Elephants and the trade in elephant specimens: a review of existing analytical and reporting systems and recommendations for a way forward

WORKSHOP REPORT

May 9-11, 2011 Nairobi, Kenya

Acronyms and abbreviations

AAED	African and Asian Elephant Database
AfESG	African Elephant Specialist Group (IUCN/SSC)
AsESG	Asian Elephant Specialist Group (IUCN/SSC)
BIDS	Bad Ivory Database System
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CoP	Conference of the Parties
DELC	Division of Environmental Law and Conventions (UNEP)
DRWG	Data Review Working Group
ETIS	Elephant Trade Information System
HEC	Human–elephant conflict
IUCN	International Union for Conservation of Nature
LEM	Law enforcement monitoring
MIKE	Monitoring the Illegal Killing of Elephants
MIST	Management Information SysTem
PIKE	Proportion of Illegally Killed Elephants
SSC	Species Survival Commission
SSO	Sub-regional Support Officer
SSU	Sub-regional Support Unit
PAME	Protected area management effectiveness
TAG	Technical Advisory Group
UNEP	United Nations Environment Programme
WCMC	World Conservation Monitoring Centre
WCO	World Customs Organization

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I. Executive summary

The workshop on "Elephants and the trade in elephant specimens: a review of existing analytical and reporting systems and recommendations for a way forward" was held in Nairobi, Kenya from 9 to 11 May, 2011. The workshop focused on systems associated with and relevant to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), in particular the MIKE (Monitoring the Illegal Killing of Elephants) programme, the Elephant Trade Information System (ETIS), and the elephant data management systems overseen by the Species Survival Commission (SSC) of the International Union for Conservation of Nature (IUCN).

The workshop was facilitated by Dr. Holly Dublin and Mr. Ken Stansell, with support from the CITES MIKE Central Coordinating Unit and the Secretariat of the African Elephant Specialist Group.

The workshop brought together selected experts to review and provide recommendations to improve the effectiveness of the existing analytical and reporting systems for elephants and the trade in elephant specimens in the context of a supply chain dynamic. The workshop undertook its discussions in the context of Resolution Conf. 10.10 (Rev. CoP15), which governs MIKE and ETIS. The objectives of MIKE and ETIS, according to the resolution, are:

1. Measuring and recording levels and trends, and changes in levels and trends, of illegal hunting and trade in ivory in elephant range States and in trade entrepôts;
2. Assessing whether and to what extent observed trends are related to changes in the listing of elephant populations in the CITES Appendices and/or the resumption of legal international trade in ivory;
3. Establishing an information base to support the making of decisions on appropriate management, protection and enforcement needs; and
4. Building capacity in range States.

In the course of the discussions it became clear that it was necessary to differentiate between the objectives which assist the CITES community to make policy decisions regarding elephants and trade in elephant specimens (Objectives 1 and 2) and the objectives which contribute to management needs in elephant range States (Objectives 3 and 4). Throughout the Executive Summary and accompanying Workshop Report, '**CITES policy objectives**' refers to Objectives 1 and 2, while '**range State management objectives**' refers to Objectives 3 and 4.

The expected outputs of the workshop were:

- Draft revised operational framework for MIKE
- Draft revised analytical framework for MIKE
- Recommendations for joint analytical framework and reporting by IUCN/SSC, MIKE and ETIS
- Practical suggestions to enhance operational compatibility and synergies between the IUCN/SSC, MIKE and ETIS.

Draft revised operational and analytical frameworks for MIKE

The original operational and analytical framework for MIKE was designed to provide data for both CITES policy and range State management objectives. The implementation of the original operational and analytical framework for MIKE was not realistic given the available resources and resulted in significant data gaps and insufficient input to the range State management objectives. It is doubtful that the original operational and analytical framework for MIKE can be achieved without greatly enhanced additional resources over an extended timeline.

A greatly simplified experimental analytical framework based on the proportion of illegally killed elephants (now known as PIKE) has proven to be more feasible and, if technically validated, could contribute to the CITES policy objectives, but will not meet range State management objectives. Additionally, if PIKE is not found to be representative at the site level, it will not be sufficient to contribute to CITES policy objectives, and there will be a need to revert back to the full original analytical framework to achieve any and all of the Resolution's objectives.

It was noted that MIKE relies heavily on elephant population data (from the IUCN/SSC) to implement its analytical framework. The importance of linking the analyses of MIKE and ETIS was also emphasized. As such, minimum data and resource needs were also developed for these two monitoring systems. This information can be used to substantially inform the logical continuation of a third phase of MIKE.

Recommendations for joint analytical framework and reporting by IUCN/SSC, MIKE and ETIS

For continued development of the current analytical framework for MIKE, the linkages with the information generated by IUCN/SSC and ETIS are important. The three systems are related but were developed separately and therefore, there has been little opportunity for a joint analytical framework, to date. The workshop identified opportunities for joint reporting and closer collaboration and noted that adequate resources will be required for MIKE and ETIS to meet their objectives, and to link in effectively with each other, and with the IUCN/SSC.

Practical suggestions to enhance operational compatibility and synergies between IUCN/SSC, MIKE and ETIS

The workshop produced an outstanding array of practical suggestions to enhance operational compatibility and synergies among the various monitoring systems established to support elephant conservation. Additionally, the workshop was able to identify a number of informational gaps and areas where these synergies could be implemented or enhanced.

The major recommendations from this workshop are to:

1) **Validate the PIKE approach;**

   It is imperative that the PIKE approach be validated. The workshop report identifies the issues which remain to be investigated to determine whether PIKE is representative at the site level.

2) **Consider the ramifications of the identified minimum critical data needs for the IUCN/SSC, MIKE and ETIS to contribute to CITES policy and range State management objectives; and**

   The minimum data needs of each system to contribute to CITES policy and range State management objectives should be considered, both in terms of data availability and resources needs.

3) **Consider the far-reaching possibilities for enhanced synergy between IUCN/SSC, MIKE and ETIS.**

   The workshop report outlines the existing and possible synergies between IUCN/SSC, MIKE and ETIS, and illustrates the power of working together more closely through clearer linkages to provide information to both CITES Parties and to range States.

II. Introduction

The purpose of the workshop was to review existing analytical and reporting systems for elephants and the trade in elephant specimens, and to formulate recommendations for the improvements of these systems as necessary. The full workshop concept is outlined in Annex I. The workshop was facilitated by Dr. Holly Dublin and Mr. Ken Stansell. Meeting support and rapporteuring was provided by Ms. Diane Skinner.

The workshop was held over three days from 9 to 11 May, 2011 in Nairobi, Kenya. The working programme is provided in Annex II. The workshop brought together a number of selected experts and a full participants list is attached in Annex III.

The objective of the meeting was to review and provide recommendations to improve the effectiveness of the existing analytical and reporting systems for elephants and the trade in elephant specimens in the context of a supply chain dynamic. The intended outputs of the workshop were:

1. Draft revised operational framework for MIKE;
2. Draft revised analytical framework for MIKE;
3. Recommendations for joint analytical framework and reporting by IUCN/SSC, MIKE and ETIS; and
4. Practical suggestions to enhance operational compatibility and synergies between the IUCN/SSC, MIKE and ETIS.

This detailed workshop report summarizes the background presentations and outputs of the different working sessions, and then goes on to deal with each output as outlined above.

III. Workshop presentations

A number of background presentations were given, outlining the successes and challenges faced in the implementation of each monitoring system. A summary of each presentation is given, followed by a synthesis of any questions or discussions that followed the presentation.

Mr. Tom De Meulenaer opened the meeting by summarizing the various elephant and elephant trade monitoring systems that operate under the auspices of CITES or that are associated with it. In order to make sound policy decisions concerning international trade in elephant specimens, particularly ivory, CITES needs objective facts and figures on species status, poaching, illegal trade in elephant specimens, trends and drivers, and an understanding of the impacts of CITES decisions concerning such trade. He outlined five global monitoring systems for elephants and trade in elephant specimens: 1) monitoring of authorized international trade in elephants and elephant specimens through annual trade reports from CITES Parties, collated by UNEP-WCMC; 2) monitoring of poaching through the CITES MIKE programme, managed by the CITES Secretariat in partnership with IUCN and the elephant range States; 3) monitoring the illegal trade in ivory and other elephant specimens through ETIS, managed by TRAFFIC, using information from CITES Parties and the CITES Secretariat; 4) monitoring of the status of African and Asian elephants through the African and Asian Elephant Database, managed by the IUCN/SSC African and Asian Elephant Specialist Groups; and 5) monitoring compliance of the *Action plan for the control of trade in elephant ivory*, managed by the CITES Secretariat. Mr. De Meulenaer gave a brief overview of the CITES Decisions and Resolutions in which these monitoring systems are anchored, and of the relevant decision-making processes and structures of CITES.

Mr. De Meulenaer outlined the four objectives of MIKE and ETIS, as defined in Resolution Conf. 10.10 (Rev. CoP15), and described the current status of both systems. He explained that the MIKE and ETIS Technical Advisory Group (TAG) has long recognized the need for a standard analytical and reporting framework to more deeply understand the ivory supply chain. In December 2010, the

MIKE and ETIS TAG held a one-day workshop to outline the drivers of illegal killing of elephants and the illegal trade in ivory and other elephant specimens. The purpose of the current workshop was to refine this work, discuss a move towards a joint analytical and reporting framework, and to provide reality checks. The MIKE TAG was to meet again later in 2011 and was expected to review the outputs of the workshop.

Mr. De Meulenaer noted that the outputs of the workshop would also feed into the implementation of Decision 15.74, which directs the CITES Standing Committee to evaluate the need to revise Resolution Conf. 10.10 (Rev. CoP15), and of Decision 14.78, which calls for ETIS, MIKE, IUCN and UNEP-WCMC to report to the CITES Standing Committee. Mr. De Meulenaer closed by outlining the upcoming meetings at which the results of this workshop would be considered, in particular the MIKE TAG meeting (30-31 May 2011) and the 61st meeting of the CITES Standing Committee (15-19 August 2011).

Dr. Holly Dublin welcomed the participants and introduced Mr. Ken Stansell, who had kindly agreed to bring his expertise to assist as co-facilitator.

Dr. Dublin outlined the many inputs to this workshop, noting that participants brought: analytical expertise; field expertise; experience with running the ETIS, MIKE and AAED (African and Asian Elephant Database) systems; members of the MIKE-ETIS Subgroup of the CITES Standing Committee; members of the TAG; Customs and law enforcement expertise; as well as representation from the CITES Secretariat. An additional input was the report of the third African elephant range States meeting (AEM3, Gigiri, November 2010), which had reviewed Resolution Conf. 10.10 (Rev. CoP15) in compliance with the implementation of Decision 15.74. She highlighted missing inputs, in particular the experience and views of the Asian elephant range States, as well as the key analytical players from ETIS (Mr. Bob Burn) and MIKE (Dr. Ken Burnham).

Dr. Dublin outlined the proposed outputs and advised the participants to keep in mind operational realities as well as analytical and reporting outputs. She reviewed the structure and *modus operandi* of the workshop. MIKE and ETIS needed to contribute effectively to both policy-making in the CITES context (as required in the two first objectives of MIKE and ETIS), as well as to build capacity and to serve the day-to-day needs of those managing elephants and controlling the trade in ivory (as mentioned in the two last objectives of MIKE and ETIS). Under the current Resolution, the systems had to meet both purposes, catering for quite distinct audiences, which she believed to be a serious challenge. In order to set up systems that were more efficient, sustainable and achievable, she emphasized that MIKE, ETIS and IUCN/SSC needed to minimize the impacts of working in silos, and effectively link monitoring and analyses to tell the most accurate story with regard to the entire supply chain from live elephants to trade in elephant specimens.

Mr. Trevor Salmon requested clarity on the mandate of the meeting, i.e. whether it was to review Resolution Conf. 10.10 (Rev. CoP15) or to provide a reality check and technical inputs into the process initiated by the TAG in December 2010. Mr. De Meulenaer clarified that the workshop would feed into work initiated by the TAG. The TAG would review the workshop's outcomes and consider them in developing the ETIS and MIKE analytical frameworks. This workshop would furthermore provide input on operational realities. He clarified that ETIS and MIKE needed better and more integrated analytical and reporting frameworks, regardless of Decision 15.74. Dr. Dublin noted that the Chair (Uganda) and Vice-chair (Botswana) of the MIKE-ETIS Subgroup, in addition to the United Kingdom and Thailand, had been invited to the workshop with the express purpose of participating in these discussions and representing the conclusions of the workshop to the other members of the MIKE-ETIS Subgroup. Unfortunately, neither Uganda nor Botswana was able to attend.

Ms. Diane Skinner outlined the sources of African elephant population and range data (full survey reports, recces, personal communications and information gleaned from a variety of 'informal' sources). These data are collected by the Secretariat of the African Elephant Specialist Group (AfESG), reviewed by members of the AfESG's Data Review Working Group (DRWG), digitized

and uploaded into the database. The data are classified into four categories for population data, and three for range data. The goal of the AfESG is to publish an African elephant Status Report (which includes qualitative information as well as tables and maps) every three years. She explained that the AfESG also collects a great deal of other information, including information on land use change impacting habitat, human-elephant conflict (HEC), illegal activities, policy changes, and so on. This information is collected both passively and actively, such as through the recent study into the elephant meat trade in Central Africa.

The main operational challenge in collecting and collating these data is the lack of resources, as much of the work is highly labor-intensive. Collection of survey data can be difficult, as so many different institutions conduct surveys throughout Africa. In addition, because the system relies heavily on the voluntary inputs of the AfESG and DRWG members, the turnaround speed for data analysis can be slower than for other systems that rely on fully-paid staff and inputs.

Analytical challenges are faced in producing population trends over time at the continental level and for the Central and West African sub-regions. Equally, the data seldom allow identification of true trends (i.e. contraction or expansion) of elephant range. While some additional data (HEC) are captured, there is no system for analyzing these data.

Ms. Skinner closed by summarizing the need, expressed by many range States and elephant managers, to have a more effective 'early warning system' which can help to identify an emerging poaching crisis more quickly. This 'early warning system' could incorporate information from experts on the ground, the media and other 'informal' sources. She noted that it would be difficult for MIKE or ETIS to play that role under their current objectives and *modus operandi* because the data flow and reporting are relatively slow.

There was an extended discussion on the matter of trends in elephant population numbers over time. Mr. Tom Milliken suggested that statisticians could help with analyzing trends in elephant populations, even in the absence of repeated, comparable surveys, perhaps through the use of Bayesian networks or other methods. Dr. Dublin responded that Bayesian networks might be able to assist with identifying and understanding causal relationships between trends and drivers, but could not give quantifiable population or range trends. Dr. Fiona Maisels suggested using the known rates at some sites of decline in elephant populations to extrapolate rates of decline at sites without data. Dr. Maisels noted that in central Africa, transects are undertaken where appropriate and financially possible and recces (providing presence/absence information only) where elephant densities are known to be lower. She informed the meeting that there was now a fairly decent map of elephant and human populations in Central Africa which provides a good overview of the dynamics of elephant poaching.

Dr. Mike Norton-Griffiths cautioned that there are deficiencies in the MIKE standards for aerial surveys of elephant populations and that therefore potentially erroneous or unreliable information could make it into the AAED without the deficiencies being articulated. This observation led to an extended discussion about facilitating data validation by providing appropriate detailed metadata in survey reports, including ways to evaluate skills/training of those conducting aerial surveys. Mr. Julian Blanc suggested that the AAED could promote a set of 'reporting standards'.

Dr. Maisels noted that elephants are moving into MIKE sites and other protected areas due to human activities and poaching pressures in unprotected areas, resulting in population compression in particular places.

Dr. Philippe Chardonnet suggested that the data on African elephant range could be refined by using habitat suitability as a model, in particular in those areas which have not been surveyed. Dr. Maisels confirmed that this could be done with confidence in Central Africa based on distance to human populations and structures. Dr. Chardonnet also suggested refining the African elephant range maps

by approaching the livestock and development sectors to interview practitioners about absence/presence of elephants in certain areas.

Mr. Simon Hedges presented the successes and challenges in gathering data on the status of the Asian elephant. He outlined the sources of the data, primarily population surveys, which occasionally also include results of law enforcement monitoring. There are other types of data, such as reports and expert information on large scale land use change and conservation policies, or specific studies, for example on noxious weeds that contribute to a reduction in habitat quality for elephants (*Lantana* and *Parthenium*).

In Southeast Asia, most information on elephant populations has been reported directly from NGOs or researchers to the range States, and not through the Asian Elephant Specialist Group (AsESG). Ideally, the range States then pass this information onto MIKE when it pertains to MIKE sites. For this reason, there is currently no review of Asian elephant survey information by an equivalent of the AfESG's Data Review Working Group. Reviews are done within the NGO community or resulting from a direct request from the MIKE CCU to a number of specialists to review reports. He highlighted a lack of rigorous scientific monitoring in many places. The same Asian elephant estimate has been in place for over 25 years (30,000-50,000 Asian elephants), but Mr. Hedges believed that at present, no scientifically rigorous population estimate for Asia can be made, impeding MIKE and conservation. He indicated, however, that the MIKE standards for elephant surveys based on either dung density or fecal DNA based capture–recapture methods have now been used at a number of MIKE sites, that repeat surveys using these methods to estimate trends at the sites are underway, and that the MIKE standards are increasingly being used at non-MIKE sites, especially in Southeast Asia. Despite the limits on their use (i.e. the difficulty of applying the methods to very large areas of forest), it would be useful for MIKE to make these standards mandatory for surveys funded by MIKE. In addition, training standards have been developed for law enforcement monitoring and they are being adapted for use in Africa.

Mr. Hedges identified a number of challenges. Data collation and curation for the new AAED is still labor intensive and a database manager is needed. Having the AAED the official as MIKE's formal depositary of elephant survey information makes it dependent on voluntary Specialist Groups and their ability to raise funds. Analytical challenges include in particular: the difficulties of analyzing population trends and trends in illegal killing at various scales in Asia given the still small number of reliable population estimates; spatial and other biases in the way law enforcement monitoring (LEM) data are collected; and concerns about the reliability of the Proportion of Illegally Killed Elephants (PIKE) data, as these data are usually collected on the perimeter of the protected area, and therefore likely related to HEC rather than to poaching for ivory; and sex- and age-ratio related issues (i.e. the importance of tuskers in Asia), although this problem is fading as fecal DNA based monitoring methods are increasingly used (but it is still an operational challenge in terms of rollout because of the small number of suitable laboratories and the difficulty of exporting samples from some range States).

Mr. Milliken asked about the national elephant population estimate that had just been made available for India. Mr. Hedges questioned its reliability but noted that the August 2010 report of the Indian Government's Elephant Task Force, *Securing the Future for Elephants in India*, recognizes the need to use more robust survey methods.

Dr. Norton-Griffiths presented the results of his recent consultancy to review the MIKE Phase 2 project for Africa. He reviewed the functional structure, noting that it reflected a supply-driven rather than a demand-driven process. During MIKE Phase 1, the MIKE system was set up in Africa. Phase 2 has displayed real progress towards implementing that system and producing important results. Within the MIKE CCU, which was re-established and embedded in UNEP's Division of Environmental Law and Conventions (DELC), the critical factor was the hiring of the Data Analyst, which allowed two major achievements: the establishment of a baseline of elephant mortality in MIKE sites in 2007, and a comprehensive analysis of MIKE information for the 15th meeting of the Conference of the Parties in 2010 (CoP15). A number of African elephant range States expressed

interest in joining the monitoring programme, while participating range States were eager to have more MIKE sites. Monitoring was moving from specific sites to wider ecosystems and there was an increase in cross-border cooperation. There was also good uptake of MIST as a preferred method for law enforcement monitoring.

Dr. Norton-Griffiths identified a number of concerns. The bureaucracy in UNEP may be a challenge for the CCU. While sub-regional support officers (SSOs) were making more national and site visits, the distribution of these visits was sometimes skewed. He also noted that many sites are still totally dependent on donor funding, which could be considered good, as it shows that MIKE is considered valuable, or bad, illustrating lack of sustainability. In his view, elephant population surveys in MIKE sites should be happening more often. There were a number of long-standing concerns that originated in Phase 1. In particular, inter-departmental conflicts and the high rate of turnover of National and Site MIKE Officers in certain elephant range States continued to prevent the normal functioning of MIKE. Additionally, in many elephant range States law enforcement monitoring was still seen as an additional burden and has not been institutionalized as a central activity.

The recommendations of the review include: to support the continuation and expansion of MIKE; to review the Terms of Reference for SSOs, National and Site MIKE Officers; to review range State commitments towards the implementation of MIKE and protocols to implement MIKE at site level; to prepare for bringing additional sites and African elephant range States into the MIKE programme; to continue promoting MIST; and to develop new standardized ranger curricula in training institutions across the range of African elephants. He also mentioned recommendations concerning the TAG, MIKE's elephant survey standards, the location of the CCU, and other aspects. He cautioned about mission creep as the pressure to expand MIKE increases. Dr. Norton-Griffiths noted that while the MIKE system is not perfect, information is now emerging which is appreciated at both the national and international level. The methodologies and outputs of MIKE needed to be peer-reviewed, and he also recommended that the entire MIKE data set, along with its analysis protocols, should be publically available to allow external scientists to undertake additional or better analyses.

The presentation covered the various institutional relationships that MIKE maintains. IUCN hosts the MIKE Sub-regional Support Units and, with its good regional presence, he recommended that MIKE and IUCN become more programmatically linked. The relationship with AfESG appeared to work well. He observed that some TAG members have served for more than 10 years and recommended recruiting new people. Dr. Norton-Griffiths also recommended that the sub-regional economic groupings in Africa (EAC, SADC, etc.) can be used to get high-level politicians aware of and engaged in MIKE. He felt that this would be particularly important before meetings of the Conference of the Parties to CITES. He suggested that ivory consumer countries be invited to these discussions. With regard to MIKE's sustainability, he noted that to date, MIKE's annual costs are Euro 1.8 million, and therefore fundraising should be a current priority in order for MIKE to continue to deliver on its mandate.

Mr. Blanc presented information on the operational challenges of the MIKE programme. The original idea behind MIKE was to apply a 'catch per unit effort' approach to measure and compare the levels of illegal killing of elephants in MIKE sites. The original analytical framework (Figure 1) took into account carcass counts, patrol effort, other illegal activities, elephant population data, and a number of site-specific and national covariates.

Figure 1: Original analytical framework for MIKE

In order to procure all the information required for this framework to operate, MIKE Phase 1 had a large roll-out of data collection forms, MIKE-specific computer applications, hardware, training and survey work. However, there were a number of unrealistic expectations and many practical problems associated with this framework quickly became apparent, such as the high cost of surveys, the cumbersome, overcomplicated data collection forms, problems with the custom-built MIKE database, computer problems including electricity supply and viruses, and high staff turnover within range State authorities.

Moving into MIKE Phase 2, it was decided to focus on meeting the needs of the range States, using appropriate technologies and institutionalizing the training programmes. In many cases, SSOs are still doing the job of the National or Site MIKE Officers in the reporting framework, and this remains a major challenge. MIST is now being used by many range States and seems highly useful because the data collection and storage tool serves wider management needs and not only MIKE data needs. However, Mr. Blanc noted that it is necessary to have sufficient technical support within each site and each range State to continue deploying MIST in a successful manner.

Mr. Blanc closed the presentation by pointing out the operational challenges of MIKE, noting that to effectively establish monitoring practices and data flow across more than 70 sites in more than 40 countries takes much more time and human and financial resources than originally envisaged. It also required full institutional support from the participating national authorities.

Ms. Elsabe van der Westhuizen asked about the use of data collection systems such as MOMS that do not rely on computers. Mr. Blanc commented that Phase 1 had created the expectation that all MIKE sites would be equipped with computers, but that MIKE is not exclusively pushing computer-based systems – if elephant range States would prefer to use MOMS or other systems, they can do this, although the MOMS data would eventually need to be digitized.

Dr. Maisels asked whether it was only Central Africa which was facing the operational difficulties highlighted by Mr. Blanc. Mr. Blanc clarified that to some extent, these shortcomings had been observed in all sub-regions.

Dr. Dublin noted that if the range States are putting demands on MIKE, they should be held accountable in terms of commitment to the programme. Ms. Skinner asked whether the MIKE Sub-regional Steering Committees could play a role in ensuring such commitments. Mr. Tapera Chimuti responded that in Southern Africa, MIKE is strongly owned and there is a good level of accountability in the sub-region. Mr. Moses Kofi Sam indicated that in West Africa, ownership and accountability is increasing, with one of the reasons being peer-pressure amongst Directors of wildlife authorities when attending regional MIKE meetings. Mr. De Meulenaer noted that obtaining such commitments would in any case be a gradual and long process. Similar to West Africa, peer-pressure strengthened MIKE in Eastern and Central Africa, but conservation is not a political priority in Central Africa, making it more challenging.

Mr. Blanc then focused on the analytical challenges of the MIKE programme. As a result of the operational challenges in gathering data, the current analytical framework is greatly simplified (Figure 2), with only cause of death, elephant population estimates (and precision) and external covariates at the site and country level available.

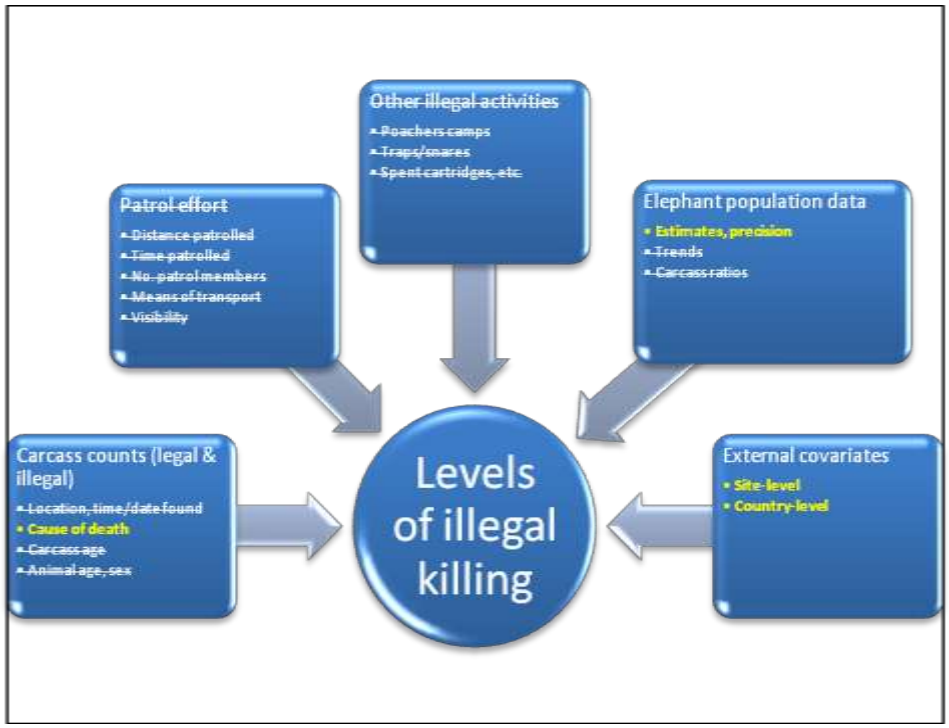

Figure 2: Revised analytical framework for MIKE

PIKE, the proportion of illegally killed elephants, is a measure that can be used to eliminate 'effort' from the equation (c*f* the original intention to apply a 'catch per unit effort' approach to measure and compare the levels of illegal killing of elephants in MIKE sites), by using the proportion of the total number of carcasses found that were deemed to be illegally killed. It was used for the CoP15 analysis. MIKE sites contain some 30 to 40% of all elephants, but reporting rates vary across the sites, so estimation of carcass detection rates is important. There are many gaps in the data, but analysis of those sites which have reported data for either 8 or 9 consecutive years gives similar results to analyzing the entire dataset. Carcasses are recorded with a cause of death: illegally killed, non-illegally killed (management action or natural death) or cause unknown. For a large number of carcasses, the cause of death is unknown, which makes it difficult to measure PIKE. Encouragingly, Mr. Blanc reported that the percentage of such carcasses appears to be going down.

The MIKE data suggests that PIKE varies both spatially and temporally, but the greatest variation appears to be spatial rather temporal. Pooled data for all sites show little temporal trend, but when plotted at the sub-regional level, important differences in levels of PIKE become apparent. It is

important to note that some of the inter-annual changes within sub-regions appear to reflect the influence of the data imbalance rather than real trends.

The data are analyzed using binomial logistic regression, adjusted for overdispersion. Data are weighted by sample size and modeled against covariates at the site, country and global level. In the most recent analysis, at the global level, the annual percent change in China's household consumption expenditure and the GDP deflator (a measure of inflation) were used as a proxy for demand for ivory, under the rationale that changes in general consumer demand will be correlated with changes in demand for ivory. As in previous MIKE analyses, there was a strong negative correlation between PIKE and governance and human development at the national level, and a strong positive correlation between PIKE and infant mortality at the site level, suggesting a link between levels of poverty and poaching rates. Livestock density was negatively correlated with PIKE, suggesting that where protein needs of the local population are met by meat from domestic animals, there may be less of an incentive to go out hunting for wildlife – and indeed for ivory. Land cover heterogeneity, which is regarded as a simple proxy for land use change or human impact was also found to be positively correlated with PIKE. As in previous analyses, both net primary productivity – a proxy for vegetation cover – and site area were significantly correlated with PIKE. The final model explained more than 60% of the variation in PIKE.

Ms. Van der Westhuizen asked about using protected area management effectiveness (PAME) as a covariate. Mr. Blanc responded that PAME assessments have only been conducted in a relatively small number of MIKE sites, and there was therefore insufficient usable data. Dr. Chardonnet suggested that the deforestation rate, now available from the REDD+ programmes, could be used as a covariate.

Mr. Blanc closed by noting that PIKE seems to be working, but there are a number of outstanding questions which must be answered to validate PIKE, particularly regarding: uncertain reliability of within-site sample; data verification and quality control; data imbalance; risk of ecological correlation; changes in natural mortality and history of illegal killing; carcass detection probability; and accounting for tusklessness in the case of Asian elephants.

Mr. Milliken presented the operational challenges of ETIS. Before the ban on international trade in ivory in the late 1980s, there was easy access to data on the ivory trade. After the ban, law enforcement data (seizures) became the main tool to understand trends and dynamics of the trade in ivory and other elephant specimens. In 1997, TRAFFIC's Bad Ivory Database (BIDS) morphed into ETIS with the adoption of the original Resolution Conf. 10.10. ETIS utilizes statistical methods to meet the demands of CITES concerning information on trends. ETIS also builds capacity in elephant range States. Resolution Conf. 10.10 (Rev. CoP15) requires Parties to provide data on ivory seizures to ETIS within 90 days of a confiscation. The database now has more than 16,000 cases from 1989 to the present.

Mr. Milliken presented the framework for ETIS. A central database on seizures is supplemented by external or subsidiary databases on law enforcement effort and efficiency, ivory markets, the corruption perception index, background economic data, and rates of reporting to help to identify and remove biases in the data. He outlined the anatomy of a seizure of an ETIS record, which involves not only the country where the specimen is seized, but also the countries through which the commodity moved without detection. This allows ETIS to identify countries implicated in the movement of illegal ivory even if they are not contributing data.

ETIS is currently able to identify trends in the volume of the illegal ivory trade and to relate these trends to CITES decisions. It is starting to identify underlying drivers of the illegal trade, such as large unregulated domestic ivory markets and the involvement of organized crime. The data are also used in a cluster analysis to identify the key players in the illegal trade and to group these players with others of similar characteristics. The system shows the influence of key countries on trends in illegal ivory trade. Work on trade routes and their changes over time has been initiated. Finally, the measurement

of law enforcement effort efficiency is a powerful tool in identifying the paths of least resistance for the illegal trade in ivory.

Mr. Milliken outlined a number of reasons why ETIS works, in particular the clear mandate from CITES through Resolution Conf. 10.10 (Rev. Cop15). This mandate confers international legitimacy and profile on ETIS, forms the basis for data collection, prompts periodic reviews and analysis, and provides a platform for discussion and making decisions about results. There is a standardized data collection and verification policy and also data sharing agreements with WCO and training programmes for Parties. ETIS feeds back to every CITES Party on a periodic basis, providing the data that involves that Party and a coversheet helping them to interpret the data. Throughout its evolution, ETIS has developed innovative subsidiary databases to make use of grey and secondary data. There has been dedicated investment of funds, human resources and technical oversight into ETIS every year of its existence.

Major challenges are: inadequate and irregular funding for structural improvements, developing best practice issues or undertaking exploratory analysis; the analysis is entirely focused on CITES reporting deadlines, rather than following a logical, stepwise development of the analytical framework; ETIS depends on a small number of key personnel; there are few fully-developed tools to ensure long-term sustainability; and the challenges of translating science into meaningful, balanced messages for essentially non-technical decision makers.

Finally, Mr. Milliken pointed out that the ETIS results and associated messages repeatedly identified the Democratic Republic of Congo, Nigeria and Thailand as the most problematic nations in the illegal ivory trade, and yet little or ineffective action has been taken by the CITES community concerning these Parties.

Mr. Milliken presented the analytical framework of ETIS and its challenges. The primary questions for the ETIS analysis are: trends in illegal ivory trade over time; key countries in the illegal ivory trade; and key drivers of illicit trade in ivory. Secondary questions concern trade dynamics and major trade routes. The key analytical challenge is that seizures data give a biased picture of the true (unknown) illicit trade in ivory. The reasons for this bias are: not all illegal shipments are detected; not all seizures are recorded or reported to ETIS; data collection is uneven within and between countries over time; and the seizures themselves have a deterrence effect on streams of illegal ivory.

There are two components to a seizure: occurrence and weight. Mr. Milliken gave an overview of the ideal model for the occurrence of seizures, but noted a number of deficiencies in the model, including two unknowns: the seizure rate and the reporting rate. ETIS uses a simplified model for occurrence, which combines the reporting rate and seizure rate into a single variable, and does not include the deterrence effect. Once the relative number of annual seizures for each country has been estimated and adjusted for bias, weight is brought into the model to calculate the adjusted total weight for each country in each year.

Mr. Milliken overviewed the future of ETIS. ETIS is currently undergoing a major overhaul, as a result of a Darwin Initiative Project grant. Under this project, there will be: a new database; a revised analytical framework; standard operating procedures; and training. Using the trade or supply chain concept (Figure 3), a number of changes will take place in the central database and its definitions. For example, the definition of 'origin' will be revised so that only range States can be assigned that label, rather than the place from where it was shipped. There will also be work to differentiate between raw and worked ivory in the trade chain. A major gap is knowledge of ivory stockpiles.

Mr. John Sellar challenged Mr. Milliken's assertion that there is large organized crime in Nigeria. He noted that the inter-sessional country reports could also be sent to Interpol and WCO and their national focal points, and not only to the CITES Management Authority. He observed that while ETIS is of use for CITES decision-making processes, it may not be of great use for the law enforcement community because of the inherent lag time of the reporting. In terms of the long-term sustainability

of ETIS, he suggested to explore options to hand the programme over to the World Customs Organization, INTERPOL or similar intergovernmental bodies.

Mr. Hui Fu noted that there has been little follow-up in Vietnam, Philippines and Thailand after large ivory seizures, with few investigations or prosecutions. Mr. Fu noted that in many cases, Customs and police agencies do not work well together and Customs authorities lack jurisdictional authority. He also mentioned a recent seizure in Nigeria of 51 tusks in March 2011, which is an encouraging sign of increased law enforcement effort. Dr. Dublin noted an increase in the number of flights going directly to China from Africa, and questioned whether people on those flights are aware of the legal restrictions on the trade in ivory.

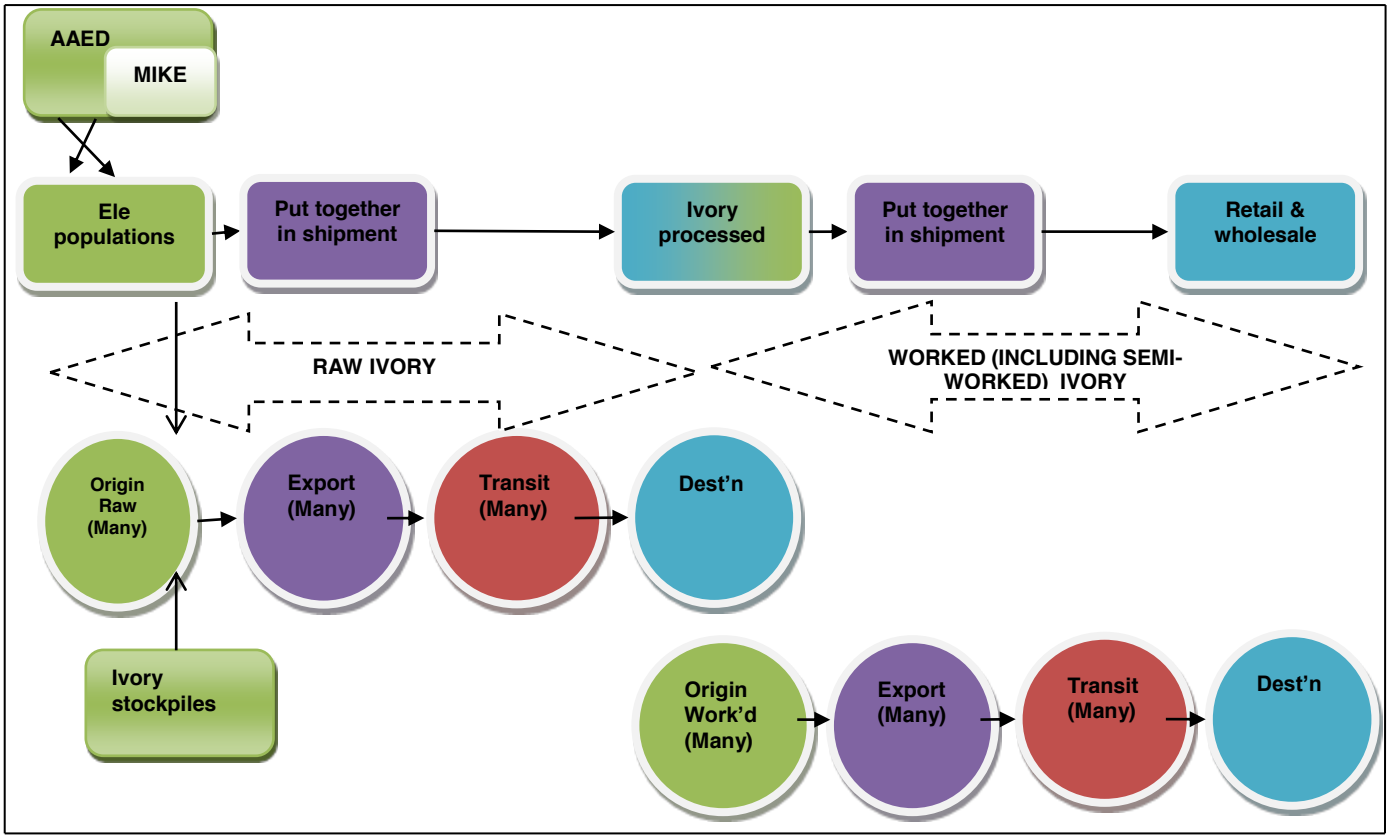

Figure 3: ETIS Trade Chain Concept

IV. Workshop activities

The workshop then undertook a number of activities, designed to examine the IUCN/SSC, MIKE, and ETIS monitoring systems in the context of Resolution Conf 10.10 (Rev. CoP15). The resolution is presented in Annex IV. The four objectives for MIKE and ETIS in that resolution were used as a framework for discussion.

The objectives are:

1. Measuring and recording levels and trends, and changes in levels and trends, of illegal hunting and trade in ivory in elephant range States and in trade entrepôts;

2. Assessing whether and to what extent observed trends are related to changes in the listing of elephant populations in the CITES Appendices and/or the resumption of legal international trade in ivory;

3. Establishing an information base to support the making of decisions on appropriate management, protection and enforcement needs; and

4. Building capacity in range States.

Throughout the workshop discussions it became clear that it was necessary to differentiate between the objectives which assist the CITES community to make policy decisions regarding elephants and trade in elephant specimens (Objectives 1 and 2) and the objectives which contribute to management needs in elephant range States (Objectives 3 and 4). Throughout this document, '**CITES policy objectives**' refers to Objectives 1 and 2, while '**range State management objectives**' refers to Objectives 3 and 4.

Four activities were undertaken to assist the workshop participants to contribute to the workshop outputs. They are outlined in detail.

a. Workshop activity 1: Gap analysis

Using the presentations as a base, the workshop undertook an exercise to identify analytical or reporting gaps in four categories: elephant numbers, range and conservation status; MIKE; ETIS; and ivory supply chain synergy. The results of this exercise were combined with the inputs from the African elephant range States and the gaps and challenges identified in the presentations from IUCN, MIKE and ETIS. This information was fed back to the workshop, which went through a process of identifying whether each gap identified would be useful for informing either a CITES policy objective or a range State management objective. The results of these exercises, divided into 'Operational' and 'Analytical', are combined and presented in Annex V.

More specific results from this exercise were then assessed for their technical feasibility in the short, medium and long term. The results of this exercise are outlined in Annex VI.

b. Workshop activity 2: Strengthening and improving systems

Following the gap analysis, potential ways to strengthen the IUCN/SSC, MIKE and ETIS monitoring systems were discussed in some detail.

Strengthening IUCN/SSC monitoring of elephant conservation status

The workshop recognized that trend analysis was necessary in all MIKE sites to contribute to CITES policy objectives. The context of the entire elephant population (not restricted to MIKE sites) was confirmed to be necessary for CITES policy objectives. Such analysis requires support from the IUCN/SSC and requires comparable, repeated surveys in those sites. Additionally, in order to accurately assess changes in elephant conservation status, occupancy and range trends are also necessary. The realities of achieving these analyses were discussed in detail. Trends in elephant numbers at the national level in all range States cannot be obtained, but trends for sub-regional elephant populations can be provided for a majority of savanna African elephant populations, provided that regular surveys continue to be conducted. Obtaining trends would be more complicated for populations of Asian elephants and African forest elephants. There were a number of ideas about the ways in which proxy data and statistical modeling could help to fill the gaps in survey data, and it was agreed that a modeling approach should be explored. While the technical expertise exists to undertake such analyses, financial resources and political will are restrictive.

While the workshop agreed that work on analysing these trends should continue, participants agreed that it was very important to make clear to policy makers the difficulties in obtaining species trends across the entire range.

Strengthening MIKE

The workshop agreed that the current primary concern for MIKE was to ensure that PIKE is representative within the site sample. The original concept of the MIKE analytical framework (Figure 1) outlines the full set of data inputs which are necessary to triangulate the PIKE data to establish whether the reporting from the range States is reliable and representative of what is going on at the site. It was established that it may be possible to validate which of these data inputs (from Figure 1) are meaningful by testing them at the sites where sufficient data are available. In addition to this, data quality would need to be checked at each site on a regular basis. The workshop considered the possibilities of using a set of indices to help determine PIKE trends, as long as there is a measure of reliability, with both spatial sampling and detectability included in the monitoring design. Using only indices might be sufficient to contribute to CITES policy objectives, but they would likely not contribute to conservation action on the ground, and the capacity building and other management needs of the range States.

Strengthening ETIS

ETIS requires, at a minimum, information on the date and place of an elephant specimen seizure; the agency or authority responsible for a seizure; the number and/or volume of ivory specimens seized, by type (raw or worked); and information on non-ivory specimen seized by type. The new ETIS database will capture the minimum amount of information, but will also record any additional information which is available, and such information could be used in the future for particular analyses of subsets of the database. It is also necessary to continually update subsidiary databases, in particular to resurvey domestic ivory markets.

For ETIS to provide information to help achieve CITES policy objectives, the needs are: global elephant specimen seizure records; updated subsidiary databases; and resources to conduct the statistical analysis. For support to range State management objectives, it is necessary to have regular feedback reports to Parties, which will become available in the future as automated web-based downloads, and training for participation in ETIS. It was suggested that providing country reports with only ivory seizure data and no analysis is not useful for management purposes. This was acknowledged but additional analyses would require resources.

It was noted that more motivation needs to be built for law enforcement officers responsible for controlling the illegal ivory trade – training does not necessarily result in motivation. The workshop

also discussed the need to monitor price in transiting and consuming countries and to peg those prices within a conceptual value chain.

c. Workshop activity 3: Minimum critical data needs

The three systems were asked to summarize their minimum critical data needs to achieve CITES policy and range State management objectives.

Minimum critical data needs for monitoring African elephant status

To achieve both CITES policy and range State management objectives, it was agreed that the IUCN/SSC needs to provide information on the status of African elephants, including numbers, range and trends. While currently practically able to report on numbers and range, with the data available, it is not possible to report on trends across the entire range. Therefore a modeling exercise is required to attempt to provide these trends.

All of the above is resource dependent.

Minimum critical data needs for Asian elephant status

To achieve both CITES policy and range State management objectives, the following data were agreed to be necessary for analyzing the status of Asian elephants:

- More surveys need to be conducted to refine the understanding of range, population sizes, and trends in population size and range;
- A better understanding of threats is needed; and
- Modeling methods are needed to assess impacts of human population growth and climate change.

All of the above is resource dependent.

Minimum critical data needs for MIKE

To achieve CITES policy objectives, PIKE, based on annual counts of illegally and non-illegally killed elephants encountered, may be all that is needed, provided that the data are representative at the site level and that carcass detection efficiency is adequate and random with respect to cause of death. As these issues remain unknown, guidance should be sought from the TAG on the following:

- Establishing the reliability of within-site sample
- Verifying data for quality
- Establishing any effects of data imbalance on trends
- Investigating the existence of ecological correlation
- Investigating the effect of changes in natural mortality and the history of illegal killing
- Appropriate ways of accounting for tusklessness in Asian elephants
- The effects of the possible relationship between cause of death and detection probabilities

On the basis of this, the reliability of PIKE will be evaluated. This will inform further decisions about the necessity to continue collecting other data, such as effort, other illegal activities and all the other variables identified in the full MIKE analytical framework (Figure 1).

To achieve range State management objectives, the *full* set of data in the full MIKE analytical framework (Figure 1) would be necessary.

All of the above is resource dependent.

Minimum critical data needs for ETIS

In order to meet CITES policy objectives, continued management of the ETIS database and periodic analyses are required. Particular resurveys of domestic ivory markets are necessary in Nigeria, Democratic Republic of Congo and Benin. An assessment of stockpiles is also necessary.

All of this is resource dependent.

d. Workshop activity 4: Maximizing synergies

The workshop participants were divided into three groups and asked to undertake an exercise to develop a framework to maximize synergies among elephant monitoring systems. Groups were asked to consider five CITES-related global monitoring/management tools for elephants and trade in elephant specimens operating at current levels (i.e. AAED; MIKE; ETIS; UNEP-WCMC; and Decision 13.26 on ivory trade action plan requirements) within the context of an ivory supply chain dynamic, starting with the status of live elephants in Africa and Asia in time T1, going to illegally killed elephants and then to illegally traded ivory and then back to the status of live elephants in time TX.

The tasks were to:

1) design a conceptual framework that would maximize analytical, operational, and reporting synergies among the five global tools to most efficiently inform policy and management decisions to achieve effective African and Asian elephant conservation objectives in elephant range States; and
2) After the development of the conceptual framework:
    a. identify where synergies amongst the existing global tools are taking place efficiently;
    b. identify where they are taking place but could be enhanced; and
    c. identify where they are not taking place but should be.

The outputs of the exercise were to:

1) Provide a diagram of the conceptual framework showing pathways and linkages among the global tools when plotted against the supply chain dynamic; and
2) Annotate the diagram to identify where in the framework the various tool synergies are:
    a. working efficiently;
    b. working but could be enhanced; and
    c. not working.
3) Provide a list of the synergies noting if they are analytical, operational or reporting.

The results from each group are summarized in Annex VII.

V. Workshop outputs

The objective of the workshop was to: review and provide recommendations to improve the effectiveness of the existing analytical and reporting systems for elephants and the trade in elephant specimens in the context of a supply chain dynamic.

This section of the report outlines the results of the workshop, by output.

Output 1: Draft revised operational framework for MIKE and Output 2: Draft revised analytical framework for MIKE:

As outlined above, discussion concerning both the operational and analytical framework by the workshop participants was framed by the underlying objectives outlined in Resolution Conf. 10.10 (Rev. CoP15) that establishes the remit of MIKE. The original operational and analytical framework for MIKE was designed to provide data for both the CITES policy and range State management objectives in the Resolution. It became apparent that the implementation of the original operational and analytical framework for MIKE, which was based on a catch per unit effort approach, was not realistic given the resources provided and resulted in significant data gaps. It is doubtful that the original operational and analytical framework for MIKE can be achieved without greatly enhanced additional resources over an extended timeline.

Phase 2 of MIKE implementation focused on the development of a greatly reduced analytical framework based on the proportion of illegally killed elephants (now known as PIKE). Preliminary data from this modified approach were presented at CoP15. While this modified approach appears to have merit, full validation of the model has yet to be completed.

If adopted, PIKE could meet CITES policy objectives, but not the range State management objectives. It is unlikely that the range State management objectives can be fully achieved with the anticipated level of resources available and the broad range of informational needs associated with the development of timely management information and capacity building at the range State level. The workshop heard about progress with the *African Elephant Action Plan* and the African Elephant Fund. While similar plans are not in place for Asian elephants, it was suggested that future efforts to realize range State management objectives might be more effectively met through those mechanisms.

Given the current status of MIKE and resource constraints, the workshop could not offer meaningful advice on the operational and analytical framework for MIKE. However, the workshop was able to clarify the minimum data and resource needs required to adequately validate the analytical approach that is currently applied for MIKE. It was noted that MIKE relies heavily on elephant population data (from the AAED) to implement its analytical framework and the importance of linking the analyses of MIKE and ETIS was emphasized. As such, minimum data and resources needs were also developed for these two monitoring systems. This information can be used to substantively inform the logical continuation of a third phase of MIKE to validate the Phase 2 analytical framework for the CITES policy objectives outlined in CITES Resolution Conf. 10.10 (Rev. CoP15).

Output 3: Recommendations for joint analytical framework and reporting by IUCN/SSC, MIKE and ETIS

For continued development of the current analytical framework for MIKE, the linkages with the information generated by IUCN/SSC and ETIS are important. The three systems are related but were developed separately and therefore, there has been little opportunity for a joint analytical framework, to date, although the three institutions were working on a joint report for the CITES Standing Committee. The workshop identified opportunities for reporting and closer collaboration as outlined in Annexes VI and VII. The links should be formally recognized. Adequate resources will be required for MIKE and ETIS to meet their objectives, and to link in effectively with the IUCN/SSC.

Output 4: Practical suggestions to enhance operational compatibility and synergies between IUCN/SSC, MIKE and ETIS

The workshop produced an outstanding array of practical suggestions to enhance operational compatibility and synergies among the various monitoring systems established to support elephant conservation. Additionally, the workshop was able to identify a number of informational gaps and areas where these synergies could be added or enhanced. Based on an ivory supply chain dynamic, these suggestions are presented in Annex VII.

Annex I

Workshop Summary

Elephants and the trade in elephant specimens: a review of existing analytical and reporting systems and recommendations for a way forward

May 9-11, 2011
Nairobi, Kenya

Background

This workshop brings together selected experts to review the existing analytical and reporting systems for elephants and trade in elephant specimens and to provide recommendations for improvements and adjustments to these systems. The workshop is hosted by the CITES Secretariat's MIKE Central Coordination Unit and facilitated by the IUCN/SSC African Elephant Specialist Group. It is conducted in the context of the implementation of the MIKE Phase II project for Africa, supported by the European Commission.

There are four global monitoring systems for elephants and trade in elephant specimens, which are all related to or conducted under the auspices of CITES. IUCN, through the SSC African Elephant and Asian Elephant Specialist Groups, maintains the African and Asian Elephant Database, housing information on elephant population numbers and range. This information can reach the CITES Standing Committee through reporting in the context of the implementation of Decision 14.78 (Rev. CoP15). The CITES MIKE programme monitors the illegal killing of elephants, while ETIS monitors illegal trade in ivory and other elephant specimens. These two systems are mandated by the CITES Parties through Resolution Conf. 10.10 (Rev CoP15). Another system, in compliance with Article XII, paragraph 2 (d) of the Convention, requires CITES Parties to submit annual reports on their trade in CITES-listed specimens, including trade in all elephant specimens, which are compiled by UNEP-WCMC.

After years of development, MIKE and ETIS are now meeting their formal objectives, as outlined in Resolution Conf. 10.10 (Rev CoP15). ETIS has produced four comprehensive analyses for meetings of the Conference of the Parties to CITES since 2002, and the MIKE programme, having established its baseline in 2007, produced a full analysis for the 15th meeting of the Conference of the Parties in 2010 (CoP15; Doha, 2010). MIKE is now operating in 30 African elephant range States. Its implementation in Asia has been slower, but there is now progress in both Southeast Asia and South Asia, involving the 13 Asian elephant range States. At CoP15, the Parties adopted Decision 15.74, which directs the Standing Committee to evaluate the need to revise Resolution Conf. 10.10 (Rev. CoP15) and present a summary of the consultations and its proposals in this regard at the 16th meeting of the Conference of the Parties (CoP16) in March 2013. At the same time, ETIS is now benefiting from a Darwin Initiative grant which, in partnership with the University of Reading, should result in an enhanced system for monitoring and analyzing the illegal trade in elephant specimens. The African and Asian Elephant Database has also undergone recent changes, moving from a static single-species (African elephant) database to an online, server-based, multiple-species (both African and Asian elephants) database.
As such, now is an opportune time to step back, to take stock of the existing systems, to determine where improvements are necessary, and to explore the linkages between all the systems to ensure that they are integrated and contribute effectively to policy-making in the CITES context, as well as serving the needs of the elephant managers, CITES authorities and enforcement officials responsible for protecting and managing elephants and their habitats, regulating legal trade in elephant specimens and combating illegal trade.

The workshop's focus will be on possible improvements to MIKE and ETIS, exploring linkages between them as well as with the IUCN/SSC's information on elephant populations, and on

identifying options for the development of compatible analytical and reporting frameworks. Throughout the workshop, all proposals will be checked against their sustainability, utility and feasibility (at local, national and international levels) to ensure that the programmes reflect operational realities.

All outputs from this workshop will be reviewed by the MIKE and ETIS Technical Advisory Groups, and be reported to the Standing Committee.

Workshop objective:

Review and provide recommendations to improve the effectiveness of the existing analytical and reporting systems for elephants and the trade in elephant specimens in the context of a supply chain dynamic.

Workshop questions:

1. Understand more deeply the dynamics involved in the supply chain from live elephants to dead elephants to the legal and illegal trade in elephant specimens.
2. Provide recommendations to strengthen MIKE and ETIS to ensure more effective, user-friendlyand feasible operations and outputs.
3. Develop recommendations for a joint analytical and reporting framework for MIKE and ETIS, which will be tested through a process of exploratory analysis.
4. Identify ways in which IUCN/SSC AfESG and AsESG, MIKE and ETIS can work together to provide better support to Parties, elephant range States and site managers in meeting relevant CITES obligations concerning elephants and trade in elephant specimens, protecting and managing elephants, and dealing with other elephant management challenges.

Outputs:

Workshop report, including:

- Draft revised operational framework for MIKE
- Draft revised analytical framework for MIKE
- Recommendations for joint analytical framework and reporting by IUCN/SSC, MIKE and ETIS
- Practical suggestions to enhance operational compatibility and synergies between the IUCN/SSC, MIKE and ETIS

Annex II

Working Programme

Elephants and the trade in elephant specimens: a review of existing analytical and reporting systems and recommendations for a way forward

9-11 May, 2011
Nairobi, Kenya

The background, objectives and outputs for this workshop can be found in the Workshop Summary document.

Time	Agenda Item	
DAY ONE – Monday 9 May		
08.30	Participants arrive	
09.00	Welcome and introduction	Tom de Meulenaer
09.30	Workshop overview	Holly Dublin
10:00	Review of systems for collecting African elephant population data through the IUCN/SSC and collation of expert knowledge	Diane Skinner
11:00	**Tea**	
11:30	Review of successes and challenges in the analytical and operational structure of MIKE	Mike Norton-Griffithsand Julian Blanc
13:00	**Lunch**	
14:00	Review of successes and challenges in the analytical and operational structure of ETIS	Tom Milliken
15.30	**Tea**	
16:00	Gap analysis	Group activity
17:30	**Close**	
DAY TWO – Tuesday 10 May		
08.30	Review of systems for collecting African elephant population data through the IUCN/SSC and collation of expert knowledge	Simon Hedges
09.30	Gap analysis, continued	Group activity
10:30	**Tea**	
11:00	Gap analysis, continued	Group activity
13:00	**Lunch**	
14:00	Strengthening systems	Group activity
17:30	**Close**	
DAY THREE – Wednesday 11 May		
08:30	Technical feasibility of new ideas (from gap analysis)	Group activity
09:30	Minimum critical data and resource needs	Group activity
10:30	**Tea**	
	Maximizing synergies	Working groups
13:00	**Lunch**	
14:00	Maximizing synergies, feedback	Working groups
15:30	**Tea**	
16:00	Conclusions and next steps	Holly Dublin
17:30	**Close**	

Annex III

Participants

Elephants and the trade in elephant specimens: a review of existing analytical and reporting systems and recommendations for a way forward

May 9-11, 2011
Nairobi, Kenya

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Annex IV

CITES Resolution Conf. 10.10 (Rev. CoP15)
Amended at the 11th, 12th, 14th and 15th meetings of the Conference of the Parties

Trade in elephant specimens

NOTING that the Asian elephant, *Elephasmaximus*, has been included in Appendix I since 1973;

NOTING also that the African elephant, *Loxodontaafricana*, was transferred from Appendix II to Appendix I at the seventh meeting of the Conference of the Parties (Lausanne, 1989) but some populations were transferred back to Appendix II, under a set of conditions, at the 10th meeting (Harare, 1997) and at the 11th meeting (Gigiri, 2000);

RECOGNIZING that elephant range States are the best protectors of their elephants but that the majority of them lack adequate enforcement capacity to ensure the security of their elephant populations;

AWARE that monitoring systems should encompass capacity-building in range States, to provide information to facilitate elephant management, and to prioritize and guide enforcement initiatives and protection efforts;

CONVINCED that the enhancement of elephant security in Africa and Asia would be facilitated by cooperation, data-sharing and mutual assistance between and among the range States;

THE CONFERENCE OF THE PARTIES TO THE CONVENTION

Regarding definitions

AGREES that:

a) the term ‘raw ivory’ shall include all whole elephant tusks, polished or unpolished and in any form whatsoever, and all elephant ivory in cut pieces, polished or unpolished and howsoever changed from its original form, except for ‘worked ivory’; and

b) 'worked ivory' shall be considered readily recognizable and that this term shall cover all items made of ivory for jewellery, adornment, art, utility or musical instruments (but not including whole tusks in any form, except where the whole surface has been carved), provided that such items are clearly recognizable as such and in forms requiring no further carving, crafting or manufacture to effect their purpose;

Regarding marking

RECOMMENDS that whole tusks of any size, and cut pieces of ivory that are both 20 cm or more in length and one kilogram or more in weight, be marked by means of punch-dies, indelible ink, or other form of permanent marking, using the following formula: country-of-origin two-letter ISO code, the last two digits of the year / the serial number for the year in question / and the weight in kilograms (e.g. KE 00/127/14). This number is to be placed at the ‘lip mark’, in the case of whole tusks, and highlighted with a flash of colour;

Regarding control of internal ivory trade

RECOMMENDS to those Parties in whose jurisdiction there is an ivory carving industry that is not yet structured, organized or controlled and to those Parties designated as ivory importing countries, that comprehensive internal legislative, regulatory and enforcement measures be adopted to:

a) register or license all importers, manufacturers, wholesalers and retailers dealing in raw, semi-worked or worked ivory products;

b) establish a nationwide procedure, particularly in retail outlets, informing tourists and other non-nationals that they should not purchase ivory in cases where it is illegal for them to import it into their own home countries; and

c) introduce recording and inspection procedures to enable the Management Authority and other appropriate government agencies to monitor the flow of ivory within the State, particularly by means of:

i) compulsory trade controls over raw ivory; and

ii) a comprehensive and demonstrably effective reporting and enforcement system for worked ivory;

URGES the Secretariat, where possible, to assist Parties in improving these legislative, regulatory and enforcement measures; and

DIRECTS the Standing Committee to undertake a regular review of actions taken by consumer States to improve legislation and enforcement measures and to report the results at each meeting of the Conference of the Parties;

Regarding compliance with control of internal trade

DIRECTS the Secretariat, with reference to the findings of ETIS and MIKE and within available resources:

a) to identify those Parties with an ivory carving industry and internal ivory trade whose domestic measures do not provide them with the authority to:

i) register or license all importers, manufacturers, wholesalers and retailers dealing in raw, semi-worked or worked ivory products;

ii) assert compulsory trade controls over raw ivory; and

iii) establish a comprehensive and demonstrably effective reporting and enforcement system for worked ivory;

b) to seek from each Party so identified information indicating the procedures, action and time-frames that are needed in order to establish the measures necessary to properly effect the recommendations regarding internal ivory trade; and

c) to report its findings, recommendations or progress to the Standing Committee, which shall consider appropriate measures, including restrictions on the commercial trade in specimens of CITES-listed species to or from such Parties; and

DIRECTS the Secretariat, dependent on available resources, to provide technical assistance to Parties to develop practical measures to regulate their internal ivory trade;

Regarding monitoring of illegal hunting of and trade in elephant specimens

AGREES that:

a) the systems known as Monitoring the Illegal Killing of Elephants (MIKE) and the Elephant Trade Information System (ETIS), established under the supervision of the Standing Committee, shall continue and be expanded with the following objectives:

i) measuring and recording levels and trends, and changes in levels and trends, of illegal hunting and trade in ivory in elephant range States, and in trade entrepôts;

ii) assessing whether and to what extent observed trends are related to changes in the listing of elephant populations in the CITES Appendices and/or the resumption of legal international trade in ivory;

iii) establishing an information base to support the making of decisions on appropriate management, protection and enforcement needs; and

iv) building capacity in range States;

b) these monitoring systems shall be in accordance with the framework outlined in Annex 1 for *Monitoring of illegal trade in ivory and other elephant specimens* and in Annex 2 for *Monitoring of illegal hunting in elephant range States*;

c) information on illegal killing of elephants and trade in their products from other credible law enforcement and professional resource management bodies, should also be taken into consideration; and

d) technical oversight will be provided to both MIKE and ETIS through an independent technical advisory group to be established by the Secretariat;

Regarding assistance to elephant range States

RECOMMENDS that Parties assist range States to improve their capacity to manage and conserve their elephant populations through improved law enforcement, surveys and monitoring of wild populations;

Regarding quotas for and trade in raw ivory

RECOMMENDS that:

a) each State that has a population of African elephants and wishes to authorize export of raw ivory establish, as part of its management of the population, an annual export quota for raw ivory expressed as a maximum number of tusks;

b) each export quota be communicated to the CITES Secretariat in writing by 31 December for the next calendar year (1 January to 31 December);

c) Parties ensure that significant amounts of confiscated ivory are notified separately to the Secretariat and are not incorporated in quota submissions;

d) the CITES Secretariat assist in the implementation of the quota system by: reviewing information submitted on each quota, together with any information received about the status of the population in

question; discussing any concern with the relevant State; and, if there is no cause for concern, communicating the current quota to the Parties not later than 31 January of each year;

e) the Secretariat maintain its *Ivory Trade Control Procedures Manual* and that the Parties follow the procedures for quota submissions documented in this Manual;

f) if the quota is not submitted by the deadline, the State in question have a zero quota until such time as it communicates its quota in writing to the Secretariat and the Secretariat in turn notifies the Parties;

g) no export, re-export or import of raw ivory be authorized unless it is marked in accordance with this Resolution or in accordance with the Secretariat's Manual;

h) Parties accept raw ivory from producer States only where the export permit was issued in a year for which a quota for the State in question has been communicated to the Parties in accordance with this Resolution;

i) Parties may accept raw ivory from a producer non-party State only if a quota for that State has been reviewed by the Secretariat and communicated to the Parties and if the Secretariat has received from the State an annual report on its ivory trade, and if the State meets all the other conditions in this Resolution and Article X of the Convention (as interpreted by Resolutions of the Conference of the Parties);

j) in compiling their annual reports, producer party and non-party States that have authorized the export of raw ivory relate such exports to their quota for any given year, providing the Secretariat with as much relevant information as possible, including, as a minimum, the number of whole or substantially whole tusks and their individual weights and identification numbers;

k) all Parties maintain an inventory of the stock of raw ivory held within their territory, and inform the Secretariat of the level of this stock each year before 31 January, indicating the source of the ivory; and

l) Parties assist the Secretariat to ensure that the duties set out in this Resolution are carried out; and

Regarding resources required for implementation of this Resolution

APPEALS to all governments, non-governmental conservation organizations and other appropriate agencies to provide funds for the resources required in the Secretariat and producer States to ensure that the recommendations in this Resolution can be effectively implemented; and

REPEALS Resolution Conf. 9.16 (Fort Lauderdale, 1994) – *Trade in African Elephant Ivory*.

Annex 1

Monitoring of illegal trade in ivory and other elephant specimens

1. Introduction

In order to monitor and record levels of illegal trade in ivory and other elephant specimens on a global basis, there is a need for a system to collect and compile law enforcement data on seizures and confiscations. The Conference of the Parties recognizes the Bad Ivory Database System (BIDS) established by TRAFFIC for this purpose in 1992.

Through further development and refinement of BIDS, the Elephant Trade Information System (ETIS) was developed to monitor the pattern and scale of illegal trade in ivory and other specimens.

2. Scope

ETIS will include the details of law enforcement records for seizures or confiscations of elephant ivory and other elephant specimens which have occurred anywhere in the world since 1989. ETIS will also include subsidiary information on law enforcement effort, legal and illegal elephant product markets and background economic data.

3. Methods

- source of information
- date of seizure
- type of transaction
- country of seizure
- country of origin
- country of export
- country of destination/import
- type of ivory and quantity
- mode of transport
- *modus operandi*
- profile of offenders/suspects
- status of cases in the courts
- law enforcement effort.

A data collection form has been designed and circulated to all Parties by the CITES Secretariat.

4. Data collection and compilation

The MIKE and ETIS Technical Advisory Group (TAG) support the development and implementation of ETIS. ETIS will be managed and coordinated by TRAFFIC in consultation with the TAG.

All Parties should provide information on seizures and confiscations of ivory or other elephant specimens on the prescribed form to the Secretariat within 90 days of their occurrence. In addition, law enforcement agencies in States not-party are also requested to provide such information.

TRAFFIC will assist the relevant Parties with the collection of data, ensure data quality and consistency, and provide training in data collection and information management techniques to designated officials around the world as appropriate.

5. Data analysis and interpretation

The analysis and interpretation of data will be coordinated by TRAFFIC in association with the CITES Secretariat and institutions involved with monitoring the illegal hunting of elephants (see Annex 2) and in consultation with TAG.

6. Reporting

TRAFFIC will produce a comprehensive report to each meeting of the Conference of the Parties.

7. Intersessional remedial action

In the event that there is a need for urgent intersessional action, TRAFFIC will report to the Standing Committee via the Secretariat as appropriate.

8. Funding

A funding mechanism will be established to ensure that ETIS is fully operational.

Annex 2

Monitoring of illegal hunting in elephant range States

1. Introduction

In order to address the concerns of many elephant range States, it is necessary to establish a system through which the impact of CITES decisions with respect to elephants and trade in elephant specimens can be assessed. Of primary importance is the establishment of a simple system of international reporting of incidents of illegal hunting as a baseline against which levels and trends can be determined and changes in these levels and trends can be detected.

It is recognized that such measurement must consist of two elements. The first of these is the monitoring of parameters relevant to the issue, such as the pattern and scale of illegal killing, the pattern and scale of illegal trade in ivory, the effort and resources being applied to detection and/or prevention, and the monetary value of illegally traded ivory, as well as other factors that might affect these parameters, such as civil strife, the flow of illegal arms and ammunition, loss of habitat and drought.

The second element is the establishment of correlations between relevant parameters and the decisions of the Conference of the Parties with regard to elephants.

The overall aim of this system is to provide information needed for range States and other Parties to CITES to make appropriate management and enforcement decisions, and to build institutional capacity within the range States for the long-term management of their elephant populationsby improving their ability to monitor elephant populations, detect changes in levels of illegal killing, and to use this information to provide more effective law enforcement and to strengthen any regulatory measures required to support such enforcement. The system should be established in such a way that it can continue after financial support for the programme has come to an end.

2. Scope and methodology

The monitoring system will include elephant range States in both Africa and Asia and trade entrepots.

It will be based on a standardized methodology for the reporting of illegal hunting by CITES Management Authorities in range States and for monitoring in specific sites or areas. Relevant databases and standard reporting protocols will be established by the CITES Secretariat in consultation with the range States and the MIKE and ETIS Technical Advisory Group (TAG).

3. Data collection, compilation and reporting

Data collection will cover the following topics:

– elephant population data/trends;

– incidence and patterns of illegal hunting; and

– measures of the effort and resources employed in detection and prevention of illegal hunting and trade.

Data and information on illegal hunting and illegal trade in ivory will be collected through active communication with range States through the implementation of MIKE and ETIS (see Annex 1).

The CITES Secretariat will request/sub-contract technical support from appropriate experts, with the advice of the TAG, to:

a) select sites for monitoring as representative samples;

b) develop a standardized methodology for data collection analysis;

c) provide training to designated officials in countries with selected sites and to CITES Management Authorities of elephant range States;

d) collate and process all data and information from all sources identified; and

e) provide a report to the CITES Secretariat for transmission to the Standing Committee and Parties to CITES.

4. Reporting

The CITES Secretariat will provide an updated report on information collected, as part of this monitoring programme, at each meeting of the Conference of the Parties

5. Funding

Substantial funding will be required for the above activities.

Annex V

Results from workshop activity 1: gap analysis

Analytical

	Challenge or gap identified by:			Challenge or gap relevant to:				Objective:	
Analytical challenge or gap	**African Range States**	**Institutions (IUCN, MIKE, ETIS)**	**Workshop participants**	**Elephant numbers, range & conservation status**	**MIKE**	**ETIS**	**Synergies**	**CITES Decisions**	**Range State Management**
Problems with dung decay…explore presence/absence occupancy models			X	X				X	X
Aerial survey in light woodlands: thermal imagery for counts…? (More efficient than ground surveys?)[1]			X	X					X
Use rate of decline in nearby sites to fill data gaps (especially in Central Africa)			X	X				X	X
Survey metadata needs to include information about observer skill and training			X	X				X	X
Use habitat unsuitability as a model for predicting absence to refine range map in unsurveyed zones			X	X				X	X
Use supplementary techniques such as interviews with livestock managers or hunting area managers, forestry concessions, etc. to refine range map in unsurveyed zones			X	X				X	X

[1] Challenges or gaps in **bold** are items which were brought up by the workshop participants which were thought to be new ideas.

	Challenge or gap identified by:			Challenge or gap relevant to:				Objective:	
Analytical challenge or gap	**African Range States**	**Institutions (IUCN, MIKE, ETIS)**	**Workshop participants**	**Elephant numbers, range & conservation status**	**MIKE**	**ETIS**	**Synergies**	**CITES Decisions**	**Range State Management**
Difficulties of analyzing population trends over time at the sub-regional or continental level.		X		X				X	
The data very seldom allow us to identify true contraction or expansion of range.		X		X				X	X
Reliability of elephant data may not be comparable across forest and savannah ecosystems		X		X				X	X
Other data (HEC, habitat loss, poaching incidences, etc) are captured (sometimes), but never analyzed and reported.		X		X				X	X
Can serving two masters work - look at minimum data needs for each			X		X	X			
Would it be appropriate to model sub-regional plus site-specific PIKE trends			X		X			X	X
Adjust statistical tests of significance of covariates for small sample size e.g. using Kenward-Rodger method			X		X			X	
PIKE could be modelled as the number of illegally killed offset by total killed using negative binomial regression			X		X			X	

	Challenge or gap identified by:			Challenge or gap relevant to:				Objective:	
Analytical challenge or gap	**African Range States**	**Institutions (IUCN, MIKE, ETIS)**	**Workshop participants**	**Elephant numbers, range & conservation status**	**MIKE**	**ETIS**	**Synergies**	**CITES Decisions**	**Range State Management**
Were potential interactions between covariates examined? Or potential non-linearity of relationships with covariates?			X		X			X	
The current dataset of population data is not able to provide population trends		X			X			X	X
Missing data from original analytical framework still needed to validate PIKE		X			X			X	
From other organized smuggling products (gold? Drugs??) is it known what level of enforcement results in a shift to other types of crime (variables % seizure or % economic loss)			X			X		X	X
In local, unregulated ivory markets, turnover is as or more important than the number of items on sale			X			X		X	X
More on measures and indications of organized crime?			X			X		X	X
Relationship between law enforcement, number of seizures and weight of ivory seized			X			X		X	X
Analysis is entirely focused on CITES rather than stepwise development of analytical framework.		X				X		X	X

	Challenge or gap identified by:			Challenge or gap relevant to:				Objective:	
Analytical challenge or gap	**African Range States**	**Institutions (IUCN, MIKE, ETIS)**	**Workshop participants**	**Elephant numbers, range & conservation status**	**MIKE**	**ETIS**	**Synergies**	**CITES Decisions**	**Range State Management**
How do MIKE PIKE values by country and sub-region relate to ETIS seizure data trade flows over time			X				X	X	X
What about price? Nowhere in the equation			X				X	X	X
Economics and value of illegal ivory trade			X				X	X	X
What about DNA for ivory origin			X				X	X	X
What about isotope tracing for ivory origin and age			X				X	X	X
What about radio carbon dating for ivory age			X				X	X	X

Operational

	Challenge or gap identified by:			Challenge or gap relevant to:				Objective:	
Operational challenge or gap	**African Range States**	**Institutions (IUCN, MIKE, ETIS)**	**Workshop participants**	**Elephant numbers, range & conservation status**	**MIKE**	**ETIS**	**Synergies**	**CITES Decisions**	**Range State Management**
Someone must pay for elephant baseline and for followup surveys			X	X				X	X
Need for stringent, comparable, repeatable surveys (opportunity?)			X	X				X	X
New AAED makes it easier to get population and range data into the database, and to undertake the preliminary analysis, but the process is still labor-intensive, requiring financial and human resources (Database Manager)		X		X				X	X
Collection of survey reports (and spatial data) is a challenge		X		X				X	X
Process relies on voluntary inputs from the AfESG members		X		X				X	X
These resource requirements make it difficult to match the reporting schedule of MIKE and ETIS		X		X				X	X
Identify the enforcement best practices and put a toolkit together			X		X	X			X

	Challenge or gap identified by:			Challenge or gap relevant to:				Objective:	
Operational challenge or gap	**African Range States**	**Institutions (IUCN, MIKE, ETIS)**	**Workshop participants**	**Elephant numbers, range & conservation status**	**MIKE**	**ETIS**	**Synergies**	**CITES Decisions**	**Range State Management**
Need for peer (RS) review, which will require data input from MIKE and ETIS to be shut down well in advance of the CoP (perhaps a year)	X				X	X		X	
MIKE needs to be more institutionalized within RS			X		X			X	X
Have technology-independent law enforcement monitoring systems available as a back-up where it makes sense.			X		X			X	X
RS must take responsibility and action on illegally killing and trade information from MIKE and ETIS in their countries			X		X				X
Time, human and financial resources		X			X			X	X
Full institutional support necessary from the National Authorities		X			X			X[2]	X
Need to institutionalize training		X			X			X[2]	X
Need to use appropriate technologies		X			X			X[2]	X
Need to meet the needs of the range States		X			X			X[2]	X
SSOs doing the Site Officer's jobs		X			X			X[2]	X
Revisit SSO TOR and SSU functions		X			X			X[2]	X
Need for RS commitment protocols		X			X			X[2]	X
Site management protocols		X			X				X

[2] If PIKE is validated, then these data will not be needed to meet CITES policy objectives.

	Challenge or gap identified by:			Challenge or gap relevant to:				Objective:	
Operational challenge or gap	**African Range States**	**Institutions (IUCN, MIKE, ETIS)**	**Workshop participants**	**Elephant numbers, range & conservation status**	**MIKE**	**ETIS**	**Synergies**	**CITES Decisions**	**Range State Management**
More range States want to join and to add sites - leading to a need to clarify site selection		X			X				X
Site rationalization (e.g. sites with no elephants)		X			X				X
Information system advisor necessary at site level (or compromise with national officer taking this on)		X			X			X[2]	X
Population surveys unrealistic		X			X			X[2]	X
Staff turnover within the wildlife authority - leading to constant capacity-building needs		X			X			X[2]	X
Need for application of MIKE data at the site/national level (through MIST, perhaps)		X			X			X[2]	X
System does not address monitoring in unprotected areas		X			X			X[2]	X
RS responsibilities with regard to equipment provision and maintenance		X			X			X[2]	X
SSOs stretched too thin across many sites for training and capacity building, backstopping		X			X			X[2]	X
Data flow from site to national not happening in most cases		X			X			X[2]	X

	Challenge or gap identified by:			Challenge or gap relevant to:				Objective:	
Operational challenge or gap	**African Range States**	**Institutions (IUCN, MIKE, ETIS)**	**Workshop participants**	**Elephant numbers, range & conservation status**	**MIKE**	**ETIS**	**Synergies**	**CITES Decisions**	**Range State Management**
Data not being submitted by some countries or in some years		X			X			X[2]	X
Supportive of the usefulness of the MIKE data at national and site level – design of global objectives misses out on helping out at national and site level.	X				X			X[2]	X
Desire for additional MIKE sites and consideration of trans-boundary sites.	X				X			X	X
No intelligence service			X			X		X	X
Inadequate and irregular funding for structural evolutionary development and improvements, changing best practice issues or exploratory analysis.		X				X		X	X
Depends on a small number of key personnel.		X				X		X	X
Few fully-developed tools to ensure long-term sustainability.		X				X		X	X
The challenge of taking 'science to sound bite' in communicating ETIS results to essentially non-technical decision makers.		X				X		X	
Ineffective action on ETIS results		X				X		X	X
Important need for ETIS to work more closely with the RS.	X					X		X	X

	Challenge or gap identified by:			Challenge or gap relevant to:				Objective:	
Operational challenge or gap	**African Range States**	**Institutions (IUCN, MIKE, ETIS)**	**Workshop participants**	**Elephant numbers, range & conservation status**	**MIKE**	**ETIS**	**Synergies**	**CITES Decisions**	**Range State Management**
Getting the three monitoring systems to analyze data together			X				X	X	X
Link MIKE analyses and meaningful in situ conservation action			X				X		X
Should someone else do it - UNODC? WCO?			X				X	X	X
Funding mechanisms to sustain all three systems			X				X	X	X
Clear statement of the need for closer linkages between MIKE and ETIS – and that linkage should be made at the sub-regional level.	X						X	X	X
Greater clarity over the relationship between ETIS, CITES, MIKE and IUCN.	X						X	X	X
Clarify roles and responsibilities of RS, MIKE CCU, MIKE SSU, TAG, IUCN								X	X

Annex VI

Results from workshop activity 1: gap analysis (technical feasibility)

Key for timeframe notation

Timeframe	Meaning:	Abbreviation:
Short	2012	S
Medium	2015	M
Long	Beyond	L

Operational challenges and their technical feasibility

Operational challenge or gap	Technical Feasibility	Notes
Need for stringent, comparable, repeatable surveys (opportunity?)	L	
Identify the enforcement monitoring toolkits available and provide a single platform to access them	M	
MIKE needs to be more institutionalized within ALL RS - i.e. ALL RS take complete ownership of MIKE	L	MOUs, or range State commitment protocols, will contribute
Have technology-independent law enforcement monitoring systems available as a back-up where it makes sense.	M	
RS take responsibility and action on illegal killing and trade information from MIKE and ETIS in their countries		Not answerable by this workshop
Getting the three monitoring systems to analyze data together	S	
Link MIKE analyses and meaningful in situ conservation action in all MIKE sites	L	
Involve the expertise of relevant international enforcement organizations to assist in analysing the supply chain.	M	

Analytical challenges and their technical feasibility

Analytical challenge or gap	Technical Feasibility	Notes
Difficulties of analyzing population trends over time at the sub-regional or continental level.	L	More data points needed
The data very seldom allow us to identify true contraction or expansion of range.	L	Occupancy data set as a baseline

Analytical challenge or gap	Technical Feasibility	Notes
Reliability of elephant data may not be comparable across forest and savannah ecosystems	L	We know how to do it (almost); but getting it done across all MIKE sites and beyond would be very long-term
Other data (HEC, habitat loss, poaching incidences, etc) are captured (sometimes), but never analyzed and reported.	L	
Problems with dung decay…explore presence/absence occupancy models	S	Currently being evaluated
Aerial survey in light woodlands: thermal imagery for counts…? (More efficient than ground surveys?)	M	
Use rate of decline in nearby sites to fill data gaps (especially in Central Africa)	S	
Embedding survey metadata in survey standards, including data validation	S	Standards can be done quickly, getting uptake will be much slower
Use habitat unsuitability as a model for predicting absence to refine range map in unsurveyed zones	S	Desk exercise, without ground truthing.
toconducat an exercise using supplementary techniques to refine the range map (e.g. interviews with livestock managers or hunting area managers, forestry concessions, etc.)	L	
Would it be appropriate to model sub-regional plus site-specific PIKE trends	S	
Adjust statistical tests of significance of covariates for small sample size e.g. using Kenward-Rodger method	S	
PIKE could be modelled as the number of illegally killed offset by total killed using negative binomial regression	S	
Were potential interactions between covariates examined? Or potential non-linearity of relationships with covariates?	S	
In local, unregulated ivory markets, turnover is as or more important than the number of items on sale	S	
More on measures and indications of organized crime?	S	

Analytical challenge or gap	Technical Feasibility	Notes
How do MIKE PIKE values by country and sub-region relate to ETIS seizure data trade flows over time	M	
What about price? Nowhere in the equation	M	
Economics and value of illegal ivory trade	M	
What about DNA for ivory origin	M	Significant and growing sample (about 20 locations so far) from SE Asia already available from the DNA population monitoring
What about isotope tracing for ivory origin and age	L	
What about radio carbon dating for ivory age	S	

Annex VII

Results from workshop activity 3: maximizing synergies

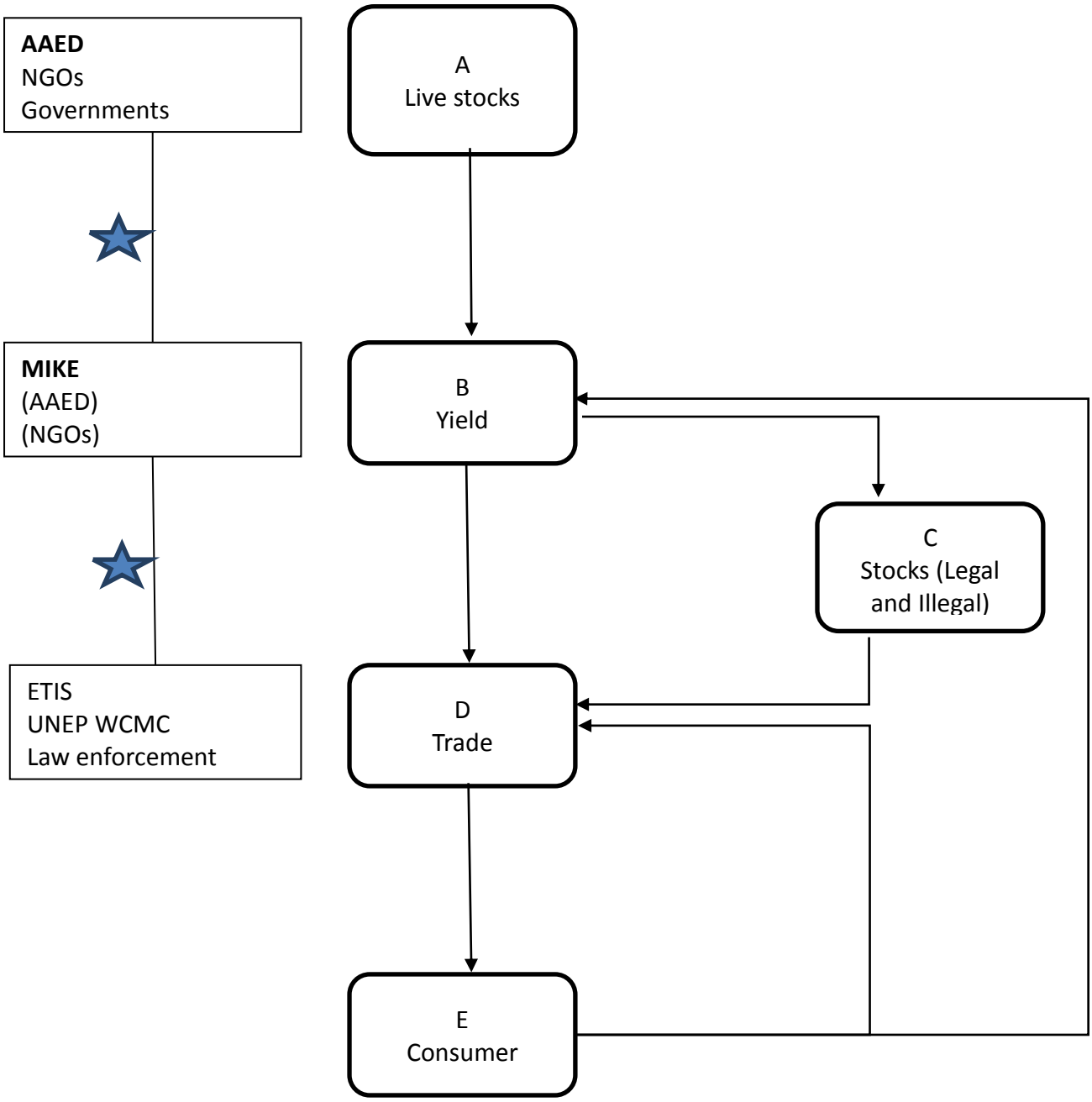
Group One

The first group outlined the trade chain from the status of live elephants at time T1 through to carcasses (including natural mortality, legal killing and illegal killing) through to stockpiles and/or onto the legal and illegal trade in ivory, and finally back to the status of live elephants at time TX. On this trade chain, the group outlined key synergies and whether the synergy was functioning or not at the present time.

Where is the synergy?	**What should it be?**	**Status**
AAED T1 - MIKE	Population size and characteristics at the site, national and sub-regional level should 'talk' to MIKE to flag anomalies and for management purposes	C
	Population size a covariate in the global MIKE analysis	A
AAED T1 - ETIS	Knowledge of national population versus trade out of that country	B
MIKE-ETIS	Trade route identification	B
	Cross-pollination of co-variates	B
	joint reporting at the national level and at the continental level	B
MIKE-13.26	MIKE can provide information on non-compliance with 13.26	C
WCMC-ETIS	WCMC should be included/considered in the ETIS analysis (i.e. data provision)	A
WCMC and ETIS - 13.26	Anomalies in the WCMC data, along with data from ETIS can inform on non-compliance with 13.26	B
ETIS - 13.26	ETIS can provide information on non-compliance with 13.26	B
	There could be a two-way information flow, e.g. questionnaire	C
AAED T1 - AAED TX	Trends!	X
MIKE - AAED TX	MIKE data can help to understand shifts in population status	C
ETIS - AAED TX	ETIS data can help to understand shifts in population status	C

Key:
A - synergies that are taking place efficiently
B - synergies that are taking place but could be enhanced
C - synergies that are not working but should be

Group Two



The second group also outlined the flow of ivory from live elephants, through to dead elephants, from which ivory either goes into trade, legal stocks, or illegal stocks. Ivory in trade ends up with consumers, and there are a number of feedback loops, for example demand increases the flow of dead elephants and law enforcement effort provides a feedback loop to constrain the trade.

The AAED, NGOs, governments and others are monitoring the stock of live elephants, and there is a large demand for information on trends. It is also necessary to know the rates of natural and non-natural (mainly illegal) mortality and the rates at which these flow into the various stocks. Both MIKE and the AAED are important for this.

For monitoring trade, it is important to know the flows in and out of the legal and illegal stocks. To determine how much of the current 'yield' it is important to know the age of the seizures and the source of the ivory. It is critical to know whether a seizure is from a stock or from a current population.

It is assumed that both poaching and stockpiling (and using ivory from stocks) is going on together, but this ratio between what is coming from stocks and from fresh elephants is dynamic in time and in space. It is important to get an idea of the percentage yield vs. stocks and some probability about the size of the known and unknown stocks.

There are three key elements:

1) The flow of dead elephants and the flow into trade
2) The size of the stocks (known and unknown) and the flow in and out of these stocks
3) The source and age of the ivory in trade.

There is also a feedback loop from seized ivory going back into the illegal trade.

Group Three

Group three identified the stages of the supply or trade chain and mapped these against the six monitoring mechanisms.

*** -** synergies that are taking place efficiently
**-synergies that are taking place but could be enhanced
*** - synergies that are not working but should

	A	B	C	D	E	F
1	**B* / D****	**A* / D****		**A** / B****		**B***
2a		**F*/ A****				**B***
2b		**F*/ A****				**B***
3a		**F***				**B***
3b		**F***				**B***
4a						
4b			**E*/ F***	**F***	**C** / F***	**E* / C*****
5a			**E*/ F***	**F***	**C** / F***	**E* / C*****
5b			**E*/ F***		**C** / F***	**E* / C*****
6			**E***	**E***	**C****	
7a			**E*/ F***	**F***	**C** / F***	**D* / E* / C*****
7b			**E*/ F***		**C** / F***	**D* / E* / C*****

Supply/trade chain stages:

1. Elephants
2. a) Death legal
2. b) Death illegal
3. a) Ivory collected legally
3. b) Ivory collected illegally
4. a) Ivory in government stores
4. b) Ivory held by illegal traders
5. a) Export legally
5. b) Export Illegally
6. Import / Re-export
7. a) Domestic legal markets
7. b) Domestic illegal markets

Monitoring mechanisms:

A. IUCN/SSC AAED
B. CITES MIKE Programme
C. TRAFFIC/ETIS
D. UNEP-WCMC
E. Decision 13.26
F. Res Conf. 10.10