

**Report on the Non-Invasive Capture &
Translocation of Hard Ground Barasingha
(*Cervus duvauceli branderi*) from
Kanha Tiger Reserve
To Van Vihar National Park**



TECHNICAL REPORT-MPFD/WL/2015/01



Madhya Pradesh Forest Department





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CONTENTS

Foreword	4
Introduction :	8
Permission for Translocation :	8
Objectives :	9
Selection of Release Site :	10
Grasses :	10
Aquatic Plants :	11
Erection of Conservation Breeding Enclosure :	12
Plan of Operation :	14
Field Preparation and Mock Drill :	20
Actual Field Operation :	22
Assessment of physical and emotional status of the animals :	30
Transportation :	30
Release of Animals :	32
Documentation:	33
Monitoring of the Released Animals :	34
Learnings and Caveat :	35
Various Teams deployed in the Barasingha Capture and Translocation Operation	38



Foreword

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Some experts believe that till the year 2010, the management of wildlife in Madhya Pradesh was largely limited to amelioration of habitat, development of water sources, protection and tourism but that is not the fact. All this while, besides doing our modest bit to protect and manage habitats in protected areas, with the meagre resources available to the wildlife wing, we have been constantly taking innovative measures and some of those were first in India – The resurrection of hard ground barasingha from the verge of extinction in Kanha tiger reserve and of gharial in Chambal sanctuary were two major success stories of the seventies and eighties. Later, the formation of Madhya Pradesh Tiger Foundation society in 1997 and creation of development fund from tourism receipts in protected areas were two major initiatives to augment resources for wildlife conservation, which were minuscule in those days. The creation of Wildlife Heath Monitoring, Disease Diagnostic Research Cell in collaboration with the Jawaharlal Nehru Agriculture University in 1999 and its elevation to Centre for Wildlife Forensic and Health in 2008, was a step towards strengthening our capabilities in the field of wildlife health management and wildlife crime investigation. Inducting veterinarians on deputation from the veterinary department in 2000, training them in wildlife health management, and deputing them to tiger reserves and to Kuno sanctuary and Van Vihar national Park, was another milestone. In 2006, the wildlife wing created 9 (now 10) fully trained and equipped regional wildlife rescue squads located at strategic places to tackle human: wild animal conflict that had escalated overtime due to the shrinking habitats and expanding villages and towns. To strengthen crime investigation capabilities, in 2008, the wildlife wing created the State Strike



force at Bhopal with 5 other field units located at strategic places that are the hubs of wildlife crime or transit points for wildlife trade; 2 of these units have been provided with dog squads. Obviously, the management practices pursued by the wildlife wing cannot be termed 'passive' as some experts have been claiming.

We successfully reintroduced an orphaned tigress, that was raised in captivity since 2005 within natural habitat in Kanha tiger reserve, into Panna tiger reserve. This success encouraged us to raise some more orphaned tiger cubs in captivity (instead of sending them to zoo) and rewild them in the same or any other tiger reserves wherever population dynamics of tigers and prey availability permitted such supplementation. Till now we have rewilded five orphaned tiger cubs successfully. Besides, we have been regularly monitoring tigers dispersing from natal areas and whenever they were found straying into hostile territory such as human habitations, we captured them, radio collared them and released them in suitable and protected habitats. This particular activity has opened up a new path to ensure genetic exchange among tigers critical for their continued survival in the wild as natural corridor are fragmented and extremely stressed under the demands of development and ever increasing biotic pressure.

By 2010, we had created a strong foundation and gained skills to take the next step in 'Pro-Active' management and took up the task of reintroduction of those species that had gone locally extinct from some of our parks. After obtaining permission from GoI in October 2010, we began gearing up for reintroduction of gaur into Bandhavgarh tiger reserve from where it had become extinct about 20 years ago. The then Chief wildlife warden Dr. H.S. Pabla spearheaded this task with extraordinary zeal, overcoming all odds and opposition. He roped in experts from South Africa through Conservation Corporation of Africa (now -& Beyond). This collaborative exercise built up the confidence in field personnel and vets and the next batch of gaur was captured and transported to Bandhavgarh totally indigenously.

Heartened by this success the wildlife wing planned reintroduction of black buck into Kanha tiger reserve. The methodology was borrowed from Andhra Pradesh and involved immobilizing group of black buck during the night with high decibel sound and search light and then physically lifting them and loading them into transportation trucks. This operation caused heavy mortality. The reason for mortality obviously was onset of capture myopathy that ensued as the animals were physically handled by the captors while they were fully conscious. We learned an important lesson from this failure.

To avoid the recurrence of earlier mistake, we adopted the African boma capture strategy which was partially deployed in gaur capture exercise at Kanha. At this time we were facing



over abundance of chital in Van Vihar National Park, which is a 4.5 sq.km totally fenced area without any free ranging carnivore except Jackal. We sent a proposal to the state government to permit us to physically capture Chital from Van Vihar for restocking some PAs deficient in prey. Once we received permission from the Government a capture boma was set up at Van Vihar and training of staff began. By 2013 a team of staff at Van Vihar became quite adept in capturing chital and safely transporting them to other PAs. Till November 2014, we had successfully captured and transported 26 chital from Van Vihar to Ralamandal sanctuary, Indore zoological park and Ratapani sanctuary and 31 chital from Umaria to Sanjay tiger reserve.

Since 2010, we have been pursuing our plan to reintroduce critically endangered hard ground barasingha from Kanha to Satpura tiger reserve. The purpose of such reintroduction is to ensure long term survival of the species. Based on the Population Viability Study by WII, the plan envisages establishing a founder stock of 20 (with a male to female sex ratio of 1:3) individuals in a predator proof enclosure at Bori in Satpura Tiger Reserve and release them into the wild when the population within the enclosure reached nearly 50. This will be followed by supplementation of 12 animals with the same ratio of 1:3, every alternate year, for the next five years. The founding stock shall be kept in an enclosure which is approximately 27 ha in size and shall be enlarged if necessary. By the end of 5th year, the population in the enclosure is expected to reach 106. A stock of approximately 60 animals, from the enclosure shall be released into the Bori meadow at the end of 5th year and shall be supplemented with 10 animals each year, from the surpluses in the enclosure. A small breeding group shall be retained in the enclosure to supplement the wild population from time to time.

Convinced with our proposal, in May 2011, the Government of India had permitted capture of 20 barasingha but soon after the black buck capture episode prompted GoI to withhold the permission. Our relentless persuasions finally resulted in NTCA granting us permission to first translocate two male and three female barasingha from Kanha to Van Vihar National Park. As soon as we received the Concurrence from NTCA in January 2014, we began preparing for the capture and translocation operation. Chemical immobilization of barasingha was considered initially but keeping in view the delicate nature of barasingha, we ultimately decided to use the boma capture method. The capture operation began on 7 January, 2015, at 6.30 AM at Kanha meadow and culminated at 12.30 PM. In this operation we captured 7 barasingha (3 males and 4 females) as well as 3 chital.

Though we had the technique and skills to release the extra animals, the wildlife vets advised against it as it could have caused stress to the animals and resulted in subsequent capture myopathy. Therefore, all the 10 animals were immediately transported to Bhopal and were released at Van Vihar early next morning at 6 AM into the conservation breeding enclosure



erected for them. We were a little worried as the animals had travelled almost 530 km from Kanha meadow to Van Vihar, but we were relieved to watch all 10 of them jumping out of the truck with agility and sprinting swiftly to vanish under the thick fog that hung over the meadow. Standing there with my colleagues I felt a heady sense of being part of history. It indeed is one such operation which was fraught with difficulties and a very high risk of failure. Earlier attempts in late seventies and early eighties at Kanha to capture this animal using both narcotic and non-narcotic drugs had proved unsuccessful as the level of mortality had been beyond acceptable limits. In comparison, this operation turned out extremely successful with zero mortality. Besides, we have learnt a safe method to restrain and transport a species that is considered hyper sensitive to human handling and stress.

The success of this path-breaking operation has been possible due to meticulous planning and skillful implementation of the operation with confidence which comes from knowledge and experience. Dr. Suhas Kumar, APCCF Wildlife was the overall in charge of the whole operation carried out by Kanha tiger reserve and Van Vihar with technical support from WII Dehradun and Centre for Wildlife Health Monitoring & Forensic Jabalpur. Contribution of Shri Jasbir Singh Chouhan, Field Director Kanha as coordinator of entire field operation, Shri Shubhranjan Sen, Scientist WII, Dr. Atul Gupta, Dr. A.B. Srivastava and their respective teams is gratefully acknowledged. All the CCFs, DFOs and their staff of forest circles falling on the route must be praised for their whole hearted assistance for safe and smooth passage of the transportation team through check and tollnakas and for ensuring that the team is provided with all assistance including food and water throughout the long journey. The whole process, from beginning to the end has been documented in this report for the benefit of wildlife managers and researchers.

The next step is to reintroduce barasingha in Satpura valley which once teemed with barasingha. We hope ardently that in the winter of 2015 we would be bemused by the resonant, long-drawn rutting call of barasingha in Bori meadows and enthralled by the sight of them holding their neck skyward with tuft of grasses dangling like royal decorations from their majestic antlers.

Narendra Kumar, IFS

PCCF (Wildlife) & Chief Wildlife Warden,
Madhya Pradesh



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Introduction :

First systematically described by RI Pocock in 1943 and Ellerman and Morrison-Scott in 1951, the hard ground barasingha, also known as the central Indian barasingha (*Cervus duvauceli branderi* Pocock, 1943) is one of the two sub-species of the nominate species of the Indian swamp deer (*Cervus duvaucel iduvauceli* Cuvier, 1823). While it is known as the north Indian sub-species, the north-eastern sub-species of this deer, (*Cervus duvauceli ranjitsinhi* Groves, 1985), occurs probably only in the Kaziranga National Park. Each sub-species slightly differs from another morphologically.

This cervid, once widely distributed in central India, is now endemic to the Kanha Tiger Reserve, with its only free-ranging wild population. The species witnessed a steep decline in the population, and was almost on the brink of extinction during the early Seventies. By 1970 only 66 individuals were left in the wild. Extraordinary managerial efforts and strict protection has gradually restored Barasingha population in Kanha to a relatively safer status. Currently, there are around 600 animals in the protected area.

Permission for Translocation :

Such a small population confined in just one protected area of its former extensive range is considered prone to various intrinsic and extrinsic factors, such as - inbreeding, epidemics, ecological and man-made changes in its habitat and natural calamities. In order to overcome the possibility of losing the rarest deer to these eventualities, it was decided to establish a new and geographically separated population of this endangered and endemic cervid outside the Kanha Tiger Reserve.

In 2010 the Chief Wildlife Warden mooted a proposal to transfer a group of 20 barasingha to Satpura tiger reserve, part of the original distributional range of barasingha under a reintroduction programme. The Ministry of Environment and Forests, GoI, granted permission for translocation of 20 barasingha (letter No.1-4/2007/WL-pt-2 dated-4 May 2011) from Kanha tiger reserve to Satpura tiger reserve but later the permission was put on hold by another letter dated 30.11.2011. Meanwhile the State Forest Research Institute and Wildlife Institute of India carried a Population and Habitat Suitability study in Satpura and selected



Bori range for reintroduction. A soft release enclosure was erected. After about a lapse of 3 years, on 3rd January 2014 the technical committee of NTCA permitted translocation of 5 Barasingha (2 male and 3 female) to Van Vihar National Park. The permission granted by the Authority on 03.01.2014 with two conditions - the first condition was to involve the Wildlife Institute of India, Dehradun in the entire process and the second was to use chemical immobilization technique to capture swamp deer. Accordingly the Wildlife Institute of India, Dehradun was involved in the process.

The Field Director Kanha Tiger reserve was deputed to prepare and submit a detailed protocol for the pre-capture preparation, capture operation, transportation and release of these animals into the Van Vihar National Park. The protocol was duly approved by the Chief Wildlife Warden after necessary modifications.

As over last 3 years the wildlife wing of Madhya Pradesh has been actively practicing non-invasive capture and translocation of chital, therefore the general consensus was to use this technique instead of chemical capture as earlier experience with barasingha captured using narcotic and non-narcotic drugs have been unsuccessful as each operation entailed heavy mortality. The field team in Kanha, too, had reservations on the use of chemical immobilization technique in swamp deer capture as there are no fool-proof drugs or protocol for chemical immobilization swamp deer, besides the field personnel of Kanha Tiger Reserve and Van Vihar National Park were experienced and confident in non-invasive physical capture technique.

This issue was raised with the member secretary NTCA on 13.7.2014 in a meeting at Bhopal. He was requested to permit the use non-invasive capture technique for capture of 5 barasingha. He was apprised of the fact that in Madhya Pradesh this method has been successfully deployed to capture and translocate chital and that this technique was safe as possibility of causing stress and subsequent death due to capture myopathy would be minimal. Member Secretary NTCA accorded his verbal consent to use of non-invasive technique. The Minutes of this meeting was dispatched to NTCA.

Objectives :

1. The chief objective of the introduction of the hard ground barasingha into the Van Vihar National Park (VVNP), Bhopal is to establish a gene pool of this endangered and endemic cervid outside the Kanha Tiger Reserve and create a resource for repopulating suitable and protected habitats existing in its former range of distribution. This is envisaged to be done at Van Vihar through a long term conservation breeding programme.
2. Spreading Conservation Awareness - Van Vihar, that is visited by around 5 lakh people annually, offers a huge opportunity for spreading conservation awareness about this highly endangered subspecies
3. This exercise had also been conceived with the view to standardize the exhaustive capture and translocation protocol for reintroduction of swamp deer to Satpura Tiger Reserve to establish a geographically separated population.



Selection of Release Site:

Located in the heart of Bhopal, the state capital, the Van Vihar National Park is spread over a small area of 445.21 ha. The protected area is a classic example of a combination of in-situ and ex-situ conservation activities for the representative central Indian wild fauna. The Central Zoo Authority has also recognized this National Park as zoo on 24-11-1994. The landscape consists of hills and plains and contains several manmade water bodies besides the huge Bhoj wetland along its north, west and south boundary. Van Vihar has a wide range of wild animals, with free-ranging herbivores. They include sambar, chital, nilgai, blackbuck, langur, wild pigs, porcupine and peafowl etc. Carnivores like tigers, lions, leopards, sloth bears and hyena are kept in the enclosures. Besides gharial, crocodile and tortoises, different species of snakes are also conserved in the National Park.

It was decided that initially the barasingha will be released in a section of Van Vihar national park that more or less represents and simulates the habitat of free ranging barasingha. Once the population increases, the new generation may be made fully free ranging in Van Vihar national park. This satellite population will act as an insurance to deal with eventuality such as epidemics and natural calamity.

A rapid ocular survey was carried out to select a possible site for erecting a conservation breeding enclosure for Barasingha. A suitable site of 7 hectare was identified within the grassland which has a manmade waterbody and a variety of palatable grasses along with tuft forming tall grasses like sacchrum and vetiveria .A survey was carried out to assess the availability of grasses and hydrophytes preferred by barasingha.

Some of the preferred grasses and aquatic plants available in Van Vihar National Park are as follows-

Grasses:

No.	Botanical name	Local Name	Family
1	Apluda mutica	Phuli	Poaceae
2	Bothriochloa pertusa	Kail	
3	Bothriochloa intermedia	Kail	
4	Coix lachryma	Garu	
5	Cynodon dactylon	Doob	
6	Cenchrus ciliaris	Anjan	
7	Echinochloa colonum	Sama	
8	Eragrostis biferia	Bhurbhus	
9	Eragrostis tenella	Bhurbhus	



10	Eragrostis nioloides	Bhurbhus	
11	Eragrostis tinifolia	Bhurbhus	
12	Heteropogon contortus	Kusla/ sukla/ lampa	
13	Hygrorhiza asiatica	No local name	
14	Imperata cylindrica	Dabh	
15	Iseilima prostratum	Mushel	
16	Leersia hexandra	Jangali Dhan	
17	Oplismenus compositus	No local name	
18	Paspallum sanguinale	Takri	
19	Saccharum spontaneum	Kans	
20	Sehima sulcatum	Paonia	
21	Setaria glauca	Bandhari grass	
22	Setaria tomentosa	Bandhari grass	
23	Themeda quadrivalvis	Gunaiya	
24	Themedat riandra	Gunaiya	
25	Vetiveria zizanoides	Khus/ Urai	

Aquatic Plants :

No.	Name of the plants	Family
1	Ceratophyllum demursum	Ceratophyllaceae
2	Chara aspera	Characeae
3	Eleocharis dulcis	Cyperaceae
4	Eriocaulom achiton	Eriocaulaceae
5	Eriocaulom quinquangulne	Eriocaulaceae
6	Hydrilla verticillate	Hydrocharitaceae
7	Nymphaea stellata	Nymphaeaceae
8	Polygonum glabrum	Polygonaceae
9	Potamogeton nodosus	Potamogetonaceae



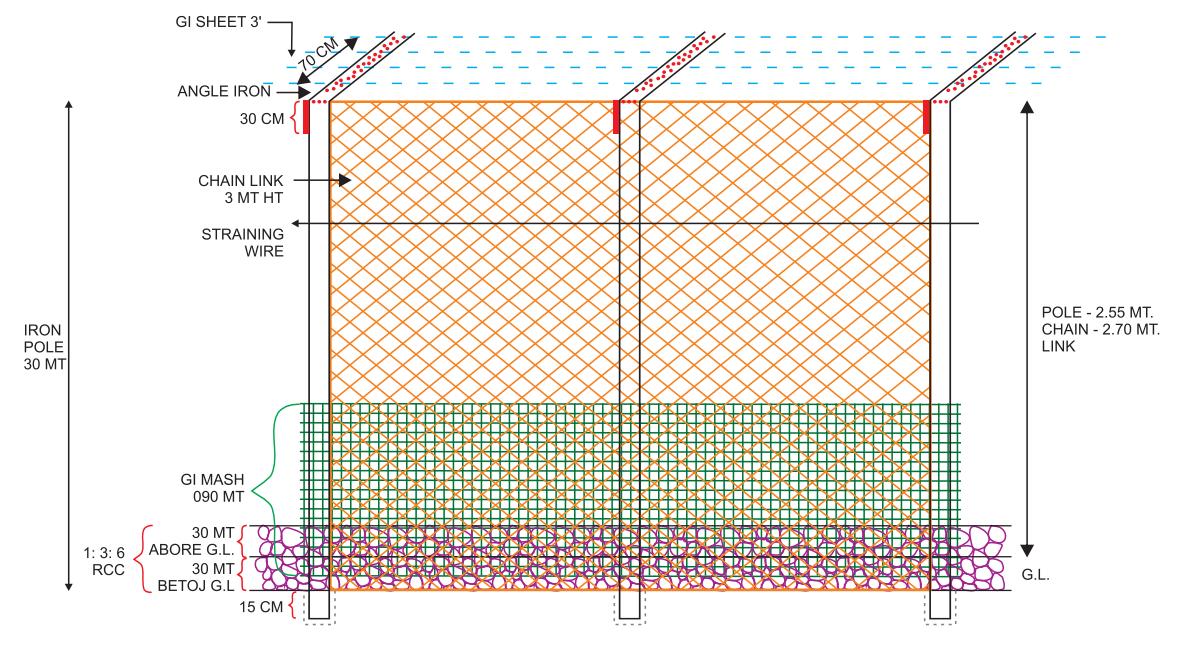
Erection of Conservation Breeding Enclosure:

The total area of the enclosure constructed for the animals was around 7 ha. The habitat within the enclosure covers all the basic requirements of food, swamp and wallows for hard ground barasingha, and has sufficient space for their movement. The perennial water body had around 2 hectare area of submergence. The depth of water varies from 1 to 6 feet to enable the animals feed on aquatic plants in shoulder deep water. To maintain a continuous supply of water in the pool two pipelines have been laid to supply water from tube-wells using solar pumps. The enclosure has groves of shade trees for the animals to take rest in hot weather.



Conservation Breeding Enclosure at Van Vihar National Park

FENCING DESIGN FOR BARASINGHA ENCLOSURE





The design of the barasingha enclosure makes it carnivore as well as pig, porcupine and python proof. The purpose of making the fence pig and porcupine proof was to prevent tunnels being formed under the fence and creating breaches that may be used by predators to gain access into the enclosure. The details of the design of the barasingha enclosure constructed at the Van Vihar National Park were as under:

Height of GI Pipe	Measurement	Height of GI Mesh	Measurement
Height	4.50 mt.	Height	1.5 mt.
Below GL	30 cm.	Below GL	30 cm.
GL to upwads	4.20 mt.	Above GL	1.20 mt.
Height of Chain Link	Measurement	Square of GI Mash	1 x 1 cm.
Height	4 mt.	Length of Angle Iron	Measurement
Below GL	30 cm.	Total Length	75 mt.
GL to upwards	3.70 mt.	Inside GI Pipe	30 cm.
Square of chain link	5 x 5 cm.	Above GI Pipe (at 45° angle)	45 cm.

The enclosure consisted of 4.15 mt. (3.7 mt. + 0.45 mt.) high fence with the following features:

- 5 cm. X 5 cm. chain-link was placed 30 cm. deep in the ground to prevent the intrusion of porcupines.
- Another mesh of 1 x 1 cm. size was also placed with chain link fence to keep out pythons and venomous snakes. This fence was also restricted the unnecessary intrusion of wild pigs which dig out root stocks of abundant Saccharum and Vetiveria inside the enclosure. This mesh was 1.2 mt. above the ground level
- Inclined fencing at 3.7 mt. level with 45° inclination to prevent intrusions of leopards was in place. At this height, 1 mt. width steel plate was also used for the same purpose.
- An off-load ramp was also prepared to support the translocation truck and facilitate easy exit/ release of these animals.



Plan of Operation:

The entire plan of field preparations, training of personnel, capture, and ultimate release into the Van Vihar National Park included the following:

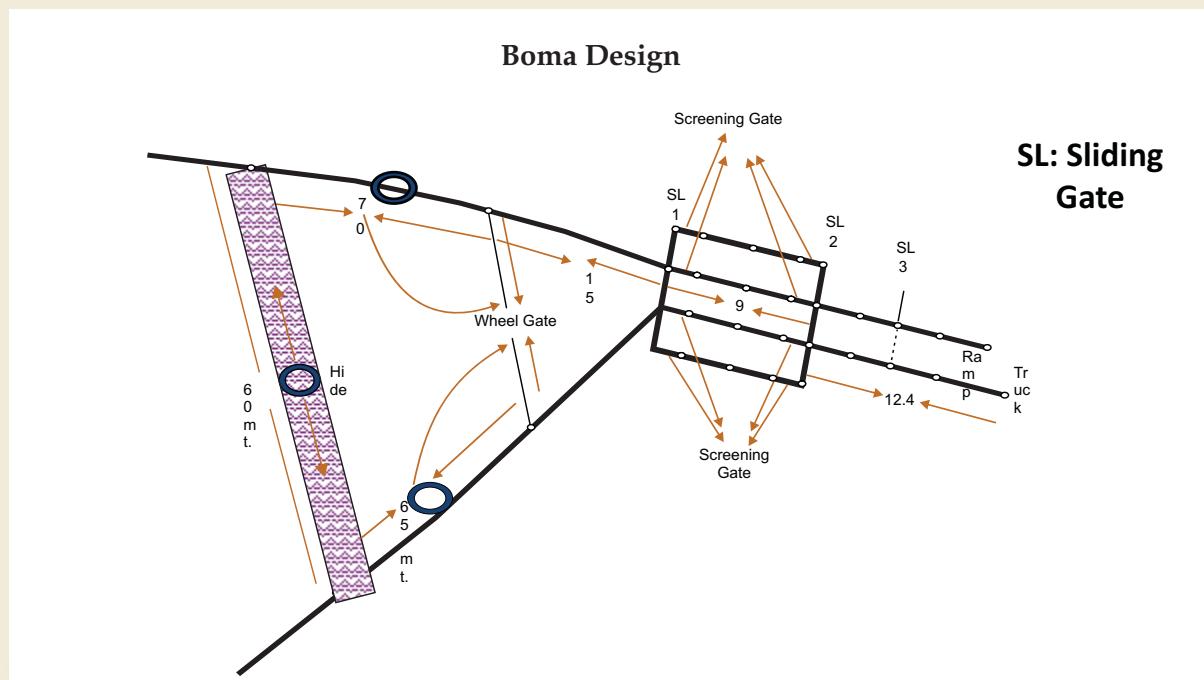
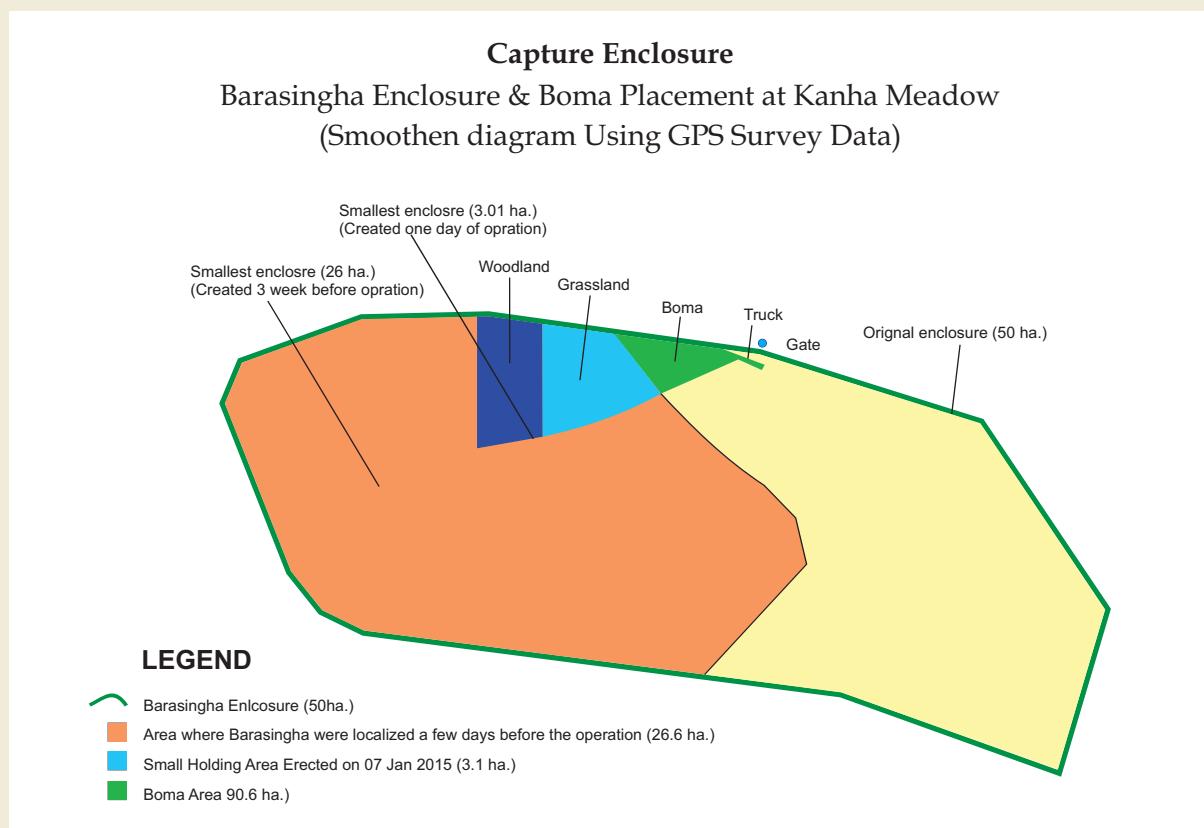
- **Review Meetings :** These meetings were held on 11.02.2014 and 05.07.2014 at Bhopal to review preparations and discuss modalities of the entire barasingha introduction programme. The meeting was chaired by Shri Narendra Kumar, IFS, Principal Chief Conservator of Forests & Chief Wildlife Warden, Madhya Pradesh and attended by Shri Jitendra Agrawal, IFS and Dr. Suhas Kumar, IFS, Addl. Principal Chief Conservators of Forests (Wildlife), Shri JS Chauhan, Field Director, Kanha Tiger Reserve, Dr. K Ramesh, Scientist, Wildlife Institute of India, Dehradun and Dr. Sudesh Waghmare, Assistant Director, Van Vihar National Park. It was agreed at the meeting that without standardizing the drugs and doses it would not be wise to go for chemical immobilization of the swamp deer, rather it would be much more feasible to opt for the non-invasive capture technique that had been tried and tested in case of chital and release in Kanha Tiger Reserve and Van Vihar National Park.
- **Health Screening of Barasingha :** The Centre of Wildlife Forensic and Health, Jabalpur carried out the health screening of barasingha kept in Kanha enclosure. The centre also did the analysis of water sample from the pond in the release enclosure at Van Vihar.
- **Meeting on the Proposed Protocol :** The meeting was held on 25.11.2014 at the Centre for Wildlife Forensic and Health, Jabalpur to discuss the detailed protocol and the pros and cons of different capture methods. It was decided to adopt the passive capture technique as the first option and administer tranquilizing drugs only if the animals are physically handled. Besides, the Field Director of Kanha Tiger Reserve and Wildlife Veterinarians of Kanha, Pench and Van Vihar, Dr. Parag Nigam, Senior Scientist, Wildlife Institute of India, Dehradun, Dr. AB Shrivastava, Director, Centre for Wildlife Forensic and Health, Jabalpur and his team of veterinarians.
- **Site of Capture :** As it had already been decided that the Option-I (without immobilization), as mentioned in the protocol, would be employed to capture these animals, the barasingha enclosure at Kanha was found to be the best site for the capture operation. The in-situ enclosure of around 50 hectare had 23 animals of different age and sex classes, and it was considered operationally feasible to capture target animals from this population.
- **Time of Capture/Translocation :** At the above meetings it was decided that the capture operation would be carried out in the peak winter season. The choice of season facilitated better operational conditions for the staff in the field and easier transportation of the captured animals. Besides, in the peak breeding season there would be no confusion regarding the status of encumbered females with fawns. The identification of the status of conceived females would have been very difficult during any other period.



- **Assembling of a Capture Boma :** Inside the barasingha enclosure, close to the main gate, a capture boma had already been assembled by the Kanha Management by the 2nd week of December, 2014. The capture boma consisted of a wide funnel tapering into an animal selection-cum-loading chute. The main structure of the boma proposed in this case consisted of steel sections but the wings of the funnel were extended with the help of chain link fencing covered with mats of bamboo and grasses. Both ends of the funnel remained open and plastic sheet curtain were used for closing the end remained folded. To make the entrance more natural and to lure the animals toward the ramp and eventually to the vehicle. The seeds of wheat and gram were broadcast all over the flor of the loading ramp.

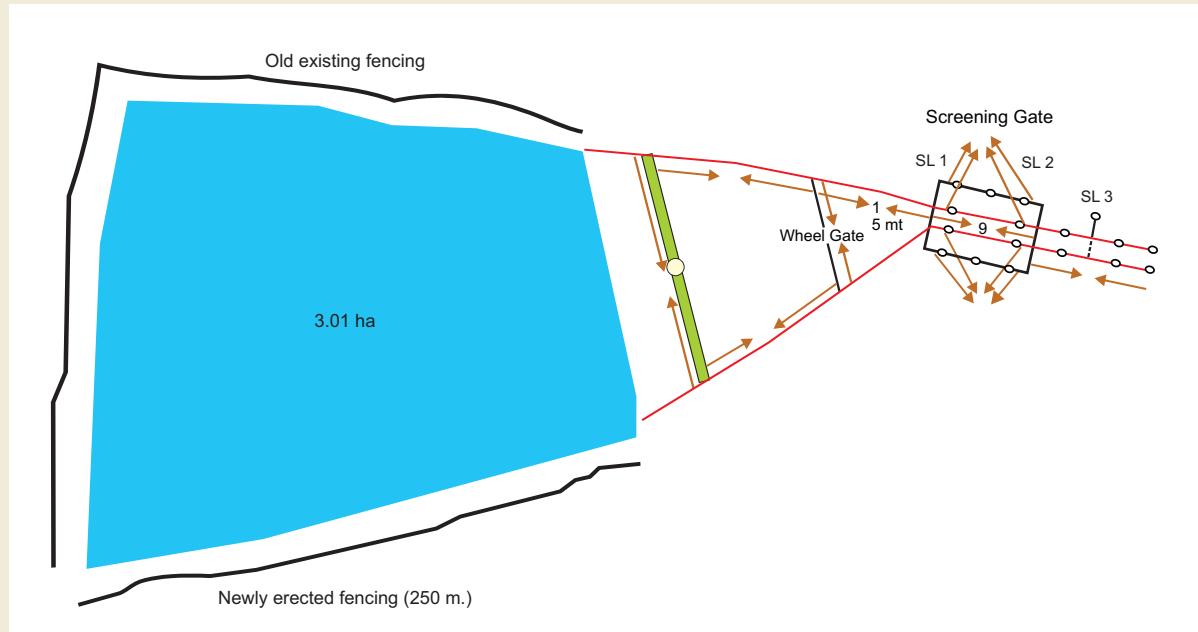


Loading ramp being assembled





Boma with Newly Erected Fence (Total Area 3.6 Ha.)



Loading ramp

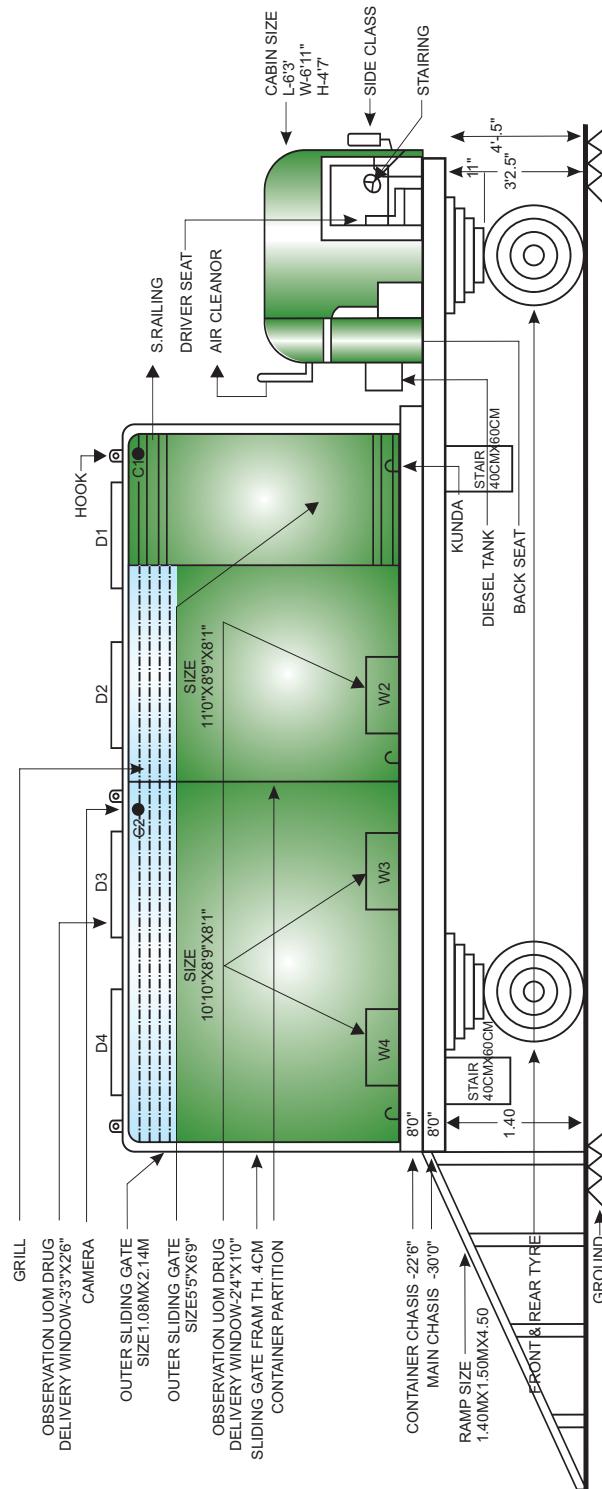


The capture boma was made of steel sections 2.5 m. high by 3 m. long made out of 50 mm. x 75 mm. x 3 mm. rectangular hollow tubes. 1.5 m. of the steel section was of solid 2 mm. pressed steel plate. Each steel section had a total height of 2.5 m., with three verticals at 750 mm. (50 mm. x 50 mm. x 3 mm.) intervals and one horizontal at 1.5 m. (50 mm. x 50 mm. x 3 mm.). A 1 m. expanded metal mesh above the steel section was welded to the front of the frame above the solid steel, with the smooth section facing inside the boma. This included 6 mm. flat bar brackets with 30 mm. holes reinforced with 6 mm. gusset welding at 300 mm. from the top and bottom of the frame on the left hand side at 400 mm. from the top and bottom of the frame on the right hand side. The connecting bolts were made of 25 mm. round bars, 300 mm. long and tapered on one end. Approximately 30 sections were used in the boma.

- **Sliding Gates :** Three sliding gates 1.5 m. wide sliding on a 3 m. rail and 2.5 m. high were part of the boma. The gates were made of 50 mm. x 50 mm. hollow square tubes with three rollers. The gates were made of solid 2 mm. pressed steel. They were provided with locks that could be operated from outside. A provision was made for fitting a solid shade cloth above the gate height as the rest of the boma. Provision was made for the walkways to be attached to a few steel sections 300 mm. wide and extending along the entire length of the section, 1.5 m. thick and 2 m. high. This was done to facilitate the loading of animals into the truck.
- **Design of Transport Truck :** Transportation trucks and containers were designed according to the animals needs. The design was based on the specifications used in South Africa. The details are provided below:
 - Standard container had a length of 6.7 m ±.
 - Roof of the container: minimum internal height of 2.2 m.
 - Two external doors, one on the right rear side and one on the front right side of the front compartment
 - Doors 1.2 m. wide suspended from a 2.4 m. rail with rubber stoppers to prevent over-opening or over-closing
 - Each door provided with a U-shaped locking mechanism
 - Each door suspended by two 500 kg. (minimum) rollers
 - Bottom of each door ran behind a 6 mm. steel flat bar
 - 'D' rubber attached below each door, extending beyond the opening
 - Four hatches provided at the centre of the roof, 75 cm. wide
 - Hatches raised and made waterproof
 - Latches to lock the hatches open
 - One adjustable partition with sliding door in each compartment



CAPTURE BOMA VEHICLE ELEVATION/SECTION NO DRIVER SIDE MAP



RIGHT SIDE VIEW



- Sliding door of central compartment operated from outside
- All sliding doors 1.2 m. wide, made of solid steel
- Four side hatches, 30 cm. x 70 cm., on both sides (specially whether four hatches on each side or two hatches on each side) just above the base of the wall; front right compartment alone with only one hatch to facilitate the opening of the sliding door
- Lower container wall with 4 mm. gap to allow free flow of urine
- Floor of solid checkered steel plate with 100 sq. cm. grids made of round iron bars
- Outer surface of the roof painted white and with anti-skid surface (sprinkle sand on wet paint) applied
- Roof tapered by 5 cm. from raised centre to side walls
- Monitoring of animals inside the transportation truck was improvised by installing CCTV cameras inside the truck with the monitor in the driver's cabin.
- Hollow tube (50 mm.) welded between verticals to form a ladder to climb onto the roof
- Mechanical louvers (75 cm.) along both sides

Field Preparation and Mock Drill :

A mock drill exercise was conducted on 04.01.2015. In this exercise all the field staff was briefed about the actual plan of operation and duty of each staff was assigned for proper implementation. A drill was conducted to achieve synchronization of the timing of closing of all the gates of boma was carried out. The first gate of boma was named as the curtain gate which was of 60 m. width, and was divided at centre in two equal parts. Two persons were assigned the job of closing the curtains as soon as the animals crossed the curtain gate. The curtain was attached to the wire string with metal rings to ensure smooth and fast closure. A grass hut was erected at the middle of the curtain as a hide for the staff. The wheel gate, part of the boma, 12 m. and 3 m. high, was also manned by two persons. They also underwent the mock drill to shut the wheel gate as soon as the animals entered the boma. Persons were also trained to shut the three sliding gates, one by one, as soon as the animals moved ahead and crossed these gates. Four persons were deployed in the segregation unit of the boma to select the animals of desired sex and age. Another two persons were deployed at the back door and the compartment sliding door of the transportation truck to shut them accordingly. All these persons were guided by a person standing on a makeshift control tower erected on a nearby large tree. The person was equipped with a binocular and hand set. All deployed persons were provided with a wireless handset and they were instructed to keep the volume of the handset at a minimum possible level. It was also instructed that all the handsets must be tuned to an assigned channel so as to avoid any interruption by other wireless communications. The staff was also instructed not to make any noise. The staff was also instructed to drink minimal amount of liquid and use wash facilities before the operation. The members were instructed to avoid any perfume, cosmetics etc. Six persons were kept in reserve for any eventuality.



- **Inspection of Capture Boma and Preparedness Review Meeting before Actual Field Operation :** Dr. Suhas Kumar, Addl. PCCF (Wildlife), Madhya Pradesh, the overall in-charge (Task Leader) of the barasingha capture and translocation inspected the Capture Boma and enclosure in the afternoon of 6.1.2015 along with the Field Director Kanha, Wildlife Vet, Van Vihar National Park, Shri Shubharanjan Sen, IFS, Senior Scientist from the WII, Dehradun, and Dr. AB Shrivastava, Director, CWFH, Jabalpur. The inspection revealed that though the barasingha were confined in a smaller enclosure than before, the size of present enclosure still was very large (26 hectare). A decision was taken then to create a further smaller enclosure of 3-4 hectare by using a portion of the exiting fence created some time back for separation of Chital and drive at least 10 to 12 barasingha into smaller enclosure early morning the next day. We felt that keeping animals localized in small area would allow easy maneuverability and would keep the animals confined and secure in a small area for repeated attempts, if necessary. After the field inspection the team met at upper cabin at Kanha and discussed the minutest details of actual field operations and transportation. It was an open and wide ranging discussion that covered all pros and cons of this delicate and important task.



6.1.2015, Inspection of capture boma



The main outcomes of the discussion were as follows:

- To keep the animal in the smallest possible area, a chain-link fence should be erected at the outside area of curtain gate and covered with green mesh. This would ensure that once the animal entered into this area they could not return to the big enclosure.
- To ensure the safety of the staff, they were instructed to wear helmets, safety jackets and protective shield.
- Starting time of operation was fixed at 6.30 am.
- It was also planned that the team of personnel that often entered the enclosure and were well acquainted with behavior of barasingha would enter first and quietly steer the animals towards the boma. Once the animal entered inside the newly fenced area the team would swiftly close the opening with mesh-wire and cover it with green mesh.
- Once the fence was closed, the team would come out quietly and for the next two hours nobody would enter the enclosure to allow the animals calm down.
- After two hours, the team would enter the newly fenced area and start walking towards the narrow end of the boma. It was expected that this maneuver would compel the animals to slowly move towards the narrow end of the boma and into the loading ramp.
- To ensure safe transportation it was decided to alert all Chief Conservators and District Forest Officers en-route before commencing the journey from the capture site. This would help cutting down delays at toll stations, check barriers and crowded areas.

Actual Field Operation:

On 7th January, 2015 the operation started sharp at 6.30 am, and went through the following sequence:

- A team of 6 persons, well acquainted with the barasingha enclosure and familiar with its behaviour, led by Shri Jodha Singh Baiga, entered the barasingha enclosure. This team gently ushered a group of 10 barasingha into the newly fenced smaller enclosure (3.1 hectare); 3 chital also came in along with this herd. This area was now closed by a chain-link fence, covered with green-mesh. All animals were thus confined in this area. A break of two hours was announced to give enough time to the animals to calm down.



7.1.2015, 6.10 A.M. haka team getting ready



Briefing before capture operation



Safety briefing



- After the break, a team of 30 persons gently ushered these animals towards the narrow end of the boma. These animals then moved slowly ahead, and crossing the curtain area reached the wheel gate area. During this time, the sudden closer of the wheel gate and the drawing of curtain produced noise; the animals sensing danger, turned back and ran. They jumped over the curtain and dispersed into the woodland.



First attempt- barasingha moving towards loading ramp



Debriefing after failed first attempt

- After this failed attempt, another break of two hour was announced.
- During this break, debriefing was done and shortcomings were listed. Following shortcomings were noticed:
 - i. The smaller enclosure (3.01 hectare) still quite large and required more people for driving the animals gently into the funnel of the Boma. At least 30 more people were needed for the Haka (drive) team.
 - ii. There was lack of synchronization among personnel deputed to close the gates of the boma. It was decided to depute some experienced members of the Van Vihar capture team to close the wheel gates in a synchronized manner.
- Another 31 staff members and watchers brought from Kanha and Kisli were added to the haka team. Before the start of the operation all the team members were briefed again about how the haka (drive) would proceed.



Briefing before second attempt



Haka team proceeding for second attempt

- This time it was decided not to draw the curtain as it was not at all effective, instead it had alarmed the animals during the previous effort.



Haka team herding barasingha

- A chain of 61-member team gently maneuvered the animals towards the narrow end of the boma. This time the animals moved upto the curtain area, but only one animal crossed the gate and ran through the loading ramp into the transportation truck. This animal was shifted and confined in the first compartment of the truck. The rest of the animals dispersed and returned to the woodland. The direction team noticed that the haka team was too slow and were over 50 meters behind when the animal reached the curtain area. This delay on the part of the haka team gave enough time to the herd to turn back after sensing danger, besides the team members were moving in staggered fashion, leaving large open spaces for the animals to run through.



Barasingha herd just before entering the loading ramp

- Before commencing the third attempt the haka team was instructed to form an impenetrable chain and walk together in a synchronized manner. They were also instructed to increase their pace and make some noise as soon as the animals left the woodland and entered the grass land, this instruction was followed meticulously by the haka team.
- As the animals crossed the wheel gate, it was quickly closed. The animals kept moving, and all the sliding gates were closed one by one. All these animals ultimately entered the transportation truck, and the back door of the truck was closed.
- In the third attempt, 7 barasingha (3 males and 4 females) and 3 chital were captured in the transportation truck.



Inspection after successful capture

The health status of all the 10 animals was monitored by the wildlife vets and found satisfactory. As the animals were physically and emotionally found fit no sedative was administered.



Barasingha inside transportation truck



The capture team

- The solitary animal in the first compartment was freed by opening the compartment gate so that all the animals may stay close together during the transportation.
- Four small water containers (tagadi) were slipped into the transportation truck through the side windows.
- The transportation truck started from Kanha for Bhopal at around 1.30 pm., and the two CCTV cameras fitted inside the truck were switched on.

Assessment of physical and emotional status of the animals:

The team of wildlife veterinarians observed the animals through the observation windows and reported that they were a little restless but otherwise in good condition. Though the technique and skills were available with the team to release the extra animals, the wildlife vets advised against it as it could have caused stress to the animals and resulted in subsequent capture myopathy.

After an hour, the animals were again observed by the vets at Kisli, who found them fit for transportation.

Transportation:

The following precautions were observed throughout the transportation up to Van Vihar National Park:

- The transportation truck was piloted by a vehicle with a team of officers to ensure safe and smooth passage of the captured animals.
- The transportation truck was also followed by two vehicles with wildlife veterinarians and support teams from Kanha Tiger Reserve and Van Vihar National Park.



- The animals were monitored through a CCTV screen by a wildlife veterinarian seated in the transportation truck.
- Every two hours, each animal was observed by accompanying wildlife veterinarians through side windows for any sign of indisposition.
- Throughout the translocation journey, local forest officers of the respective forest circles piloted and guided the transportation truck through easier routes and by-passes to avoid traffic rush and any untoward road mishaps.
- Throughout the journey, the engine of the transportation truck was kept running even at brief stops so as to create a feeling of continuous traveling and avoid disturbance to animals.
- The entire translocation team was provided with packed lunch and dinner by local forest officers to avoid delay in the translocation.
- All the officers of the Kanha Tiger Reserve, Seoni, Chhindwara, Hoshangabad, Bhopal circles and Van Vihar were in constant touch on cell phone throughout the translocation period.
- The transportation truck reached Van Vihar National Park at around 6.30 am on the 08.01.2015. The translocation took around 17 hours and covered a distance of around 530 kms.
- During transportation at one point it was felt that the transportation truck could reach the release site well before time at the night itself, so it was decided to further slow down the speed of the convoy so that they could make it around 6 am.



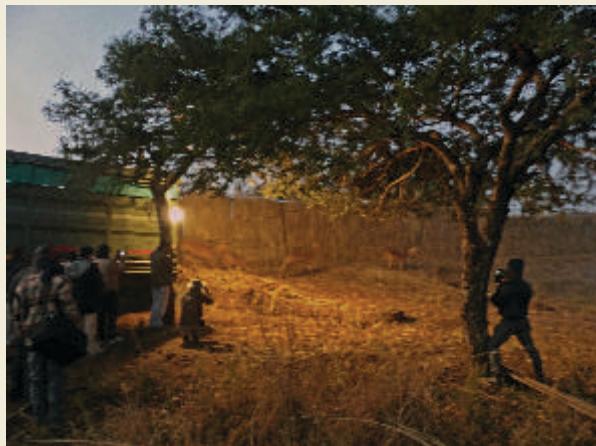
Second health status monitoring at Kisli



Release of Animals:

All the senior officers of the wildlife wing of Madhya Pradesh, including Shri Narendra Kumar, IFS, Principal Chief Conservator of Forests (Wildlife), Shri Jitendra Agrawal, IFS and Dr. Suhas Kumar, IFS, Addl. Principal Chief Conservators of Forests (Wildlife), and local officers of the Van Vihar National Park were present to oversee the release operation.

- A well-camouflaged off-load ramp had already been constructed inside the barasingha enclosure to facilitate safe the release of the animals.
- The halogen lights (placed behind the truck) were switched on to monitor the release of animals into the enclosure.
- The backdoor of the transportation truck was opened and the sides of the truck were slightly thumped to move these animals outside.
- All the animals ran out into the enclosure with agility and alertness and vanished behind tall grasses.
- The visual barriers were created with thatch all along the mesh-wire fence of the release enclosure to avoid any accident, and observation towers were also erected for monitoring the released animals.
- A detailed monitoring protocol has been prepared and duties have been assigned.



8.1.2015, 6.30 A.M. Release operation at Van Vihar



Barasingha in their new home



Documentation:

The entire capture and release operation was photographed and videographed. A detailed report is in your hand.

In this way the entire barasingha capture and translocation programme was completed successfully.

Summary of Capture Operation

- Step -1 Two Planning meetings at headquarter and third at Centre for Wildlife Forensic and Health, Jabalpur.
- Step - II Confinement and acclimatization within an enclosure in natural habitat at Kanha.
- Step-III- Barasingha Transferred from 50 hectare enclosure to a 26 hectare enclosure. Creation of Boma attached to a specially designed truck for wild animal translocation .Teams for various operations constituted by FD, Kanha Tiger Reserve.
- Step IV- Capture operation was planned between 6 to 10 January. Teams of officers and staff were constituted for smallest of tasks involved. Experts from Wildlife Institute and Centre for Wildlife Forensic and Health, and the capture team from Van Vihar were asked to report by the evening of 5th January. APCCF (wildlife) arrived in the morning of 6th January.
 - 6.1.2015 - The entire team inspected the Boma in the afternoon.
 - It was found that based on the decision taken in the meeting at Jabalpur on 25.11.2015. The animals were confined in a smaller enclosure but still the size of enclosure was a huge 26 hectare. A decision was taken on the spot to further reduce the size of the enclosure to 3-4 hectare and drive at least 10-15 barasingha into the smallest enclosure. The transportation truck was inspected. The ventilator curtains were found damaged, they were replaced the same evening.
 - A detailed operational plan was discussed in the evening in a meeting of all team leaders at upper cabin in Kanha. Minutest details involved in capture, health assessment, and preparedness of the team of vets for any eventuality and transportation plan were discussed and decisions were taken on the spot.
- Step -V 7-1.2014 – operation began at 6.30 A.M. A small team of individuals led by RO Kanha and the enclosure watcher set out to herd a group of barasingha into the smaller enclosure. After an hour 10 barasingha were herded into the new enclosure and it took another one hour to close the area with mesh wire fence.
 - Attempt I - At 10 A.M. the haka began Curtain was found ineffective hence a decision was taken to not to use curtain.
 - Debriefing –revealed the causes of failure – large area, less number of people, failure to close the gates in time.
 - 2 hour recess. Reassembly by 11.30 A.M.
 - Attempt -II Reassembling, deployment of 30 more people brought from Kanha and Kisli. Briefing of the team to close the gate in a synchronized manner; the team from Van vihar was also deployed.
 - One male was captured and shifted to the inner compartment; the inner sliding door was closed.
 - Reason for failure was analyzed- haka team was slow, this gave enough time to the herd to turn back after sensing danger, the team members were moving in staggered manner hence space was available for barasingha to escape.
 - Attempt III- The haka team was instructed to form a human chain and walk together in a synchronized manner and as soon as the animals left the woodland and got into the grassland increase their pace and make some noise. This worked very well and the barasingha ran and entered the boma chute, gates were closed.By 12.30 PM the capture operation was over. Starting the engine, and keeping it running is critical as it has a calming effect on animals.



Monitoring of the Released Animals:

- Protocol for monitoring of the released animals and habitat within the enclosure:
- The perennial water body inside the in-situ enclosure needs to be maintained throughout the year.
- Assessment of water quality of the water from the ponds inside the release enclosure should be carried out periodically and more frequently in the summer season.
- The availability of palatable species of aquatic plants has to be ensured in the water body throughout the year.
- Availability of grass should be closely watched, and, if possible, eradication of weed species must be undertaken periodically in such a way that it causes minimum disturbance to the animals.
- Providing saltlick within the enclosure will be essential.
- The enclosure should be frequently inspected and repaired, if needed, to ensure it always remains predator proof.
- Some observation towers or platforms at suitable vantage point should be built for monitoring the animals with the aid of binoculars.
- Observations should be recorded in prescribed formats.
- The enclosure should be scanned periodically on foot to ensure that no small carnivore remains trapped inside.
- The wildlife veterinarian of the Van Vihar National Park and his staff will undertake regular health monitoring of the animals daily in the morning and evening for at least the first three months of their acclimatization in the new habitat conditions. Besides, their general body conditions should also be monitored at least once in a fortnight under the prescribed format.
- Fecal samples must be collected and analysed at three months for assessment of parasitic load in the released animals.
- Each event of mortality in released animals should be immediately reported and thoroughly investigated and, if needed, help of premier institutes of the Central or State government should be sought.
- Utmost vigil must be kept to protect the area from fire. A fire-line should be maintained all around the enclosure.



Larnings and Caveat:

The methods, tools and strategy that were deployed to successfully capture barasingha, without the aid of drugs and chemicals, are in nascent stage in India. The Boma method commonly used to capture groups of ungulates in Africa is useful but it requires several modifications in the strategy and the design of capture boma. In Africa large open grasslands and huge herds of ungulates allow the practitioners to deploy helicopter or vehicles for driving herds of animals into the boma funnel, this advantage is unavailable in Indian condition. In central India we don't have extensive grasslands and large herd forming ungulates. The methods and strategy detailed in preceding pages is applicable to smaller herd forming animals like chital and barasingha; the same may not be effective for capturing bluebull or gaur. In our situation, the tool for driving the herd into the boma was the 'haka team' and not a helicopter or a vehicle. In Barasingha capture operation the critical task was to confine the animals into smaller area and keep them there till the drive was successful.

The non-invasive method of capture though reduces the chances of animals dying from capture myopathy but there is always a chance of serious injury to animals while running in high speed through the loading ramp. Besides, these animals may dash and injure the members of the haka team; therefore, all precautions must be taken to ensure safety of the team members as well as the animals. Injury to animals may be avoided by ensuring that the interior of the truck and the metal section of the loading ramp do not have sharp edges or projections. The fencing of the enclosure must be covered at least up to 5' from the ground with thatch or green-mesh. Such operation requires detailed planning, coordinated team effort and immense amount of patience; obviously, there is no room for complacency, despair or fault finding while the operation is on. Briefing and debriefing of teams is critical to the success of operation.



The team after the release operation



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स्थान :

दिनांक :

प्रजाति— वयस्क / अर्धवयस्क / बच्चा, सेक्स—नर / मादा

विभिन्न गतिविधियों पर कितना समय व्यतीत किया गया- (Time spent on each activity)

- डाटा भरने में निम्नलिखित संक्षिप्त शब्दावली का प्रयोग करें—

FE-चरना, ST-जानवर यदि खड़ा हो, MO-चल रहा हो, RE-आराम कर रहा हो, AUG-स्वयं को चाट रहा हो, ALG-अन्य बारासिंधा को चाट रहा हो, DR- पानी पी रहा हो, AB-लड़ने की प्रवृत्ति प्रदर्शित कर रहा हो, SB- समागम करने की तत्परता हो अथवा समागम हो रहा हो, DE-मलत्याग कर रहा हो, UR-मूत्र त्याग कर रहा हो, VO- अलार्म कॉल या रटिंग कॉल दे रहा हो, ALB-पूँछ उठा रहा हो या पैर पटक रहा हो, OS-बारासिंधा नहीं दिख रहे हों



ANNEXURE -2

Health Monitoring data sheet for Barasingha at Van Vihar National Park

Periodicity - Every 15 days

Generalized description and evaluation of different parts of ungulates
(Adapted from Riney et al, 1960)

BODY PART	POINT=0	POINT-1	POINT-2	SCORE
FLANK AREA	Depression barely visible. Flank area outline is indistinct	Flank area slightly concave & outline visible	Depression concave and tucked in	
RIBS	Thoracic surface is smooth and ribs are difficult to see	Ribs are visible but not all can be counted with ease	Ribs prominent with distinct inter-costal depression	
PELVIC GIRDLE	Bony projections of pelvic girdle are barely visible	Pelvic girdle outline slightly visible	Bony projections of pelvic girdle are clearly visible	
VERTEBRAL COLUMN	When seen laterally, it runs smooth without any breaks. Lumbar process visible	Lateral processes of lumbar vertebrae are visible but not prominent	Lateral processes of lumbars very prominent. Dorsal processes of vertebrae seen	
LUMBAR SHELF	No depression in shelf. Appears almost round from behind	Slight depression on either side	Depression deep and concave	
SKIN AND COAT	Smooth and shiny	Skin dry and rough	Haggard appearance, rough and dry	

- Interpretation: 0-4='Good'; 5-7= 'Fair'; 8-10- 'Poor'
- Name- Sign-
- Designation-Various Teams deployed in the Barasingha Capture and



Various Teams deployed in the Barasingha Capture and Translocation Operation

Direction and Logistic team

1. Dr. Suhas Kumar, Addl. PCCF (Wildlife), Madhya Pradesh - Task leader
2. Shri JS Chauhan, Field Director, Kanha Tiger Reserve - Overall coordinator in-charge of the capture operation.
3. Shri OP Tiwari, Deputy Director, Kanha Tiger Reserve
4. Shri Ripu Daman Singh Bhadoria, Deputy Director, Kanha Tiger Reserve
5. Shri RN Tiwari, Park Superintendent, Kanha Tiger Reserve
6. Shri Rajnish Kumar Singh, Assistant Director (Halon), Kanha Tiger Reserve
7. Dr. Rakesh Shukla, Research Officer, Kanha Tiger Reserve

Wildlife Veterinary and Expert Team

1. Dr. AB Shrivastava, Director, Centre for Wildlife Forensic and Health, Jabalpur
2. Dr. Sandip Agrawal, Wildlife Veterinarian, Kanha Tiger Reserve
3. Dr. Atul Gupta, Wildlife Veterinarian, Van Vihar National Park
4. Dr. Nidhi Rajput, Centre for Wildlife Forensic and Health, Jabalpur
5. Shri Subharanjan Sen, IFS, Scientist F, Wildlife Institute of India, Dehradu

Boma management Team

1. Shri Chunnilal Taram, Forest Guard, Mukki-Control Tower In-charge
2. Shri Naval Singh, Daily Wager (TPF), Kisli
3. Shri Nar Singh, Daily Wager (TPF), Kisli
4. Shri Chait Ram, Daily Wager (TPF), Kisli
5. Shri Mahendra Ukey, Daily Wager (TPF), Kisli

6. Shri Nain Singh Saiyam, Daily Wager (TPF), Kisli
7. Shri Chhabbi Das Bairagi, Daily Wager (TPF), Kisli
8. Shri Govind Yadav, Daily Wager (TPF), Kisli
9. Shri Sukkal Singh Markam, Daily Wager (TPF), Kisli
10. Shri Ghanshyam Khairwar, Daily Wager (TPF), Kisli
11. Shri Phool Chand Maravi, Daily Wager (TPF), Sarhi
12. Shri Narbad Yadav, Daily Wager (TPF), Sarhi
13. Shri Tika Ram Yadav, Daily Wager (TPF), Sarhi

Animal Drive Team:

1. Shri SK Pandre, Range Officer, Kanha - Team Leader
2. Shri Jodha Singh Baiga, Daily Wager, Kanha
3. Shri Krishn Kumar Namdeo, Range Officer (Prob.), N. Balaghat (T) Division
4. Shri Raj Kumar Yadav, Range Officer (Prob.), S. Balaghat (T) Division
5. Shri Ravi Kumar Kushwaha, Range Officer (Prob.), S. Balaghat (T) Division
6. Shri DP Sharma, Deputy Range Officer, Van Vihar National Park
7. Shri Rajesh Namdeo, Range Assistant, Van Vihar National Park
8. Shri Kamlesh Chaturvedi, Forest Guard, Van Vihar National Park
9. Shri PL Bhawre, Range Assistant, Kanha
10. Shri Ramesh Rahangdale, Forest Guard, Kanha
11. Shri Raj Kumar Bisen, Forest Guard, Bhapsabehra



12. Shri Amar Singh Parte, Forest Guard, Umarpani
13. Shri Om Prakash Warkade, Forest Guard, Kanhari
14. Shri Santosh Parte, Forest Guard, Ghangarmuda
15. Shri Prem Narayan Padam, Forest Guard, Parsatola
16. Shri Biru Singh Markam, Assistant Mahout, Kanhari
17. Shri Birju Khairwar, Assistant Mahout, Digidola
18. Shri Mangal Yadav, Daily Wager, Kanha
19. Shri Dharam Parte, Daily Wager, Kanha
20. Shri Chaitu, Daily Wager, Kanha
21. Shri Bhaiya Lal Katre, Daily Wager, Kanha
22. Shri Govind, Daily Wager, Kanha
23. Shri Deepak Saiyam, Daily Wager, Kanha
24. Shri Budh Singh, Daily Wager, Kanha
25. Shri Nand Kumar Yadav, Daily Wager, Kanha
26. Shri Rajnish Tiwari, Daily Wager, Kanha
27. Shri Nanhu, Daily Wager, Kanha
28. Shri Pradeep Thakur, Daily Wager, Kanha
29. Shri Om Prakash, Daily Wager (TPF), Kisli
30. Shri Ram Chandra Sarvey, Daily Wager (TPF), Kisli
31. Shri Rewa Ram, Daily Wager (TPF), Kisli
32. Shri Sundar, Daily Wager (TPF), Kisli
33. Shri Tulsi, Daily Wager (TPF), Kisli
34. Shri Samharu Yadav, Daily Wager (TPF), Kisli
35. Shri Jairam Yadam, Daily Wager (KWS), Kisli
36. Shri Radheshyam, Daily Wager (KWS), Kisli
37. Shri Santosh Yadav, Daily Wager (KWS), Kisli
38. Shri Brijesh, Daily Wager (KWS), Kisli
39. Shri Vijay Patle, Daily Wager, Kisli
40. Shri Chandra Kumar Khairwar, Daily Wager, Kisli
41. Shri Dhobi Singh, Daily Wager, Kisli
42. Shri Sukhchain/ Shyam Lal, Daily Wager, Kisli
43. Shri Rajesh Bhagat, Daily Wager, Kisli
44. Shri Sukhchain/ Dhansingh, Daily Wager, Kisli
45. Shri Lalla Yadav, Daily Wager, Kisli
46. Shri Nand Kumar Yadav, Daily Wager (KWS), Kanha
47. Shri Tej Lal, Daily Wager (KWS), Kanha
48. Shri Siya Ram, Daily Wager (KWS), Kanha
49. Shri Dil Singh, Daily Wager (KWS), Kanha
50. Shri Nehru, Daily Wager (KWS), Kanha
51. Shri Santosh Dhurvey, Daily Wager (KWS), Kanha
52. Shri Santosh Bhalavi, Daily Wager (KWS), Kanha
53. Shri Ram Bharosh, Daily Wager (KWS), Kanha
54. Shri Vinod Dongre, Daily Wager (KWS), Kanha
55. Shri Bharat, Daily Wager (KWS), Kanha
56. Shri Ranjit, Daily Wager (KWS), Kanha
57. Shri Uttam Singh Taram, Daily Wager (TPF), Bhaisanghat
58. Shri Kehar Singh Karayat, Daily Wager (TPF), Bhaisanghat
59. Shri Umendra Tembhre, Daily Wager (KWS), Bhaisanghat
60. Shri Mohan Yadav, Daily Wager, Sarhi
61. Shri Neel Kanth Yadav, Daily Wager (TPF), Sarhi



Transport team :

1. Shri Rajnish Kumar Singh, Asst. Dir. Kanha Tiger Reserve -Team Leader
2. Dr. Sandip Agrawal, Wildlife Veterinarian, Kanha Tiger Reserve
3. Dr. Atul Gupta, Wildlife Veterinarian, Van Vihar National Park
4. Shri S.K. Pandre, Range Officer, Kanha
5. Shri D.P. Sharma, Deputy Range Officer, Van Vihar National Park
6. Shri Rajesh Namdeo, Range Assistant, Van Vihar National Park
7. Shri Kamlesh Chaturvedi, Forest Guard, Van Vihar National Park
8. Shri Sita Ram Dhangar, Daily Wager, Kanha - Compounder
9. Shri Devi Das, Driver, Van Vihar National Park - Main Driver, Transport Truck
10. Shri Santosh Thakur, Daily Wager, Bhaisanghat- Standby Driver, Transport Truck
11. Shri Dinesh, Daily Wager, Mukki - Driver
12. Shri Satyam Singh Thakur Kanha - Driver

Ancillary Support Team:

1. Shri Chinteshwar Yede, Computer Operator, Kanha - Office Support
2. Shri Sandeep Singore, Computer Operator, Kisli - Videographer
3. Shri Anil Patle, Computer Operator, Kisli - Still Photograph
4. Shri Gajendra Johar, Daily Wager (KWS), Kanha - Food & Water

5. Shri Sadok Nand, Daily Wager (KWS), Kanha - Food & Water
6. Shri Arvindra Chaturvedi, Daily Wager (KWS), Kanha - Food & Water
7. Shri Rakesh/ Sukhlal, Daily Wager (KWS), Kanha - Food & Water
8. Shri Dhan Singh, Daily Wager (KWS), Kanha - Food & Water
9. Shri Bramha Nand, Daily Wager (KWS), Kanha - Food & Water
10. Shri Khushi Ram Bisen, Daily Wager (KWS), Khapa - Arrangement of Equipments

Release Site Selection team and Conservation Breeding Enclosure Design Team:

1. Dr. Suhas Kumar, Addl. PCCF (Wildlife)
2. Shri B.P.S Parihar, Director Van Vihar
3. Shri Sudesh Waghmare

Release Operation team -

1. Shri P.K. Ghai
2. Shri Tarun Kourav
3. Shri Sanjay Pathak
4. Shri K.L. Agrawal
5. Shri K.B.S. Parihar
6. Shri Surendra Gawahde

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