EDITORIAL

The Zimbabwe National Conservation Trust which is responsible for the Rhino Survival Campaign was founded in 1974 by a group of leading conservationists. Of the two main functions of the Trust the first is to raise funds nationally and internationally in order to finance projects in the field of Natural Resource Conservation.

Since 1974 the Trust has raised some Z$3 million and financed over 150 projects. The second function is one of co-ordinating the activities of non-Governmental resource conservation orientated organisations and, as necessary, to act as spokesman on behalf of those NGO's when presenting matters of concern to the Government of Zimbabwe or its technical departments.

The reason the Trust has been successful in gaining the confidence of international organisations is due to the annual support given to the Trust by the nation's industrial, commercial and financial houses.

This support enables the Trust to maintain a full time Secretariat headed by an Executive Director. This administration is responsible to a Board of Trustees with the President being the Hon. Cde V. F. Chitepo who is also the Minister of Natural Resources and Tourism. The patron of the Trust is His Excellency Cde C. F. Banana, President of Zimbabwe, while the current Chairman is the Hon. J. C. Graylin, Managing Director of Bikita Minerals and the current President of the Chamber of Mines. In 1985 when Zimbabwe first experienced the full onslaught of poaching activities Government took immediate action by recruiting some 100 additional staff to be trained to serve with the anti-poaching unit of the Department of National Parks and Wildlife Management. At the same time the Trust, in conjunction with the Wildlife Society of Zimbabwe and the Zambezi Society, were requested to develop a support programme capable of providing the necessary equipment such as back packs, water bottles, sleeping bags, mosquito nets and tents for the men in the field. Also required were 4-wheel drive vehicles, boats and engines for patrol in the Kariba Lake, and if possible a helicopter.

Under the umbrella of the Trust a Rhino Survival Sub-Committee constituted under the Trust's Co-ordinating Committee has raised in cash and kind well over Z$1 million.

With the backing of the Rhino Survival Campaign the anti-poaching units are maintaining a most creditable performance against poachers who are equipped with the most modern and sophisticated weapons. These poachers operate mainly from Zambia and pose a very real threat to Zimbabwe's Black Rhino population.

Despite the sterling efforts of all concerned it is evident that poaching continues apace. The fact that some 27 poachers have lost their lives and more have been imprisoned does not appear to have in any way daunted the poachers or their wealthy lords who hide in the safety of other countries, no doubt getting fatter and certainly richer by the day.

Unless the intensity of poaching operations can be drastically curtailed it has been publically stated by those in authority that our Black Rhino population will be annihilated in three to six years. It is evident therefore that more positive action is needed at international level to curb the illicit trade in rhino products. The Convention on international Trade in Endangered Species of Wild Fauna and Flora (CITES) has a major role to play in helping to end the international trade in rhino products. Here perhaps consideration could be given to persuading producer countries to sell all legal stocks of rhino horn to CITES at a nominal figure. This with the view of the Secretariat launching the Rhino horn on the world market at very depressed prices thus bringing down the value of illegal trading so that it becomes uneconomic.

Organisations such as the World Wildlife Fund International and the IUCN supported by other international groups could consider canvassing for diplomatic pressure to be brought to bear on states which give support to poachers and those that fail to enforce laws prohibiting the importation of rhino products. Such pressure could well include suspension of foreign aid or be a condition in providing foreign aid. In this modern age when we can sustain humans in outer space it should not be beyond the capabilities of scientists and industrialists to develop a synthetic product that would be difficult to distinguish from the genuine rhino horn article.

Here in Zimbabwe the Department of National Parks and Wildlife Management is already capturing black rhino in the Zambezi Valley and translocating them to safer areas where the habitat is suitable. This with the view to developing breeding herds. Mention has also been made that research is being undertaken as to the effects of de-horning rhino, which would mean depriving the animal of a natural means of protection for itself and its young. Nevertheless it may prove that even without its horn the rhino is able to protect itself against predation, whereas the animal has no protection against the poachers bullet.

Finally, sight should not be lost of the fact that while everyone has their attention focused on the plight of our Black Rhino other species are on the endangered list. Such animals as Lichtenstein's Hartebeest, Red Hartebeest, Roan Antelope, Wild Dog, Oribi and others may well become extinct well before the Black Rhino.

It also behoves everyone to awaken their conscience to the fact that in Tropical Rain Forests live more than half the world's wild plants and animals.

If present trends continue 500 000 or more species will be extinct within the next 20 years.

A principal cause of this tragic destruction as with the Black Rhino is the greed of man.

John A. Pile

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ZIMBABWE AND THE CONSERVATION OF BLACK RHINO

David Cumming

Chairman, IUCN/SSC African Elephant and Rhino Specialist Group

The black rhinoceros *(Diceros bicornis)* declined from over 65 000 animals in Africa in 1970 to about 12 000 in 1981. Since 1981 black rhino have continued to decline at an alarming rate and there are now less than 4 000 left in Africa. Fifteen years ago Zimbabwe's black rhino population was estimated to be about 1 000 and formed less than 2% of the continental population. The black rhino population of some 1 700 in Zimbabwe is now the largest in Africa and forms 46% of the continental population. The only remaining population of more than 500 animals in Africa is that in the Zambezi valley between Kariba and Kanyemba. This population has been identified as the top priority for conservation action by the African Elephant and Rhino Specialist Group of IUCN Species Survival Commission. Zimbabwe has a special responsibility for the survival of this species in the wild in Africa.

The rhinoceroses belong to the odd toed ungulates or Perissodactyla in which Order are also included the horses and tapirs. Rhinoceroses first appeared in the Oligocene some 30 million years ago. The earliest deposits containing remains of the living species of African rhino date back some 3 to 4 million years. During the period 18 to 8 million years ago there were seven genera of rhino in Africa with about 12 species in all. Towards the end of the Miocene era (5m years ago) all but two genera, *Diceros* and *Ceratotherium,* became extinct. So in Africa we now have two species in two genera, namely, the black rhinoceros, or hook lipped rhinoceros *(Diceros bicornis)* and the white rhinoceros, or square lipped rhinoceros, *(Ceratotherium simum).* There are a further three species of rhino in India and south east Asia all equally endangered and numbering less than 2 500 individuals.

The distribution of white rhino in Africa has been discontinuous at least in historical times and perhaps for very much longer. Many taxonomists recognise a northern race *(C.s. cottoni)* and a southern race *(C. s. simum).* Black rhino on the other hand have, until very recently, had a more or less continuous distribution from Cameroon eastwards to Ethiopia and Somalia and then southwards through East Africa to southern Africa (Fig. 1). Despite this a number of subspecies have been described. By 1900 black rhino had disappeared from most of South Africa but were still well distributed through much of the remainder of their former range (Fig. 1). By 1981 the range of black rhino had been fragmented but there were still populations larger than 3 000 in the Central African Republic, Tanzania and Zambia. Those populations have now collapsed (Table 1) and the distribution of black rhino is even more fragmented. The decline in range and numbers of the black rhino over the last 15 to 20 years is characterised by the rapid disappearance of large populations in Kenya followed by the Central African Republic, Zambia and more recently Tanzania (Figs. 1-2 and Table 1). Associated with the decline is the increasing fragmentation of once contiguous populations into smaller and smaller isolated units. This in turn brings its own threat to survival in the form of reduced genetic diversity and inbreeding depression even if these populations are effectively protected from poaching.

Table 1. Numbers of black rhino in African countries. (Data for 1980 and 1984 from Western and Vigne (1984), for 1986 from AERSG records).

Country	1980	1984	1986
Zimbabwe	1 400	1 680	1 737
South Africa	630	640	510
Namibia	300	400	440
Tanzania	3 795	3 130	400
Kenya	1 500	550	381
CAR	3 000	170	?
Zambia	2 750	1 650	200
Mocambique	250	130	?
Cameroon	110	110	70?
Sudan	300	100	?
Somalia	300	90	?
Angola	300	90	?
Malawi	40	20	30
Rwanda	30	15	20
Botswana	30	10	?
Ethiopia	20	10	?
Chad	25	5	?
Uganda	5	0	0
Total	14-15 000	8 9 000	3 788

The overiding cause of the decline in black rhino in Africa has been commercial poaching for the horn which is exported illegally to North Yemen and to the Far East. In Yemen the horn is carved into dagger handles while in Asia it is used in traditional medicines where it is believed to reduce fevers and cure other ailments (Martin and Martin 1982). The price of raw rhino horn in Africa is about $850 per kg. The gross value of the trade in rhino horn in African over the past six years is about $13 000 000.

The poaching of rhino is a highly organised operation involving wealthy international traders and often highly placed and corrupt politicians and officials. These people hire experienced and determined poachers as the anti-poaching forces in Zimbabwe have discovered over the past 18 months during which time some 150 rhino

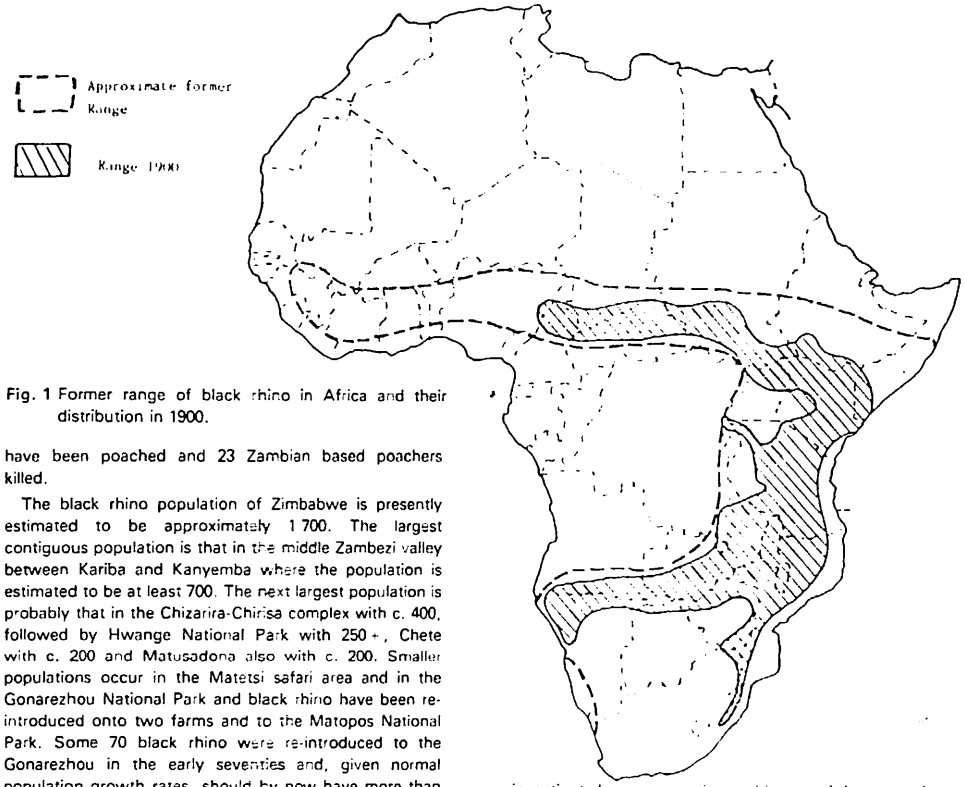

Fig. 1 Former range of black rhino in Africa and their distribution in 1900.

have been poached and 23 Zambian based poachers killed.

The black rhino population of Zimbabwe is presently estimated to be approximately 1 700. The largest contiguous population is that in the middle Zambezi valley between Kariba and Kanyemba where the population is estimated to be at least 700. The next largest population is probably that in the Chizarira-Chirisa complex with c. 400, followed by Hwange National Park with 250 +, Chete with c. 200 and Matusadona also with c. 200. Smaller populations occur in the Matetsi safari area and in the Gonarezhou National Park and black rhino have been re-introduced onto two farms and to the Matopos National Park. Some 70 black rhino were re-introduced to the Gonarezhou in the early seventies and, given normal population growth rates, should by now have more than doubled in number. This population has, however, been subjected to a continuous low level of poaching which has recently escalated and numbers are now below 70. There are still a few rhino in areas outside the parks and wildlife estate in the Zambezi Valley areas of Zimbabwe.

IUCN, the International Union for the Conservation of Nature and Natural Resources, has a major network of largely honorary members comprising scientists, conservationists, and administrators who provide specialist information, advice and services to the Union. These members operate through a series of commissions and specialist groups supported by a core executive staff based mainly at the IUCN headquarters in Switzerland. The largest Commission is the Species Survival Commission (SSC) which has some 90 Specialist Groups and whose task is *"to prevent the extinction of species, subspecies and discrete populations of fauna and flora thereby maintaining genetic diversity of the living resources of the planet"*. One of the SSC's specialist groups is that of the African Elephant and Rhino Specialist Group (AERSG) which has its headquarters in Harare. The group's 34 members are drawn from 16 countries in Africa. The primary role of the AERSG is to monitor the numbers and distribution of rhino and elephant in Africa, identify and investigate key conservation problems and threats to these populations, and advise on priorities for action to conserve rhino and elephant in Africa. This is done partly through an Action Plan which is updated annually and published in *Pachyderm*, the AERSG newsletter. Black rhino became the highest priority two years ago and the main components of the AERSG Action plan for black rhino are as follows (extracts from Chairman's report in *Pachyderm* No. 7):

Field Action

1. Develop a conservation strategy for the black rhino.

   The continuing rapid decline of black rhino populations in most parts of its range coupled with the fact that many viable populations do still exist in the wild merits the placing of black rhino, as opposed to the northern white rhino, as the top priority for conservation action. The development of a continental conservation strategy for the species involves three major, and preferably concurrent, actions:

   1.1 Examine the taxonomic status of presently described subspecies of black rhino so as to provide a sound basis for ordering priorities for action amongst the now geographically separated populations in Africa.

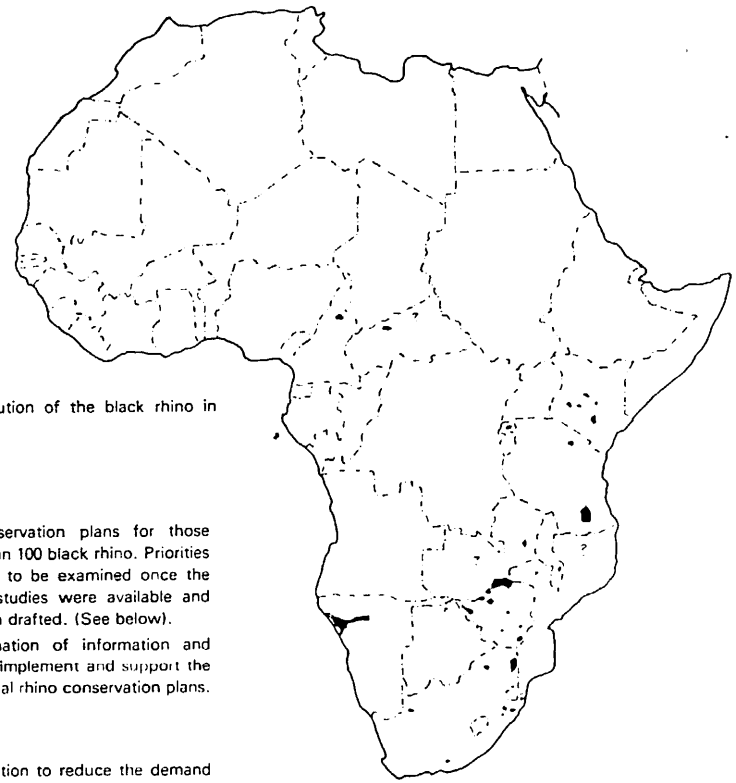

Fig. 2 Present known distribution of the black rhino in Africa.

   1.2 Develop national conservation plans for those countries with more than 100 black rhino. Priorities for action would need to be examined once the results of taxonomic studies were available and national plans had been drafted. (See below).

   1.3 Promote the dissemination of information and expertise necessary to implement and support the international and national rhino conservation plans.

Trade priorities

1. Rhino horn

   1.1 North Yemen. Take action to reduce the demand for rhino horn and, if possible, close down the trade.

   1.2 East Asia. Take action to reduce the demand for rhino horn and, if possible, close down the trade in horn.

   1.3 Investigate the movement of horn within Africa.

   1.4 Investigate discrepancies between reported declines of rhino populations and amount of horn appearing in the trade.

   1.5 Inform governments of the value, and potential value, of their rhino populations and so encourage the allocation of more resources to their conservation."

Progress is being made on each of these items and some of it is reported by du Toit (this issue). At the AERSG meeting in Luangwa in July, 1986, AERSG priorities for field action for black rhino populations throughout Africa were examined in terms of paragraph 1.2 under Field Action of the Action Plan (see above). The top five of the priority areas are given below and these highlight the importance of the Zimbabwean populations in the conservation of black rhino in the wild in Africa.

1. *Zambezi Valley – Zimbabwe (Population estimate 750)*

   This area lies downstream from Lake Kariba and includes a number of components of the Zimbabwean Parks and Wildlife estate. The Mana Pools National Park and the Chewore and Sapi Safari Areas comprise a World Heritage Site. The Zambezi Valley complex carries the largest remaining coherent population of black rhino left in Africa and the only population of more than 500.

   Key actions identified were an increase in anti poaching forces, infra-structural development for the valley, field research, and greater co-operation between Zimbabwe and Zambia to stop cross border poaching

2 *Etosha National Park — Namibia*
(Population estimate 350)

Etosha lies within an incipient war zone and with the second largest coherent population of black rhino on the continent it is vulnerable. No immediate requirement for assistance from the international conservation community was identified.

3 *Selous Game Reserve — Tanzania*
Population estimate 200?)

This was the top priority for black rhino conservation five years ago. In ranking the Selous at the Luangwa meeting AERSG worked on a population of 300 black rhino. Actions considered necessary were a review of the management of Selous, provision of equipment and the establishment of a monitoring programme. Funding for a survey had already been secured.

4 *Hwange National Park — Zimbabwe*
(Population estimate 250)

Black rhino were re introduced into this park in 1960 and more than 100 have been introduced from the Zambezi Valley over the last three years. It is one of the best protected parks in the country and no rhino poaching has been recorded. Immediate assistance is not required.

5 *Chirisa, Chizarira — Zimbabwe*
(Population estimate 350)

These contiguous protected areas hold up to 400 black rhino in mostly rugged terrain. Poaching has not been a problem but the present forces are inadequate to counteract commercial poaching. The Zimbabwean authorities were urged to examine the situation carefully and take appropriate action. A small, mobile, well equipped anti-poaching unit established in the district could act as an early antidote to any commercial poaching in the complex comprising Chirisa, Chizarira, Chete and Matusadona.

Of the total list of seventeen priority areas for action five were populations within Zimbabwe. This brief outline of priorities and the figures contained in Table 1 serve to emphasise just how important a role Zimbabwe can play in saving black rhino from extinction in the wild.

Acknowledgement

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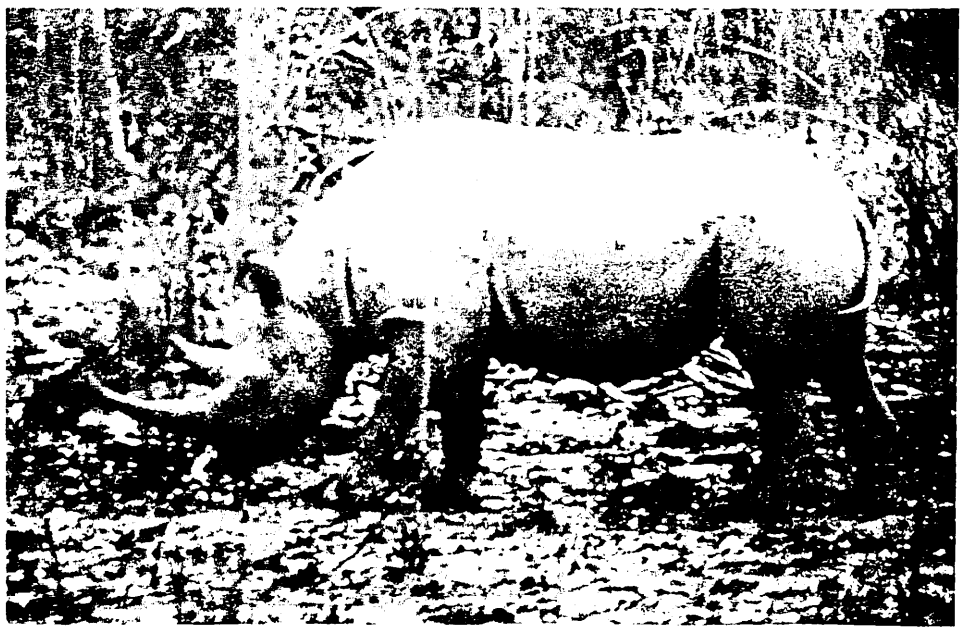

Black Rhino in Chizarira National Park. Photo: R. Maasdorp.

CONSERVATION BIOLOGY OF BLACK RHINO

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The precipitous decline of black rhino populations over most of the range of the species in Africa necessitates emergency measures to ensure that at least some viable breeding groups are protected in African sanctuaries and in overseas zoos. The urgency of the situation places a responsibility on scientists to come up with quick answers to a number of questions. Upon which rhino populations should conservation efforts be concentrated in order to maintain the existing genetic variability within the species? What is the minimum number of animals required in a particular population to give a margin of safety against foreseeable factors that could depress the breeding? What degree of inbreeding is likely to occur in populations of certain sizes, and what recommendations can be made for transfer of animals or genetic material between populations to prevent excessive inbreeding? What are the major health problems that have to be considered when moving rhino and keeping them in zoos or small sanctuaries? This article elaborates on these issues and outlines progress in providing some guidelines.

Black Rhino systematics

It may appear strange to many people concerned about the survival of black rhino that some of the organizations which are centrally involved in the international rhino conservation effort (notably the African Elephant and Rhino Specialist Group and the American Association of Zoological Parks and Aquaria) are currently laying considerable emphasis on the seemingly academic issue of subspecies designations. This emphasis stems from the need to get a better idea of the genetic variability within the remaining black rhino. The available resources of money and expertise are too scanty to provide all rhino in Africa with the level of protection that is necessary to stave off commercial poaching. So which rhino should we try to save?

Decisions on this rather cold question are often determined by very practical considerations; international support will best be directed to areas where the prevailing social, political and economic influences are most conducive to rhino conservation – if a country's administrative and legislative framework is insufficiently developed to counter illegal depredations, it would be wasteful to throw in funds to finance some sort of cosmetic attempt at conservation, regardless of how unique the rhino in such a country may be. Conversely, if local initiatives are being made to save rhino, then the international conservation community has a considerable obligation to provide material support for these initiatives, even if they concern a race of rhino that is already relatively well-conserved elsewhere.

In some important cases, meaningful priorities can be set for rhino conservation initiatives that do take genetic factors into account. At present, American zoos are following a co-ordinated plan to provide more space for black rhino, in order to increase the captive breeding population as quickly as possible, thus insuring against failure of the various projects to save the animals in good breeding situations within Africa. All but five of the seventy-odd black rhino in zoos in the United States are of East African origin, and therefore the zoo breeding programme must be expanded to include representatives of other black rhino "subspecies", in order to maintain the overall genetic diversity of the species at the highest level possible.

Past work on black rhino taxonomy has been scanty and provides an inadequate basis for deciding how to distinguish populations for a conservation strategy. As with many other species, the taxonomic work has consisted almost entirely of the measurement and comparison of the dimensions of skulls collected from different parts of Africa by museums. The last revision of the black rhino subspecies (Groves, 1967) cut down the number of designated subspecies to seven, but since only two of these were based on measurements of more than ten skulls, there has been considerable suspicion that there could be greater variability within the populations, thus making the taxonomic divisions less certain.

Confusion has also arisen over which of the supposed subspecies are still surviving. Rookmaker and Groves (1978) decided that the subspecies with the largest skull, *Diceros bicornis bicornis,* had occupied parts of Namibia and the Cape Province of South Africa until it was exterminated in about 1850. However, other zoologists (e.g. Smithers, 1983) still apply the name to extinct rhino in Southern Africa. The question of whether or not there are two subspecies in the subcontinent illustrates the central issues involved in the taxonomic debate. There are about 70 black rhino living in near-desert conditions in northern Namibia, and another 350 or so in the arid Etosha National Park. Are these populations significantly different to the rhino in Zululand and Zimbabwe? Is it worth making a special effort to get some of these animals into captive breeding facilities, in view of the political instability of Namibia?