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RHINO TRANSLOCATION REPORT

1991

From
Royal Chitwan National Park
to
Royal Bardia National Park

Submitted by:

The King Mahendra Trust for Nature Conservation

Prepared by:

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Program Officer

RHINO TRANSLOCATION REPORT

1991

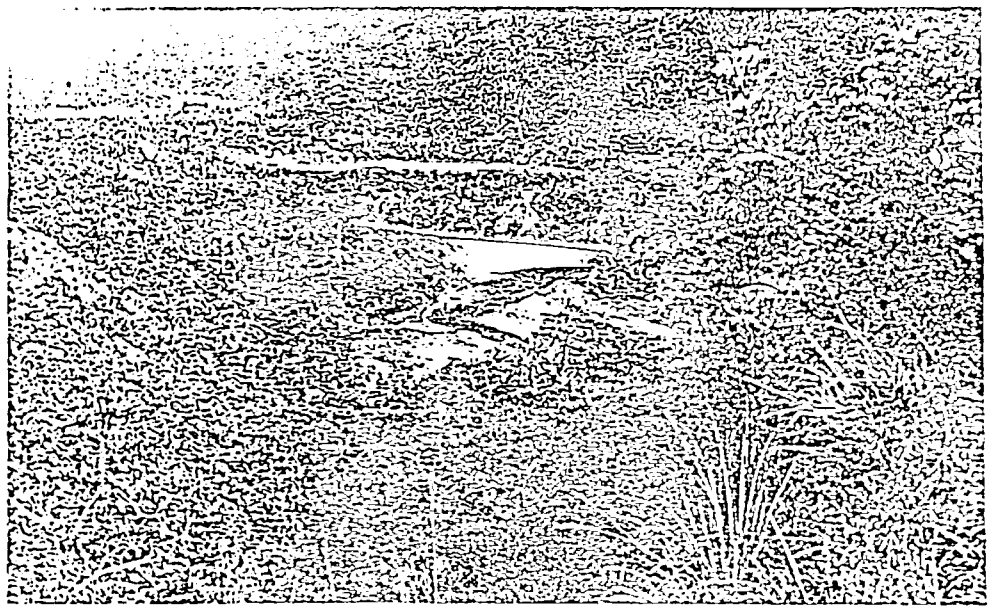
Grant No. 6701

Content

TRANSLOCATION OF THE GREATER ONE-HORNED RHINOCEROS from THE ROYAL CHITWAN NATIONAL PARK to THE ROYAL BARDIA NATIONAL PARK (January 15 to February 19, 1991)

A mutual conservation effort of:

The King Mahendra Trust for Nature Conservation
Nepal Conservation Research and Training Center
Department of National Parks and Wildlife Conservation
World Wildlife Fund - USA
Fort Worth Zoological Society - Texas.



The Babai Valley in the Royal Bardia National Park

INTRODUCTION:

In accordance with the Grant Agreement # 6701, dated December 14, 1991, between the World Wildlife Fund (WWF) and the King Mahendra Trust for Nature Conservation (KMTNC), this is the first "Progress report" and a "Interim financial report" for the period December 14, 1990 through March 31, 1991.

The report highlights the activities carried out by the Trust during this period and the financial statement for the period follows the activity report.

BACKGROUND:

The Royal Bardia National Park (RBNP) contained Greater One-Horned Rhinoceros (Rhinoceros unicornis) until about 200 years ago. Efforts to restore this population, using individuals from the expanding population in the Royal Chitwan National Park (RCNP) had been under consideration by the King Mahendra Trust for Nature Conservation (KMTNC) and the Department of National Parks and Wildlife Conservation (DNPWC).

In 1986, KMTNC, DNPWC and World Wildlife Fund - US carried out a successful translocation of rhinoceros from RCNP to RBNP, which earned Nepal the admiration of conservationist worldwide. A total of 13 individuals were translocated to the western border of RBNP, about 10 km north of the park headquarters at Thakurdwara in the River Karnali watershed. Soon after arrival, one of the females was bred by the dominant male and gave birth to a calf in March 1988. The present population of these rhinoceros have increased to 16 after four other females gave birth to calves. Of the 13 individuals translocated from RCNP, one male died of old age and another male was poached outside the park boundary. Reports indicate that all the translocated individuals, after the initial wandering, have become established in their home range. Reports also indicate that the size of the home range of these rhino are bigger than what was observed in the RCNP.

Electrophoretic analysis of blood samples taken from 9 of the 13 individuals demonstrated that Chitwan Rhinoceros unicornis maintain levels of genetic variability approaching the highest levels recorded for free-ranging mammals. The conservation implication of this finding is that it may be possible to preserve the genetic variability of an introduced population with a small founder group. However, high the level of genetic variation, the threat of

demographic extinction associated with low population size requires that the founder group should consist of at least 30 animals.

The purpose of this project is to improve the management and protection of Royal Bardia National Park. A detailed management plan has never been prepared for the RBNP. The main objective of this project is to create a viable population of rhinoceros in the RBNP. Specifically, the project calls for the reintroduction of 30 individuals into the Babai Valley of the RBNP with a second phase of moving some of the problem animals to the Babai Valley.

Studies conducted by KMTNC experts and RBNP park officials have suggested restricting all future translocations of rhinoceros to the Babai Valley because: 1) the absence of nearby villages and croplands; 2) the ease with which rhinoceros could be monitored from a narrow river valley; and 3) the potential adverse impact of the Karnali dam project on the rhino habitat in the Karnali watershed. The main disadvantage of choosing the Babai Valley as a relocation site is that the current population along the Karnali river would not mix with the members of the Babai population limiting future genetic variability, but his would be resolved as the second phase has been considered feasible.

The second phase of the rhinoceros translocation was considered feasible because of the relationship between KMTNC and Fort Worth. The endowment along with the financial support from the WWF has enabled KMTNC and DNPWC to initiate the program. The involvement of the Bass brothers, Mr. Lee Bass and Mr. Edward Bass, has opened new avenues for the KMTNC's conservation programs.

Financial Support for the Royal Bardia National Park Conservation Program:

In order to support a multi-year program, the establishment of an endowment is recommended, the income from which would be used to improve management of Royal Bardia Wildlife Reserve and to support the reestablishment of the endangered greater one-horned rhinoceros in the reserve. The endowment would initially be managed by World Wildlife Fund for an estimated five year period. Since the most effective way to maximize return on the endowment will be to invest in long term financial instruments and allow the interest to be compounded, the endowment will not realize any income for the initial investment period of five years. During this period, WWF will advanced the funds necessary to cover the costs to be paid by the endowment and repay these funds when the income is finally realized at the end of the five years period.

This is considered a critical time for the project, and maximizing income in secure financial investments is essential to provide adequate support for the project. Assuming a $150,000 endowment is established, the estimated return from interest would range from 12 to 15 percent based on WWF's past history of managing its own financial reserves and endowment. When the interest is compounded this would provide an estimated $122,000 to $166,000 in income over the five year period for the project. The balance of support needed for the project would be funded as detailed in the attached budget, by the King Mahendra Trust for Nature Conservation, the Department of National Parks and Wildlife Conservation and WWF under its' Asian Ecosystem and Habitat Preservation Program.

When the income earned has covered the cost of the portion of the program to be financed by the endowment (estimated to be about five years for the first phase and six years if the second phase is feasible) and with successful completion of the project, WWF would transfer the principal of the endowment to the unrestricted endowment of KMTNC to be managed by the Trust for the continued support of the Trust's conservation activities.

PRE-OPERATIONAL PHASE:

The first proposal for the rhino translocation was drafted by the October 30, 1989. But, due to some technical details, the proposal was not acceptable to KMTNC. The proposal was acceptable to all the parties, after it had been redrafted by the KMTNC/NCRTC's Principal Investigator, KMTNC's Program unit and the Chief Warden of the RBNP.

The agreement to this effect was signed by the President of WWF, Mrs. Kathyrn Fuller, and the Member Secretary of KMTNC, Dr. Hemanta R. Mishra, on December 14, 1990.

The Pre-operational phase of the rhinoceros translocation began from December 15, 1990. The tentative schedule to commence the rhino translocation was to start from January 15, 1991.

<u>December 1, 1990 - January 14, 1991.</u>

1. <u>Work Description:</u> Making 6 crates and 4 sledges for translocation.
   <u>Job Initiated by:</u> Executive Officer to write letters to the Director General, DNPWC and Chief Wardens, RCNP and RBNP to make timber available.
   <u>Job Supervised by:</u> The Principal Investigator, NCRTC-Bardia

and Camp Manager, NCRTC-Chitwan to supervise construction of crates and sledges.
Completion date: To be completed by January 14, 1991.

Status: Job completed by Jan. 14, 1991. 5 crates and 3 sledges built in NCRTC-Chitwan and 1 crate and 1 sledge built in NCRTC-Bardia.

2. Work Description: Place order for equipment and drugs.
Job Initiated by: Camp Manager, NCRTC-Chitwan and Principal Investigator, NRCTC-Bardia to give list and specifications of all necessary equipment and drugs to Program Officer, KMTNC.
Job Supervised by: Program Officer to place order and coordinate with WWF. Administrative Officer to oversee all matters relating to custom and license formalities.
Completion date: Try to get all equipment and drugs by Jan. 14, 1991 or use from KMTNC inventory.

Status: Due to Christmas and New Year, work could not be completed by Jan. 14, 1991 and received 10 radio collars only. All equipment and drugs cleared from customs by February 28, 1991.

3. Work Description: Inform all concerned HMG officials about the Translocation Program.
Job Initiated by: Executive Officer to write letters to the Ministry of Forests, DNPWC, RCNP, RBNP, Royal Nepalese Army, and other concerned officials.
Job to be Supervised by: Administrative Officer to see that the letters reach all concerned officials in time.
Completion date: December 14, 1991.

Status: Letters despatched to all concerned officials by !st week of December, 1991.

4. Work Description: Get Diesel stock (1500 liters) in view of the Gulf situation.
Job Initiated by: Administrative Officer to write to the General Manager of Nepal Oil Corporation for the sanction of diesel to be used for rhino translocation.
Job to be supervised by: Program Officer to follow up and get the letter of authorization from N.O.C.
Job to be completed by: By December 14; 1991

Status: Letter received by January 11, 1991 authorizing KMTNC to receive 1500 liters of diesel and quota at NCRTC camp.

5. Job Description: Make road from Chepang (on the highway) to the release site in Babai Valley.

Job Initiated by: NCRTC-Bardia's Principal Investigator to try to get road construction equipment from Roads Department or make the road using manual labor.
Job to be supervised by: NCRTC-Bardia's Principal Investigator to supervise construction of road.
Job to be completed by: December 14, 1991

Status: Road construction done using manual labor and completed by December 14, 1991.

6. Job Description: Hiring of Rhino loading and transporting equipment.
Job to be Initiated by: Administrative Officer and Program Officer to write letters to the Chitwan Irrigation Department for the "Wheel Loader" and hire trucks to transport the rhinos.
Job to be supervised by: Program Officer to oversee that all equipment reach the NCRTC camp.
Completion date: All equipment to reach NCRTC Chitwan camp by January 14, 1991.

Status: All loading equipment and trucks arrived at NCRTC Chitwan camp by January 14, 1991.

7. Job Description: Make Guard Posts in the Babai Valley.
Job to be Initiated by: Executive Officer to write to DNPWC to make wood available for construction of 2 guard posts. He is to also coordinate with Royal Nepalese Army to take the charge of the guard posts.
Job to be supervised by: NCRTC-Bardia's Principal Investigator to supervise the construction of the guard post.
Completion Date: Guard posts to be completed by January 14, 1991.

Status: As the Royal Nepalese Army could not begin till they had a road to bring in supplies and since the wood for the construction had not been released, the guard post have not been constructed.

8. Job Description: Construction of Research camp in the Babai Valley.
Job to be Initiated by: Executive Officer to request the DNPWC to make wood available for the construction of the camp.
Job to be supervised by: NCRTC-Bardia's Principal Investigator to oversee the construction of the research camp.
Completion Date: Camp to be constructed by January 14, 1991.

Status: As it was thought that we should let the rhinos settle down first and then choose the camp site, construction

was not started.

9. Job Description: Purchase 2 elephants.
Job to be Initiated by: NCRTC-Bardia's Principal Investigator to look for 2 elephants to purchase.
Job to be supervised by: NCRTC-Bardia's Principal Investigator to supervise the purchase of 2 elephants.
Completion Date: Purchase to be made by January 14, 1991.

Status: As elephants were not available for purchase in Bardia and the ones found in Chitwan were not suitable, the elephant personnel are still looking for suitable elephants. DNPWC, Bardia's Chief Warden has deputed 2 elephants for KMTNC's use until the elephants are purchased.

10. Job Description: Hiring of 6 trackers for Bardia.
Job to be Initiated by: NCRTC-Chitwan's Camp Manager and Bardia's Principal Investigator to look for 6 new trackers.
Job to be supervised by: NCRTC-Bardia's Principal Investigator to interview the new recruitment and hire them on probation.
Completion Date: 6 new trackers to be hired by December 31, 1991.

Status: No new trackers were hired by end of December,1 990. Four new trackers were hired by middle of January, 1991 and are under training.

TIME-TABLE FOR RHINO TRANSLOCATION:

From Chitwan to Bardia:

January 15 to 18, 1991 - First lot of 4 rhinos.

January 19 to 22, 1991 - Second lot of 4 rhinos.

January 23 to 26, 1991 - Third lot of 4 rhinos.

January 27 to 30, 1991 - Fourth lot of 4 rhinos.

January 31 to February 3, 1991 - Fifth lot of 4 rhinos.

February 4 to 7, 1991 - Last lot of 4 rhinos.

February 11 to 15, 1991 - Relocate problem rhinos from the Karnali area to Babai Valley (provided the male rhino which stays in India enters Nepal).

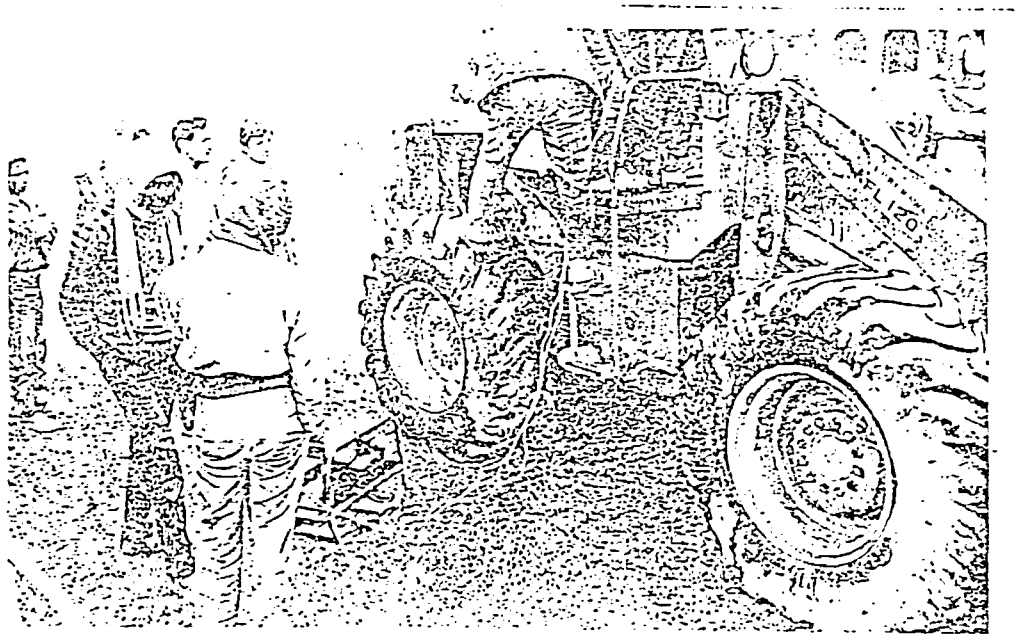
A total of 28 rhinos are to be translocated to the Babai Valley Of the Royal Bardia National Park in 1991.

OPERATIONAL PHASE:

The Operation Phase was tentatively set to begin of January 15, 1991 and would continue till around the middle of February, 1991. As five crates had been built, it was decided that we would try to translocate five rhinos in each lot. As NHK TV (Japan Broadcasting Corporation) were coming to film the rhino translocation it was decided to leave the last lot until their arrival which had yet to be confirmed.

The wheel loader was provided by Chitwan Irrigation Department of His Majesty's Government's Department of Irrigation.

The translocation operation began on January 15, 1991. Under the guidance of Dr. Hemanta R. Mishra, Member Secretary of KMTNC, the staff of KMTNC, NCRTC and DNPWC combined their efforts to make the translocation as smooth as possible



Charging the batteries of the Wheel Loader early in the morning

The Translocation Process:

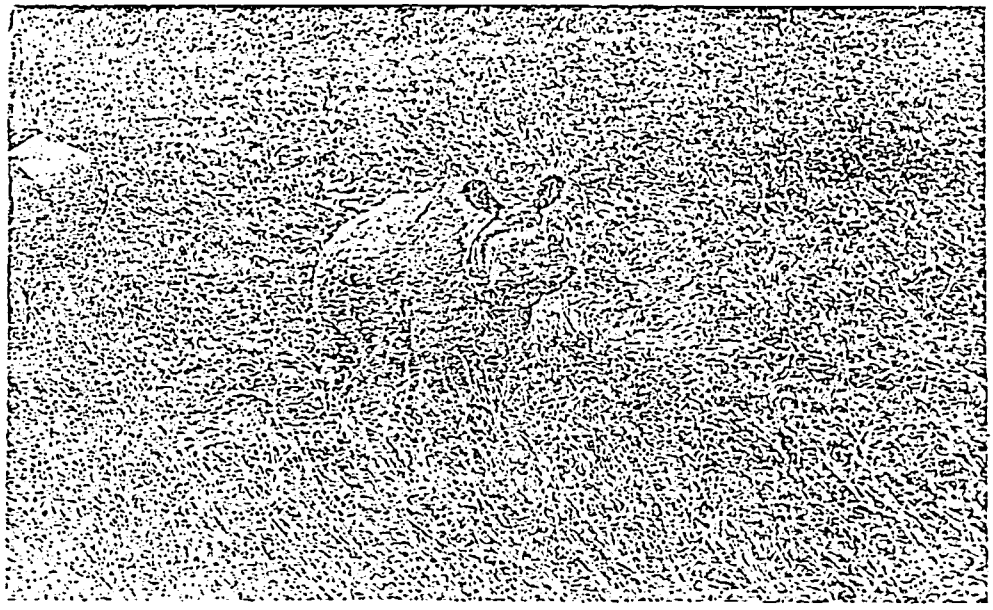
1. First of all, the rhinos were scouted and the prospective animals were identified for possible translocation.

2. On the night before the actual operation, the crates were loaded on the trucks. The trucks, the bull dozer, sledges for transporting the rhinos to the crates and the tractor were sent to the area where the rhinos would be darted.

3. On the day of the translocation, about 20 elephants were sent in the early morning to track down the rhinos so that their location could be easily found and they did not wander off too far into the jungle.

4. In the mean time, the bull dozer would dig a ramp so that the crates could be easily pulled out of the trucks.

5. Around eight in the morning, the personnel from the King Mahendra Trust, Nepal Conservation Research and Training Center, Department of National Parks and Wildlife Conservation and Royal Nepalese Army leave the NCRTC camp at Sauraha and proceed to the operation site.



A darted rhino about to be immobilized

6. The technicians and other personnel get on the elephants and while other elephants keep track of the rhinos. To make sure that the rhino did not bolt, about 10 elephants would surround the rhiho in a large circle. The technicians to dart the rhino approach the rhino and dart the rhino from the back of an elephant using a dart gun.

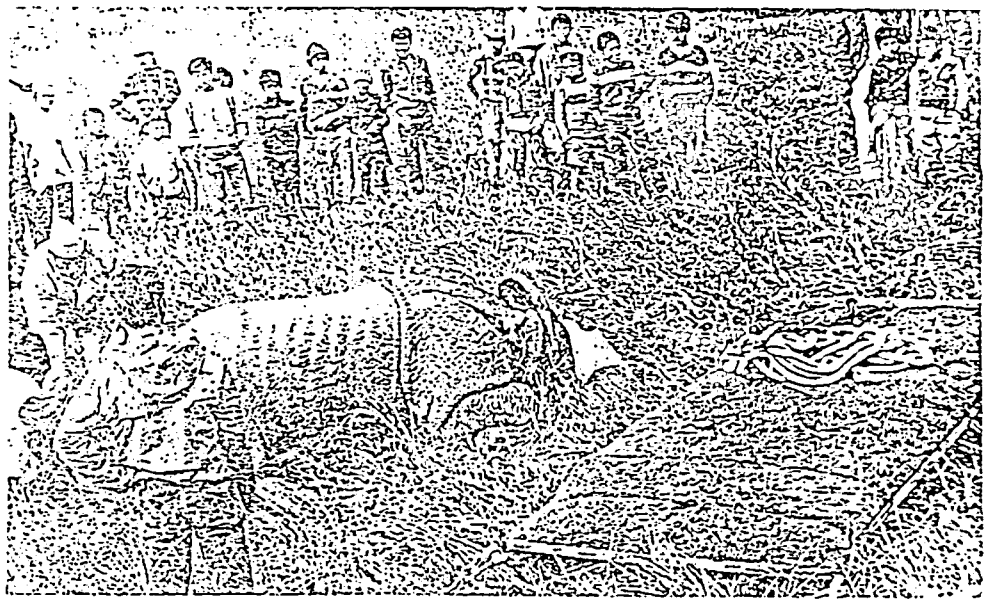
7. The darted rhino would be allowed to be totally immobilized.

8. Once the rhino has been immobilized, the KMTNC/NCRTC personnel get down from the elephants and blindfold and put ear plugs on the rhino. Then they take necessary measurements of the immobilized rhino.

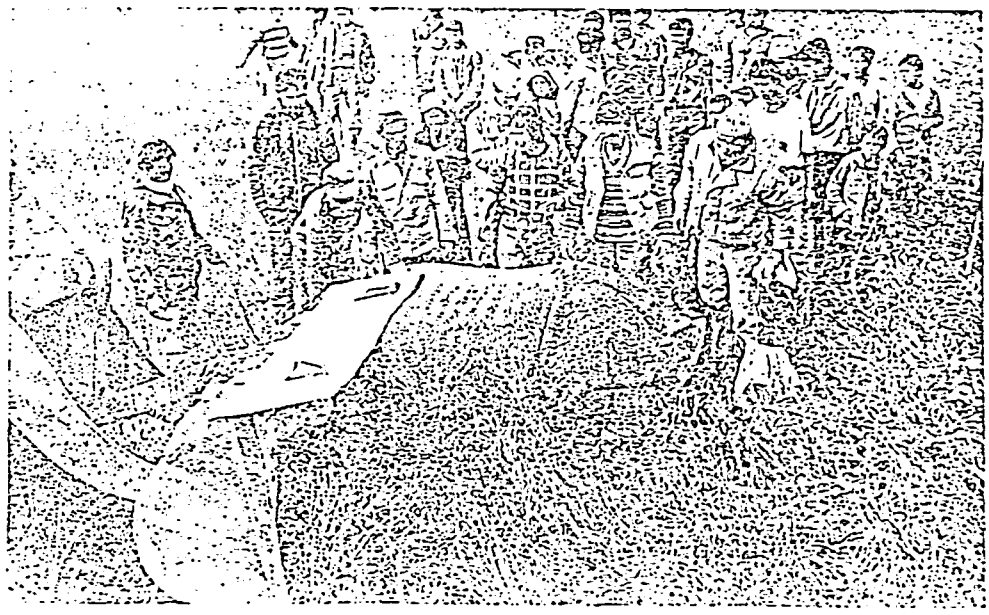
KMTNC/NCRTC personnel taking measurements of the rhino

9. The bull dozer is called for and the tractor with the laborers and the sledge follow the bull dozer.

10. The bull dozer then digs a trench right next to the rhino so that the sledge can be pulled right next to the rhino and the level of the sledge is lower than the ground on which the immobilized rhino is lying so that it can be easily toppled over.



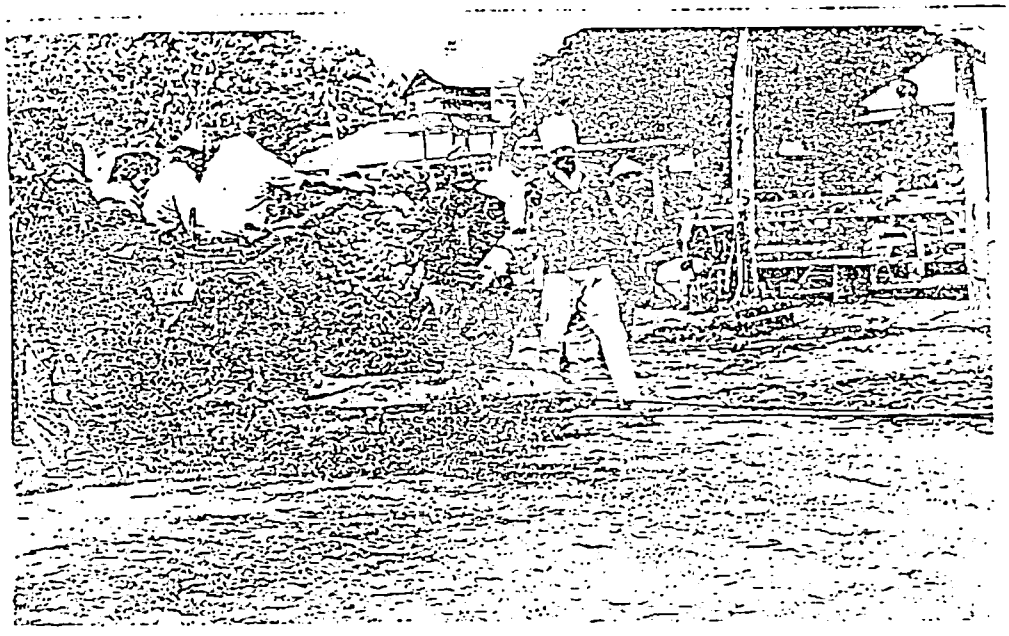
A sledge next to the immobilized rhino



The bull dozer digging a trench next to the immobilized rhino

11. After the sledge is placed next to the rhino, the laborers manually topple the rhino on the sledge and the rhino is tied to the sledge with ropes so that it does not fall over while the bull dozer pulls it to the ramp where the trucks and crates are waiting.

12. The bull dozer or the tractor pulls the sledge with the rhino to the ramp in front of the crate.



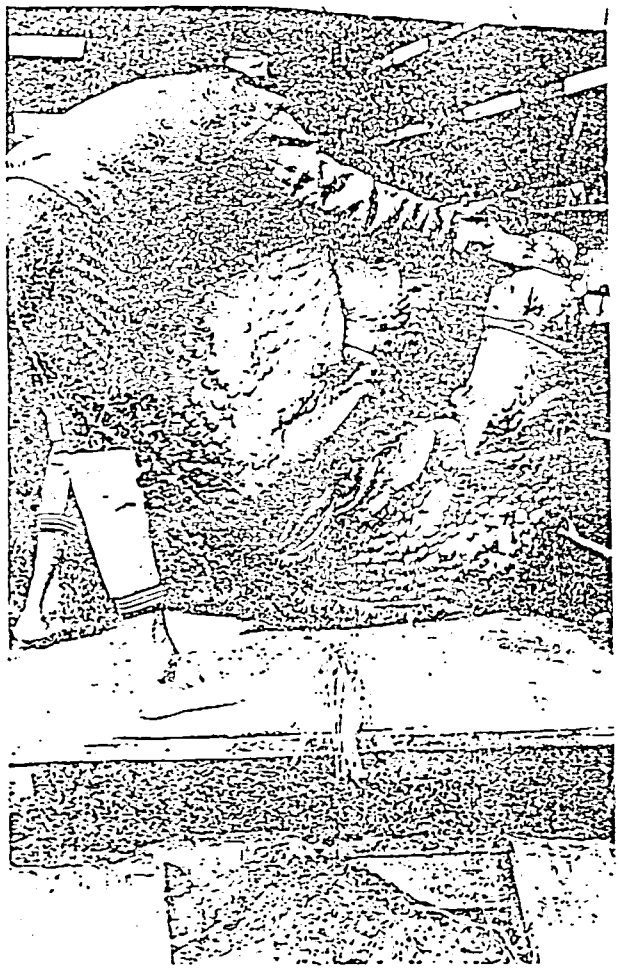
The sledge, with the rhino, being pulled

13. The bull dozer goes in front of the crate and pulls the sledge from the front as the crates have been built with doors both in front and back.

14. After the sledge is pulled completely into the crate, the veterinary doctor injects the rhino with a antidote and both the doors of the crate are lowered.

15. After the rhino gets up inside the crate, the sledge is slowly pulled out of the crate.

16. The doors are then completely lowered and bolted.

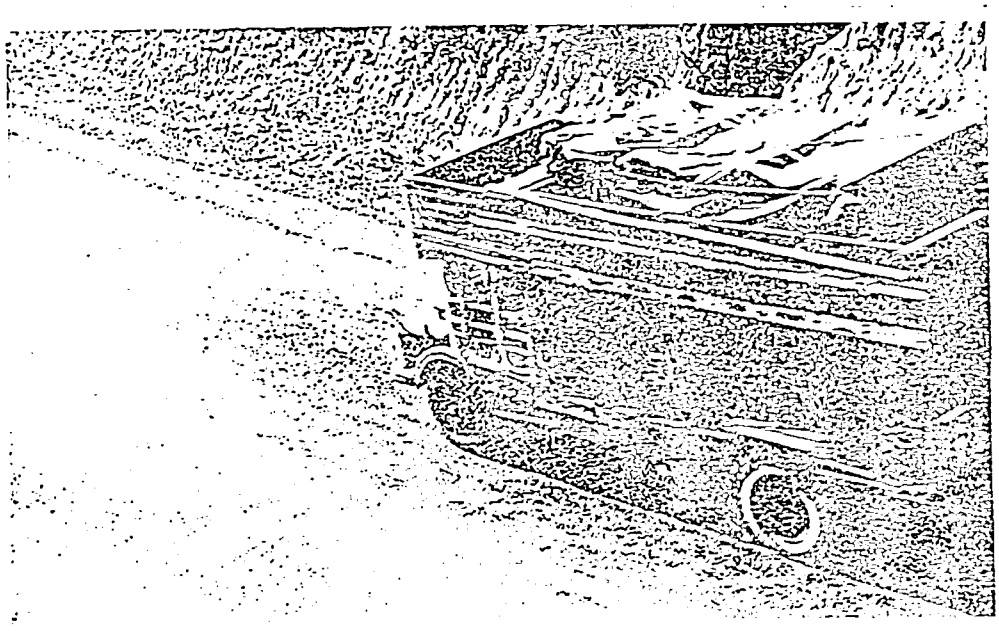


The sledge with the rhino is pulled into the crate

17. The bull dozer slowly pushes the crates with the rhino on the truck.

18. When all the rhinos for the day are captured and put into the crates, the trucks come to the NCRTC camp to rest the rhinos before the journey starts.

19. In the evening, the trucks leave the NCRTC camp, Chitwan for the Royal Bardia National Park.



A truck on the road with a rhino inside the crate

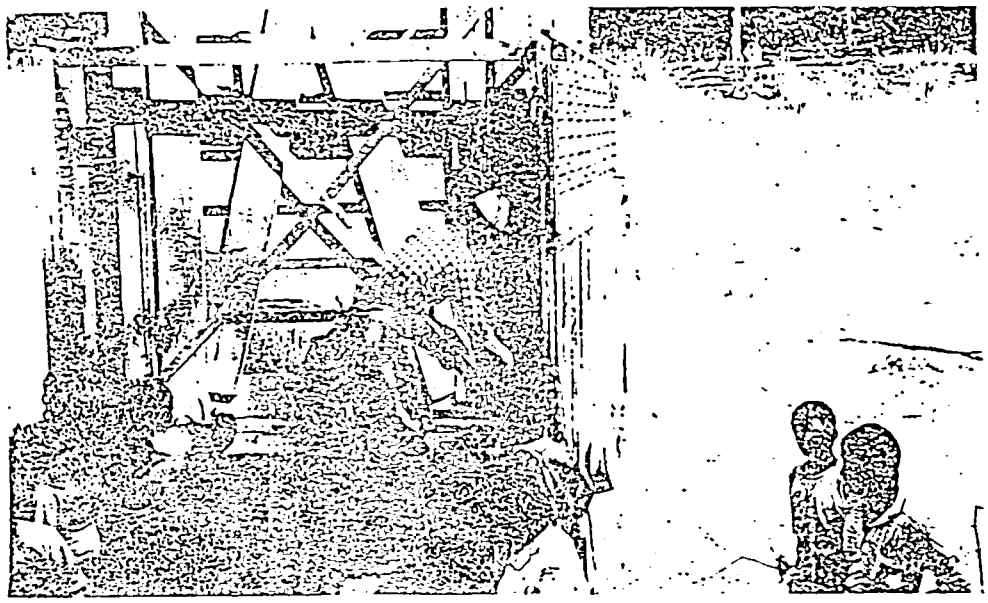
20. The trucks are escorted by KMTNC vehicle which has KMTNC personnel and technician with necessary immobilizing equipment should there be any mishaps on the road.

21. The trucks drive throughout the night followed by the KMTNC vehicle and arrive around nine o'clock the next morning after about 12 hours drive.

22. The road to the release site has been made and the trucks arrive at the release site.

23. There are other KMTNC/NCRTC staff and local laborers who unbolt the door of the crates.

24. The trucks then back to the ramp and the door of the crates is lifted up by five strong persons.



KMTNC/NCRTC personnel opening the bolts on the cage before the trucks back to the release ramp.

25. The rhino is allowed to back out of the crate and the release is complete.

A rhino senses his new home in the Babai Valley

26. The trucks and the KMTNC vehicle head back to NCRTC, Chitwan for the next lot of rhinos.

27. The crates would be unloaded and any damages to the crates would be repaired at the NCRTC camp and reloaded on the trucks.

Day 1. Tuesday, January 15, 1991:

1 adult male and 1 adult female rhinos are captured from Khorsor area. Total of 2 rhinos were captured on the first day of operation.

Day 2. Wednesday, January 16, 1991:

2 adult female and 1 sub-adult female are captured from Bodreni area. Total of 3 rhinos captured on the second day of operation.

Day 3. Sunday, January 20, 1991:

3 adult males, 1 sub-adult male and 1 sub-adult female captured from Kathar area. Total of 5 rhinos captured on the third day of operation.

Day 4. Wednesday, January 23, 1991:

3 adult females and 2 sub-adult females captured from Icharni area. Total of 5 rhinos captured on the fourth day of operation.

Day 5. Saturday, January 26, 1991:

3 adult females, 1 sub-adult female and 1 sub-adult male captured from Kathar area. Total of 5 rhinos captured on the fifth day of operation.

The KMTNC decides to postpone the remaining 5 rhinos until the NHK TV team arrives from Japan to film the translocation. NHK TV team arrive on February 11, 1991 and they say that filming of three rhinos will give sufficient footage. The KMTNC decides to continue the translocation of two more rhinos before the NHK team arrives in NCRTC, Chitwan.

Day 6. Thursday, February 14, 1991:

1 adult female and 1 sub-adult female are captured from Bodreni area. Total of 2 rhinos captured on the sixth day of operation.

Day 7. Monday, February 18, 1991:

1 adult male captured from Bodreni area. 1 adult male and 1 adult female captured from Khorsor area. Total of 3 rhinos captured on the seventh day of operation.

NHK TV films the entire translocation process.

A total of 25 rhinos were translocated from the Royal Chitwan National Park to the Babai Valley of the Royal Bardia National Park. A new team of four trackers has been hired to track the rhinos in their new home ground. These trackers are being trained by the field technicians of the NCRTC Chitwan.

The Babai River in the winter

CONCLUSION:

The translocation from the Royal Chitwan National Park to the Royal Bardia National Park was carried out professionally. Since it is a superstitious belief that one should never translocate an even number of animals, we decided to translocate 25 rhinos to the Babai Valley. This was one more than the targeted number of 24 rhinos to be translocated from the Royal Chitwan National Park to the Babai Valley of the Royal Bardia National Park.

The problem rhinos from the Thakurdwara area would be translocated as soon as the male rhino which resides in India and comes in at night into Nepal to raid crops moves further up the River Karnali. As of the latest field report, that rhino is moving along the border of Nepal and India. As soon as it moves to a place where it can be easily darted and transported, it will be moved to the Babai Valley along with the other three problem rhinos.

Though there were some minor irritants, like the bull dozer never starting around 8 o'clock in the morning, the whole process was done very precisely and in a coordinated manner. Due thanks has to be given to the authorities of DNPWC and their field staff both in Chitwan and Bardia national parks for making this translocation such a successful job. Due thanks has to be also given to all the KMTNC/NCRTC staff members for all the logistic support and field work. Thanks has to be also given to all the KMTNC staff in Kathmandu who never saw the translocation of even one rhino but were equally a part of the whole team.

APPENDIX - I

KING MAHENDRA TRUST FOR NATURE CONSERVATION

Nepal Conservation Research and Training Center

RHINO TRANSLOCATION 1991

MEASUREMENT OF RHINOCEROS

	Date	Sex	ToL mt.	TaL cm	HDFW cm	Ear mm	NCS mt.	SKLN cm	2FXL mt.	TOO	LLI mm	LRI mm	HRL mm	HRC mm	SKC mt.
1.	15.1.91	aM	4.28	67	64	24	2.1	95	1.14	"	Broken	46.8	23	50	1.82
2.	"	aF	4.24	72	55	26	1.4	88	1.11	Light	31.6	31.6	31	54	1.65
3.	16.1.91	aF	4.09	64	56	25	1.9	75	1.09	Heavy	57.5	46.0	16	37	1.59
4.	"	saF	3.25	62	50	22	1.1	62	0.85	Light	12.6	12.3	8	30	1.20
5.	"	aF	3.40	57	52	24	1.2	64	1.00	"	30.1	31.1	10	38	1.25
6.	20.1.91	aM	3.97	67	58	25	1.8	72	1.11	"	50.2	50.5	22	56	1.35
7.	"	aM	3.90	65	57	25	1.5	78	1.10	"	36.0	30.0	20	55	1.58
8.	"	aM	4.23	75	67	25	2.0	77	1.13	"	58.2	57.6	25	60	1.80
9.	"	saM	3.73	56	54	27	1.1	68	1.00	"	20.2	20.2	15	49	1.18
10.	"	saF	3.70	52	56	24	1.0	64	1.10	"	49.4	40.0	16	40	1.21
11.	23.1.91	aF	3.90	65	52	24	1.4	70	1.09	"	53.2	53.0	15	48	1.30
12.	"	aF	3.58	60	50	26	1.3	75	0.98	"	49.1	49.1	12	38	1.45
13.	"	saF	3.56	62	53	25	1.1	84	0.95	"	13.8	14.0	11	40	1.36
14.	"	saF	3.10	50	48	22	0.9	63	0.90	"	10.0	10.0	8	36	1.29
15.	"	aF	3.85	66	54	25	1.5	73	1.10	"	48.4	37.9	17	47	1.40
16.	26.1.91	aF	4.07	65	54	24	1.5	80	1.05	"	55.2	54.5	17	45	1.32
17.	"	aF	4.09	67	55	25	1.8	88	1.17	Heavy	55.3	56.4	30	50	1.50
18.	"	saF	3.75	65	47	24	1.3	79	1.05	Light	18.3	19.2	10	44	1.40
19.	"	saM	3.25	52	54	25	1.1	65	0.85	"	20.4	20.3	11	40	1.13
20.	"	aF	3.91	71	58	25	1.2	72	1.05	"	52.6	52.5	18	42	1.58
21.	14.2.91	saF	3.28	56	46	23	1.0	65	0.77	"	10.0	11.0	6	31	1.16
22.	"	aF	3.30	60	53	24	1.3	64	0.84	"	48.2	48.2	22	38	1.30
23.	18.2.91	aM	3.71	62	56	24	1.7	77	1.20	"	70.3	74.5	25	54	1.75
24.	"	aF	3.92	65	46	26	1.3	76	1.20	"	51.2	53.6	16	46	1.60
25.	"	aM	4.20	50	56	23	2.2	90	1.25	"	70.1	72.1	26	55	1.85

Notes:

ToL = total length
TaL = tail length
HDF = hind foot with toes
NCS = neck circumference
SKLN = skull length
2FXL = length between second fold points
TOO = tooth wear
LLI = left lower incisor
LRI = lower right incisor
HRL = horn length
HRC = horn circumference
SKC = skull circumference

mt. = meters; cm = centimeters; mm = millimeters

aM = Adult male; aF = Adult female
saM = Sub-adult male; saF = Sub-adult female

APPENDIX - II

KING MAHENDRA TRUST FOR NATURE CONSERVATION

Nepal Conservation Research and Training Center

RHINO TRANSLOCATION 1991

DRUG DOSAGES

	Date	Sex	Location	Habitat	Drug Dosages (in cc)	Time Induction	Time Sedation	Antidote (M50-50)	Time anti-dote given	Time got up	Total Time Immobilized
1.	15.1.91	aM	Khorsor	RIF	1.0 Imb + 0.5 Imb	14.25	14.35	3.5 cc	15.14	15.24	59 min
2.	"	aF	"	"	1.0 Imb	15.29	15.32	2.5 cc	16.29	16.37	1 hr 5 min
3.	16.1.91	aF	Bodreni	"	1.0 Imb + 1.0 Imb	12.22	12.29	4.5 cc	13.37	13.52	1 hr 23 min
4.	"	saF	"	"	1.0 Imb	12.37	12.45	2.5 cc	13.50	13.58	1 hr 21 min
5.	"	aF	"	"	1.0 Imb	13.14	13.29	2.5 cc	14.14	14.24	1 hr 10 min
6.	20.1.91	aM	Kathar	RIF shrub	1.0 Imb + 2.0 Ket	12.15	12.23	2.5 cc	12.56	13.20	1 hr 5 min
7.	"	aM	"	"	1.0 Imb	12.57	13.12	2.5 cc	14.00	14.14	1 hr 17 min
8.	"	aM	"	"	1.0 Imb	13.46	14.14	2.5 cc	14.50	15.05	1 hr 9 min
9.	"	saM	"	"	1.0 Imb	15.10	15.28	2.5 cc	15.55	16.12	1 hr 2 min
10.	"	saF	"	"	1.0 Imb	16.04	16.12	2.5 cc	17.15	17.28	1 hr 24 min
11.	23.1.91	aF	Icharni	RIF	1.0 Imb + 0.5 Imb	8.39	8.56	3.5 cc	10.02	10.11	1 hr 32 min
12.	"	aF	"	"	1.0 Imb + 0.3 Imb	12.14	12.31	3.5 cc	13.30	13.36	1 hr 22 min
13.	"	saF	"	"	1.0 Imb	13.17	13.34	2.5 cc	14.30	14.29	1 hr 12 min
14.	"	saF	"	"	1.0 Imb	15.01	15.13	2.5 cc	16.23	16.34	1 hr 33 min
15.	"	aF	"	"	1.0 Imb + 1.0 Imb	15.12	15.21	5.0 cc	16.03	16.09	57 min
16.	26.1.91	aF	Kathar	RIF shrub	1.0 Acp + 2.0 M99	9.27	9.47	2.5 cc	10.41	10.59	1 hr 32 min
					+ 2.0 Ket						
17.	"	aF	"	"	1.0 Acp + 2.0 M99	9.45	9.52	2.5 cc	11.06	11.14	1 hr 25 min
					+ 2.0 Ket						
18.	"	saF	"	"	1.0 Acp + 2.0 M99	11.13	11.29	2.5 cc	12.19	12.29	1 hr 16 min
					+ 2.0 Ket						
19.	"	saM	"	"	1.0 Acp + 2.0 M99	12.57	13.06	2.5 cc	14.17	14.26	1 hr 29 min
					+ 2.0 Ket						
20.	"	aF	"	"	1.0 Acp + 2.0 M99	14.38	15.00	2.5 cc	16.05	16.13	1 hr 35 min
					+ 2.0 Ket						
21.	14.2.91	saF	Bodreni	RF	1.0 Acp + 2.0 M99	8.26	8.39	2.5 cc	9.37	9.53	1 hr 29 min
22.	"	aF	"	"	1.0 Acp + 1.25 M99	8.46	8.58	2.5 cc	10.10	10.16	1 hr 18 min
23.	18.2.91	aM	Bodreni	"	1.0 Acp + 2.0 M99	9.43	10.31	5.0 cc	11.29	11.42	1 hr 59 min
					+ 1.0 Acp + 1.3 M99						
24.	"	aF	Khorsor	"	1.0 Acp + 2.5 M99	12.18	12.34	2.5 cc	13.41	13.52	1 hr 34 min
25.	"	aM	"	"	1.0 Acp + 2.5 M99	15.17	15.30	3.0 cc	16.12	16.45	1 hr 22 min

Acp = Acpermazone
Imb = Immobilin
Ket = Ketaset

aM = Adult male; aF = Adult female
saM = Sub-adult male; saF = Sub-adult female