MIKE REPORT

LEVELS AND TRENDS OF ILLEGAL KILLING OF ELEPHANTS IN AFRICA TO 31 DECEMBER 2016 – PRELIMINARY FINDINGS

Background on MIKE

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

MIKE aims to inform and improve decision-making on elephants by measuring trends in levels of illegal killing of elephants, identifying factors associated with those trends, and building capacity for elephant management in range States. MIKE operates in a large sample of sites spread across elephant range in 30 countries in Africa and 13 countries in Asia. There are some 60 designated MIKE sites in Africa, which together hold an estimated 30 to 40% of the African elephant population, and 27 sites in Asia.

MIKE data is collected by ranger patrols in the field and other means in designated MIKE sites. When an elephant carcass is found, site personnel try to establish the cause of death and other details, such as sex and age of the animal, status of ivory and stage of decomposition of the carcass. This information is recorded in standardized carcass forms, details of which are then submitted to the MIKE Programme. A database of more than 15,900 carcass records has been assembled to date, providing the most substantial information base available for making a statistical analysis of the levels of illegal killing of elephants.

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

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

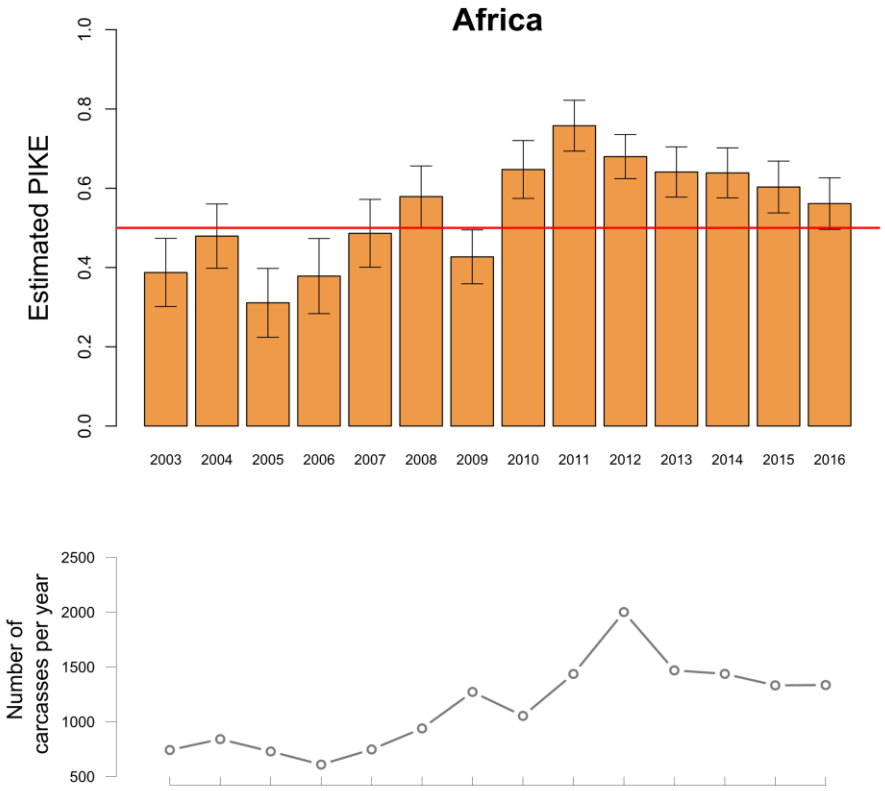
Details of the MIKE trend analysis for 2016

Trend analyses of MIKE data using standardized methodology have been presented to the 15th, 16th and 17th meetings of the Conference of the Parties to CITES, in 2010, 2013 and 2016 respectively; to the 61st, 62nd, 65th and 66th meetings of the CITES Standing Committee, as well as to other meetings such as the African Elephant Summit (Gaborone, December 2013) and the Kasane Conference on Illegal

Wildlife Trade (Kasane, March 2015). In addition, analyses of MIKE data have been published in the peer-reviewed scientific literature (Burn et al. 2011; Wittemyer et al. 2014).

Since the report submitted to the 17th meeting of the Conference of the Parties to CITES held in South Africa in September-October 2016, which included records received up to the end of 2015, records for 1,335 elephant carcasses encountered in the course of 2016 were received from 33 sites in Africa. Records are still being sought from sites that have not reported, as a result this report is a preliminary analysis based on records received up to 31 December 2016. While the number of reporting sites declined compared to 2015, when 38 sites reported, the number of carcass records received is comparable (see Fig 1, lower chart).

The data set used for analysis consists of 15,942 records of elephant carcasses found between 2003 and



the end of 2016 at 51 MIKE sites in 27 range States in Africa, representing a total of 539 site-years. Data for Asian sites is still being compiled and will be presented in the MIKE report to the 69th Meeting of the CITES Standing Committee, which will be held in Geneva, Switzerland, from 27 November to 1 December 2017.

Figure 1. The upper chart shows the PIKE trend in Africa with 90% confidence intervals, based on 15,942 elephant carcasses (illegally killed or otherwise) reported to MIKE for the period 2003-2016. PIKE levels above the horizontal line at 0.5 (i.e. where half of dead elephants found are deemed to have been illegally killed) are considered cause for concern. The lower graph shows the total number of carcasses reported by year, irrespective of cause of death. The total number of carcasses reported per year has remained relatively unchanged since 2013.

Figure 1 shows empirically derived time trends in PIKE at the continental level for reporting African MIKE sites, with 90% confidence intervals. The chart shows a steady increase in levels of illegal killing of elephants starting in 2006, peaking in 2011, and leveling off and slightly declining thereafter. As in 2015, the PIKE level shows a slight decline but the estimated poaching rate in 2016 remains high – that is above a PIKE value of a half, more elephants die from poaching that die from natural causes. This may imply that elephant population at MIKE sites overall is likely to have continued to decline in 2016.

It is difficult to estimate poaching impact at the site level, especially in sites that do not have sufficiently large carcass sample sizes, or where there may be indications of bias in reported PIKE levels or where climatic conditions have dramatically varied, such as drought. Uncharacteristically, in 2016 the number of carcass records from Tanzania dropped by 55% relative to 2015 from three MIKE sites (Katavi Rukwa, National Park & Game Reserve, Ruaha Rungwa, National Park & Game Reserve and Selous-Mikumi, Game Reserve and National Park). As of now no explanation has been received why there was a significant drop in the number of carcasses reported from these sites in Tanzania. The absolute number of carcass records from Kruger (South Africa) notably increased from 74 records in 2015 compared to 165 in 2016. While the number of illegally killed elephants reported remained almost the same: 30, in 2015 and 46 in 2016, the resulting PIKE value for Kruger declined from 0.41 to 0.2. This may be explained by two consecutive years of below average rainfall and potentially higher natural mortality rather than an actual decline in the poaching losses there.

Among sites that have reported 20 or more carcasses in 2016, where the site-level PIKE can be taken to be relatively reliable, those that remain of concern (with a PIKE of 0.7 or higher) in 2016 include Garamba (Democratic Republic of the Congo); Gourma (Mali); Odzala-Koukoua (Republic of the Congo) and Niassa (Mozambique). In a recent correspondence in Cell Biology (Poulsen, 2017), 161 carcasses of poached elephants between 2012 and 2015 were reported at Minikèbè N.P (Gabon). This MIKE site last reported in 2014 with a total of 63 illegally-killed carcasses between 2012-2014. If the published numbers are correct then a total of 98 (=161-63) illegally-killed carcasses have not been reported in 2015. As of now no official numbers for 2015 and 2016 have been reported to the MIKE programme.

From 2015 to 2016 PIKE levels changed at several sites. Among these, where the change in site-level PIKE can be taken to be relatively reliable - sufficiently large carcass sample size (an average of 20 or more carcasses across years) - were Dzanga-Sangha (Central African Republic) where PIKE dropped from 0.43 to 0.23 (a decrease of 20%), and Tsavo Conservation Area (Kenya), where PIKE declined by 11%; in contrast, in Gourma (Mali), PIKE increased from 0.77 in 2015 to 1.0 in 2016 (a 23% increase). Sites from South Africa and Tanzania, that had unusual reporting patterns from previous years (see above), were not included in the analysis.

The PIKE levels over the last three years are reflected at the sub-regional level, with the PIKE values in the African sub-regions in 2016 being statistically indistinguishable from those reported in 2015 except for Eastern Africa (Figure 2). In Eastern Africa, PIKE levels declined from 0.42 in 2015 to 0.30 in 2016. This decline is principally due to the PIKE-site level in Tsavo Conservation Area (Kenya) in 2016, coupled with the number of elephant carcasses (illegally killed or otherwise) reported (170). Systematic exclusion of carcass data from East African MIKE sites in 2016 from the analysis shows that the carcass numbers from Tsavo had the highest influence on the decline of PIKE from 2015 to 2016 for the sub region. Without the 2016 Tsavo data in the analysis PIKE changed from 0.42 in 2015 to 0.36, a 6% decrease in 2016 whereas including the Tsavo data, PIKE changed from 0.42 in 2015 to 0.30, a 12% decrease in 2016. This highlights that regional trends can be influenced by local change at a single site.

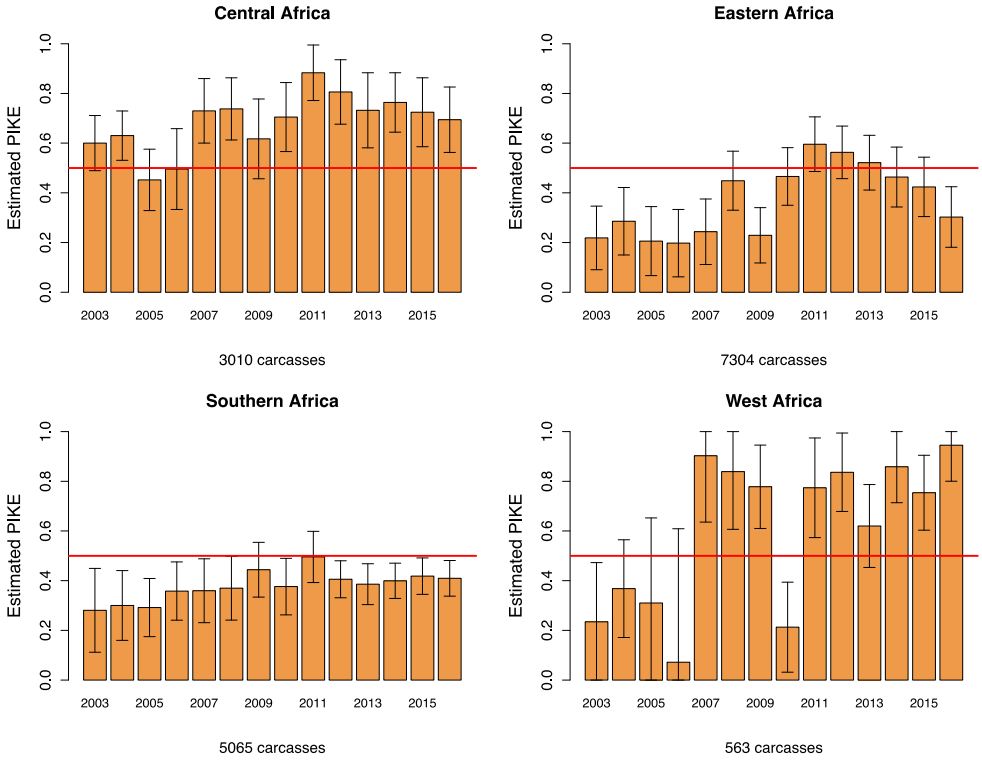


Figure 2. Sub regional PIKE trends with annual 90 % confidence intervals. The numbers of carcasses on which the graphs are based are shown at the bottom of each graph.

With only seven sites reporting data for 2016, West Africa continues to be a cause for concern in terms of data quantity and quality, making reliable inference on trends impossible for the sub-region.

Despite variation at the site level, poaching levels show a slight downward trend since 2011 at the continental scale, albeit at a potentially worrying levels, especially in Central Africa and specific sites in Eastern and Southern Africa. In West Africa, due to low reporting rates, it is hard to make reliable inference with the year over year trend.

References

Burn, R.W., Underwood, F.M. & Blanc, J., 2011. Global trends and factors associated with the illegal killing of elephants: a hierarchical Bayesian analysis of carcass encounter data. *PLoS ONE*, 6(9), p. e24165.

Farge, E., 2015. Poaching threatens Mali's rare desert elephants: UN mission. *Reuters Africa*. Available at: http://af.reuters.com/article/topNews/idAFKCN0S30MR20151009 [Accessed February 23, 2016].

Wittemyer, G. et al., 2014. Illegal killing for ivory drives global decline in African elephants. *Proceedings of the National Academy of Sciences,* 111(36), pp.13117–13121.

John R. Poulsen, Sally E. Koerner, Sarah Moore, Vincent P. Medjibe, Stephen Blake, Connie J. Clark, Mark Ella Akou, Michael Fay, Amelia Meier, Joseph Okouyi, Cooper Rosin, Lee J.T. White, 2017. Poaching empties critical Central African wilderness of forest elephants, *Current Biology*, *Volume 27, Issue 4*. Pages R134-R135, ISSN 0960-9822, http://dx.doi.org/10.1016/j.cub.2017.01.023.