

Indian Rhinoceros (*Rhinoceros unicornis*)
PHVA held in Jaldapara Wildlife Sanctuary, West Bengal
6-10 December 1993

Executive Summary

A Population and Habitat Viability Analysis Workshop for the Great India Rhino was conducted for three days in Jaldapara Wildlife Sanctuary with a day spent in the Gorumara Wildlife Sanctuary, along with concurrent sessions of the Asian Rhino Specialist Group. The PHVA was organised by the Forest Department of West Bengal and sponsored jointly by the Department, the Ministry of Environment and Forests, Government of India and the Asian Rhino Specialist Group. Some of the members of the AsRSG participated in Working Groups for the PHVA. Parallel Working group sessions were held alternately with Plenary, or reporting sessions. Written reports were prepared by all of the Working Groups which form this Report.

The Working Groups included:

1. Population and Habitat Dynamics
2. Management Strategies
3. Trade
4. Human Impact
5. Public Awareness
6. Funding requirements
7. Translocation and Reintroduction
8. Captive Breeding and Disease Management
9. Population Modelling

The Population and Habitat Dynamics Working Group attempted to quantify and assess population parameters using data on population structure, number and density obtained from the forest department, and habitat requirements using information on the behavioural and biological characteristics of the Indian rhino.

The present populations in the six protected areas varies from 30% to 65% of their respective estimated carrying capacity. In all the protected areas the growth rate of the population is relatively less compared to the rate of mortality, mostly due to the high rate of poaching. Analysis of adverse factors indicated that flooding and grazing were the most frequently occurring.

The Modelling Group considered scenarios in all of the rhino habitats and ran models both taking into account the general parameters existing in all of the habitats and more specific scenarios as applied to some of the smaller populations. Recommendations were made looking at the existing conditions and the future predictions. It was noted that four of the five small populations of Jaldapara, Gorumara, Pobitora and Manas were under threat of extinction if poaching continued unabated. The population at Gorumara is needed to be managed more intensely with supplementation for it is too small to survive

on its own. The models showed that all of the populations to survive on its own. The models showed that all of the populations to survive for the next 100 years with no poaching and with good metapopulation management strategies.

The Working Group for Management Strategies focused on the preservation of existing biodiversity with emphasis on maintenance or attainment of ecologically viable populations of Indian rhino. Recommendations were made to provide genetic continuity through expansion of existing organisational structure to orchestrate, coordinate and intensify anti-poaching measures. Vegetation and water management for all areas was recommended.

Special management measures were suggested for medium and small populations, such as the identification and inclusion of additional habitat and improvement of existing habitat. For small populations it was suggested additionally that they be maintained as a genetic resource to facilitate research of reproductive biology of small populations and translocation of compatible breeding stock from one area to another. Other strategies for all rhino bearing areas were economic recovery of fringe human population, wildlife tourism, training, monitoring and veterinary care.

The Threats Working Group divided into three separate groups related to trade, which directed their attention to the subjects of Trade, Human Impact and Public Awareness respectively.

The Trade Working Group centred their discussion on the rhino horn, including legal structures at the international and national levels. They recommended measures for enhancing enforcement and dealing with poaching techniques, poaching pressures, market trends, trade routes. Substitutes for rhino horn usage were suggested.

The Human Impact Working Group addressed the topic of communities in proximity to the protected areas for the rhino, including demographic changes, patterns of dependency, attitudinal changes, socio-economics, and political/civil unrest.

The Public Awareness Working Group analyzed people's participation and NGO involvement, motivation of service personnel, education extension, interpretation programmes and eco-tourism.

The Captive Breeding and Disease Management Working Group looked at the history of rhino management in India and made recommendations on the basis of their past performance and present facilities including holdings of animals. It was felt that zoos that have had breeding successes should be given priority when pairing animals and that all efforts must be taken to assure maximum breeding potential. Specific recommendations were made in this regard. It was also felt that Guwahati Zoo should not be used as an orphanage as this arrangement affects the management of the existing captive population there. It was felt that surplus males could be used for reintroduction research. In respect of health and disease the working group felt that more information

and research was essential on neonatal mortality, infectious disease survey and post-mortem results of rhinos in captivity.

The Funding Requirements Working Group did a costing of the requirements for all five areas for submission to international aid agencies under broad categories, e.g., Reinforcement of infrastructure for anti-poaching measures, Habitat management, Veterinary and rescue of marooned animals, Security Staff support, Eco-development, Compensation payment, Translocation/Reintroduction of animals, Wildlife Tourism and Awareness, Training Research and Monitoring.

The Translocation and Reintroduction Working Group discussed means of 1. strengthening non-viable populations and 2. establishing new populations by reintroduction. The following factors were stressed : areas which have recently lost rhinos should be “preferred” but only where the original causes of extermination/extinction have been removed or are in the process of being removed and where habitat requirements of the species have been satisfied; the extent of recipient areas must have adequate rhino habitat for a minimum of 100 individuals; the area should have the strictest possible legal protection status with good implementation of enforcement measures; the areas should have a management plan and adequate overall infrastructure. Monitoring should be carried out on released animals.

P.H.V.A. for Indian Rhinoceros Combined Recommendations

Population Modelling

1. The modelling exercise demonstrated that if a management goal of 70 rhinos for Jaldapara is considered, the present population may take 15-25 years to grow to this level through normal reproduction and births if no additional poaching occurs. This size population is a viable sub-population in a metapopulation management strategy.
2. According to the modelling exercise, the Jaldapara population at the present status and growth rate cannot sustain an annual poaching rate of even 2% or one rhino per year.
3. At the present rate of growth and the initial number of animals, the model showed the Jaldapara population to be inbred (heterozygosity retained may be around 75%). Supplementation of fresh lines into this population at intervals will increase the gene diversity and the viability of the population.
4. The Gorumara population will require intensive management and frequent supplementation to survive demographic, stochastic and potential inbreeding depressions from genetic drift.
5. A metapopulation management strategy needs to be developed taking into account the population trends in each area, the current and expected habitat availability and quality and the levels of which poaching can be controlled. Given the small area available, it may be that the Gorumara population will not recover unless poaching is controlled.
6. The estimated total rhino numbers is 1400-1500 in 6 populations with the Kaziranga population comprising 1100+ of the total. The modelling shows that four of the five smaller populations (except Gorumara) are potentially viable in 100 year projections if

poaching can be controlled. Poaching is an important factor in the nonviability of populations. Stringent steps must be taken to curb poaching.

7. Pabitora population is near habitat capacity. It will require monitoring to detect population trends and to restore the population in the event of a catastrophe.

8. According to the model, Dudhwa population should be supplemented periodically to sustain it for the next 100 years. The population is otherwise too small to grow and stabilize on its own.

Protected Area Management

9. The P.A. Management Group suggested that Rhino reintroduction may be considered in potential areas of Assam State viz: Laokhowa WLS, Burachapori Reserve Forest, Kochmara Reserve Forest, Kuruwa Reserve Forest, Disangmukh area and some areas of Uttar Pradesh and West Bengal in former range after evaluation of habitat suitability index for reintroduction.

10. The genetic continuity of rhino bearing areas such as Kaziranga, Orang and Laokhowa can be enhanced by expanding existing protected area and building of corridors to facilitate natural migration of individuals from one protected area to another.

11. As flood is the major adverse factor in rhino habitats, raising more artificial high-grounds for providing shelter to flood affected rhinos may be done.

12. In small areas which have small populations, translocation of compatible breeding stock from one area to another to increase the genetic variability and raise the recovery rate of the population may be done with a careful view that amelioration of degraded habitat and elimination of adverse factors (such as grazing) have been achieved.

13. Monitoring of habitat and population in rhino bearing areas should be done on a two year basis using satellite imageries of the areas for assessment of suitability of habitat and undertaking census of rhino population at regular intervals in order to classify them into age and sex classes.

14. Research—both theoretical and applied—should be undertaken to improve management, to shed light on the behaviour and biology of the species and assist in assuring its long-term survival.

Trade

15. Coordination between the 10-12 departments dealing with enforcement of law concerning rhino poaching and trade in India needs to be strengthened so that perception of the effectiveness of enforcement agencies as well as actual enforcement is strengthened.

16. Systems of intelligence gathering and informers have been demonstrated to be dramatically more effective than other strategies for prevention and capture of poachers in other rhino countries. Measures such as well-publicised and well paid reward schemes, developing an elite group of forest people trained in combatting poaching, and systematic involvement of other agencies besides wildlife (police, revenue) should be taken up.

17. Effective intelligence networks are badly required along porous borders (which greatly encourage poaching) between India and other countries.

18. Investigation of rhino poaching/smuggling cases should be entrusted to the specialised agencies, working on a national level (e.g. C.B.I. and I.B. in India) so that the whole group of poachers/smugglers who are seldom confined to a single state can be

exposed and prosecuted; the agencies should have access to INTERPOL to follow up a case across national boundaries.

Human Impact

19. The Human Impact Working Group identified areas fo threat from human impact in terms of human **population** growth—fertility, mortality, in-migration from other areas, patterns of dependency, changes in attitude to rhino and the reserve, and political and civil unrest. The greatest threat may be from the trend over the last two decades of percentage of the growing population to be increasingly landpoor and therefore dependency if rhino and its habitat are to be protected.

Education, Training And Public Awareness

20. The attitudes toward rhinoceros and its reserves often meets with animosity due to crop damage by rhinos straying out of their reserve and to the imposition of protection on forest areas used by local people. Programmes providing compensation for crop damage and alternate strategy for use of the forest need to be developed.

21. The Workshop noted the steps taken by the Forest Department of West Bengal to establish participatory management mechanism in Jaldapara. The development of such programmes is essential in areas where use of p.a resources must be made compatible with conservation objectives.

22. Training in interaction with local people, as well as wildlife and handling of arms must be given to forest personnel in rhino areas.

23. Education programmes (with the Forest Department as a special advocate to improve education in general for local people around the reserves) along with extension and interpretation programmes need to be organised. Such programmes could integrate with Ecotourism programmes to insure benefits accruing for both animal and man in the reserves.

Captive Breeding

24. The zoos that have had breeding successes should be given priority when pairing or supplying animals.

25. Mates should be provided to proven breeders in different zoos so that maximum breeding potential is realised.

26. The use of Guwhati Zoo as orphanage for young rhinos stranded during flood has affected the management of the other rhinos in the zoo and should be curtailed. The orphanage should be attached with the Kaziranaga National Park or other rhino rearing area where facilities could be established to rear young animals. If surplus females are available from the orphanage, they may be kept for the ex situ breeding programme while surplus males could be used for re-introduction research.

27. A feasibility study should be undertaken to determine if indeed reintroduction of captive born rhinos into the wild is a viable possibility and what captive management activities should be undertaken to ensure a successful project. This could be done in consultation with the Reintroduction Specialist Group, SSC, IUCN.

28. All data related with each individual, namely date of birth, date of any acquisition, transfer, date of death and cause of death should be sent to the National Studbook Keeper (Kanpur Zoo), the Species Coordinator (Addl. I.G., Wildlife), and Central Zoo

Authority. The National Studbook Keeper should take all the responsibility to send all information to the International Studbook Keeper.

29. All the zoos that maintain the species should have educational materials available to the visitors and they can be in the form of signage, brochures, or pamphlets in the light of conserving the species.

Health And Disease

30. Suitable veterinary units should be established in all protected areas through which immunisation of domestic livestock in fringe areas and monitoring health of rhino population can be done.

31. Every zoo that maintains this species should perform post-mortem for each and every animal and the results should be made available to the Regional Studbook Keeper, Species Coordinator and Central Zoo Authority. The post-mortem results may be maintained in accordance with the format as already laid down in the guidelines by the Central Zoo Authority. Additional required information may be added to the existing format of C.Z.A.

32. The disease which can be prevented by periodical testing and vaccination like rinderpest, haemorrhagic septicaemia, and tuberculosis should be taken into consideration for routine prophylactic measures. The treatment records should be kept properly.

Translocation and Reintroduction

33. Objectives of Translocation for rhinoceros as defined by the Workshop are : to strengthen non-viable populations to become permanent, self-perpetuating populations; to establish new populations in former range, to maintain high heterozygosity in the population; to distribute populations over large range to prevent loss due to catastrophic event.

34. The Workshop laid down basic criteria for identification of recipient areas: recipient area should have a carrying capacity of 100 rhinos; area should have strictest possible legal protection status (e.g. National Park Sanctuary); area must have high quality law enforcement and no significant poaching case in recent years; area should have a management plan and infrastructure for carrying it out; area should be subject of detailed study including expertise in the following areas: ecology, botany, management, law enforcement, sociology, and captive management.

In the case of a location which currently has no rhinos, an initial reintroduction should be minimum of 10 animals of an age to reproduce reproductively in the new area as soon as possible. As soon as breeding is successfully established, further supplementation can be considered.

35. The Workshop established priorities for animals to be selected for translocation: they should be sought from isolated or doomed areas where their future existence is doubtful, first priority going to areas which have no legal protection status and next priority going to surplus animals in well stocked areas.

36. Translocated animals should be systematically monitored including their effect on the habitat and until they have established equilibrium with the new surroundings and are breeding successfully.

Funding

37. Funding proposals should be submitted to international aid agencies as per broad subject headings which have been drawn up by the working group, keeping in mind the management requirements of the rhino population of different sizes in India.