

REPORT REVIEW

Renowned elephant ecologists and aerial survey experts review 2018 aerial survey of elephants and wildlife in northern Botswana

On the 7th January 2019, a comprehensive technical report on the 2018 Aerial Survey of Elephants and Wildlife in Northern Botswana was submitted to the Department of Wildlife and National Parks (DWNP). Prior to its submission, the report was extensively peer reviewed, verified and validated by some of the world's foremost authorities on elephant conservation and wildlife aerial surveys. The reviewers' names and comments from their examinations are listed below.

1. Dr Iain Douglas-Hamilton, CBE (<https://www.savetheelephants.org/about-ste-2/staff-trustees-2/#>)

One of the world's foremost authorities on the African elephant, Dr Douglas-Hamilton pioneered the first in-depth scientific study of elephant social behaviour. He received a DPhil in zoology from the University of Oxford. During the 1970s he investigated the status of elephants throughout Africa and was the first to alert the world to the ivory poaching holocaust. He chronicled how Africa's elephant population was halved between 1979 and 1989. He founded Save the Elephants in 1993. He serves on the data review task force of the African Elephant Specialist Group of IUCN, and the Technical Advisory Group for MIKE. In 2012, Dr. Douglas-Hamilton spoke before the Senate Foreign Relations Committee on Ivory and Insecurity: The Global Implications of Poaching in Africa. In 2013, Iain's high-level meeting at the White House was followed by both the Obama Executive Order, and the Clinton Global Initiative Commitment to action to Stop the Killing, Stop the Trafficking and Stop the Demand for ivory. For his work on elephants he was awarded one of conservation's highest awards the Order of the Golden Ark in 1988 and the Order of the British Empire (CBE) in 2015.

"I am very impressed with the thoroughness and expertise in the way the count was planned, implemented, analysed and written up. I found the methodology thorough, employing well tested standard methods developed over the years and embodied in the CITES guidelines for elephant surveys. The experience of the team was also an important factor for the success of the survey.

On the evidence I am persuaded that your conclusion is correct that there has been an overall increase in elephant poaching in Botswana, particularly in areas where clear hot spots are shown by the concentration of poached elephant carcasses. I also agree from the evidence, both trends and current carcass ratios, that there has not yet been a significant decrease in numbers.

However, from a number of studies elsewhere in Africa, an initial increase in elephant poaching similar to that now seen in Botswana, has often been a precursor to major reductions subsequently. In my view your count showing that elephant poaching has increased to a greater level than any previously recorded raises the possibility that further escalations are possible."

2. Dr Keith Lindsay (<https://www.elephanttrust.org/index.php/meet-the-team/item/dr-keith-lindsay>)

Keith Lindsay is a conservation biologist and project manager with the Environment & Development Group (EDG) in Oxford, with over 30 years' professional experience. He has undertaken or managed projects in biodiversity research and conservation, protected area monitoring and management, environmental assessment, land use planning, information systems and institutional analysis in the Middle East, South-East Asia, Latin America, the Caribbean, Europe, Canada and all parts of Africa. His involvement with elephants dates back to 1977, when he joined AERP. Beginning by building second-hand radio-collars and monitoring

vegetation plots, his work led to MSc and PhD research projects on feeding ecology, habitat interactions and population demography, and more recently the analysis of ecosystem change with Geographic Information Systems. A past member of the African Elephant Specialist Group, he maintains his research interests in the conservation of African elephants, with particular reference to population management, ivory trade and welfare issues. Recently, he has worked on elephant conservation in relation to CITES – including the links between culling and financial aspects of the ivory trade, consultations by the South African government on culling policy in Kruger National Park and helping Kenya Wildlife Service develop its national elephant strategy.

“This report is very well-written. The methodology of data collection and analysis is thoroughly and transparently described and justified, so that the results and conclusions – which are clear and objective – are well-supported. This 2018 survey was clearly the most precise, and quite possibly most accurate, survey of elephant numbers, trends and poaching pressure undertaken to date in northern Botswana. Its conclusions are robust, and indisputable.”

3. Dr Keith Leggett (<https://www.bees.unsw.edu.au/keith-leggett>)

Director of Fowlers Gap Research Station, UNSW. Field of Research: Arid zone, mammals, behaviour and ecology. Dr Leggett is a spatial ecologist and is primarily interested in movement biology. He worked on the desert elephants in north-west Namibia for many years, where he focused on elephant movement ecology and human–elephant conflict mitigation in arid environments.

“This aerial survey is considered to be the most comprehensive survey of wildlife ever undertaken in northern Botswana. The aerial survey techniques used are systematic, methodical and the “standard operating procedures” used across Africa for aerial surveys for the least 30 years. The intensity of the survey is greater than would normally be expected, but this enhances the validity of the data. The observers are experienced and their reported variation in data gathering is within ‘experimental error’. The conclusions drawn from the data are scientifically sound and valid.

I can find no fault with the manner in which Dr Chase and his team have analysed and reported the poaching incidents in northern Botswana, which were in accordance with the IUCN MIKE (Monitoring the Illegal Killing of Elephants) protocols. Their methods are sound, their findings are accurate, and I believe their conclusions are valid.

It is safe to say that, if the observed poaching trend continues, there could be a significant decrease in elephant populations, which could very easily undermine conservation efforts. Politicians never like to see negative publicity: however, this should act as a warning call, and preventative action taken.”

4. Professor Samuel Wasser (<http://conservationbiology.uw.edu/about-us/director/>)

Dr. Samuel Wasser holds the endowed chair in Conservation Biology at the University of Washington, where he is a Professor in the Department of Biology and Director of the Center for Conservation Biology.

He is acknowledged worldwide for developing noninvasive tools for monitoring human impacts on wildlife. Professor Wasser pioneered methods to measure the abundance, distribution and physiological condition of wildlife from their feces, relying on detection dogs to locate these samples over large wilderness areas. He uses these methods to address diverse conservation questions including impacts of poaching, oil

development or overfishing on the well-being of multiple endangered wildlife populations. He also applies these tools to forensic analyses of transnational wildlife crime. He used elephant dung to assemble a DNA reference map of elephants across Africa, which is now widely used to determine the geographic origins of poached ivory. By comparing genotyped ivory to this reference map, he has been able to identify Africa's largest elephant poaching hotspots, track the number and connectivity of major ivory traffickers operating in Africa, and uncover strategies that transnational organized crime syndicates use to acquire and move their contraband around the world. This work has led to prosecutions of major transnational ivory traffickers and nurtured key collaborations with the International Consortium on Combatting Wildlife Crime, INTERPOL, US Homeland Security Investigations, the Task Force on Combatting Wildlife Trafficking, US Fish and Wildlife Service, US Department of State and wildlife authorities in numerous source and transit countries across Africa and Asia.

"This is an exceedingly thorough and well conducted analysis of wildlife numbers in northern Botswana, and especially of the African elephant population in that area. Surveys were conducted by fixed wing aircraft with left and right observers, documented to have high interobserver reliability. Additional ground truthing was conducted of fresh and recent carcasses to confirm or refute signs of poaching. Criteria used to distinguish fresh, recent, old and very old carcasses were well defined and documented, as were criteria used to assess the probability that the elephant was the victim of poachers. The report also included an extensive appendix with substantial photo documentation of the measures used to assess cause of death of elephants surveyed in this study.

The large number of crosschecks employed to support the validity of the authors conclusions was exceptional and thorough.

In summary, this is a very thorough and carefully documented report demonstrating exceptionally high rigor. Based on recent press reports, this is clearly a sensitive issue and the authors have gone to great lengths to both document their findings and present them in a conservative and thoughtful manner. The findings in this report should greatly serve Botswana authorities by carefully documenting poaching hotspots in need of increase law enforcement efforts."

5. Dr Paul Elkan (<https://global.wcs.org/Resources/Staff/projectid/-1/currentpage/65.aspx>)

Senior Conservationist for the Wildlife Conservation Society. Completed his BA at St Lawrence University in Political Science with a Minor in Biology and fulfilled his service in the Peace Corps Cameroon, W. Africa as a biology teacher and a volunteer for WCS elephant tagging and monitoring program. He then moved to the Republic of Congo to conduct his PhD research on bongo antelope, and 2 years later ended up as the Director for one of WCS's largest and innovative projects working to promote sound wildlife management and land-use planning in forestry concessions. While running this project, he completed his PhD degree at UMN in Conservation Biology. Six years after establishing this project, he was moved to the capital, Brazzaville where he helped to bring together six Projects into a Country Program as Country Director, and established one of WCS's largest Programs in Africa. Four years later Paul moved to Southern Sudan where he is today. His survey work indicated that Southern Sudan hosts what many believe is the world's second largest migration of land mammals, resulting in worldwide press and hope for this new nation.

"The survey design and methods as well as implementation is of very high standard and well within current accepted aerial survey standards for strip sampling. Excellent scientific effort in documenting the actual observations through ground verification providing indisputable evidence of the observations.

Regardless of overall estimates (and the associated uncertainties), the fact that 128 recent/fresh carcasses were observed (not estimated) out of which 80% were verified (certain and probable) illegally killed is highly significant and cause of great concern. Further, it can be assumed that the fresh and recent carcass estimate is an underestimate of the actual situation.”

6. Professor Rudi van Aarde (<http://www.ceru.up.ac.za/meetus/index.php>)

Directs the Conservation Ecology Research Unit (CERU) as a self-sufficient research entity funded via grants from national and international organisations and private industries. These grants also support research fellows, support staff, and post-graduate bursaries. My research on elephants focuses on the drivers of demographic variability and heterogeneity in spatial utilization, with emphasis on finding solutions for the causes rather than symptoms of so called 'elephant problems'. This research is conducted across gradients of environmental and management conditions in southern African protected areas in Mozambique, Malawi, Zambia, Botswana, Namibia, and South Africa. CERU's development of the 'megaparks for metapopulations' concept is an innovative platform for elephant management that emphasizes spatial structuring of populations and demographic responses to heterogeneity in environmental resources. This management option has important implications for the continuing and controversial debate on elephant management.

“A commendable survey effort. In essence your survey shows overall stability in elephant numbers, probably since 1996, localised changes in distribution that we yet do not understand but which could be due to localised changes in resource quality and quantity induced by rainfall changes (spatial and temporal heterogeneity). The directional negative trend in Chobe National Park’s elephant population is of some concern and needs detailed investigation. The upward rate of poaching is of major concern.”

7. Dr Richard Fynn (http://www.sawma.co.za/images/4_AGM2013_Invited_Theme_Speakers.pdf)

Currently Senior Research Scholar at the Okavango Research Institute (since 2009), working on rangeland ecology and herbivore ecology. His qualifications are: National Diploma in Nature Conservation, BSc (Botany and Grassland Science), BSc Hons. (Grassland Science), MSc. (Rangeland Ecology), PhD. (Plant Ecology). Dr Fynn has broad research interests related to plant-herbivore interactions, which can otherwise be referred to as grazing ecosystem ecology. He is particularly interested in the concepts of functional habitat heterogeneity and herbivore adaptive foraging strategies in relation to large spatial and temporal variation in resources in African Savannah ecosystems and how these factors affect the productivity and stability of herbivore populations. Dr Fynn is also very interested in the ecosystem engineering effects of large herbivore populations on ecosystem processes and functioning such as nutrient cycling, grassland composition, structure and productivity, forage quality and tree-grass interactions.

“This is an important survey. The survey work and the statistical analyses have been conducted using scientifically robust methods, according to accepted protocols. Moreover, the survey work was conducted with exceptional detail and coverage. The findings of the survey are very important in that this is the third such survey since 2010 and it enables trends in wildlife numbers to be established from data derived from the same researcher using the same sampling intensity and protocol.”

8. **Falk Grossman** (<https://mozambique.wcs.org/About-Us/Staff.aspx>)

Niassa Reserve Conservation Aviation Manager and Elephant Protection Coordinator. His main interests are landscape ecology, the status and trends in wildlife on the African continent, wildlife survey methods, aerial survey methods, and GIS & RS and OpenSource GIS & database applications in developing countries. Falk has planned and executed landscape scale wildlife surveys in all five World Heritage Sites in DR Congo, in addition to a number of other sites - with a particular focus on Bonobo, Chimpanzee, Gorilla, Elephant and Okapi. He has conducted further ecological field research in Tanzania, Kenya, Iceland, UK, DRC and South Sudan, and holds a US Commercial Pilots License (CPL) with an Instrument Rating (IR). Falk led Mozambique's national elephant survey in late 2014, before joining WCS Mozambique in mid 2015 and moving to Niassa Reserve in his current role.

“The survey implementation is well documented providing reason for high confidence in the presented conclusions reached in regard to elephant trends and the certainty of incipient elephant poaching taking place at significant levels within certain, identified hot spots. These observations are further supported by a set of collaborative evidence.”

9. **Dr. Chris Thouless** (<https://www.savetheelephants.org/about-ste-2/staff-trustees-2/>)

Has nearly 30 years of experience working for governments, NGOs and private sector in Africa and Asia. He has a particular interest in elephant conservation, having worked on elephant movement patterns, human wildlife conflict and elephant surveys in several countries. He was Chairman of CITES Panel of Experts on the African Elephant in 1996 and has been a member of the IUCN Species Survival Commission since 1986. He was lead author of the African Elephant Status Report (2016) and has been a member of the IUCN Species Survival Commission since 1986. Chris Thouless is Chair of the Data Review Working Group of the IUCN African Elephant Specialist Group. Chris holds an MA in zoology from the University of Oxford, and a PhD from the University of Cambridge. He was awarded the Queen's Gallantry Medal in 1991.

“This is not a full technical review of the methodology used, although the survey appears to have been carried out to a very high standard. All aerial surveys for wildlife are subject to various sources of error, but efforts have been made to keep these to a minimum, and overall this is an impressive piece of work.

The report presents strong evidence that there has been a relatively high level of poaching (for Botswana, rather than Africa as a whole) during 2018 and in previous years.”

Note: The 2018 aerial survey was funded by both Elephants Without Borders and Conservation Trust Fund (CTF). An independent board voted unanimously in favor of awarding a grant to EWB. CTF is specifically mandated by the Convention on International Trade in Endangered Species (CITES) to use CTF funds explicitly for elephant conservation. EWB was not contracted by DWNP and no taxpayer funds were used to pay for this survey. The experienced survey team included a DWNP observer throughout the duration of the survey.