

ZAMBIA

IMPLICATIONS OF THE ADOPTION OF THE PROPOSAL

1. If the proposal of Zambia were adopted, all ivory of Zambian origin, wherever it is currently held, would effectively be from a species in Appendix II of the Convention. However, the adoption of the proposed annotation would mean that no trade in ivory would be possible under the provisions relating to species in Appendix II except for hunting trophies and the government-owned stock of ivory originating in Zambia, excluding seized ivory and ivory of unknown origin. In effect, this means the stock owned by Zambia Wildlife Authority and derived from natural mortality and from problem-animal control. All other ivory of Zambian origin would be subject to the provisions for trade relating to species in Appendix I.
2. Neither the proposal nor the supporting statement indicates a cut-off date to identify exactly which of the eligible ivory tusks and pieces in the strongroom are included in the stock proposed to be sold (e.g. ivory that was held in the strongroom on 14 October 2009). This leaves some ambiguity about which pieces of ivory are covered by the proposal to allow a "one-off sale". As the proposal does specify the total amount of ivory that could be traded if the proposal is accepted, the Conference may consider this imprecision of little importance.
3. Acceptance of the proposed annotation would mean that the international trade would be permitted in live elephants of Zambian origin to 'appropriate and acceptable destinations'. However, the Panel has not considered this aspect of the proposal, which is outside its terms of reference.

STATUS AND MANAGEMENT OF ZAMBIA'S ELEPHANT POPULATION

Viability and sustainability of the population, and potential risks

Viability

4. Zambia's Protected Area network covers 30% of the country (224,075 km²) for which ZAWA is responsible. There are 19 National Parks covering 63,587 km² (28%) and 32 Game Management Areas (GMAs) 160,488 km² in extent, or 72% of the country's PA network (Nyirenda, *et al.*, 2008; IUCN 1987). Most GMAs, which are inhabited by rural farmers, either surround National Parks or are adjacent to them.
5. Elephants in Zambia extend across seven sub-regions or ecosystems covering the protected area network, namely Tanganyika and Bangweulu in the north, West Lunga in the north-west, Luangwa in the north-east, Kafue in the south central area of the country and Upper and Lower Zambezi along the Zambezi river and valley. In 2008, the first ever countrywide survey and census of elephants in Zambia, using both stratified sample and total counts (Norton-Griffiths, 1978), estimated that the elephant population comprised 26,382±4,405 (95%CL¹) animals over 166,713 km² or almost 70% of the protected area network (Simukonda, 2009). The survey did not cover West Lunga because of time and financial constraints.
6. The Luangwa system supports most elephants, with 18,634±3,592 (72%), followed by Kafue with 3,348±933 (13%), Upper Zambezi 2,464±2,239 (9%) and Lower Zambezi 1,299±860 (5%) elephants. Of this total number, 66% were in National Parks and the remainder (34%) in GMAs. Only in the Lower Zambezi system were the majority of elephants (78%) counted outside the National Park, these being found mostly in Chiawa GMA (45%) and Rufunsa GMA (10%).
7. In the northern Tanganyika system, over a survey area of 7,083 km², elephants were seen only in Nsumbu National Park, with an estimate of 27 animals. Simwanza (2003) estimated a population of 65 in 2003. Both estimates are derived from aerial surveys over a habitat of dense itigi thicket to which dung counts are probably better suited. In Bangweulu (15,115 km² surveyed) elephants were sighted only in Kasanka National Park, providing an estimate of 136 animals. The area is adjacent to the Democratic Republic of the Congo, across which border elephants could possibly be moving.

¹ Confidence Limit

8. Whilst elephants still occupy historical range in Zambia (Ansell, 1978), numbers, range and connectivity have been much reduced over the past 40 years, especially among the northern populations where elephant numbers and density are very low and restricted, as shown by the survey data for Tanganyika and Bangweulu. Connectivity between West Lunga and Kafue is uncertain and even unlikely but there is no confirmation of this as West Lunga was not surveyed. Consequently, and as the survey results reveal, most elephants (99%) are found in the subpopulations of Luangwa, Kafue and the Lower Zambezi.
9. The South Luangwa Area Management Unit (SLAMU), comprising South Luangwa National Park and Lupande GMA, is the one area in the Luangwa system where long-term estimates of elephant numbers provide comparable trend data. Between 1993 and 1999 elephant numbers ranged from 5,929 to 8,834 ($n = 5$ surveys, Jachmann and Phiri, 1999). From 2000 to 2008, numbers ranged from 2,414 to 9,176 ($n = 4$ surveys, Simukonda, 2009). Although both Jachmann and Phiri (1999) and Simukonda (2009) report significant differences between years for a number of these estimates, there appears to be neither an increasing or decreasing population trend over the past 17 years in a population that has not exceeded 10,000 elephants.
10. For Kafue, a separate survey was undertaken by Frederick (2009) on behalf of ZAWA, the results of which are incorporated into the main countrywide report by Simukonda (2009). As only 68% of the Kafue system could be surveyed, because of a restricted area in Zambian airspace, the results were extrapolated for the entire area. Based on this, there has been a significant increase in the elephant population from $1,555 \pm 876$ (95% CL) elephants in 2004 to $3,348 \pm 933$ in 2008, but not from 2006 ($2,506 \pm 1,212$). Wildlife trends generally in Kafue show high variation between surveys over the past 18 years, owing more to poor application of survey methods and analysis (Frederick, 2009) than to seasonal fluctuations, so that long-term trends are difficult to analyse, given the variable nature of these surveys. However, since the sharp decline of the late 1990s to the early 2000s, to fewer than 2,000 elephants, as a result of poaching and lack of enforcement, especially in Kafue National Park, the Kafue population now appears to be slowly increasing again.
11. In Lower Zambezi, the elephant population estimate in 2008 was $1,298 \pm 860$ (95% CL) which was not significantly different to the 2003 estimate of $1,522 \pm 768$ (Dunham, 2004). Simwanza (2005) provides an estimate of 3,417 elephants in 2005 and, for 2007, Simukonda (2009) reports an unreferenced estimate of 1,413. Additionally, these estimates are derived from survey areas of differing sizes. Although a possibly declining population is indicated, there is no significant trend over all counts between 2003 and 2008 ($n = 4$ surveys). In 2008, most elephants were found outside Lower Zambezi National Park (78%) with 586 animals (45%) in Chiawa GMA. Fluctuating numbers both in the National Park and the GMAs are related to movement across the Zambezi river to and from Zimbabwe, where there is no settlement on the opposite bank.
12. Elephant populations in Upper Zambezi are also part of cross-border populations (with Angola, Botswana, Namibia and Zimbabwe). The only elephants observed in this very large area of 18,563 km² were in Sioma Ngwezi National Park, where the population was estimated at $2,433 \pm 2,239$ (95% CL). In the small fenced Mosi-oa-Tunya National Park of 67 km², 31 elephants were counted. Compared to previous unreferenced estimates of 1, 975 and 788 elephants respectively in 2004 and 2007, this population appears to be increasing.
13. Total population estimates for elephants in Zambia, as summarized on the African Elephant Database in 1995, 1998, 2002 and 2007 (respectively Said *et al.*, 1995; Barnes *et al.*, 1998; Blanc *et al.*, 2002; Blanc *et al.*, 2007), all indicate a population that is between a minimum of 16,562 definite elephants and a maximum of 29,229 (the sum of probable, possible and speculative estimates) so that no clear overall population trend is evident. The 2008 estimate of ca. 26,000 elephants is, however, the highest figure reported to date over this period. The present population can therefore be considered stable and viable (certainly the Luangwa and Kafue subpopulations), and possibly increasing.

Sustainability

14. Legal offtakes of elephant in Zambia are those related to natural mortality, problem-animal control (PAC) and trophy hunting. (See further below regarding the latter). From information provided to the Panel, it established that 122 elephants were destroyed on PAC between 2005 and 2008, an average of 31 animals yearly. Most PAC activity (>50%) takes place in the Eastern Region, in the Luangwa system GMAs adjacent to South and North Luangwa National Parks. This is followed by Lower Zambezi, in the Central Region, where 30% of elephant control occurs, again in the GMAs, notably Chiawa. Only about 2% of all PAC occurs in the Western Region (Kafue system). There is increasing PAC in the Northern Region (Tanganyika-Bangweulu system) where 12 elephants were destroyed in 2008 alone. This region accounts

for 17% of all PAC elephant destroyed. However, it is unlikely that these animals were killed in the Tanganyika-Bangweulu systems and most likely they were destroyed adjacent to Luangwa in the Eastern Region.

15. The PAC offtake from each subpopulation is less than 1% (range 0.01-0.72) and they are all biologically sustainable. The offtakes in Lupande GMA and Lower Zambezi are 0.72% and 0.71% respectively. Sport hunting offtake in the same areas are seven male elephants for Lupande and five for Chiawa (mean numbers over five years), representing a 0.33% and 0.38% offtake respectively, so that total legal offtake amounts to 1.1% in each area. This level of offtake is probably sustainable for maintaining trophy quality, but preferably should be <1%. However, these legal offtakes need to take into account illegal offtake.
16. In Luangwa, carcass ratios averaged 1.57% with one high value of 13.1% in west Musalangu GMA to the north and west of North Luangwa National Park. Poaching activity in this area was confirmed by D. Lewis (pers. comm.), who informed the Panel that poached ivory moved into the United Republic of Tanzania through the border town of Nakonde near Tunduma in Tanzania. South Luangwa is a MIKE site with an average PIKE value of 0.49 between 2003 and 2008, suggesting that half of all carcasses detected by ground based patrols are illegally killed.
17. Carcass ratios were lowest in Kafue (0.97%) and highest in Lower Zambezi, with an average 14.37% ranging from 7.47-18.36%. The ratio of 18.36% was from Lower Zambezi National Park, where PAC and trophy hunting are absent. In Upper Zambezi the average ratio was 3.2%. Highest ratios are all in close proximity to international borders, i.e. North Luangwa (13.1%) and Lower Zambezi (14.4%).
18. With the exception of Lower Zambezi, both legal and illegal offtakes appear sustainable. For Lower Zambezi, the offtake data indicate the likelihood of a declining population.

Potential risks

19. Following the reductions of numbers, range and connectivity over the past 40 years, further losses, or the disappearance of subpopulations, cannot be ruled out if action is not taken urgently to address the risks. This requires meaningful investment to protect them.
20. Upper Zambezi is an important area in the context of planned regional economic development vis-a-vis the Kavango-Zambezi Trans-frontier Conservation Area linking elephant populations across the five range states of Angola, Botswana, Namibia, Zambia and Zimbabwe. There is also the possibility of re-establishing connectivity with the Kafue system. The apparent absence of elephants over a large part of the Upper Zambezi system, as reflected in the 2008 survey could prevent the realisation of these important trans-frontier and economically linked elephant conservation opportunities
21. The greatest risk lies in the Lower Zambezi, where further decline in the elephant population will affect sustainable use of elephants, which is of considerable importance to resident communities currently benefitting from elephant trophy hunting revenues. Ecotourism in Lower Zambezi National Park will also be affected so that levels of illegal activity need to be reduced as a first priority. Thereafter sustainable PAC and hunting offtakes can be properly managed.
22. All protected areas with elephant populations are adjacent to GMAs which support human livelihoods through the return of hunting revenues. The survival of elephants in these areas depends on the efficacy of mitigation of human elephant conflicts coupled with meaningful and timely disbursements of community benefits and active community involvement and participation in dealing with these problems.

Management Plan

23. A National Strategy for Elephant Management in Zambia was produced in 2005 with the following goal and objectives:
 - Goal: "Conservation of elephants at population level which promote conservation of biodiversity while providing for sustainable utilization."

24. The Strategy has 4 objectives with specific actions attached to each.

Objective 1. *To mitigate human – elephant conflicts*

Objective 2. *To reduce poaching levels*

Objective 3. *To establish and maintain a comprehensive ivory management system*

Objective 4. *To provide for sustainable elephant utilization*

25. Whilst a detailed assessment of this plan has not been undertaken by the Panel, a number of actions within the objectives have been implemented. The achievement and effectiveness of these are reflected in the different sections of this report.

26. General Management Plans for specific areas (e.g. Lower Zambezi) provide management objectives and guidelines.

Communities adjacent to elephant range

27. From ZAWA records, the Panel learned that, over the years 2005 to 2009, a total of USD 6,171,126 had been disbursed to 56 Community Resource Boards (CRBs) in 35 GMAs. This figure is 40% of total hunting revenue (USD 15,429,920) earned over the same period from foreign clients hunting in GMAs and accrued to ZAWA for subsequent disbursement to communities. On average this equates to an annual dividend of USD 21,653 to each CRB.

28. The disbursement mechanism is specified in the Wildlife Act and Regulations and stipulates that the hunting revenues (made up of concession and hunting fees) should be divided equally between ZAWA and the community concerned. Fees for elephant hunts are subject to a separate Statutory Instrument which stipulates payment of USD 10,000 per elephant. All fees due to CRBs are clearly documented by ZAWA, and hunting revenues are disbursed quarterly upon receipt of reports by CRBs on expenditure for the previous quarter and budgets for the forthcoming quarter. Traditional leaders (Chiefs) receive 5% of the 50% CRB disbursement directly.

29. The Panel met representatives of the Chiawa CRB at Chirundu in Lower Zambezi, including the Chairman, the Finance Officer and the Community Development Officer. The CRB's 2009 disbursement was USD 50,400. The CRB was in possession of a statement from ZAWA which detailed monthly payments received by ZAWA and the final division of funds.

30. The CRB allocates 20% of its share (45%) of the hunting revenue to administration, 35% to community projects, and 45% to wildlife management (salaries for 24 trained village scouts, patrol equipment and clothing, and patrol rations).

31. The CRB reported a high incidence of poaching during 2005-2006 and had information on an elephant poacher from Lusaka who had recently been caught. They believed that there were no foreign poachers (although this was not supported in later discussion with enforcement officials). They reported that elephants crossed from Zimbabwe especially during the hunting season and that both wet and dry season crops and fruit trees are ravaged by elephants. Crop damage and loss of life is a major problem facing the majority of villagers, with large groups of crop-raiding elephants limiting food production. Most human-elephant conflict mitigation methods are no longer working and elephants are shot only in cases of loss of human life. Between 2000 and 2010 elephants killed 20 people in this community.

32. At a later meeting with Nkambo Chieftainess Chiaba of the Goba People, at ZAWA headquarters in Chilanga, the severity of elephant conflicts and the associated problems faced by her subjects was confirmed to the Panel and further elaborated upon.

Sustainability of total levels of offtake

33. The causes of elephant offtake in Zambia are problem-animal control (PAC) (defence of human life and property), natural mortalities, sport hunting and illegal killing. ZAWA statistics provided to the Panel show between 26 and 35 elephants killed on control each year between 2005 and 2008, averaging 31 animals. However, a review of the ivory management database showed 525 whole tusks recovered from PAC operations during the same period, equivalent to a higher annual average removal of 66 animals.

34. Records of natural mortalities were not available for the whole country. However, the accumulation rate of ivory from natural mortalities and breakages is known from the ivory management database. On average, the tusks from at least 47 elephants were recovered annually between 2005 and 2009, plus a further 16 of unknown origin. Since 2005, ZAWA has maintained an annual quota of 20 trophy-quality males for sport hunting. In practice, the quota has never been fully used, with 60 hunted from the available 100 elephants from 2005 to 2009.
35. ZAWA records of poached elephants show an average of 59 animals killed annually in the period 1995-1998, although the numbers recorded have increased from 27 in 2002 to 70 in 2008. In 2008, 60 of the 70 illegal killings of elephants occurred in the South Luangwa and Lower Zambezi AMUs (Area Management Units).
36. The overall level of elephant offtake from all legal and illegal causes is therefore estimated to be a minimum of 208 annually (66 control operations + 47 natural mortalities + 16 unknown + 20 sport quota + 59 poached), which is equivalent to 0.8% of the 2008 elephant population estimate (26,382). Even if this value were substantially increased, to allow for undetected natural mortalities and poached elephants, it would still fall within the expected rate of increase of the elephant population, in the range 3-5% per annum. Thus, the Panel believes that overall elephant offtake can be considered as sustainable at the national level, especially when interpreted with the stable and possibly increasing overall elephant population since 2002.
37. Levels of offtake vary at the sub-national (AMU) level. In this connection, the Panel believes that the level of offtake is not sustainable in the Lower Zambezi ecosystem, where the 2008 census confirmed both a population decline since 2005 and the highest carcass ratio in the country (14.4% for entire ecosystem and 18.4% in Lower Zambezi National Park). Another localized area of concern is Musalangu GMA within the Luangwa ecosystem where the carcass ratio was 13.1%.
38. The Panel also assessed the sustainability of legal sport hunting. Annual quota of 20 animals has been maintained since the sport hunting of elephants in Zambia started in 2005, and is divided between Luangwa (16) and Lower Zambezi (4) ecosystems. The number of trophy-quality males removed from the population by other causes was assessed by examining the ivory management database, which showed a total of 112 whole tusks weighing more than 15 kg (the legal minimum weight for sport trophies) derived in the period 2005-2009 from PAC (62), natural mortalities (33) and confiscations (17). This represents the equivalent of a further 11 trophy-quality animals per annum. Taking into account the proposed increase in the sport hunting quota to 120 animals, the potential total offtake of 131 trophy-quality animals a year is equivalent to 0.5% of the 2008 total elephant estimate, which falls within the range 0.5-1% that is widely considered to be the limit to sustainable hunting of trophy-quality males in a healthy elephant population (Martin, 1986).
39. Analysis of trophy quality also allows an indication of sustainability. An analysis of ZAWA records showed a steady decline in average tusk weight from 23.1 kg in 2005 to 19.6 kg in 2009. It is of some concern that 2009 trophies are the smallest on record in terms of maximum weight, average weight and length, despite being above (on average) the minimum legal requirements. While the Panel believes that the legal hunting of trophy quality males is sustainable, ongoing monitoring of trophy quality is required particularly in areas where illegal offtake is relatively high (see paragraph 37). Further, the accumulation of 112 trophy-quality tusks from natural mortality, PAC and confiscations from 2005 to 2009 represented a large increase from 68 during the years 2000-2004, and highlights why such offtake should be factored into quota setting.

Zambia's ability to monitor its elephant population

40. Aerial surveys and wildlife monitoring in Zambia were previously undertaken by the Wildlife Resource Monitoring Unit, established under the Environmental Council of Zambia, to provide cost-recovery monitoring services, including training, on request, e.g. to the then Department of National Parks and Wildlife Services. Even so, survey coverage was incomplete or inadequate over the country, as was variability amongst surveys. After 2000, this service came to an end and aerial surveys were undertaken more opportunistically, often through donor or aid agency funding support. Consequently surveys over the past decade have been linked more to the availability of external support, directed mostly at the donor's area of interest, rather than the planned and programmed needs of ZAWA, further compounding the problems of inadequate coverage and survey frequency.
41. Although stratified sample counting (Norton-Griffiths, 1978), using either transects or blocks, has been employed as a standardized approach for estimating elephant population numbers, there have been differences within these; e.g. Jachmann and Phiri (1999) used double-counting (Graham and Bell, 1989) to

correct observer visibility bias whereas Dunham and Simwanza (2002) provided correction for observer sighting rates. For example, in the 2002 survey, one observer saw significantly fewer animals than the other. If the two observers had seen animals at the same rate, the estimated number of elephants would have been 28.5% higher than that reported. However the 95% CI on the estimate was $\pm 30.5\%$, and thus larger than the observer error, obviating the need for correction. Few elephant population estimates lend themselves to meaningful long term trend analysis, as reflected in the African Elephant Database.

42. The 2008 country-wide survey reflects a strong commitment to address these long-standing difficulties. Even so, much of this survey relied on outsourcing, in terms of equipment, expertise and funding (World Bank, Norwegian Government and African Wildlife Foundation) although the Government of Zambia, through ZAWA, met a large portion of the costs, including personnel costs and salaries. Although ZAWA has increasingly competent staff with monitoring experience and capability, further mentoring and guidance is required so as to provide robust and rigorous reporting in order to counter criticism from peer and outside review. ZAWA is still lacking ground and air transport and funds for the hiring of aircraft. Consequently, in its present financial situation, ZAWA does not have a number of the basic resources needed for monitoring its elephant population.

Effectiveness of current anti-poaching measures

43. The Panel was informed that ZAWA employs 1,189 law enforcement staff, including the staff of nine National Parks that cover the main elephant range. In addition, Village Game Scouts are employed by CRBs in some of the GMAs and patrol together with ZAWA Game Scouts. Anti-poaching efforts in GMAs are sometimes hampered by delays in salaries for Village Game Scouts.
44. It appears that there has been an improvement in the effectiveness of Zambia's anti-poaching activities, especially in the vast Kafue National Park, thanks in particular to the 'Support for Economic Expansion and Diversification' project there, supported by the World Bank. The project has funded the provision of vehicles for resource protection and training of officers, both of which have contributed to a reduction in poaching and an increase in arrests in the Park. Poaching however remains a big problem in several protected areas, notably in Lower Zambezi where 26 elephants were poached within the AMU in 2009.
45. The total number of patrol man-days for the four regions of the country (i.e. eastern, central, western and northern) increased from 159,857 in 2005 to 227,177 in 2008. Patrol man-days for 2008 among the four regions were: eastern 78,604, central 21,520, western 64,357 and northern 62,664.
46. In the nine National Parks, the patrol strength is currently about one scout to 50 km². This is generally considered to be the level of coverage that is needed for good protection of an area. However, the average for all protected areas is reported to be one scout to 105 km².
47. Annual expenditures on patrol in Zambia is currently about USD 50 per km² which is far lower than the generally accepted norm of USD 200 per km² required to provide adequate patrol of protected areas across southern and eastern Africa (Cumming, 2004). This draws attention to the need for better funding for wildlife protection. On the other hand the lack of funding is mitigated to some extent by initiatives to seek external support.
48. For example, ZAWA has initiated a 'Private Public Partnership' mechanism, whereby some protected areas are managed by private organizations, thus leaving ZAWA to deploy its scarce resources in fewer areas. An example is Liuwa Plains National Park, managed in partnership with Africa Parks.
49. In a similar vein, the panel was informed that the South Luangwa Conservation Society, working in GMAs in the Luangwa valley in 2009, supported ZAWA wildlife protection efforts by providing 3,562 mandays of anti-poaching work by scouts, during which period 53 suspects were apprehended 22 firearms confiscated and 38 pieces of elephant ivory recovered.
50. Other partners that help in control of poaching are the professional hunters because the areas where they operate tend to be avoided by poachers. But they sometimes also provide more direct assistance. The Panel was informed that Mr Barry Bell-Cross, a safari outfitter, has supported Lunga-Luswishi GMA by subsidizing its protection by almost 100 % through funding of patrols, providing vehicles for transport and maintaining a year-round presence.
51. There appears to have been an improvement in the organization of patrols in protected areas. During the Panel's visit to Lower Zambezi the ZAWA officers reported that they had started using a ranger-based

computerized protocol for law enforcement (MIST-Management Information System being applied in many MIKE sites elsewhere in Africa and Asia), which is already in use in South Luangwa and will later be used in other ZAWA Protected Areas. MIST allows more efficient and effective planning of law enforcement patrols and subsequent data entry and analysis.

ZAMBIA'S ABILITY TO CONTROL TRADE IN IVORY FROM AFRICAN ELEPHANTS

Control of ivory stocks

52. The Panel inspected the two strongrooms at ZAWA headquarters in Chilanga (near Lusaka) where ivory is centralized, including the ivory that Zambia is proposing to sell. The Panel was provided with an explanation of the ivory management procedures, a copy of the 2008 National Ivory Management System Procedures and Guidelines (which describe source categorization, documentation, marking, transfer, storage, database, staff and training) an internal audit report conducted by ZAWA in November 2009, and other relevant documentation. The Panel also visited the ZAWA office at Chirundu to review management practices for ivory sourced from Lower Zambezi.

Storage and separation:

53. Construction of a new strongroom at Chilanga was completed in 2008. This spacious strongroom contains all ivory known to have derived from legal origins (and some of unknown origin, kept separate). All ivory is stacked in an orderly manner on numbered wooden racks, with clear separation of tusks derived from natural mortalities and PAC operations, and a limited number of legal sport-hunted elephant trophies awaiting export. The rack numbers are also recorded on a Main Ivory Register and in a computer database. The Panel was able to locate individual tusks with relative ease.
54. The old strongroom remains in use and holds all ivory derived from illegal origins, including confiscations and recoveries from poached elephants. Within the confines of limited storage space, the majority of the ivory is placed on numbered wooden shelves. Exceptions include several labelled sacks holding most of the worked ivory, and a metal trunk containing smaller pieces of ivory.
55. The strongrooms are permanently guarded by armed ZAWA security personnel and metal security doors. Entrance requires the presence of two staff mandated to operate the dual lock system. The Panel inspected two access-control registers maintained by ZAWA since mid-August 2008. A comprehensive key-collection register is used to record the timing and purpose of all key movements from metal key safes. A register of visitors records the date, timing, identity and purpose of all entrants. It is apparent that limited random checks are made on the strongrooms. The Panel was informed that documentation pertaining to the ivory strongroom is kept in a locked metal cabinet in a separate location.
56. The Panel visited an outposted ivory storage facility, at Chirundu. The store room there was found to be secure but cramped, poorly arranged and with low air circulation.

Weighing and marking

57. The Panel was informed that when ivory is brought into official possession, it is first weighed and recorded at AMU level using a spring balance, and later re-weighed and recorded at headquarters using more accurate scales. Both weight measurements are recorded in the database. Length measurements are also taken in the field and headquarters.
58. Ivory is marked with two sets of numbering systems using indelible ink. Initially, it is marked at the AMU with four sets of digits. For example, the mark "SLAMU 09/026/20" represents the 26th tusk from South Luangwa AMU in 2009, weighing 20 kg. An analysis of the database confirmed that, in 2008, ZAWA made a strong attempt to standardize the ivory marking system used by AMUs, since it had previously been highly variable. Following receipt at headquarters, ivory is marked, using indelible ink, with a national tusk serial number in accordance with CITES Resolution Conf. 10.10 (Rev.CoP14). For example, ZM09/009/20 represents the ninth tusk collected from Zambia in 2009, weighing 20 kg.
59. There is some inconsistency in the marking of sport-hunted elephant trophies in the field and recording of details, although this is not believed to be of great concern, because of the low number of trophies. Once a CITES export permit is issued, sport-hunted elephant trophies are punch-died in accordance with the following example: ZM 06 LP 2009 T1 17.8 (country / serial number / area code / year/ tusk 1 or 2 / weight).

Registration and computerization

60. ZAWA has computerized the Main Ivory Register, a copy of which was made available to the Panel. The database is kept separate from the strongrooms, password-protected and with variable access levels. As of 2 February 2010, the total amount of ivory recorded in the database was 8,357 pieces, weighing 34,000.95 kg. This ivory has accumulated at Chilanga since 1992, following the burning of around 9.5 tonnes. Owing to ongoing accumulation, the Panel was not able to specify precisely which ivory was included within the 6,692 pieces weighing 32,230.03 kg declared in the proposal. The Panel was informed that ivory pieces weighing less than 1kg were not included in the proposal.
61. The Panel was shown four Main Ivory Registers spanning the whole period since ivory started accumulating at headquarters in March 2003. With the exception of the first register (used from 24 March 1993 to 30 November 2002), subsequent registers are in official printed books. The Panel also inspected copies of other official documentation implemented by ZAWA since mid-2008 in accordance with the National Ivory Management System Procedures and Guidelines, including the Area Management Unit Ivory Register, Ivory Dispatch Notes and Ivory Received Notes (the latter being vouchers). In the case of confiscated ivory, information is only entered into the Main Ivory Register after completion of the case when the ivory is formally surrendered to ZAWA by the police.
62. The licensing office maintains all records of sport hunting, trophy registration and export. The strongroom does not maintain a register for sport-hunted elephant trophies, which would otherwise facilitate checks of existing trophies. However, the Ivory Received Note voucher has been used to record trophies received since December 2008, while the Ivory Dispatch Note (or Stores Requisition Note) is issued to the owner when processing payments in preparation for export.
63. In the case of ivory received from mid-2008 onwards, the Panel is satisfied that this documentation provide the basis of a traceable audit trail, owing to: the cross-referencing of ivory and document serial numbers; the provision for counter-signatures at all stages of transfer; and the use of duplicate copies as confirmation of transfer and receipt to and from AMUs and headquarters. The documentation was found to adequately record the location, date and cause of death, how the ivory was obtained, and measurements of each ivory piece.
64. The Panel conducted numerous checks on randomly selected tusks from both stores, all of which were found to match supporting documentation satisfactorily, as well as an electronic database. Some minor discrepancies, clearly attributable to human error (such as weight measurements), were noticed in the database. A selection of confiscated tusks taken from the shelves was found to match the register entries from an audit report conducted by TRAFFIC in 1997.
65. Regarding source documentation, the Panel inspected copies of source documents that accompany ivory to headquarters. Existing documents are filed in an organized manner at headquarters. As documented in the 2002 report of the Panel of Experts, it is evident that not all original pre-2008 source documentation exists, while some did not always show the individual AMU serial numbers or measurements. In response, in the period 2008-9 each AMU submitted spreadsheets detailing ivory sent to headquarters since 1993, each signed by three AMU officials.
66. The Panel visited Chirundu to verify the source documentation and information included in the respective spreadsheets. The Panel was unable to verify details of ivory received at Chirundu prior to mid-2008 owing to the following:
 - a) The Panel was informed that source documents from Chirundu relating to the period between 1993 and September 2007 no longer exist. The oldest existing source document is a Stores Requisition Note ledger book used from 7 September 2007 to 8 October 2008, although discrepancies were noted. In particular, the Panel found that 12 out of 66 ivory tusks/pieces received and included in the Chirundu ivory register between March and October 2008 did not record the accompanying Stores Requisition Note. They were, however, issued with documentation during transfer to headquarters, and do appear in the Main Ivory Register. The Panel also recorded a discrepancy regarding the number of elephants destroyed during PAC operations from 2002 to 2009, with Chirundu statistics stating 63 as compared to a higher number (105) derived from ivory store records.
 - b) While an electronic copy of the ivory information was reportedly passed on during changes in staffing (the last being September 2008), neither a formal record of the hand-over process nor archive copies of the electronic files were kept.

67. It was reported to the Panel that a new armourer was appointed to Chirundu in September 2008 to address previous lapses in practices. Since that time, documentation appears to have improved and a range of cross-checks by the Panel did not reveal serious deficiencies. However, filing of records is poor, annual audits conducted in Chirundu between 2005 and 2008 did not comment on ivory management, and it was apparent that visits from senior staff at headquarters to check ivory management practices are infrequent.
68. The report of the internal audit by ZAWA in November 2009 noted that the audit trail for ivory received from the prosecutions department was not always complete, since the Ivory Receiving Note often lacked the supporting document reference numbers (e.g. Certificate of Identification of Trophy/Specimen).
69. A review of the database records of ivory receipts shows that the transfer of ivory to headquarters in the period 2000-2007 was sporadic and infrequent for most AMUs. From 2008 onwards, however, transfers have been more regular, with six out of the nine AMUs transferring ivory to headquarters at least twice a year. The 2008 National Ivory Management System Procedures and Guidelines aim for ivory to be transferred to headquarters at least on a quarterly basis.
70. The Panel was provided with an internal audit report of the national ivory management system at ZAWA head office, covering the period January 2008 to November 2009. The report did not highlight any serious security concerns, but noted that the audit trail for ivory received from the prosecutions department was not always complete, since the Ivory Receiving Note often lacked the supporting document reference numbers (e.g. Certificate of Identification of Trophy/Specimen). Various other recommendations were made pertaining to source documentation, standardized marking and the sequence of use of documentation, and the Panel confirmed that some recommendations were already being addressed by ZAWA.

Legal provisions regulating international and domestic trade in ivory

Nature conservation legislation

71. Responsibility for wildlife in Zambia falls under the Ministry of Tourism, Environment and Natural Resources. The Zambia Wildlife Act No.12 of 1998 is the primary legislation for wildlife protection in the country. The Act establishes the Zambia Wildlife Authority whose functions include the establishment, control and management of National Parks and Game Management Areas, and to provide for the licensing of hunting and control of the processing, sale, import and export of wild animals and trophies. The Act also provides for the implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora.
72. Under the Zambia Wildlife Act, "ivory" means elephant ivory and includes any article manufactured from ivory (i.e. worked and semi-worked). Ivory is described as a "prescribed trophy", which is subject to stricter legal controls. The Act covers provisions for reporting, weighing, marking and registering ivory trophies, the mandatory need for a certificate of ownership, and permit requirements for exports, imports and re-exports.
73. Penalties for ivory-related infractions provide one of the strongest deterrents in the region. Illegal possession, sale, purchase, import or export of ivory carries a mandatory minimum jail sentence of five years (but not exceeding 10 years) without the option of a fine or suspended sentence. A second or subsequent offence carries a jail sentence not less than seven years but not exceeding fifteen years. In the case of illegal hunting of elephant, if committed for the purpose of illegal trafficking in ivory, the maximum jail sentence can reach twenty-five years without the option of a fine. The Panel reviewed 57 convictions for ivory cases during the period 2004-2009, and confirmed that the minimum five-year sentence was given in each case.
74. Legal sport hunting of elephants is covered by the Zambia Wildlife (Elephant) (Sport Hunting) Regulations, 2005. These regulations provide for hunting season, minimum trophy size, annual quota, post-hunt reporting, trophy registration, marking, export and revenue sharing. The export of elephant by-products other than ivory is not permitted. According to the Regulations, elephants may only be hunted for sport providing the tusks are of a desired trophy size with a minimum weight of 15 kg per tusk and a minimum length of 150 cm per tusk. The Panel's analysis of ZAWA trophy quality records from elephants hunted in the period 2005-2009 showed that 13 out of 118 tusks were less than 15 kg, while 22 out of 118 tusks were less than 150 cm.

Transit

75. The Zambia Wildlife Act regulates the transit through Zambia of ivory (as well as any wild animal or meat of any wild animal and trophy). The transit of ivory requires either the presentation of transit Customs documents issued in the country of origin or export at a Customs port of entry, or the surrendering to a Customs officer of a certificate issued in the country of origin stating that the person is lawfully authorized to export.
76. The Panel was informed by the Zambia Revenue Authority that trucks passing through Zambia in transit have a Customs seal placed on their container and have five days to exit, after which investigations begin and no further transit clearance for the company is allowed until the missing container is accounted for.

Effectiveness of law enforcement

77. Customs and Excise, which comes under the control of the Zambia Revenue Authority, is responsible for the import and export at all entry and exit points. The Panel was informed that manpower was a real challenge. Over recent years, the staff has been reduced by from 600 to 318 officers, including those at headquarters, 20 border posts and four international airports. This was partly a result of a reduction in budget and partly a result of changes in practices and more reliance on intelligence and random checks (as for Customs in many countries). The Panel was informed that there were now two scanners at border posts including the border with Zimbabwe at Chirundu. It was planned to obtain a further eight scanners for use on other borders before the end of 2010. The use of these clearly improves effectiveness in checks of the huge volume of container traffic. In the basic training of Customs officers, they learn that cases of wildlife smuggling should be referred to ZAWA.
78. ZAWA Investigations Unit is headed by a senior officer seconded by the Zambia Police Service. The Unit has 11 staff at headquarters and 34 staff in the four regions of the country, including at five border posts. The main activities of the unit are the investigation and collection of intelligence on both internal and external trade and on poaching. ZAWA has its own Prosecutions Unit which works closely with the Investigations Unit. A number of the officers have attended the investigations training in Botswana run by the United States Fish & Wildlife Service. ZAWA has worked with ICPO-Interpol and Lusaka Agreement in actions against illegal domestic ivory markets, and further operations are planned. ZAWA has also worked with the same institutions to organize workshops to enhance collaboration with various law enforcement agents in an effort to control illegal trade in wildlife specimens.
79. The Panel met not only with representatives of ZAWA but with the Zambia Police Service, the Zambia Revenue Authority and the Drug Enforcement Commission. These agencies meet regularly at the operational level in a Permanent Joint Operations Committee together with the Immigration Service and the Defence Forces in order to coordinate actions and provide mutual support. The panel was impressed by the level of cooperation between ZAWA and the other agencies, which have helped to make many ivory seizures. Moreover, the fact that enforcement officers in the other agencies know that any illegal activity regarding wildlife (and ivory in particular) should be referred to ZAWA, effectively raises considerably the number of staff who are watching for such activity. There are, for example, some 15,000 police officers and 337 field operatives of the Drug Enforcement Commission. The Panel was informed that ZAWA, Zambia Police and the Drug Enforcement Commission conduct joint operations every year, focusing on drugs, wildlife and vehicles.
80. According to ETIS, From 1989 to 2009 there were 229 ivory seizures in the country and 92 outside the country that implicated Zambia. The annual breakdown is shown in the table below. Using these data, ETIS thus gives Zambia a law enforcement ratio of 71.34% (indicating the number of seizures that take place in the country as a proportion of the total). This puts Zambia in the "Good law enforcement" category.

Year	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09
IN	17	16	21	17	9	10	6	3	4	1	0	1	0	3	17	26	12	23	16	16	11
OUT	0	9	9	5	11	0	0	3	4	7	1	7	3	1	6	5	9	4	1	6	1

Evidence of illegal trade through Zambia

81. According to ETIS, Zambia has been involved in just three large ivory seizures in the period 1989 to 2009: 1,201 kg from Angola, seized in Zambia itself in 1994; 7,146 kg recorded as originating in Zambia, and passing through Malawi before being seized in Singapore in 2002; and 3,720 kg, also recorded as

originating in Zambia, and as passing through the United Republic of Tanzania before being seized in the Philippines in 2005.

82. Enforcement officials interviewed confirmed that the existence of large-scale illegal shipments suggest the involvement of organized criminal networks.
83. However, it appears from these data that, of the large-scale ivory seizures recorded by ETIS, none of them is recorded as having passed through Zambia from one country to another. The seizure in Zambia in 1994 is an indication of good enforcement. The exports from Zambia to neighbouring countries in 2002 and 2005 are a clear reflection of the problems of controlling the large volume of cross-border truck traffic.
84. It is notable, and encouraging, that there have been no large-scale ivory shipments seized involving Zambia since 2005.
85. According to ZAWA records, from 2002 to 2009, 66 elephant ivory seizures have occurred in Zambia, some of them at international airports and land-border, indicating persistent low-level attempts to smuggle ivory.

IMPACT OF THE ACCEPTANCE OF THE PROPOSAL ON THE ZAMBIAN POPULATION

86. The Panel is required to evaluate whether acceptance of the proposal from Zambia is likely to have a positive or negative impact on the conservation of the elephant population and its environment in Zambia. For the purpose of this assessment, the Panel has considered primarily the trade in ivory, which is the main focus of the demand for trade in elephant specimens.
87. With regard to the proposal to allow trade in an increased number hunting trophies for non-commercial purposes, the Panel believes that this is not relevant to this assessment because such trade can already be permitted with the elephant population of Zambia in Appendix I of CITES.
88. What is relevant is the proposal to allow export of the existing government-owned stock of ivory, from elephants that died of natural causes or that were shot in problem-animal control. to 'trading partner' countries already designated by the the Standing Committee as having met standards of legislation and control specified in the proposal. Those countries are China and Japan.
89. The Panel believes that there would be no risk of the mixing of non-authorized ivory in the shipment with ivory certified as legally acquired, provided that adequate checks were made before the ivory was shipped. In this connection, one condition of the proposal is that no ivory would be exported before the CITES Secretariat has verified the stock that could be exported. The Panel notes that the Secretariat would need to determine which part of the ivory stock is clearly identifiable as legally acquired.
90. The Panel knows of concerns expressed by a number of States and non-governmental organizations that the transfer of African elephant populations from Appendix I to Appendix II and the authorization of trade in ivory do, or are likely to, stimulate poaching and illegal trade in ivory. However, the data available do not indicate that there is any clear relationship between such authorizations of ivory trade and the illegal killing of elephants or illegal trade in ivory. In fact, the data indicate that, following the first 'one-off sale' authorized by the Conference of the Parties (CoP), in 1999, the international illegal trade in ivory declined (see TRAFFIC, 2007). Following the second sale, which took place at the end of 2008, the total volume of illegal trade has evidently increased (see Milliken, *et al.*, 2010). In view of these two quite different trends after a sale, the Panel sees no reason for concluding that there is any definite link between the CoP authorization of ivory sale and export and the trends in global illegal ivory trade.
91. For the broad responsibilities of ZAWA described above (including the protection of 30% of the territory of Zambia), the financial resources are very limited. The Panel was informed that ZAWA is supposed to be self sustaining, and so it is able to retain all the revenues that it raises (except for the proportion that must be shared with local communities). Its income from fees charged (hunting, concessions, park entrance, tourists, etc.) has almost doubled, from c. USD 6 million (M) in 2005 to USD 10.7 M in 2009. In addition it has received a number of grants to support its work but, over the same period, these have dwindled rapidly from a peak of USD 5.7 M in 2007 to USD 1.7 M in 2009. In the same five-year period, its expenditure has grown from USD 10.8 M to USD 16.1 M. To maintain its level of activity however, ZAWA needs to meet its current shortfalls. The Government has granted some USD 1 M a year to ZAWA to help bridge the gap in 2009 and 2010. And ZAWA is implementing a number of innovations to seek further funding for its

conservation work, such as offering large areas of national parks to investors as concessions for non-consumptive wildlife use.

92. Against this background, the Panel believes that there would be a benefit for the Zambian elephant population if the Government of Zambia used part of the funds from any sale of its ivory stock to ensure the effectiveness of its anti-poaching measures.
93. One of the proposed conditions of a sale is that the proceeds would be used not only for elephant conservation but also for “community conservation and development programmes within or adjacent to the elephant range in Zambia”. The Panel believes, like previous Panels that have reviewed similar proposals, that such use of funds could help to improve the tolerance of elephants by local communities, by demonstrating that they have a financial value. Such tolerance could help to reduce the number of elephants that have to be shot in problem-animal control. It must be recognized, however, that there would be a conservation disadvantage if local communities came to regard non-tolerance of elephants as preferable because they were regarded as a source of income.
94. The overall impression of the Panel is that the impact of the adoption of the proposal would be positive for the Zambian elephant population if the funds obtained from sale of ivory are channelled to law enforcement and community conservation and development programmes.

CONCLUSIONS

Is the population viable and sustainable and are there particular risks?

95. Zambia’s elephant population can be considered stable and viable, and possibly increasing. With the exception of Lower Zambezi, both legal and illegal offtakes appear sustainable. For Lower Zambezi, the offtake data indicate the likelihood of a declining population.
96. Further loss in range and numbers cannot be ruled out, especially for populations in the north and west of the country, and if these populations are to be retained, there is an urgent need to address the risk of their loss. Without meaningful investment in securing their integrity and protection, they will disappear.
97. Greatest risk lies in the Lower Zambezi, where further decline in the elephant population would affect sustainable use and probably affect both elephants and communities negatively, reducing benefits in the case of the latter. Levels of illegal activity need to be reduced as a first priority.
98. An overall risk lies in the growing number of conflicts between humans and elephants. The survival of elephants in the areas of conflict depends on the efficacy of mitigation measures coupled with meaningful and timely disbursements of community benefits and active community involvement and participation in dealing with these problems.

Has the range State demonstrated its ability to monitor its African elephant population?

99. Whilst strongly committed to the need for good long-term monitoring, ZAWA’s present financial situation does not guarantee the needed resources to adequately and efficiently monitor its elephant population. Without long-term funding, reliable and regular ZAWA-driven monitoring will continue to be difficult.

Are the current anti-poaching measures effective?

100. Zambia has greatly improved its anti-poaching activity although there some geographical areas of concern such as Lower Zambezi. The current efforts seem to be effective but could be more so with improved resources.

Is the total level of offtake from both legal and illegal killing sustainable?

101. The Panel considers the level of legal and illegal offtake as being sustainable at the national level, since it falls within the expected rate of increase (3-5%) of the elephant population, which itself is considered stable. However, as said above, the level of offtake in the Lower Zambezi ecosystem is not believed to be sustainable, primarily because of the relatively high levels of illegal killing.
102. The current annual quota of 20 sport-hunted males is sustainable, falling well within the 0.5-1% offtake level that is widely considered to be the limit to sustainable hunting of trophy quality males in a healthy

elephant population. The proposed increase in the sport hunting quota to 120 animals would still be within this limit, as would the inclusion of trophy quality male removals from problem-animal control, natural mortality and illegal killing. However, indications of declining trophy quality suggest the need for a precautionary approach such as making gradual increases in the trophy hunting quota, accompanied by close monitoring of trophy quality.

Is the control of ivory stocks adequate to prevent the mixing of legal and illegal ivory?

103. If the proposal were accepted, the only raw ivory that would be authorized to be traded is the stock of known legal origin held at ZAWA headquarters. The previous report of the Panel of Experts on a proposal from Zambia, in 2002 (CoP12 Doc. 66 Annex 4) noted deficiencies in most aspects of ivory stock management including marking, documentation, registration, storage, computerization and audit practices. In the present review, following physical inspection of the ivory stock, the verification of records, and an assessment of internal policy implementation, the Panel was satisfied that improvements in all areas have been made since that time. Notable improvements have occurred since 2008, the year when ZAWA developed and started implementing National Ivory Management System Procedures and Guidelines. The Panel found the stores to have sufficient security and storage facilities, adequate ivory marking and separation of legal and illegal stock, and an operational computerized register.
104. The Panel found that documentation and systems in operation since mid-2008 should provide for an auditable system and to ensure that ivory of legal and illegal origins are not mixed. Numerous random cross checks did not raise serious discrepancies between physical stock, supporting documentation and electronic database. The absence of much pre-2008 source documentation, which was previously documented in the 2002 report of the Panel of Experts, has been addressed by ZAWA through the generation during 2008-9 of authorized spreadsheets detailing ivory sent from each AMU to headquarters since 1993. However, a field visit to Chirundu highlighted missing supporting documentation as well as discrepancies in records, which will likely affect the ability to conduct a full audit in the future.

Is law enforcement effective?

105. There is good and regular cooperation between ZAWA and the leading law enforcement agencies, and all are involved in monitoring and acting against poaching of elephants and illegal trade in ivory. As a result, the scale of domestic ivory markets appears to be relatively low. There have been 229 ivory seizures in Zambia since 1989.
106. The level of poaching appears to be relatively low, with the possible exception of Lower Zambezi.
107. The ETIS analysis gives Zambia a good rating for effectiveness of law enforcement.

Are enforcement and controls sufficient to ensure that no significant amounts of ivory taken or traded illegally from other countries are traded within or through the territory of the affected range State?

108. ZAWA's cooperation with the principal enforcement agencies responsible for border controls, in particular Customs and the Drug Enforcement Commission is exemplary.
109. On the negative side, the staff of the Customs and Excise service has been severely reduced. This may be mitigated to some extent by the introduction of scanners at ports and the plan to introduce several more in 2010.
110. The ETIS data indicate that, in the last 20 years, Zambia has been involved in three large-scale seizures. One was within the country, involving ivory from a neighbouring country; the other two in Asia, apparently involving ivory from Zambia. These large-scale illegal shipments may suggest the involvement of criminal syndicates but it should be noted that the last one was in 2005.

Are there adequate controls on trade in parts and derivatives from the African elephant other than ivory in the proponent State?

111. The only parts and derivatives other than ivory proposed to be traded by Zambia are raw hides. The Panel was informed that there is no immediate intention to start trading raw hides and that there is no tannery to treat elephant hides in Zambia. If such trade takes place, the CITES Management Authority intends to apply the usual CITES procedures. The Panel believes that there is no reason why the controls on any

such trade should be different than for trade in parts and derivatives of other CITES species in which Zambia has experience.

Are there adequate controls on ivory trade in specified importing countries?

112. One of the conditions of the proposal of Zambia is that the commercial export of ivory would be “to trading partners that have already been designated by the Standing Committee as having sufficient national legislation and domestic trade controls to ensure that the import ivory will not be re-exported and will be managed in accordance with all requirements of Resolution Conf. 10.10 (Rev. CoP14) concerning domestic manufacturing and trade”. The proposal specifies that the countries concerned are China and Japan. As these countries were already designated by the Standing Committee, in accordance with the current annotation regarding African elephant populations in Appendix II, the Panel considered that this question was already dealt with.

Would the acceptance of the proposal be likely to have a positive or negative impact on the conservation status of the elephant population and its environment in the affected range State?

113. The Panel noted a positive trend in relation to many of the factors assessed since the last Panel report on Zambia, in 2002, such as the status of elephants, population monitoring, ivory management and law enforcement.

114. The Panel believes that the acceptance of the proposal by the Conference of the Parties would be beneficial to the conservation of the elephant population of Zambia provided that:

- the money obtained from the commercial sale of ivory and from hunting fees and other related income were used to improve the anti-poaching measures, in particular in Lower Zambezi; and
- a significant proportion of the funds from sale of the ivory resulting from problem-animal control were returned to the local communities where the elephants were killed.

115. It must be clear however that, although a short-term improvement can be achieved by an ‘injection’ of funds from the sale of the legally obtained stock of ivory, what is really required is long-term funding for conservation of elephants (with a benefit for other species in the same range). The Panel was encouraged that ZAWA is seeking additional sources of long-term funding, but believes that additional government support might be needed to unlock the country’s tourism potential.

REFERENCES

- Ansell, W.F.H. (1978). *The Mammals of Zambia*. The National Parks and Wildlife Service, Chilanga.
- Barnes, R.F.W., Craig, G.C., Dublin, H.T., Overton, G., Simons, W. and Thouless, C.R. (1998). *African Elephant Database 1998*. Occasional Paper of the IUCN Species Survival Commission No. 22. IUCN, Gland.
- Blanc, J.J., Thouless, C.R., Hart, J.A., Dublin, H.T., Douglas-Hamilton, I., Craig, G.C. and Barnes, R.F.W. (2002). *African Elephant Status Report 2002*. Occasional Paper of the IUCN Species Survival Commission N. 29. IUCN, Gland.
- Blanc, J.J., Barnes, R.F.W., Craig, G.C., Dublin, H.T., Thouless, C.R., Douglas-Hamilton, I. and Hart, J.A. 2007. *African Elephant Status Report: An update from the African Elephant Database*. Occasional Paper of the IUCN Species Survival Commission No. 33. IUCN, Gland.
- Dunham, K.M. (2004). *Aerial survey of elephants and other large herbivores in the Zambezi Heartland (Zimbabwe, Mozambique and Zambia): 2003*. African Wildlife Foundation, Kariba.
- Dunham, K. and Simwanza, H. (2002). *Aerial census of elephants and other large herbivores in South Luangwa National Park and Lupande GMA, Zambia: 2002*. Zambia Wildlife Authority and WWF Southern Africa Regional Programme Office. WWF SARPO, Harare.
- Frederick, H. (2009). *Aerial survey of Kafue Ecosystem 2008*. Zambia Wildlife Authority, Lusaka.
- Graham, A. and Bell, R.H.V. (1989). Investigating observer bias in aerial survey by simultaneous double counts. *Journal of Wildlife Management* 53, 1009-1016.
- IUCN/UNEP (1987). *The IUCN Directory of Afrotropical Protected Areas*. IUCN, Gland.
- Jachmann, H. and Phiri, C.M. (1999). *Aerial sample survey of the central Luangwa valley: Animal abundance, distribution and trends 1993-1999*. Wildlife Resource Monitoring Unit, Environmental Council of Zambia, Lusaka.

- Milliken, T., Burn, R.W. and Sangalakula, L. (2010). *The Elephant Trade Information System and the Illicit Trade in Ivory*. Document CoP15 Doc. 44.1 Annex, presented at the 15th meeting of the Conference of the Parties to CITES. 40pp.
- Norton-Griffiths, M. (1978). *Counting Animals*. No. 1 of a series of Handbooks on techniques currently used in African wildlife Ecology. Ed. J.J.R. Grimsdel. African Wildlife Foundation, Nairobi.
- Nyirenda, V.R., Liwena, S. and Kaumba Chaka, H. (2008). *Atlas of the national parks of Zambia*. New Horizon Printing, Lusaka.
- Said, M.Y., Chunge, R.N., Craig, G.C., Thouless, C.R., Barnes, R.F.W. and Dublin, H.T. (1995). *African Elephant Database 1995*. Occasional Paper of the IUCN Species Survival Commission No. 11. IUCN, Gland.
- Siamudaala, V.M., Nyirenda, V.R. and Saiwana, L.M. (2009). *Effectiveness of law enforcement on Wildlife Crimes in the Kafue Ecosystem in Zambia*. New Horizon Printing, Lusaka.
- Simukonda, C. (2009). *The elephant survey (2008) – a country report*. Zambia Wildlife Authority, Lusaka.
- Simwanza, H. (2005). *Aerial survey of large herbivores in the Zambezi Heartland, Zambia, October 2005*. Zambia Wildlife Authority, Chilanga. African Wildlife Foundation, Kariba.
- TRAFFIC (2007). *Monitoring of Illegal trade in ivory and other elephant specimens*. Document CoP14 Doc. 53.2, presented at the 14th meeting of the Conference of the Parties to CITES. 60pp.

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