AMENDMENTS TO APPENDICES I AND II OF THE CONVENTION

Other Proposals

A. PROPOSAL

Transfer of the population of Botswana of Loxodonta africana from Appendix I to Appendix II.

B. PROPONENT

The Republic of Botswana.

C. SUPPORTING STATEMENT

1. Taxonomy

11. Class: Mammalia

12. Order: Proboscidae

13. Family: Elephantidae

14. Species: Loxodonta africana (Blumenbach, 1797) includes subspecies L. a. africana, the savannah elephant, and L. a. cyclotis, the forest elephant. The pygmy elephant (L. a. pumilio) is generally not accepted as a valid subspecies.

15: Common Names:
English: African elephant
French: éléphant d'Afrique
Spanish: Elefante africano
Setswana: Tlou

16. Code Numbers: ISIS 530.1415.001.002.001.001

2. Biological Data

21. Distribution: Botswana has two major elephant populations. The first occurs in the area north of the 20 degree south latitude, and covers an area of 80,000 square km. The area includes the Chobe National Park and it's environs, the Moremo Game Reserve and the fringes of the Okavango swamps, and extends down south to the Nxai Pan National Park. This population adjoins and is only separated from the Hwange National Park (Zimbabwe) population by an unfenced border. The elephant distribution in this zone though, is not uniform but is rather clumped in some parts. This is especially true along the Chobe/Linyati River system during the dry period of the year. Even during the wet season, when the distribution is more spread out, certain areas receive disproportionately heavier use.

The second population, which is about 1% of the country population, is found in the Tuli Circle/Tuli Block area on the eastern part of the country. This area is approximately 800 square km and most of the elephants occur in a private

game reserve, the Mashatu Game Reserve. There is an occasional small population in the Bobirwa District which comes into the area from neighbouring Zimbabwe.

22. Population: Several southern African countries have growing elephant populations, to an extent that some, namely, South Africa and Zimbabwe have been undertaking major culling programmes in order to keep their populations within habitats' "carrying capacities".

In the case of Botswana a self-imposed hunting ban has been on since 1983, while research on the species was being carried out. This entailed population assessments through aerial surveys and elephant/habitat interaction studies.

The northern Botswana elephant population is currently estimated at 61000 (the mean of the recent population estimates), and is perceived to be growing at a yearly rate of between 2.5 and 5% based on an aging exercise conducted in July 1991. Table I below gives a summary of wet (March or April) and dry (September) season elephant population estimates for northern Botswana compiled for the period 1989 to 1991.

TABLE I: Results

Survey	Estimate	95% C.L.
Wet season 1989	67000	30%
Dry season 1989	59896	29%
Wet season 1990	49064	24%
Dry season 1990	55835	36%
Wet season 1991	64916	31%
Dry season 1991	68900	29%

It has been reported by several earlier researchers that the elephant population of northern Botswana was exerting a destructive effect on the woody vegetation particularly on the Chobe River riparian strip due to their high densities. Child (1968) reported that as early as 1963 that mature Acacia eriolaba were being particularly adversely affected, but the elephant densities were much lower than at present. Subsequent researches such as Sommerlatte (1976), Simpson (1978) and Moroka (1984) upheld the view.

Sommerlatte estimated a Chobe National Park (area 11,000 sq. km) elephant population of 5,740 in 1973-1975, whereas a 1987 estimate for the same area went up to 12,220. For an area of 22,500 sq. km, Sommerlate estimated 12,030 elephants vis-a-vis an estimate of 17,810 in 1983 quoted by Spinage (1990).

These figures, point to a growing elephant densities in certain parts of the range, and since the 'alarm bells' have been sounded on the destructive effect the elephant were exerting on woody vegetation at population densities much lower (Child, 1968; Sommerlatte, 1976; Moroka, 1984) that the current ones, it goes without saying that this was of major concern in drawing up the elephant management plan. The concern derives from the fact that allowed to grow unchecked the elephant population could endanger themselves and the other species in the range.

In addition, the northern elephant range, has the highest diversity of wildlife as well as vegetation types in the country. Thus management considerations should aim for the preservation of that diversity. Some of the species found in the area include such protected animals as sable (Hippotragus niger), roan (H. equinus), which the rising elephant compete with for food (RSA, 1991), as well as the rhinoceros and the rare Chobe bushbuck (Tragelaphus scriptus ornatus). In addition the area has the only commercial forests in the country. Therefore, the need to mitigate excessive vegetation change by elephants is crucial. The argument is not that vegetation change in the ecosystem is undesirable, but rather that the rate of change of the habitat induced by high densities of elephants bounded in not so large an area amongst a diversity of other species, could induce other undesirable rates of changes on these species.

In his study, Moroka like some of his predecessors came to the conclusion that the elephant population had to be controlled to some level that would curb excessive vegetation change. Moroka suggested a 30% reduction of Chobe elephant population of 1984 would not be unreasonable and recommended that subsequent monitoring of vegetation and elephant population to determine need for further population reduction be undertaken. Earlier, Sommerlatte (1976) had recommended that the elephant population of Chobe and Linyanti be reduced by 30% during the first year of such an operation and subsequent years at a rate of 5-6% annually.

The Department of Wildlife and National Parks (hereafter referred to as DWNP) in Botswana has proposed that the elephant population be maintained at 1990 levels through some cropping programme, which entails removing a number equal to the annual rate of increase. Any culling will initially be limited to a maximum of 3000 elephants.

The resulting elephant density after the proposed level of cropping would be about .7 elephant per sq. km, which is above the density that would permit tree regeneration, according to some research results from Zimbabwe. In Zimbabwe the density that would allow specified woodlands to persist is reported to be about .5 per sq. km (Spinage, 1990). On-going elephant/vegetation interaction studies in Botswana will monitor the effect of the resulting (after culling) level of elephant population on the vegetation and come with appropriate recommendations.

As mentioned in the preceding text, Southern Africa is replete with successful elephant management programmes. In South Africa, culling of the Kruger National Park population has been going on for a number of years, and the population of elephants has been maintained at about 7,500 since 1967 (U.R.T., 1989). The elephant population in South Africa is said to have "reached an absolute minimum around the turn of the century" (U.R.T.,1989). Because of good management, however, the population in the Kruger National Park increased to levels where it had to be controlled.

As for Zimbabwe, a major cropping operation has been going on for some time too, with no apparent adverse effect on the status of the species in that country. The Zimbabwe elephant population is estimated to be growing at a rate of almost 5% (Martin et al., 1989), but kept at an nearly constant level by culling. Thus Botswana's culling operation would not be a stab-in-the-dark exercise, especially that the northern Botswana elephant population and that of Hwange National Park in Zimbabwe are only separated by an unfenced border.

It is the contention of the Botswana Government that wildlife is a resource from which can accrue, economic benefits to the nation, hence passage of the Wildlife Conservation Policy (WCP) by Parliament in 1986. This policy is based on sustainable utilization of the wildlife resources; therefore there should be no fear of Botswana over-exploiting the elephant population for profit. This is supported by the fact that while the price of ivory was very high in the world market in the 1980's, Botswana in 1983 suspended elephant hunting as the status of the elephant population in the country was still under observation.

The elephant management policy resulting from that period of observation has as its objectives, the following:

a) Manage elephants on a sustainable multiple use basis in accordance with the 1986 WCP policy and the 1990 Tourism Policy.

b) Maintain elephant populations at their 1990 level by removing the annual increment.

c) Maintain elephant occupied woodland in an acceptable state, subject to climatic influence.

d) Reduce elephant populations if research and monitoring indicate unacceptable changes to elephant habitat.

e) Maintain biodiversity and essential life support systems in the national parks and game reserves.

f) Reduce conflict between elephants and humans.

g) Support and undertake elephant population and elephant habitat research and monitoring programmes.

Thus if, as it has already been determined through ecological studies referred to in the preceding text, the Botswana elephant population has to be actively managed (culled), all the inherent benefits (economic and ecological) should be realised. It is thus on the foregoing premise that the Republic of Botswana is requesting a transfer of it's elephant population to Appendix II, so that it can trade in all elephant products internationally.

As stated under the management objectives of the elephant management policy, the government policy, the Government of Botswana in its management of the elephant population, has also to take account of the conflicts between the species and communities in the elephant range. It should be appreciated that these communities have a very different view with regard to the whole concept of the conservation of the species. Theirs is predicated on the daily realities of living next door to the elephant and hence intimate experience of the attendant pressures the situation can impose. The government would like these communities to benefit from the conservation of the species lest they develop negative attitudes towards the whole concept of wildlife conservation. If elephants are to be killed in defense of property, it should be possible to trade in their products so that the property owners could be compensated. This will be possible if an Appendix II listing of the Botswana population is effected.

23. Habitat: Loxodonta africana is an adaptable species which occurs in a variety of habitat types. Its range include among others, forested savanna, dense rain and montane forests, acacia grasslands, dry bush country, low marshy areas, and high moorlands (United Republic of Tanzania, hereafter referred to as U.R.T., 1989). African elephants also inhabit relatively arid regions on the southern fringes of the Sahara and in Namibia. Occurrence of the species has been recorded as high as 4,422 meters on Mt. Kenya (U.R.T., 1989).

The Botswana elephant habitat ranges from the swamps of the Okavango, the wooded grasslands of the Savuti, to the forests of the Chobe. Studies, referred to in the preceding text on elephant/habitat interaction in Botswana have revealed that there is a negative impact on some woody species especially around the major dry season concentration areas. Though elephants are said to be adaptable to a variety of habitats, the northern Botswana elephant range has the most diverse fauna and flora in the country. Consequently, management objectives are to preserve that bio-diversity and therefore unmitigated destruction of the vegetation by the elephant will not be consistent with such objectives. Indeed the range includes at least three protected areas where protection of biodiversity is the main goal.

3. Trade Data

31. National Utilization: Elephants were hunted up to the self-imposed ban on hunting by Botswana in 1983. The most prized item from the elephant was the tusks as there was a strong demand and hence high price paid for the ivory then. Most of the ivory was exported, with the remaining usually sold to a local company, Botswana Game Industries, for processing.

Ever since the ban on hunting, the DWNP has dealt in ivory only up till 1985, when the last tusk auction was held (Mangubo, pers. comm.). The only tusks sold thereafter are those that were allocated to the local authorities in the elephant range. Current ivory stockpile in Botswana is estimated at 15 tons.

32. Legal International Trade: DWNP, as stated already, has not dealt in ivory since the last auction in 1985, except allocation of some tusks to local authorities in the elephant range and issuing of re-exports permits for those individuals who were on transit through Botswana with some ivory.

TABLE II: Ivory exported from Botswana after 1985

14 tusks	1986 (1)
20 tusks (weighing 233 kg)	1987 (1)
0 tusk	1988 (1)
410 kg of pieces of raw ivory	1090 (2)

(1) CITES (1989)
(2) DWNP (1989)

33. Illegal Trade: Elephant poaching statistics in Botswana ante and post Appendix I listing follows:

TABLE III: Poaching statistics in northern Botswana

Year	Numbers Recorded Poached
1988	52
1989	113
1990	125

Table III above does not indicate there was a drop in poaching activities in Botswana after the CITES listing of the elephant in Appendix I. Even then, elephant poaching in the country does not seem to be posing much of a threat to the species at current levels. There are also rumours of some poached ivory from the north being smuggled to the south through Botswana.

34. Potential Trade Threats:

341. Live Specimens: Botswana has not been dealing in live elephants, hence this nonexistent trade cannot threaten the species.

342. Parts and Derivatives: Most of the trade has been in ivory. There is a feeling in Botswana that a potential exists for trade in elephant meat and skins and this will also be fully exploited in the event of Appendix II listing.

The trade in derivatives was not that large in the 1980's as elephant hunting was banned in Botswana in 1983. Botswana over the years after the hunting ban, did not even use all of the quota alloted it by CITES prior to the 1989 Appendix I listing of the elephant.

4. Protection Status

41. National: The elephant is a protected animal in Botswana. There has been no legally authorised hunting (save for a few animals that strayed out of the elephant range or those killed in defense of property) since the ban in 1983.

Legislation is in place to deal with anybody who illegaly kill the elephant or any other animal for that matter. Much tougher legislation has since been proposed to act as deterrent to would-be poachers. That piece of legislation is currently with the Attorney Generals Chambers for drafting.

In addition, the northern elephant range include protected areas, namely, the Chobe National Park, Moremi Game Reserve, and Nxai National Park. There are also proposed wildlife management areas in the range, on which wildlife will be the major landuse.

Botswana has in the past few years and now been training an anti-poaching unit to strengthen its law enforcement capabilities. In addition, the Botswana Defence Force has deployed some of its units in the northern elephant range to assist the anti-poaching unit in its law enforcement tasks. This has paid dividends as it has been reported that poaching incidences have fallen considerably this year.

42. International: The last meeting of the Conference of the Parties conferred an Appendix I listing to the elephant in a bid to protect it, as it was felt that some countries were losing the species at an alarming rate.

43. Additional Protection Needs: The southern African countries (Botswana, Malawi, Namibia, Zambia and Zimbabwe) which want their elephant populations listed in Appendix II have formed an organization, namely Southern African Center for Ivory Marketing (SACIM), to be headquarterd in Botswana. It is the aim of the organization to do away with middlemen in the trade in ivory, but instead deal directly with consumers. In this way there will be certainty as to the origin of all the ivory that enters the market. Thus ivory from those countries not involved in trade and poached ivory would be kept out of the market, thus discouraging poaching in those countries.

In addition, it is stated by Georgiadis et al. (1990) that regulating ivory trade through Polymerase Chain Reaction, which give population specific markers, is technically and biologically feasible. Therefore this testing procedure should be employed at the market to ensure that only ivory from those countries that are allowed to trade enter the market.

It is worth stating that SACIM countries intend to use the proceeds from the sale of ivory to support wildlife conservation in member countries. So the intended ivory trade will in fact benefit the conservation of the African elephant as well as other wild species.

5. Information on Similar Species

The Asian elephant (Elephas maximus) is the only other extant proboscidean. It is listed in Appendix I of the Convention. E. maximus is much smaller that the African elephant and has quite distinct features.

The threat to this species is mostly due to habitat loss rather that poaching for ivory (RSA, 1991).

6. Comments from Countries of Origin

The Southern African countries that constitute SACIM, namely, Botswana, Malawi, Namibia, Zambia and Zimbabwe, support the transfer of their elephant populations from Appendix I to Appendix II. Angola and Mozambique have no objection.

7. Additional Remarks

8. References

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

EIGHTH MEETING OF THE CONFERENCE OF THE PARTIES
Kyoto (Japan), 2-13 March 1992

AMENDMENTS TO APPENDIX I AND II OF THE CONVENTION

AFRICAN ELEPHANT
(Loxodonta africana)

Supplement to the proposal B2.1 submitted by Zimbabwe and the proposal submitted by Botswana providing additional data in respect of Botswana only

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AMENDMENTS TO APPENDIX I AND II OF THE CONVENTION

A. PROPOSAL

Transfer of the population of Loxodonta africana occurring in Botswana from Appendix I to Appendix II.

B. PROPONENT

Botswana

C. SUPPORTING STATEMENT

1. Taxonomy

11. Class: Mammalia

12. Order: Proboscidea

13. Family: Elephantidae

14. Species: Loxodonta africana (Blumenbach, 1797)

15. Common Names:

English:	African elephant
French:	Elephant d'Afrique
German:	Afrikanischer elephant
Portuguese:	Elefante africano
Spanish:	Elefante africano

16. Code numbers:

CITES A-115.001.002.001
ISIS 5301415001002001001

SUPPLEMENT TO THE ORIGINAL PROPOSALS

Proposals for the transfer of the elephant populaton of Botswana from Appendix I to Appendix II of CITES were contained in Doc. B2.1 submitted by Zimbabwe and in the separate document submitted by Botswana. The present supplement was requested by the Panel of Experts constituted in accordance with Resolution Conf. 7.8, who visited Botswana on 19-22 November 1991. It was agreed that each of the five southern African countries whose elephant populations are proposed for transfer from Appendix I to Appendix II in Doc. B2.1 should provide such a supplement.

The additional data provided here should be read in conjunction with the original supporting statements. Reference numbers used in the original statements have been retained in this supplement. The data reported are intended to clarify any possible confusion arising in the earlier proposals from discrepancies between figures, and this supplement should be considered the accepted version.

2. Biological data

21. Distribution

Historical

The historical distribution of elephants in Botswana has been reviewed by Campbell (1990); see Figure 1. He concluded from the accounts of early European observers that the area regularly occupied by elephants was at its recorded maximum in the late 18th century, when it covered much of northern, north-western, eastern and south-eastern Botswana. The drying of Kalahari water sources, the spread of human settlement and, particularly, excessive hunting were thought to be responsible for reducing the distribution of elephants to a minimum in about 1890, when small concentrations of a few thousand animals remained only in the vicinity of the Okavango Delta and the western Chobe and Linyanti-Kwando Rivers in the north and the Tuli Block in the southeast.

Child (1968) and Sommerlatte (1976) described elephant concentrations appearing along the eastern section of the Chobe River and southwards in Chobe District by the mid 1960s. These observations suggest a re-occupation of parts of the former elephant range in northern Botswana which had been abandoned by the turn of the century.

Current

The current estimates for distribution and population size of elephants are derived from aerial surveys which form part of the nationwide animal census programme in the Department of Wildlife and National Parks (DWNP). Botswana's aerial surveys of the elephant range take place twice a year.

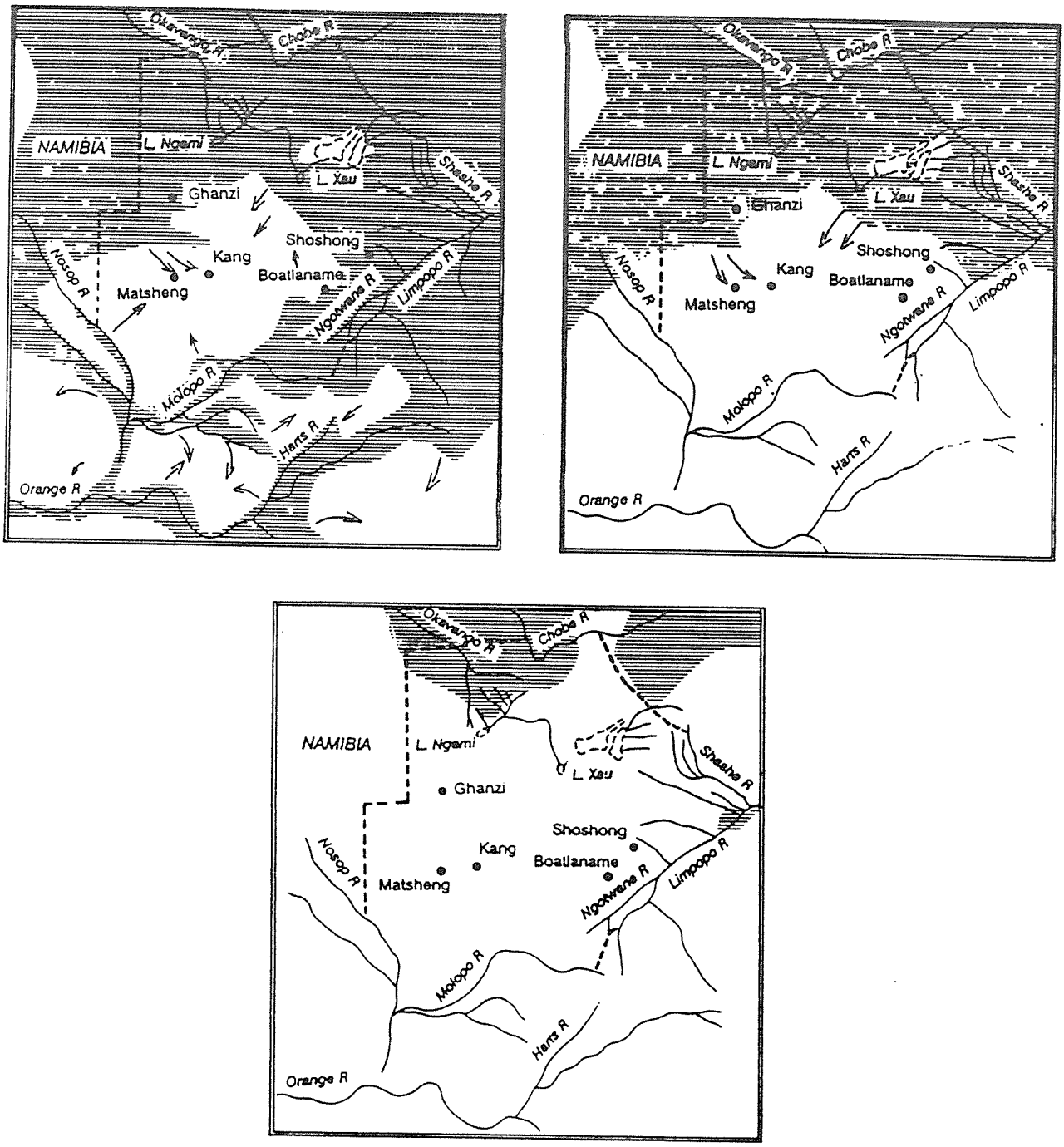

Figure 1: Historical elephant distributions (from Campbell 1990).
Top left: Probable distribution in late 18th century
Top right: Probable distribution in about 1850
Bottom: Probable distribution in about 1890

Surveys are usually unstratified sample counts using the systematic reconnaissance flight method at a sampling intensity of about 4%, with observer strip widths of 200m and transect spacing of 6′ of longitude. The counts are unstratified because:

(a) a very large area is covered to obtain information about elephant distribution as well as numbers. Concentrating sampling effort in the more densely populated parts of the elephant range would lose important distribution information around the edge of the range.

(b) Elephant densities vary greatly over short distances and periods of time. An effective stratification would require a detailed pre-survey reconnaissance flight over the whole range, the cost of which would be prohibitive.

Elephant range

The elephant "range" is difficult to define, since animal ranges tend to tail off with very large areas of low population density around the periphery, which it is difficult to measure because there is so little distribution information there. Differing estimates are likely to arise from different interpretations.

Figure 2 interprets "range" as follows:

In south eastern Botswana, there is a small population in Northern Tuli Game Reserve. Although there are some elephants in a much larger area (10000 sq.km.) of the Bobirwa sub-district adjacent to this, their density is negligible, and their limits not definable since surveys have not detected them. The limits of the south eastern population are therefore shown as the boundary of the Northern Tuli Game Reserve (550 sq. km.).

Elephants in northern Botswana have not been detected by surveys south of 20 degrees south, or west of the eastern margin of the Okavango system (with one exception), during the past 3 years. An elephant was shot in Ghanzi farms (22 deg.E., 21.5 deg. S.) in 1990, which could be taken to indicate a range approaching 200000 sq.km., though this would clearly be ridiculous when one considers where elephants are mostly seen (Figs 3 and 4). The main distribution in the north seems to be circumscribed by human settlement and activity (stock rearing), except in the Nxai/Makgadikgadi area, where the reason for their not crossing the 20th parallel towards Makgadikgadi Pans Game Reserve, to which they have unrestricted access, is not clear.

Since elephants avoid areas of human activity and are often unwelcome there, such areas make a convenient point at which to define a boundary to their continuous, relatively undisturbed, range. The northern range in Fig. 2 is defined by masking out all contiguous cells with sighting records of livestock surrounding the elephant range, and all cells south of the 20th parallel, and shading the remainder as the

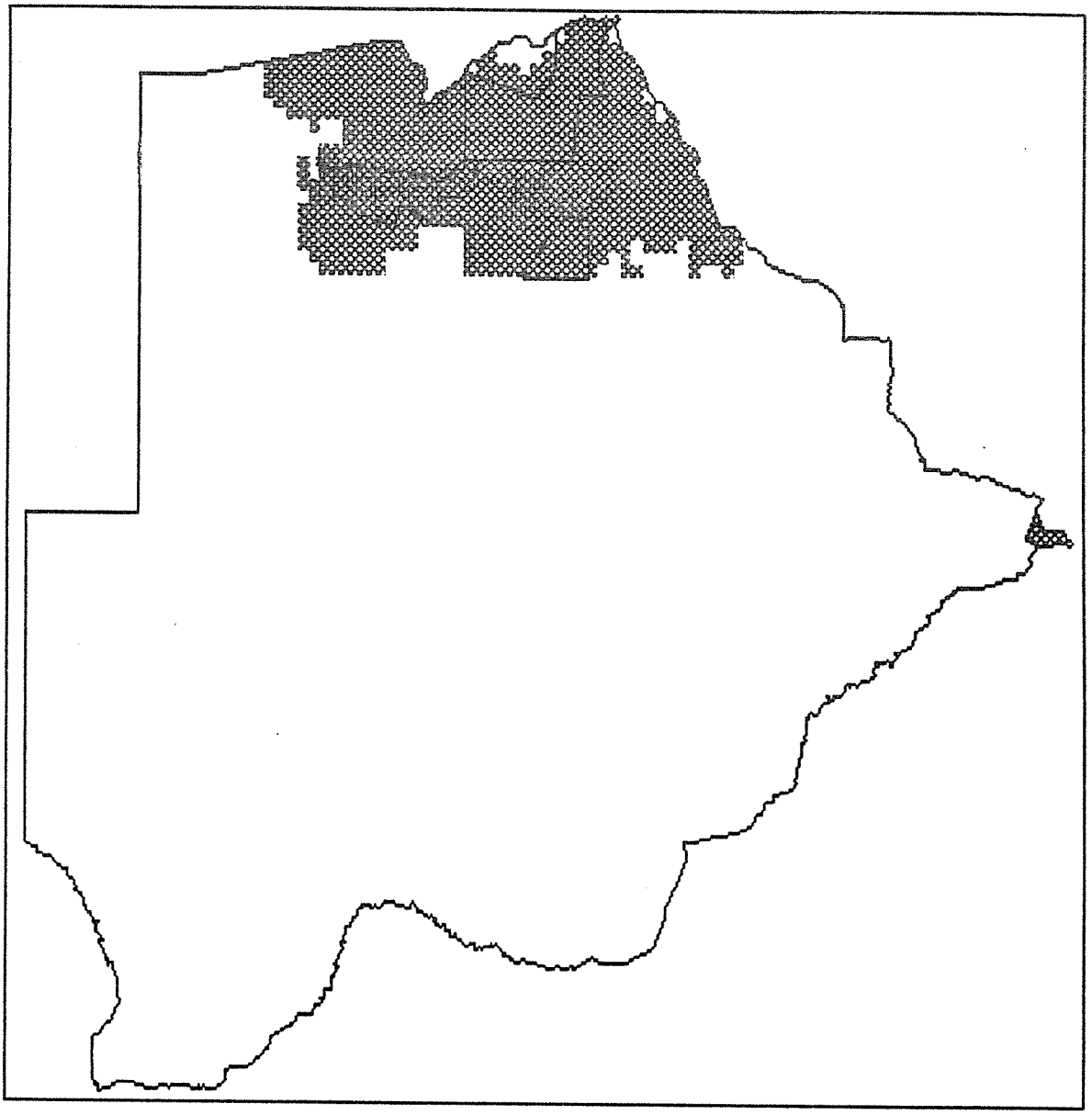

Figure 2: Elephant Range in Botswana

elephant range. The shaded area amounts to 73000 sq.km.

Although previous estimates of the extent and area of the range may be different to these, no range contraction is implied. The differences are because of different criteria being applied, and rounding of figures due to the inherent uncertainty. Disputes arise from a failure to understand that the area of a range is inherently impossible to measure, as is the length of a coastline. However, to avoid such disputes it is expedient here to have defined the range in explicit, if slightly artificial, terms.

Fig. 2 also shows National Parks and Game reserves within the elephant range.

Elephant distribution

Apparent elephant distributions for wet and dry seasons, from survey data collected since 1989, are shown in Figs 3 and 4. Shadings are based on a weighted average of extrapolated numbers (numbers seen in the 6′ x 6′ cell, corrected for local sampling intensity and cell size) in each cell. Shading is proportional to $\log_2$ animal numbers. The information is unsmoothed, so a lot of sampling noise is present, although distributions appear to be adequately visually represented.

Dry season distributions are noticeably concentrated along the Kwando-Linyanti-Chobe river systems on the Namibian border. This concentration must overlap into Namibia at these times. There are small concentrations along the Zimbabwe border which are probably continuous with populations on the other side, since there are few barriers to movement.

In the wet season populations appear to shift mainly south and east, parallel to the Zimbabwe border, though cross border movement can't be ruled out. Whether the range extension apparent in the northwest is occupied by animals moving west from the Kwando or south from the Namibian Caprivi Strip is not known. According to Namibian authorities, there appears to be a regular movement in both directions across the common border at the Caprivi during wet seasons (M. Lindeque, pers. comm.). Note that in the wet season elephants occupy most of the range delimited in Fig. 2.

Elephants are present in the Northern Tuli Game Reserve in all seasons, though some of these regularly cross a short way into Zimbabwe's Tuli Circle. Map cells recording elephants here represent elephants just inside Botswana.

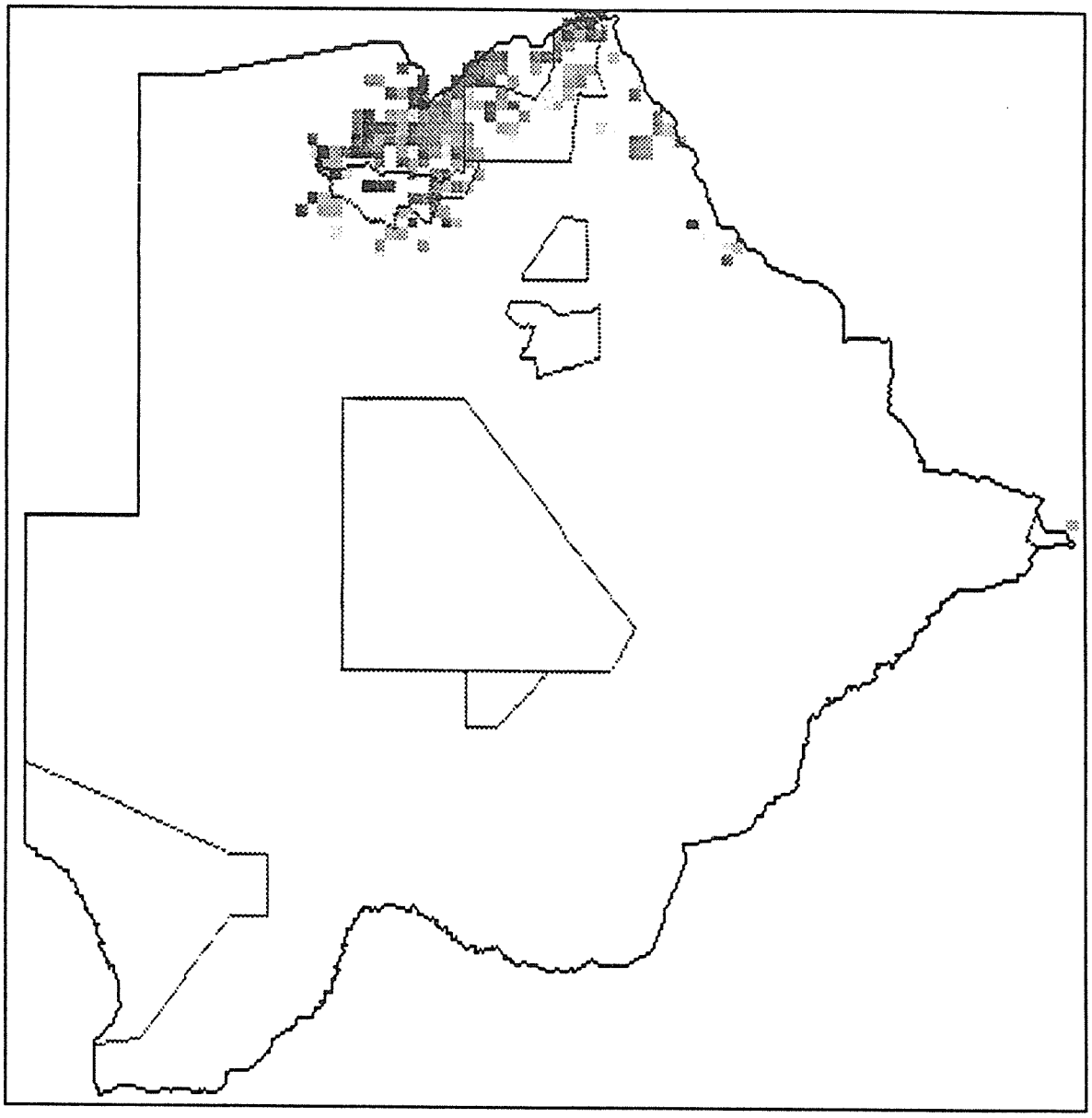

Figure 3: Dry season Elephant Distribution, all data 1989-1991. Shading proportional to Log numbers in cell.

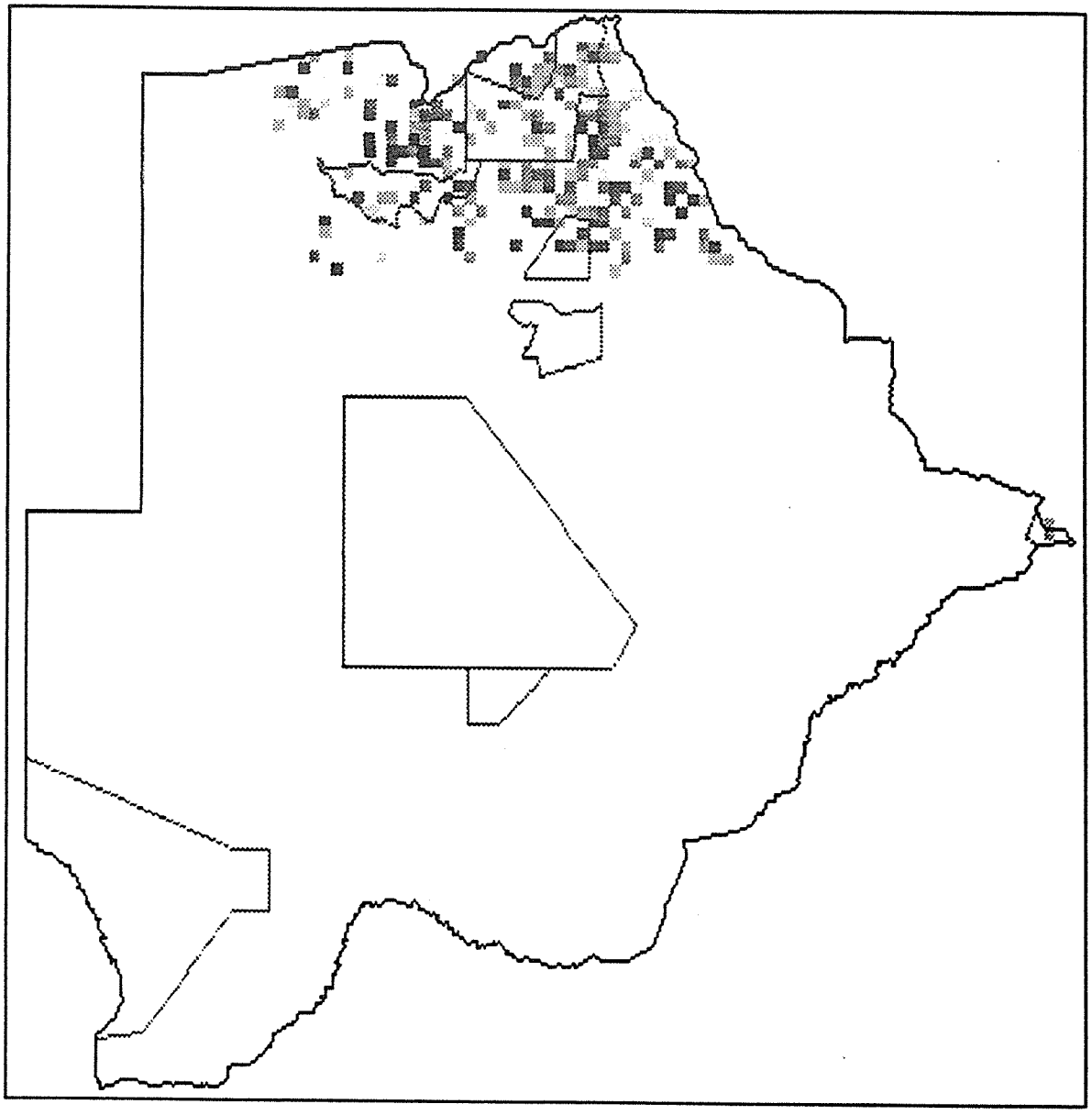

Figure. 4: Wet Season Elephant Distribution, all data 1990-1991. Shading Proportional to Log Numbers per grid cell.

22. Populations

Elephant population estimates

The official figure from aerial sample counts for Botswana's Northern elephant population as of 1990 is 54600 +-8400, as given in the Botswana Elephant Management Plan (DWNP 1991). Aerial total counts of the Northern Tuli Game Reserve population estimated about 400 in 1989 (NOTUGRE 1990). As noted above, an additional few elephants are occasionally reported in the Bobirwa sub-district in eastern Botswana, usually involved in incidents of crop raiding, but these have never been detected in aerial surveys or searches. Adding the Tuli total to the Northern estimate gives an figure of 55000.

Surveys done since the Management Plan was drafted suggest a somewhat higher figure. Literal interpretation of continuously updated estimates, based on the most recent surveys, can be confusing however, because the estimate may fluctuate due to sampling error alone. It is Botswana's policy to update the elephant management plan, and the figures it contains, every three years. For that reason, and because it represents a conservative, safe estimate in the light of more recent information, Botswana prefers the estimate of 55000.

In the joint proposal, Doc. B2.1, written by Zimbabwe on the behalf of the five southern African countries, Zimbabwe made the unilateral but not unreasonable decision, in view of the level of precision in elephant estimates, to round up the estimate for Botswana. Botswana supported this decision in its separate submission by giving information collected since its own policy was written. For the purposes of clarity, however, it is stressed that Botswana's official 1990 elephant population estimate is still 55000.

Botswana's northern elephant population was surveyed simultaneously with that of Zimbabwe's western Matabeleland in the dry seasons of 1989, 1990 and 1991. Namibia's Caprivi has also been surveyed for several years, most recently in July 1991. Since these estimates were consistent with other recent estimates in all three countries it is unlikely that unsynchronised surveys have given rise to large errors in the combined totals for the three countries. In future, dry season surveys of the elephant range will be coordinated with Zimbabwe and Namibia. In the case of Botswana, where two surveys per year have been carried out since 1987 (excluding 1988), the variation between survey results poses an upper limit of +- 17% of the average population which might move in and out of the country, but even that figure is unlikely, since this is within expected between-survey sampling error.

Rate of increase and other indicators of status

At present there is not a sufficiently long series of reliable aerial surveys to permit an estimate of the rate of increase to be made using this information. The present series of surveys by the Department of Wildlife and National Parks was started in 1987. Earlier surveys reported by Melton (1985),

KCS (1984a & b, 1985) and Work (1984, 1986) give rough indications of population size from 1980 to 1985, but they cannot be included in a rigourous statistical analysis of population trend because their methods, analyses and quality of reporting are too variable. Ten years of surveys at the present frequency and level of precision are likely to be necessary in order to give an estimate of the rate of increase with an acceptable degree of precision. Increasing the precision of individual surveys may not improve the situation much if the population is fluctuating due to occasional cross-border migrations.

When it is possible to give a rate of increase based on the survey results it will still not be possible to distinguish between intrinsic rate of increase in the population and increases due to immigration. It is therefore necessary to estimate rate of increase from other sources as well, for example calf classification counts.

Calf ratios have been estimated by visual observation in northern Botswana since 1987 (Calef 1991), with a recent review of the methodology by Moss (1991). In the most recent exercise in July 1991, an estimate of 4.4% was obtained for the ratio of first year calves to total numbers. This result is consistent with models giving population growth rates of 2.5 to 4.5% per annum, depending on the mortality schedule applied. Further research on juvenile mortality rates is now planned. These studies and further classification counts using the revised age estimation methods will allow more reliable estimates of population growth.

Aerial surveys do enable an index of adult mortality to be made using the carcass ratio (100% x number of carcasses seen/total number of elephants + carcasses seen). This may be compared with ratios from populations with known demography to obtain a crude impression of what sort of population trend the mortality might be associated with.

Unfortunately the presently available data on carcass ratio from Botswana is of variable quality. Half the surveys have been done during the wet season when carcasses are more difficult to see in the denser vegetation at ground level. Some observers obtained significantly lower carcass counts than those of other observers, even during the dry season, suggesting that they were unable to maintain a searching image for carcasses while looking for live elephants. Clearly it wouldn't be useful to give an overall estimate of carcass ratio in these circumstances, because it would be bound to be an underestimate. The only possible course is to ignore much of the information and select the best data set.

Taking only the data of the best carcass observer for a dry season count gave figures of 29 carcasses seen against 1187 live elephants seen by the same observer - an index of 2.4% with a 95% confidence interval of 1.5% - 3.3%. This is within the range for those populations in Zimbabwe known to have a healthy rate of increase.

According to the method of Douglas-Hamilton & Burrill (1991), a carcass ratio of 2.4% (+- 0.9%) corresponds to an annual rate of increase of 15.7% (range: 11.3 - 22.9%). This figure is too high to be biologically meaningful and it is probably an artefact of the authors' dataset which leans strongly on heavily poached populations. However, it does suggest that Botswana's elephant population is healthy and growing at a significant rate.

Frequency of group size is sometimes taken as an indicator of status, populations subject to extreme hunting pressure tending to display very large group sizes. Fig. 5 shows the frequency distribution of family group and bachelor bull group sizes for the 1991 dry season survey. The distributions are typical of a relatively undisturbed population.

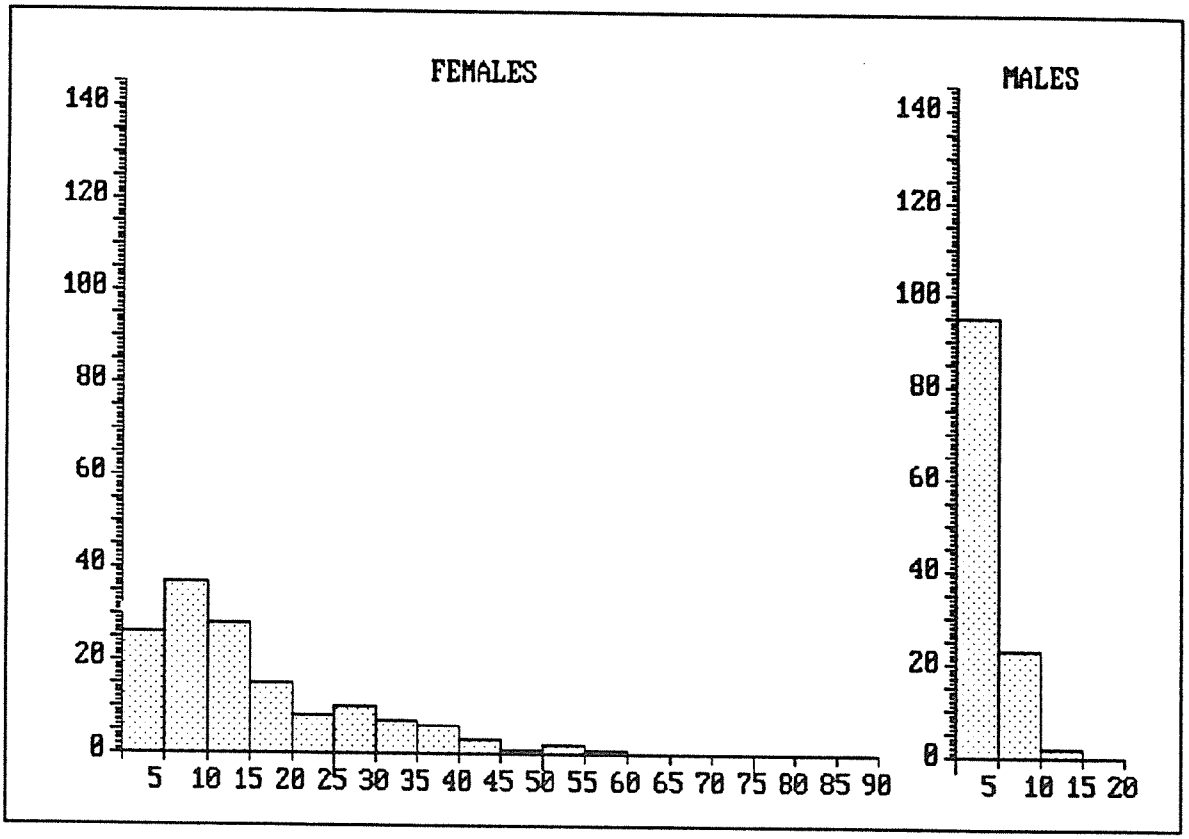

Figure 5: Frequency Distribution of Herd-size for Botswana Elephants.

In summary, four separate sources of data, namely aerial surveys, calf classification counts, carcass ratios and group size frequency distribution, all suggest that the status of the Botswana elephant population is healthy. While the data are not yet available to conclusively establish a precise figure for rate of increase, it seems clear that the population is growing at a positive rate.

23. Habitat

Within the northern elephant range, there are five broad habitat types, as defined by the dominant tree species present: riverine woodland (including the Chobe/Linyanti Rivers and the Delta system), Acacia woodland, Colophospermum mopane woodland, Terminalia/Burkea woodland and Baikeaia plurijuga woodland. Various combinations of these categories also occur, with mixed dominance of the major species.

Concern has been expressed over elephant impact on these habitat types, particularly the riverine, by a variety of observers since the 1960s (Child 1969, Sommerlatte 1976, Simpson 1978, Moroka 1984), as in southern Africa in general (reviewed in Martin, Craig & Booth 1989). While the research workers in Botswana took a variety of measurements of the extent of elephant feeding impact on trees in selected areas, and all suggested that such impact was responsible for severe habitat change, none attempted to measure rates of canopy tree loss or regeneration. Nevertheless, each of the authors felt that the level of elephant impact was excessive and each recommended reduction of elephant density through culling.

In addition to the aesthetic and commercial value of the trees themselves, elephant-induced habitat change may have consequences for other animal species. It seems intuitively likely that if elephants reduce browse abundance, particularly of palatable species, then other browsing herbivores such as rhinoceroses, elands or kudus will be affected. Equally, if elephants convert open woodland to dense coppice thickets, then woodland or ecotone grazers, such as sable, roan, and tsessebe could decline. These processes have been described by various authorities, Hall-Martin (1990) among others, who argue that these possibilities require management to hold elephants at a level where their impact on woody canopy is minimal. Hard data on the subject are lacking, however, despite the many descriptive reports and there remains a real need for research to clarify the processes at work.

Current elephant density over the entire range is 0.75/km^2, but during dry seasons, some 75% of the population concentrates near water into 16% of the area, where the average density is 3.5/km^2. It is in this concentration area, most notably within the Chobe National Park, Moremi Game Reserve and the Linyanti/Kwando area, where the diverse yet geographically restricted riverine habitats occur, and where impact on trees is likely to be greatest. Concern continues to be expressed over habitat change within these areas.

In the Tuli Block, where the elephant densities of 0.75 to 1.0/km^2 are comparable to northern Botswana, the habitat is dominated by C. mopane and there is concern over the conversion of woodland to thicket shrubland.

In the Zimbabwe, the management objective adopted is to preserve mature canopy woodland by maintaining an overall elephant density of 0.25 animals/km^2 in the elephant range, or

less than 1.0/km^2 in dry season areas (Martin, Craig & Booth 1989). In Kruger National Park, the same objective has apparently been achieved with an overall density of 0.35 elephants/km^2. In Etosha National Park, Namibia, however, the management objective is to allow a degree of fluctuation in elephant numbers and moderate amount of habitat interaction (M. Lindeque, pers.comm.).

A single figure for desired density is not well established in Botswana, since the necessary research support for such a definitive prescription has been lacking. An active programme of research into habitat interactions has now begun and is expected to reveal rates of habitat change in relation to elephant density over the next few years. A separate project on the relationship between elephant-induced habitat change and the diversity of other animals, including birds, has been inititated.

In the meantime, an adaptive (trial and error) approach will be taken. The current Elephant Management Plan calls for numbers to be held at a ceiling set by the 1990 population estimate through culling and/or cropping and, possibly through fencing of selected sites. It also calls for woodlands to be maintained in their 1990 condition. This policy will be assessed in light of the research findings on habitat change with particular emphasis, in both management and research, on the riverine areas, and on the effects of culling on elephant population dynamics and behaviour. Different scenarios of habitat interaction are being explored with reference to the different management goals: conservation of biotic diversity and processes, and sustainable utilisation for the benefit of local communities and the national economy.

3. Trade data

31. National utilisation

Ivory recovery/production

There has been no legal hunting of elephants in Botswana since the ban on such hunting by Cabinet Order in 1983. Prior to that time, ivory was the main product for citizen hunters, with some local processing of hides and consumption of meat.

All ivory produced in Botswana since the ban came from three sources: confiscation from illegal hunters, problem animal control and natural mortality. The ivory produced per year in 1989 and 1990 under the second two categories is shown in Table I. There was no data available on ivory recovered from poachers for these years.

Table I. Ivory recovered in the years 1989-90

Year	No. of tusks recovered	
	Problem Animal Control	Found/Natural
1989	50	144
1990	112	298

A system is being put in place for improved recording of ivory production statistics at the District offices in the elephant range, namely Maun (Ngamiland District), Kasane (Chobe District) and Francistown (Central District), and for reporting of such statistics to DWNP Headquarters in Gaborone.

Culling and cropping

As noted above, the current Elephant Management Plan calls for stabilisation of elephant numbers at the 1990 level of 55000. This would require a provisional annual offtake of some 2000 elephants. Botswana intends to precede any full-scale culling exercise with a sample cull of some 300 animals to examine the feasibility of culling operations and marketing of products, the effects on the elephant population and any environmental impacts of such activities.

The option of live capture of elephant calves for translocation is being explored. An elephant-back safari operation is currently run on a small scale in the Okavango Delta and its manager is developing a proposal to establish a "training school" for elephant calves. The DWNP is interested in reviewing this and any similar proposals.

Proceeds from elephant utilisation

Proceeds from culling and/or cropping operations will be directed towards local communities and by promoting the participation of local citizens in such activities. The culling operations will be carried out by Botswana-based private companies which will submit tenders; successful tenderers will pay a fee to the Government, which is likely to go to the Treasury. The company will then be able to sell the products on, deriving its profits from sales of meat, hide and bones. The principle is to direct revenue to the private sector and generate employment opportunities.

Ivory will be sold only by the central Government through the SACIM, but a portion of the proceeds from the sale of such ivory, decided by the SACIM Board, will be placed in a conservation fund, which will assist the development of natural resource utilisation in the communities in the elephant range. The remainder of the proceeds will go to the Government Treasury and then through the annual Budget to the Districts and the DWNP.

Any proceeds deriving from the sale of products from elephants killed on problem animal control will be placed in a compensation fund, which will be available to local citizens.

Sport hunting licence fees will go to the local District Council, while rental of hunting areas will go to the local Land Board. Profits from such operations will accrue to the individual hunting safari operator, the local lessee or in the case of community joint ventures, to the local community as well.

Manufacturing of ivory products

There were four private companies in Botswana involved in manufacturing ivory products before the CITES Appendix I resoluton. About five more companies were showing interest in entering the business at the time. With the Appendix I resolution, most of these companies have dropped their interest in elephant products, and most ivory carvers have abandoned the craft. A minority of carvers have taken up bone carving, and it is possible that these people would be able to return to ivory should the trade be opened again. It is not clear at present whether business interest could be rekindled at a future date.

All companies manufacturing ivory products are registered under the present legislation. They are given trophy journal registers for recording all trophies in their possession and are required to account for all stocks held on their premises. Monitoring of their premises is conducted to check compliance with the law and its specific regulations (see Annex 1a).

These regulations are paralleled in the proposed legislation (see Annex 1b).

Current ivory stocks

The current ivory stocks held in the central storeroom in Gaborone amounts to a minimum of 15 tonnes. With present system of storage and documentation, it is not possible to differentiate between tusks from different sources within Botswana. However, it is possible to report the country of origin of the ivory: 13.2 tonnes are from Botswana and 1.8 tonnes come from a confiscated shipment from Zaire (see Section 33. below).

Ivory storage and documentation

The DWNP is in the process of securing a new ivory store. This premises will be specifically designed for storing large quantities of ivory, bearing in mind the need for correct preservative conditions and for adequate security, and the need to satisfy the requirements of SACIM.

The Zimbawean system of marking and recording ivory and tracking ivory movements will be adopted with modifications where considered appropriate. All records will be brought in from the District stations and these will be reconciled with those at DWNP Headquarters. Records will be entered and backed up in computer databases. An officer will be appointed with specific responsiblity for registration and record-keeping.

At the moment, ivory in bonded transit through Botswana cannot be examined, but this situation will be amended in the proposed new Wildlife legislation (see Section 41. below). The Attorney-General has given assurance that stocks in bond will also be subject to the regulations concerning import and re-export.

32. Legal international trade

The last ivory auction held in Botswana was in 1985. Ivory exported from Botswana after 1985, according to local records, is reported in Table II.

Table II. Ivory exported or re-exported by Botswana in 1986-89

Year	Amount
1986	14 tusks
1987	20 tusks weighing 233kg
1988	0 **
1989	37 tusks
	27 pieces of ivory
	1538 kg of ivory

** Note that this figure does not tally with records at the Wildlife Trade Monitoring Unit, and it is not possible to reconcile this discrepancy with the local records.

33. Illegal trade

Antipoaching efforts

Allocation of resources

The Management and Utilisation Division currently has 318 senior officers and Game Scouts whose duties include antipoaching patrols. There are 50 vehicles currently available for use in the M. & U. Division, with another six on order for 1992.

In 1989, a special Antipoaching Unit within the Department was established. This now numbers 85 officers and Game Scouts and has 14 vehicles at its disposal, with six on order.

There are two Cessna 206 fixed wing aircraft with pilots in the Department's Aviation Unit, available on a permanent basis to assist in anti-poaching reconnaisance, and the Botswana Defence Force (see below) is prepared to provide more aircraft if needed. The purchase of two helicopters is proposed under the present National Development Plan period.

Within the elephant range, the annual operational budget currently stands at US$ 7/km^2, but this is planned to increase to US$ 95/km^2 over the course of the next six years under the new National Development Plan.

Cooperation with other agencies

The DWNP has cooperative enforcement arrangements with the Botswana Police in the detection and prosecution of persons hunting elephants and trading in elephant products illegally in Botswana. Of particular importance are intelligence activities, which are coordinated with the Combined Diamond and Drugs Investigation Unit of the Criminal Investigation Division.

The Botswana Defence Force has expressed a strong committment to assisting in antipoaching efforts. It currently has a large body of some 600 ground troops, not including logistical backup support, deployed in the field at a given time. These troops are replaced on shift, so there are 1200 men actually involved. The antipoaching patrols are particularly concentrated in the border areas of the Kwando/Linyanti/Chobe River system along the Caprivi, and in the Tuli Block and Gemsbok National Park areas. Assistance in the form of paramilitary training is also given to all DWNP officers and more specifically to the Antipoaching Unit.

Contact is maintained with the Wildlife authorities in South Africa and with the Endangered Species Protection Unit of the South African Police. There is also coordination with the Directorate of Wildlife, Conservation and Research of Namibia.

Elephant poaching statistics and effectiveness of efforts

The number of elephants recorded poached from 1988 to 1991, according to the most recently compiled statistics are shown in Table III.

Table III. Number of elephants recorded as poached 1988-91

Year	Number recorded poached
1988	114
1989	92
1990	48
1991	19

The discrepancy between the figures supplied in the original Botswana proposal and the present Supplement is regretted. It can only be assumed that previously reported figures included some animals from other poached species.

The apparent decline in poaching activity may be attributed to the increased allocation of effort and resources devoted to antipoaching actions in recent years.

According to the available statistics, there are on average three cases of elephant poaching and ivory smuggling taken to court per year. In all these cases, convictions were obtained. It is likely that several more cases have been prosecuted through direct Botswana Police and Botswana Defence Force channels, but unfortunately these records are not accessible at present. An improved system for inter-service reporting of poaching cases is being developed.

Cross-border movements of ivory

One serious incident occurred recently at the Zambia-Botswana border crossing at Kazungula. In this case, 1.8 tonnes of Zairean ivory were seized.

34. Potential trade threats

It is considered that the measures detailed in the SACIM treaty (Annex 4 of the original proposal Doc. B2.1), whilst open to further improvement and definition by the SACIM Board, should ensure that the trade in ivory in southern Africa will not prejudice elephant populations in other parts of Africa.

With reference to the amended version provided in the Zimbabwe supplement of the original Annex 5 (Marketing and Control System) of the proposal Doc. B2.1, Botswana has no problem with this version bearing in mind that additional details regarding the marking and recording of ivory and the bonding and monitoring of shipments can be negotiated within the framework of SACIM.

A further point of clarification can be made concerning safeguards against the entry of ivory originating from outside southern Africa into the trade via SACIM, and in particular, the scientific methods available for determining origins of ivory. In Botswana's original proposal, a method was described as the "Polymerase Chain Reaction". This is more correctly termed the "DNA method" which is under development as described by Georgiadis, Patton & Western (1989). Another more expensive, but perhaps more precise identification tool is the "isotope method" (van der Merwe et al. 1990). It is the intention of SACIM to explore both of these methods for ensuring that SACIM ivory is southern African ivory only.

4. Protection status

41. National

In Botswana, it is the responsibility of the Department of Wildlife and National Parks to protect and conserve elephants throughout the country. The Department provides the law enforcement staff to prevent illegal hunting in protected areas, and under the present hunting ban, elsewhere in the country, takes all management decisions concerning elephants, issues all import and export permits for elephant products, monitors and regulates the domestic carving industry and controls the government ivory store.

The laws and regulations pertaining to the protection of elephants and control of ivory in Botswana are given in Annex 1 of this supplement. Included in this Annex are both existing legislation and the much more comprehensive proposed legislation, the Wildlife Conservation and National Parks Bill, which has been drafted and reviewed by the Attorney General's Chambers. The latter is being examined by Cabinet

at the moment and will be presented to Parliament at its next session in February this year (1992).

42. International

The species is listed on Appendix I of CITES. Botswana, Malawi, Namibia, Zambia and Zimbabwe have entered reservations against this listing. In accordance with Resolution Conf. 4.25, these Parties are continuing to regard the elephant as if it were listed on Appendix II. On regaining official Appendix II status for elephants, Botswana intends to withdraw its Appendix I reservation.

5. Information on similar species

No additional information is supplied.

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ANNEX TO THIS SUPPLEMENT

Annex 1. Laws and regulations pertaining to elephant hunting and ivory in Botswana

a. Existing legislation. Excerpts from the Fauna Conservation Act (1982) as amended (1987).

b. Proposed legislation. Excerpts from the Wildlife Conservation and National Parks Bill, to be presented to Botswana Parliament in February 1992.