

GARAMBA NATIONAL PARK PROJECT,
MONITORING AND RESEARCH

Annual Report 1995

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OBJECTIVES

The overall goal of the monitoring and research project is to contribute to maintaining and improving the long term conservation of the ecosystem of Garamba National Park and surrounding *Domaines de Chasse* through the systematic collection, analysis and provision of information on the ecosystem, with focus on the rhinos, the threats and law enforcement activities and the results of the conservation action.

To achieve this, the **long term objectives** are:

1. Continued monitoring and reporting on the rhino population.
2. Basic monitoring of the whole ecosystem to provide information on the resources to be conserved and managed, and to measure the effects of conservation action on the fauna and flora.
3. Collaboration with management to monitor the poaching and anti-poaching activities to assess the levels of threat and to feed-back to modifying the strategy as necessary.
4. Carrying out and promoting research on priority aspects of the ecosystem and management problems.
5. Training and the establishment of standardised systems for the long term continuation of the monitoring.
6. Contribution to planning and feed-back on the results of activities.

Specific objectives for 1995 within this framework were:

- 1.a Continue and develop the rhino monitoring.
- 1.b Analysis of rhino data, and provision of material for Northern White Rhino Workshop.
2. General aerial count and analysis and review of ecosystem trends.
3. Refinement and annual analysis of the patrol monitoring.
- 4.a Collaboration with Dr W.B.Karesh in health survey of elephants, combined with body and tooth measurements and radio telemetry.
- 4.b. Supervision of expatriate researchers, with Zairian counterparts on the topics:
 - ▶ Study of bushmeat utilisation and its effects on illegal offtake of wildlife
 - E.de Merode & Monungu Likango
 - ▶ Analysis and write up of the results of survey of elephant use of the *Domaines de Chasse* surrounding the park and the distribution of other mammals and effects of man in these reserves.
 - A.Nicholas & Amube Ndey

- ▶ Investigation of the problems of crop raiding in the *Domaines de Chasse* around the park.

B.Buls & Amube Ndey

- 5.a Researcher training on method of analysis of aerial count.
- 5.b Guard training on monitoring of poaching and anti-poaching.
- 6.a Contribution to development of a Management Plan.
- 6.b Contribution to development of a Strategy for the Long Term Conservation of the Northern White Rhinoceros.

RESEARCH ACCOMPLISHMENTS

Research, Training and Conservation accomplishments will be outlined in relation to the Specific Objectives given above.

1.a Rhino monitoring.

Rhino monitoring continued, with a total of 266 observations during the year. The majority of observations are made from the air, both on specific rhino recces, which are carried out as a series of block counts, during which all individuals seen are identified, and on flights for other purposes. The aerial rhino recces have the further value in collecting information on other species, the state of the ecosystem and on signs of poaching. The results contribute directly, and often simultaneously, by radio, to directing the anti-poaching patrols in the rhino sector. This is backed up by ground work in the short grass season and by observations made by guards on patrol, or anyone who sees a rhino. Only verified observations are used in analysis.

In January a young adult female, F5 *Mama Giningamba* was found dead. Her horns were present and there was no sign of any unnatural cause. It is thought she may have been in the process of giving birth, and was attacked by hyenas. It was, however a grave loss, as a young breeding female.

In August a calf 1eF *Kasi* was born to F1 *Mama Moke* and in September a calf 3f *Aligaru* was born to F3 *Kuni* and another, 6dF *Willibadi* was born to F6 *Pacque*. This brought the total of known individuals recently observed to 31. The full list is given in the accompanying table, together with the current population structure and a graph of the growth rate (mean 7% per annum) since the start of the project in 1984. The change in age structure over time is graphed.

The monitoring was constrained to some extent by the need to focus on data analysis and by the increasing need to ration fuel for aircraft and vehicles, since the annual fuel load ordered in October 1994 only finally began to arrive at the station in October 1995 after many negotiations and let downs.

1b Analysis of rhino data and reports and publications

Further analysis of rhino monitoring data was done, particularly with a view to examining the status of the population and differences between northern and southern white rhinos.

An examination of the periodicity of parturition shows, that of 25 known births, they have occurred in every month of the year except November, but with a certain peak from June through September. This coincides with being roughly 16 months after the period of short grass and early wet season, with greater food availability and occasionally observed periods of somewhat heightened sexual activity from February through May.

Inter-calf intervals average 31 months, or drop to 29 months if we assume the undetected, but suspected loss of at least one calf.

The most frequently observed rhino group size during the period 1992-1995 is of 1 (39%), which the graphs of group composition show is usually a single adult male. Groups of 2, most often composed of an adult female and a juvenile or a female sub-adult comprised 26% of observation and groups of 3 comprised 21% of the observations. Most frequently these groups consist of an adult female with two of her offspring, but may also comprise a male with two sub-adults or a male with an adult female and offspring.

During the same period since 1984, the captive northern white rhino population has declined from 12 to 9.

Preliminary analysis of rhino ranges was carried out using the programme *Ranges* (Kenward, update 1995). The concave polygon areas of verified adult male home ranges average 277.18 km² (205.3-335.7, n=3), adult females average 373.7 km² (328-429.3, n=4) and sub-adult females plotted averaged 570 km² (552-588.1, n=2). These are some ten times larger than those found for southern white rhinos (*Ceratotherium simum*). These large ranges facilitate inter-individual interactions and a varied mix of reproductive partners in this low density population (0.02/km²).

An interesting feature that has emerged from this long term monitoring of a low density known population, and the ear marking of certain sub-adults for better identification has been the existence of long term extended family bonds. Although there is considerable individual variation, we commonly find loose aggregations that comprise an adult female and her latest offspring, with satellite groups containing her older offspring. Although separated by a few km, behavioural responses indicate that any one group is aware of the presence of the others and the satellite groups may move many km in conjunction with a move by the female. 46% of observations of sub-adult groups were composed principally of siblings. This percentage is biased on the low side by a high proportion of observations of a very cohesive unit of two sub-adult females, who were born within two months of each other and whose mothers had overlapping home ranges.

2. General aerial count

The general systematic aerial sample count of the ecosystem was carried out in June, later than usual, but delayed awaiting the return of Dr Mbayma from Kinshasa. The latest figures are reproduced in the summary table. Elephant numbers were up to 11,752 ± 3,679 (SE).

Trends since 1976 were also examined in the report. It would appear that between the FAO project in 1976 and the start of the current Garamba project in 1984, it was the commercially valuable species, elephants and rhinos that suffered most from poaching. Following 1984, most of this poaching was controlled and there was just a low level gradual offtake for meat, largely of buffalo *Synceros caffer brachyceros*). Most species have increased during this period, except for buffalo, that are now down to 25,714 ± 8,299.

2.b Meteorology

Meteorological observations continued as usual and annual figures are reproduced.

3. Monitoring of poaching and anti-poaching

Monitoring of poaching and law enforcement is very much a joint exercise between the law enforcement staff, management and research. The record of number and distribution of indices of illegal activity is made by guards on patrol. Indices include numbers of armed contacts, poaching camps found, dead animals, ivory and weapons recovered. The measure of search effort is based on numbers of man.days on patrol, distances and regions covered and time spent walking.

As the graphs indicate poaching has increased since the influx of refugees and arms and ammunition from the civil war in neighbouring Sudan, in 1991 and subsequently. Figures for 1995 were not significantly higher than previous years, but there was a serious change in type of poaching towards the end of the year. From October onwards, elephant carcasses were found further south than previously and with only the ivory removed, no meat. This is due largely to participation of a different and powerful source of poaching, and this type of poaching leads to the killing of far more elephants per unit time than previously and seriously threatens the rhinos, since it is now occurring within the rhino sector. A major effort at all levels is needed to contain or remove this threat, which is continuing and increasing into 1996.

4.a Elephants

In March Dr Billy Karesh of WCS Field Veterinary Unit carried out a health survey of the elephants, involving the immobilisation of 16 elephants. This enabled us to collect more data on body and tooth measurements for our study of age determination of these inter-grade elephants, and to put on four of the old rhino collars as part of the on-going elephant study. Material was also provide for Nick Georgiadis' genetic study of regional and sub-species differences.

Georgiadis's results showed how the Garamba elephants are somewhat intermediate between *L.a.africana* and *cyclotis* but they appear to be more closely africana, and lack the indicator forest haplotype.

The radio telemetry, although a small sample, because we lacked the researcher to do full follow up, was part of an on-going elephant study. This is based largely around the question of the habitat requirements of this population which is increasing again from a low in the early 1980s due to poaching, but which is still condensed in the grasslands in the south. They are a contributory cause in the maintenance of the grassland, but as a result also move increasingly out into the wooded *Domaines de Chasse* at night, to feed on and modify the vegetation and where they are coming into conflict with humans. (Hillman Smith et al 1995).

Our question was whether all elephants had equal requirements for a certain amount of woody browse or whether certain groups were more habituated to going out than others. A satellite collar put onto a female by Karesh in conjunction with Powell's study in Cameroun had appeared to indicate that the female in question spent most of her time in a core area south central but moved out from time to time in several different directions.

The VHF transmitters indicated a marked difference between the behaviour patterns of the two females. One remained sedentary and central, always in a small group and not moving out during the 10 months of observation. The other was always peripheral, moving out at night and associated with very large groups during the day time. These groups of several hundred that form particularly in the early wet season are characteristic of Garamba, but we had not previously noted the strength of the association with the external movements. The males ranged wider than the females, and one was poached when he left the park to the west.

Amube Ndey has always been involved in aspects of the elephant study. His report of feeding observations from an earlier period is included.

4.b. Other studies

► Study of bushmeat utilisation.

Emmanuel de Merode, registered for a PhD with the Dept. of Anthropology, University College London, and working with Monungu Likango has begun a study of bushmeat utilisation in the *Domaine de Chasse Azande* and the level of legal and illegal offtake.

► Elephant use of the *Domaines de Chasse* surrounding the park and the distribution of other mammals and effects of man in these reserves.

Aaron Nicholas and Amube Ndey completed the analysis and write up of the first draft of their study, Although there are some modification to be made, these reports were presented in June.

► Investigation of the problems of crop raiding

Barbara Buls carried out the second phase of her MSc study of crop raiding, from September through November. Registered with the University of New Hampshire, she was working with Amube Ndey, since the principle culprit is elephants and Atolobako Vukoyo. This phase

was a detailed investigation of the level and type of crop raiding at the station of Nagero, which is adjoining the park and therefore particularly vulnerable, and where the problem is especially important to the guards themselves, who also have to risk their lives protecting the same animals who destroy their own food resource. She made preliminary tests of methods of deterrence and would like to continue this phase of the work if support can be found in 1996. She further investigated the extent of the problem in the *Domaines de Chasse* within the framework of the model presented in Hillman Smith et al (1995) in *Pachyderm*. If any positive results can be obtained from the deterrence tests, it will be important to expand this to the reserves as part of the proposed community extension project.

Publications and reports written or contributed to by the monitoring and research group in 1995 included:

- Hillman Smith, K. (1995)** Problematique de la Conservation à partir des stocks génétiques réduits, cas des rhinos et autres espèces rares, dans le contexte de la conservation de la biodiversité. Temoignage, présenté au Symposium National sur les priorites pour la Conservation et l'Utilisation Durable des Ressources de la Biodiversité au Zaire
- Hillman Smith, K. (1995)** Garamba National Park; *Swara* 18 (4);18-22
- Hillman Smith, K. (in press)** Contribution to a chapter on northern white rhinos for "Die Nashorner", Ed. Dr U. Ganslosser; Filander Press.
- Hillman Smith A.K.K., E.de Merode, A.Nicholas, B.Buls & A.Ndey (1995)** Factors affecting elephant distribution at Garamba National Park and surrounding reserves, Zaire, with focus on human-elephant conflict. *Pachyderm* 19; 39-48
- Hillman Smith K., Mbayma Atalia, Monungu Likango, F.Smith, Amube Ndey, & Giningayo Panziama (1995)** Parc National de la Garamba et Domaines de Chasse, General Aerial Count 1995 and evaluation of the status and trends of the ecosystem./ Recensement general et evaluation du statut et tendances de l'ecosystème. WWF/FZS/IZCN
- Hillman Smith A.K.K. & Mbayma Atalia (1995)** The monitoring of Illegal Activity and Law Enforcement in Protected Areas. Workshop document presented at PARCS workshop, Epulu, May 1995. (English and French)
- Hillman Smith A.K.K. & Mbayma Atalia (1995)** L'application du GIS dans la production des informations necessaires à l'aménagement, cas du Parc national de la Garamba. Workshop document presented at PARCS workshop, Epulu, May 1995.
- Hillman Smith, K., J.Watkin, E.de Merode & F.Smith (1995)** Parc National de la Garamba et Domaines de Chasse, General Aerial Counts, Manual of Methods and Analysis / Recensement General Aerie,ne,

Manuel des Methodes et Analyses. Garamba National Park Project Report.

Mbayma Atalia (1995) Quelle strategie pour la conservation de Rhinoceros Blanc du Nord au Zaire? Temoignage, presenté au Symposium National sur les priorites pour la Conservation et l'Utilisation Durable des Ressources de la Biodiversité au Zaire

Nicholas A. (1995) A report on the results of line transect work undertaken during the dry and wet seasons in the Domaines de Chasse of Garamba National Park, north eastern Zaire. 2. Large Mammal abundance and distribution in the Domaines de Chasse.

Nicholas, A. & Amube Ndey (1995) A report on the results of line transect work undertaken during the dry and wet seasons in the Domaines de Chasse of Garamba National Park, north eastern Zaire. 1. Elephant distribution, density and feeding preferences in the Domaines de Chasse.

Project Management Unit & Watkin J. (1995) Draft Framework Document for the Dvelopment of a Management Plan for Garamba National Park. Garamba National Park Project Document.

Smith K. , F.Smith, T.Foose & H.Dublin (1995) Background document for the development of a strategy for the metapopulation management of the Northern White Rhinoceros (*Ceratotherium simum cottoni*) Document prepared for workshop at White Oaks, Florida, October 1995

as above, French translation by Monungu Likango & Mbayma Atalia

Dublin H. T. Foose, K.Smith, (1995) Options Document to guide strategy development for the Northern White Rhinoceros (*Ceratotherium simum cottoni*) Document prepared for workshop at White Oaks, Florida, October 1995

A Full list of project publications and reports is included at the end of this report for background information.

TRAINING ACCOMPLISHMENTS

One approach to training of Zairian researchers is the counterpart system, where expatriate researchers independently funded or with minimal support from the project work with Zairian counterparts to carry out research projects to the mutual benefit and motivation of both. In this contaxt, the above projects carried out by members of the Research Group, with some supervision from myself have a training component.

5a Aerial count analysis

A manual was written on the method of systematic aerial sample counting at Garamba and its analysis satem, which had been developed largely by John Watkin. With this as a basis, the whole system of analysis was added to the training aspect of the aerial count and the

analysis was largely carried out by the IZCN researchers themselves this year. One of the aims of this is to have a standard system which can continue to be repeated in the long term and will give comparable results.

5b. Training and development of poaching and anti-poaching monitoring.

The forms for patrol monitoring were refined and training in their use was carried out at a guard training course in May.

The system was written up and presented as a workshop exercise at the PARCS workshop held by Dr Annette Lanjouw at Epulu in May. In this context the system was presented with the example of the savanna ecosystem of Garamba and then the participants had the exercise of defining the specific objectives and indices and developing a system for the monitoring of illegal activity and law enforcement in a forest ecosystem of their own experience.

At the same workshop we also presented an example of the use of GIS (Geographic Information System) in data presentation for management planning.

CONSERVATION ACCOMPLISHMENTS

6.a First National Biodiversity Symposium in Zaïre

In July Dr Mbayma and I attended the First National Symposium to develop a Biodiversity Strategy for Zaïre. We each made short invited presentations and contributed to the working groups on species conservation.

6.b Contribution to development of a Management Plan.

During August and September, the Project Management Unit (PMU) (Fraser Smith, Conservateur en Chef Muhindo Mesi, Dr Kes Hillman Smith & Dr Mbayma Atalia) of Garamba National Park held a series of Working meetings using a Logical Framework Approach, to develop the framework for a Management Plan for the Park and Reserves. The meetings were facilitated by John Watkin, who then organised the material and produced the document. Although considerably more work on Tables and Chapters was done than finally appeared in the document, it was decided to limit it to just one set of tables of activities, as a basis for comment and development.

The workshop identified Poaching as the Focal Problem and its reduction to defined levels as the primary objective. It was very indicative of the need to address the root of the problem, that most of the factors contributing to the focal problem arose from the surrounding areas.

Full Management Plan development is to be completed in mid 1996, and a detailed outline and draft future plan for the Monitoring and Research has been prepared.

6.c Contribution to development of a Strategy for the Long Term Conservation of the Northern White Rhinoceros.

Following a series of meetings of which I have attended all but one, a Workshop was held at White Oaks Plantation, Florida, under the kind auspices of the Howard Gilman Foundation, in October. This was aimed at bringing together all the key contributors to the conservation of Northern White Rhinos in order to try to develop a strategy for the long term conservation of the sub-species as a metapopulation. There were at the time 31 wild northern whites in Garamba National Park and 9 in captivity, of which 8 belong to Dvur Kralove Zoo in the Czech Republic, but of which 4 are held by San Diego Wild Animal Park. There is the remote possibility that some remain in South Sudan.

Background material was gathered and drafted for this meeting, and Monungu Likango and Mbayma Atalia translated the Background document into French. The members of the PMU participated in the workshop. It was an excellent forum to bring together the interested parties, but there was insufficient time and guidance to address and resolve all the issues.

In situ conservation in Garamba remained highest priority, but there was no indication of increased support to an adequate level. The captive rhino holders were unwilling to send their old captive-adapted rhinos to Africa or even at this stage to consolidate them in a semi free ranging situation in the USA, though they did indicate a willingness to further negotiation. Zaïre concluded that rhinos could not be sent to captivity without suitable returns or demonstration of willingness to consolidate in more natural breeding conditions, but they are open to further negotiation, including the possibility of contributing to a third population, as back up, in the future when certain conditions have been met with the source population.

OTHER ACCOMPLISHMENTS

Alan Root's film "Garamba, the Impossible Elephants" has been completed and released, and although it has not yet been shown on British or US television he gave permission for it to be used to raise support for Garamba. We should like to thank him for all he has done for Garamba through the film and generally.

Following the meeting in White Oaks, we visited various donors and potential donors to report on project activities, show the film and slides and to try to raise further support. These included Columbus Zoo/ International Rhino Foundation, WWF (US), Wildlife Conservation Society (WCS), WWF(UK), and the film was shown at the Royal Geographic Society in London under the auspices of Save the Rhino International, with backing from Motorola and opening presentation by Douglas Adams.

Columbus Zoo agreed to continue to give support through the IRF and to seek possible equipment donations. IRF kindly provided a GPS for the monitoring and mapping work. WWF(US) provided some useful contacts and information. WCS gave us a warm welcome and a stimulating time in terms of information exchange. We are very grateful indeed for their financial support to the monitoring programme, and to the huge

logistical support and financial support to the radio transmitters provided by Karesh through the Field Veterinary program. Transparencies were provided for an article by Karesh, to which I had also contributed. At WWF(UK) we had a very intensive and stimulating day and thank them very much for having taken a big responsibility in raising major funds for the main project and possible extension work. The film showing with SRI went well, though it did not raise many funds. I am also grateful to Zoological Society (London) for having donated funds to the Monitoring. As always we are very grateful for the lead support that WWF(International) has given to the main project throughout and to the Monitoring in the past, and of course to the Frankfurt Zoological Society for the project aircraft and to Wildlife Conservation Fund for their contribution to the monitoring and research aircraft.

PROPOSED ACTIVITIES 1996

January	Rhino monitoring recess Data analysis, Writing background document and proposal for Monitoring Correspondence Contribution to medical support to guards Guard training in monitoring
February	Attendance at AfRSG meeting, Natal, South Africa Office work and logistics, Nairobi Donor visit (IRF)
March	Guard training in monitoring Rhino immobilisation for radio telemetry Ground and aerial rhino monitoring WWF(UK) Journalists
April	Ground (with assistants) and aerial rhino monitoring General aerial sample count & analysis Evaluation mission
May	Ground and aerial rhino monitoring and study Hippo count Work on management plan? Guard training Data analysis
June	Ground and aerial rhino monitoring and study Data analysis Tourist development visits

PROBLEMS AND CONSTRAINTS

We have been faced with major problems in the increasing needs for support within Zaire and the increasing poaching and its change to commercial exploitation. This has necessitated changing tactics of anti-poaching and of monitoring to try to combat it.

A major problem in the second half of this year has been the lack of funds, particularly for monitoring and the amount of effort that has to go into seeking support for the project as a whole. I am very grateful for the support that has been forthcoming.

Zaire, as always poses logistical constraints, such as fuel taking a year to reach us, maintenance of anything being a major task, failure of radio communications and the need for a logistical support person in Nairobi in the second half of the year as well as the first. However, if we could not laugh at these and renew our efforts, we would not still be here. We feel Garamba is worth it.