclusion of any power of year. Thus the use of this covariate provides a more powerful explanatory model and highlights a clear, quantitative link between MIKE and ETIS results, showing that both systems are detecting essentially the same patterns along different points in the illegal ivory trade chain.

Hierarchical model

In order to relax the assumption that observations in different sites within a country, or in a given site across years, are independent of each other, the above model was used as a basis to fit a mixed-effects model that took full account of the hierarchical structure in the data. Random effects for subregion, country site and year, as well interaction terms for all levels of the data hierarchy were included in the model. The interaction terms ensured that there were as many levels in the grouping factor as observations there were in the data. This has the effect of correcting for over-dispersion in the mixed-effects model. The summary of fixed effects in this model is shown below.

	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	3.300	1.943	1.699	0.089
infant_mort	0.003	0.001	3.771	1.60E-04
farming	-0.023	0.008	-2.735	0.006
logarea	-0.543	0.176	-3.077	0.002
le_capacity_adequacy	-1.894	0.837	-2.261	0.024
res_mon	0.682	0.674	1.012	0.312
cpi	-0.956	0.205	-4.661	3.15E-06
hhcons	0.139	0.031	4.519	6.23E-06
etislssz	0.039	0.011	3.675	2.40E-04

The only covariate that could be ‘dropped’ from this model is res_mon (research and monitoring). Nevertheless, an F-test for res_mon, adjusted by the mean error square for the “sites within countries“ group gave a significant result, and so the covariate was retained in the model.

The table below shows the correlations between the covariates in the model. Note that the only substantial correlations among covariates are those between infant mortality and site area, and between law enforcement capacity and research & monitoring. Furthermore, the only covariates whose values repeat across all sites in a given country are cpi and hhcons

(and both are time-dependent), while the only covariates that repeat in a given site across all years are logarea, infant_mort and farming.

	infant_mort	farming	logarea	le_cpcty_adeq	res_mon	cpi	hhcons
infant_mort							
farming	-0.039						
logarea	-0.2	0.562					
le_cpcty_adeq	0.002	0.111	0.158				
res_mon	0.247	-0.093	-0.135	-0.402			
cpi	0.197	0.085	-0.051	-0.231	0.077		
hhcons	-0.027	0.013	0.005	0.123	-0.094	-0.11	
etislssz	-0.035	-0.006	0.019	0.092	-0.103	-0.104	0.14

Estimating absolute numbers of elephants illegally killed at reporting MIKE sites

At the 10th Meeting of the MIKE Technical Advisory Group, Ken Burnham presented a formula he developed to estimate numbers of elephants killed based on PIKE and estimates of population size and natural mortality rates, as follows:

$$\hat{K} = Nm\frac{\hat{p}}{1-\hat{p}}$$

where K is the estimate of numbers killed, N is the elephant population estimate and p is the PIKE estimate (Burnham, in preparation).

As there is considerable uncertainty surrounding elephant population numbers, particularly in large forested areas where reliable survey methods are difficult to apply in practice, the MIKE Technical Advisory Group advised at its 11th meeting (April 2012) that the above equation be re-arranged as

$$\frac{\hat{K}}{N} = m\frac{\hat{p}}{1-\hat{p}}$$

thus yielding the proportion of the total elephant population estimated to have been illegally killed in a given year. Estimates of PIKE from the final flat model above were used for *p*, but as no estimates of natural mortality *m* are available at the site level, two sets of estimates were calculated, corresponding to upper and lower bounds for mortality rates. According to the MIKE TAG, natural mortality is estimated to vary between 1% and 4% in forest sites, while in savanna sites it is estimated to range between 1.5% and 4.5%. The formula was applied only to MIKE sites, there being therefore no extrapolation to non-reporting sites. The results of applying this formula at the subregional and continental levels are presented in document SC62 Doc. 46.1.

Table C1. Summary of PIKE data received by MIKE: 2002-2011. PIKE values are given along with sample size (in brackets).

	Range State	Site	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Central Africa	Cameroon	Boumba-Bek		0.68 (19)	0.71 (7)	1 (3)	0 (12)	0 (1)	0 (1)	0.36 (14)	0.6 (5)	0.8 (5)
		Waza		0.33 (3)	0.5 (2)	0.5 (2)	0.33 (3)	0 (1)	0 (2)	1 (1)	0 (1)	1 (1)
	Central African Republic	Bangassou		1 (3)	1 (8)						1 (6)	0.88 (8)
		Dzanga-Sangha				0.89 (9)	0.5 (2)	0.5 (2)	0.63 (27)	0.3 (10)	0 (5)	0.1 (10)
		Sangba		0.1 (10)	0 (1)				1 (8)	1 (4)	1 (2)	1 (6)
	Chad	Zakouma		0.65 (34)	0.86 (35)	0.27 (11)	0.67 (60)	0.97 (160)	0.94 (86)	0.6 (20)	0.92 (39)	0.71 (7)
	Congo	Nouabale-Ndoki		0.63 (8)	0.29 (14)	0.75 (4)	0 (5)	0 (1)	0.25 (4)	0.4 (5)	0.33 (6)	0.4 (10)
		Odzala		0.05 (38)	0.53 (36)	0 (73)	0 (1)	0.97 (36)	0.53 (17)	1 (3)		0.96 (123)
	Democratic Republic of the Congo	Garamba		0.96 (114)	0.89 (197)	0.9 (86)	0.94 (34)	0.5 (14)	1 (4)	1 (6)	0.67 (15)	0.93 (14)
		Kahuzi-Biega		- (0)	- (0)	- (0)	- (0)	- (0)	- (0)	- (0)		
		Okapi		1 (20)	0.9 (10)	0.95 (22)	1 (5)	1 (11)	0.67 (3)	1 (18)	0.87 (15)	1 (37)
		Salonga		0 (2)	0.64 (56)	0.25 (4)	- (0)	- (0)	- (0)	0.93 (15)	0.97 (29)	1 (9)
		Virunga				0.44 (9)	0.33 (3)	0 (15)	1 (63)	0.8 (20)	1 (25)	1 (16)
	Gabon	Lopé		0.57 (7)	0.25 (4)	- (0)	0 (1)	- (0)	0 (1)	0.67 (3)	0 (4)	0.25 (8)
		Minkébé		0.73 (11)	0.92 (13)	0.5 (6)	- (0)	- (0)	1 (4)	0.75 (4)	0.94 (18)	0.87 (31)
Eastern Africa	Eritrea	Gash-Setit	0 (3)	0.33 (3)	0 (1)		0.14 (7)	0.5 (4)	0.4 (5)	0.17 (6)	0 (2)	
	Kenya	Meru					0.5 (14)	0.27 (11)	0.38 (13)	0.48 (40)	0.7 (40)	0.78 (81)
		Mount Elgon		0.86 (7)	0.71 (7)	0 (1)	0.4 (5)	0.5 (2)	0.5 (2)	0.71 (7)		0.58 (12)
		Samburu Laikipia	0.38 (159)	0.18 (195)	0.31 (128)	0.17 (160)	0.14 (96)	0.24 (97)	0.51 (278)	0.26 (326)	0.47 (164)	0.61 (264)
		Tsavo		0.22 (82)	0.29 (65)	0.28 (60)	0.17 (88)	0.2 (56)	0.33 (79)	0.16 (329)	0.68 (81)	0.61 (107)
	Rwanda	Akagera			- (0)	- (0)	0 (1)				0 (1)	0.25 (4)
	Uganda	Murchison Falls	- (0)	1 (10)	0.5 (2)		1 (2)	0.5 (2)	0.5 (2)	0.4 (5)	0.29 (7)	0.92 (26)
		Queen Elizabeth	0 (3)	1 (1)	0.38 (8)	0 (1)	0.18 (11)	1 (4)	0.44 (9)	0.38 (8)	0.36 (11)	0.8 (20)
	United Republic of Tanzania	Katavi Rukwa		0.75 (12)	0.75 (20)	0.5 (6)	1 (2)	1 (2)	1 (9)	0.8 (5)	0.92 (13)	0.86 (29)
		Mkomazi										1 (2)
		Ruaha Rungwa		0.1 (10)	0.17 (6)	0.67 (15)	0.89 (9)	0 (2)	0.67 (3)	0.33 (3)	0.57 (28)	0.94 (34)
		Selous Mikumi		0.22 (9)	0.18 (11)			0.42 (103)	0.59 (90)	0.48 (100)	0.55 (195)	0.64 (224)
		Tarangire		0.14 (7)	0 (11)		0.25 (4)	0.2 (5)	0.4 (5)	0 (2)	0.5 (42)	0.2 (5)

	Range State	Site	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Southern Africa	Botswana	Chobe	- (0)	0 (59)	0.07 (73)	0.05 (153)	0.1 (111)	0.14 (101)	0.04 (113)	0.13 (120)	0.24 (37)	0.33 (42)
	Mozambique	Cabora Bassa	0 (1)	0.33 (3)	1 (2)						0.58 (12)	0.83 (18)
		Niassa			0 (14)		0.33 (3)		0.88 (16)		0.84 (77)	0.89 (85)
	Namibia	Caprivi	0 (1)	0.25 (8)	0 (6)	0.25 (4)	0.4 (5)	0 (5)	- (0)	0 (7)	0.33 (6)	0.59 (29)
		Etosha	0 (24)	0 (18)	0 (4)	0 (25)	0 (15)	0 (25)	0 (14)	0 (21)	0 (11)	0 (27)
	South Africa	Kruger	0 (1)	0 (2)	0 (18)	0 (35)	0 (51)	0.03 (34)	0 (18)	0.03 (35)	0 (14)	0.05 (20)
	Zambia	South Luangwa	0.25 (4)	0.63 (8)	0.65 (23)	0.25 (4)	0.77 (35)	0 (11)	0.88 (8)	0.43 (14)	0.53 (49)	0.64 (22)
	Zimbabwe	Chewore	0.37 (19)	0.3 (10)	0.21 (14)	0 (20)	0.12 (17)	0.79 (14)	0.08 (13)	0.38 (26)	0.14 (29)	0.67 (51)
		Nyami Nyami	0.67 (3)	0.29 (7)	0.82 (11)	0.83 (6)	0.67 (3)	0.5 (10)	0.9 (20)	0.87 (52)	1 (19)	0.81 (16)
West Africa	Benin	Pendjari	0 (1)	0.5 (2)	0.33 (3)				0 (1)	0.88 (8)	0 (6)	
		W du Bénin	0 (1)	0 (1)	0 (3)					0 (1)		
	Burkina Faso	Nazinga	0 (1)		0 (2)	0 (3)	0 (1)		1 (4)	1 (1)	1 (1)	
		W du Burkina	0 (1)		0 (1)				1 (6)	0.89 (9)		
	Côte D'Ivoire	Marahoué						1 (8)	1 (1)	1 (2)		
		Taï			1 (2)							
	Ghana	Kakum	0.5 (2)	0 (6)	0 (5)			0 (1)	1 (1)	1 (1)	0 (1)	
		Mole	0 (1)	0.5 (2)	0.25 (8)	1 (3)		0.8 (5)	1 (2)		1 (1)	
	Guinea	Ziama		1 (1)	1 (2)			1 (1)	1 (4)	1 (11)		
	Liberia	Sapo						1 (1)	1 (1)	1 (3)		
	Mali	Gourma	0 (3)	0 (1)	0 (1)	0 (2)	0 (3)	0 (2)	0 (2)	0.25 (4)	0 (27)	
	Niger	W du Niger	1 (1)	0.25 (4)	1 (2)					0.33 (3)	0.33 (3)	0.83 (6)
	Nigeria	Sambisa		0.33 (3)	0.5 (2)							
		Yankari	0 (6)	0.25 (4)	0.6 (5)	0 (2)					0.67 (6)	1 (1)
	Senegal	Niokolo-Koba		0 (1)								

	country	Site	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
South Asia	Bangladesh	Chunati				- (0)	0 (1)	0 (1)	0 (1)	0 (1)		
	Bhutan	Samtse				- (0)	- (0)	- (0)	- (0)			
	India	Chirang-Ripu		0 (1)	0 (2)			0 (1)	0 (8)	0 (5)		
		Deomali				- (0)	0 (2)					
		Dihing Patkai			0.5 (2)	0 (1)	0 (1)	0 (3)	0.2 (5)	0 (3)		
		Eastern Dooars		0 (4)	0 (12)	0.13 (8)	- (0)	0 (15)	0.07 (15)	0 (2)		
		Garo Hills		0 (6)	0.1 (10)	0 (2)	0 (4)	0.09 (11)	0.17 (6)	0.38 (8)		
		Mayurbhanj			0 (12)	0.12 (17)	0 (1)					
		Mysore				0.13 (30)	0.33 (3)					
		Shivalik				0 (2)						
		Wayanad			0 (2)	0.13 (8)	- (0)					
	Nepal	Royal Suklaphanta			- (0)	- (0)	- (0)	- (0)	- (0)	- (0)		
South East Asia	Cambodia	Mondulkiri					0 (1)				0.67 (3)	
	China	Xishuangbanna				- (0)	0 (1)					
	Indonesia	Bukit Barisan Selatan					- (0)					
		Way Kambas					0 (1)					
	Lao PDR	Nakai Nam Theun		1 (1)				0 (1)				1 (1)
	Malaysia	Gua Musang				- (0)	- (0)	- (0)	- (0)	- (0)	1 (1)	
		Kluang						0 (1)		0.5 (2)	1 (1)	
	Myanmar	Alaungdaw Kathapa					1 (2)			1 (1)		
		Shwe U Daung					0 (1)			0 (1)		1 (1)
	Thailand	Kuibiri				- (0)	- (0)				1 (1)	0 (3)
		Salakphra				0 (1)	- (0)			0 (1)	0 (1)	
	Viet Nam	Cat Tien					- (0)			1 (6)		

D. Legal trade in Ivory

Tables D1 to D3 have been sourced from the CITES Trade Database, UNEP World Conservation Monitoring Centre, Cambridge, United Kingdom.

*Table D1. Direct trade in *wild-sourced tusks of Loxodonta africana from African range states, 2009-2010 (all purposes).*

Exporter	Reported by	2009	2010	Total
Botswana	Importer	128	177	305
	Exporter			
Cameroon	Importer	9	12	21
	Exporter	4		4
Ghana	Importer			
	Exporter		2	2
Mozambique	Importer	11	31	42
	Exporter	20	30	50
Namibia	Importer	31	16	47
	Exporter	52	53	105
South Africa	Importer	28	30	58
	Exporter	48	173	221
Sudan**	Importer			
	Exporter		95	95
United Republic of Tanzania	Importer	40	17	57
	Exporter	160	128	288
Zambia	Importer	19	8	27
	Exporter	32	16	48
Zimbabwe	Importer	190	244	434
	Exporter	117	102	219
Total	Importer	456	535	991
	Exporter	433	599	1032

* 'Wild-sourced' includes trade recorded as source 'W' and without a source specified.
**Prior to secession of South Sudan.

Table D2. Direct trade in wild-sourced Loxodonta africana tusks reported by weight (kg) from African range States, 2009-2010 (all purposes), rounded to the nearest kilogram.*

Exporter	Reported by	2009	2010	Total
Botswana	Importer	**26687		26687
	Exporter			
Mozambique	Importer	208		208
	Exporter			
Namibia	Importer	3751		3751
	Exporter			
South Africa	Importer	**33094		33094
	Exporter			
Zimbabwe	Importer	3147	648	3794
	Exporter	32	2541	2573
Total	Importer	66886	648	67533
	Exporter	32	2541	2573

* 'Wild-sourced' includes trade recorded as source 'W' and without a source specified.
**Reflects imports of CITES-approved one-off sale ivory stocks.

Table D3. Export quotas for Loxodonta africana tusks as sport-hunted trophies 2009-2012 established in compliance with Resolution Conf. 10.10 (Rev. CoP15) on trade in elephant specimens. The number of elephants represented by the quotas is half the number of tusks (i.e. two tusks per elephant).

Exporter	2009	2010	2011	2012
Botswana*	800	800	800	-
Cameroon	160	160	160	160
Mozambique	120	200	200	-
Namibia	180	180	180	180
South Africa	300	300	300	300
United Republic of Tanzania	400	400	400	400
Zambia*	40	40	160	160
Zimbabwe	1000	1000	1000	1000

*Export quotas for Botswana and Zambia were published for “tusks and other trophy items” of a specified number of animals.

E. Illegal trade in elephant specimens

Table E1: Number of ivory seizures in ETIS by country by year (17 April 2012)

Region/country/territory	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total *
Africa																				
Angola	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Algeria	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Benin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Botswana	-	3	1	-	1	4	5	9	4	14	4	10	20	8	14	18	13	15	-	144
Burkina Faso	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	2
Burundi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1
Cameroon	2	-	-	-	-	3	12	1	-	1	5	4	15	6	6	11	5	4	3	84
Cape Verde	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Central African Rep.	-	-	-	1	-	-	-	-	1	1	1	-	-	-	-	2	2	-	-	8
Chad	-	-	-	-	3	-	-	-	-	-	-	-	-	1	-	-	-	1	-	5
Comoros	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Congo	-	-	-	-	-	-	-	-	-	2	1	1	-	-	3	-	-	1	-	8
Cote d'Ivoire	-	-	-	-	-	-	-	-	7	1	2	1	-	-	-	-	-	-	-	11
Democratic Republic of the Congo	-	-	-	-	-	-	3	-	-	-	-	-	3	-	-	-	2	-	-	8
Djibouti	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	2
Egypt	-	-	-	-	-	3	10	6	21	-	1	-	-	-	-	-	-	1	-	42
Equatorial Guinea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Eritrea	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Ethiopia	12	5	5	4	17	16	12	3	8	9	15	78	-		4	5	1	163	-	372
Gabon	-	-	1	-	1	-	-	-	-	-	1	3	-	-	1	1	16	3	-	28
Gambia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Ghana	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	2
Guinea	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Guinea Bissau	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Kenya	7	24	8	6	2	10	33	32	29	36	21	58	57	27	30	87	61	67	11	645
Lesotho	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0

Region/country/territory	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total *
Liberia	-	-	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-	0
Libyan Arab Jamahiriya	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Madagascar	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	0
Malawi	4	9	2	1	1	4	1	4	2	5	2	7	0	-	-	-	-	2	-	156
Mali	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1
Mauritania	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Mauritius	-	-	-	-	-	-	-	0	0	-	-	-	-	-	-	-	-	-	-	0
Morocco	1	3	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	6
Mozambique	-	-	-	-	-	1	1	-	1	1	2	3	-	-	20	-	-	1	-	30
Namibia	69	71	50	58	22	25	21	17	14	13	11	12	8	10	14	13	-	-	-	635
Niger	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Nigeria	-	-	-	-	-	-	-	-	0	0		-	-	-	-	-	1	5	-	18
Reunion	-	-	-	-	-	-	1	-	1	-	-	1	2	-	-	-	-	-	-	5
Rwanda	-	-	-	-	-	-	1	-	-	-	2	1	1	-	-	-	-	-	-	5
Sao Tome and Principe	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Senegal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Seychelles	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	0
Sierra Leone	-	-	-	-	-	-	-	-	-	-	1	1	0	0	0	-	-	-	-	2
Somalia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
South Africa	22	16	26	49	62	63	13	9	25	14	10	2	6	2	8	16	6	4	1	498
Sudan	-	-	-	-	-	-	-	-	-	-	-	1	10	3	41	57	-	-	-	112
Swaziland	-	-	-	-	1	-	-	1	1	-	-	-	-	-	-	-	-	-	-	3
United Republic of Tanzania	21	11	19	17	10	5	6	15	29	13	10	7	47	33	16	31	17	1	3	460
Togo	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Tunisia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Uganda	1	1	-	1	-	1	3	2	3	3	2	0	4	5	5	2	-	11	3	51
Zambia	10	6	3	4	1	-	1	-	3	17	26	13	23	16	16	11	7	2	-	239
Zimbabwe	5	17	12	28	35	39	29	19	9	10	3	24	20	2	14	30	27	18	1	432
Subtotal	*155*	*168*	*128*	*170*	*157*	*174*	*152*	*121*	*158*	*141*	*121*	*227*	*216*	*113*	*193*	*284*	*159*	*299*	*22*	*4,019*

Region/country/territory	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total *
Asia																				
Afghanistan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Bangladesh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Brunei Darussalam	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Bhutan	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	0
Cambodia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
China	3	1	3	-	3	11	30	75	74	61	73	65	32	90	53	735	702	2	-	2,015
Hong Kong SAR	8	11	14	8	5	4	9	4	4	2	5	5	4	1	4	6	40	39	-	235
India	1	2	11	11	12	12	28	25	16	58	4	9	5	10	5	12	8	1	-	242
Indonesia	-	-	-	-	-	-	-	-	-	2	1	-	2	4	2	-	-	-	-	11
Iran	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Israel	-	-	-	-	-	2	-	-	-	-	-	-	1	-	-	-	-	-	-	3
Japan	6	46	39	23	17	18	8	14	9	9	6	7	12	5	6	6	6	2	-	254
Jordan	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Kuwait	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Laos People's Democratic Republic	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Macau SAR	3	3	2	-	-	-	-	1	2	1	0	0	0	-	-	-	1	-	-	26
Malaysia	0	0	-	-	1	-	-	2	-	1	1	-	-	-	-	-	-	4	1	23
Mongolia	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	0
Myanmar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Nepal	-	-	-	-	-	1	2	-	-	-	1	1	-	1	-	-	-	-	-	7
Pakistan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Philippines	-	-	1	2	1	-	0	0	-	-	-	4	1	-	-	1	-	-	-	10
Qatar	-	-	-	-	-	-	-	-	-	-	-	2	4	1	-	-	-	-	-	7
Republic of Korea	0	1	-	1	-	-	4	-	-	-	1	-	-	-	-	-	-	1		10
Saudi Arabia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Singapore	2	1	-	-	-	-	-	-	2	-	-	-	2	-	-	-	-	-	-	13
Sri Lanka	-	-	-	1	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Syrian Arab Republic	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0

Region/country/territory	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total *
Taiwan, province of China	13	10	10	11	15	13	7	-	-	-	-	1	2	2	2	2	-	1	-	97
Thailand	9	5	4	1	1	1	1	2	16	1	8	-	-	-	1	2	6	3	-	67
United Arab Emirates	-	-	-	-	-	1	-	-	-	1		-	1	1	-	-	-	1	-	5
Uzbekistan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Viet Nam	-	-	-	-	1	-	1	2	-	-	1	-	2	1	1	5	5	5	-	24
Yemen	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Subtotal	*45*	*80*	*84*	*58*	*56*	*66*	*91*	*125*	*123*	*136*	*101*	*94*	*68*	*116*	*74*	*769*	*768*	*59*	*1*	*3,054*
Europe																				
Albania	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Armenia																0	0	-	-	0
Austria	0	0	0	6	8	2	1	6	0	0	2	1	2	5	0	1	1	0	-	35
Azerbaijan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Belarus	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	0
Belgium	55	36	57	24	12	8	14	10	31	27	19	13	13	10	8	5	29	51	1	551
Bulgaria	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Croatia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Cyprus	-	-	1	2	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	4
Czech Republic	-	-	-	-	3	1	-	-	-	-	-	2	-	1	1	4	-	-	-	12
Denmark	5	5	1	1	10	3	2	1	2	6	6	5	2	1	1	-	9	-	-	82
Estonia	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	2
Finland	-	-	-	-	-	1	-	-	1	2	-	-	-	-	-	-	-	-	-	4
France	-	1	-	1	1	25	141	89	60	29	7	37	57	20	10	8	13	92	-	964
Georgia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Germany	1	-	49	62	51	49	48	39	27	39	26	53	66	41	34	68	45	41	-	999
Greece	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1
Hungary	-	4	3	1	3	0	2	5	4	1	1	-	4		-	2	-	-	-	30
Iceland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Ireland	-	-	-	1	0	0	0	0	0	0		-	-	-	-	-	-	-	-	1
Italy	2	2	-	4	1	1	8	8	35	25	9	15	8	5	3	-	-	-	-	180

Region/country/territory	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total *
Kazakhstan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Latvia	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	0
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Lithuania	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Luxembourg	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Macedonia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		-	-	0
Malta	0	-	1	1	0	0	0	0	0	0	1	-	-	-	-	-	-	-	-	3
Monaco	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	0
Montenegro	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	0
Netherlands	1	-	4	1	1	2	30	19	31	31	2	3	5	14	5	3		-	-	153
Norway	-	-	-	-	-	-	-	1	-	2	3	-	1	1	-	-	-	-	-	8
Poland	-	-	-	-	-	9	3	4	2	4	5	-	5	-	2	1	0	-	-	35
Portugal	0	-	-	-	-	1	10	16	4	33	43	32	30	50	25	-	-	-	-	303
Republic of Moldova	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	0
Romania	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	2
Russian Federation	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Serbia	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	0
Slovakia	0	0	0	0	0	1	0	0	2	0	0	0	0	-	-	-	-	-	-	3
Slovenia	-	-	-	-	-	-	-	-	-	-	1	-	1	-	1	-	-	-	-	3
Spain	1	12	36	5	21	14	24	21	15	17	10	10	7	-	-	1	23	-	-	295
Sweden	-	-	-	1	2	4	-	1	1	-	-	1	5	1	2	0	-	-	-	18
Switzerland	5	7	5	50	38	60	36	47	29	44	26	11	11	8	6	2	10	6	-	638
Turkey	-	-	-	-	-	0	0	0	-	-	-	-	-	-	-	-	-	-	-	0
Ukraine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
United Kingdom	1	4	57	7	55	12	11	32	27	32	15	27	24	11	7	18	9	17	3	727
Subtotal	*71*	*71*	*215*	*167*	*207*	*194*	*331*	*299*	*271*	*292*	*176*	*211*	*242*	*170*	*106*	*113*	*139*	*207*	*4*	*5,056*
North America																				
Canada	1	-	1	-	21	19	9	22	15	24	24	-	1	2	6	-	-	-	-	145
Mexico	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2

Region/country/territory	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total *
United States	112	199	218	194	221	182	227	185	157	148	172	174	165	146	112	177	169	-	-	4,080
Subtotal	*113*	*199*	*220*	*195*	*242*	*201*	*236*	*207*	*172*	*172*	*196*	*174*	*166*	*148*	*118*	*177*	*169*	*0*	*0*	*4,227*
Oceania																				
Australia	-	-	45	89	70	46	39	34	-	54	109	92	114	117	199	154	-	87	-	1,249
Fiji	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
New Zealand	-	-	8	-	-	-	7	30	10	-	-	-	-	13	5	1	-	-	-	149
Papua New Guinea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Palau	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Samoa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Vanuatu	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Subtotal	*0*	*0*	*53*	*89*	*70*	*46*	*47*	*64*	*10*	*54*	*109*	*92*	*114*	*130*	*204*	*155*	*0*	*87*	*0*	*1,399*
Central and South America and the Caribbean																				
Antigua and Barbuda	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Argentina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Bahamas	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Barbados	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Belize	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Bolivia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Brazil	0	0	0	0	0	0	0	0	0	0		-	-	-	-	-	-	-	-	0
Chile	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Colombia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Costa Rica	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Cuba	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Dominica	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Dominican Republic	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Ecuador	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
El Salvador	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Grenada	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Guatemala	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0

Region/country/territory	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total *
Guyana	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Honduras	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Jamaica	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Nicaragua	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Panama	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Paraguay	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Peru	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
Saint Kitts and Nevis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Saint Lucia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Saint Vincent and the Grenadines	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Suriname	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	0
Trinidad and Tobago	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Uruguay	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Venezuela	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Subtotal	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*2*
Grand Total	**384**	**518**	**700**	**679**	**733**	**681**	**857**	**817**	**734**	**795**	**703**	**798**	**806**	**677**	**695**	**1,498**	**1,235**	**652**	**27**	**17,757***

*Totals in last column include data from 1989 – 1993 not shown in this table.

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