

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



Monitoring the Illegal Killing of Elephants (MIKE) and
Elephant Trade Information System (ETIS)

Fifteenth meeting of the Technical Advisory Group
Nairobi, 16 – 19 September 2019

MINUTES OF THE 15TH MEETING OF THE TECHNICAL ADVISORY GROUP

In attendance:

- *TAG sub-regional representatives:*
 - Leonard Mubalama: Central Africa
 - Chris Thouless: Eastern Africa
 - Russell Taylor: Southern Africa
 - Emmanuel Hema: West Africa
- *Global members:*
 - Holly Dublin
 - Andy Royle
 - Carl Schwarz
- *Co-opted members:*
 - Benson Okita Ouma: Co-Chair, IUCN/SSC African Elephant Specialist Group
 - Fiona Underwood: ETIS Statistician
- *ETIS*
 - Tom Milliken: Director
- *MIKE Central Coordination Unit (CCU):*
 - Thea Carroll: Coordinator
 - Dave Henson: Programme Officer
 - Mrigesh Kshatriya: Data Scientist
 - Bernard Koech: Finance officer
 - Wubalem Negash: Finance and admin officer
- *Sub-regional Support Units:*
 - Martha Bechem: Central and West Africa (PACO)
 - Tapera Chimuti: Eastern and Southern Africa (ESARO)
 - Aditya Gangadharan: South Asia

Apologies:

- *TAG sub-regional representatives:*
 - Sukumar Raman: South Asia
 - Aster Li Zhang: Southeast Asia
- *Global members:*

- Hugo Jachmann
- *Co-opted members:*
 - Vivek Menon: Chair, IUCN/SSC Asian Elephant Specialist Group
- *Sub-regional Support Units:*
 - SayLin Ong: South East Asia (SEA)

1. **Adoption of the agenda**

The TAG indicated that the MIKE CCU should clarify that the meeting referred to under item 23 (All African elephant range States MIKE meeting), is not an African elephant range States meeting, but a MIKE regional meeting. It may cause some confusion if it is not clear that the meeting is focused on MIKE implementation and planning issues, rather than broader African elephant conservation matters. Previous African elephant range States meetings and African elephant Dialogue meetings included the MIKE Programme as an agenda item, while the meeting planned by the MIKE CCU for November 2019 will not include agenda items that are not directly linked to the MIKE Programme.

The following item was included under “Any other Business” (agenda item 28):

28.1 Scope of issues addressed by the TAG

TAG Recommendations

1.1 The agenda with the additional item under Any other Business was adopted.

2. **Approval of the minutes of the previous meeting**

2.1 The minutes of the fourteenth TAG meeting was adopted.

3. **Progress on action points (MIKE-ETIS TAG14)**

Key issues discussed

Progress on action items contained in document TAG15 Doc. 3 was noted, taking into consideration a number of items were included and the agenda to be discussed during the meeting. The ETIS review and the lack of funding for the review was discussed by the TAG. The ETIS Director reflected on the impact of the delay in the review on TRAFFIC’s ability to fundraise due to uncertainty about the outcome of the review process.

The cost estimate for the review was based on the cost of the independent review of the PIKE trend analysis methodology the MIKE programme initiated. A preliminary review by the new MIKE ETIS TAG statisticians could assist in getting a better understanding of the specific issues to be addressed and the cost involved.

TAG recommendations

3.1 The CITES Secretariat should continue to engage donors to secure funding in a timely manner for the ETIS review. In this regard, the CITES Secretariat should engage potential donors bilaterally.

3.2 If funds have not been secured by the 73rd meeting of the Standing Committee, the impact of the delay in the process should be explained to the Standing Committee to inform the way forward.

3.3 The new MIKE ETIS TAG statisticians (Carl Schwarz and Andy Royle) to do an informal review of the statistical model and prepare a concise report on aspects to be addressed from a statistical perspective. The ETIS Director (Tom Milliken) and ETIS Statistician (Fiona Underwood) to provide the necessary information for the review.

4. Outcomes of CITES CoP18

Key issues discussed

The MIKE Coordinator, Thea Carroll, presented the MIKE report discussed at CITES CoP18 and the decisions as well as amendment to Resolution Conf. 10.10 (Rev. CoP17) that were adopted (TAG15 Doc. 4). The ETIS Director, Tom Milliken, presented the other elephant related documents that were discussed at the CoP, including the ETIS report, the document on the implementation of Resolution Conf. 10.10 (Rev. CoP17), and the elephant proposals.

TAG members raised concerns about the information originating from forensic analysis to determine the origin of seized ivory that is used in the ETIS analysis to extend the illegal ivory trade chain. Due to the fact that this information is used in the ETIS analysis and that the TAG is responsible to ensure the scientific robustness of the analysis, there is a need to unpack concerns relating to the methodologies used for the forensic analysis and the results produced. A key concern raised by range States relate to the accuracy of the findings. This is important if the ETIS analysis for CITES CoP18 is considered, because, as an example, Gabon was included in the analysis based on the results of the forensic analysis. The TAG recommended that the concerns and challenges associated with the current methodologies used for the forensic analysis and the application of the results should be documented, and the institutions / organisations involved in the forensic analysis engaged to address these before its used in further ETIS analysis. Tom Milliken also indicated that the results are not shared with TRAFFIC on a regular basis and usually information is only obtained after publication. This also presents constraints in terms of the incorporation of the information in the ETIS analysis.

Other issues raised by CITES Parties relating to the ETIS analysis included the use of what Parties consider “unverified” data; the inclusion of transit countries in the categorisation (Category C), and the need for the ETIS review. TRAFFIC made an Information document ([Inf. 93](#)) available during the CoP to address issues raised by the CITES Parties.

The TAG furthermore discussed the decisions adopted by CITES CoP18 relating to the trade in Asian elephant specimens, including parts and derivatives. The TAG questioned whether the current MIKE data collection forms used in Asia as well as Africa allow for the recording of data relating to parts and derivatives. The MIKE CCU confirmed that the carcass forms include information relating to this and the collection of this data will continue.

One of the key Decisions adopted by the CITES Parties relates to the reporting of stockpile information. Although Resolution Conf. 10.10 (Rev. CoP17) requires the submission of stockpile data on an annual basis, the reporting has been poor. The CoP adopted Decisions to address this, including decisions directed to the CITES Secretariat to identify those Parties that have not provided information on the level of government-held stockpiles of ivory and significant privately held stockpiles or where stockpiles are not well secured and report to the Standing Committee. The implementation of this decision may assist in providing more information relating to stockpiles that could be integrated or considered in the ETIS analysis.

The role of mammoth ivory in the illegal African elephant ivory trade was also discussed and Tom Milliken indicated that ETIS recorded only one seizure record out of the 30,000 seizure records that it maintains that involved the labelling of mammoth ivory as elephant ivory. It therefore seems that mammoth ivory is not used to ‘hide’ elephant ivory. The CITES Parties did however adopt a decision to initiate a study on the trade in mammoth ivory, and its impact and contribution to the illegal trade in elephant ivory and the poaching of elephants.

The other key outcomes relevant to MIKE and ETIS discussed by the TAG are contained in document TAG15 Doc. 4. An important aspect for the TAG was the amendment to the data access provisions in Resolution Conf. 10.10 (Rev. CoP17) to allow TAG members access to detailed data.

TAG members requested TRAFFIC to share the steps taken by the organisation to ensure the ETIS programme will continue after the retirement of the current Director (Tom Milliken). Thomasina Oldfield,

Science, Research and Analysis Coordinator in TRAFFIC and Tom Milliken explained that an ETIS analyst position will be created and that recruitment will be initiated as soon as funds have been secured. The position will include analysis relating to both rhino and elephant data (pachyderms). She re-iterated that TRAFFIC remains committed to ensure the system continue to work, but they are hampered by lack of funding. She furthermore indicated that TRAFFIC would like to move towards the submission of an annual illegal ivory trade trend analysis (similar to the MIKE annual analysis) while the cluster analysis will still be done every three years.

TAG recommendations

- 4.1 A process should be initiated to engage the institutions / organisations involved in the forensic analysis to determine the origin of seized ivory and this should include an assessment of the methodologies used in the forensic analysis and the identification of the concerns relating to the methodologies and the use of the results. These concerns and challenges should be discussed with the institutions / organisations that undertake the analysis to determine whether the concerns / challenges can be addressed.
- 4.2 Results from the current forensic analysis should not be used in future ETIS analysis unless concerns can be addressed.
- 4.3 Carcass data collection forms must include provision for information relating to the removal of any other parts of the elephant to be recorded.
- 4.4 TRAFFIC to prioritise the appointment of an ETIS analyst and develop a specific timeline for an annual ETIS illegal ivory trade analysis.

5. Outcomes of the meeting of the MIKE ETIS TAG Contact Group on statistical matters

Key issues discussed

A presentation relating to the issues discussed at the meeting of the MIKE-ETIS Contact Group that took place from 8 – 9 August 2019, as well as the recommendations made by the Contact Group, was made by the MIKE Data Scientist, Mrigesh Kshatriya. The main issues discussed were the review of the PIKE trend analysis methodology, the co-variate analysis for Africa, observed vs real PIKE, review of demographic data, the biases that effect PIKE, the possibility to include stockpile information in the ETIS analysis, and linking the monitoring systems (AED, ETIS, MIKE).

With regards to the PIKE trend analysis, the various models assessed and documented by Alain Zuur were discussed. The TAG discussed whether PIKE, as a metric for poaching levels, should remain the focus and it was agreed that it should continue to be used and that the Generalised Linear Mixed Effects Model (GLMM), that is similar to the Burn et al. 2011 model should be used for the PIKE analysis. Some adjustments should be made to address pseudo replication and zero inflation.

The MIKE CCU in collaboration with the TAG should address the biases that effect PIKE and document the work in this regard. If a bias cannot be addressed, the reasons why it cannot be addressed should be documented and future reports must reflect that the PIKE trend analysis could be impacted due to the challenges to address it at this point in time. Key issues that should be looked at include:

- Other causes of death to be recorded (Anthropogenic causes of death, other than illegal killing, should not be recorded as 'natural mortality' and management related deaths should be removed from data used for PIKE trend analysis)
- The impact of drought on PIKE should be addressed
- Natural mortality – guidance on the use of the term in the MIKE context to be provided and the "poaching rate equation" should be reviewed

- Unknowns – improve guidance to sites on how to deal with unknowns and the TAG proposed that a simple decision tree could assist in this regard. A possible way to deal with ‘unknowns’ could be to allocate the unknowns pro-rata at the site level based on knowledge of the site and the other carcass information.

The co-variate analysis and the provisions in Resolution Conf. 10.10 (Rev. CoP17) were also discussed and one key aspect highlighted by the TAG members that require clarification in all reports, is that although the resolution refers to correlation between PIKE and other variables, it does not mean causality and is actually factors/variables associated with trends in PIKE. This should be clearly stated in all reports moving forward. The need to examine potential alternative variables for the co-variate analysis, identified by the contact group, was supported by the TAG.

With regards to the “Real vs Observed PIKE” issue discussed by the contact group, a number of recommendations were made, but the TAG indicated that some should be prioritised and that the MIKE CCU should produce a list of the issues that can be addressed within the next year.

The report on the literature review conducted by a consultant appointed by the MIKE CCU is discussed in more detail in section 9 of the minutes.

The incorporation of stockpile information in the ETIS analysis seems to present some challenges due to poor reporting by CITES Parties, but there are concerns about the leakage of stockpiled ivory into the illegal ivory trade chain. Tom Milliken, ETIS Director, therefore recommended that the possibility that recent large-scale seizures reported in 2019 represent stockpiled ivory entering illegal trade should be investigated and the TAG supported this recommendation.

The possible options to link the monitoring or data systems were discussed and although there are concerns about the current status of each of the systems (ETIS review to be done; independent review of MIKE concluded and the maintenance and update of the AED); it was recommended that as a first step, the ‘informal integration’ of the survey data in the AED and the PIKE trend could be considered. The joint and collaborative reporting to the CITES Standing Committee should also continue. With regards to integration of MIKE and ETIS data, the TAG discussed the delay in obtaining seizure data and the time illegal ivory could “spend” in the illegal ivory trade chain, that may continue to present some challenges for integration of the systems.

The contact group’s key recommendations are contained in the report (document TAG 15 Doc. 5 Annex 1).

TAG recommendations:

- 5.1 The MIKE Programme should continue to use PIKE as the metric for poaching levels, while undertaking research on alternatives (future research actions).
- 5.2 Carcasses originating from management related interventions should be removed from the PIKE analysis (trophy hunting or HEC interventions by authorities).
- 5.3 The next PIKE trend analysis (including 2019 data) should be done using a GLMM model with some adjustments as recommended by the TAG statisticians. In this regard, Carl Schwarz will provide the changes to the code to be incorporated.
- 5.4 Guidance to MIKE sites on how to deal with carcasses where the type of death is “unknown” to be improved and a decision tree to guide this should be developed.
- 5.5 Guidance on the meaning of ‘natural mortality’ in the MIKE programme context should be developed and shared with MIKE sites as part of the training material and protocols.
- 5.6 The poaching rate equation should be reviewed taking into consideration the different types of death and range of natural mortality rates available in the African elephant demographic data literature review.

- 5.7 Elephant deaths caused by anthropogenic activities to be recorded separately (not included in natural mortality).
- 5.8 With regards to future work to be done in terms of the PIKE trend analysis model, the TAG recommended that the following should be done:
- i. A sensitivity analysis should be applied
 - ii. The model validation should be extended by dropping specific sites
 - iii. Incorporate population size information in the model to obtain PIKE trends that are weighted by population size at each site
 - iv. Research: the application and use of Spatial binomial Generalised Linear Models (GLM) or Generalised Additive Models (GAM) as well as Spatial-temporal binomial GLM or GAM.
- 5.9 The following issues must be addressed in the report produced by the independent statistician, Alain Zuur:
- i. Add a binomial GLMM in which country is used as random effects (i.e. using two-way nested random effects). Such random effects may serve as a proxy for spatial correlation.
 - ii. Extend the Executive Summary with a paragraph that states that observations with zero carcasses reported (at the moment zeros refer to situations where PIKE is zero) can only be included with the bivariate Poisson model. In all other models such observations are excluded.
 - iii. Compare the PIKE trends obtained by models 1 to 5 in Figure 1 and try to understand why model 5 gives a different pattern after 2010.
 - iv. Refer to the power analysis report that is currently being drafted by Dr Alain Zuur (Improving the experimental design for the MIKE programme in Asia and Africa – Zuur A.F 2019), and briefly explain that the power of a test is defined as the probability of detecting an effect (e.g. a change in the PIKE trend) if there is indeed such an effect.
 - v. Investigate whether the random effect 'Country' can be added to the spatial-temporal GLM model.
 - vi. "Split" or amalgamate multiple sites and explain what the impacts are on the GLMM and INLA models (Test the assumption that the GLMM will treat amalgamated/split sites as separate independent sites and therefore will have a large impact on the trend, but the INLA model will regard the amalgamated/split sites as highly spatially correlated and therefore the impact would be minimal).
 - vii. Add a simple comparison (e.g. scatterplots) between the PIKE trend obtained by the spatial-temporal model and available covariates.
- 5.10 TRAFFIC (ETIS) should investigate the possibility that recent large-scale seizures reported in 2019 represent stockpiled ivory entering illegal trade.
- 5.11 Informal 'integration' of the AED and MIKE (PIKE trend analysis) to be done by MIKE CCU and TAG members (Ben Okita & Chris Thouless)
- 5.12 Joint and collaborative reporting on the monitoring systems to the CITES Standing Committee should continue.

6. **MIKE database**

Key issues discussed

The MIKE Data Scientist, Mrigesh Kshatriya presented the MIKE online database, including the forms to be completed, the dashboards that visualise data, the administration of the system as well as pilots done at site and national level. The TAG provided guidance relating to the following aspects:

- Record retention for any changes made – not only the name of the person making changes in the database should be kept, but also the specific changes that were made
- The database should include all data points in the carcass forms and terminology used should be aligned
- The user guide or manual should include guidance on how to deal with data capturing
- The TAG members should also be able to access and read the data (specific provision relating to rights to TAG members to be included – access and read only).

He also presented a report on the reconciliation of historic data that was initiated in 2018. In this regard some progress was made with sites confirming carcass records, but unfortunately the data from MIKE sites in Kenya (Tsavo and Samburu-Laikipia) remains a challenge. The MIKE CCU will continue to engage KWS, but the sub-regional representative was requested to assist in this regard. The MIKE CCU was also requested to make site specific recommendations relating to the other outstanding cases.

TAG recommendations:

- 6.1 The MIKE CCU should aspire to align the data points and terminology contained in the carcass form with the workbook and the database
- 6.2 The user manual should provide clear guidance on data capturing and clarify potential uncertainties relating to data capture
- 6.3 The online database should retain records of all changes made to the database
- 6.4 The database should allow the administrative team (MIKE CCU) to assign rights to TAG members to access and read data
- 6.5 MIKE CCU to engage KWS with the aim of clarifying the data for Tsavo and Samburu. The subregional representative for east Africa to assist the MIKE CCU in this regard.
- 6.6 Site specific recommendations to be made for all other sites where data reconciliation must be done. Recommendations to be submitted to the relevant subregional TAG representative for consideration.

7. Ranger Patrol Bias

Timothy Kuiper presented the research he is conducting in Chewore Safari Area in Zimbabwe relating to the uncertainty in ranger-based monitoring of elephant poaching and his preliminary results.

The key issues he highlighted included:

- Ranger patrol bias affects conclusions about where poaching happens
- Elephant distribution at the site is an important part of the patrol style adopted
- Rangers are useful co-modellers with on the ground knowledge
- Rangers seem to view MIKE as just a reporting requirement (with no feedback to the sites) and there is a lack of ownership
- Role of information or intelligence – patrols influenced by both
- Carcasses were however found on extended patrols
- The categorisation in the MIKE form is not really used and usually they report that carcasses were found by regular patrols
- The basic patrol effort data being collected could be of value and should be collected

He also shared information relating to the remaining research he is conducting that includes further work on the perceptions of the MIKE programme and a simulation to see how well PIKE simulates the true poaching rate and trend at the site level. Concerns were raised about the number of carcasses that may be present but not seen by patrols. If it's possible to "double check" an area with another patrol or through an aerial patrol it could assist in determining how many carcasses are missed, but that is not practically feasible. Andy Royal indicated that the spatial data (distribution of carcasses) could possibly be used to estimate how many carcasses were missed by patrols.

The TAG indicated that this detailed level of work currently conducted by Timothy Kuiper cannot be repeated at each MIKE site but could potentially inform means to address some of the challenges in the PIKE trend analysis or MIKE implementation.

The MIKE CCU will therefore continue to engage him on the research he is conducting.

TAG recommendations:

- 7.1 MIKE CCU to continue to engage Timothy Kuiper on the research he is conducting in Chewore, Zimbabwe especially in terms of the elements that could assist in addressing biases in PIKE and MIKE implementation in general.

8. Patrol effort and coverage and Detection probability

Key issues discussed

The MIKE Coordinator, Thea Carroll, presented detailed patrol effort data, including estimates of coverage of the MIKE site by patrols, obtained from a few sites with digital systems. It remains a challenge to get this level of detailed data and the TAG was requested to provide guidance relating to the importance to collect this data and how it could be used. Various questions are raised about the role of patrols in discovering / detecting carcasses. The TAG is however of the view that basic patrol effort data should still be collected and captured in the database.

Patrol effort is therefore also linked to detection probability. The current assumption is that the probability of detecting an elephant carcass of an elephant illegally killed is the same as the probability of detecting a carcass of an elephant that died of other causes. This is not always the case and does not take into consideration the use of information and intelligence used to detect carcasses.

If experimental studies could be done or if MIKE programme could direct the sites on how to conduct patrols or if replicated surveys or dual sampling could be done; it would be possible to consider options to address detection probability, but none of the aforementioned is possible at this point in time. The TAG therefore recommended that the MIKE CCU prepare a one-page document that explains why the detection bias in PIKE will be difficult to address; the options considered and why they are not feasible at this point in time.

In forest sites, data from dung surveys (ground surveys) could potentially be used to determine whether carcasses were not detected by patrols or the number of carcasses detected by patrols. The MIKE CCU was requested to engage with the AfESG and Chris Thouless to access data from dung surveys and to compare the number of carcasses detected with those reported to MIKE.

TAG recommendations

- 8.1 MIKE to continue to request MIKE sites to collect basic patrol effort data.
- 8.2 MIKE CCU to develop a one-page document reflecting options to address differential detection probability bias and the challenges to do so based on the information available at this point in time.
- 8.3 Assess information in dung surveys / dung counts where carcass information was recorded and compare with PIKE data

9. Natural mortality

Key issues discussed:

The consultant appointed by the MIKE CCU, Severin Hauenstein, presented the literature review on demographic data of African elephant as well as the database he developed that contained all the data. The final report with recommendations on how the information could potentially be used was not available, but potential uses of the data were briefly discussed, including using the information in population modelling and guiding future research.

The estimates of pure natural mortality rate are scarce. Natural mortality data for Amboseli, Addo and Dzanga Bai were available and included in the database. Sex and age specific demographic data relating to other parameters were however available and could be useful to the MIKE programme. The demographic data could potentially assist in addressing biases in PIKE through the use of modelling. The elicitation process done by Fiona Underwood was also discussed, but the TAG recommended that it would not be pursued at this point in time.

Due to the limited information available on natural mortality rate of populations under different scenarios, the TAG recommended that the MIKE CCU prepare a one page document that contains the information that is available (range of natural mortality rate based on literature review) and that provide advice on the use of the rates in determining poaching rates, including extreme scenarios to be taken into consideration, e.g. the impact of drought on natural mortality.

Issues relating to natural mortality was also discussed in sections 5 of the minutes, but the following additional recommendations were made by the TAG.

TAG recommendations:

- 9.1 MIKE CCU to prepare a one page document that contains the information relating to natural mortality rates that is available (range of natural mortality rate based on literature review) and that provide advice on the use of the natural mortality rates in determining poaching rates, including extreme scenarios to be taken into consideration, e.g. the impact of drought on natural mortality.
- 9.2 MIKE CCU to distribute the final report that includes implications, to the TAG members for consideration.

10. Dynamics modelling

Sandor Frigyik and Julian Blanc from UNEP, Ecosystems Division (Wildlife unit) joined the TAG meeting to present the work done in terms of the development of a systems dynamic model. At TAG14 the collaboration with UNEP relating to the development of a model to assist in addressing certain areas of uncertainty was supported and during this agenda item, Sandor Frigyik presented progress made in this regard.

Key issues discussed:

The TAG members indicated that a population dynamics model should:

- take into consideration the challenges relating to natural mortality rates and clarify why a specific rate is used / ensure the model can include varying natural mortality rates;
- consider the fact that some populations are shared (transboundary populations);
- carefully consider the parameters used in the model (although demographic data (age and sex specific data) are available and could be used to calibrate a model; expert input should also be obtained to refine it);
- include a sensitivity analysis; and
- consider issues of scale (site level as well as a sub-regional and regional level).

In general the TAG members expressed support for the development of a model that could assist in assessing the impact of certain levels of PIKE on a population at the site level, but also at the sub-regional and regional level, taking into consideration different scenarios (populations impacted on by poaching, populations at ecological carrying capacity; populations in stressed environments – drought).

TAG recommendations:

- 10.1 Parameters used in the model should be refined and sensitivity analysis should be done.
- 10.2 Natural mortality rate used in model must be clarified.
- 10.3 Site level as well as continental level model needed (both considered important and of value to the MIKE programme).
- 10.4 TAG members are willing to assist in providing guidance to UNEP (Sandor Frigyik) in support of the development of the model (Dr C Thouless and Dr H Dublin indicated that they are willing to assist in this regard).

11. Operations of MIKE in Africa and Asia

Key issues discussed

The subregional support officers from Central and West Africa; Eastern and Southern Africa and South Asia presented information relating to the implementation of the MIKE Programme in their respective subregions. The TAG members noted that the reports developed for consideration by the TAG was standardised as requested. It was recommended that some engagement with the sub-regional representatives should take place prior to the meeting when the reports are being compiled. That will provide the subregional representatives on the TAG with an opportunity to comment on the document prior to distribution to the TAG members.

11.1 Central and west Africa

Various challenges were experienced by the Sub-regional Support Unit in central and west Africa, including security situations that resulted in delays in site visits being conducted. The subregional representative for Central and West Africa reflected on the interventions he made to assist.

TAG Recommendation:

Subregional representative to assist the SSUs in terms of engagements with range States.

11.2 Eastern and southern Africa

The report for eastern and southern Africa was noted, but no further recommendations were made by the TAG. The issues highlighted by the sub-regional support officer were addressed under other agenda items, including the item relating to patrol effort and coverage.

11.3 Southeast Asia

The report for Southeast Asia was noted. The concerns relating to the low number of carcasses or no carcasses reported by a number of range States in the subregion were noted. This will hopefully be addressed through the process to review the MIKE site network in Southeast Asia. The TAG did not make any further recommendations relating to Southeast Asia.

11.4 South Asia

The report and presentation by the sub-regional were noted. Concerns were expressed relating to the activities implemented in South Asia relating to human-elephant conflict, because these do not seem to directly relate to the objectives of MIKE as set out in the Resolution. The current European

Union funded project implemented in Asia does however include activities relating to human elephant conflict. The ability and capacity of the MIKE programme to provide support to the range States on matters relating to human-elephant conflict, especially in terms of monitoring all incidences of human-elephant conflict and supporting mitigation measures, were questioned. The role of IUCN in supporting the activities aimed at supporting the conservation of Asian elephants were briefly discuss, especially because it seems better placed than the CITES MIKE programme to fulfil this role. Considering the challenges experienced in securing funds to support MIKE implementation in South Asia; broadening the scope will have significant implications.

12. Review of MIKE network

12.1 Report: Review of MIKE Network in Africa

Key issues discussed

The TAG considered the draft report on the review of the MIKE network inadequate and requiring extensive additional work as set out in the Terms of Reference.

TAG Recommendations:

12.1.1 The TAG recommended the following, in line with the Terms of Reference for the review:

- A definition for the term 'site' should be proposed.
- Assessment to be done to determine whether sites still meet the original site attributes.
- Covariates and covariate analysis should be considered to identify possible sites that could provide contrast for the analysis.
- Identify 'marginal areas' (areas not necessarily part of core protected area / strongholds) (although these may present challenges in terms of data collection if there is no process or mechanism to gather and report data).
- Transboundary populations should be considered and discussed (should these be amalgamated in the analysis? The patrol effort and enforcement effort may differ between the countries).
- Potential spatial correlation should be considered; therefore, sites that are not close to one another, but that will be able to report on carcass data should be considered.
- Remove the proposal relating to core sites – not considered viable due to potentially variable situations in MIKE sites.
- If possible, new sites added to the MIKE network should be as dissimilar as possible to allow for detection of differences (co-variate analysis).
- It is clear that some regions are 'under-represented' in terms of elephant population size and this should be addressed.
- Resources available to support MIKE sites should be considered.

12.1.2 With regards to the Power Analysis, the TAG recommended that it should be done based on five-year trend.

12.2 Report: Review of MIKE Network in Asia

Key issues discussed

The draft report on the MIKE network review in Asia was discussed. Due to the absence of the MIKE subregional representatives from Asia, the TAG members were reluctant to make detailed comments on the report and recommended that the report should be discussed with the range States at the upcoming sub-regional meetings.

Key issues in the report that were of concern:

- The small elephant population sizes at the MIKE sites
- The alignment/non-alignment between the MIKE mandate and the issues of importance in terms of elephant management and conservation to the MIKE sites in Asia (main threats: habitat loss and human-elephant conflict)
- The appropriateness of PIKE as metric to use in terms of trend analysis (PIKE is associated with illegal killing of elephants for ivory and illegal elephant deaths in Asia are in few cases linked to poaching for ivory).

TAG Recommendations:

12.2.1 As recommended for the Africa MIKE network review, the power analysis for Asia should also be done based on a five-year trend.

12.2.2 The MIKE CCU should share the outcomes of the discussions at the sub-regional meeting with the TAG before a report is submitted to the MIKE ETIS Subgroup of the CITES Standing Committee.

13. IUCN SSC AfESG

Three reports were submitted for consideration by the TAG:

- i. Outcomes of AfESG meeting relevant to MIKE and ETIS
- ii. African Elephant Database
- iii. Review of AEAP (outcomes of IUCN AfESG World Café and possible implications for MIKE & ETIS)

Key issues discussed:

The TAG discussed all three reports and it was recommended that detailed comments will be submitted to the co-chair of the AfESG, who will consider the comments and submit amended documents.

With regards to the possible review of the African Elephant Action Plan (AEAP), there was some uncertainty about the process to make the inputs provided by the IUCN AfESG members available to the range States for consideration and discussion. The TAG members indicated that there may be some confusion about the process that require clarification by UNEP.

TAG Recommendation:

13.1 Reports to be amended based on comments made by the TAG members.

13.2 Active fundraising for the AED should be done by the IUCN co-chairs and SSC.

13.3 UNEP (Wildlife Division) should be requested to clarify the process to take the inputs provided by the IUCN AfESG members forward and shared with the TAG.

14. IUCN SSC AsESG

The report submitted by the IUCN SSC AsESG was noted and no recommendations were made. The AsESG Chair was requested to, in future reports, clarify which activities were carried out by the

AsESG and which were carried out in collaboration with the MIKE South Asia Subregional Support Unit.

15. Training Material

The training material used during capacity building exercises at the site level is based on information collated by Howard Fredericks, but standardised training material has not been produced by the MIKE Programme. The MIKE CCU appointed the Southern African Wildlife College to assist in the development of a training curriculum, standardised presentations, handouts that can be used during training and by rangers subsequent to training, a pocketbook, as well as a training of trainers' guide.

The training material could then be used by the various sites, training institutions and wildlife agencies/authorities to train rangers / patrol staff.

The current material used by the SSU for eastern and southern Africa was distributed and TAG members were requested to provide comments on the material.

Key issues discussed:

The need for a decision tree to support decision-making, as discussed in section 5 of the minutes, was highlighted again. The TAG indicated that it will be important to get feedback from rangers on the training material. The MIKE CCU should provide an e-mail address that allows for sharing of experiences in using the material and comments on how to improve it further.

Anthropogenic causes of elephant deaths should be covered separate from natural mortality and illegal killing for ivory/ parts and derivatives. The carcass forms, guidance on data to be captured and database should be aligned.

The importance of briefings and debriefings at the site level was also discussed and should be included in the training to ensure the data collected at MIKE sites inform patrols and law enforcement related activities.

TAG Recommendations:

- 15.1 MIKE CCU to provide a mechanism that will ensure it receives feedback relating to the training material (where training is not provided by the MIKE CCU, but the MIKE Programme training material is used).
- 15.2 Include contact details for the MIKE CCU or SSUs in training material.
- 15.3 TAG members to submit comments on the training material handouts and carcass forms by 9 October 2019. MIKE CCU to consolidate comments and distribute to TAG members and submit to SAWC for consideration and incorporation. Issues requiring clarification or further guidance will be referred to the Contact Group.
- 15.3 A contact group comprised of Russell Taylor, Leonard Mubalama, Chris Thouless, Emmanuel Hema, Holly Dublin and Ben Okita, was established to provide further inputs to the development of the training material, including the development of a decision tree to guide decision making relating to type and cause of death.

16. Projects (2020+) – MIKE Programme

Dave Henson, CITES MIKE Project Manager, presented information relating to the current projects implemented by the MIKE Programme as well as the project concepts developed for future projects in Africa and Asia.

Key issues discussed:

The Cross Regional Wildlife Conservation in East and Southern Africa project does not include the MIKE analytical work. If the MIKES+ funding is not secured, the PIKE trend analysis reporting may be impacted.

Securing funds for South Asia and South East Asia remain challenging and although concepts were submitted, a provisional positive response was received from only one potential donor. The project concept however only covers South East Asia.

TAG Recommendations:

16.1 The MIKE CCU to engage USAID and Asian Development Bank on future projects in Asia.

17. **Preparations for SC73**

The preparations for the joint report to the 73rd CITES Standing Committee were discussed. The joint report to the Standing Committee includes information provided by MIKE on trends in illegal killing, ETIS on illegal trade in ivory, IUCN SSC AfESG and AsESG on the conservation status, as well as legal trade data from UNEP WCMC. Depending on the date for the Standing Committee meeting, the MIKE CCU will request the organisations involved to submit draft reports that will be consolidated into the report to the SC. Draft reports should be submitted to the MIKE CCU at least 6 months before the Standing Committee.

Key issues discussed:

The date for the Standing Committee meeting has not been confirmed but could be as early as July 2019. In addition to the joint report, a Decision was adopted by the CoP that instructs the CITES Secretariat to develop a proposal for consideration by the 73rd Standing Committee on possible approaches to be explored to address the financial and operational sustainability of the MIKE and ETIS programmes. Funds are required to undertake the work.

TAG Recommendations:

17.1 MIKE report to SC73: The MIKE CCU to prepare the MIKE report including the PIKE trend analysis based on the existing data (2003-2018) by the beginning of November 2019 (note – the GLMM with some adjustments to address for pseudo replication will be used for the analysis). The new analysis will be shared with the range States at the MIKE Regional meeting. If the 2019 data is received by the end of January 2020, the analysis will be updated.

17.2 The MIKE CCU and TRAFFIC to discuss the Decisions relating to the financial and operational sustainability of the MIKE and ETIS programmes and report to SC73, considering the lack of funds currently to undertake the work.

17.3 ETIS report to SC73: Annual trend analysis to be done by the end of the year.

17.4 Report by the IUCN AfESG and AsESG to SC73: AfESG to prepare its report to SC73 before the end of the year when the MIKES project comes to an end.

18. **Image-based counting (Oblique camera count)**

Dr Richard Lamprey presented a presentation on the implementation of a new survey method, referred to as an Oblique Camera Count. The method does not require any observers and only cameras are used during the transect flights but trained ‘observers’ are used to assess the images produced.

Key issues discussed:

There is a significant gap between the current methods used and the oblique camera count method. A number of surveys are done where a combination of rear seat observers and cameras are used.

There are advantages associated with the oblique camera count method, including:

- Improved accuracy
- Permanent record of survey count
- Sample size can be determined for the entire survey
- Simple means to gather data in the field

Concerns raised by some TAG members include:

- The costs associated with this method (the oblique camera count method is approximately 27% more expensive than strip transect counts)
- The delays caused due to the time required to assess the photos (Tsavo core area: >160 000 photos with approximately 2800 with wildlife images – machine learning will assist in reducing the time required to assess the photos)
- A limited number of surveys have been done using this method, but a manuscript on the method will be published in due course (based on the Tsavo Core area survey that included a sample 'systematic reconnaissance flight' (SRF sample count), conducted with rear-seat-observers (RSOs), as well as an oblique camera count).
- Comparability of surveys: Data should be comparable to data from previous surveys.

TAG Recommendations:

18.1 MIKE CCU to make the presentation available to the TAG members

18.2 The presentation to be considered in terms of the review of the MIKE aerial survey standards. Dr Lamprey to present the oblique camera count method at the expert workshop scheduled to take place in October 2019 to discuss the review of the MIKE aerial survey standards.

19. Review of MIKE aerial survey standards

The need to review the MIKE aerial survey standards was discussed at the 14th meeting of the TAG. Since 2012, survey methods have been further refined and new methods have been developed and although the MIKE programme no longer funds surveys, the standards remain an important resource for range States that is used to guide elephant population surveys. The TAG advised that the MIKE aerial survey standards should be reviewed to assess whether any changes are required and whether additional standards for new methods may be needed.

Key issues discussed:

The MIKE CCU appointed a consultant to assist with the review, and WWF organised an expert's workshop to discuss the standards; identify any changes required and additional standards required.

The following comments, to be considered during the review of the aerial survey standards, were made by the TAG members:

- Standards for the use of cameras in aerial surveys: The current standards do not seem adequate and requires updating.
- Image-based counting: Consider whether there are existing standards that can be included at this point in time.
- Jolly's method for unequal sized sampling units – should that be "reviewed"? The following issues were raised in this regard: Inappropriate calculation of confidence intervals & assumption of random distribution.
- Observer issues: Observer requirements / standards must be documented properly (not currently part of standards) (Issues such as training, observer fatigue, etc.)
- Cost consideration should be kept in mind – the MIKE standards provided a minimum set of standards that the majority of range States could adhere to. If the standards have a significant

impact on cost, it will have implications in terms of the range States' ability to adhere to the standards.

- Ways to address non-detectability: This may not be an aspect that can be addressed through the review of the standards.

The TAG members also briefly discussed alternative techniques / methodologies used to estimate population size in specific/unique situations, e.g. "elephants in gallery forests / in canopy forests", method used to count elephants in and around water course. There may be a need to document these methods.

The TAG furthermore also discussed whether there is a need to "transfer" the aerial survey standards to the IUCN, especially considering that the MIKE Programme no longer funded surveys. The importance of the MIKE standards, especially to range States, should be considered.

TAG Recommendations:

- 19.1 Issues raised by the TAG members to be considered in the process to review the MIKE Aerial survey standards.
- 19.2 TAG statisticians to assist in "review" of Jolly II.
- 19.3 MIKE CCU, in collaboration with the IUCN AfESG, to consider documenting alternative techniques used in unique situations to estimate population sizes.

20. Review of MIKE dung survey standards

The MIKE CCU indicated that the process to review the current MIKE Dung Survey standards have not been initiated.

Key issues discussed:

Chris Thouless reflected on the suite of experimental approaches that are currently being used, including the DNA capture-recapture method, individual identification, fixed point distance sampling using camera traps; as well as some of the challenges associated with the current MIKE dung survey methodology (measuring decay rate, defecation rates not always measured on site). The TAG discussed the need for a ground count manual but proposed that this be considered when the current experimental work has been concluded.

TAG Recommendations:

- 20.1 MIKE CCU to consult with five or six leading practitioners (to be identified in collaboration with the IUCN AfESG and AsESG) to confirm whether the current MIKE dung survey standards could still be used in the interim (until a review and update can be done).
- 20.2 The MIKE CCU, in collaboration with the IUCN AfESG and AsESG, to compile a document that reflect a summary of the current methodologies used by range States to estimate population sizes in forested areas.

21. MIKE Regional meeting

- 21.1 Proposed agenda

The MIKE CCU shared the provisional agenda for the MIKE regional meeting with the TAG. A key item on the agenda is an engagement between the sub-regions and the sub-regional representative on the MIKE ETIS TAG. This will present an opportunity to the TAG sub-regional representatives to discuss issues of importance with the range States. During the

meeting the sub-regional representatives from Central and West Africa confirmed their availability to attend.

The TAG members were requested to submit comments on the provisional agenda to the MIKE Coordinator.

TAG Recommendations:

21.1.1 MIKE CCU to amend the agenda based on comments received.

21.1.2 MIKE ETIS TAG sub-regional representatives for Africa to attend the MIKE Regional meeting.

21.2 Role of TAG members

As discussed above, the sub-regional representatives on the TAG were requested to attend and participate in the meeting.

22. Any other business

22.1 Scope of issues addressed by TAG

Concerns were raised about the scope of issues to be addressed by the TAG. The MIKE Coordinator prepared a summary of the priority issues for the short and medium term to ensure the TAG members have a common understanding of the most pertinent issues that will be addressed. The following were agreed as priorities:

A. Data collection and management

- i. Decision tree: Develop a decision tree to guide decision making relating to type and cause of death.
- ii. Training material:
 - o Comments from TAG members to be considered in the development of the training material.
 - o The contact group that was established will further engage on the training material.
- iii. Online database:
 - o Align the carcass forms, MIKE excel workbook and database.
 - o Develop a user manual that includes guidance on how to capture data and clarify possible uncertainties.
 - o Ensure TAG members have read only user rights
 - o Resolve outstanding data reconciliation issues (site specific recommendations)

B. Data analysis (PIKE)

- i. Model:
 - o GLMM with some adjustments to be further developed and the PIKE trend analysis for SC73 should be based on the new model (with the old to show changes)
 - o Sensitivity analysis should be done, and weighting based on population size
 - o Further exploration of more complex / advanced models (as part of Future Activities)
- ii. Biases:
 - o Natural mortality – Define / explain natural mortality; document the range of natural mortality rates and the use of the rates in the poaching rate equation.
 - o Differential detection probability – Develop a one-page documents on possible options to address this bias; and assess information in dung surveys to determine if it could be used to address this for forest populations.
 - o Patrol effort – Continue to collect and consolidate basic patrol data.
- iii. Poaching rate: Exclude other types of death (only illegally killed and natural mortality); and develop a document on FAQ relating to the calculation of poaching rate (incl. assumptions).
- iv. PIKE threshold: Continue to engage UNEP Wildlife Division on modelling to assist in understanding the importance of thresholds.

- v. Explanatory notes for analysis: Develop a technical and non-technical guideline to explain the analysis.
 - vi. Reports (Standing Committee): Prepare and submit reports to CITES Standing Committee meeting (73rd SC meeting).
- C. Site review
- i. Asia:
 - o Power analysis to be done with a 5-year trend
 - o Consultation with range States
 - o Feedback to TAG and MIKE-ETIS Subgroup
 - ii. Africa
 - o Power analysis to be done with a 5-year trend
 - o Following issues to be addressed, prior to consultation with range States:
 - Site level attributes (sites with different attributes needed)
 - Covariates (sites with different covariates needed)
 - Marginal areas (not only core conservation areas)
 - Spatial correlation to be considered
 - o Consultation with range States
 - o Feedback to TAG and MIKE-ETIS Subgroup
- D. Future Activities and Research
- i. Explore advanced models (bivariate poisson)
 - ii. Review of PIKE vs population trajectory and carcass ratio for sites with multiple surveys
 - iii. Poaching pressure (considering varying levels of mortality)
 - iv. Integrating AED, ETIS and MIKE
 - v. TAG sub-regional members to attend sub-regional and regional meetings

23. Action items

The MIKE Coordinator prepared an action list that was briefly presented and discussed during the meeting. The document was made available to the TAG members for consideration and comments within a two-week period.

24. Date and venue for the next meeting

The Chair thanked all the TAG members for attending the meeting and their active participation. Due to the uncertainty relating to future funding, a date for the next meeting could not be confirmed.