AMENDMENTS TO APPENDICES I AND II OF THE CONVENTION

Other Proposals

A. PROPOSAL

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

B. PROPONENT

South Africa.

- C. SUPPORTING STATEMENT
 - 1. <u>Taxonomy</u>
 - 11. <u>Class</u>: Mammalia
 - 12. Order: Proboscidea
 - 13. Family: Elephantidae
 - 14. <u>Scientific Name</u>: *Loxodonta africana* (Blumenbach, 1797). Only the nominate race *Loxodonta africana africana* (Blumenbach, 1797) occurs in South Africa (Meester *et al.*, 1986) and it includes:

1797 *Elephas africanus*, Blumenbach 1798 *Elephas capensis*, G Cuvier 1907 *Elephas africanus toxotis*, Lydekker

15. Common Names:

African elephant English: Eléphant d'Afrique French: Spanish: Elefante africano Afrikaans: Olifant Afrikanischer Elefant German: Elefante africano Portuguese: Zulu: Ndhlovu Ndhlovu Xhosa: Ndhlovu Siswati: Tsonga: Ndlopfu Tlou Tswana: Tlou Sotho: Venda: Ndou Sindebele: Ndhlovu, Nkubu

16. <u>Code Numbers</u>:

ISIS 5301415001002001001

2. Biological Data

21. Distribution

211. Historical Distribution: The recorded distribution of elephants in South Africa begins with a report of their occurrence at Mossel Bay on the Cape south coast by Vasco da Gama, a Portuguese navigator in 1497 (Skead 1980). The continuous record of In that year a modern history of South Africa, however, dates from 1652. provisioning station for ships sailing from Europe to the East Indies was established by the Dutch East India Company in Table Bay, later known as Cape Town. At that time elephants are reported to have occupied much of the territory (Fig. 1) later to become South Africa (Skead 1980, 1987; Smithers 1983; Hall-Martin 1992 a.). The arid central Karoo plains, Bushmanland and the Kalahari are however, unlikely to have supported large or permanently resident populations. The historical record shows little evidence that the grasslands of the interior, now known as the Highveld of the Orange Free State and southern Transvaal were particularly rich in elephants either. The savanna and woodland regions of the Transvaal and the high rainfall areas on the East Coast as far south as the Cape of Good Hope, however, supported large elephant populations (Smithers 1983).

No reliable estimate has ever been derived of the total numbers of elephants which may have existed in South Africa, but it is quite likely to have been of the order of 100 000 animals before 1652. The decline in the South African elephant population took place in three phases (Hall-Martin 1992 a.) characterised by:

<u>Settlement</u>: The decline of the species between the years 1652 and 1790 was largely caused by the increase in settlement and human population growth, with the ivory trade playing only a small part. The onset of this process of elephant decline was commented upon early in the historical record by Kolbe in 1731 and Mentzel in 1787 (Skead 1980), and is reflected in Fig. 2.

<u>Ivory Trade</u>: From about 1790 to 1870 the main force eliminating elephants was the growth of the ivory trade and the emergence of professional ivory hunters on a large scale (Skead 1987). These hunters operated as far north as the Zambezi Valley and their ivory was moved southwards to the ports of Durban and Port Elizabeth.

<u>Crop-protection</u>: By about 1870 the large elephant populations had been wiped out. From 1870 to 1920 the shooting of elephants was due, in large measure, to crop protection, especially in the Addo area of the eastern Cape (Stokes 1941; Hall-Martin 1980). Crop protection mortality was the major cause of the continuing decline of elephants in the Tembe area until as recently as 1983 (Bosman & Hall-Martin 1986). Small numbers of elephants from the Kruger National Park are still shot every year for crop-protection purposes on adjoining agricultural land.

As a result of these forces the distribution of elephants was drastically curtailed to four remnant populations permanently resident within the borders of the country by 1910 (Stevenson-Hamilton 1947; Hall-Martin 1980). These populations were at Knysna on the Cape south coast, Addo in the Eastern Cape Province near Port Elizabeth, the Sihangwane (Tembe) area of northern Natal, and the Olifants Gorge area of the eastern Transvaal in an area which was proclaimed a game reserve in 1898 and in 1926 became the Kruger National Park (Fig. 3).

212. <u>Current Distribution</u>: The distribution of the four elephant populations of South Africa occupied no more than 100 000 ha in total in 1910. Since then the distribution of elephants has changed dramatically as populations increased. By 1991 the elephant range of South Africa had grown to about 2,6 million ha (Fig. 4), and elephants were to be found in 33 discrete populations or ranges (Hall-Martin 1992 a.). The continuing establishment of new populations (not all of them of biological significance) has resulted in elephants being found at 49 localities in South Africa by 1994 (Table 1, Fig. 1). The range occupied by elephants had increased to almost 3,0 million ha by 1994 (Table 1).

The change in elephant distribution in South Africa since 1910 is the result of conservation and wildlife management practices largely initiated by the National Parks Board of South Africa. An active policy of elephant conservation through protection, management, utilisation and translocation has resulted in South Africa having increasing populations of elephants whose range is steadily growing. Between 1979 and 1994 alone 38 discrete new populations of elephants were established by the translocation of 663 young elephants, largely from the Kruger National Park and 347 animals in family groups, to areas where the species had earlier been exterminated. Two small populations (numbering 18 animals) were also established in Swaziland through translocations from the Kruger National Park. Over 93% of translocated calves survived, and stable reproducing populations have been created (Hall-Martin 1992 b.).

The distribution of elephant populations in South Africa in 1991 in relation to rainfall is shown in Fig. 6, and the actual size of each range in 1994 is given in Table 1. All new elephant populations have been established within the historical range of the species; most translocated populations occur in areas of above 600 mm mean annual rainfall. The new populations in the 400-600 mm rainfall regime have mostly been established naturally by emigration from the Kruger National Park. The absence of elephants above the 800 mm rainfall, with the exception of Knysna, is due to the higher rainfall areas having the highest human population density and high agricultural productivity. The exclusion of elephants here is to some extent a further example of the fundamental competition for habitat between man and elephants - as seen also in other areas in Africa (eg. Parker and Graham 1989).

The total elephant range of South Africa in 1994 comprises 29 552 km² or about 2,4% of the total surface area of 1 221 037 km² of the country. Most of the available occupied elephant range (66%) in South Africa is accounted for by the Kruger National Park which also accounts for 81% of the country's elephants. The other ranges are either state-owned with different legal status (18%) or privately owned (16%).

The difference between the above figure for elephant range in South Africa and that quoted by Douglas-Hamilton (1989) is largely due to the translocation of elephants to several game reserves and privately owned ranches from 1990 to 1994 (see Table 2). In sharp contrast to the Pan-African trend where elephant numbers and range are shrinking (Douglas-Hamilton 1989; Parker and Graham 1989; Caughley, Dublin and Parker 1990) the range available to elephants under legal protection and secure management in South Africa has increased by 479 178 ha (16%) under State control, and by 270 180 ha (9%) in private ownership since 1979.

22. <u>Population (estimates and trends)</u>: The status of the major elephant populations in South Africa is determined annually during the dry season by means of a total count carried out by helicopter in the Addo Elephant and Kruger national parks and either helicopter or fixed-wing aircraft on private reserves (Dublin 1989). In the case of Kruger there is a mean 1,4%

variation from year to year between the expected and actual count which can be attributed to census technique, weather and other factors which can influence a count. The census at the Addo National Park is more precise (as virtually all animals in the population are individually known). The number of elephants in Tembe, which is a mosaic of forest and dense woodland where aerial counts are not successful, are estimated on the basis of known animals, evidence of movements from tracks and droppings and helicopter counts. Census techniques are designed to yield data on sex and age composition of the elephant populations as well as numbers. In the smaller, recently established elephant populations numbers are determined from aerial census, the known numbers of animals translocated and known mortalities.

The estimates and counts quoted range over the period August 1990 to April 1994. Because the census work is carried out as routine operations in the national parks and on some of the private nature reserves, no detailed descriptions of the procedures followed have been published recently in the formal literature. However, internal reports (eg. Ostrosky 1988a, Whyte 1990) are produced for every census carried out. The earlier surveys carried out in the Kruger National Park were, however, published (Pienaar, van Wyk and Fairall 1966).

The status and potential maximum size of the present populations of African elephant in South Africa - under management regimes similar to that of the Kruger National Park - are shown in Table 2.

Kruger National Park

Estimates of the numbers of elephants in the Kruger National Park were made at irregular intervals between 1903 and 1964 as shown in Table 3. During the early years the Park Warden, Col James Stevenson-Hamilton, made estimates on the basis of known herds and individually known groups of bulls. By the 1950's rough road counts together with estimates or 'guesses' were being used. The first aerial survey, using a fixed-wing aircraft and covering only part of the park was carried out in 1960 (Pienaar, *et al* 1966). The first comprehensive total count by helicopter of elephant and buffalo was carried out in 1967 and has been repeated every year since with the exception of 1979 when insufficient funds were available. The census totals for the period 1967 - 1980 can be found in Hall-Martin (1984). All totals for the period 1967 - 1993 are included in Whyte & Wood (1994) and are also presented in Table 3.

The Kruger elephant and buffalo count was carried out from 1967 to 1973 using a Bell 47 helicopter, and from 1974 onwards using a Bell Jet Ranger 206 B helicopter (Hall-Martin 1992a.). The pilot is accompanied by a navigator/observer who sits left front, and two observers in the rear seats. The helicopter flies at a height of 600 - 800' above ground, and at a speed of 90 - 100 mph. The census takes 18 days to complete and the total flying time is 125 hours with two pilots taking turns. This flying time includes time taken for placement (ie. base to point where census begins and return to base) and time spent circling over both elephant and buffalo herds during the count. The flight path is traced on a map (1:100 000) of the park and follows all visible drainage lines; these are usually indicated by denser, taller riverine vegetation. The aircraft is usually positioned midway between the watercourse and the watershed as indicated in Fig. 7. Where the riverine fringing vegetation is particularly well developed, or dense enough to hide elephants, the flight path on either the outward or inward leg is set closer to the drainage line. At the top of the drainage line a wide sweep is flown to the watershed to check not only that there are no elephants in the drainage area counted, but also no elephants close to the watershed in adjoining drainage basins. Such groups are possible candidates to leave the counting area overnight by crossing a watershed and so their position and group composition is mapped and monitored on subsequent flights Because the census is carried out at the height of the dry season, it takes as well.

advantage of elephant daily movements. The animals tend to spend the cold winter nights on the watersheds to escape cold air drainage, and they drift down to water in the drainage line during the course of the morning as it warms up, to drink.

Elephant herds can be seen up to 3 - 5 km away depending upon the height and density of vegetation. On open plains even solitary bulls can be spotted at distances of 5 km and further. Breeding herds are circled at heights of 100 - 200' and while they are counted, calves thought to be less than one year old are recorded. Such calves are easy to distinguish up to about 6 months of age on size and the overlap of the pinnae on the head. Young calves are still hairy, older ones have a more "polished" look. The final basis of calf classification depends upon the experience of the observer. In the case of the 1990 census the average length of service in the park of the observers was 20 years per man and the pilots was 16 years per man. The pilots also contribute towards the estimate of the age of a calf but the final decision is left to one nominated observer throughout the duration of the count. The pilots, however, are also expert at estimating ages of calves because they are involved in the selection for capture of up to 140 calves, 2-4 years old, per year. The position of all elephants counted is plotted on a map.

The method has been unchanged since 1967 and results should therefore be comparable. The accuracy of the Kruger annual elephant census can be assessed by comparing the number of elephant counted with the expected census total for the same year (Fig. 8). The expected census total is calculated by adding the number of calves born since the previous survey, to the previous year's total and subtracting the number of animals culled during the year:

Expected total = previous year's total + calves born - cull

Both the expected and observed census totals from 1982 to 1990 are presented in Table 4. The difference between the two sets of totals for the nine year period is not significant $(X^2 = 85,955; df = 8; p < 0.0001)$ and the percentage deviation varies from 0,2% to 7,9% (X = 1,4%).

The variation in the calf crop from year to year (as estimated from the air) can be explained by rainfall during the year of conception and is presumably linked to the body condition of the cows. The relationship between the calf crop counted in any year and rainfall was shown by Hall-Martin, Whyte and Viljoen (1987) to be described by the expression: y = 1,403 + 0.048 x (r = 0,7748) where y is the calf percentage and x is the rainfall of the year of conception as a percentage of the long-term mean rainfall. This is another indication of the consistency of the methods used and the results obtained.

A further indication of the reliability of the Kruger census and the increasing trend of the population can be derived from the fact that the population has been kept fairly stable at around 7 500 animals over a period of 24 years (Fig. 9) during which time nearly 13 000 elephants have been culled in the park (Hall-Martin 1991a). Immigration of elephants into the park cannot be invoked as an explanation as the park has been fenced off from Mocambique (the main historical source of immigrant elephants) since 1974 (Hall-Martin 1991a). The long-term mean calf crop (percentage of less than one-year-old calves counted in each annual census) is 6,2% per annum or 476 calves per year. The mean number of elephants culled per year since 1974 (when immigration was effectively ended) is 517 animals. Numbers estimated as born in the park each year (476) can thus be safely revised upwards to at least 517. This reflects an actual increment of 6,8% per annum of the mean population of 7 642 animals (Hall-Martin 1991a) after natural mortality. Alternatively the observed calf crop could be a lower percentage of an elephant population which is larger than 7 500 animals. Either way these figures indicate a good degree of consistency from year to year.

The elephant population estimates for the Kruger National Park are plotted in Fig. 10 and the rate of change is indicated for the period 1900 - 1960 as 8,9% which is a reflection of recruitment, immigration and possibly inaccurate early estimates. From 1960 - 1970 the increase was 23,1% per annum which is accounted for by recruitment, massive immigration due to heavy hunting pressure and drought in Mozambique and the implementation of regular, repeatable, accurate censussing. The overall trend 1970 - 1990 is a decline of 0,2% per annum which for all practical purposes represents a stable population. A decline of this magnitude could be turned into an increase simply by relaxing the cull in any year, or a bumper calf crop. The variation in estimated calf crops (2,7 - 11,0%) indicates that a good crop could easily change this trend.

Addo Elephant National Park

Since 1976 the elephant population has been intensively studied and most of the animals are individually known (Hall-Martin 1980). Nevertheless the elephants are counted routinely during the annual game census (eg. Hall-Martin 1991 b) which is done using a Bell Jet Ranger 206 B III Helicopter following parallel flight paths within clearly defined counting blocks or areas. The height above ground, speed and strip width is adapted according to density of vegetation, light conditions and terrain. In general the Addo census is flown at 35 - 50 mph (ground speed) at about 50 - 100' above ground and flight paths are 200 - 300 m apart. The Addo census is designed for black rhinoceros counting which require a low-flying aircraft to flush them in the dense thicket vegetation. All rhino are known and marked (Hall-Martin 1986) and the accuracy of the count can be monitored. The elephant count is also checked against known animals, and known births and deaths during the year. The estimates, known population size and counts for the Addo elephant population for 1931 - 1994 is given in Table 5.

The trend of the Addo elephant population from 1931 to 1990 is shown graphically in Fig. 11. From 1930 to 1954 the overall rate of increase was only 2,6% per annum. This was largely because the elephants left the park regularly to raid crops or to feed on prickly pear (Opuntia sp.), and were shot. Only after the completion of the Armstrong fence in 1954 which confined the elephants to the park, was a more positive recruitment rate possible. The rate of increase between 1954 and 1979 when there was no interference with the population was 6,7% per annum (Fig. 11). The higher rate of increase of 7% per annum which was quoted by Hall-Martin (1980) was based on a 1954 population of 18 animals and not the 20 as shown in Table 5. This high rate of increase has been tempered in recent years by increasing mortalities among sub-adult males killed by bulls in musth (Hall-Martin 1987) and the disturbance by the translocation of 5 animals to Pilanesberg in 1979. The high mortality recorded (over 6% of the population was killed between 1977 and 1989) may well be related to the high density and the limited range in the park. This has been slightly alleviated by the recent purchase of land by the Rhino and Elephant Foundation, the Southern African Nature Foundation and the State which has increased the park area by 34% (Hall-Martin 1991c).

Tembe Elephant Park

The known data on the Tembe elephant population is summarised in Table 6. The early estimates are guesses based on local knowledge. The figure for 1975 was derived from a helicopter survey and intensive tracking and observation on the ground (e.g. Bosman and Hall-Martin 1986). There were reports of breeding herds in the area in the 1940's, 1954 and 1971 (Ostrosky 1988b) and again in 1973 (Thomson 1978). During 1975/76 intensive reconnaissance found evidence only of bulls and no breeding herds of elephant in the Tembe area (Hall-Martin 1980). All sightings, droppings and spoor records were of bulls. After the 1975 change of government in Mozambique heavy poaching of elephants and illegal settlement in the Maputo Elephant Reserve caused a movement of elephants southwards

across the border into South Africa. These immigrants included breeding herds (Klingelhoeffer 1987). In recent years the estimates of numbers of the Tembe elephants have been based on aerial reconnaissance and sightings of known individuals documented by means of a photo-file (Ostrosky 1988b). The apparent decline between 1978 and 1986 is due to the figures being based on minimum helicopter counts (Fig.12). Later estimates are helicopter counts supplemented by photo-file records.

The Tembe elephant population has been stable because of poaching mortality affecting these animals when they crossed the international border to Mozambique (Bosman & Hall-Martin 1986; Ostrosky 1988a). During the dry season of 1989 the border was sealed with an elephant-proof electrified fence which should stop future elephant movements. This population should then also show a similar rate of increase to other protected populations in South Africa.

Knysna Forest

The only elephant population in South Africa with a less than encouraging recent history is the remnant population in the Knysna Forest. The decline of this population from 1876 -1981 is shown in Table 7 and Fig. 13. In the past these elephants have been a low management priority for the forestry authorities and no specific management or protection action has ever been taken to benefit them (Hall-Martin 1980). Suggestions have also been made that the present range of the population is not adequate elephant habitat (Hall-Martin 1980; Koen, Hall-Martin & Erasmus 1988) but other observers have placed the blame for the decline of this population on poaching and crop protection shooting by smallholders (Carter 1970). The low point was reached in 1981 when only three elephants - an old bull, an adult cow and a calf could be accounted for (Koen 1981). Recent reports have however confirmed the birth of a calf during early 1989 indicating a slight recovery in the population. To assist this hopeful trend the Minister of Water Affairs and Forestry took (June 1991) a decision to start a process of elephant introductions to Knysna. The first three calves in this programme are scheduled to be moved during 1994 from the Kruger National Park.

Lowveld Private Nature Reserves

The Transvaal Directorate of Nature and Environmental Conservation carried out an annual aerial census of elephants in the Klaserie and Timbavati Private Nature Reserves. The census was done using a Bell Jet Ranger helicopter flying at a height of 250' above ground, the census strip was demarcated by strips attached to the helicopter (P. de Villiers pers. comm). The census was regarded as a total count. The data derived up to 1990 are shown in Tables 8 and 9.

The removal of game fences along part of the western boundary of the Kruger National Park during 1993 created an open system between the park and the private nature reserves of Timbavati, Klaserie, Sabie Sand and Umbabat. Since 1993 there has been unrestricted game movements, including elephants, and so the Kruger elephant census was extended in 1993 to include the other areas (Whyte & Wood 1994).

The population data for 1970-1990 are also plotted in Figs. 14 (Timbavati) and 15 (Klaserie). The fluctuations are most likely explained by movements across the boundary into the Kruger National Park and back again. Such movements by radio-collared animals are well known to researchers in the area. The decline in elephant numbers in Klaserie (Fig. 15) after the 1984 drought is clearly indicated.

Translocated Populations

The translocated populations are all stable or increasing slowly as they are mostly too young to breed and they are mostly far below ecological carrying capacity (Table 2 and Hall-Martin 1992 b.)

The first calf of parents translocated as calves was born in November 1989 in the Pilanesberg National Park. The parents are a bull translocated from Addo at the age of 3-4 years and a cow translocated from Kruger National Park at about 3 years of age. At the time of conception of the calf the bull was about 12-13 years old and the cow was 10 years old. During 1990 a further two calves were reported in Pilanesberg and the first calves (8) born to translocated parents in Natal were reported from Hluhluwe/Umfolozi Game Reserve.

Several of the translocated populations represent pioneer groups which will be added to in the future to achieve a more natural age structure of the population over time. The value of the transplanted populations on private land to elephant conservation is not significant. This is because most privately-owned ranges are too small to support viable populations in the long-term (Table 2). This problem may well be overcome by the 'conservancy' concept where adjoining landowners are encouraged to take down their fences so as to allow free range to game within the conservancy area.

During May 1994 the first translocations of complete family groups of elephants (including adult females) from Kruger National Park to privately owned ranches, and provincial nature reserves took place. Some 158 animals were involved in these moves made possible by procedures and equipment for translocating adult elephants pioneered in Zimbabwe during 1993. During the Zimbabwe operations 189 elephants (including adult females) were moved from Gona-rhe-Zhou National Park to the Madikwe Game Reserve in South Africa.

23. <u>Habitat (trends)</u>: Crude elephant population densities on South African elephant ranges vary from 0,01 elephants/km² in Knysna to 1,66 in Addo (Table 2). With the exception of Addo Elephant and Kruger national parks, the major elephant populations are still well below estimated carrying capacities of about 0,35 elephants/km² in summer rainfall savanna habitats of South Africa. This carrying capacity is determined by the management criteria as applied in the Kruger National Park and is a crude overall density (Joubert 1986). However, local densities over substantial areas may vary from 0,28 - 0,42 km² and may be maintained for periods of several years between culling reductions of populations in particular areas (eg. Hall-Martin *et al.* 1987). The population size and density recorded for the established populations of Timbavati and Klaserie can be influenced by immigration and emigration - both these reserves adjoin the Kruger National Park and there is a regular two-way movement of elephants. The dropping of the game fences between Kruger and the Klaserie, Timbavati and Sabie Sand game reserves during June 1993 has removed any restrictions on elephant movements between these areas.

In the Addo Elephant National Park the current population of 195 elephants is rapidly approaching the estimated carrying capacity of the presently fenced area of the park which is 11 718 ha and can support up to 2,0 elephants/km². The higher carrying capacity at Addo is determined by a different climatic system, with almost year round rainfall, and the nature of the vegetation which is a dense, succulent, evergreen thicket (Hall-Martin 1980; Hall-Martin *et al.* 1982). The carrying capacities of Mpongo Park and Shamwari (private animal parks) are also likely to be much higher than the estimate for the drier parts of the country as they are similar to Addo.

Studies on the impact of the Addo elephants on their habitat have been reported (Barratt and Hall-Martin 1990). These studies have measured changes in the species composition, plant volume, biomass, density and height of the vegetation. Because the vegetation at Addo is

a dense, low evergreen predominantly succulent thicket with many multi-stemmed shrubs making up most of the plant cover (Hall-Martin 1980) it is easily studied by methods approximating those described by Anderson & Walker (1974) and Walker (1976). The results of the studies at Addo included recommendations for the enlargement of the park to accommodate the elephant population at a level where no degradation of the vegetation will be taking place. This is particularly important because Addo also supports a population of 35 black rhinoceros *Diceros bicornis michaeli* (the Kenya/N. Tanzania subspecies) whose dietary requirements show substantial overlap with the elephants. If the financial means to substantially enlarge the park cannot be found, then the culling of elephants in the future appears unavoidable. Non-governmental organisations such as the Rhino and Elephant Foundation and the S A Nature Foundation in partnership with the state have, however, recently added 2 951 ha of land to Addo (Hall-Martin 1991c).

In the Transvaal similar studies on the impact of elephants on their habitat outside the Kruger National Park are being conducted by Nature Conservation Scientists from the Hans Hoheisen Research Centre.

The impact of elephants on their habitat in the Kruger National Park has long been studied and debated (Pienaar *et al.* 1966; Pienaar 1969; van Wyk & Fairall 1969; Coetzee *et al.* 1979; Engelbrecht 1979; Hall-Martin 1984; Viljoen 1988; Hall-Martin 1991a). The ecological, philosophical and practical considerations governing the policy of controlling elephant numbers in the Kruger National Park have been reviewed by Pienaar (1983) and Hall-Martin (1991a, 1992c). The National Parks Board's policy towards elephants aims to maintain biological diversity. Any process, such as the impact of a large elephant population which could impair habitat quality by bringing about large scale rapid vegetation change as has been documented in many other areas in Africa (e.g. Glover 1963; Napier Bax & Sheldrick 1963; Laws 1970; Martin, Craig & Booth 1989) as well as the Kruger, is therefore held to be incompatible with basic management objectives (Joubert 1986).

The deleterious effect that a large elephant population has on the dynamics of plant communities, individual species of woody plants, water supplies and interactions with other animal species as well as the effects of drought have all been considered (Pienaar 1983, Hall-Martin 1991a, 1992c). In this regard it should be recognised that the rainfall of the area is low by world standards (Fig. 6) and subject to regular cycles of below and above average rainfall (Gertenbach 1980). The volume of water flowing into the system from outside the park boundaries is also declining due to increased water utilisation by urban developments, industry and agriculture in the catchment areas of the major perennial rivers feeding the park (Pienaar 1985).

An increasing elephant population has also been shown to compete for food and limited water supplies with rare animal species in the Kruger National Park such as sable *Hippotragus niger*, roan *H. equinus*, tsessebe *Damaliscus lunatus* and eland *Taurotragus oryx* (Pienaar 1969; Hall-Martin 1984). Furthermore, the Kruger National Park now supports growing populations of both white rhinoceros *Ceratotherium simum* and black rhinoceros *Diceros bicornis minor*, both CITES Appendix-I species which are potentially sensitive to competition for grazing, browse and water with an overabundant elephant population. The numbers of white (1 900) and black (250) rhinoceros in the park, the present rate of increase of 6% -9% for white and 7.0% for black (Hall-Martin 1986), and the potential carrying capacity of the park for these species makes the Kruger National Park one of the most important rhinoceros sanctuaries in Africa. It is important, therefore, to ensure suitable habitat for these endangered species by controlling the numbers of elephants in the park so as to avoid the mortality seen elsewhere among black rhino when excessive numbers of elephants and drought destroyed their habitat (Corfield 1973, Cobb 1980, Parker 1983, Hall-Martin 1992c).

Long-term Trends

As far as can be predicted, the management policies followed towards elephants in national parks and game reserves in South Africa will ensure ecological stability (Hall-Martin 1992c). Whether this will result in long-term loss of ecological resilience within the system remains to be seen. The damping down of ecological perturbations will, however, ensure that more time is won to better understand ecological processes before elephants are allowed, if ever, to have an overpowering impact on the environment.

The elephant population is, therefore, culled to maintain it at a level which can be carried through drought years without detrimentally affecting the habitat (Joubert 1986, Hall-Martin 1984, 1992c). In reality this means limiting the elephant population to between 7 000 and 7 500 animals or a crude population density of about 0,36 - 0,38 elephants per km² (Hall-Martin 1984, 1991a).

There are several national parks and game reserves (Table 10) with habitat suitable for elephants, which when fenced to a suitable elephant-proof standard, will be restocked. These areas will add a further 391 937 ha to the national elephant range with a carrying capacity estimated at over 1 600 elephants at crude population densities approximately those of equivalent areas. The extent of land in private ownership which is also potentially available for elephants is likely to be less than this, and in smaller, fenced, holdings with less viable populations. The potentially available privately-owned land could accommodate a further 1 000 elephants at crude population densities of around 0.3 - 0.4 elephants per km². The potential maximum elephant population for South Africa, therefore, (Table 2 and 10) is about 13 000-14 000 animals.

3. Trade Data

- National Utilization: The trade in ivory within South Africa from South African sources 31. (Kruger National Park) has never been large. Most ivory sold to local ivory manufacturers was in turn sold as curios to foreign tourists. Since the Appendix-I listing, the ivory carvers have gone out of business and curio shop stocks are virtually static. There is also a trade in elephant meat, fat and carcass meal derived from the culling of surplus elephants in the Kruger National Park (Table 11). All these products are consumed within South Africa and yielded USD 257 505 per year on average between 1985 and 1992 (Table 11) to the management budget of the park. A well developed elephant leather industry based on skins derived from the cull (Table 22) yielded USD 394 348 per annum between 1985 and 1989 (Table 11). As was the case with ivory prices for the various grades and cuts of hide were rising steadily (Fig. 16). The price of speciality cuts such as trunk skin (Fig. 17) and ear skin (Fig. 18) were more variable and subject to fluctuating demand. Most of the elephant hide was exported as tanned and finished leather or as finished leather goods (luggage, brief The elephant leather industry was worth cases, purses, handbags, wallets etc). USD 0,75-1,50 million per annum to the local economy and accounted for 25% of the turnover of Exotan, the company doing the processing. The closure of the elephant leather market resulted in the retrenchment of 30 workers by Exotan and a significant financial loss to the industry and to the National Parks Board. The elephant leather trade, as well as the trade in other derivatives such as bracelets made from elephant tail hairs, and other articles was also of value in Zimbabwe and Botswana (Child & White 1988, Thomsen 1988).
- 32. <u>Legal International Trade</u>: As far as can be established none of the CITES range States who took out reservations after Lausanne (Zimbabwe, Zambia, Malawi, Botswana, Namibia and South Africa) have sold any ivory on the international market between June 1989 and the time of writing of Caldwell & Luxmoore's (1990) report and there is no indication of any significant sales taking place up to 1994. The state of the legal international trade in ivory was exhaustively reviewed and documented prior to the 7th meeting of the Conference of

the Parties and needs no repetition. Major sources of data are to be found in the Report of the Ivory Trade Review Group (Cobb 1989). Other sources of data, all of which refer to the situation pertaining before the Appendix-I listing of the African elephant are the reports of R B Martin (1989) on the ivory trade in southern Africa; the consultant report for CITES on the raw ivory trade by Parker (1989), the report on intra-African trade up to 1988 as reflected in Cote d'Ivoire (Friedlein and Hykle 1989), the Hong Kong ivory trade (Milliken and Melville 1989) and numerous earlier reviews and compilations.

South African trade records concerning the export of ivory (raw and worked) as reflected in Customs statistics are freely available and were extensively quoted by Martin (1989) and Parker (1989). Much has been made of discrepancies between these records and those of importing countries, and between Customs records and the figures given in the CITES annual reports. However, South Africa is a member of a Customs Union that includes Botswana, Lesotho, Swaziland and Namibia. Exports from any of these countries are sometimes recorded as imports from South Africa (in the recipient country) but may not be reflected as exports from South Africa as such goods exported from, for example, Botswana would not have passed through the books of the South African customs authorities. A further complication is that ivory exports are listed by SA Rand values, and not by weight. These values have therefore been converted to US Dollar prices and from that to mass. In some calculations the number of tusks recorded in Customs statistics have been converted to mass using an assumed mean tusk weight of 5.00 kg. This is a very rough mean tusk mass based on data in the ITRG report (Renewable Resources Assessment Group 1989). The scope for inaccuracy in such assumed calculations is great. It is also not always clear that records of imports from South Africa did in fact originate in southern Africa and the possibility of forged waybills or other documentation has not been adequately investigated. The distinction between worked and unworked ivory does not always appear to have been rigidly applied and records of ivory pieces could be either. The South African annual reports to CITES list the export of unworked and carved tusks (Table 12), for which CITES permits were issued by Management Authorities. A more complete picture may be derived from a comparison of WCMC, Cambridge records of Customs data. An analysis of these records, converted to mass, are given in Table 13. The discrepancy between these figures and the CITES report figures are not easy to reconcile, given the several sources of error and the assumptions on which these data are derived as mentioned above. The important point, however, which is made by the data of Table 13, is that raw ivory exports from South Africa from 1980 - 1989 could be accounted for by declared imports.

The data (Table 12 and 13) support the conclusions of Ilsley (1989), Martin (1989) and Parker (1989) and clearly indicate that the legal ivory trade in South Africa was in a phase of decline even though prices were steadily increasing (Table 14 and Fig. 19). The major portion of registered stocks of tusks in private ownership has been exported since 1980 - as is clear from a comparison of the number of tusks registered by the various management authorities (Table 15) with the number of tusks still held in South Africa in 1991 (Table 16). A portion of the unworked tusks exported were derived from the Kruger National Park. The mean annual production of ivory from Kruger amounted to 874 tusks weighing 5 067,9 kg per year for the period 1973 - 1993 (Table 17). Ivory sales from the park yielded USD 730 900 per year to the park budget from 1985 - 1989 (Table 11). No ivory has been sold internationally since the Appendix I listing and the current stock of ivory held by the park amounts to 2 282 tusks with a mass of 14 258,5 kg (Table 18). Sales of elephant leather, most of which entered into international trade yielded USD 394 348 per year from 1985-1989 (Table 11). The current stock of unsold elephant skin is 95 150 Kg (Table 22) with a 1989 market value of R4 953 509.00.

For the purposes of the present submission there is no legal international trade in ivory or African elephant leather. Movements of limited numbers of live African elephants has occurred with the necessary CITES permits (Table 19).

33. <u>Illegal Trade</u>: Relevant data on the illegal ivory trade was compiled in the report of the lvory Trade Review Group (Cobb 1989), and in the reports of R B Martin (1989), Parker (1989), and Milliken & Mellville (1989). None of these reports mentioned any illegal trade in elephant hide.

Reports on the extent of illegal trade in ivory passing through South Africa have appeared in the media. As the 7th meeting of the Conference of the Parties drew near the intensity of reports on South Africa's role in the illegal ivory trade increased. That an illegal trade in ivory and rhinoceros horn operating within and through South Africa exists, is not disputed. The recognition of this problem was the major motivation for establishing an Endangered Species Protection Unit (ESPU) within the South African Police Service. However, virtually no hard evidence has ever been presented to the international community to substantiate claims of this illegal trade other than discrepancies in Customs statistics and the reports of seizures and arrests mostly made by the ESPU. Reports of the movement of up to 100 tons of ivory per year through South Africa, derived mainly from Angolan sources (van Note 1988) have never been substantiated. No complicity of any South African authorities in any illegal ivory trade has been proved though security force involvement is claimed. The integrity of South Africa's CITES authorities, and the reliability of their records have, however, been favourably commented upon (Martin 1989, Parker 1989). The Endangered Species Protection Unit within the South African Police Service continues to make arrests and disrupts the illegal ivory and rhinoceros horn smuggling rackets (Table 20). Special investigation units of the Transvaal and Cape Provincial Administrations have achieved a similar degree of success; the Natal Parks Board has expanded its wildlife investigations section for operation outside its formal protected areas.

Excellent contact is maintained by the ESPU with countries of destination of illegal ivory. Ongoing training of a special unit by South African officials is done in Taiwan, while a special unit has also been established in Hong Kong. South African police officials also provide training to this unit. Liaison has been established with Japan through the embassy, and information is exchanged through this channel. China was visited during November 1993 during a meeting of the CITES technical group. Good contacts were established during this visit between the South African and Chinese authorities.

The Endangered Species Protection Unit has free access to neighbouring countries to perform law enforcement. Co-operation with these countries (eg. Botswana, Namibia, Zimbabwe, Swaziland) is excellent, and police officers of the neighbouring states are currently also being trained in South Africa.

In terms of the recent Lusaka Agreement (December 1992) an international task force was established, to carry out cross-border operations with a view to reducing illegal trade in wild fauna and flora in Africa. Considerable progress has been made and the Agreement was refined during subsequent Working Group meetings. Countries such as Malawi, Kenya, Lesotho, Mozambique, South Africa, Swaziland, the United Republic of Tanzania, Uganda and Zambia are currently participating in this process.

34. Potential Trade Threats

341. <u>Live Specimens</u>: An increasing trade in live African elephants sold by the National Parks Board has been a positive feature of the elephant culling programme in the Kruger National Park (Hall-Martin 1990, 1991a, 1992b). The sale of live elephant calves has resulted in new populations being established within South Africa and overseas (see Table 1 and 2). The trade in live elephants from South Africa should therefore be seen as a positive development which enhances African elephant conservation nationally and internationally. The export of live elephants since 1986 has been covered by CITES export permits (Table 19).

342. <u>Parts and Derivatives</u>: Some of the elephant leather derived from the culling operations in the Kruger National Park, in its processed form, was sold in the tourism trade and moved from South Africa as personal effects of visitors. Much of the production of elephant skin was exported as tanned leather to the USA and was there used for the manufacture of leather items. The trade in elephant leather did not, in any way, constitute a threat to any elephant population (TRAFFIC 1989). No other elephant parts or derivates (other than ivory, tail hair, and leather) entered international trade.

It is unlikely that the proposed international trade in elephant hide will stimulate additional illegal killing of elephants in South Africa or elsewhere. There is no recorded instance of skin from an illegally killed elephant entering the international trade. Elephant skin is not a durable commodity as is ivory. In order to meet international trade standards, elephant skin must be removed in large panels treated and dried in a time consuming process. This procedure, with its associated logistics, would be very difficult to carry out undetected in the presence of even a minimal law enforcement capability. Elephant skin is a relatively bulky and easily identifiable commodity; it can not be cut into small pieces and disguised while retaining its commercial value as can ivory; illegal transportation would be relatively easy to detect.

4. Protection Status

41. <u>National</u>: Under the constitution of the Republic of South Africa effective from 27 April 1994, the country was divided into nine provinces. Each of the provinces has a provincial government having competance over nature conservation, excluding national parks. The National Parks Board remains a statutory body reporting to the Minister of the Environmental Affairs and Tourism and the National Assembly. The various management authorities and territories of the former provinces (Natal, Transvaal, Orange Free State and Cape of Good Hope) the self-governing territories (such as KwaZulu) and the independent states (such as Transkei) will now be amalgamated within the new boundaries of each of the nine new provinces. Harmonisation of laws, regulations and control systems within the new structures is being pursued.

The text which follows refers to provincial and other legislation as in place on 26 April 1994. This legislation will be valid and binding until new provincial legislation is promulgated.

The African elephant enjoys legal protection in all the jurisdictional entities in South Africa. The exact status in each area, and the penalties for infringing on the status of the species, vary somewhat at present. There is, however, an effort underway to ensure uniform penalties for the illegal killing of elephants, or the illegal possession of ivory or trade in ivory throughout the Republic's various jurisdictional areas. Penalties providing for fines of up to R100 000 and/or 10 years imprisonment for the illegal trade in elephants and elephant products, and the illegal hunting of elephants have been enacted in all four Provinces and are also applicable for similar offenses in national parks.

The National Parks Act (No 57 of 1976) as amended prohibits hunting within a park or otherwise wilfully or negligently killing or injuring any animal (Section 21 (1) (c). The penalty for contravention is listed in Section 24 (1)(b): With regard to elephant or rhino - on conviction are liable to a fine of not less than R30 000 and not more than R100 000 or in default, imprisonment for not less than 5 years and not more than 10 years. With a previous conviction any contravention leads to imprisonment without a fine. Section 24(9) makes provision for the forfeit of weapons and vehicle in addition to the fine and imprisonment.

In Natal elephants are classified in terms of Schedule 2 of the Nature Conservation Ordinance No. 15 of 1974 as protected game. Section 37(1) of the Ordinance states that

no person shall at any time hunt, capture or keep in captivity any protected game. Section 55 (1a (i)) provides that in the event of a conviction or a contravention of Section 37 a person in the case of the hunting, capture or the keeping in captivity of elephants, shall be liable to payment of a fine not exceeding R100 000 or imprisonment for a period not exceeding 10 years or to both such fine and such imprisonment. Section 51 provides that no person shall export game from Natal unless he obtains a permit from the Natal Parks Board with the prior approval of the Administrator. In terms of Section 55 the penalty for a first offender contravening this section is as in the case of elephants, the same. Section 55(2) provides that upon a second or subsequent conviction, the court may impose double the fine or alternately, double the term of imprisonment, or double the term of imprisonment without the option of a fine.

Elephants are protected wild animals in the Cape Province according to Schedule 2 of the Nature and Environmental Conservation Ordinance (No. 19 of 1974). Section 27 prohibits hunting of protected wild animals without a permit and Section 42(1) makes it an offence to possess any part of the carcass of any wild animal unless legal possession can be proved. Section 44 prohibits the import, export and transport without a permit. This is emphasised in Section 44(b) (ii) with specific reference to CITES. Penalties for contravening these sections are covered in Section 86(1)(b): On first conviction a fine not exceeding R 100 000 or imprisonment for a period not exceeding 10 years or to both such fine and imprisonment. Upon a second or subsequent conviction, the court may impose double the fine or alternately, double the fine term of imprisonment without the option of a fine. The confiscation of all goods, firearms, vehicles, etc., involved in both cases in the discretion of the court also exists.

The Transvaal Nature Conservation Ordinance (12 of 1983) lists the elephant as specially Protected Game (Article 15(1) (a)). Protected game may only be hunted under special permit (Article 16(1)). Penalties for contravening this article are listed in Article 16(2) (a) and (b): A fine not exceeding R100 000 or imprisonment not exceeding 10 years, or both. A conviction also attracts an additional fine not exceeding three times the commercial value of the animal in respect of which the offence was committed. Article 97 lists the elephant as a rare and endangered species in terms of the Washington Convention and Article 98 regulates the international trade in the species and its products according to CITES requirements. Contraventions in terms of Article 98 are subject to penalties as in the case of Article 16(2) (a) and (b) quoted above. Article 32 prohibits the sale of ivory without a valid permit; Articles 37 and 38 prohibit the receipt, possession, acquisition and conveyance of raw products (ivory), Article 112 provides mandatory forfeiture of ivory following any conviction in terms of all articles quoted above.

In the Orange Free State elephant are listed as protected game. Schedule 1 Section 2(1) of the Nature Conservation Ordinance (No. 8 of 1969). No person shall hunt protected game without a permit (Section 2(3)). Export and import of elephants or products, possession, conveyance, processing and manufactures, also requires a permit. The penalty for contravention with respect to elephant is a fine not exceeding R100 000, or imprisonment not exceeding 10 years, or both.

According to the KwaZulu Nature Conservation Act (No. 8 of 1975) all wild animals are protected wild animals (Schedule 4). Section 5(1) prohibits the hunting, buying and selling of protected wild animals without authorization. The sale, donation, possession and transportation of protected wild animals is also prohibited unless under permit (Section 13). The penalties are listed in Section 37: On a first conviction, R200 or 200 days imprisonment. On a second or subsequent conviction, no less that R400 and no more than R800 or imprisonment of not less than 400 days, but not more than 800 days. In KwaZulu elephants may be hunted legally with a permit. The KwaZulu Nature Conservation Regulations (Notice 29 of 1979) make provision as follows: Any person who kills an

elephant shall within 15 days produce the ivory for registration by the Nature Conservation Officer in the region where the elephant was killed. Permits according to Schedules 5 and 13 are, however, not normally issued. Amendments to the Act, which will bring it into line with the penalties of the other agencies are at present being processed.

Bophuthatswana has two Acts that are applicable to elephants. The Bophuthatswana Nature Conservation Act (No. 3 of 1973) classified elephants as protected game (Schedule 1). Section (3)(a) prohibits hunting, buying and selling without a permit and Section 6 the sale, donation, possession or transport of dead animals without a permit. Section 19 deals with the protection of animals in game reserves and nature reserves - hunting is prohibited. Penalties are listed in Section (28) - for contravening Section (3) (a) a fine not exceeding R100 000 or imprisonment not exceeding 5 years in the case of a first or second conviction. The penalty for a third or subsequent conviction is imprisonment without the option of a fine. The National Parks Act (No. 180 of 1987) prohibits the killing or injuring of any animal (Section 32(1) (c)). Section 36(1) (b) states the penalty for contravening Section 32 (1) (c) with specific reference to elephants. On a first conviction a fine not exceeding R100 000 or imprisonment not exceeding 5 years. Subsequent convictions lead to imprisonment without the option of a fine.

Legislation also provides that all ivory in private and state possession must be registered and marked in accordance with CITES prescriptions. This has been carried out since 1982 (Table 15). In the case of the Transvaal Ordinance regulations may be passed which will provide for mandatory fines of R50 000 or 5 years imprisonment for failure to register ivory.

The illegal hunting, or poaching, of elephants does not represent a threat to any South African elephant population. No elephants have been illegally killed in Addo in the past 50 years, no elephants are known to have been killed illegally at Knysna in the past 20 years; no illegal kills have been made in Tembe either. None of the reintroduced populations of elephants have suffered any losses due to illegal activities. In the Kruger National Park a spate of illegal incidents in 1981-83 resulted in 184 elephants being killed by poaching gangs operating from a neighbouring State. Stepped-up anti-poaching patrols resulted in a number of armed clashes in which the poaching gangs, armed with military weapons, were eliminated. Sporadic incidents of poaching of elephants in the Kruger National Park were recorded in recent years accounting for a further 20 bulls by May 1989. Since July 1989 there has been a marked increase in poaching and by March 1993 a total of 64 elephants had been illegally killed. Many of the individuals involved in the elephant poaching have been arrested, and four have been killed in contacts with park rangers. Ten military weapons and twelve hunting rifles have been confiscated in these incidents. The majority of the individuals involved in these activities are foreigners.

The incidence of illegal killing of elephants in the Kruger National Park though having increased since the Appendix-I listing, is still relatively low because of the adequate allocation of resources and manpower to the security of the park (Hall-Martin 1990, 1991 a). Furthermore, the establishment of a full-time Anti-Poaching Unit in the park during 1992 has contributed to a sharper response to the perceived threat of poaching directed at rhinoceros as well as elephants. Examples of the protection budget within national parks and game reserves in South Africa, as well as outside protected areas, are given in Table 21. It can be seen that the recommended protection effort of one man per 50 km² and expenditure of USD 200 per km² (Cumming, du Toit and Stuart 1990) is greatly exceeded in South Africa.

42. <u>International</u>: The status of the African elephant prior to June 1989 was adequately covered in the documentation submitted to the 7th meeting of the Conference of the Parties held in Lausanne, Switzerland from 1-10 October 1989. Little purpose can be served in attempting to review the situation prior to that date in the present submission. Benchmark reports on the status of the African elephant, throughout its range (Douglas-Hamilton 1989), are contained in the report of the Ivory Trade Review Group. The estimate for the numbers of elephants in Africa was 609 000 (Douglas-Hamilton 1989) in 1989 and this figure has changed little since with the most recent estimates being in the range of 549 000 - 652 000 (Douglas-Hamilton, Michelmore and Inamdar 1992).

5. Information on Similar Species

The Asian elephant *Elephas maximus* is the only other living representative of the Proboscidea. It is also listed under Appendix I. Most threats to the Asian elephant in recent years have been as a result of habitat loss, rather than poaching for ivory (Sukumar 1989). The poaching of Asian elephants in Laos and Viet Nam reported by Martin (1990 b.), and linked by him to a rising ivory price in those two countries, is on a small scale, serving a domestic market and likely to be of little consequence to the survival of the species. No recent reports have linked the African elephant ivory market to factors affecting the Asian elephant (Martin 1990 b., Caldwell and Luxmoore 1990). A recent report on the export of live Asian elephants from Myanmar (Burma) to Europe indicated that these activities constituted a threat to the status of the species in Myanmar (Broad 1990). Subsequently both the CITES Secretariat and the Commission of the European Community issued directives against the import of live Asian elephants from Myanmar (Broad 1990). The reported trade in elephant leather in Thailand has been shown to be based on fake products (Elephant and Ivory Information Service No.14 p.47).

6. Comments from Countries of Origin

Not applicable.

7. Undertaking

The South African authorities initiated a process of developing a secure trading system for raw ivory originating from South Africa (refer paragraph 84. below). It was the intention to submit these proposals to the 10th meeting of the Conference of the Parties for formal approval. However, it is deemed advisable that the CITES Secretariat be requested to accept responsibility for the development of such a system. Until such time as a system has been approved by a meeting of the COP, the South African Government undertakes not to export any State or parastatal stocks of raw or worked ivory, and not to issue any import or export permits, or re-export certificates for ivory would thus be limited to hunting trophies and other non-commercial transactions as may be authorised under Article VII of the Convention; the same would apply in the case of species being listed in Appendix I.

South Africa would accept that the listing of its African elephant population in Appendix II be annotated "only for trade in commodities other than ivory", or that the COP decides upon a mechanism under which the Depositary Government shall, upon request from the Secretariat or the Standing Committee, propose the transfer of the South African elephant population back to Appendix I if South Africa were to take up trade in ivory without a previous adoption of a trade control system by the COP.

In addition, South Africa will withdraw its reservation on the listing of the African elephant in Appendix I within 90 days after the adoption of the present proposal.

- 8. Additional Remarks
 - 81. <u>AERSG Conditions</u>: The opinion of the IUCN/SSC African Elephant and Rhino Specialist Group on the possibility of a split-listing for the African elephant (as was also recommended by TRAFFIC, 1989) was published, with additional comment in *Pachyderm* (Western 1990).

The key paragraph for purposes of the present submission is quoted in full: "AERSG considers that the southern African position must be accommodated in the interests of elephant conservation in the region and in the interests of supporting the CITES Convention. The dual listing of African elephants on Appendix I and Appendix II is supported but must be accompanied by strong controls to ensure that trading nations do not become a conduit for illegal ivory". The statement continued to address the split-listing concept and set out five further steps which it urged should be taken if the dual listing was agreed upon. These steps are again quoted from the text of Western (1990):

- 1. The development, by producer States, of clear and openly stated criteria on which their elephant management programmes are based.
- 2. The introduction of simple and stringent controls on the movement of both raw and worked ivory between producer states and trading partners to preclude the laundering of illegal ivory.
- 3. The introduction of mechanisms for routinely verifying the origin of ivory shipments between legal trading partners.
- 4. The introduction of a moratorium by range states wishing to export ivory until such time as adequate criteria and controls have been developed and implemented.
- 5. A declaration by each of those states opting for Appendix I on how they intend to deal with confiscated ivory, ivory originating from management programmes such as problem animal control, and ivory from natural mortality. The volumes of ivory involved and its disposal should be clearly and openly reported to the CITES secretariat.

Clearly the first four steps are those which, in the view of the AERSG, are incumbent upon a state wishing to trade ivory from an Appendix-II population. The South African management authorities submit that the first of these steps (conditions) has been clearly met in the biological criteria set out above in this submission (Section 2). The question of a moratorium has also been addressed. The South African Government, while entering a reservation against the decision of the Conference of the Parties to list the African elephant in Appendix I, nevertheless announced a moratorium on ivory sales from 18 January 1990 until 31 December 1990. This moratorium has subsequently been extended and will now run until the 9th Conference of the Parties has reviewed the present submission. The initiation of the moratorium was to give the ivory ban a chance to work as many of its proponents still claim it is only of temporary necessity and to allow time for a better system of ivory trade control to be developed.

- 82. <u>Report of the 1990 CITES Panel of Experts</u>: A panel of experts, as set out in Resolution Conf. 7.9, was set up to evaluate the proposal of South Africa to transfer the population of *Loxodonta africana* of that country from Appendix I to II. The report was favourable to the proposal providing that certain procedures were followed.
- 83. <u>International Trade in Elephant Hide</u>: The sale of elephant hide, derived from animals culled during the management of the Kruger National Park, has in the past contributed towards the income of the park (see section 32. above, and Table 11). This represented a legitimate use of a natural resource. It can be sustained for as long as there is an ecological requirement to control elephant numbers in the Kruger National Park through culling.

The procedure followed in the treatment and drying of the hide is sufficiently complex, and the value of hide sufficiently low to ensure that it is unlikely to be carried out on any significant scale as an illegal activity. The skin is removed from the animal in panels which are soaked in brine tanks for 48 hours, then packed in a mixture of salt and sodium carbonate in deep shade (indoors) for 14 days, before air drying on shaded racks for 30-60 days. The skin is bulky and heavy and difficult to transport other than by vehicle.

It is intended to sell the hide only to reputable South African processors of leather (such as Exotan) who will only be allowed to export finished elephant leather, under CITES export permits, marked in the same manner as crocodile skins. Full records will be kept of the number and weight of panels of raw skin, and the quantity of leather produced and sold or exported.

- 84. <u>Commitment Regarding Ivory Trade</u>: In making its proposal South Africa wishes to affirm that it does not see it as a step deliberately aimed at a reopening of the ivory trade. It believes that the question of if and when conditions would be right for the latter is a matter for the CITES community as a whole.
- 85. <u>Sustainable Use and Motivation for Trade</u>: The complexities of the African elephant ivory trade, the different status of different elephant populations, and the need for controls are recognised by all responsible commentators on the issue. Mechanisms for effective control, so as to allow the sustained use of elephant products from the abundant, well-managed population in the Kruger National Park is the key argument presented by South Africa. That the sustainable use of wild animals can be an effective strategy for their conservation is clearly recognised in the declaration issued after the donors meeting in Paris in April 1990 (see Elephant and Ivory Information Service No. 10: p 33-34). More recently, at the General Assembly of the IUCN the World Conservation Union held in Perth, Western Australia, a comprehensive resolution entitled "Conservation of Wildlife Through Wise Use As a Renewable Natural Resource" was unanimously accepted. This resolution, reflecting the opinion of a significant body of the world conservation movement, clearly recognised also that the sustainable use of wildlife resources can enhance the conservation of wildlife populations and their ecosystems because of the economic and other benefits that such use provides. Clause 3, in particular, sums up the views contained in the present submission:

"Recognises that, consistent with national and international legal obligations and policies, trade in clearly identified products derived from properly managed sustainable use of wildlife carried out in accordance with agreed guidelines and safeguards can confer incentives that enhance the conservation of the species or population involved".

Subsequently the Conference of the Parties to CITES also adopted a Resolution on the benefits of trade in Wildlife. (Res. Conf. 8.3)

The income derived from the sale of elephant products by the National Parks Board of South Africa flows directly into its conservation budget out of which, among other activities, the protection of elephants is funded. Between 1985 and 1989 sales of elephant products (including ivory) yielded USD 1,4 million per year (Table 11). The motivation for the cull, however, is elephant population control and not economic benefit. Nevertheless, with a recurrent expenditure of USD 2,9 million per annum (Table 21) on park security and maintenance of the wildlife estate (excluding tourism infrastructure) the contribution of the elephant cull to the economy of the park is evident. The utilisation of the products of the benefit of the resource itself and for the people of South Africa. Such a national benefit can only contribute towards the long-term survival of the Kruger National Park and its elephant population in the face of enormous competing demands for land and resources by a growing, and politically emancipated human population (e.g. Khan 1990, ANC 1994).

It has been argued on economic grounds, that to establish a controlled trade in elephant products, however small, on a sustainable yield basis will in the long term do more to ensure the survival of the African elephant than the present ban on trade (Simmons & Kreuter 1989; Barbier and Swanson 1990; Barbier, Burgess, Swanson & Pearce 1990). The South African proposal allows for a pilot project and a testing of this hypothesis and the technology to control the trade. It is an opportunity which could be used to develop procedures for much wider application in Africa.

9. <u>References</u>

- ANC 1994. The Reconstruction and Development Programme. A policy framework. African National Congress, Johannesburg.
- ANONYMOUS 1978. Statement to African Wildlife on the Tongaland elephants. KwaZulu Department of Agriculture and Forestry. Afr. Wildlife 32(3): 43.
- ANDERSON G D and B H WALKER 1974. Vegetation composition and elephant damage in the Sengwa Wildlife Research Area, Rhodesia. J. sth. Afr. Wildl. Mgmt. Ass. 4 (1): 1-14.

BARBIER E B, and T SWANSON 1990. Ivory: the case against the ban. New Scientist 128(1743): 52-54.

- BARBIER E B, J C BURGESS, T M SWANSON and D W PEARCE 1990. *Elephants, Economics and Ivory*. Earthscan Publications, London.
- BARRATT D G and A J HALL-MARTIN 1990. The effect of indigenous browsers on Valley Bushveld Vegetation in the Addo Elephant National Park. Proceedings "Valley Bushveld Workshop, Thomas Baines Nature Reserve, CSIR.

BOSMAN P and A HALL-MARTIN 1986. Elephants of Africa. Struik, Cape Town.

BROAD S 1990. Controversy over Asian elephants. Traffic Bulletin 11 (4): 49.

- BRUTON M N, M SMITH and R H TAYLOR 1980. A brief history of human involvement in Maputoland. In: Studies on the Ecology of Maputoland. Eds. M N Bruton and K H Cooper. Rhodes Univ. Grahamstown and Wildlife Soc. Durban.
- BURTON C M 1968. History of Elephants in the Eastern Cape. Appendix B, Knysna Elephant Symposium, Wildlife Society, Port Elizabeth.

CALDWELL J R and R A LUXMOORE 1990. Recent changes in world ivory trade. Traffic Bulletin 11 (4): 50-58.

CAUGHLEY G, H DUBLIN and I PARKER 1990. Projected decline of the African elephant. Biol. Conserv. 54: 157-164.

- CARTER N 1970. Knysna Elephant Survey, February 1969 January 1970. Wildlife Society of SA, Eastern Province Branch.
- CHILD G and J WHITE 1988. The marketing of elephants and field-dressed elephant products in Zimbabwe. *Pachyderm* 10: 6-11.
- COBB S 1980. Tsavo National Parks, their first thirty years. Swara 3(4): 12-16.
- COBB S 1989. Editor: The lvory Trade and the Future of the African Elephant. lvory Trade Review Group, Oxford.
- COETZEE B J, A H ENGELBRECHT, S C J JOUBERT and P F RETIEF, 1979. Elephant impact on Sclerocarya caffra trees in Acacia nigrescent tropical plains thornveld of the Kruger National Park. Koedoe 22: 39-60.

CORFIELD T F 1973. Elephant mortality in Tsavo East National Park, Kenya. E. Afr. Wildl. J. 11 (3 & 4): 339 - 368.

CUMMING D H M, R F DU TOIT and S N STUART 1990. African Elephants and Rhinos. Status Survey and Conservation Action Plan. IUCN/SSC African Elephant and Rhino Specialist Group. Gland.

DOMMISSE E.J. 1951. The Knysna elephants - historical sketch of a world-famous herd. Afr. Wildlife 5 (3): 195 - 199.

DOUGLAS-HAMILTON I 1989. Overview of status and trends of the African elephant. Report 1 in *The Ivory Trade and the future of the African Elephant*. Ed. S. Cobb, Ivory Trade Review Group, Oxford.

- DOUGLAS-HAMILTON I, F MICHELMORE and A INAMDAR 1992. African Elephant Database. European Commission African Elephant Survey and Conservation Programme pp. 1-176. UNEP, Nairobi.
- DUBLIN H 1989. Elephant numbers, distributions and trends in the Southern African region: A review of census methods and recent population data. Typescript 24 pp. EEC/WWF Elephant Programme.
- ENGELBRECHT A H 1979. Olifantinvloed op *Acacia nigrescent*-bome in 'n gedeelte van die Punda Milia-sandveld van die Nasionale Krugerwildtuin. *Koedoe* 22: 29-37.
- FRIEDLEIN T J and D J HYKLE 1989. Intra-African lvory Trade Study. An Assessment of Côte D'Ivoire's Ivory Trade. Typescript 20pp.
- GERTENBACH W P D 1980. Rainfall patterns in the Kruger National Park. Koedoe 23: 35-44.
- GLOVER J 1963. The elephant problem at Tsavo. E. Afr. Wildl. J. 1: 30-39.
- HALL-MARTIN A J 1977. South African Elephants Pattern for the future. In: WWF/IUCN Elephant Survey and Conservation Programme. Newsletter No. 2.
- HALL-MARTIN A J 1980. Elephant survivors. Oryx XV (4): 355-362.
- HALL-MARTIN A J 1984. Conservation and management of elephants in the Kruger National Park, South Africa. pp 104-118. In *The Status and Conservation of Africa's Elephants and Rhino's, edit.* D H Cumming and P Jackson. IUCN, Switzerland.
- HALL-MARTIN A J 1986. Recruitment in a small black rhino population. Pachyderm 7: 6-8.
- HALL-MARTIN A J 1987. Role of musth in the reproductive strategy of the African elephant (*Loxodonta africana*) S. Afr. J. Sci 83: 616-620.
- HALL-MARTIN A J 1990. Elephant conservation in the Kruger National Park, South Africa. pp. 89-112. In: *Regional Perspectives and situation Regarding Elephant Conservation and the Ivory Trade*. Background documents for Government of France, Ministers Meeting. Mimeo. IUCN, Gland.
- HALL-MARTIN A J 1991a. Elephant conservation in the Kruger National Park, South Africa from protection to management. In "Proceedings of the Kalahari Conservation Society Elephant Workshop" KCS, Gaberone.
- HALL-MARTIN A J 1991b. Report on the June 1991 game census in the Addo Elephant National Park. National Parks Board, Skukuza. Typescript.
- HALL-MARTIN A. 1991c Adding to Addo. Rhino and Elephant Journal 5: 18 20.
- HALL-MARTIN A J 1992a. Distribution and status of African elephant *Loxodonta africana* in South Africa, 1652 1992. *Koedoe* 35(1): 65-88.
- HALL-MARTIN A J 1992b. Translocation and re-establishment of populations of juvenile African elephants. *Elephant* and lvory Information Service No. 20 Special Issue 1-5.
- HALL-MARTIN A J 1992c. The question of culling. In "Elephants Majestic Creatures of the Wild". Edit. J. Shoshani, Weldon Owen, Sydney.
- HALL-MARTIN A J, T ERASMUS and B P BOTHA 1982. Seasonal variation of diet and faeces composition of black rhinoceros *Diceros bicornis* in the Addo Elephant National Park. *Koedoe* 25: 63-82.
- HALL-MARTIN A J, I J WHYTE and P C VILJOEN 1987. Census results and culling quotas for the larger herbivore species in the Kruger National Park. National Parks Board, Skukuza. Typescript.
- HELBOK M 1990. Ivory trade bans are succeeding. Wildlife Conservation 93 (5): 28.
- ILSLEY J D 1989. Help! I am an endangered species. Rhino and Elephant Journal 2: 24-25.
- JOUBERT S C J 1986. Masterplan for the Management of the Kruger National Park. Vol. VI. Mimeo. National Parks Board, Skukuza.
- KEEPING G B, G L SMUTS and J H M DAVID 1968. Report on Wildlife Society Expedition to Survey the Knysna Elephants. Wildlife Society of SA, Port Elizabeth.

KHAN F 1990. Beyond the white rhino. Confronting the South African land question. African Wildlife 44 (6): 321-324.

- KLINGELHOEFFER E W 1987. Aspects of the Ecology of the Elephant <u>Loxodonta africana</u> and a Management Plan for the Tembe Elephant Reserve in Tongaland, KwaZulu. MSc Thesis, University of Pretoria.
- KOEN J H 1981. A study of the distribution, population composition, movements, etc. of the Knysna elephants. Preliminary Report. Saasveld Forestry Research Station, Typescript.
- KOEN J H, A J HALL-MARTIN and T ERASMUS 1988. Macro nutrients in plants available to the Knysna, Addo and Kruger National Park elephants. S. Afr. J. Wildl. Res. 18 (2): 69-71.

LAWS R M 1970. Elephants as agents of habitat and landscape change in East Africa. Oikos 21: 1-15.

MARTIN EB 1990 b. After the ivory bans. Wildlife Conservation 93 (6): 28-31.

- MARTIN R B 1989. The lvory Trade in Southern Africa. Report to I S C Parker for the CITES Secretariat. Dept. of National Parks and Wildlife Management, Harare, Zimbabwe. 64pp.
- MARTIN R B, G C CRAIG and V R BOOTH 1989. Editors: *Elephant Management in Zimbabwe*. Dept. of National Parks and Wildlife Management, Harare.
- MEESTER J A J, I L RAUTENBACH, N J DIPPENAAR and C M BAKER, 1986. Classification of Southern African Mammals. Transvaal Mus. Mono. No.5. Transvaal Museum, Pretoria.
- MILLIKEN T and D MELVILLE 1989. The Hong Kong Ivory Trade. Draft Report to the Second Meeting of the CITES African Elephant Working Group. 91pp.
- NAPIER BAX P and D L W SHELDRICK 1963. Some preliminary observations on the food of elephant in the Tsavo Royal National Park (East) of Kenya. *E. Afr. Wildl. J.* 1: 40-53.
- OSTROSKY E W 1988a. Monitoring of elephant movements across the international border between South Africa and Mocambique in the Tembe Elephant Park, Second Annual Report, 1987. Kwazulu Bureau of Natural Resources, Ulundi. Typescript.
- OSTROSKY E W 1988b. The Elephant population of the Tembe Elephant Park, KwaZulu: Management Recommendations. KwaZulu Bureau of Natural Resources, Ulundi. Typescript.
- PARKER ISC 1983. The Tsavo story: An ecological case history. In: Management of Large Mammals in African Conservation Areas. Ed. R.N. Owen-Smith. Haum, Pretoria.
- PARKER ISC 1989. The Raw Ivory Trade 1979 1987. A consultant report for Parties to CITES through the Secretary General, 140pp.
- PARKER IS C and A D GRAHAM 1989. Elephant decline (Part 1). Downward trends in African elephant distribution and numbers. Intern. J. Environmental studies 34: 287-305.
- PHILLIPS JFV 1925. The Knysna elephant: a brief note on their history and habits. S. Afr. J. Sci. XXII: 287 293.
- PIENAAR UDEV 1963. The Large Mammals of the Kruger National Park their distribution and present-day status. Koedoe 6: 1 - 37.
- PIENAAR U DE V 1969. Why elephant culling is necessary. African Wildlife 23: 181-195
- PIENAAR U DE V 1983. Management by intervention: The pragmatic/economic option. pp. 23-36. In Management of Large Mammals in African Conservation Areas. Ed. R.N. Owen-Smith. Haum, Pretoria.
- PIENAAR UDEV 1985. Indications of progressive dessication of the Transvaal Lowveld over the past 100 years, and implications for the water stabilisation programme in the Kruger National Park. *Koedoe* 28: 93-165.
- PIENAAR UDEV, PVANWYK, and NFAIRALL 1966. An aerial census of elephant and buffalo in the Kruger National Park, and the implications thereof on intended management schemes. *Koedoe* 9: 40-107.
- RAUTENBACH IL, D J SKINNER and J A J NEL 1980. The past and present status of the Mammals of Maputoland. In: Studies on the Ecology of Maputoland. Eds. M N Bruton and K H Cooper, Rhodes Univ. Grahamstown and Wildlife Soc. Durban.

RENEWABLE RESOURCES ASSESSMENT GROUP 1989. The impact of the lvory Trade on the African elephant population. Section 5.3, in "The lvory Trade and the Future of the African elephant". I.T.R.G., Oxford.

ROBERTS A 1951. The Mammals of South Africa. "Mammals of SA" Book Fund, Johannesburg.

SANDENBERGH J A B 1946. Kruger National Park, Warden's Annual Report - 1946. Typescript.

- SIMMONS R T and U P KREUTER 1989, Herd mentality Banning ivory sales is no way to save the elephant. *Policy Review Fall* 1989: 46-49.
- SKEAD C J 1980. Historical Mammal Incidence in the Cape Province. Vol.I Dept. of Nature and Environmental Conservation, Cape Town.
- SKEAD C J 1987. *Historical Mammal Incidence in the Cape Province*. Vol.II Dept of Nature and Environmental Conservation, Cape Town.

SMITHERS R H N 1983. The Mammals of the Southern African Subregion. University of Pretoria.

STEVENSON-HAMILTON J 1903a. Report on Singwitsi Game Reserve. Transvaal Administration Reports for 1903. Typescript. Sabie Bridge.

STEVENSON-HAMILTON J 1903b. Game preservation. Transvaal Administration Reports for 1903. Typescript.

- STEVENSON-HAMILTON J 1905. Report on the Government Game Reserves for the year ended 30th June 1905. Typescript. Komati Poort.
- STEVENSON-HAMILTON J 1912. Government Game Reserves. Sabi and Singwitsi. Annual Report 1912. Typescript.

STEVENSON-HAMILTON J 1925. Extracts from annual report of the Transvaal Game Reserves. 1925. Typescript.

STEVENSON-HAMILTON J 1932. Kruger National Park, Warden's Annual Report - 1932. Typescript.

STEVENSON-HAMILTON J 1933. Kruger National Park, Warden's Annual Report - 1933. Typescript.

STEVENSON-HAMILTON J 1936. Kruger National Park, Warden's Annual Report - 1936. Typescript.

STEVENSON-HAMILTON J 1937. Kruger National Park, Warden's Annual Report - 1937. Typescript.

STEVENSON-HAMILTON J 1947. Wild Life in South Africa. Cassell, London.

STEYN L B 1958. Jaarverslag van die Opsiener Nasionale Krugerwildtuin vir die tydperk 1 April 1957 tot 31 Maart 1958. Typescript.

STOKES C S 1941. Sanctuary. The Sanctuary Production Committee, Cape Town.

SUKUMAR R 1989. The Asian Elephant: Ecology and Management. Cambridge University Press, Cambridge.

THOMSEN J B 1988. Recent US imports of certain products from the African elephant. Pachyderm 10: 1-5.

THOMSON G 1978. Natal's last elephants. Afr. Wildlife 32(3): 42-43.

THOULESS C 1990. Laikipia elephant count - 1990. Kenya Wildlife Service, Laikipia Elephant Project.

- TRAFFIC 1989 . Recommendations on Proposals to Amend the CITES Appendices at the Seventh Meeting of the Conference of the Parties to CITES. TRAFFIC, Lausanne.
- VAN WYK P and N FAIRALL 1969. The influence of the African elephant on the vegetation of the Kruger National Park. Koedoe 12: 57-89.
- VILJOEN A J 1988. Long-term changes in the tree component of the vegetation in the Kruger National Park. In "Longterm data series relating to southern Africa's renewable natural resources". Edited by I A W Mc Donald and R J M Crawford. South African National Scientific Programmes. Report no 157, pp. 310-315.
- VAN NOTE C 1988. Statement on US Enforcement of the Convention on International Trade in Endangered Species. Monitor, Washington.

WALKER B H 1976. An approach to the monitoring of changes in the composition and utilization of woodland and savanna vegetation. S. Afr. J. Wildl. Res. 6 (1): 1-32.

WESTERN D 1990. Is the tide turning for elephants and rhinos. Pachyderm 13: 2-4.

WHYTE IJ 1990. Census results for elephant and buffalo in the Kruger National Park in 1990 and culling quotas for the 1990/91 culling year. National Parks Board, Skukuza. Typescript.

WHYTE I J and WOOD C A 1994. Census results for elephant and buffalo in the Kruger National Park in 1993 and culling quota for the 1993/94 culling year. Scientific Report 3/94. Scientific Services Section, Skukuza.

E9-ZA02.PRO

Table 1: The legal status and size (ha) of South Africa's elephant ranges in 1994 (For location refer to map numbers in Fig. 4)

.

Map No.	Location	Size (ha)	Total size (ha)				
National Park	National Parks (Proclaimed under the National Parks Act of the South African Parliament)						
1	Kruger National Park	1 948 528					
2	Addo Elephant National Park	11 718	1 960 246				
National Park South Africa.	s or Game Reserves (proclaimed under legislation of formerly indepe These areas are being incorporated into new provincial structures)	ndent or self-gover	ning states within				
3	Tembe Elephant Park, KwaZulu	29 878					
5	Pilanesberg National Park, Bophuthatswana	58 000	•				
8	Makuya National Park, Venda	18 500					
9	Letaba Ranch, Gazankulu	40 000					
	Andover Game Reserve, Gazankulu	7 100					
14	Manyeleti Game Reserve, Gazankulu	22 700					
17	Mthethomusha Game Reserve, KaNgwane	8 000					
45	Songimvelo National Pa r k, KaNgwane	65 000					
46	Madikwe Game Reserve, Bophuthatswana	75 000					
47	Borakolalo Game Reserve, Bophuthatswana	12 000	336 178				
Game Reserv	ves (Proclaimed under legislation of Provincial Governments)						
6	Hluhluwe/Umfolozi Game Reserve, Natal	90 000					
7	Itala Game Reserve, Natal	30 000					
50	Atherstone Nature Reserve	23 000	143 000				
Forestry Res	erve (Proclaimed under legislation of the South African Parliament)						
4	Knysna Forest Reserve	30 000	30 000				
Privately own	ned land (Proclaimed as private nature reserves or game ranches in	terms of Provincial	legislation)				
10	Foskor/Phalaborwa Mining	4 100					
16	Sabie Sand Game Reserve	57 200					
11	Klaserie Private Nature Reserve	62 818					
12	Timbavati Private Nature Reserve	78 495					
25	Mabula Lodge	8 000					
33	Mpongo Park	2 500					
23	Touchstone Game Ranch	7 500					
15	Tshukudu Game Ranch	5 000					
18	Mtibi Game Ranch	2 500					
19	Lowhills	3 000					

Map No.	Location	Size (ha)	Total size (ha)
20	Kwalata Game Ranch	8 000	
20	Rhinoland Safaris	6 800	
24	Vosdal Game Ranch	11 500	
26	Welcome Game Ranch	2 130	
23	Mahlatini Game Ranch	1 500	
28	Rietboklaagte	2 500	
29	Sutton Game Ranch	2 000	
30	Pumalanga	2 500	
31	Phinda Resource Reserve	13 500	
32	Game Valley (Karkloof)	1 400	
35	Bonamanzi	4 200	
36	Shamba Safaris	600	
37	intsu	30 000	
~ 38	Kapama	7 000	
39	Riverside	4 000	
40	Shamwari	6 000	
41	Zulu Nvala	650	
42	Thukela	60 000	
22	Venetia Mine	35 000	
48	Welgevonden Game Reserve	26 000	
49	Thornybush Game Reserve	7 500	
51	Makalali Game Reserve	7 500	
52	Umbabat Private Nature Reserve	14 400	485 793
			2 955 217

Table 2: Numbers and crude population density (1992\94); area, and potential maximum population for existing elephant ranges in South Africa (Map no. refers to Fig.5)

7

Map No.	Area	Size (ha)	Elephant numbers 1993/4	Density elephants (km²}	Maximum elephant population	Date of first intro- duction	Open Systems
1	Kruger National Park	1 948 528	7 834	0.40	7 500	¥	+
2	Addo Elephant National Park	11 718	195	1.66	220	*	
3	Tembe Elephant Park	29 878	95	0.32	119	*	
4	Knysna Forest	30 000	4	0.01	30	*	
5	Pilanesberg National Park	58 000	75	0.13	174	1979	
6	Hluhluwe\Umfolozi Game Reserve	90 000 ,	170	0.19	360	1981	
7	Itala Game Reserve	30 000	49	0.16	120	1990	
8	Makuya National Park	18 500	40	0.22	65	* .	+
9	Letaba Ranch	40 000	31	0.08	120	1987	+
10	Phalaborwa Mining Co.	4 100	14	0.34	14	*	+
11	Klaserie Private Nature Reserve	62 818	180	0.29	238	*	+
12	Timbavati Private Nature Reserve	78 495	207	0.26	297	*	+
13	Andover Game Reserve	7 100	10	0.14	27	1987	
14	Manyeleti Game Reserve	22 700	10	0.04	86	*	+
15	Tshukudu Game Ranch	5 000	2	0.04	19	1990	<u> </u>
16	Sabi-Sand Game Reserve	57 200	51	0.09	217	1975	+
17	Mthethomusha Game Reserve	8 000	37	0.46	30	1990	
18	Mtibi Game Ranch	2 500	9	0.36	10	1991	<u> </u>
19	Lowhills	3 000	6	0.50	11	1991	<u> </u>
20	Kwalata Game Ranch	8 000	19	0.24	30	1989	<u> </u>
21	Rhinoland Safaris	6 800	6	0.09	25	1991	<u> </u>
22	Venetia Mine	35 000	45	0.13	105	1991	
23	Touchstone Game Ranch	7 500	10	0.13	26	1990	
24	Vosdal Game Ranch	11 500	3	0.03	34	1990	
25	Mabula Lodge	8 000	14	0.18	24	1989	
26	Welcome Game Ranch	2 130	5	0.23	8	1991	
27	Mahlatini Game Ranch	1 500	5	0.33	6	1991	

Map No.	Area	Size (ha)	Elephant numbers 1993/4	Density elephants (km²)	Maximum elephant population	Date of first intro- duction	Open Systems
28	Rietboklaagte	2 500	3	0.12	10	1991	
29	Sutton Game Ranch	2 000	4	0.20	8	1990	
30	Pumalanga	2 500	3	0.12	10	1990	
31	Phinda Resource Reserve	13 500	71	0.52	54	1.991	
32	Karkloof Falls Safari Park	1 400	2	0.14	11	1988	
33	Mpongo Park	2 500	8	0.32	37	1988	
35	Bonamanzi	4 200	4	0.10	17	1993	
36	Shamba Safaris	600	3	0.50	2	1993	
37	Intsu	30 000	18	0.06	120	1992	
38	Kapama	7 000	18	0.26	28	1992	
39	Riverside	4 000	4	0.10	16	1992	
40	Shamwari	6 000	14	0.23	90	1993	
41	Zulu Nyala	650	4	0.62	3	1993	
42	Thukela	60 000	6	0.01	180	1993	
45	Songimvelo National Park	65 000	18	0.03	260	1993	
46	Madikwe Game Reserve	75 000	221	0.30	225	1993	
47	Borakolalo Game Reserve	12 000	2	0.02	42	1993	
48	Welgevonden	26 000	49	0.19	78	1994	
49	Thornybush	7 500	17	0.23	30	1991	
50	Atherstone	23 000	20	0.09	92	1994	
51	Makalali	7 500	13	0.17	30	1994	
52	Umbabat	14 400	37	0.257	58	*	+
	TOTAL	2 955 217	9 667		11 316		

NOTE:

~

1. This table contains all updates on population size as available on 1994-07-05.

 It is clear that some of the ranches listed above do not have any potential for conserving viable elephant populations and cannot be considered as of any importance to the conservation of the species.

Natural populations.

+ Populations not discrete, either open systems or regular movement across boundary fences.

Year	Number	Nature of Estimate	Source
1903	0	Local knowledge	Stevenson-Hamilton 1903a, 1903b
1905	10	Local knowledge	Stevenson-Hamilton 1905
1912	25	Estimate	Stevenson-Hamilton 1912
1925	100	Estimate	Stevenson-Hamilton 1925
1931	135	Estimate	Pienaar, Van Wyk & Fairall 1966
1932	170	Estimate	Stevenson-Hamilton 1932
1933	200	Estimate	Stevenson-Hamilton 1933
1936	250	Estimate	Stevenson-Hamilton 1936
1937	400	Estimate	Stevenson-Hamilton 1937
1946	450	Estimate	Sandenbergh 1946
1947	560	Estimate	Pienaar, Van Wyk & Fairall 1966
1954	740	Estimate	Steyn 1958
1958	995	Estimate	Pienaar, Van Wyk & Fairall 1966
1960	1186	Aerial survey	Pienaar, Van Wyk & Fairall 1966
1962	1750	Fixed-wing survey	Pienaar 1963
1964	2374	Helicopter count *	Pienaar, Van Wyk & Fairall 1966
1967	6586	Helicopter count *	Cited in Hall-Martin 1984
1968	7701	Helicopter count *	Cited in Hall-Martin 1984
1969	8312	Helicopter count *	Cited in Hall-Martin 1984
1970	8821	Helicopter count *	Cited in Hall-Martin 1984
1971	7916	Helicopter count *	Cited in Hall-Martin 1984
1972	7611	Helicopter count *	Cited in Hall-Martin 1984
1973	7965	Helicopter count *	Cited in Hall-Martin 1984
1974	7702	Helicopter count 1	Cited in Hall-Martin 1984
1975	7408	Helicopter count †	Cited in Hall-Martin 1984
1976	7257	Helicopter count †	Cited in Hall-Martin 1984
1977	7715	Helicopter count †	Cited in Hall-Martin 1984
1978	7478	Helicopter count †	Cited in Hall-Martin 1984
1979	No census		
1980	7454	Helicopter count †	Cited in Hall-Martin 1984
1981	7343	Helicopter count †	Cited in Whyte 1990

Table 3: Estimates of elephant numbers in the Kruger National Park 1903 - 1993

Year	Number	Nature of Estimate	Source
1982	8051	Helicopter count 1	Cited in Whyte 1990
1983	8678	Helicopter count †	Cited in Whyte 1990
1984	8273	Helicopter count †	Cited in Whyte 1990
1985	6887	Helicopter count †	Cited in Whyte 1990
1986	7617	Helicopter count †	Cited in Whyte 1990
1987	6898	Helicopter count †	Cited in Whyte 1990
1988	7344	Helicopter count †	Cited in Whyte 1990
1989	7468	Helicopter count †	Cited in Whyte 1990
1990	7278	Helicopter count †	Cited in Whyte 1990
1991	7470	Helicopter count †	Cited in Whyte & Wood 1994
1992	7632	Helicopter count †	Cited in Whyte & Wood 1994
1993	7834	Helicopter count †	Cited in Whyte & Wood 1994

* Census using Bell G47 helicopter

† Census using Bell Jet Ranger helicopter

Table 4: A comparison between the observed and expected elephant census totals for the KNP (1982 - 1990)

YEAR	EXP	OBS	DEV (O-E)	%
1982	7 890	8 051	161	2.0
1983	9 061	8 678	-383	-4.4
1984	7 619	8 273	654	7.9
1985	7 192	6 887	-305	-4.4
1986	7 114	7 617	503	6.6
1987	7 270	6 898	-372	-5.4
1988	6 824	7 344	520	7.1
1989	7 208	7 468	260	3.5
1990	7 266	7 278	12	0.2
MEAN	l _{e, commune assessed assessed assessed assessed assessed assessed as a second assessed as a second as a second}	4	•	1.4

Year	Number	Year	Number	Year	Number
1931	11	1953	20	1975	78
1932	12	1954	20	1976	89
1933	15	1955	22	1977	93
1934	15	1956	24	1978	99
1935	18	1957	26	1979	102
1936	21	1958	28	1980	105
1937	23	1959	26	1981	108
1938	25	1960	29	1982	112
1939	23	1961	32	1983	116
1940	20	1962	35	1984	118
1941	20	1963	. 41	1985	120
1942	20	1964	43	1986	127
1943	20	1965	45	1987	135
1944	18	1966	46	1988	140
1945	18	1967	52	1989	151
1946	18	1968	54	1990	162
1947	18	1969	58	1991	173
1948	19	1970	59	1992	175
1949	22	1971	63	1993	183
1950	20	1972	68	1994	195
1951	18	1973	70		
1952	18	1974	75		

;

Table 5: Numbers of elephant in the Addo Elephant National Park 1931 - 1994⁵

⁵ Individually known population from 1931 and from 1978 an annual helicopter census as well.

Year	Number	Nature of Estimate	Source
1947	35 - 40	Estimate - local knowledge	A.I. Ferraz and H.C. Lugg in Bruton, Smith and Taylor 1980
1971	16	Estimate	T.P. Dutton in Ostrosky 1988
1973	15 - 25	Estimate	Anonymous 1978
1974	20 - 40	Estimate and aerial survey	G. Thomson 1978
1976	20 - 30	Helicopter survey and ground tracking	Hall-Martin (1977)
1980	50	Fixed wing survey and photography	A.J. Hall-Martin in Rautenbach, Skinner and I 1980
1981	75	Estimate	Klingelhoeffer 1987
1984	39	Minimum helicopter count	Ostrosky 1988
1985	32	Minimum helicopter count	Ostrosky 1988
1986	35	Minimum helicopter count	Ostrosky 1988
1987	41	Minimum helicopter count	Ostrosky 1988
1988	80	Minimum helicopter count and known individuals - photo file	Ostrosky 1988
4990	80	Minimum helicopter count and known individuals - photo file	E.W. Ostrosky 1991 pers. comm.
1993	95	Minimum helicopter count	KwaZulu Dept of Nature Conservation 1994

.

Table 6: Estimates of elephant numbers in the Tembe Elephant Park, Sihangwane area, 1947 - 1993

×

Year	Number	Nature of Estimate	Source
1876	400 - 500	Estimate of Capt. Harrison, Conservator of Forests	Phillips 1925
1902	30 - 50	Forestry Dept. Records	Dommisse 1951
1904	20	Forestry Dept. Records	Dommisse 1951
1908	20	Forestry Dept. Records	Dommisse 1951
1910	17	Forestry Dept. Records	Dommisse 1951
1914 •	13	Forestry Dept. Records	Dommisse 1951
1916	10 - 12	Forestry Dept. Records	Koen 1981
1918	15 - 16	Forestry Dept. Records	Koen 1981
1920	13	Record less 5 killed by Maj. Pretorius	Hall-Martin 1980
1921	12	Forestry Dept. Records	Koen 1981
1924	13	Observations of individuals	Phillips 1925
1925	12	Observations of individuals	Phillips 1925
1928	10 - 13	Observations of individuals	Burton 1968
1931	13	Forestry Dept. Records	Koen 1981
1940	7	Forestry Dept. Records	Roberts 1951
1942	· 8	Forestry Dept. Records	Roberts 1951
1943	7	Forestry Dept. Records	Roberts 1951
1950	4	Bernard Carp Expedition	Koen 1981
1951	4 - 8	Forestry Dept. Records	Dommisse 1951
1955	7	Fraser Expedition	Koen 1981
1967	7 - 11	Forestry Dept. Records	Burton 1968
1968	.7	Individuals identified	Keeping, Smuts and David 1968
1969	10	Individuals identified	Carter 1970
1970	13	Forestry Dept. Records	Koen 1981
1974	6	Forestry Dept. Records	Koen 1981
1976	4	Forestry Dept. Records	Koen 1981
1977	6	Stroebel family records	Koen 1981
1979	4	Forestry Dept. Records	Koen 1981
1981	3	Forestry Dept. Records	Koen 1981
1989	4	Birth of calf - press release	'Die Burger' Cape Town 1989.02.24
1991	4	Forestry Dept. Records	G. von dem Bussche, pers. comm.
1994	4	Forestry Dept. Records	G. von dem Bussche, pers. comm.

Table 7: Estimates of elephant numbers in the Knysna Forest, 1876 - 1994

Veer	Number	Nature of Estimate	Source
rear	Number	Huidie of Louinato	
1970	20	Local knowledge	*Research report P.C. Viljoen
1978	125	Aerial census	Research report P.C. Viljoen
1980	180	Aerial census	Research report P.C. Viljoen
1983	146	Aerial census	Research report P.C. Viljoen
1984	184	Aerial census	Research report P.C. Viljoen
1985	119	Helicopter census	Research report P.J. de Villiers
1986	129	Helicopter census	Research report P.J. de Villiers
1988	144	Helicopter census	Research report P.J. de Villiers
1989	268	Helicopter census	Research report P.J. de Villiers
1990	395	Helicopter census	Research report P.J. de Villiers
1994	180	Helicopter census	Whyte & Wood 1994

Table 8: Estimates of elephant numbers in the Klaserie Private Nature Reserve, Eastern Transvaal, 1970 - 1994

 All Research reports are official documents of the Chief Directorate of Nature and Environmental Conservation of the Transvaal Provincial Administration, Pretoria.

Table 9: Estimates of elephant numbers in the Timbavati Private Nature Reserve, Eastern Transvaal 1970 - 1994

Year	Number	Nature of Estimate	Source
1970	40	Local knowledge	*Research report P.J. de Villiers
1985	39	Helicopter census	Research report P.J. de Villiers
1986	89	Helicopter census	Research report P.J. de Villiers
1988	129	Helicopter census	Research report P.J. de Villiers
1989	153	Helicopter census	Research report P.J. de Villiers
1990	167	Helicopter census	Research report P.J. de Villiers
1994	207	Helicopter census	Whyte & Wood 1994

 All Research reports are official documents of the Chief Directorate of Nature and Environmental Conservation of the Transvaal Provincial Administration, Pretoria.

•

Area	Size (ha)	Potential Density Elephants/km²	Potential elephant population
Zuurberg National Park	24 138	1,0	241
Marakele National Park	30 000	0,3	90
Vaalbos National Park	22 696	0,25	57
Greater Tembe/Ndumu Elephant Park	45 103	0,25	113
Greater St. Lucia Wetland Park/Mkuze	190 000	0,35 - 0,4	685
Andries Vosloo/Sam Knott/Double Drift	40 000	1,0	400
Molopo Game Park	8 000	0,25	20
Botsalano Game Reserve	6 000	0,25	15
Loskop Dam Nature Reserve	20 000	0,15	30
	395 937		1 681

Table 10: National Parks and Game Reserves identified for elephant introduction in South Africa, 1994 - 2000

	1985	1986	1987	1988	1989	1990	1991	1992
	791 808	912 400	559 514	574 412	816 366	0	4 942*	4 879*
Skin	407 140	236 257	346 584	622 253	359 510	5 000	0	0
Most - tipped	114 939	40 919	47 475	24 920	23 077	43 005	188 095	130 004
Meat - dried	112 367	33 605	31 999	42 826	38 462	45 153	88 851	68 514
Meat - fresh	36 394	57 765	74 923	· 79 795	57 692	53 561	63 179	56 372
Fat	35 281	13 460	12 129	11 819	4 035	13 116	5 775	3 493
Carcass meal	68 380	61 273	48 464	55 050	40 928	47 793	52 349	32 801
Live Elephants	47 541		81 596	43 810	42 500	113 077	215 887	223 112
TOTAL:	1 613 849	1 355 678	1 202 682	1 454 885	1 382 570	315 705	619 078	519 175

Table 11:Income derived from the sale of elephants and elephant products by the Kruger National Park 1985-1992. All values in USD converted at the mean rate of exchange for each year.

* Sale of ivory to South African buyers only, and not exported.

Table 12: Export and re-export oftusks from South Afric	a, 1986 - 1989
---	----------------

Year	No. of ZA-marked comm. tusks	Mass: Kg	Re-exported tusks: non-ZA	Mass: Kg	Carved tusks	Mass: Kg	Trophy tusks	Mass: Kg
1986	4 203	30 682	118	909	449	-	52	911,8
1987	2 060	14 523	280	2 948	437	-	55	904,1
1988	683	8 086	229	1 344	690	-	-	•
1989	575	8 590	127	1 289	400	<u> </u>	12	242,2

	IMPO	RTS	EXPORTS		
YEAR	Kg	Kg Pieces		Pieces	
1980	22 291	145	11 730	290	
1981	19 622	20 900	18 985	285	
1982	63 785	5	. 54 115	263	
1983	79 029	2 695	57 748	9 729	
1984	45 600	354	52 563	23	
1985	61 869	151	79 131	97	
1986	32 570	28	31 676	27 050	
1987	24 927	85	26 287	45	
1988	25 009	2 771	26 953	657	
1989	16 174	11	23 810	32	
Total	390 876	27 145	382 998	38 471	

Table 13: Comparison of South African ivory imports and exports (kg) by year 1980 - 1989. Data derived from W.C.M.C. records (see text)

Table 14: Mean prices paid for tusks from the Kruger National Park at twice-yearlysales, 1983 - 1989. Prices quoted in South African Rands

YEAR	1st Tender	2nd Tender
1983	60.00	-
1984	63.00	164.00
1985	210.50	247.83
1986	284.00	269.33
1987	290.83	333.17
1988	407.33	519.17
1989	606.00	727.20

Year	Natal		Transvaal		Cape		O.F.S.	
	Tusks	Mass (KG)	Tusks	Mass (KG)	Tusks	Mass (KG)	Tusks	Mass (KG)
1982	53	319,75	4845	34520,0	216	2204,6	0	-
1983	44	673,00	466	5045,6	456	4550,7	14	208,04
1984	57	400,97	551	4831,0	45	609,6	0	-
1985	499	5376,20	1547	14864,0	50	474,2	0	-
1986	1000	10402,71	2288	16119,0	287	2913,1	48	452,39
1987			305	3880,7	55	515,0	102	832,40
1988	158	2308,02	235	2017,7	-	-	45	546,56
1989	1		1740	17723,3	15	147,2	4	5,0
Total	1811	19480,65	11977	99001,3	1124	11414,4	213	2044,39

Table 15: Summary of ivory marked according to CITES specifications by the management authorities in South Africa 1982-1989

Table 16: Registered ivory stocks held in South Africa in mid-1991*

	Region	Tusks	Total Weight (kg)
Private Property	Transvaal	2599	27 616,16
	Natal	1655	17 986,93
	Cape Province	330	2 705,25
	0. F. S.	244	2 293,98
Dealers	Transvaal	710	3 834,62
Management Authorities	Transvaal - confiscated	189	1 365,74
	- crop protection	125	903,27
	Natal - confiscated	415	- 1300,00
	Cape Province - confiscated	104	852,56
	Kwazulu - confiscated	9	35,80
	- natural mortality	33	428,10
	National Parks Board - culling and mortality	1196	6 655,10
Total		7 609	55 059,31

* The National Parks Board stock has increased since 1991 (see Table 18). Stocks (small) held by the SA Police and Courts and the SA Department of Customs and Excise are not reflected.

Year of Harvest	Number of Tusks	Total Mass (kg) (kg)
1973	939	4 194,0
1974	1 297	5 478,5
1975	1 592	5 866,5
1976	721	3 226,0
1977	643	4 628,9
1978	906	4 661,6
1979	733	4 488,2
1980	654	3 567,4
1981	954	5 823,7
1982	278	4 388,5
1983	829	6 776,4
1984	2 304	12 087,0
1985	2 044	10 238,3
1986	558	6 359,9
1987	709	3 914,8
1988	525	3 521,0
1989	695	4 544,7
1990	495	2 922,9
1991	383	1 961,7
1992	608	4 117,5
1993	481	3 658,3
Mean	874	5 067,9

Table 17: Number of tusks harvested by the National Parks Board from 1973 - 1993

Year of Harvest	No. of Tusks on Stock	Total Weight (kg)
1988	24	123,3
1989	307	1 917,6
1990	490	2 722,0
1991	375	1 892,2
1992	605	3 945,1
1993	481	3 658,3
Total	2 282	14 258,5

Table 18: Ivory stocks held by the National Parks Board, as at end of 1993

.

Table 19: Exports of live elephants from South Africa, 1986 - 1994

Year	No. of live elephants exported
1986	5
1987	20
1988	20
1989	18
1990	33
1991	37
1992	15
1993	32
1994	21

Case	Date	No. arrested	Citizenship	Rhino horns	Tusks	Other
1	89/02/20	1	Portuguese	•	130	an
2	89/08/10	1	Taiwanese	-	106	-
3	90/10/31	· 2	Taiwanese	110	-	-
4	90/11/05	2	Taiwanese	29	-	-
5	90/11/06	3	RSA	-	3	-
6	90/12/19	3	RSA	-	1	
7	90/12/19	3	RSA	-	3	•
8	90/01/07	2	RSA	1	-	-
9	90/01/07	3	RSA	-	1	
10	90/01/11	2	RSA	1	-	-
11	91/02/04	3	Zambia	21	14	
12	91/02/04	2	RSA	-	1	-
13	91/02/04	2	Zambia	13	-	-
14	91/02/04	3	RSA	3	4	-
15	91/02/20	2	RSA	1	•	-
, 16	91/02/21	3	RSA	3	-	-
17	91/02/22	1	Zambia	6	-	-
18	91/02/25	3	RSA	-	-	Dead Animals
19	91/02/25	3	Zaire	-	-	1 060 pieces worked ivory
20	91/02/25	1	RSA	1	-	-
21	91/03/15	1	RSA	7	7	-
22	91/04/11	1	Zaire	-	-	108 ivory blocks
23	91/04/15	1	Zambia	1	-	-
24	91/04/26	1	Zimbabwe	-	1	-
25	91/05/13	2	Zimbabwe	-	2	-
26	91/05/19	2	Zimbabwe	2	-	-
27	91/06/11	1	Botswana	1,2 kg	27 kg	-
28	91/08/27	4	Malawi	1	2	-
29	91/01/03	6	RSA	1	-	-
30	91/05/07	4	RSA	1	-	-

Table 20: Record of arrests and confiscation of ivory and rhinoceros horn by the Endangered Species Protection Unit of the South African Police Service, 1989 - 1993.

Case	Date	No. arrested	Citizenship	Rhino horns	Tusks	Other
31	91/05/23	3	RSA	2	-	-
32	91/06/03	3	RSA	-	2	
33	91/06/17	3	RSA	1	-	-
34	91/06/13	2	Taiwanese	55	-	-
35	91/06/22	2	RSA	-	2	-
36	91/06/27	5	RSA	-	2	
37	91/06/25	1	Malawi	-	6	_
38	91/07/03	2	RSA	-	1	-
39	91/07/03	2	RSA	1	-	_
40	91/07/06	1	Namibia	-	9	-
41	91/07/13	1	RSA	1	-	
42	91/07/22	1	RSA	-	1	_
43	91/07/29	2	RSA	1	-	
.44	91/07/30	3	RSA	-	2	
45	91/08/09	2	RSA	1	-	
46	91/08/09	2	RSA	-	3	
. 47	91/08/21	3	RSA	-	1	· -
48	91/08/22	. 3	RSA	1	2	·-
.49 .vii.	91/08/13	2	Zaire	-	-	1 115 ivory blocks - 57 kg
50	91/08/21	2	RSA	-	1	
51	91/08/21	2	RSA	1	-	-
52	91/08/23	1	Taiwanese	-		2 667 ivory blocks - 113 kg
53	91/08/28	4	Zambia/Botswana	1	-	-
54	91/09/02	2	Botswana	1.	-	-
55	91/09/03	2	Zimbabwe	-	-	2 ivory pieces
56	91/09/09	1	RSA	2	-	
57	91/09/14	3	RSA			
58	91/09/17	2	RSA	2		
59	91/09/19	3	RSA		1	
60	91/09/20	2	RSA		4	
61	91/09/25	1	RSA	1		

 \cap

Case	Date	No. arrested	Citizenship	Rhino horns	Tusks	Other
62	91/09/25	3	RSA	2		
63	91/09/26	2	RSA	2		
64	91/09/27	2	RSA	1		
65	91/09/27	2	RSA		1	
66	91/10/03	3	RSA		9	
67	91/10/05	2	RSA	1		
68	91/10/07	4	RSA		1	
69	91/10/09	3	RSA	2		
70	91/10/09	2	RSA		2	
71	91/10/14	1	RSA		37	
72	91/10/18	1	RSA	1		
73	91/10/26	3	RSA		1	
74	91/11/01	1	RSA		1	
75	91/11/07	3	RSA	1		
76	91/11/10	4	RSA	1	1	
77	91/11/12	2	RSA	1		
78	91/11/16	2 ′	RSA		19	
79	91/11/19	2	RSA	2		
80	91/11/20	2	RSA	2		
81	91/12/21	3	RSA\Zimbabwe	2		
82	91/11/21	2	RSA		1	
83	91/11/21	4	RSA	2		
84	91/11/30	2	RSA	2		
85	91/12/06	11	RSA		1	
86	91/12/10	1	RSA		1	
87	91/12/10	3	RSA		4	
88	91/12/18	2	Namibia		2	

.

- Anna -

	CONFISCATION OF RHINO HORN											
	JANUARY TO DECEMBER 1992											
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ост	NOV	DEC
	8	10	25	5	4	4	7	5	1	7	5	3
TOTAL 8	34											
	CONFISCATION OF IVORY											
				JAN	UARY TO	DECEMBE	R 1992					
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ост	NOV	DEC
Tusks	115	22	20	10	8	37	24	30	3	6	15	17
Pieces	16	2	0	8	0	5	8	0	0	0	3	5
Blocks	0	0	0	0	0	0	o	174	861	169	0	, 50
TOTAL TUSKS - 292 TOTAL PIECES - 47 TOTAL BLOCKS - 1 304												
CONFISCATION OF IVORY AND RHINO HORN 1992 TOTAL CASES - 181 TOTAL ARRESTS - 279												

Continuation of Table 20 (Different format due to change in record-keeping)

82

Table 20 continues (Different format due to change in record-keeping)

CONFISCATION OF RHINO HORN								
JANUARY TO MARCH 1993								
JAN FEB MAR								
	2	9	5					
TOTAL 16								
TOTAL 9	TOTAL 9 TOTAL 21							
CONFISCATION OF IVORY								
JANUARY TO MARCH 1993								
	JAN	FEB	MAR					
Tusks	9	59	13					
Pieces	16	1	0					
Blocks 0 0 370								
TOTAL TUSKS 81	TOTAL	PIECES 17	TOTAL BLOCKS 370					
TOTAL CASES 25 TOTAL ARRESTS 55								

Within protected areas							
Region	Area Ha.	Protection staff	Protection ² budget - USD	Operational ³ . budget - USD	Km²/ man	Protection ⁴ USD/Km ²	Operational USD/Km²
Kruger NP	1 948 528	209	\$2 929 207	\$2 606 785	93,2 ^₅	\$ 150,30⁴	\$ 133,80⁴
Addo ENP ⁶	8 767	13	\$ 108 996	\$ 73 878	6,8	\$1 243,20	\$ 842,70
Natal	575 774	922	\$7 714 286	\$3 857 143	6,2	\$1 340,00	\$ 670,00
Maputoland ⁷	60 000	147	\$1 150 000	\$ 455 357	4,1	\$1 916,60	\$ 758,90
Bophuthat- swana	55 000	55	\$ 773 822	\$ 373 000	27,6	\$1 406,90	\$ 678,20
OFS	164 479	341	\$1 714 286	\$ 957 143	4,8	\$1 042,11	\$ 581,85
Transvaal	224 482	480	\$3 250 000	\$2 214 286	4,7	\$1 447,66	\$ 986,32
Cape	1 633 270	449	\$8 505 214	\$5 783 545	36,4	\$ 520,77	\$ 354,12

Table 21: Examples of the allocation of resources to protection of conservation areas in different regions, and by different agencies in South Africa in 1990

Within a	administrative r	egions	(Not including protected areas)					
Region	Area Km²	Law enforce- ment staff	Protection Budget - US \$	Operational ² Budget - US \$	Km²/ man	Law en- forcement ³ US\$/Km²	Operational US\$/Km²	
Natal	55 781	108	\$ 857 142	\$ 428 571	516,4	\$ 15,49	\$ 7,70	
Maputoland ⁶	8 500	4	\$ 14 285	-	2 125	\$ 1,70	-	
Bophuthat- swana	4 400	49	\$ 377 162	\$ 368 839	89,8	\$ 85,72	\$ 83,83	
OFS	127 670	52	\$ 750 000	\$ 714 285	2 455,2	\$ 5,87	\$ 5,59	
Transvaal	262 499	210	\$1 678 571	\$1 357 143	1 249,9	\$ 6,39	\$ 5,17	
Cape	721 000	434	\$5 670 142	\$3 855 696	1 661,3	\$ 7,86	\$ 5,35	

² Protection budget includes total annual allocation for salaries, vehicle running costs, recurrent costs (road maintenance, fire control, camp upkeep, etc) and capital expenditure.

³ Operational costs are for salaries, travel/subsistance and recurrent costs (eg. transport) only.

⁴ An exchange rate of R2,80 = \$1.00 has been used.

- ⁵ An additional force of 250 military personnel, permanently deployed in the park effectively halves the km²/man and has the effect also of doubling the US\$/km² spent on protection.
- ⁶ The additional 2 951 ha reflected in Table 1 and 2 and referred to in the text has not yet been incorporated into the elephant range fencing is in progress.
- ⁷ Maputoland (N. KwaZulu) protected areas include forest reserves.

Table 22:Elephant hide produced (1985-1994) and sold (1985-1991) from the Kruger National
Park.

YEAR	PRODUCTION KG.	SOLD KG.
1985	119 546	190 149*
1986	44 428	43 107
1987	36 754	32 230
1988	24 358	25 338
1989	27 921	22 204
1990	23 021	1 500
1991	28 436	No sales
1992	19 817	No sales
1993+	19 246	No sales

* Includes hide from the 1984 cull

+ Stockpile as at 1994.03.31 stands at 95 150 kg



Fig. 2. Distribution of the African elephant in South Africa ca. 1800.











Fig. 4. Distribution of the African elephant in South Africa, 1991 (A and B indicate regions where many small, translocated populations occur on privately owned land).



Fig. 5. Localities of all natural and translocated African elephant populations in South Africa, June 1994.



Fig. 6. The distribution of African elephants in South Africa in 1991 relative to generalised mean annual rainfall isohyets.



Fig. 7. Schematic representation of helicopter flight path relative to drainage lines during elephant census, Kruger National Park.



Fig. 8. Histograms showing expected numbers and actual numbers of elephants recorded during census in the K.N.P., 1982 - 1990.

E • R + B - C E: Expected; R: Previous year's total B: Calves born; C: Cull



Fig. 9. Histograms showing elephant population counted in Kruger National Park and quotas of elephants culled in each year. (1967-1990)

Other Proposals - Mammalia - page 112

Cull



Fig. 10. Trend of the African elephant population in the Kruger National Park, 1900 - 1990.



Fig. 11. Trend of the African elephant population in the Addo Elephant National Park, 1930 - 1990. Three phases characterised by no perimeter fence, noninterference, and translocation and musth-related mortality in males are indicated.



Fig. 12. Trend of the African elephant population in the Tembe Elephant Park, 1945 - 1990.



Fig. 13. Trend of the African elephant population in the Knysna Forest, 1870 - 1990.



Fig. 14. Trend of the African elephant population in the Timbavati Private Nature Reserve, 1970 - 1990.



Fig. 15. Trend of the African elephant population in the Klaserie Private Nature Reserve, 1970 - 1990.



Fig. 16. Tendered prices (S / kg) for South African elephant skins between 1983 and 1989.



Fig. 17. Tendered prices (S / kg) for South African elephant trunks between 1983 and 1989.



Fig. 18. Tendered prices (S / kg) for South African elephant ears between 1983 and 1989.



Fig. 19. Tendered ivory prices (\$ / kg) for South African ivory between 1983 and 1989 under different tusk weight classes. The mean for all classes is represented by the solid line.

.