

# DEVELOPMENT OF THE ZIMBABWE NATIONAL CONSERVATION STRATEGY FOR BLACK RHINOCEROS

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## INTRODUCTION

The research findings outlined in the previous paper (Martin, this volume) formed the basis for the development of a management plan for black rhino in Zimbabwe. The key points to emerge from the research were:

- i) At the prevailing intensity of illegal hunting the rhino population was effectively static - neither increasing or decreasing.
- ii) To achieve a positive rate of rhino population growth of the order of 2-3%, law enforcement effort would have to increase approximately five-fold. Densities of field staff would need to be increased from 1man/100sq.km to 1man/20sq.km.
- iii) The budget associated with this new level of law enforcement would need to be US\$400 per sq.km of rhino range.

The conservation strategy was required to take into account the present distribution of rhino in Zimbabwe, the reality of a possible further decline in numbers, and the likelihood of increased staffing and operational budgets being granted by government.

Prior to the development of this strategy, emphasis had been placed almost exclusively on the conservation of large wild rhino populations in the Parks and Wild Life Estate. There were good reasons for this: large wild populations are the major reservoir of the genetic diversity of black rhino and, if they are permanently destroyed, there is little likelihood that they will ever be restored through captive breeding programmes or translocation from other areas.

After the completion of the research work, several workshops were held to address the options for a conservation strategy. Members of the AAZPA (American Association for Zoological Parks and Aquariums) and several independent scientists participated in these workshops and helped the Department to formulate a "minimum regret" strategy. This strategy, while continuing to place the primary emphasis on conservation of large wild rhino populations, puts into place the necessary components of a "fall-back position" should the decline of rhino continue.

## OBJECTIVES OF THE STRATEGY

Recognizing that there are considerable risks in banking all rhino conservation efforts solely on large wild rhino populations, it would appear wiser, while numbers of rhino are still significant, to adopt a strategy which takes into account the possibility of a continued decline in numbers.

Such a strategy entails securing the full sequence of "fall-back" positions before being forced to adopt them in a crisis situation. This involves tackling four main objectives simultaneously. Each objective deals with an alternative option for holding and managing black rhino. The order in which the objectives are arranged reflects their desirability in a conservation context.

## **OBJECTIVE 1: TO CONSERVE VIABLE POPULATIONS OF BLACK RHINO IN THE PARKS AND WILD LIFE ESTATE**

### **1.1 DEFINITIONS AND CONSTRAINTS**

1.1.1 The Minimum Viable Population for long-term genetic fitness should be larger than 1,000 animals. As a discrete population falls below this number, further evolutionary adaptation through natural selection becomes unlikely. Hence the ideal is to build up freely-breeding populations in sufficiently large areas to at least 1,000 individuals (preferably 2,000).

1.1.2 No single region in Zimbabwe now contains a breeding population of this size, although several have the potential (Zambezi Valley, Sebungwe, Matabeleland North and the South-east Lowveld).

1.1.3 The total population within the Parks and Wild Life Estate exceeds a Minimum Viable Population provided it is managed as a Metapopulation which consists of several Subpopulations.

1.1.4 For purposes of decision-taking, the following definitions will apply to Subpopulations:

- i) **Large Wild Populations** will consist of 200 or more animal. Such populations will not at this stage require management to conserve genetic variability.
- ii) **Intermediate Wild Populations** will be those whose size lies between 100-200 animals. In order to counter the loss of genetic variability, one or two effective breeders are required to be added to such populations every 10-15 years.
- iii) **Small Wild Population** are discrete populations of less than 100 animals. These will require more intensive management to counter excessive inbreeding.

1.1.5 Breeding Nuclei outside the Parks and Wild Life Estate (Objective 2) will be described by the same definitions. They will be managed in conjunction with subpopulations in the Parks and Wild Life Estate as part of the overall Zimbabwe Metapopulation.

1.1.6 Successful protection of rhino populations in the wild entails a staff density greater than one man/50sq.km. and preferably one man/20sq.km.

1.1.7 The recurrent expenditure associated with this level of law enforcement is US\$200/sq.km in the case of 1 man/50sq.km and US\$400/sq.km in the case of 1 man/20sq.km. This expenditure includes salaries and refers to 1989 costs (Tables 1 and 2).

1.1.8 Anti-poaching units must be quipped with modern, sophisticated equipment to detect and combat heavily armed illegal hunters using quasi-military tactics. Such equipment is expensive and staff require training in its use.

### **1.2 IMPLEMENTATION**

1.2.1 The present levels of staff and funding available to the Department fall below those laid down in criteria 1.1.6 and 1.1.7 above. Therefore, the Department's initial strategy will be to approach the Treasury for the required budget to achieve the first objective.

1.2.2 In the event that such a budget cannot be provided, the Department will adopt the following strategy:

- i) Staff will be redeployed in the existing rhino range to ensure a minimum coverage in all ares of 1 man/50sq.km.

- ii) A limited area will be designated within the Parks & Wild Life Estate where effort will be intensified to protect certain Large and Intermediate Wild Populations. Staff densities in this area will initially be 1 man/25sq.km.
- iii) This special area will initially comprise eight separate zones in different parts of the Parks and Wild Life Estate, each of which is greater than 1,000 sq. km. and contains more than 100 rhino. Each zone contains areas of optimal rhino habitat in order to reduce the overall area which requires intensive protection. These areas will be designated **INTENSIVE PROTECTION ZONES**.
- iv) Outside Intensive Protection Zones, certain translocations of rhino will take place to improve the viability of subpopulations and increase the probability of adequate protection.

1.2.3. The Department will monitor rhino population numbers throughout the Parks & Wild Life Estate. Various levels of population will be used as "trigger points" at which management decisions become operative under conditions of decline:

- i) Effort will be focused on Large and Intermediate Wild Populations. Populations which have fallen to the level of Small Wild Populations will be translocated in their entirety and the Intensive Protection Zone deproclaimed.
- ii) Intensive Protection Zones will not be used as a source from which to translocate animals for building up other populations while their numbers are below carrying capacity;
- iii) Following the deproclamation of any Intensive Protection Zone, the additional staff which were protecting that zone will be redeployed to increase staff densities in the remaining Intensive Protection Zones.

1.2.4 The Department will implement a standard system of monitoring law enforcement effort and the degree of illegal activity.

1.2.5 Rhino populations in the communal lands adjacent to the Parks and Wild Life Estate present a special problem. All of them fall into the category of Small Wild Populations and, according to the above principles, should be translocated in their entirety to safer areas. However, such a move could have negative effects on the current initiatives being taken by rural communities to manage their own wildlife and appropriate actions should only be taken after full discussions with District Councils.

**OBJECTIVE 2: TO DEVELOP BREEDING NUCLEI ELSEWHERE IN ZIMBABWE AND TO MAINTAIN THEIR GENETIC VARIABILITY.**

Breeding Nuclei are translocated populations of rhino held under semi-extensive conditions. Existing Breeding Nuclei on commercial farms now contain slightly less than 200 rhino. In order to ensure that Breeding Nuclei can be developed into populations which are genetically and demographically viable, the following conditions will be observed:

2.1 Each nucleus will be established in an area with carrying capacity for over 100 rhinos. This will permit Intermediate Wild Populations to be established ultimately, requiring less intensive management than Small Wild Populations (1.1.4). Breeding nuclei will be treated as Small Wild Populations until they reach 100 animals.

2.2 The minimum number of Founder Animals in each nucleus will be 40.

2.3 Each nucleus will be managed as a Subpopulation of the total Metapopulation in Zimbabwe (1.1.5) with controlled exchange of breeding animals between the subpopulations.

2.4 The selected areas for Breeding Nuclei will be in the Parks and Wild Life Estate (other than where Large and Intermediate Wild Populations are located) and in certain commercial farming areas.

2.5 The Department will select areas for Breeding Nuclei which satisfy the following criteria:

- i) The areas will be located at least 50km from the border of the country and preferably more than 100km.
- ii) The areas adjacent to any property or protected area on which black rhino are to be held should be "friendly" territory. If a rhino escapes from the selected area it should not be necessary to recapture it as a matter of urgency.
- iii) Because few individual properties are sufficiently large to hold 100 rhinos, preference will be given to consolidated blocks of farms all of whom are willing to accept rhino, or small protected areas in the Parks and Wild Life Estate in combination with adjacent farms.
- iv) In certain cases, rhino may be placed within a smaller area as an interim holding measure, or for controlled breeding and research programmes.

2.6 All custodians of Breeding Nuclei will be required to be members of an Association, linked to the Department of National Parks and Wild Life Management, whose objectives will be to:

- i) Establish minimum standards of protection for their areas;
- ii) Establish a statistical data base of all rhino in Breeding Nuclei for management purposes;
- iii) Co-operate in the management of Subpopulations (Small Wild Populations) to maintain genetic diversity;
- iv) Manage Breeding Nuclei according to the best available technical information. To this end, close liaison will be maintained with the Captive Breeding Specialist Group of the International Union for the Conservation of Nature and Natural Resources (IUCN) and its regional captive breeding organizations.

2.7 Breeding Nuclei may only be established or added to from populations falling into the following categories:

- i) Large Wild Populations at their carrying capacity;
- ii) Populations which have declined below 100 animals and are regarded as seriously threatened;
- iii) Translocated groups which are too small to satisfy the criteria laid down for Breeding Nuclei;
- iv) Surplus animals from other Breeding Nuclei which have reached their carrying capacity;
- v) Animals selected as desirable to prevent inbreeding.

2.8 The proposed programme of translocation of rhino into breeding nuclei has been prepared.

2.9 Additional introductions to small Breeding Nuclei will be closely monitored to observe if they are subject to aggressive behaviour by the resident animals. If necessary to prevent mortality, they would be moved.

2.10 No animals will be captured and translocated from designated Breeding Nuclei during their period of establishment other than to satisfy the requirements of 2.7 v) or to protect the life of a threatened individual.

2.11 If the Department decides that any particular Breeding Nucleus is threatened due to an escalation of illegal activity or is not being adequately managed and protected, it will take whatever measures it deems necessary to secure the survival of the population.

### **OBJECTIVE 3: TO DEVELOP ONE OR MORE CAPTIVE BREEDING CENTRES IN ZIMBABWE**

Captive breeding implies individuals or small groups of rhinos being held in relatively small areas (a few hectares) where they can be afforded maximum protection and can be intensively managed for breeding purposes. Almost the entire food requirement has to be externally supplied.

At this stage Zimbabwe has not yet established a major *in situ* captive breeding centre although there is a small private facility at Chipangali Wildlife Orphanage. However, it was foreseen as part of the conservation strategy in 1985 and the Zimbabwe Government has stated publicly that it would establish its own captive breeding programme before supporting ex-situ captive breeding efforts elsewhere in the world.

3.1 The Zimbabwe Government will establish its first captive breeding centre for black rhino in 1991 at a site to be determined.

3.2 The centre will be run by the Department of National Parks and Wild Life Management.

3.3 Further centres may be established in the country under government or private management in the coming years.

3.4 The captive breeding centre will provide for 6 rhino initially, with a maximum capacity of 16 rhino at full development.

3.5 In the event of a continued decline in rhino numbers, a maximum holding capacity of 60 rhino under captive breeding conditions in Zimbabwe will be the final target.

3.6 Captive breeding centres will meet the highest zoological standards adopted internationally.

3.7 The department will seek advice and assistance from the Captive Breeding Specialist Group of the IUCN and the AAZPA in order to meet these standards and optimize management.

3.8 The Department is aware that the present cost of holding rhino under captive breeding conditions is approximately US\$10,000 per rhino per year at the rates applicable in 1989.

3.9 Rhino in captive breeding centres will be managed as subpopulations in conjunction with Small Wild Populations in Zimbabwe and may be integrated into the international ex-situ captive breeding programme for black rhino.

3.10 A key aspect of the government centre will be to provide a research facility to examine the following:

- i) Requirements for capture, confinement and translocation;
- ii) Reproduction;
- iii) Disease.

**OBJECTIVE 4: TO CONTINUE TO SUPPORT THE INTERNATIONAL EX-SITU CAPTIVE BREEDING PROGRAMME.**

It is recognized that ex-situ captive breeding is a "back-up" to in-situ conservation. Proponents of the international programme for captive breeding do not in any way view this form of rhino propagation as a substitute for conservation of wild populations. Rather it is seen as the final form of insurance against the ultimate loss of a species.

The international captive breeding programme recognizes four separate sub-species (or races) of black rhino:

- i) The south-western population in Namibia;
- ii) The southern-central populations extending from Natal through Zimbabwe and Zambia into southern Tanzania (*Diceros bicornis minor*);
- iii) The eastern populations in Kenya and northern Tanzania; and
- iv) The northern-western populations extending from the horn of Africa to the Central African Republic and Cameroon.

It has been agreed by the Captive Breeding Specialist Group that, until evidence is presented to the contrary, it would be wisest to pursue separate captive breeding programmes for each of the above groups to preserve their genetic diversity.

At this stage, only the eastern populations are adequately represented by sufficient founder animals in zoos outside Africa. The minimum number of founder animals recommended for each of the above groups is 20 animals, but a larger number (up to 50) would be preferable to ensure adequate genetic diversity. As of December 1989, 14 founder animals of the southern-central group are represented in the captive breeding programme.

4.1 Zimbabwe recognizes that the ex-situ captive breeding programme for black rhinoceros is designed as an adjunct to efforts to conserve rhinos in-situ in Africa.

4.2 Zimbabwe understands that, at considerable cost to the zoo community, provisions have been made for breeding a captive population of up to 150 black rhinoceros (of all the above races).

4.3 Zimbabwe feels strongly that the ex-situ captive breeding programme must be carried out under the auspices of coordinated scientific institutions such as the American Association of Zoological Parks and Aquariums (AAZPA) and the IUCN Captive Breeding Specialist Group. The Government will be most reluctant to release rhino from Zimbabwe except to a technically sound programme such as that managed by the AAZPA.

4.4 Zimbabwe has contributed 14 animals since 1982 to the ex-situ captive breeding programme (excluding a donation of 4 animals to North Korea, 2 to Yugoslavia and 6 to Swaziland).

4.5 Zimbabwe will continue to support the provision of *Diceros bicornis minor* founder animals to the ex-situ captive breeding programme until there are adequate numbers of southern-central rhino for a high probability of successful propagation in the long-term.

4.6 However, Zimbabwe is aware that other countries could contribute to the provision of these founder animals and that, in pursuance of a policy of translocating the least viable and most vulnerable animals, there is a strong case for *Diceros bicornis minor* founder animals to be drawn from other parts of the region.

4.7 Zimbabwe will relate its own captive breeding programme to the ex-situ propagation effort and manage in-situ captive animals as a subpopulation within the global metapopulation (para 3.6).

4.8 Zimbabwe is optimistic that it will succeed in its own conservation effort and that it will never be necessary to seek the return of black rhino to re-establish a population which has become extinct. However, Zimbabwe is confident that, in this unlikely eventuality, it will be able to rely upon the international zoo community to honour its obligations in this respect.

## **THE FUTURE**

Having outlined a conservation strategy we will now express our discomfort with it. As a plan, it is the conventional reaction of any responsible conservation agency when faced with the sort of crisis which presently confronts the black rhinoceros. The reaction is to intensify law enforcement and to prepare emergency measures to remove rhino from vulnerable areas. It may work in the interim. The fact that Zimbabwe still has a large rhino population is due to dedicated law enforcement staff and government commitment to conservation.

There is little doubt that the situation is critically poised. The current rate of loss of rhino to illegal hunting is closely balanced by annual recruitment to the population. Statistics for 1988 - 1991 indicate that there has not been any further significant decline in rhino numbers. Equally well it is unlikely that the population has increased. If anything, the recent intensification of illegal hunting outside the Zambezi Valley foreshadows further declines in the future.

It would require very little to tip the scales in either direction. A large increase in government investment supporting the law enforcement effort could significantly improve matters. Any further deterioration in the budget allocated to the Department is likely to destroy morale and precipitate a rapid escalation in illegal hunting.

The Department views the problem primarily as one of recurrent expenditure. The threshold levels of staff and funding for successful law enforcement are clearly defined in this document and they far exceed any possible contributions which can be realistically expected from local or external donors.

To conserve the effective range of black rhino on State Land in Zimbabwe requires an annual departmental budget of the order of US\$20 million (approximately double the current budget). The contribution from all donor sources has never amounted to US \$1 million in any year since the inception of the present crisis. Moreover donor funding is generally in the form of capital assistance and has no influence on operational costs. The problem will have to be solved within government.

The costs of conserving black rhino in the wild (roughly double the normal law enforcement costs) must inevitably be viewed by the managers of government funds as a large non-productive investment. Even if the Department is successful in its conservation efforts it is difficult to see what tangible benefits will arise to convince the investors that the exercise was worthwhile. The argument that it has been done for the sake of conservation is not enough: the treasurer can justifiably argue that this type of conservation is a bottomless pit and that existing grants are the full and final measure of the extent to which public monies can be diverted from other productive uses.

There is a growing mood amongst many southern African conservationists that the time has come to review the options for conserving the black rhino. There is an undeniable economic value attached to rhino which might well be used to conserve the species.

Options which offer themselves readily as a sustainable source of income are:

- i) Re-opening the legal trade in rhino horn. Many southern African countries are now holding large legal stocks of horn which could contribute significant funds to rhino conservation.
- ii) Farming rhino for their horn. This would involve removing horns painlessly under captive conditions without killing animals. The horns regrow and provide a sustainable income. As a form of land use, returns might be as high as US \$50/ha which should be compared with cattle farming at approximately US \$5/ha.
- iii) Permitting a small sustainable quota of animals for sport hunting. The potential trophy fee for a black rhino may be as high as US \$250,000. The use of this income could provide the essential funds for conserving the species.
- iv) Supplying live rhino for external and internal captive breeding programmes in exchange for major contributions to conservation budgets within Zimbabwe. This option may be particularly appropriate for threatened rhino in communal lands.

Some of these options are repugnant to many people. However the situation may well have reached the stage where moral and ethical preferences are secondary to the larger issue of species extinction. Removal of the present constraints which are actually acting against survival of the species could provide the turning point in black rhino conservation.

Of the above options, one which should be considered urgently is the re-opening of the legal trade in rhino horn. There is a fundamental flaw in the conventional reasoning process which underlies the Convention for International Trade in Endangered Species of Flora and Fauna (CITES) ban - which goes thus:

"Too many rhino are being killed to satisfy a demand for horn"

ergo -

"If trade is stopped then fewer animals will be killed."

It sounds plausible. But before accepting either the first sentence, which is a statement of the problem, or the second sentence, which is the supposed solution to the problem, there are questions to be asked:

- i) Is it not possible to prevent the rhino from being killed?
- ii) Can the demand for horn be reduced to the point where it is not worth killing a rhino?
- iii) Can trade be prevented?
  - Rhino are being killed because they are inadequately protected. It costs US \$400/sq.km to protect rhino and, with the exception of South Africa, no country in Africa is spending this amount.
  - A recently published paper indicates that the medicinal efficacy of rhino horn may be real (But, Lung and Tam, 1990), in which case it is unlikely that demand will be significantly reduced.



- A world trade ban has been in place for fifteen years and it has failed dismally: markets which have been established for hundreds of years cannot be easily closed.

If it is not possible to prevent rhino being killed AND the demand cannot be reduced AND trade cannot be prevented then the reasoned solution is not a solution at all. If the species cannot be protected, it will be illegally killed as long as there is any level of demand.

It is quite irrelevant if every government in the world agrees to a ban. If governments cannot prevent rhino being killed, by the same token they cannot prevent illegal movement of rhino horn. The law enforcement costs are too high. It is not feasible to prevent smuggling amongst Asia's human population of two billion and Africa's population of one billion. There is no African government that allows legal killing of rhino or movement of rhino horn. The problem is that they can do little about it and neither can importing countries.

The reasoned solution also fails to make any distinction between legal or illegal trade. If the illegal trade exceeds a sustainable harvest from the population, it is reasoned that the legal trade should cease. Rhino horn owned by African governments is not obtained from any overt harvesting programme. Rather it arises from an accumulation of natural mortality, horns knocked off rhino in the course of translocation or fighting, and confiscations from illegal hunters. Trade in such products will in no way influence the survival of rhino.

It may be argued that the legal trade provides the conduit by which illegal goods can be 'laundered'. Illegal horns will be added to legal consignments at various staging posts along the route to the end consumer and so be legalized along the way. The response to this is that the illegal trade is alive and well at the moment without the assistance of the legal trade. If it really is impossible to separate legal and illegal trade then there is no purpose in the CITES convention. We do not believe it would be impossible in the case of rhino horn: government-to-government transactions involving uniquely marked or tagged horns are eminently feasible.

The question to be asked is whether conservation of the species would be better served through a controlled supply of horn or by the rejection of consumers who will obtain horn illegally if denied a legal source. There is no question of flooding the market with horn to reduce price: the sustainable yield from the present rhino population in Africa is too low to meet the Asian demand.

Zimbabwe has always resisted any form of exploitation of black rhino largely to indicate solidarity with other African countries where the species has been endangered and to comply with the Appendix I status of the species under CITES. However, the ban has not worked and most of these countries have now lost their large wild rhino populations.

Zimbabwe's conservation philosophy is pragmatic. We believe that protective legislation contributes little to species survival. Where the status of a species gives rise for concern what is required is a positive conservation effort to increase its numbers, such as the restoration of habitats or intensive captive breeding programmes. When crocodiles were endangered 20 years ago, Zimbabwe embarked on a vigorous programme of crocodile farming which not only restored the species to abundance but also resulted in a sustainable multi-million dollar industry.

In the case of black rhino we are anxious to see the status of the species improved to the point where there is no longer any need for legal protection and where the animals can be treated like every other successful species in Zimbabwe.

Zimbabwe has at present over 1300 rhino horns weighing about two tons. Depending on the price assumed, their value lies between US \$5-10million. This sum of money returned to conservation would have a significant impact - it would far exceed all external conservation donor funding.

The dilemma for us is that failure to implement normal economic systems which have enhanced the status of other species may soon result in a situation where we are never able to implement them in the case of rhino. Any further decline in the population will result in a more precarious situation and we will have lost the opportunity.

**REFERENCE**

Paul Pui-Hay But, Lai-Ching Lung and Yan-Kit Tam (1990): Ethnopharmacology of rhinoceros horn. I: Antipyretic effects of rhinoceros horn and other animal horns. *Journal of Ethnopharmacology* 30:157-168.