

# CAPTURE, IMMOBILIZATION AND TRANSLOCATION OF AN ELEPHANT FROM PULAU UBIN, SINGAPORE TO ENDAU-ROMPIN STATE PARK, JOHORE, MALAYSIA

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## 1. Introduction

On Friday 1st March 1991, it was reported that a wild elephant was sighted by villagers at Pulau Ubin, an island (15 km<sup>2</sup>) located north-east of Singapore (Fig. 1). There were about 200 residents on the island and on the weekend there could be as many as 2,000 visitors.

The following day a team of wildlife officers and rangers from the Johore Department of Wildlife and National Parks was despatched to Pulau Ubin to carry out an investigation. On Sunday 3rd March 1991 Mr. Bernard Harrison, Executive Director of the Singapore Zoological Garden, informed us that there were sightings of a male wild elephant at Pulau Ubin, Singapore.

The animal was also reported to have attacked an old man while he was praying near a to-kong (temple). Later, Mr. Harrison had officially requested assistance from the Headquarters, Department of Wildlife and National Parks (DWNP) Kuala Lumpur to enable officers and rangers from Zoo Melaka and the Elephant Management Unit to capture and relocate the solitary elephant from Singapore.

## 2. Materials and methods

### 2.1. Personnel

Tracking, drugging and relocation teams were from Johore DWNP, Zoo Melaka and Elephant Management Unit based in Temerloh, Pahang. Singapore Zoo, Armed Forces and Marine Police provided the support and security during the operation

### 2.2. Monitor elephants

Mek Bunga, Female  
Che Mek, Female

### 2.3. Drugs and Veterinary supplies

Immobilon (1 ml = 2.45 mg Etorphine HCl and 10 mg Acepromazine)  
Revivon (1 ml = 3 mg Diprenorphine HCl)  
Rompun (1 ml = 100 mg Xylazine)  
Reverzine (1 ml = 10 mg Yohimbine HCl)  
Syringes and needles of various sizes  
Disposable surgical gloves  
Thermometer  
Steel tape  
Watch  
Venject vacuum tubes — ETDA, Heparine and plain  
cotton swabs  
Alcohol  
KY gel  
Clean towels  
Ice chest

### 2.4. Capture gear and hardware

Palmer Cap-Chur gun  
5 ml capacity barrel with collared needles  
2 pcs 458 riffles  
Double barrel short gun  
High tensile steel chain  
U-chain clips (high tensile steel)  
2" diameter PVC hose (large enough to insulate the steel chain)  
36 ins chain cutter  
Adjustable spanners  
PVC water hose  
PVC water containers  
Parang

## 2.5. Transportation and communication

Ten-wheeler Izuzu truck (1 DWNP & 2 hired)  
Long wheel base Land Rover 110 (1 DWNP & 4 SAF)  
2 units Izuzu Trooper  
Suzuki 4 x 4  
Outboard Marine Police patrol boat  
Barge and tug (hired @ \$1000/trip)  
Mechanical shovel  
4 units Police outriders  
Hand-held telephone (Singapore Zoo)  
Motorola walkie-talkie (Zoo Melaka and Marine Police)

## 2.6. Documentation

Sony video cam camera  
SLR Nikon FM and FM2 cameras  
Polaroid 600 camera  
Agfachrome CT 100 36/135

TPR (temperature-pulse-respiration) was taken on a 15-minute interval during the duration the animal was kept sedated. A conventional mercury-glass thermometer was placed against the rectal meosa for about one minute. The pulse rate was taken by palpating the right ear vein. Respiratory rate was determined by placing the hand against the nostril and ocular observation of the chest movement.

Blood was collected into the vacuum tubes from the marginal ear vein using 21 G needle.

Body measurements were taken in inches using steel tape and was later converted into metric.

## 3. Immobilization, capture and relocation

At 0842 hr, Wednesday 6th March 1991, a male free ranging elephant was immobilized using 3.5 ml of Immobilon by Dr Zainal Zahari Zainuddin near the Ubin Buddhist Meditation Centre. It was darted on the right shoulder. Six minutes later the animal was found completely sedated and recumbent on left lateral under a clump of trees near pandan and fruit trees. Policemen quickly encircled the site about 20-30 m away from the elephant and demarcated the area using plastic tape. This was done to deter the curious public from encroaching and disturbing the elephant.

A quick physical examination by Dr Zainal and Dr Shirley Llizo revealed that the animal was in excellent body condition. However, there was a long and deep scar of about 15 cm long on the right lateral of the distal end of the trunk. A wire snare could probably have caused such a scar. A circular laceration, 5 cm diameter, was located antero-laterally on the foot pad of the right fore limb.

Morphological and physiological measurements were taken. Both fore limbs were shackled using a steel chain and secured to a tree about 38 cm diameter. The right hind limb was also leashed with steel chain which was covered with pvc hose and secured to a tree about 26 cm diameter. After about 1hr 10 mins the animal was revived using 4 ml of Revivon. At 0958.5 hr, the animal recovered, 2.5 minutes after the antidote was administered intravenously into the marginal ear vein.

After regaining full consciousness the animal made several mock charges, broke the PVC water container and was calm after about 15 minutes. Banana stems, jack fruits and banana fruits were provided for the animal to feed. It was observed that the elephant would throw banana stems when we attempted to examine its condition at a closer range. A villager was seen by Mr. Vasantha Nugegoda giving water to the elephant by throwing handball-sized plastic bags containing clean water. The animal then tore the bag and used its trunk to suck the water for drinking.

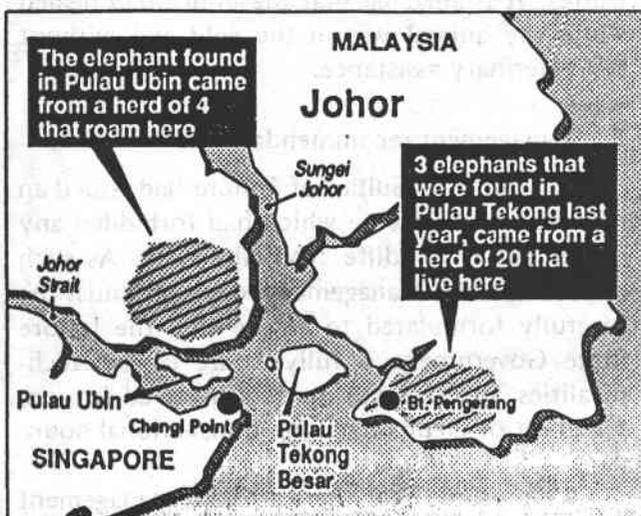


Fig. 1. Location of Pulau Ubin in Singapore.

An elephant loading bay measuring about 250 cm wide and 90 cm deep was prepared a few meters away from an access road along a hill ridge.

On Saturday 9th March 1991, after a brief discussion between Mohd. Shariff, Dr Zainal and Nasharuddin, the animal was darted with 80 mg of Xylazine and 30 mg of Atrophine sulphate at 0710 hr. Ten minutes later the penis was fully relaxed and at 0730 hr the elephant was fully sedated. About 35 minutes were spent to drag the wild elephant out of the estimated 60 cm deep muddy site. Before the animal was loaded on to a ten-wheeler truck at 0834 hr, its left upper ear was tattooed No. PU01.

At 1008 hr, the elephant entourage arrived at Commando Jetty on a barge (Eng Tou 175; tug, Kepah) and was escorted by police outriders to the causeway. However, the monitor elephants detoured to Singapore Zoo for a short break. Meanwhile during transportation, the wild elephant was again topped-up with 100 mg of xylazine near Kluang, Johore. At about 2000 hr the wild elephant was immobilized and unloaded near Kahang. A few minutes upon administration of Yohimbine HCl, the animal charged into its new home in Endau-Rompin state park, Johore.

#### 4. Comments

4.1. This elephant capture exercise was well coordinated by the Singaporean and Malaysian parties involving some 37 personnel directly and about 15 people (policemen on a 24-hr guard; drivers and conductors of Marine Police boat, tug and barge, mechanical shovel and private trucks to transport monitor elephants) indirectly.

4.2. The presence of free ranging elephant on Pulau Ubin with an area of 15 km<sup>2</sup> and a population of about 200 is alarming and it could have endangered the lives of the residents and the weekend visitors.

4.3. Immobilization of the free ranging animal was smooth using 3.5 ml of Immobilon. Induction was 6 minutes and the animal was kept sedated for 1 hour and 10.5 minutes. Revival took only 2.5 minutes after administration of Revivon.

Under xylazine the animal was responsive to maneuvering by the monitor elephants for loading on to the 10-wheeler truck. During the long journey from Singapore to the release site (about 214 km; 4 hours 45 minutes), an additional 100 mg of xylazine was required to calm down the elephant. Another 80 mg of xylazine was administered for unloading at the release site (Sg. Emas, Kahang, Johore) and was effectively revived with 20 mg of Yohimbine HCl.

4.4. The use of PVC hose to cover the leg chain was useful to deter any damage to the limbs or skin of animal which was tied for about 72 hours. High tensile steel chain 3 mm diameter was found to be extremely strong to hold free ranging elephant of may be up to 4 metric ton weight.

4.5. A field data sheet was specially designed and used for the first time on the elephant capture work at Pulau Ubin. Unlike other capture operations, the exercise at Pulau Ubin has provided much information on the habitat, morphology, physiology and tranquilization. In this instance, data collection was made possible due to the presence of at least two experienced field officers to measure and monitor the animal as sedation progressed.

4.6. The presence of wire snares for illegal trapping of wild boar along the costal forest of Johore and Pulau Nenas had probably taken its toll on some wildlife including the large mammals. However, the Pulau Ubin elephant was rather fortunate to escape lightly (injured trunk). It is amazing that the injury had healed while the animal was in the wild and without any veterinary assistance.

#### 5. Management recommendations

In 1986, the Sultan of Johore had issued an informal royal decree which had forbidden any movement of wildlife from the state. As such any long-term management decision must be carefully formulated to ensure that the Johore State Government is fully aware of the technicalities and delicate matters involved in conservation of elephants along transnational boundary.

We presume that there are four management options for the elephants found in the southern parts of Johore;

### 5.1. Relocation of all herds within 100 km radius from Singapore:

There are 6 elephant herds consisting of about 56 animals along the coastal areas from Mersing to Ulu Sedeli and the inland areas from Kota Tinggi-Kluang. Considering the capture cost to be about M\$20,000/animal (M\$15,000/head and M\$5,000/capture in acquiring new equipment and vehicles), it would require M\$1,120,000 for the relocation of elephants within 100 km radius from Singapore. This is considered costly but the operation could be financially feasible if both governments (Malaysia and Singapore), and perhaps also IUCN/SSC, agree to sponsor the relocation programme.

However, in terms of *in-situ* conservation, the operation would create immediate extinction of elephants in southern Johore and some problems may arise in determining a viable release site for such large number of animals.

### 5.2. Relocation of coastal herds in the vicinity of Singapore

There are about four herds of 24 elephants roaming from Ulu Sedeli to Penggerang region. Operational cost of capture and relocation would be about M\$480,000 which could be shared between the two governments. In a short-term this might be the most realistic approach in solving the problem of wild elephants from Malaysia encroaching into international boundary and populated areas in Singapore. However, over a long period, vacuum areas left by relocated animals could be taken over by surplus animals from the inland and the situation could be self repeating.

It would be advisable to carry out detailed research on ranging patterns of the southern herds. Simultaneously, a feasibility study must be carried out on all potential release sites to determine the carrying capacity of different habitat types in Johore or other states in Peninsular Malaysia. Subsequently, after gathering all the vital information, a well-planned capture and relocation of the elephant herds could be carried out in about 24 months.

### 5.3. Transnational elephant sanctuary:

Pressure on the habitats or traditional/historical ranging routes may have motivated the

elephants to swim across from Johore to Pulau Tekong and Pulau Ubin in Singapore. Enacting certain areas (within the present land use system) as a sanctuary may be a generous solution for the elephant conservation in this region. Suitable forested areas in southern Johore and Pulau Tekong could be declared as a pilot elephant sanctuary. Implementation of this project would involve all agencies affected by the elephant problem.

### 5.4. *Ad hoc* capture and relocation programme

The wait-and-see approach could be cheap in the short-term but over a long term it could be financially costly and also could run into operational and executional problems. The capture and relocation work of this nature is entirely dependent on the availability of teams of field men (trackers, capture, relocation, logistics and veterinarian) to be assembled immediately on site. For example, the Pulau Ubin exercise had taken seven days, from first sighting of animal, to assemble a full complement of the field staff. Some of the delays were inevitable as the same field men were also translocating elephants elsewhere.

## 6. Acknowledgements

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