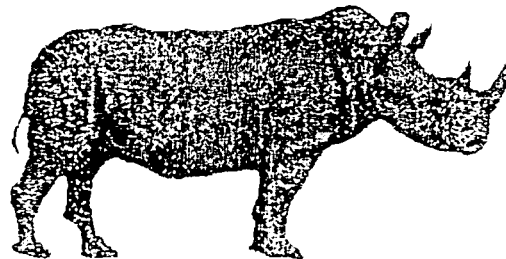


**OPTIONS DOCUMENT  
TO GUIDE STRATEGY DEVELOPMENT  
FOR  
THE NORTHERN WHITE RHINOCEROS**  
*(Ceratotherium simum cottoni)*



**Prepared by  
Kes Smith, Fraser Smith, Holly Dublin, Tom Foose**

**On Behalf of  
The IUCN/SSC African Rhino Specialist Group**

**August 1995**

---

## LIST OF CONTRIBUTORS AND ACKNOWLEDGEMENTS

A number of persons have provided information and participated in discussions from which this Options Document and the Companion Reference Document have been compiled. They include:

Dr. Rob Brett, Former Rhino Coordinator, Kenya Wildlife Services (KWS)

Dr. Martin Brooks, Chairman IUCN/SSC African Rhino Specialist Group (AfRSG)

Dr. Eric Edroma, Director, Uganda National Parks (UNP)

Dr. James Else, Former Director of Research, KWS; Adviser UNP & Uganda Game Department

Dr. Tom Foose, Programme Officer, International Rhino Foundation (IRF)

Dr. Kes Hillman Smith, Technical Advisor, Garamba National Park(GNP)/PMU/WWF

Mr. Mark Infield, Technical Advisor, Lake Mburo National Park, AWF

Mr. Peter Jenkins, Technical Advisor, Murchison Falls National Park, UNP

Dr. Richard Kock, Senior Veterinarian, KWS

Dr. Mbayma Atalia, Rhino Protection Officer, GNP/PMU

Dr. Pete Morkel, Capture Veterinarian, South African National Parks Board

Mr. Muhindo Mesi, Conservateur Principal, GNP/PMU

Mr. Nuwe John Bosco, Deputy Director, MFNP/UNP

Mr. Fraser Smith, Chief Technical Advisor, GNP/PMU

Dr. Mark Stanley-Price, Chairman IUCN/SSC Re-introduction Specialist Group

---

---

## TABLE OF CONTENTS

I.	Executive Summary	1
II.	Purpose of the Documents	2
III.	Problem Statement	3
IV.	Chronicle of Strategy Development Process to Date	7
V.	Objectives of Proposed Strategy	9
VI.	General Outline of a Possible Strategy	10
VII.	Options	11
VIII.	Considerations and Constraints When Deciding Among Options	14
IX.	Preliminary Analysis of Options	18
X.	Specific Questions/Decisions Requiring Resolution	29

---

## I. EXECUTIVE SUMMARY

The entire global conservation community recognizes and commends Zaïre for the very successful program for conservation of the northern white rhino that has been conducted in Garamba National Park over the last 10 years by the Institute Zaïrois Pour La Conservation de la Nature (IZCN) in conjunction with a number of partners: WWF, IUCN, UNESCO, Frankfurt Zoological Society, World Bank, International Rhino Foundation, Save the Rhino International, and others.

During this period, the rhino population in Garamba has doubled from 15 to about 30 rhino. Despite the success of the *in situ* program, Zaïre and its conservation partners have recognized that the poaching challenges to the northern white rhino and Garamba National Park are intensifying, aggravating the risks that always exist when all of the few individuals of a small population are in a single site, i.e. all the eggs are in one basket. Moreover, economic conditions both in Zaïre and worldwide have reduced the funds available for *in situ* conservation activities in Garamba.

The other 9 northern white rhino which are confirmed to exist on our planet are maintained at two sites in captivity. Unfortunately, these surviving rhino have not reproduced well to date. There has also been growing concern that this group of rhino which represents 25% of the world's total are not contributing to the survival of the subspecies.

In response to this critical situation, a number of meetings and discussions have been conducted over the last 2 years concerning a new strategy that would be biologically more viable and financially more satisfactory and sustainable for the northern white rhino and Garamba. Two results of this planning process have been:

- (1) the production of this Options Document and its Companion Reference Document
- (2) the organization of a workshop of all stakeholders and stewards of the northern white rhino and its only inhabited ecosystem Garamba National Park with the objective of agreeing on a new strategy.

A number of crucial questions and decisions now confront the stewards and stakeholders of northern white rhino and Garamba National Park.

- How will adequate and sustainable funds for Garamba be provided over both the short-term (5 years) and long-term (> 5 years)? What commitments can be expected from current or impending international donors and partners? Are Trust Funds possible? What is the realistic potential and details for significantly increased conservation tourism?
- Should captive rhino be relocated or the current groups reconfigured? If so, should they be consolidated to a single site? If so, where, e.g. inside or outside Africa? What else should/could be done to enhance contribution of captive population to viability of the taxon?
- Should any rhino be removed from Garamba? If so, how many and which individuals? Also, where would they be moved, again inside or outside Africa?
- How will funds for translocation of rhino within captivity or from Garamba be recruited without interfering with support for Garamba?
- Will there be a survey for rhino in southern Sudan? If so, who will provide funds needed?
- Are there other major options that should be considered? Are there other decisions that are required?

## II. PURPOSE OF THIS DOCUMENT

The purpose of this document is to provide the background information and a logical framework to *guide* the development of a strategy for the long-term metapopulation management of the northern white rhinoceros (*Ceratotherium simum cottoni*) and its habitats with the ultimate goal of recovery and conservation of this subspecies in its natural ecosystems.

There is no intention to be prescriptive or pre-emptive in this document. Rather, there has been an attempt:

- (1) to delineate as fully as possible the various problems confronting conservation of the rhino as both a taxon and a component of the Garamba ecosystem;
- (2) to present options that might contribute to an improved strategy for the northern white rhinos.

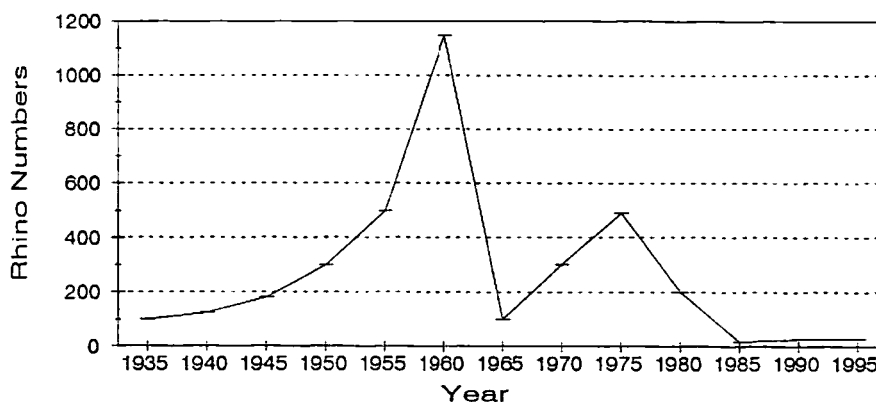
A Companion Reference Document has been compiled to provide further information to guide decisions.

It is envisioned that these documents will be used as the process of strategy development by the stakeholders in northern white rhino and Garamba National Park continues.

### III. PROBLEM STATEMENT

- The northern white rhinoceros (*Ceratotherium simum cottoni*) is the rarest of the distinct kinds (species or subspecies) of rhino. Only about 30 (28 confirmed and 3 possible) are known to exist in the wild, all of them in a single location, Garamba National Park in Zaïre, which is itself a World Heritage Site. Unconfirmed reports persist that a few northern white rhino may survive in natural habitat in southern Sudan. There is no indication any rhino survive in the other three countries (Central African Republic, Chad, and Uganda) where they once occurred.
- Over the last 50 years (1945-1995), there have been significant, even drastic, fluctuations in numbers of this population (Figure 1). From an estimated 100 rhino at the time Garamba National Park was established in 1938, the population increased to 1,000-1,300 by 1961. Heavy poaching during the civil war of the early 1960s decimated the population to an estimated 100 in 1965. Numbers increased again to an estimated  $490 \pm 270$  (i.e. 220-760 by 1976) with assistance of an UNDP/FAO project presence. After withdrawal of this project commercial poaching erupted, at least 50% of which was believed perpetrated by Park staff. Rhino numbers declined again, even more drastically than before, to an estimated 13-20 in 1983 and more precisely 15 in 1984.

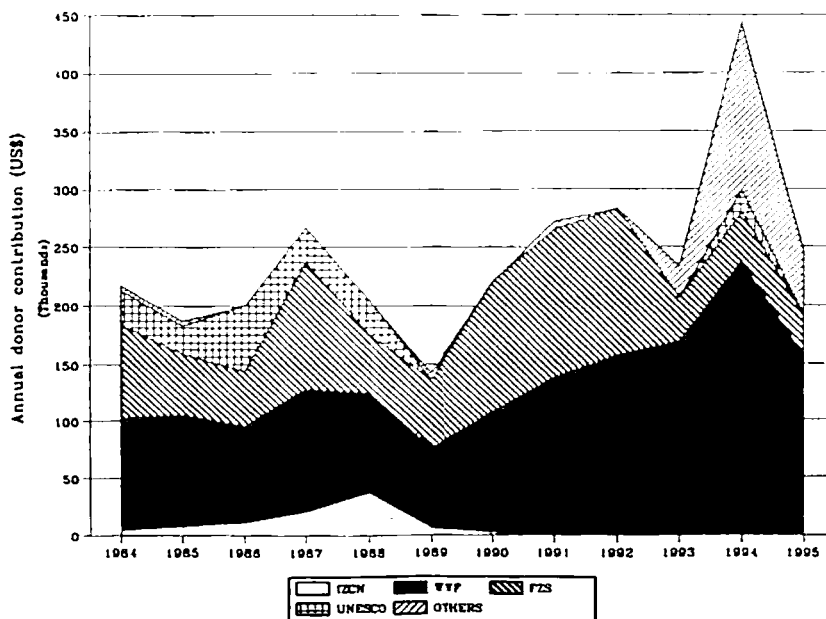
Figure 1 : Population Numbers of Northern White Rhino in Garamba National Park  
1938-1995



- For the last 10 years, a very successful program for conservation of the northern white rhino has been conducted in Garamba National Park Zaïre by IZCN in conjunction with a number of international donors and partners: WWF, IUCN, UNESCO, Frankfurt Zoological Society, International Rhino Foundation (IRF), and Save The Rhino International (STRI). During this period, the rhino population has increased twofold to the current number of about 30 rhino: of the 28 confirmed rhino, there are 14 females and 14 males. This number is well below the carrying capacity of the Park (estimated to be at least 1000 considering past history). Despite this success, it appears that there are only 4 breeding females in the population. One breeder female was lost to natural causes in January 1995. (Table 1).

- Despite the success of the *in situ* program, the challenges to the northern white rhino and Garamba National Park have intensified, aggravating the risks that always exist when all of the few individuals of a small population are in a single site, i.e. all the eggs are in one basket.
  - Poaching is increasing in the Park and the surrounding reserves due to
    - influx of refugees (at least 50,000 in vicinity), arms and ammunition from the civil war in neighboring Sudan;
    - poor economic conditions in Zaïre.
  - The relationship between Park authorities and local communities is at times adversarial, and there are some negative attitudes about the Park.
- Economic and political conditions in Zaïre have caused great challenges for management of the Park by Zairian authorities over the last 30 years. Despite its long-term commitment to conservation, IZCN currently cannot adequately manage the Park due to these economic and political conditions. Recently, IZCN has been unable to provide regular or adequate (apace of devaluation/inflation) salaries to their field staff. International donors have provided compensatory support for the guards. (Figure 2.)
- Indeed, international donor and partner support has been essential to survival of the rhino and the Park. However, many of the same economic and political conditions inside Zaïre have caused declines, fluctuations, and uncertainties about continuation of this donor support at a time when the need for external assistance is perhaps greater than ever. A major international partner/donor (Frankfurt Zoological Society) has reduced its contribution and the major international donor (WWF) is confronting increasing difficulty in maintaining its level of support. The result is that budgets for Garamba have fluctuated and are now actually in decline (Figure 2.)

Figure 2 - Financial Support for Garamba National Park 1984-1995



- Another 9 northern white rhino (~ 25% of the known global population) are maintained at two sites in captivity: 5 (2 males and 3 females) at Dvur Kralove in the Czech Republic and 4 (2 males and 2 females) at the San Diego Wild Animal Park in the USA. None of the captive northern white rhino originate from the Zaire population but rather from Sudan and Uganda. These rhino have not reproduced well to date: the last captive birth was in 1989 and none of the females in captivity are known to be proven breeders. (Table 1). The captive population has actually declined since 1984 from 12 to the present 9, with deaths exceeding births. Moreover the captive population is advancing in age. Reproductive manipulation to stimulate breeding is in progress at both facilities, but there have been logistical and economic constraints to optimal management at both facilities. Hence, there has been growing concern that the 25% of the world's northern white rhino that exist in captivity are not contributing to the survival of the subspecies.

Table 1 - Summary Population Structure and Performance - Garamba and Captive Population

POPULATION STRUCTURE AND PERFORMANCE SUMMARY NORTHERN WHITE RHINOCEROS								
CATEGORY	GARAMBA POPULATION				CAPTIVE POPULATION			
	Total		Proven Breeders		Total		Proven Breeders	
	♂♂	♀♀	♂♂	♀♀	♂♂	♀♀	♂♂	♀♀
ADULTS Age > 7 Yrs ♀♀ Age > 10 Yrs ♂♂	8	9	3?	4	4	4	2	0
SUBADULT 4 Yrs < Age < 7 Yrs ♀♀ 4 Yrs < Age < 10 Yrs ♂♂	4	3	-	-	0	1	-	-
JUVENILES Age < 4 Yrs	2	2	-	-	0	0	-	-
ADVANCED AGED ADULTS Age > 25 Yrs	1	0?	-	-	1	1	-	-
NEW BREEDERS SINCE 1985	1?	1	1?	1	0	0	0	0
BIRTHS 1984-1995	11	11	-	-	1	1	-	-
DEATHS 1984-1995	4	3	1	2	2	2	0	1
RATE AND EXTENT OF CHANGE	Rate of increase equivalent to 6%/year 1984-1995 Numbers increased from 15 to at least 28.				Crude rate of decrease equivalent to 4%/year 1984-1995 Numbers decreased from 13 to 9			



- Despite the small size of the global population, none of the 3 different groups of rhinos are in breeding contact or are part of an inclusive and integrated management programme linking wild to captive animals.
- Thus, the northern white rhino manifests all 3 signs of impending extinction becoming recognized by conservation biologists (17 June 1995 *New Scientist*; *IUCN Red List Categories 1995*):
  1. There is only one (wild) or two (if captive included) surviving populations;
  2. Numbers are very low so the population may not have genetic or demographic resources to contend with environmental challenges;
  3. Numbers have drastically declined twice in the last 30 years and the cause for such declines remain a clear and present danger.

#### IV. CHRONICLE OF STRATEGY DEVELOPMENT PROCESS TO DATE

- In response to this situation, a series of discussions and meetings have been conducted, mostly during the last year and a half, by parties interested and involved in the conservation of northern white rhino and Garamba National Park:
  - Victoria Falls, Zimbabwe - November 1992 Preliminary discussions about the serious and deteriorating situation in Garamba at the IUCN African Rhino Specialist Group.
  - Gland, Switzerland - March 1994: Meeting at IUCN/SSC Headquarters under auspices of the IUCN/SSC African Rhino Specialist Group. In attendance were representatives of IZCN, the Garamba Management Team, WWF, IUCN, and IRF
  - Mombasa, Kenya - May 1994 A further working session in conjunction of the meeting of the IUCN African Rhino Specialist Group in May 1994 in Mombasa. Members of the Garamba Management Team, IUCN, and WWF participated.
  - Nairobi, Kenya - October 1994 A further meeting on the assessment of options and organization of a workshop was conducted under auspices of the IUCN/SSC African Rhino Specialist Group at WWF offices in Nairobi 12 October using the opportunity provided by a meeting between the IUCN Elephant and Rhino Specialist Groups with the newly established UNEP Elephant and Rhinoceros Conservation Facility. Members of the Garamba Management Team, IUCN, and WWF participated.
  - Ft. Lauderdale, FL, USA - November 1994 The CITES COP 10 provided the opportunity for discussions of this matter between Zairois officials (the then Minister of Environment and Tourism and the PDG of IZCN) and IUCN SSC representatives (The Chairman and Head of Species Conservation).

#### Conclusions and Recommendations of These Meetings:

A number of conclusions and recommendations have emerged from these meetings and discussions.

- Conservation of the core population in Garamba is central to any strategy for the northern white rhino and therefore adequate support for *in situ* conservation of the rhino in this Park must remain the highest priority of a renewed strategy.
- A multi-faceted, both short-term and long-term, integrated management plan for Garamba and conservation strategy for the northern white rhino should be formulated for implementation in response to various challenges and emergencies which might occur.
- This strategy should include contingency measures that would be activated when certain trigger events occurred or threshold conditions developed.
- The strategy for the rhino should attempt to maximize the rate of increase of the global population of rhino as rapidly as possible as well as to ensure the long-term viability of the taxon.

- Toward this goal, there should be metapopulation management for all known northern white rhino, including:
  - possible translocation of some rhino from Garamba to establish a second free-ranging population in another country, recognizing there may be sound conservation reasons to translocate rhino from Garamba to establish a second population, possibly combining them with rhino from captive community.
  - stipulation that ownership of any rhino moved from Garamba would be retained by Zaïre
  - the Garamba population is not placed at greater risk because of any actions of the metapopulation strategy.
  - continued efforts to stimulate reproduction including consolidation of the captive population into a more ecologically conducive situation for breeding.
- In developing a strategy that might include *ex situ* as well as continued *in situ* efforts, it has been emphasized that support for new initiatives must not divert funds from Garamba. A number of new sources of funds are emerging that may enable new initiatives to occur without detriment to the Garamba program.
  - The global captive community is one such source. Through the International Rhino Foundation (IRF), this source is already providing funds for the Garamba program.
  - Another is the Global Environment Facility (GEF) which has recently indicated interest in support of a project or series of projects for conservation of northern white rhino. They have emphasized that they believe the project(s) must have both *in situ* and *ex situ* components, i.e. must be based on metapopulation management of the northern white rhino.
- In developing this strategy, all options should be fully explored and the pros and cons of each examined. This strategy should be based on the best technical information available and the application of relevant current principles and techniques of conservation biology.
- A detailed assessment of options for a new strategy for northern white rhino should be prepared by a working group within the IUCN/SSC African Rhino Specialist Group;
- These options should be considered at a workshop where representatives of Zaïre could confer with representatives of the international rhino community, field and captive, to decide on the strategy for the rhino. This workshop would be conducted under the auspices of the IUCN SSC African Rhino Specialist Group in collaboration with IZCN, WWF, and IRF.
- Consensus recommendations for a strategy for Garamba and northern white rhino as developed at this workshop should be officially presented to Zaïre for consideration.
- If the plan is adopted by the Government of Zaïre (GOZ), a coalition of GOZ, IZCN and international partners should proceed as rapidly as possible with its implementation.

## **V. OBJECTIVES OF PROPOSED STRATEGY**

1. To establish an integrated management program that aims to maximize the rate of increase of the global population as rapidly as possible.
2. To reduce risk to the global population by ensuring, in the short term, that a second group breeds successfully in a second country.
3. To ensure that the Garamba population is not put at risk from any actions arising from the integrated management programme.
4. To ensure an effective level of support on a sustainable basis for the maintenance of the *in situ* population at Garamba.
5. To formulate and adopt a multi-faceted contingency plan to be implemented in the event of an emergency at Garamba.
6. To confirm or refute the existence and location of any rhinos in Sudan and to ensure their integration into the metapopulation.

## VI. GENERAL OUTLINE OF A POSSIBLE STRATEGY

The general outline of an integrated management strategy and a sustainable funding plan for the northern white rhinoceros and its ecosystems has been formulated during the planning process that has occurred to date. It is presented as a frame of reference and point of departure for further development.

### Integrated Management Strategy

- A multi-faceted, short-term and long-term, integrated management strategy is needed. The strategy should manage all known northern white rhino as a metapopulation. The immediate goal must be to maximize the rate of increase of the global population of rhino.
- Conservation of the core population in Garamba is considered integral to any such strategy and therefore adequate support for *in situ* efforts must remain the highest priority of any metapopulation strategy.
- Among the methods that may be included in a metapopulation strategy are:
  - possible consolidation of the captive population into a more ecologically conducive situation for breeding.
  - possible translocation of some rhino from Garamba to establish a second free-ranging population in another country, but with Zaïre retaining ownership of any rhinos moved.

### Sustainable Funding Plan

- A more innovative and self-reliant system of support is need that may include:
  - utilizing *ex situ* rhino programs to generate funds for the conservation of *in situ* populations and ecosystems
  - establishment of a Trust Fund to support the northern white rhino, Garamba National Park, and integrated conservation and development in the buffer zone areas.
  - ecotourism (At Garamba this option would be over the longer term if and when the area stabilizes.)
- Development of a GEF project of approximately US\$10 Million over a period of 5 years (1996-2000) is considered central to initiation of both the integrated management strategy and the sustainable funding plan for conservation of northern white rhino as well as Garamba National Park and other protected areas in the native habitat and historic range to which the northern white rhinoceros may be restored.

### Initial Actions in Response

The first steps in development of the management strategy and funding plan are to:

- (1) Prepare a document delineating options for this strategy and plan.
- (2) Conduct a workshop of key players and major stakeholders from both the field and captive conservation communities to consider these options and recommend the preferred strategy.
- (3) Produce a workshop document presenting conclusions and recommendations that will constitute a project proposal to GEF to initiate and catalyze an integrated management strategy and sustainable funding plan.

## VII. OPTIONS

This section presents the options that have been delineated to date for consideration as part of the strategy for long-term conservation of the northern white rhino. These options are not intended as an exhaustive or exclusive set but do represent the collective effort of most of the parties that have been directly involved with the northern white rhino over the last 5 years. Other options not included here are encouraged as the strategy development process continues.

The northern white rhino, which once occurred in five countries (Zaire, Sudan, Uganda, Central African Republic, Chad) in northern central Africa, is currently represented by fewer than 50 confirmed individuals worldwide. Less than 30 of these remaining animals are currently in one wild population in Garamba National Park in Zaire. Nine others are maintained in captivity at two facilities, one in the Czech Republic and the other in the U.S.A. There are unconfirmed reports of a few isolated stragglers in southern Sudan. Over the last ten years the wild population in Garamba has increased twofold. However, the captive population has declined.

Recently, poaching pressure in Garamba has been increasing due to the civil war in Sudan, the free flow of automatic weapons, the immigration of large numbers of Sudanese refugees and the general economic deterioration in Zaire. Financial support from external donors has also been constrained and reduced due to political instability in the country.

Recognizing the very real successes in Garamba, there is still great cause for concern for the future viability of the northern white rhino overall. The northern white rhino carries the characteristic "trademarks" of a species destined for extinction:

- (1) There is only one population known to be successfully breeding at present;
- (2) The absolute numbers of remaining individuals are very low and may present both demographic and genetic limitations to long-term survival; and
- (3) Their numbers have drastically declined in the recent past for reasons which remain a clear and constant threat.

These facts must not be ignored.

The northern white rhino presents a supreme conservation challenge. The parties involved with conservation of northern white rhino recognize there is urgent need for a concerted effort to logically and intentionally plan an integrated strategy for the survival of the subspecies in the short, medium and long term.

Possible options for such a strategy available for discussion, selection and subsequent action include:

1. CONTINUATION OF STATUS QUO OF BOTH WILD AND CAPTIVE POPULATIONS
  - A. Attempt to secure adequate funding for *in situ* conservation activities by maintaining current and achieving higher levels of support for Garamba, with no translocation of rhinos
  - B. Maintain current distribution of captive rhinos in the two existing institutions with continued technical interventions (e.g., hormonal manipulation, eventually embryo transfer technology) to stimulate reproduction and with improvements in the facilities for management especially to allow better emulation of social behavior normal in the wild.
2. INDEPENDENT IMPROVEMENTS OF WILD AND CAPTIVE POPULATIONS
  - A. Attempt to secure adequate funding for *in situ* conservation activities by maintaining current and achieving higher levels of support for Garamba, with some relocation of rhinos to:
    - a. another sanctuary in Africa
    - b. another free-ranging location outside Africa
  - B. Consolidate, recombine or relocate captive rhinos at the existing sites or another new suitable location with continued technical interventions (e.g., hormonal manipulation, eventually embryo transfer technology) to stimulate reproduction and with improvements in the facilities for management especially to allow better emulation of social behavior normal in the wild. Possible management modifications include:
    - a. maintaining the consolidated or reconfigured group in a relatively free-ranging situation;
    - b. allowing multiple male/female interaction to permit development of some degree of territoriality by males;
    - c. further attempting to stimulate territoriality and other normal social behavior by maintaining northern white rhino males and females in a relatively free-ranging situation adjacent to a breeding group of southern white rhino with sensory and therefore perhaps social but not reproductive interaction;
    - d. if all of the above fail, introducing northern white rhino females into a breeding group of southern white rhino to determine if breeding can be stimulated. (While by itself, this option may seem to be rather self-defeating for a goal of preserving the taxon of northern white rhinoceros, the purpose would be to stimulate and initiate breeding which could then be continued using northern white rhino males.)

**3. COMBINING WILD AND CAPTIVE RHINO UNDER A COORDINATED METAPOPOPULATION MANAGEMENT APPROACH**

While trying to secure adequate funding for *in situ* conservation activities by maintaining current and achieving higher levels of support for Garamba:

- A. Establish a second breeding population in Africa, comprised primarily of rhino translocated from Garamba (supplemented by rhino from the captive population);
- B. Establish a second breeding population in Africa, comprised primarily of captive animals (supplemented by rhino from Garamba);
- C. Establish a second breeding population, in a free-ranging situation outside Africa comprised primarily of existing captive rhinos (supplemented by rhino from Garamba);
- D. Establish a second breeding population, in a free-ranging situation outside Africa comprised entirely of rhinos held in captivity (with eventual supplementation from Garamba once that population has expanded further).

Other components of a true metapopulation management strategy would include:

- More earnest efforts, initially and specifically a survey, to confirm or refute the existence of remnant population(s) in Sudan and to explore the possibility of their integration into the metapopulation management strategy;
- Formulation of explicit plans for exchange of rhino or genetic material (once reproductive technology is developed) among all subpopulations of the metapopulation including infusion of "new blood" into the Garamba population from animals currently in captivity or in Sudan.



## VIII. CONSIDERATIONS AND CONSTRAINTS WHEN DECIDING AMONG OPTIONS

There are a multitude of considerations and constraints that must be considered and prioritized in attempting to select among the options and decide upon actions for the strategy. These fall broadly into two categories:

1. **Biological and Ecological**
  - (A) Conservation of northern white rhino as a taxon versus as a component of its ecosystem
  - (B) Biodiversity importance of Garamba ecosystem
  - (C) Flagship value of northern white rhino in Garamba
  - (D) Availability and suitability of possible new sites as habitats for rhino in terms of the ecological adaptations of the taxon.
  - (E) Relative risks/benefits of status quo versus changed management strategy, e.g.:
    - (a) Status Quo Risks:
      - Single breeding population in wild subject to significant and increasing challenges to survival
      - Continuing failure of captive population to reproduce
    - (b) Changed Management Risks:
      - Possible impairment of viability of source population in Garamba if rhino removed for relocation.
      - Unpredictable success of relocating rhino to new site.
    - (c) Status Quo Benefits:
      - No new risks to wild or captive population
      - Perhaps less expensive financially than alternatives
    - (d) Changed Management Benefits:
      - Opportunity to establish a second breeding population
      - Possible improvement in probability that captive rhino will reproduce
2. **Socio-political and Financial**
  - (A) Ownership of rhinos and progeny
  - (B) Management responsibility and authority for rhino
  - (C) Cost implications for each option.

## 1. BIOLOGICAL AND ECOLOGICAL

It must always be kept in mind that the northern white rhino have value which goes beyond their biological role in the Garamba ecosystem. As a "flagship" species, the northern white rhino focus attention on the important biodiversity represented within Garamba National Park and the surrounding Domaines de Chasse. The 133 species of mammals recorded in Garamba and environs include: the nation's densest elephant population (about 11,000), representing an inter-grade between savannah (*Loxodonta africana africana*) and forest (*Loxodonta africana cyclotis*) elephants; the only population of Congo giraffe (*Giraffa camelopardalis congoensis*); lelwels hartebeest, bongos, chimpanzees, 11 primate species; and an endemic sub-species of ant-eater (*Orycteropus afer faradjius*). These areas, along with Virunga National Park, were endorsed at the First National Biodiversity Seminar in Kinshasa in June 1995 as being of the highest priority. This places the protection of the northern white rhino currently living in Garamba as the highest priority for conservation action. The immediate priority is, therefore, to ensure that adequate support is provided in Garamba to protect the population against poaching and other threats. Given that any actions recommended through this strategic planning process may take time to implement, maintaining or improving the *status quo* in Garamba is of immediate importance.

Given the serious predicament of the northern white rhino, managing the remaining individuals under a coordinated strategy according to metapopulation principles seems worthy of consideration. Such management will require actively manipulating the social and genetic structure in a manner which brings the global population of the species out of a bottleneck as rapidly as possible.

For example, under metapopulation management all rhinos presently maintained *ex situ* might be placed in ecological and social settings that provide free-ranging conditions which most closely resemble their present natural habitat in Garamba.

In terms of management actions with the captive rhino, there must be consideration of the experience provided by southern white rhino. There are data indicating that movement of rhino to more spacious enclosures, maintaining multiple male and female groups, and simply change of environment does correlate with breeding by previous non-breeder rhino. Since many of the captive rhino are older, there must also be consideration of the relative importance of and risks to welfare of individuals versus the realistic assessment of potential benefits to the population and subspecies.

Moreover, all metapopulation management decisions should be made against a set of *a priori* performance criteria agreed to by all relevant stakeholders. These criteria should be accompanied by well-reasoned time frameworks and clear guidelines for the evaluation of population performance, at both the individual and metapopulation levels.

These criteria should ensure that any and all movement of northern white rhino to new sites will result in an improvement of overall population viability and will not in any way negatively affect the viability of any source population unless: (i) the population is already inviable for other reasons or, (ii) it has been decided to reduce the source population for other reasons.

Furthermore, the establishment of any new populations should be based on some minimum standards including: ecological suitability of the area, adequate security, proper social composition and numbers of founder populations, viable genetic representation and the extent to which they can be managed by metapopulation principles.

Ultimately, it will be desirable to establish other wild populations, preferably within historical range of the species. Therefore, it is essential that one aim of the coordinated, metapopulation strategy is to provide rhinos for release back into this former range, extending first preference to original donor sites. In recognition of the importance of the northern white rhino and the precarious status of the species, movements of any and all rhinos between sites should be done according to the highest technical standards.

## 2. SOCIO-POLITICAL AND FINANCIAL

The decision of how to move forward with the selection of options for the future management of the northern white rhino has important political and financial considerations and constraints. First is the issue of the internal political situation in Zaïre. Second is the relationship between Zaïre and countries having potential *ex situ* translocation sites. These political considerations have important financial corollaries.

The future of the northern white rhino in Garamba must be seen in the context of the present situation which gives justifiable cause for concern. Zaïre is currently experiencing severe political and economic instability and the central government has been unable, for some time, to provide basic recurrent costs to IZCN for the running of the Park. Salaries for the IZCN personnel have been historically inadequate and, more recently, virtually non-existent. In addition to the struggle for survival among IZCN staff, the national economic situation has also lowered the standard of living for the communities living adjacent to the Park. Demand for game meat is high and local attitudes towards the Park have not always been positive.

The area is also plagued with cross-border problems. Arms and ammunition originating from the armed struggle in neighboring Sudan make their way across the border and directly into the Park and surrounding areas. Poachers based in Sudan are entering the Park and as many as 50,000 Sudanese refugees have settled to the east and west of the Reserves which surround the Park. Poaching gangs are often numerically large and heavily armed. There are certainly potential, if not active, threats to the long-term security of the northern white rhinos in the Park. Despite these threats, the Park's rhinos have been well protected for the past ten years, however, the cost of this protection has been largely borne by external donors and even this support, at a reduced level, has not been sustainable under the present political conditions within Zaïre.

Clearly, continuing and increasing support to the *in situ* conservation of the northern white rhino in Garamba continues to be the highest priority. Moreover, this support needs to involve community integration in the surrounding reserves for long-term success. However, if a decision is taken to move to a broader, metapopulation management strategy, then both political and financial concerns must expand beyond the borders of Zaïre. New players will become involved in the process and new, previously unaccessed, funds will be required.

From the outset, there will be a need to identify the party or parties responsible for the implementation of any agreed upon metapopulation management strategy for the species over the long-term. This will require the drafting of a formal management strategy; identifying the ultimate authorities responsible for the rhinos and the extent and location of necessary expertise; assigning of management responsibilities; developing a system of reporting progress and problems and the formulation of procedural guidelines to be followed when management decisions are needed.

Legal agreement over ownership of any animals translocated out of Zaïre as well as any progeny they may produce in their new home will be required from the outset. And, of course, there will need to be identification of sources for funds to cover implementation of the agreed strategy, including costs of capture, translocation, release and eventual re-introduction of northern white rhinos. These funding arrangements will require cooperation and understanding and, where necessary, legal agreements between all the relevant stake-holders including the source government, the host government, any private owners and the donors providing support.

## IX. PRELIMINARY ANALYSIS OF OPTIONS

Selection among the options for the strategy requires prioritization of the biological, ecological, technical, political or financial consideration and constraints. This pre-requisite prioritization must involve all relevant stakeholders. For example, considering the ecological needs of northern white rhino the number one priority could result in the selection of a different option than would occur if financial concerns were to be considered first and foremost.

For this reason, there is no attempt here to select the "final" option. Rather, each option is provided with a list of "pros" and "cons". These lists are not exhaustive or exclusive, but include some of the more important factors to be considered against one another in analysis and selection of the options.

Finally, if any rhino are to be moved to a new site from Garamba or from the captive collections, there must be agreement on and prioritization of criteria for evaluation of suitability of the site. It is suggested that a tabulation of the criteria with some system of priority imposed be used to then evaluate the sites. The table below is presented as a possible tool for such tabulation and evaluation.

NORTHERN WHITE RHINO RELOCATION SITE CRITERIA & ASSESSMENTS											
SITES	KENYA			UGANDA			RSA	CZECH.	U.S.A.		Zaire
CRITERIA	Ruma	Oi Pejeta	Shimba Hills	Queen Elizabeth	Murchison Falls	Ajai		Dvur Kralove	SDWAP	White Oak	Garamba
Habitat Suitability											
Carrying Capacity											
Historic Range											
Veterinary											
Legal Status/ Continuity											
Security, Current											
Security, Potential											
Cost Effectiveness											
Cost Feasibility											
Proximity											
Rhino Ownership											
Total Score											

## 1. CONTINUATION OF THE STATUS QUO OF BOTH WILD AND CAPTIVE POPULATIONS

- A. Attempt to secure adequate funding for *in situ* conservation activities by maintaining current and achieving higher levels of support for Garamba, with no translocation of rhinos

### PROS

- + Permits rhinos to act as a "flagship" species to concentrate the focus on the conservation of Garamba's biodiversity
- + Has proven successful for propagation of rhinos
- + Any and all biological adaptations of the rhino maintained
- + Provides source of local and national pride and motivation
- + Risks of intervention avoided
- + Is politically acceptable
- + Is probably the least expensive option over the long-term
- + Concentrates funding focus in one locality
- + Maintains uniqueness of the northern white rhino in Garamba for eco-tourism earning potential

### CONS

- Continues risks of a single population, i.e. all eggs in one basket (risks include disease, poaching, instability, etc.)
- Possible biological limitations (demographic and genetic)
- No local veterinary capacity nearby
- Continued political and economic instability
- Virtually total dependence on external donors

*All these Pros & Cons apply to other options since all involve securing adequate support for Garamba.*

**1. CONTINUATION OF THE STATUS QUO OF BOTH WILD AND CAPTIVE POPULATIONS**

- B. Maintain current distribution of captive rhinos in the two existing institutions with continued technical interventions (e.g., hormonal manipulation, eventually embryo transfer technology) to stimulate reproduction and with improvements in the facilities for management especially to allow better emulation of social behavior normal in the wild.**

**PROS**

- + Maintains current research/management interests of institutions
- + Provides research opportunities
- + Reduces risk to individual rhino
- + Avoids expense of moving rhino

**CONS**

- Still no recent success in breeding after many years
- May not be a cost effective way to conserve the species long-term
- Animals prone to medical disorders in captivity

## 2. INDEPENDENT IMPROVEMENTS OF WILD AND CAPTIVE POPULATIONS

- A. Attempt to secure adequate funding for *in situ* conservation activities by maintaining current and achieving higher levels of support for Garamba, with some relocation of rhinos to:

- a. another sanctuary in Africa

### PROS

- + More readily available expertise and experience (south-south technical potential)
- + Easier metapopulation management
- + Lower transport cost
- + Re-introduction more likely and more feasible
- + Probably politically preferable from African perspective (south-south political potential)
- + May bring "flagship" attention to other important areas in Africa and contribute to the conservation of biodiversity
- + Better biological potential for successful breeding
- + Low exposure to foreign diseases
- + Garamba subadults may breed earlier than under current circumstances in Garamba

### CONS

- May detract from donor focus on Garamba National Park
- All founders would have to come from Garamba
- May not be in former range and, therefore, rhinos may not be pre-adapted
- Rhinos may be more susceptible to diseases in translocation site
- May detract from uniqueness of viewing northern white rhino in Garamba (dilute money-earning potential)
- No stimulus to captive breeding initiatives
- May endanger source population by reducing breeding stock and genetic variability as well as by physical and social disruption
- Risk of illegal offtake greater than in sanctuary outside Africa
- Risk of loss of rhino during capture and translocation



## 2. INDEPENDENT IMPROVEMENTS OF WILD AND CAPTIVE POPULATIONS

- A. Attempt to secure adequate funding for *in situ* conservation activities by maintaining current and achieving higher levels of support for Garamba, with some relocation of rhinos to:
- b. another free-ranging location outside Africa

### PROS

- + No illegal offtake of rhino
- + Better veterinary facilities
- + Higher fund-raising potential
- + Potential to increase profile of plight of northern white rhino in Garamba
- + Garamba subadults may breed earlier than under current circumstances in Garamba

### CONS

- Limited political support from country of origin
- All founders would have to come from Garamba
- High transport cost
- High risk factor in long-distance movement
- Lack of local knowledge of effective rhino management techniques in a free-ranging situation
- Limitation of available sites with sufficient area
- Reduced potential for eventual re-introduction
- Limits potential for true metapopulation management in the long-term
- No stimulus to captive breeding initiatives
- May endanger source population by reducing breeding stock and genetic variability as well as by physical and social disruption
- Risk of loss of rhino during capture and translocation

Refer also to Page 19.

## 2. INDEPENDENT IMPROVEMENTS OF WILD AND CAPTIVE POPULATIONS

- B. Consolidate, recombine or relocate captive rhinos at the existing sites or another new suitable location with continued technical interventions (e.g., hormonal manipulation, eventually embryo transfer technology) to stimulate reproduction and with improvements in the facilities for management especially to allow better emulation of social behavior normal in the wild. Possible management modifications include:
- a. maintaining the consolidated or reconfigured group in a relatively free-ranging situation;
  - b. allowing multiple male/female interaction to permit development of some degree of territoriality by males;
  - c. further attempting to stimulate territoriality and other normal social behavior by maintaining northern white rhino males and females in a relatively free-ranging situation adjacent to a breeding group of southern white rhino with sensory and therefore perhaps social but not reproductive interaction;
  - d. if all of the above fail, into a breeding group of southern white rhino to determine if breeding can be stimulated. (By itself this option seems to be rather self-defeating for a goal of preserving the taxon of northern white rhinoceros. However, the purpose would be to initiate breeding which could then be continued using northern white rhino males.)

### PROS

- + May produce evidence of reproductive fitness with fewest possible invasive techniques or interventions
- + May provide behavioral stimulus necessary for successful breeding
- + May remove the behavioral dominance effects (between females) within current captive populations
- + Adds a new dimension to current captive situation for northern white rhino
- + Could be attempted without extensive manipulation and movement of captives (i.e. in San Diego, Dvur Kralove or White Oak)
- + (d.) Could involve introduction of captives into a free-ranging situation without moving both sexes at once (i.e. could move captive females to free-ranging southern white males in Africa)

### CONS

- Could result in no breeding activity
- Could confound the intra-individual reproductive problems with inter-specific problems
- May involve high cost of moving animals between continents
- May involve risk due to movement
- (d.) May initially produce mixed race offspring and therefore not contribute to northern white rhino as a distinct taxon

### 3. COMBINING WILD AND CAPTIVE RHINOS UNDER A COORDINATED METAPOPOPULATION MANAGEMENT APPROACH

While trying to secure adequate funding for *in situ* conservation activities by maintaining current and achieving higher levels of support for Garamba,

- A. Establish a second breeding population in Africa, comprised primarily of rhino translocated from Garamba (supplemented by rhino from the captive population)

#### PROS

- + More readily available expertise and experience (south-south technical potential)
- + Easier metapopulation management
- + Re-introduction more likely and more feasible
- + Lower transport cost
- + Politically preferable from African perspective (south-south political potential)
- + May bring "flagship" attention to other important areas in Africa and contribute to the conservation of biodiversity
- + Better biological potential for successful breeding and eventual re-introduction to former range
- + Less risk to extant captives
- + Garamba subadults may breed earlier than under current circumstances in Garamba

#### CONS

- May detract from donor focus on Garamba National Park
- Most founders would have to come from Garamba
- May not be in former range and, therefore, rhinos may not be pre-adapted
- Rhinos may be more susceptible to diseases in translocation site
- May detract from uniqueness of viewing northern white rhino in Garamba (dilute money-earning potential)
- No stimulus to captive breeding initiatives
- Limited demonstration of political good will from captive community
- May endanger source population by reducing breeding stock and genetic variability as well as by physical and social disruption
- More risk of illegal offtake than if located outside Africa
- Risk of loss of Garamba rhino during capture and translocation
- Risk of loss of captive rhino during transport

Refer also to Page 19.

### 3. COMBINING WILD AND CAPTIVE RHINOS UNDER A COORDINATED METAPOPOPULATION MANAGEMENT APPROACH

While trying to secure adequate funding for *in situ* conservation activities by maintaining current and achieving higher levels of support for Garamba,

- B. Establish a second breeding population in Africa, comprised primarily of captive animals (supplemented by rhino from Garamba)

#### PROS

- + Could initiate the re-introduction process
- + Promote very positive "north-south" political will
- + Could involve minimum offtake from Garamba, in a step-by-step manner
- + May stimulate breeding of formerly inactive captive rhinos
- + Garamba subadults may breed earlier than in Garamba
- + Could benefit Garamba and northern white rhino through positive reciprocal support agreements
- + Could catalyze better management of animals remaining in captivity
- + Could result in generation of substantial revenues from tourism that could go into Garamba
- + Could generate income for *in situ* conservation by reciprocal agreement
- + Garamba subadults may breed earlier than under current circumstances in Garamba

#### CONS

- More risk to captives through potential illegal offtake
- More risk to captives through disease
- Uncertain reasons for poor breeding of captives
- More risk to captives through translocation to Africa
- Major financial implications for transport
- May mean a loss of viewing revenues to captive facilities
- Risk of loss of Garamba rhino during capture and translocation
- Risk of loss of captive rhino during transport
- High cost of transport of captive rhino
- May endanger source population by reducing breeding stock and genetic variability as well as by physical and social disruption

### 3. COMBINING WILD AND CAPTIVE RHINOS UNDER A COORDINATED METAPOPOPULATION MANAGEMENT APPROACH

While trying to secure adequate funding for *in situ* conservation activities by maintaining current and achieving higher levels of support for Garamba,

- C. Establish a second breeding population, in a free-ranging situation outside Africa comprised primarily of existing captive rhinos (supplemented by rhino from Garamba)

#### PROS

- + No poaching risk
- + No political and economic instability
- + Possibly most cost-effective integration option
- + Cost borne by captive community and would not detract from conservation funds targeted to the field
- + Garamba subadults may breed earlier than under current circumstances in Garamba

#### CONS

- Metapopulation management is inherently more difficult
- Risk that lack of breeding activity will continue if it is a problem within the captive rhinos
- Risk of loss of Garamba rhinos during capture and translocation
- Re-introduction less likely and less feasible
- No direct, positive conservation effect for Zaïre or Garamba
- Risk loss of wild-caught animals through disease transmission from captives
- High cost of capture and translocation from Garamba
- May endanger source population by reducing breeding stock and genetic variability as well as by physical and social disruption
- Risk of loss of rhino during capture and translocation
- High cost of transport for Garamba rhino

### 3. COMBINING WILD AND CAPTIVE RHINOS UNDER A COORDINATED METAPOPOPULATION MANAGEMENT APPROACH

While trying to secure adequate funding for *in situ* conservation activities by maintaining current and achieving higher levels of support for Garamba,

- D. Establish a second breeding population, in a free-ranging situation outside Africa comprised entirely of rhinos held in captivity (with eventual supplementation from Garamba once that population has expanded further).

#### PROS

- + No poaching risk to captive rhino
- + No political or economic instability
- + Less transport risk to captive rhino
- + Can test breeding potential of captives without risk to Garamba rhino
- + Less cost for transport of captive rhinos than if moved to Africa
- + Justification for captives and demonstration of active collaboration of captive stewards as prerequisite to metapopulation management involving Garamba rhino
- + No risk of capture/transport of Garamba rhino in immediate future
- + Fewer political negotiations

#### CONS

- Could result in no breeding activity
- Could detract from interests/activities of current owners/holders
- Could entail significant rhino transport and site preparation costs

Other components of a true metapopulation management strategy would include:

- More earnest efforts to confirm the existence of remnant population(s) in Sudan and the possibility of their integration into the metapopulation management strategy;

**PROS**

- + Could locate additional individuals for this critically small population
- + Would expand known and managed distribution

**CONS**

- Could divert funds and attention from known wild population which is already under funded and under staffed

- Formulation of explicit plans for exchange of rhino or genetic material (once reproductive technology is developed) among all subpopulations of the metapopulation including infusion of "new blood" into the Garamba population from animals currently in captivity or in Sudan.

**PROS**

- + Would reconfirm commitment of all parties to metapopulation management
- + Would reassure stewards and stakeholders of Garamba that they are not to be abandoned

**CONS**

- Could be premature

## X. SPECIFIC QUESTIONS/DECISIONS THAT NEED RESOLUTION

- (1) HOW WILL ADEQUATE AND SUSTAINABLE FUNDS FOR GARAMBA BE PROVIDED?
  - (A) Short-term (5 years):
    - (a) What commitments can be expected from current or impending international donors and partners?
  - (B) Long-term (> 5 years):
    - (a) Are Trust Funds possible?
    - (b) What is the realistic potential and details for significantly increased conservation tourism?
  
- (2) SHOULD CAPTIVE RHINO BE RELOCATED?
  - (A) If so,
    - (a) Should they be consolidated to single site?
      - (1) If so, where?
        - (A) Outside Africa?
        - (B) Inside Africa?
      - or-
    - (b) Should the captive rhino groups be configured over more than one site?
      - (1) If so, where?
        - (A) Entirely Outside Africa?
        - (B) Partially in Africa?
          - (a) If so, should captive animals be relocated in combination with possible rhino from Garamba?
  - (B) If not,
    - (a) What should/could be done to enhance contribution of captive population to viability of the taxon.



- (3) SHOULD ANY RHINO BE REMOVED FROM GARAMBA AND RELOCATED TO A SECOND SITE?
- (A) If so,
- (a) How many?
- (b) Which individual animals?
- (c) To where?
- (1) To second site in Africa?
- (A) As sole founders for new population?
- (B) In combination with some/all rhino from captivity?
- (2) To second site outside Africa?
- (A) If so, should it be only if in combination with:
- (a) All rhino from captive population
- (b) Some rhino from captive population.
- (Answers to these questions are probably inextricably linked to answers to questions in 3).*
- (4) HOW ARE THE CRITERIA THAT HAVE BEEN DEVELOPED FOR SELECTION OF NEW SITES FOR NORTHERN WHITE RHINO TO BE PRIORITIZED AND APPLIED?
- (5) HOW WILL FUNDS FOR TRANSLOCATION OF RHINO AMONG CAPTIVE FACILITIES OR FROM GARAMBA BE RECRUITED WITHOUT INTERFERING WITH SUPPORT FOR GARAMBA?
- (6) WILL THERE BE A SURVEY FOR RHINO IN SOUTHERN SUDAN? IF SO, WHO WILL PROVIDE FUNDS NEEDED?
- (7) ARE THERE OTHER MAJOR OPTIONS THAT SHOULD BE CONSIDERED? OTHER DECISIONS THAT ARE REQUIRED?