

**Sumatran Rhinoceros  
Managed Breeding  
GLOBAL MANAGEMENT  
AND  
PROPAGATION BOARD**



**REPORT no 1:  
RESCUE AND EVACUATION OF A  
YOUNG FEMALE RHINO FROM WAY  
KAMBAS NATIONAL PARK**

**GMPB Technical Committee, 5 November 2005**

## **REPORT ON THE RESCUE AND EVACUATION OF A FEMALE SUMATRAN RHINO THAT STRAYED OUT OF WAY KAMBAS NATIONAL PARK, SUMATRA, INDONESIA**

On 20 September 2005 a rescue and evacuation operation of a young female Sumatran Rhino was carried out by the staff of the NP, with assistance of teams from SRS, RPU, WCS-IP and PKHS (Sumatran Tiger Program).

The Rescue and Translocation Operation was successful and the rhino, named 'Ratu' is now in the Sumatran Rhino Sanctuary (SRS) in Way Kambas NP, to supplement the captive breeding program for this very rare and highly endangered species. The rhino will need some more time to recover from the stress and exhaustion of her wanderings and subsequent translocation, but a full recovery is expected.

The name 'Ratu' was taken from the name of the village 'Labuhan Ratu' from where she was taken to the SRS. 'Labuhan' means 'city', 'ratu' means 'queen'.

A detailed report of the events and the actions taken, prepared by staff of the SRS, is presented.

Nico van Strien, Chair of the GMPB Technical Committee,  
Marcellus Adi, SRS Site Manager,  
Muhammad Agil, SRS Veterinary Consultant.

## CHRONOLOGY OF RESCUE AND RELOCATION

### 20 SEPTEMBER 2005 - 04:00 (AM)

On Tuesday 20 September 2005 at 04:00 AM a Sumatran rhino was seen in the neighbourhood of Braja Asri village, about 1 km from the boundary of the Way Kambas NP (TNWK). The rhino was first reported by Bpk. Hardjo (staff of the Elephant Centre (PLG) in TWWK) and several other inhabitants of Braja Asri village.

### 05.00-06.00 (AM)

The rhino moved to Plangkawati village, desa Labuhan Ratu VII (closer to the boundary of the reserve). The Head of TNWK was contacted and he instructed the team to salvage the rhino by guiding it back into the NP, and in case this proved to be difficult, to rescue it by capture and placement in the SRS. The WCS-IP team and Bpk. Firman (TNWK ranger) went to the location and saw the rhino first in Plangkawati village (05:30 AM). Assisted by police staff from the Police Station in Way Jepara, they started to guard the rhino that continuously ran away because of disturbance caused by villagers wanting to see the rhino.

### 06.00-07.00 (AM)

The rhino kept on moving, watched by the staff of TNWK and WCS-IP, went back in the direction of Braja Asri village and turned then to Marga village, desa Labuhan Ratu I. There the staff lost contact with the rhino that went into the direction of Kampung Sawah, desa Labuhan ratu VII.

Later the staff received information that the rhino was wallowing in village Silir Agung, desa Labuhan Ratu IV. The protection team needed to intensify the protection because local residents were observed to prepare weapons. It appears that there were rumours of a 'Babi Ngepet'<sup>1</sup> walking around in the area, but also because they were afraid the rhino might attack them.

The protection team explained to the people that the animal walking around was a Sumatran rhino that had gotten out of TNWK and that it was a protected species that should not be killed or hurt.

The rhino was wallowing for 20 minutes and then moved to the village Kampung Sawah, desa Labuhan Ratu VII.

### 07.00-10.00 (AM)

The team from the SRS, RPU and PHKS joined up with the protection team. The rhino again escaped from the protection team for about two hours. Later they found out that the rhino had moved to village Pulau Sari, desa Labuhan Ratu Induk. Finally the rhino was met again in village Labuhan Ratu VI.

The Village and District officials and the regional military joined up with the rhino protection team. The whole team was involved in an attempt to drive the rhino back to the reserve.

### 10.00-12.00 (AM)

Because driving the rhino back to the reserve proved to be difficult, because it was difficult to guide it despite being driven by all involved. Then the head of TNWK decided to localize and to constrain the rhino to be captured and moved to the SRS for protection.

The rhino entered a small stream rested in the water, and later ran back. Finally the rhino entered a 1 metre deep sewage pond behind the village houses on 10.29. The rhino appeared weak and did not move much.

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*The villagers said that they saw this animal walking around their neighbourhood in the night and they thought it was a 'babi ngepet'. 'Babi' means pig and 'Babi ngepet' is a thief than can transform in a big pig after stealing things from the houses.*

The rhino could be approached and cleaned and sprayed with water to cool the body and prevent more dehydration. To facilitate guiding the rhino the rhino's body was tied with a thick and soft nylon rope so that it would not be hurt.

Not much later, at 10:48, the rhino started to move again, the rope came loose and the rhino ran back. The protection team followed the moving rhino.

The rhino stopped moving again at 11:30 in Labuhan Ratu village, desa Labuhan Ratu Induk, and looked very weak. The protection team decided to make a fence from tarps and wire mesh. The rhino lay down on the ground and was breathing very fast. The team prevented the people from coming close and disturbing the rhino.

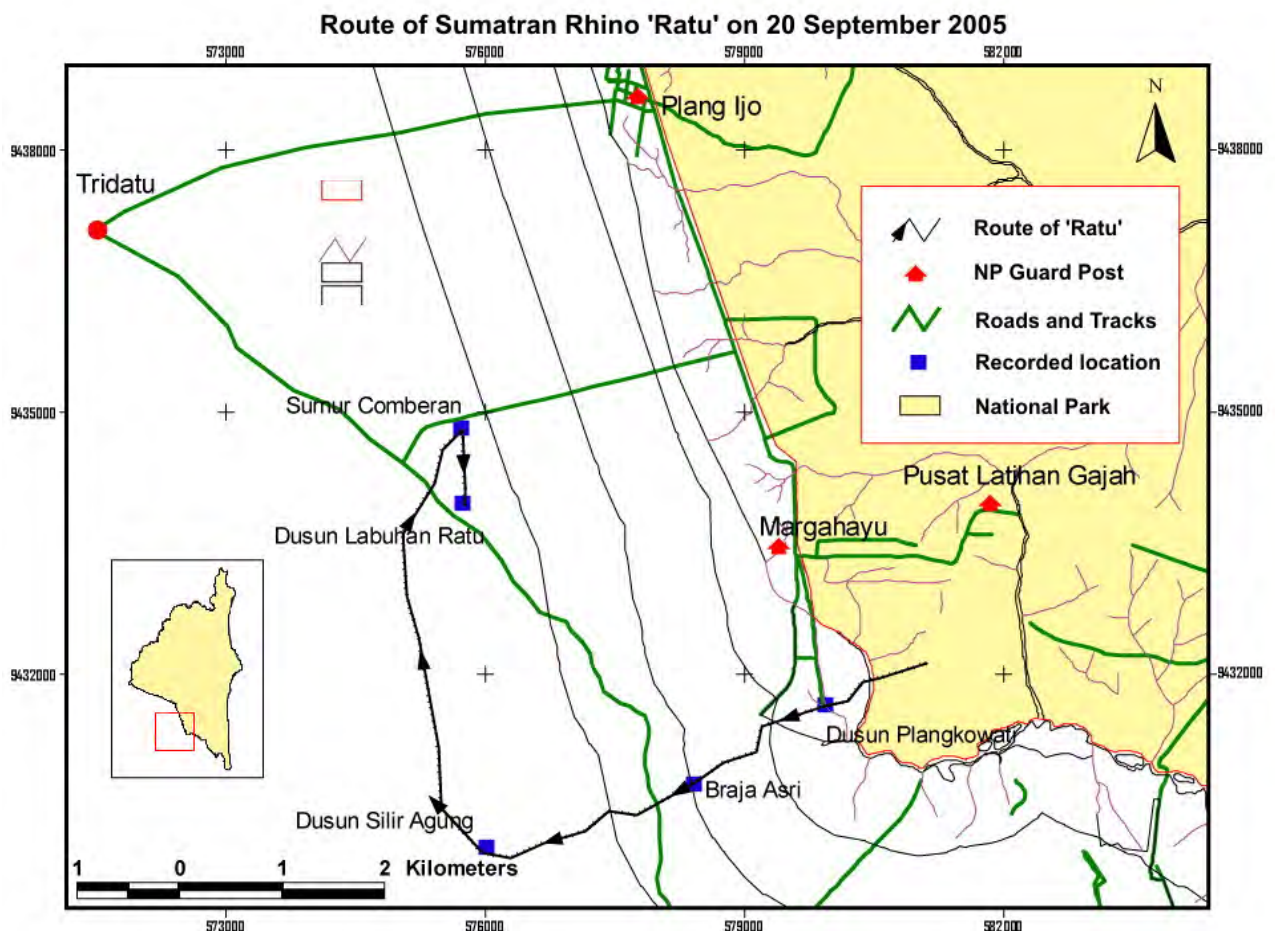
### 12.00-17.00

The team from the SRS with assistance from the other team members finally could carefully approach the rhino at 12:27. The rhino stood up again at 12:36. The rhino looked weak and allowed the staff to come close. The situation at the location was difficult to control as many people came to see the rhino. The people did not only come from the nearby villages but also from Metro [40 km away] and surroundings.

Therefore the Head of TNWK ordered the rhino to be moved immediately to the SRS so that it could be handled properly and would not be stressed more by the spectators, and at 13:00 the preparations for the transport of the rhino started.

Later the rhino was guided in the transport crate at 14:51, and at 15:10 the transport crate was loaded on the truck for transport to the SRS.

The truck with the rhino arrived at the SRS at 16:28, and the rhino safely moved into holding pen no 3 at 16:45.



## **INSTITUTIONS AND PERSONS INVOLVED IN THE RESCUE AND EVACUATION**

Officers and staff from:

Polsek (Subdistrict Police Station) Way Jepara  
Koramil (Subdistrict Military Station) Way Jepara  
Kecamatan (Subdistrict Office) Way Jepara  
Kecamatan (Subdistrict Office) Labuhan Ratu  
Village Plangkawati  
Village Braja Asri  
Village Labuhan Ratu Induk  
Village Labuhan Ratu IV  
Village Labuhan Ratu VI  
Village Labuhan Ratu VII

Way Kambas NP Office:

- ELP: Hardjo, Khalid and others
- Forest Guard: Firman
- Plang Ijo Area: Nyoman and staff
- Forest Guard Office: Bustami and staff
- Technician Staff: Riri and others

WCS (Wildlife Conservation Society) Way Kambas  
RPU (Rhino Protection Units) Way Kambas  
PKHS (Sumatran Tiger Conservation) Way Kambas  
JICA Way Kambas: Candra and others  
SRS (Sumatran Rhino Sanctuary)











## **DAILY OBSERVATIONS AND CONDITION (20 September - 29 October 2005)**

### **Day 0 (20 September 2005)**

- After the rhino was unloaded to the holding pen no.3 in the SRS at 16:45, Ratu was sniffing around the concrete floor and surroundings. She was immediately taken care of by the SRS keepers and RPU staff.
- Her movement was very slow with a marked hind-limb lameness characterized by both tremors and ataxia.
- Respiration was very fast, about 45-50 times/minute.
- She refused to eat anything but she drank in the waterpond for 5 minutes (16:50).
- Size: Length 217 cm, shoulder height 124 cm, anterior horn 11 cm, posterior horn 3 cm.
- Characteristic: color of skin brown dark, short hair in whole body and not too long hair in the ear and also on the tail.
- The granulated skin on her back, upper hind legs, inside the skin fold was peeled off and the skin looked red. Mucosa in mouth, nose, eyes, anus and vulva was red (hyperemic).
- The body temperature is normal: 36° C.
- Ratu was sometime walking around and attracted to the green shade cloth that covered the yard fence and she tried to lift it up with her horn. Later on she did it many time when she was close to the fence.
- At 18:06 the respiration had decreased to 31/minutes.
- During the first day, Ratu was sleeping and laying down but only shortly (not more than 40 minutes), and got up to stand for a while before she was laying down again. She usually changed the side and position of her body when she lied down.
- We decided to make a small outdoor yard (boma) connected to the holding pen (concrete floor yard) where she could wallow and walk in the soil, so that she could better recover.



- Until 24:00, no defecation and urination was observed.

#### **Day 1 (21 September 2005)**

- First urination was observed at 00:08. The urine color was dark red and turned immediately brown upon exposure to the air, but with normal smell.
- Respiration became normal with the frequency of 14 time/minute.
- She had flatus at 00.38, but no defecation.
- Ratu ate some leaves, 5 times about ~ 1 kg each and she drank 3 times.
- We injected 5 ml IM of Tonophosphan® compositum (contains phosphorous, cobalt, zinc, etc) as a tonic and restorative treatment for general metabolic disorder.
- Urine was still red.
- Boma was built and finished at 18:00. Rosa entered boma at 19.30 and directly went to the wallow that we made and stayed in the wallow till midnight, she several times got up and stood up for a while to change position.

#### **Day 2 (22 September 2005)**

- There was no significant improvement.
- She developed a problem with her eyes, conjunctivitis.
- Ratu was treated with antibiotics (Sulfadiazine & Trimetoprim) 20 tabs per rectal, Biosalamin 10 cc IM in the neck, Otsu-NS Normal Saline was administered per oral ad libitum in bowl and directly into her mouth using cateter, gentamycin sulfate ointment was administered to both her eyes and neurobion injection (5 cc IM + 10 cc sterile saline solution) in the neck.
- Feeding: morning - evening estimated 5 kg. She also browsed directly to eat by herself from the prepared forage. Drink: she drank 5 times from the bowl if it was lifted up directly to her mouth.
- She urinated quite some more.
- Dr. Dedi and Dr. Agil arrived and immediately inspected the rhino.

#### **Day 3 (23 September 2005)**

- Ratu spent most of the time sleeping in the wallow, although she showed significant improvement
- She became more aggressive. She walked around the boma several times, tried to push the boma and to pull up the shade cloth.
- The shade cloth was took of the fence, since she tried to pull it out.
- Faeces was found for the first time through rectal palpation. The consistency of faeces was hard and a little bit dry.
- Ratu could finally defaecate by herself in the late afternoon. She produced about 10 balls of faeces. This was the first time she produced faeces.
- She ate much more forage than the previous day and she already was browsing regularly by herself. She ate about 5 kg in total for the day. She also drank a lot.
- Urine was changed significantly. The urine was not reddish anymore, although it was still slightly brown.
- Medical treatment: antibiotic was administered perrectally, Otsu-NS normal saline/ electrolyte solution (drinking and spraying directly to the mouth), gentamycin sulphate eye-ointment.
- Vaccination: anti tetanus toxoid 1cc IM in the neck.

#### **Day 4 (24 September 2005)**

- Ratu defaecated and urinated normally.
- She was foraging and drinking more than yesterday.

- Wallowing as usual
- Respiration was normal about 13 times/minute
- The hind-limb lameness was still present and was easily observed when she get up from the wallow or when she walked.
- Medical treatment: antibiotic per rectal, electrolyte solution drinking, gentamycin sulphate eye-ointment, Neurobion® (Vit B1, B6 and B12).

#### **Day 5 (25 September 2005)**

- There was no change on the activities and her health condition, the lameness is still prominent
- Medical treatment: same as yesterday, except Neurobion® was not given

#### **Day 6 (25 September 2005)**

- The color of the urine was more yellowish
- Ratu was exploring more in the enclosure, she started to enlarge the wallow by herself.
- There was no significant improvement in browsing and drinking
- Medical treatment was the same as the previous day.

#### **Day 7 (26 September 2005)**

- Ratu entered new boma (40 x 30 m<sup>2</sup>) facility. She enjoyed to wallow in the new boma area.
- She began to explore more and browsed in the boma.
- Although the lameness problem was improving, it was still noticeable when walking.
- She ate more fruits and more varieties of forage.
- Urine returned to normal, the urine was clear and yellowish in color.
- Medical treatment: antibiotic tablets were administered orally in orange fruits, other drugs were administered as in the previous application.

#### **Day 9 (27 September 2005)**

- There was no significant improvement
- Urine and faeces were normal
- Ratu was trained to step on the Scale to measure her bodyweight. Ratu's body weight was about 478 kg
- Medical treatment was continued as before.

#### **Day 10 (28 September 2005)**

- Reproductive organs were examined using ultrasound (USG) together with Dr. Robin Radcliffe.
- The hind-limb lameness still exists and it is easily observed when she walks.
- Medical treatment was continued

#### **Day 11 (29 September 2005)**

- There was no change in the daily activities

#### **Day 12 till Day 19 (30 September till 7 October 2005)**

- The rhino was given more fruits to train her to enter and stay in the chute and eat fruit in the chute
- Ratu could eat about 5 kg fruit i.e., papaya, water melon and banana
- Since the hind-limb lameness continued, it was decided to do an X-ray to find out the reasons of the lameness.

**Day 20 (8 October 2005)**

- Ratu was scanned with X-ray, focussing on the knee and hip.
- Ratu was very calm and she ate fruits while she was x-rayed

**Day 36 (24 October 2005)**

- Vaccination: Anti tetanus toxoid (1 cc, IM) was administered as a booster.
- Although the hind-limb lameness was continuing, she looked better in hind leg movement.

**Day 41 (29 October 2005)**

- Planned to repeat the X-ray scanning on Ratu.







# REPORT ON HEALTH AND REPRODUCTIVE CONDITION OF "RATU" (NEW RHINO IN SRS WAY KAMBAS)

Muhammad Agil, DVM  
Dedi Candra, DVM  
Robin W. Radcliffe, DVM, DACZM

## General Condition

On the 20<sup>th</sup> of September 2005 a young, estimated 6-7 year old female Sumatran rhinoceros (*Dicerorhinus sumatrensis*) was translocated to the Sumatran Rhino Sanctuary (SRS) inside Way Kambas National Park in Lampung Province Sumatra. The rhino was compromised upon arrival in the SRS from the stress of capture. Her movement was slow with a marked hind-limb lameness characterized by both tremors and ataxia.

The rhino was initially reluctant to eat although she did drink well. The keepers provided fresh food and water while she was in the wallow. The rhino could only eat forage in small amounts of about 2 kg/day and drink only about 5 litres/day until day-2. The rhino was in relatively good body condition. However, she is of small stature and low body weight (478 kg.).

There appeared to be no recent fecal production indicating she had not eaten regularly in the previous few days. The rhino's oral and nasal mucosa was hyperemic. The urine was dark red and turned brown upon exposure to the air indicating myoglobin muscle pigments in the urine. The above signs are consistent with acute myopathy (exertional rhabdomyolysis) associated with the stress and running at the time of capture.

While there are certainly some "lessons" to be learned about the best way to capture a wild Sumatran rhino, we also think that these lessons must be viewed within the context of the realities of working in a remote field-setting like Sumatra. A separate document has been prepared that specifically details field capture recommendations should this event occur again in Indonesia.

## Medical Evaluation

Clinically the rhino appeared to be suffering from:

1. Stress
2. Dehydration
3. Myoglobinuria with kidney disease
4. Muscle disease with lameness

Blood analysis revealed a rather low white blood cell count (~3,700 wbc/ul) and alterations in the wbc differential suggesting the possibility of infectious disease agents. Serological analysis for a spectrum of common diseases was conducted in the laboratory in Bogor. The rhino also had significant elevations in SGPT/SGOT levels up to 2,000 IU, and CPK up to 25,000 IU, findings consistent with a diagnosis of capture or exertional myopathy. Please see addendum at the conclusion of this summary for specific clinical findings including summaries of laboratory data.

## Age Estimation

Age was estimated from the condition of the teeth. She is estimated to be about 6-7 years old. The incisors are about 1.5 cm in length and bright in colour. The pre-molars and molars are very sharp with minimal evidence of wear consistent with a young animal.

## Diagnosis

According to the symptoms observed and clinical findings, the rhino was diagnosed with **Capture Myopathy** (Exertional Rhabdomyolysis).

## Treatment

1. Electrolytes drinking *ad libitum*
2. Provide preferred forages and fruits
3. Antibiotics (Trimethoprim sulfa; 15 g PO SID) per oral for ten days
4. Antiinflammatories as indicated
5. Tonic (Biosalamin<sup>®</sup>) plus Vit. B1, B6 and B12 twice weekly
6. Tetanus toxoid 1 ml with 2 week booster

## Habituation

Since there will be a need to carefully observe and medicate the new rhino regularly, the rhino is being trained and habituated to enter the observation cage and chute. Training has been done without any handling or restraint which are probably harmful to the rhino at this early stage. Training is conducted by simply attracting the animal to come for the forage and fruit by hand in the cage. The rhino tolerates hand feeding well and enters the chute and observation cage for training.

## Chronicle of Progress & Improvement in Condition at the SRS

1. The rhino has started to move and walk better since day-3. No tremors are noted, but she still shows lameness most prominent on the left hind limb during ambulation.
2. The rhino's urine improved by day-3; the urine was not reddish anymore but it was still slightly brown.
3. The rhino started to eat and drink much better since day-3, she already has been browsing regularly by herself.
4. Ratu began to defecate normally by day-3
5. She began to explore more and browse in the boma (40 x 30 m<sup>2</sup>) by day-6
6. Urine returned to normal by day-7; the urine was clear and yellowish in color
7. The rhino's lameness problem was improved by day-7, but is still noticeable at a walk. She can walk better with only minimal difficulties in hind leg movement.
8. She now eats more fruits and more varieties of forage.
9. The rhino is now under habituation process naturally to stay in the paddock and under intensive management in SRS.
10. ***The rhino has a normal reproductive tract with several small follicles in both ovaries.***
11. The rhino tolerates hand examination well while she is in the observation cage or in the chute.

NOTE: Day-0 is the day when the rhino was captured and arrived at the SRS (20<sup>th</sup> of September, 2005)



## Monitoring and Management

The rhino will be monitored for 3 to 4 months to document any changes. During that period, the rhino will be habituated to the SRS condition naturally. In order to get the rhino in prime condition, the rhino will stay in her new boma for at least 3 months or until the rhino makes a full recovery. This is critical in order to ensure that the rhino does not suffer post-capture complications. A detailed breeding plan will also be required in order to be fully prepared for controlled introductions and managed breeding in the Way Kambas situation which is quite different from other more traditional zoo settings.

## APPENDIX

### Sumatran Rhino Health Examination "RATU" or "Queen"

Date: 26 September 2005

Sedation: Butorphanol IM (see anesthesia record for details of procedure)

#### *Physical Exam*

General: Good body condition. Normal dentition typical of a young ~ 6-7 year old Sumatran rhinoceros.

Musculoskeletal: Bilateral swelling (edema?) of both lower rear limbs, especially cranioventral to hock region bilaterally. Also large obvious swelling to rear leg muscles (ie. gluteals, semimembranosus, and gastrocnemius). In addition, there is marked dermal and subcutaneous ecchymotic hemorrhages noted over both rear limbs and suggestive of deeper underlying muscle pathology.

Nervous: Depressed.

Urogenital: Urine is now a concentrated (S.G. = 1.032) yellow color with a faint green tint, but no gross red color indicative of hemorrhage.

Respiratory: NSF. Labored respirations noted for first 24 hours post-capture have now resolved.

Cardiovascular: NSF. Possible IHVS-like lesions in damaged muscles/vessels secondary to rhabdomyolysis.

Oral: NSF. Normal dentition.

Ocular: Eyes normal OU. No abnormalities noted.

Endocrine: NE.

Lymphatic: NSF.

Integumentary: Miscellaneous superficial scratches and scrapes. Ecchymotic hemorrhage on both rear limbs. Marked edema evident dependent and cranial to both hocks.

#### *Treatments given on 26 September 2005*

- 1) 1000 mg Ketoprofen IM
- 2) 600 mg Vitamin B complex IM
- 3) 3 g Naxcel (Ceftiofur Na) IM
- 4) Follow up with oral Trimethoprim-sulfa at 30 mg/kg PO SID for 10 days  
30 mg/kg x 500 kg = 15,000 mg TMS  
15,000 mg/960 mg/tab = 15 tablets  
Therefore, dose of TMS: Give 15 tablets of 960 mg TMS PO SID for 10 days

### Diagnostics

#### CBC (SRS)

Sample: Left Aurical Vein

Anticoagulant: EDTA

WBC: 3,700

PCV: 52%

Buffy Coat: 1%

T.P.: 7.6 g/dl

Platelets: Adequate

Urinalysis (SRS)

Source: Free Catch

Color: Yellow with light green tint

Turbidity: Cloudy

Specific Gravity: 1.032 (Refractometer) / 1.030 (Dipstick)

Blood: Moderate (80)

Urobilinogen: Normal

Biliruben: NEG

Protein: 3+

Nitrite: NEG

Ketone: NEG

Glucose: NEG

Leucocytes: NEG

PH: 7.5

WBC Differential:

Bands: 0%

Neutrophils: 74%

Lymphocytes: 10%

Monocytes: 14%

Eosinophils: 0%

Basophils: 2%

UA (RS Mardi Waluyo; Kota Metro)

Color: Yellow

Turbidity: Cloudy

SG: 1.030

Leucocytes: +

PH: 7.0

Protein: 2+

Glucose: -

Ketone: +

Bilirubin: -

RBC: +

Nitrite: -

Urobilinogen: -

CBC (RS Mardi Waluyo; Kota Metro)

WBC: 8,000

RBC:  $6.7 \times 10^6$

Hgb: 17.9 g/dl

HCT: 53.3%

MCV: 78.6

MCH: 26.4

MCHC: 33.6

AT: 86,000

Sediment:

Epithelial: 6-7 /hpf

WBC: 4-6 /hpf

RBC: 4-5 /hpf

Ca Oxalate: +

Ca Phosphate: 3+

Triple P: -

Serum Chemistry (RS Mardi Waluyo; Kota Metro)

Glucose 131 mg/dl

Bilirubin Total 0.77 mg/dl

Direct 0.17 mg/dl

Indirect 0.60 mg/dl

Ureum 12.26 mg/dl

Creatinin 0.84 mg/dl

Cholesterol 70 mg/dl

Triglyceride 69 mg/dl

Urate 2.94

Total Protein 6.22 mg/dl

Albumen 4.11 mg/dl

Globulin 2.11 mg/dl

AST (SGOT) 2,735 U/L

ALT (SGPT) 1,045 U/L

LDH 683 U/L

GGT 45 U/L

Additional Tests Performed in Jakarta Laboratory

CPK >23,000 U/L

Na 135 mmol/L

K 4.3 mmol/L

Cl 90 mmol/L

Ca 11.5 mg/dl  
Ph 4.0 mg/dl

*Urinalysis Timeline*

DATE	PARAMETER					
	Color	Turbidity	PH	Blood	Protein	Specific Gr.
21 Sep	red, coffee	cloudy	6.0	Large (200)	4+	1.020
22 Sep AM	red, brown	cloudy	6.0	Large (200)	3+	1.015
22 Sep PM	red, brown	cloudy	6.0	Large (200)	3+	1.017
23 Sep AM	red, brown	cloudy	6.5	Large	3+	1.018
23 Sep PM	yellow-green	cloudy	6.0	Large (200)	2+	1.023
24 Sep AM	yellow-green	cloudy	7.5	-?	-?	1.029
24 Sep PM	yellow-green	cloudy	6.0	Large (200)	3+	1.025
25 Sep	yellow-lt. green	clear-cloudy	6.0	Large (200)	3+	1.027
26 Sep	yellow	clear-cloudy	7.5	Moderate (80)	3+	1.032
28 Sep	yellow	clear	7.0	NEG	3+	1.025



# SUMATRAN RHINO CAPTURE & TRANSLOCATION GUIDELINES

## Protocols for Sumatran rhino field capture, translocation or relocation

### *Overview of Capture Process*

The capture process for an “at risk” Sumatran rhinoceros found wandering within an Indonesian village or otherwise outside a protected area should be approached with the following guidelines in mind. Once the appropriate National Park, RPU and SRS staff have been contacted the following stepwise approach to capture and translocation is suggested.

### **Step 1 SECURE AREA**

The first priority in the event of a wild rhino found outside a protected area would be to secure the area from villagers to prevent the animal being shot or otherwise killed before capture or relocation of the rhino is possible.

### **Step 2 MAKE A PLAN FOR RHINO DISPOSITION**

If possible, a small core-group of decision makers should be formed (ie. head of National Parks, RPU and SRS) to make immediate decisions about rhino disposition. If the rhino is apparently unharmed and close to a protected area (<10 km) then it would be desirable to attempt to push the rhino back into the forest. If the animal is injured or otherwise in need of medical attention or is far (>10 km) from the forest a decision should be made to capture the animal.

### **Step 3 MAKE A PLAN FOR RHINO CAPTURE**

Considering the high risks associated with capture by the “chase to exhaustion” method (ie. rhino is captured following extensive chasing and stress without the use of routine capture methods such as veterinary drugs), this approach should be considered only as a last resort. The following suggested capture methods are listed in order of preference:

- **METHOD ONE:** *Field Capture Using a Dart Gun and Anesthetic Drugs*

If a trained capture team is available (ie. within 3 hours travel time) then it may be wise to have the RPU rangers carefully monitor and secure the rhino from a distance without pushing the animal to run as they await the capture team. The capture team MUST include one qualified veterinarian skilled in the use and handling of narcotic agents due to both human and animal safety risks. See the next page for suggested capture drug protocols.

- **METHOD TWO:** *Field Capture Using a Temporary Boma +/- Sedation*

If a trained capture team is not available, then it may be possible to follow the animal closely (without excessive chasing) until it is located in an area where it is resting and approachable (ie. laying in water or other suitable location). Large sheets of shade cloth or tarp could be used to create a temporary boma surrounding the rhino which would facilitate sedation and crating.

- **METHOD THREE:** *Chase Rhino Until Exhaustion Followed by Crating*

This approach should be avoided if at all possible because of the high risks of inducing capture myopathy and death in the animal.

## **FIELD DARTING PROTOCOLS**

### *Darting protocols for snare-removal or rescue of compromised Sumatran rhino*

The recommended protocol for field anesthesia is the butorphanol/azaperone combination due to its inherent safety for both rhino and people unless trained staff is present for use of more potent opioids such as Etorphine (skip to PROTOCOL 2 if trained staff are available). Protocol 1 may require confinement within a temporary boma or some additional restraint via a body or head rope to facilitate crating.

#### **PROTOCOL 1**

##### **Sedation for snare removal or capture of compromised Sumatran rhinoceros**

<u>Drug</u>	<u>Dose</u>	<u>Total mg dose for ~ 600 kg</u>	<u>Dart volume</u>
Butorphanol	140 ug/kg IM	80 mg IM	8.0 ml
Azaperone	140 ug/kg IM	80 mg IM	2.0 ml

*Antagonism of butorphanol (after crating or at unloading):*

*Naltrexone*                      *5 x butorphanol mg dose*    *450 mg IM*

Dart volume:

If butorphanol concentration = 10 mg/ml then 80 mg is 8.0 ml

If azaperone concentration = 40 mg/ml then 80 mg is 2.0 ml

This would make a total dart volume of 10.0 ml

This drug volume could be placed into a 10 ml Daninject dart. The above dose is greater than that generally needed to sedate captive rhinos due to the increased stress and excitement of darting wild rhinoceros which can lead to overriding of drug effects. The above protocol should work well as a starting point for field rangers as part of a "field emergency kit" in case timely interventions are needed as part of a conservation patrol (i.e. snare removal, etc.).

#### **PROTOCOL 2**

##### **Anesthesia for field capture of free-ranging Sumatran rhinoceros**

<u>Drug</u>	<u>Dose</u>	<u>Total mg dose for ~ 600 kg</u>	<u>Dart volume</u>
Etorphine (M99)	5 ug/kg IM	3 mg IM	0.3 ml (using 10 mg/ml M99)
Azaperone	140 ug/kg IM	80 mg IM	2.0 ml (using 40 mg/ml Azap.)
Hyaluronidase (optional)		5000 IU	Reconstitute with above

*Antagonism of etorphine (after crating):*

*Naltrexone*                      *50 x etorphine mg dose*    *100 - 150 mg IM*

NOTE: Since these drugs are dangerous to both the human handlers and the subject animal, an experienced wildlife veterinary capture team should only use this drug protocol. However, these drugs provide the most consistent, reversible and rapid recumbency possible in order to expedite field capture of African and Asian rhinoceros species. A rapid recumbency will be critical for safe capture of a species such as the Sumatran rhino that may escape into the wet rainforest environment and risk drowning or suffer from capture myopathy.

# Preliminary Model of Field Capture Kit for Emergency Use by Sumatran Rhinoceros RPU

Robin W. Radcliffe, DVM, DACZM

## *Proposed Concept for Field Capture Kit of Sumatran Rhino*

Today the Sumatran rhinoceros (*Dicerorhinus sumatrensis*) is considered one of the most endangered large mammals on earth with fewer than an estimated 300 animals remaining. Poaching for the animal's horn has resulted in their precipitous decline throughout Southeast Asia, with habitat loss a secondary factor contributing to population reduction and isolation. Sumatran rhinos continue to face increasing threats from human presence in the forest. The snare is one common form of poaching, and has caused significant impacts on the Sumatran rhino through injury and death. In most situations, members of the RPU will be the first lines of contact with a snared rhino or similar emergency. One or perhaps a few RPU's could be trained in the use of darting equipment and be provided a "FIELD KIT" complete with a pre-measured dose for a quick and safe anesthetic protocol for an adult Sumatran rhinoceros. In the event of a rhino emergency in the field (i.e. snared animal, etc.), the trained RPU could potentially act before other qualified help (often hours or even days away) could arrive at the scene.

## *Contents of FIELD KIT*

- 1) A short detailed instruction sheet **in English and Bahasa** with diagrams clearly outlining dart loading, delivery and pistol/pole syringe use.
- 2) RED labeled and pre-measured syringes with the two anesthetic drugs to be used for the sedation: Butorphanol and Azaperone.
- 3) A separate syringe containing the reversal agent (Naltrexone) labeled in GREEN that would be given following completion of snare removal or emergency care.
- 4) Several appropriate darts and needles with short easy to understand instructions and diagrams detailing dart loading and delivery.
- 5) Small pistol for delivery of dart to rhinoceros.
- 6) Gloves and dart/needle safety container.
- 7) Cable cutters or appropriate wire cutters for snare removal.
- 8) Topical disinfectant and triple antibiotic ointment to both clean and topically treat any snare-related injuries.
- 9) Pole syringe and appropriated syringes for hand-injection in situations where the dart pistol would be difficult to use.

## *Field darting protocol for rescue of snared or severely compromised Sumatran rhino*

**NOTE: The following drug dosages are preliminary as further investigations are needed to make appropriate recommendations for field use.**

### **Sedation for snare removal**

<u>Drug</u>	<u>Dose</u>	<u>Total mg dose for ~ 600 kg</u>	<u>Dart volume</u>
Butorphanol	100 ug/kg IM	60 mg IM	6.0 ml
Azaperone	130 ug/kg IM	80 mg IM	0.8 ml

OR

### **Recumbency for emergency treatment**

Butorphanol	150 ug/kg IM	90 mg IM	9.0 ml
Azaperone	170 ug/kg IM	100 mg IM	1.0 ml



Antagonism of butorphanol:

Naltrexone                      5 x butorphanol mg dose                      300 - 450 mg IM  
(partial dose IV if needed)

Dart volume:

If butorphanol concentration = 10 mg/ml then 60 mg is 6.0 ml

If azaperone concentration = 100 mg/ml then 80 mg is 0.8 ml

This would make a total dart volume of 6.8 ml (or 10.0 ml for recumbency)

This drug volume could be placed into a 10 ml Telinject or Daninject dart. The above dose is greater than that generally needed to sedate captive rhinos due to the increased stress and excitement of darting wild rhinoceros which can lead to overriding of drug effects. The above protocol should work well as a starting point for field rangers to have as part of a "field emergency kit" in case they need to make timely intervention as part of a conservation patrol (i.e. snare removal, etc.). Higher doses can be used to produce more marked sedation or produce recumbency as deemed necessary by the RPU team by following the guidelines outlined above.

#### *Narcotic Safety and Potential for Abuse*

While the combination of butorphanol and azaperone is considered very safe in rhinoceros compared to other narcotics, the butorphanol agent is an opiate derivative that could have significant effects if inadvertently injected into a human subject at these volumes. Based on this risk, the reversal drug (Naltrexone) should always be on hand and ready for administration to any victim should an accident occur. The Naltrexone dose that has already been pre-measured for use in the rhino should immediately be injected into the muscle of a human should an accidental exposure to butorphanol occur. Although abuse potential of these agents is low, these kits should be locked and placed under the supervision of the RPU leader only.

#### *Field darting protocol for rescue of free-ranging Sumatran rhino*

**NOTE: The following drug dosages are preliminary as further investigations are needed to make appropriate recommendations for field use.**

#### **Anesthesia for capture of free-ranging Sumatran rhinoceros**

<u>Drug</u>	<u>Dose</u>	<u>Total mg dose for ~ 600 kg</u>	<u>Dart volume</u>
Etorphine (M99)	3 - 5 ug/kg IM	2 to 3 mg IM	0.2 - 0.3 ml (using 10 mg/ml M99)
Azaperone	130 ug/kg IM	80 mg IM	2.0 ml (using 40 mg/ml Azap.)
Hyaluronidase		5000 IU	Reconstitute with above

The above protocol is provided as an alternative to use of the pit-trap for capture of the Sumatran rhinoceros when its use is not feasible. This protocol is NOT intended to be used in place of the pit-trap as the latter method is still considered the safest method for capture of free-ranging Sumatran rhinos. Since these drugs are dangerous to both the human handlers and the subject animal, this drug protocol should only be used by an experienced wildlife capture and veterinary team. However, these drugs provide the most consistent, reversible and rapid recumbency possible in order to expedite field capture of African and Asian rhinoceros species. A rapid recumbence will be critical to safe capture of a species such as the Sumatran rhino that may escape into the forest after darting and also be prone to both loss and other risks such as drowning. A capture system that employs a radio transmitter dart,

containing a transmitter that stays with the darted animal, may be important to insure that the animal can be located quickly in the thick rainforest environment.

*Full Antagonism of etorphine:*

Naltrexone	50 x etorphine mg dose	100 - 150 mg IM (partial dose IV if needed)
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**Options for sedation / tranquilization to facilitate safe translocation**

- 1) Partial reversal of narcotic effects with agonist-antagonist such as Nalorphine (without prior reversal with Naltrexone).  
Nalorphine 5 to 10 mg IV
- 2) Full reversal of narcotic with Naltrexone (see below) followed by sedation with Azaperone or Butorphanol (see doses above for sedation) for crating and translocation.  
Azaperone 100 to 150 mg IM (or to effect)