
MATING SUMATRAN RHINOCEROS AT SEPILOK RHINO BREEDING CENTRE, SANDAKAN, SABAH, MALAYSIA

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INTRODUCTION

The idea of capturing and breeding the rare Sumatran rhinoceros (*Dicerorhinus sumatrensis*) was conceived in the USA in the early 1980s and received considerable support, especially in view of the rapid turning of forest lands - the natural habitat of this species - into plantations. Although much original forest habitat is being lost, the Sumatran rhino survives even better in secondary forest and land where logging has occurred. Its main danger now is from poachers who continue to kill rhinos for their valuable horns, meat and bones. Rhinos are easy prey in areas which have been logged.

In 1985, the State Government of Sabah's Rhino and Wildlife Conservation Committee (SRWCC) established a local capture and breeding programme. The SWRCC undertook numerous ground surveys to ascertain the presence of rhinos, their home range and their safety. The capture programme was activated in 1987 and began with the capture of rhinos that were exposed to poachers due to the loss of their habitat.

CAPTURE PROGRAMME

The first rhino, an adult male, was captured at Linbar Kinabatangan on 25 March 1987. Unfortunately he died in the capture pit, due to internal injuries and respiratory failure, as seen in the Table below.

Table. The number of captures and the fate of each rhino in the capture programme.

No.	Date of capture	Sex	Remarks
1.	28.03.87	M	Caught at Linbar, Kinabatangan. Died in the pit due to internal injury and respiratory failure.
2.	14.07.87	M	Tenangang, died in Rhino Breeding Centre Sepilok (RBCS) in 1991.
3.	24.05.88	M	Died in the pit.
4.	22.04.89	F	Lumparai, mated on 28.10.95.
5.	05.05.91	M	Takala, died in RBCS on 08.05.95 due to tetanus.
6.	27.08.92	M	Sidom, mated with Lumparai and Gologob.
7.	05.06.93	M	Caught at Bulud, Sukau. Radio-tagged and released at Tabin Wildlife Reserve on 30.11.93. Located 30km from site of release recently.
8.	20.07.93	M	Tanjung
9.	17.06.94	F	Gologob, mated on 26.10.95
10.	22.11.95	M	Malbumi estate, Sukau Moved to RBCS on 25.11.95.

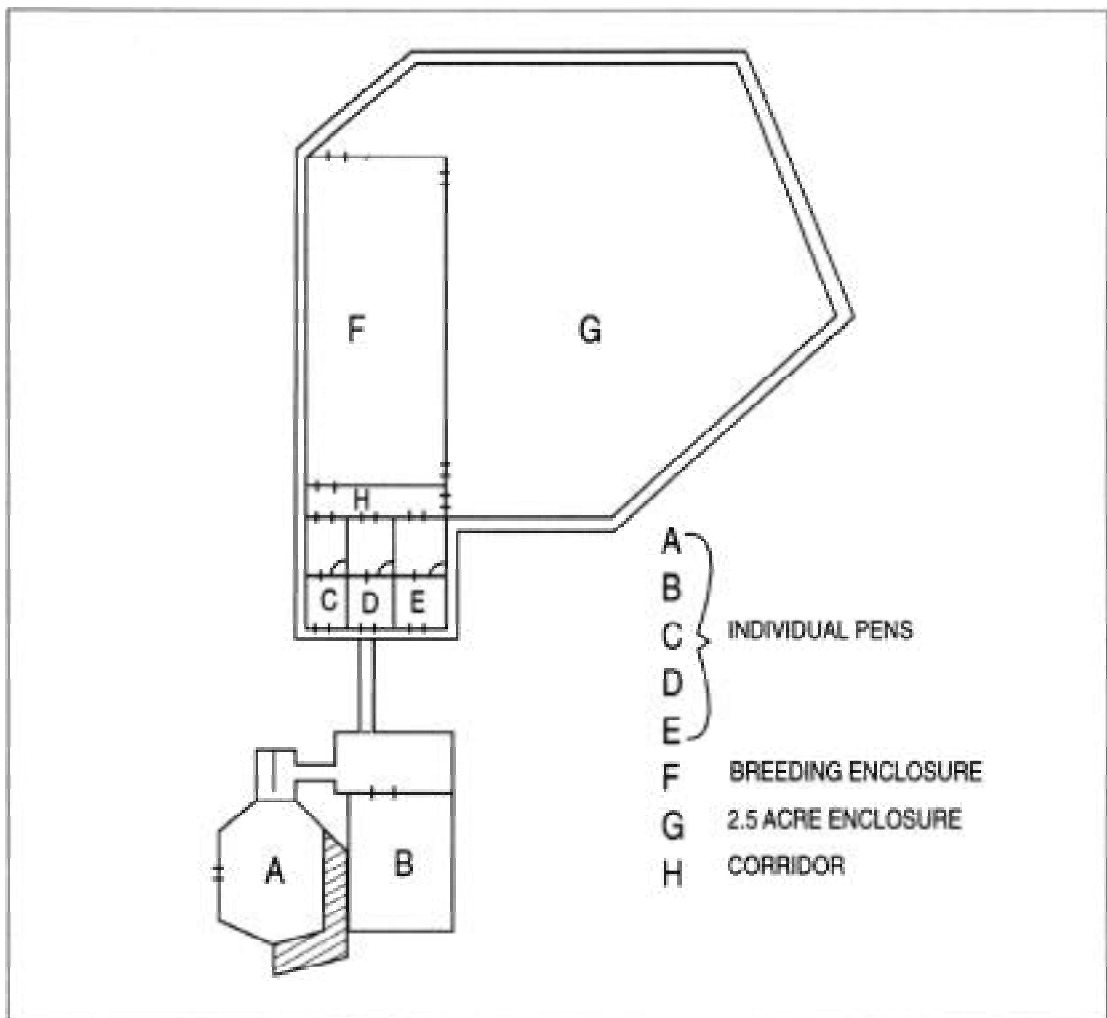


Figure. A diagram of the rhino stockade at the Rhino Breeding Centre, Sepilok.

The SRWCC, which evolved into a highly trained and efficient capture team, was absorbed into the Wildlife Department Sabah (WDS) when the latter, which was formally the Wildlife Unit of the Forestry Department Sabah, was elevated into a Department under the Ministry of Tourism and Environmental Development, Sabah, in 1988.

In March 1995, Sabah was allocated \$411,334 for a three-year rhino project under the sponsorship of the Global Environmental Facility (GEF) of the United Nations Development Programme (UNDP). This funding is mainly for the provision of facilities, manpower and technical support for the protection of this endangered species in situ. It incorporates minimal provision for captive breeding. The Wildlife Department, with the advice of Dr. Tom Foose and

Dr. Nico van Strein, decided to activate its own breeding programme in July 1995.

The Rhino Breeding Centre Sepilok (RBCS) currently has three males and two females. The facility is comprised of five individual stalls or pens, a breeding enclosure and a 2.5 acre enclosure. The walls are made from tropical hardwood ("belian"). A sketch of the facility is given in the Figure.

On 3 July 1995, a female, Gologob, was released into the 2.5 acre enclosure where 24 hour observations were conducted by a ranger, David Anthonius, assisted by Sillih Sikin, under the supervision of the author (a wildlife veterinarian). The observation team looked for signs of oestrus in the female rhino, such as a swollen vulva, mucoid discharge from the vagina and restlessness.

The 2.5 acre enclosure is part of the 4,300ha Sepilok Forest Reserve. It took less than two months for Gologob to “clear” the vegetation. She continued to be given green feeds daily, along with water and a salt lick. It was noted that an abrasion on her wither appeared to heal faster when covered with mud. She was not bothered by the presence of *Tabanus* flies.

On 3 August 1995, another female, Lumparai, who was kept in a pen, was observed to discharge clear mucous from her vagina. With this discovery, Lumparai was recruited into the study so that our observations now covered two females in different environments.

The observations were then extended to include the two males, Sidom and Tanjung. They were released into the breeding enclosure on a rotational, weekly basis. We were interested to note their reactions in the presence of Gologob. We noticed that each of them made lip contact and locked horns with Gologob at the common gate, and paced along the common wall. We also noticed that each male was excited, with his penis erect.

It was easier to note when the female was interested in the male. She would appear restless, moving around and making noises. She would stand near the gate or pace along the wall in order to look at the male on the other side. When she was lying on her side, a little manual manipulation of the vulva would reveal the clear mucous in her vagina.

Gologob

It was difficult to look for mucoid discharge in Gologob because of the mud cover and her activity near the wall. However, on two occasions we were able to see mucous in the vagina by manual manipulation to open the vulva when she was lying down on her side. Her vulva appeared swollen and soft. She was restless and would walk about more than usual when there was no male in sight. When the male was in the other enclosure, she would wait at the gate and pace along the wall.

Gologob came into oestrus on 31 July 1995, 28 August 1995 and 28 September 1995. Based on these dates, we estimated the oestrus cycle to be between 28 to 30 days. Therefore, we made plans to mate her on 27 October 1995. We moved Sidom into the breeding enclosure on 21 October 1995. On 25 October Gologob began to be restless but the male was not interested. He relaxed in the mud wallow most of the

time. On 26 October he began to show interest in Gologob by coming over to the gate and indulging in lip contact and horn-locking. We decided to open the gate for Gologob to enter the breeding enclosure at 15.15 hours and she headed straight for the male.

We let Gologob into the breeding enclosure again at about 11.00hrs on 29 October 1995 but there was no mutual interest shown between Sidom and Gologob. We decided that the breeding period was over and returned her to the enclosure.

Lumparai

On 3 August 1995, Lumparai was observed to have a mucoid, vaginal discharge. This was evident when she was lying on her side. Lumparai is a tame rhino, which made examination of her discharge relatively easy. She came into oestrus again on 28 September 1995. She was observed to urinate frequently around the stockade and to make more noises than usual. Her vulva was slightly swollen and soft.

On 26 October we moved Lumparai into the corridor where Sidom could see her. There was no mutual interest. On 27 October she was noticed to have a mucoid, vaginal discharge at 19.30hrs. We released her into the breeding enclosure during the morning of 28 October 1995 but there was no mutual interest with Sidom. She spent her time in the mud wallow while Sidom walked about. We put Sidom into the individual pen and returned him at 14.54 hours. This time Sidom went across and displaced Lumparai from the wallow. At 16.00hrs when he began to show interest in Lumparai and pursue her. There was a long courtship before he had the opportunity to mount her. We observed six mountings before it became dark. In the morning we noticed that Sidom was in the wallow while Lumparai had another wallow near the gate. We decided to return Lumparai to her pen at 09.00hrs on 29 October.

Lumparai was again observed to have a mucoid discharge from the vagina at 12.30hrs on 29 October. We decided to return her into the breeding enclosure, moving her into the corridor first. Tanjung, the second male, was in the breeding enclosure. We noticed that Tanjung was apprehensive when we moved him into the breeding enclosure. He was also “shivering” on the hindlegs when Lumparai expelled air from her lungs. Gradually they made lip contact and locked horns but were very aggressive. Lumparai lacked interest and she was returned to her pen after two hours in the corridor.

SUMMARY OF OBSERVATIONS OF MATING BEHAVIOUR

1. The oestrus cycle was estimated to be between 28 to 30 days.
2. During oestrus, the female was restless, with a swollen vulva and soft, clear, stringy mucoid discharge from the vagina. The vulva could remain swollen for five days. The discharge could be seen when the female was lying on her side. It was difficult to see the mucous when she was covered with mud but it was possible to see it when the vulva was opened manually.
3. The female was obviously interested in the male when she was in oestrus. The male would go to the common gate to make lip contact and to lock horns. The female would walk or pace along the wall, followed by the male on the other side.
4. The male was not interested in the female if she was not in oestrus.
5. Our experience with Lumparai indicates that mating is most likely to take place at least 20 hours after the mucoid discharge appears. This knowledge is useful for reducing the duration of courtship in capture.
6. We observed that mating occurred in late afternoon. Both mountings of Sidom, to Gologob and Lumparai, were accomplished after 15.00hrs.
7. The male only mounted when the female was quiet and still. When the site was not conducive to mounting, he pushed her gently from behind in order to move her where he wanted. He placed his lower jaw on her back and then lifted both front legs, one at a time. When there was stability he extended his penis, which became erect. He swung his penis towards the vaginal orifice, moving back slowly to avoid catching his penis between the female's thighs. During penetration, the two flaps remained flaccid.

Mounting lasted for up to eight minutes but the actual copulation took a maximum of about two minutes. There were thrusting movements of the hindquarters during copulation.
8. The male could be aggressive when pursuing the female. He could push or knock her hard on the abdomen until she ran away from him. In this situ-

ation the female and male had to be separated to avoid injuries.

9. The female in oestrus could tease the male by running for a short distance and looking back. If he pursued her, she would walk away. In some cases, when the male did not pursue her, she would return to him.

RECOMMENDATIONS FOR SUMATRAN RHINO BREEDING PROGRAMMES

1. Sumatran rhinos can be habituated to people. This makes oestrus detection easier.
2. Oestrus can be detected in a female by looking for three signs: swelling of the vulva, restlessness and mucous discharge. The detection of oestrous enables a planned release into the breeding enclosure with the male. Both male and female activities should be observed at the common gate and wall.
3. It is advisable to let the female into the male enclosure. She will seek out the male when she is in oestrus.
4. It is advisable to have a mud wallow in the breeding enclosure.
5. The breeding enclosure should have undulating topography for easier mating to occur.
6. It is advisable to keep the horns of the rhinos short to avoid accidents.
7. Tetanus is a threat to the Sumatran rhino. Any lameness seen after mating must be attended to.
8. It takes about two months for one rhino to clear one hectare of jungle with low vegetation. This is useful information for future planning of rhino enclosures.
9. It is necessary to ensure that there is ample space to facilitate contact between the male and female, to detect oestrus and to observe mating.

This paper was presented during the Malaysian Rhino PHVA Workshop from 27 to 28 November 1995 at the Renaissance Hotel, Sandakan, Sabah, Malaysia.