

SUMATRAN RHINO (*Dicerorhinus sumatrensis*) CAPTIVE PROPAGATION IN RELATION TO ITS CONSERVATION

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INTRODUCTION

To keep the Sumatran rhino from becoming completely extinct, an intensive cooperation project between governments of Indonesia and United Kingdom as part of a global strategy for conservation of the Sumatran rhino was launched in 1985. The United States of America joined the project in 1988.

The goal of the strategy is the long-term survival of the rhino as a species and also as a component of its natural ecosystem, which is hoped to be attempted through programs for the protection of viable population in sufficiently large areas of natural habitat, and captive propagation of doomed animals.

Twelve animals salvaged through this project have been distributed amongst zoos in Indonesia (2.2), England (1.1), and the USA (1.3). Two Sumatran rhinos (1.1) captured in March and April 1991 are still in the capture area near Bengkulu, Sumatra. All twelve rhinos were captured from forests destined for conversion to oil palm plantations.

LOCATION OF SUMATRAN RHINOS FOR CAPTIVE PROPAGATION IN INDONESIA

Four Sumatran rhinos under this project have been distributed amongst zoos in Indonesia :

1. Ragunan Zoo: One pair of Sumatran rhinos ("Jalu" and "Dusun") are kept in two enclosures separated by a 1 m high concrete wall. One enclosure has an area of 2200 m², the other 1100 m². Animals in the two enclosures can be joined by opening gates into a mud wallow between them.

They mated several times last January 1991, but the pregnancy test has not been done.

Several species of plants grow in the enclosures. These include *Lucuma nervosa*, *Mangifera odorata*, *Bambusa* sp., *Nephelium lappaceum*, *Psidium guajava*, *Acacia multijuga*, *Pennisetum purpureum*, *Imperata cylindrica*, and *Anacardium occidentale*. There is an observation tower 4 m north of the enclosures. A new enclosure has been built, with a run connecting it to one of the old enclosures.

2. Surabaya Zoo: Surabaya Zoo has received one male Sumatran rhino ("Rokan"). It is kept on a 0.5 ha moated island. This enclosure was designed to house one pair of rhinos.

3. Indonesia Safari Park: One female rhino ("Daludalu") is kept at Indonesia Safari Park, Bogor, in a concrete stall with an observation room for students or researchers, and open enclosure ca. 1800 m² which is being prepared to house one pair of rhinos.

STUDIES OF SUMATRAN RHINOS (*D. sumatrensis*) IN CAPTIVITY

In relation to its conservation, the main aim of keeping the Sumatran rhino in captivity is to increase its numbers.

Five preliminary studies of the Sumatran rhinos at Ragunan Zoo have been completed by students and Zoo staff directed by L. Prasetyo. They focused on (1) food preferences, (2) feeding behaviour, (3) diurnal activities, (4) nocturnal activities, and (5) land-use within the enclosures.

Semiawan (1990), Riyanto (1990), and Hardjanti (1990) found that the Sumatran rhinos at Ragunan Zoo were most active during seven hours of the day: 3-5 am, 6-9 am, 5-6 pm, and 10-11 pm. Most of the daylight hours were spent in a mud wallow or in the shade of roofed over areas.

The Sumatran rhino uses its prehensile lips to browse on leaves, twigs, and fruits. Those at Ragunan Zoo fed most in the early morning and evening. "Jalu" and "Dusun" together consumed 25.47 kg leaves and twigs per day, 17.76 kg fruits, and 7.07 kg concentrate (Cargill Feedmill Co.).

The leaves were *Artocarpus heterophylla*, *Xylopia glauca*, *Antidesma bunirus*, *Sandoricum koetjape*, *Hibiscus rosasinensis*, *Callophylum neulatri*, *Ficus benyamina*, *Artocarpus altilis*, *Acalypha wilkesiana*, *Achras zafatu*, *Pisonia alba*, *Nephelium lappaceum*, *ketapang*, and *Lucuma nervosa*. The fruits were *Psidium guajava*, *Musa paradisiaca*, and *Carica papaya* (Utami and Prasetyo, 1988; Hardjanti, 1990).

Saskia (1990) found that the Ragunan pair move about more while feeding at night than they did while feeding in daylight. They wallowed and drank more during the day than they did at night. The Sumatran rhinos at Ragunan Zoo lay down at many different places, showing no preference for particular resting sites. They used a specific place for defecating, but not for urinating.

Reproductive behaviour study started October 1990 and is still being done at this time, four months after they mated.

"Rokan", the male Sumatran rhino at Surabaya Zoo, was suffering from a leg injury inflicted by a poacher's snare when he was captured. Observations of his behaviour also are in progress.

To facilitate handling the animal, Indonesia Safari Park is training its female rhino to walk through a squeeze cage. They also are observing her estrus cycling.

ARTIFICIAL INSEMINATION (AI) IN SUMATRAN RHINO

Zoo scientists around the world are experimenting with AI and Embryo Transfer (ET), two methods of propagation. AI and ET are widely successful in domestic animals. Hopefully, both methods can be employed with Sumatran rhinos.

AI can be employed in the zoos in Indonesia (Prasetyo, 1990) to help achieve the goal of Sumatran rhino captive propagation. By using AI, adult rhinos that are fertile can be bred without having to deal with pair incompatibility or other behavioural problems.

It is understood that to achieve AI, we must know when, how much, and where to put the semen in the female's reproductive tract. But, developing proper AI procedures will be easier, safer, and less expensive than moving the rhinos between zoos in Indonesia to attempt their natural breeding (Prasetyo *et al.*, 1990).

We need to determine each Sumatran rhino's reproductive potential. If we know the reproductive status of every rhino, than we can use AI and ET to make each fertile individual a functional reproductive animal. We must start by accumulating baseline data on reproductive behaviour and physiology of every animal in the program.

On the Working Plan of the above mentioned project, the known technology of AI and ET will be transferred from USA to Indonesian reproductive biologists. Selected male rhinos in the USA and Indonesia will be trained for collecting semen and selected females will be trained for insemination procedures.

As one of the efforts of the government of Indonesia to protect its national wildlife, "Ipuh", a male Sumatran rhino which has been kept since July, 1990, was trained for collecting semen at the PHPA Quarantine Installation. The activity was carried out by PHPA - IPB, Team for Captive Propagation of Wildlife (Prasetyo and Noordin, 1991a). The manual massage technique has been done in the crush and in the open enclosure. The technique has made "Ipuh" fully erected, but unfortunately the collecting glove was pressed by his body in the crush. In the open enclosure, the collecting glove was stepped on by his feet and the semen was spread out on the ground.

The other effort is assigning Indonesia Safari Park as Indonesian Center for Reproduction of Endangered Wildlife (ICREW) (Prasetyo and Noordin, 1991b), which will be technically supported by the Sumatran Rhino Trust (SRT).

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