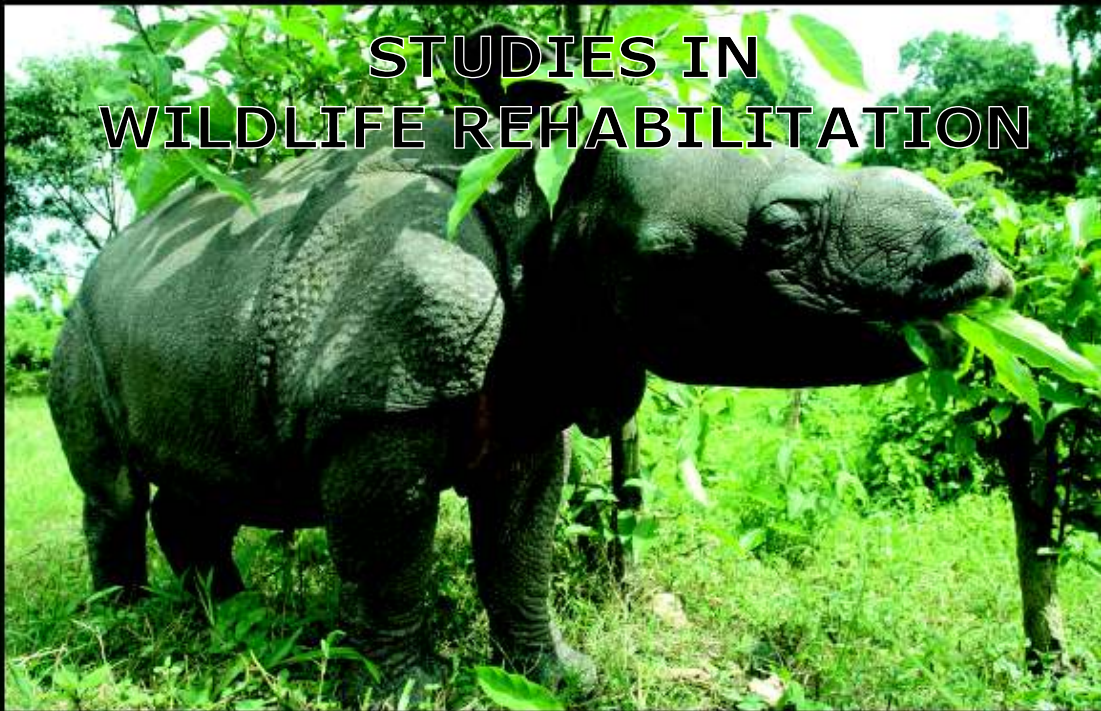


CONSERVATION REFERENCE SERIES NO. 2

# BACK TO THE WILD

## STUDIES IN WILDLIFE REHABILITATION



Eds: Vivek Menon, N.V.K. Ashraf, Prajna Panda  
and Kadambari Mainkar

PRODUCED ON THE OCCASION OF KAZIRANGA CENTENARY 1905-2005





## **Back to the Wild**

### **Studies in Wildlife Rehabilitation**

Eds: Vivek Menon, N.V.K. Ashraf, Prajna Panda  
and Kadambari Mainkar

A Conservation Reference Compendium  
Published by the Wildlife Trust of India  
Supported by the International Fund for Animal Welfare

Produced on the occasion of  
Kaziranga Centenary 1905-2005



The Wildlife Trust of India (WTI) is a non-profit conservation organization committed to initiate and catalyse actions that prevent destruction of India's wildlife and its habitat. In the long run, it aims to achieve, through proactive reforms in policy and management, an atmosphere conducive to conservation. WTI works through building partnerships and alliances and its strengths lie in its willingness to work with innovative conservation techniques like acquiring land for wildlife and rescue and rehabilitation.

Suggested Citation: <Author names> 2005. <Paper title> In: Back to the Wild: Studies in Wildlife Rehabilitation. Menon, V., Ashraf, N.V.K., Panda, P. and Mainkar, K. (Eds.). Conservation Reference Series 2. Wildlife Trust of India, New Delhi. Pp

Keywords: Conservation; Wild Rescue, Wildlife Rehabilitation, Animal Welfare, Asian Elephant, African Elephant, One-horned Indian Rhinoceros, Veterinary Care, Wildlife Ethics, Wildlife Management, Man-Wildlife conflict, Guidelines and Protocols, Asiatic Black Bear, European Brown Bear, Primates, Red Panda, Loris, Gibbon, Star Tortoise, Pygmy Hog, Greater Adjutant Stork.

The designations of geographical entities in this publication and the presentation of the material do not imply the expression of any opinion whatsoever on the part of the authors or WTI concerning the legal status of any country, territory or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries

All rights reserved. Reproduction and dissemination of material in this information product for educational or other non-commercial purposes are authorized without any prior written permission from the copyright holders provided the source is fully acknowledged and appropriate credit given. Reproduction of material in this information product for other commercial purposes is prohibited without written permission of the copyright holders. Applications for such permission should be addressed to the Executive Director, Wildlife Trust of India or by e-mail to [info@wti.org.in](mailto:info@wti.org.in)

Copyright © WTI 2005

Photo credits


Front and back cover: Idris Ahmed/IFAW-WTI

Title page: WTI

Cover Design: Rupa Gandhi Chaudhary

Layout: J. Rajesh

Printed at: Creative Grafix, XXXXXXXXx, New Delhi



# CONTENTS

<b>Acknowledgments</b>	6
<b>Foreword</b>	7
<b>Preface</b>	8
<b>Messages</b>	9
<b>Editorial</b>	17

## **The Need**

Wildlife rehabilitation as a conservation and welfare prerogative - Ian Robinson	22
Kindness, conservation or keeping alive? The philosophy of veterinary treatment and rehabilitation of wildlife casualties - James Kirkwood	29
Problems and prospects of rehabilitating wildlife displaced due to man-wildlife conflict and the wildlife trade in India - N.V.K. Ashraf and Vivek Menon	34

## **The Principles**

The principles of care and rehabilitation of orphaned wild mammals - Karen Trendler	46
The principles of wound management in wildlife rehabilitation -John Huckabee	54
The principles of establishing and managing a wildlife rescue and rehabilitation centre - Rathin Barman	62
The Principles of managing wild animals for conservation breeding with a brief note on the pygmy hog conservation programme - Goutam Narayan and Parag Jyoti Deka	70
The principles of rearing and rehabilitation of orphaned African elephant calves - Daphne Sheldrick	85

The principles of rehabilitation of large mammals (Asian elephant, Asiatic wild buffalo, Asiatic black bear and greater one-horned rhinoceros) - N.V.K. Ashraf, Rathin Barman, Kadambari Mainkar and Vivek Menon	91
--	----

---

## Case Studies

---

### Primates:

Care of rescued South Asian lorises with guidelines for hand-rearing infants - Helga Schulze , Anand Ramanathan, Helena Fitch-Snyder, K. Anna I. Nekaris, Mewa Singh and Werner Kaumanns	104
--	-----

Rehabilitating gibbons and siamang at Kalaweit, Central Kalimantan, West Sumatra, Indonesia - Aurilien Brule	119
--	-----

### Reptiles:

Rescue and rehabilitation of confiscated Indian star tortoises at Arignar Anna Zoological Park, Tamil Nadu, India - R. Thirumurugan, K. Senthil Kumar and Praveen Chandra Tyagi	125
---	-----

Rehabilitaion of repatriated Indian star tortoises in Protected Areas of Andhra Pradesh - Binod C. Choudhury and K. Thulsi Rao	129
--	-----

### Bears and Pandas:

Rehabilitating brown bears ( <i>Ursus arctos</i> ) in Russia - Sergey V. Pazhetnov	144
--	-----

Behavioral changes and enclosure use by Asiatic black bears ( <i>Ursus thibetanus</i> ) in pre-release enclosures during rehabilitation - Naim Akhtar, Darge Tsering, N.V.K. Ashraf and Chuku Loma	148
--	-----

Conservation breeding and release of red pandas in West Bengal, India - Brij Raj Sharma, Brij Kishor Gupta and Bipul Chakrabarty	157
--	-----

### Rhinos:

Rehabilitation of hand-reared rhino calves in Southern Africa: Implications for the greater one-horned rhinoceros - Bhaskar Choudhury and Kadambari Mainkar	163
---	-----

### Elephants:

Displacement, survival and placement of elephant calves in India: A preliminary analysis - Vivek Menon, Prajna Paramita Panda, Kadamabri Mainkar	170
--	-----

Care and management of elephant calves in Kodanad Elephant Camp, Kerala, India - E.K. Easwaran	180
Hand-raising displaced elephant calves at CWRC for rehabilitation in Assam, India - Kadambari Mainkar, Bhaskar Choudhury and N.V.K. Ashraf	189
Reuniting temporarily displaced elephant calves with wild herds in Kaziranga National Park, Assam, India-Bhaskar Choudhury, Rathin Barman and Niranjana Kumar Vasu	203
Rescue of twin elephant ( <i>Elephas maximus</i> ) calves at Anaikatty, Coimbatore, India - B. Rathinasababapatty and R. Manickam	207
Release and monitoring of rehabilitated Asian elephants ( <i>Elephas maximus</i> ) at the Elephant Transit Home, Udawalawe National Park, Sri Lanka - B.A.D.S. Jayawardane	209
<b>Birds:</b>	
Rehabilitation of greater adjutant storks ( <i>Leptoptilos dubius</i> ) in Assam - Bhaskar Choudhury, Simanta K. Goswami, Rajjyoti Deka, Mrigen Barua and Hillojyoti Singha	219

---

## The Guidelines and Standards

---

IUCN Position statement on translocation of living organisms	228
IUCN guidelines for re-introduction	242
Guideline for non-human primate re-introductions	250
Placement of confiscated animals	276
CZA standards for rescue centres	296
Notes on Contributors	302

---



# Rehabilitation of Hand-reared Rhino Calves in Southern Africa: Implications for the Greater One-horned Rhinoceros

Bhaskar Choudhury<sup>1</sup> and Kadambari Mainkar<sup>2</sup>

---

## Introduction

Once distributed all along the Terai grasslands in the foothills of the Himalayas, the greater one-horned rhinoceros (*Rhinoceros unicornis*) is now restricted to few pockets in India and Nepal (Singh and Rao, 1984). According to IUCN/SSC Action Plan on Asian rhinos, the Indian rhinoceros has declined over the years due to habitat loss and poaching (Foose and Strien, 1997) thus being placed in the 'Endangered' category by IUCN and in Appendix I of CITES.

Wildlife rehabilitation is an emerging science contributing to both welfare and conservation issues in India. Under the present circumstances, supplementing the existing population of the greater one-horned rhinoceros in the wild will definitely benefit the long-term conservation of the species. The Centre for Wildlife Rehabilitation and Conservation (CWRC) situated in the state of Assam at the Kaziranga National Park was established in the year 2002. Since then the CWRC has been involved with the rehabilitation of indigenous wildlife of the north-east, including successful hand-raising of three greater one-horned rhinoceros calves, which were displaced during the floods in Kaziranga National Park. The hand-reared calves, which are potential candidates for rehabilitation are undergoing a process of long-term rehabilitation at the centre.

The two authors visited Wildcare Africa Trust (WAFT), a rehabilitation center in

---

<sup>1</sup>Veterinary Officer, Wild Rescue, Wildlife Trust of India. [bhaskar@wti.org.in](mailto:bhaskar@wti.org.in)

<sup>2</sup>Programme Officer, Wild Rescue, Wildlife Trust of India. Email: [kadambari@wti.org.in](mailto:kadambari@wti.org.in)

South Africa, as part of this project in order to train with them on rehabilitation of African rhinos so as to bring back the lessons learnt there for application in India. The following paper discusses that learning curve.

## **The African rhino rehabilitation programme**

### **Nursery**

A rhino, newborn or still below one month of age, on arriving at the center is placed in the nursery, away from human habitation, for initial stabilization. The initial stabilization facility is an 8 x 8 feet room with good ventilation, provision of room heaters and coolers. Restricted entry is maintained inside the nursery and only the keeper is allowed to go in. Before entering the nursery, special clothing is worn and the boots disinfected with an antiseptic spray (Hibitane). The nursery is disinfected prior to housing an animal and a viewing window is provided to inspect the animal frequently without disturbing it. An UV lamp is always placed inside the nursery so that the animal is accustomed to it and actually feels warm and comfortable inside. The bedding of straw is changed twice a week or more frequently to avoid development of an ammonia-like smell inside the room.

### **Feeding**

The most important factor for initial stabilisation of an orphan is the hydration status and every attempt is made to rehydrate it as fast as possible. Unlike elephant calves, rhino calves are easier to bottle-feed. Simply putting the rhino teat in its mouth whenever it demands milk does the trick. Milk formula is provided at a two-hour interval in the nursery. To increase the intake, they are fed on apple juice, which is found to work well with rhino calves and they relish them.

The commercially available artificial milk formula for rhinos is Nestle Rhino milk (low fat and high lactose content) but formulas like human fat free milk, 'Denkavit' is also found to work well with rhinos. About 75 gm of the powder is added to a litre of luke-warm water and 26—28 liters is fed every day initially to a newborn calf. Depending upon the age and body weight of the calf, initially it is fed on demand every two hours and later given approximately 15—20% of its body weight (Table 1). Probiotics like Protexin/Bioirem (Bayer) are added to the formula and with every feed initially. For feeding the baby rhinos, a 1.5 litre coke bottle fitted with a rhino teat is used.

### **Hygiene and sanitation**

At WAFT, strict hygiene and sanitation are ensured while preparing the milk formula, cleaning and storage of utensils and feeds. Milk formula is prepared fresh and any left over milk is immediately discarded after feeding. The feeding bottles, teats, and other utensils are sterilised before and after preparing the formula and stored in

Age	Formula strength	Formula offered	Greens and roughages
Nursery (new born to 3 weeks)	250 gms in a litre	On demand	Nil
4 weeks - 12 weeks	Add Denkavit (cereal gradually)	3 hours interval including late nights	
12 weeks -6months	Milk formula with Denkavit	4 feedings, 20 liters per day. Night feeding gradually reduced	Expose to indigenous browse at 17 weeks
6 months -17 months	Denkavit	3 feedings, No night feeding	Greens (legumes), hay
18 months and above	Gradually weaned	Nil	Greens (legumes) hay

**Table 1. Feeding schedule followed for African Rhinos at WAFT**

refrigerators. For grown up calves, four to five months of age, the bottles can be washed in hot water with detergent ensuring all the milk residues in the teats are rinsed well. Bottles and teats of each individual are marked with indelible markers for identification and to prevent use on other orphans.

Cleaning of animal cages and the campus are handled by the animal keepers on a daily basis. The enclosure is cleaned daily and the organic debris is carried away by a trailer to be disposed off. In order to reduce the flies and other insect vector population, a commercially available plastic flytrap is hung over every boma.

## Record keeping

Comprehensive records on the diet, weight, growth, illness, behaviour and development are maintained at WAFT. After "rehabilitation" of the animal all the records are kept in separate files for reference in the future.

## Translocation to boma

Initially, the keeper never leaves the calf alone until the calf develops a strong bond with him. Once the calf settles well in the nursery and makes a strong bond with the keeper, it is taken out for exercise outside the nursery. The rhino calf is myopic and if the feeding bottle with milk is held in front of the calf, it will follow the bottle. Thus, the calf can be gradually exposed to the new surroundings and then finally moved to a bigger enclosure under chemical immobilisation.

This enclosure is enriched with a wooden night shelter and a bedding of thatch. An UV lamp similar to that of nursery is put on 24 hours to give the animal the feeling of comfort and security. There is a mud pool to wallow in, which is disinfected periodically with disinfectant.

## Weaning

Weaning at the correct stage facilitates the animal to break the bond developed with keepers (imprinting). They are kept in the company of other animals of the same species till they are ready to be released in their natural environment (Karen Trendler, pers. com.). At WAFT, rhino calves are weaned at 18 months of age and are maintained only on greens and hay after that. They are fed twice a day with lucerne and *ad-libidum* clean drinking water is provided in a pail.

## Acclimatisation *in-situ* and final release

After the rhinos are weaned and when they are about two to two and half years old, they are ready to be moved for in-situ acclimatisation and final release into the wild. After selection of the suitable site (preferably the same protected area from where the individual animal was rescued) a boma is constructed in the same design as that of the weaning boma. The boma is enriched with a wooden shelter and an UV lamp is placed inside to help the animal to quickly stabilise in the new environment. The same species of lucerne and hay is carried to the site before the animal arrives there and the animal is initially fed for at least seven days with it to avoid any digestive disturbances. Simultaneously the animal is also encouraged to access the natural grass species of the area. As the animal gets completely accustomed to the new surrounding and the fodder species of the area, the animal is released from the boma. The boma is kept for another two months at the same place for the animal to come back to have a sense of security if it feels insecure.

## Implications for Indian rhinos

The rhino calves in India can be transported to the centre in Assam in a four-wheel drive vehicle with a fabricated body having minimum internal dimensions of 5x5 feet. The calves can be sedated with "Meditimodine" @ 1µg/kg body weight during transport to minimise stress. A combination of physical and chemical capture for rhino calves below six months of age is ideal. Blindfolding the calf with a dark cloth just after immobilisation would facilitate smooth loading into the vehicle and transportation to the rehabilitation centre.

The nursery protocol should be similar to that followed at WAFT except that the nursery can be constructed inside a large herbivore enclosure (a 750 square meter paddock) so that the process of transfer to the bigger enclosure can be avoided. For animals like the rhinoceros, exposure to newer surroundings every now and then definitely adds to the stress level and may affect proper growth of the animal in subsequent stages. The animal can be put inside the nursery for the first few days until it develops a bond with the keeper and starts taking the milk formula. Then the animal can gradually be taken for a walk inside the enclosure to familiarize itself with the surroundings and feel secure and comfortable. The enclosure must have shade as

well as a wallow and the animal should be encouraged to wallow gradually. Unlike at WAFT, natural grass species available at the proposed release site can be planted inside the enclosure so that the animal has access to it prior to translocation to the release site for final release.

Indian rhino calves were found to tolerate infant milk formula with high fat content like Lactogen 2 (Nestle, India containing 21% fat). A month-old female rhino calf at the Centre for Wildlife Rehabilitation and Conservation (CWRC) has been raised with the Lactogen 2 formula (Table 2) and two other calves are being raised currently (October 2004). For feeding, a one-litre coke bottle or a three litre elephant feeding bottle and a rhino teat can be used (Figure 1).

Age	Formula strength	Quantity offered	Cereals added	Greens and roughages
New born - 4 weeks	40 gms in a litre	On demand/ every two hours	Nil	Nil
4 weeks -3 months	50 gms in a litre	2 litres of formula at 3 hour intervals	Cereals added gradually	Starts nibbling grass blades
3 months - 6 months	50 gms in a litre	3 litres 3 hourly	Cereals (moong crush and brown rice)	4-5 kg. of green succulent fodder
6 months -18 months	75-150 gms in a litre	4-6 litres, 6 hourly.	Moong crush and brown rice	<i>Ad lib</i> fodder

**Table 2: Feeding schedule followed for Indian Rhino at CWRC**

Strict hygiene and sanitation similar to the WAFT should be followed for hand-raising Indian rhino calves. An important factor is the personal hygiene of the animal handlers in the Indian scenario. The animal keepers can be a potential source of infection specially *Salmonella* and *E. coli* infections. Animal handlers can be screened for the presence of such infections prior to handling animals.

Rhinos are most susceptible to ectoparasitic infestations and other skin problems. Routine veterinary care like periodic faecal screening and de-worming should be done. To avoid skin problems, feed supplements especially fat-soluble vitamins (Vitamins A and E) and minerals rich in Calcium, Phosphorus, Iron, and Selenium should be incorporated in the feeding schedule.

Weaning should be done at 18 months of age. In case of dearth of sufficient succulent green fodder, a maintenance concentrate mixture can be fed until the animal is finally moved to the release site for *in-situ* acclimatisation.

A week before the translocation to the release site, complete blood count (CBC) and packed cell volume (PCV) should be performed. A serum-chemistry profile can be made before release of the animal. Serum samples can be stored (ultra frozen) for future tests. Pre-release immunisation against tetanus, anthrax and rabies with killed vaccine can be considered.



**Figure 1: A rhino calf being bottle-fed at CWRC**

After weaning, a large power-fenced open paddock (area not less than three acres) can be constructed at the proposed release site for *in-situ* acclimatisation of the animal before final release. The proposed release site should have a genetically viable existing population of greater one-horned rhinos in proximity and the proposed activity should not affect the existing population of the animal. The fenced area should represent a microhabitat for the species having adequate shade and elevated lands to take shelter during floods. A concentrate mixture can be provided to the animal after transportation to the new area for a period of at least a month to help the animal acclimatise quickly to the new surroundings. The same species of green fodder can also be supplemented in the lean season in the fenced paddock. The animal should be closely monitored during the acclimatisation period, which can vary from six months to a year before final release into the habitat.

Imprinting of hand-reared wildlife orphans is a subject that needs serious consideration. Appropriate mothering and weaning at correct age will minimise the chance of imprinting in hand-reared wildlife orphans (Karen Trendler, *pers. com.*). Hand-rearing of social animals like elephant calves or primates in isolation is not possible and hence minimal imprinting is inevitable, but in species like the rhinoceros it is experi-

enced that weaning at 18 months and rearing among individuals of same species or others helps in minimising the problem (Karen Trendler, *pers. com.*).

## Acknowledgments

We are grateful to Mr. Vivek Menon, Executive Director, WTI, for giving us an opportunity to work with 'Wild Rescue' programme and selecting us for the training programme at Wildcare Africa Trust. We are equally grateful to the Assam Forest Department for granting us the permission to work with the wildlife rescue and rehabilitation work in the state of Assam. We are indebted to Dr P.C. Bhattacharjee, Trustee, Wildlife Trust of India for his guidance. We are thankful to Dr N.V.K. Ashraf, Dr Rathin Barman, Dr Anand Ramanathan (currently in IFAW), all from WTI for their help and cooperation during the work. Our sincere thanks to Ms. Karen Trendler and the staff at Wildcare Africa Trust for their help and cooperation during the training period in Africa. We are thankful to the Kaziranga National Park authority and all the staff for their cooperation while working at CWRC. Last but not the least we are thankful to the animal keepers of CWRC for their dedication and support towards wildlife conservation.

## References

- Foose, T.J. and Strien, N.S. (1997). (eds.). *Asian Rhinos: Status Survey and Conservation Action Plan*. IUCN/SSC Asian Rhino Specialist Group. IUCN/SSC Gland, Switzerland.
- Singh, S. and Rao, K. (1984). *India's Rhino Reintroduction Program*. Department of Environment, Government of India Report.