



Borneo Rhino Sanctuary (BRS) programme

Six-monthly report : covering the period January – June 2014

Programme objective

To prevent the extinction of the Sumatran rhinoceros

Main participating agencies

Borneo Rhino Alliance (BORA; www.borneorhinoalliance.org), ITBC/Universiti Malaysia Sabah (www.ums.edu.my/ibtp), Leibniz Institute for Zoo and Wildlife Research (IZW; www.izw-berlin.de) and partners (Avantea, www.avantea.it; Friedrich-Loeffler Federal Research Institute for Animal Health, www.fli.bund.de/; Stanley Manne Children's Research Institute of Northwestern University, Chicago, www.luriechildrensresearch.org/; San Diego Zoo's Frozen Zoo, [www.sandiegozooglobal.org/what we do/banking genetic resources](http://www.sandiegozooglobal.org/what_we_do/banking_genetic_resources)), Sabah Forestry Department (SFD; www.sabah.gov.my/htan), Sabah Foundation (www.ysnet.org.my), Sabah Wildlife Department (SWD; www.wildlife.sabah.gov.my), WWF-Germany (www.wwf.de), WWF-Malaysia (www.wwf.org.my), Yayasan Sime Darby (www.yayasansimedarby.com).

Main financing agencies during this period

YSD, SFD, IZW and partners

Targets for this period

(A) More options than previously for production of Sumatran rhino embryos. (B) Collaboration between Indonesia and Malaysia/Sabah on Sumatran rhino.

Activities during this period

Female Sumatran rhino "Iman" (1) Two additional traps were built during February to increase chances to capture the female rhino named Iman in Danum Valley. (2) Iman was captured on 10 March, in the first trap built in 2013, and moved from the trap site on 21 March, by helicopter to Taliwas, then by road to Tabin Wildlife Reserve. (3) In March, it was thought that Iman was likely pregnant and therefore fertile. She was examined by IZW specialists in collaboration with BORA and SWD on 3 April, and found not to be carrying any foetus, but instead to be suffering from over 10 massive tumours in the uterus (the origin of her bleeding and "aggressive" behavior observed from date of capture).

Rhino work at Tabin (1) In the absence of custom-built facilities, and the desire to keep Iman close to Tam for reproductive work, the paddock occupied by Puntung was modified, to accommodate both

Iman and Puntung in separate, adjacent facilities. (2) Routine monitoring of the reproductive cycling of both Puntung and Iman was done throughout the reporting period by a combination of frequent ultrasound (US) examination (new US machine obtained in January) and serum progesterone levels. (3) No natural mating attempt was done during this period.

Advanced reproductive technology (ART) (1) A small quantity (about 10 million) sperm were obtained on 8 May, and 3 oocytes were successfully removed from Iman on 9 May by the IZW team in collaboration with Dr Cesare Galli. (2) A small portion of the sperm was made available, and intracytoplasmic sperm injection (ICSI) was achieved on 11 May in 2 oocytes, but no cell cleavage occurred. (3) In preparation for a second attempt at oocyte harvesting and ICSI, both Puntung and Iman were administered an oral hormonal contraceptive (chlormadinone acetate), May-June, which will synchronise both females for potential oocyte pickup in July. (4) Skin and other tissues were obtained from Tam, Puntung and Iman (7-9 May) and derived cells successfully cultured, initially by Dr Vasil Galat at Tabin, then at Friedrich-Loeffler Federal Research Institute for Animal Health. The cell cultures will be transferred to IZW for maintenance and development of induced pluripotent stem cells (iPSCs) in collaboration with Stanley Manne Children's Research Institute of Northwestern University, Chicago. These stem cells can be used in a variety of ways, such as development of sperm cells and eggs pending further advances in stem cell technology and ART. (5) To allow for possible alternative experimentation in the future, cell lines were also taken by Dr Oliver Ryder, and are held in San Diego Zoo's Institute for Conservation Research "Frozen Zoo". (6) The full genome of all three rhinos is now preserved, along with that of Gelogob (see below), in living cell culture.

Wild rhinos (1) Additional rhinos were sought by surveys in Danum Valley (10-22 April, 12-21 May and 9-20 June) without success, and by WWF-Malaysia through camera traps set in Danum Valley. (2) No signs of rhino other than Puntung have been detected in Tabin Wildlife Reserve since around 2008. The last camera traps were removed (27 March – 2 April) from the Tabin forest.

Rhino facilities (1) The BRS Danum Valley rhino facility was completed by end of this reporting period. (2) The BRS Tabin facility remains to be completed.

Collaboration with Indonesia BORA participated in a WWF Asian Rhino & Elephant Action Strategy (AREAS) meeting in Lampung, Sumatra, 10-11 April, as well as in one-to-one meetings with other NGO partners in Indonesia, and the Indonesian Rhino Foundation (YABI) Board meeting in Jakarta 26 May. No specific work was done to promote collaboration with Indonesia, other than periodic discussions with existing and potential Indonesian partners. A relevant paper entitled "Preventing the extinction of the Sumatran rhinoceros" (by BORA) was published and made available in public domain in Journal of Indonesian Natural History (<http://jinh.net/wp-content/uploads/2014/03/JINH-DEC-2013-03-Preventing-the-extinction-of-the-Sumatran-rhinoceros.pdf>) on 14 February.

Other updates

Gelogob The old female rhino Gelogob (also spelled Gelugob) died in Lok Kawi Wildlife Park on 11 January.

Suci & Tam Formal approval to loan Tam to Cincinnati Zoo was obtained by a Cabinet decision in February, and a loan agreement was then drafted, but the decision became obsolete due to the death of Suci in Cincinnati on 30 March. The death of Suci at age only 9 years represents a major blow to hope for captive breeding efforts with captive Sumatran rhino.

Sumatran rhino documentary A Malaysian film production company received permission in the early part of this reporting period to make a documentary on the Sumatran rhino in Sabah, and filming commenced immediately.

Malayan tapir health and reproductive training workshop

This practical workshop on tapirs was conducted in Sungai Dusun, Selangor, 26-29 May, led by BORA veterinarian Dr Zainal Z Zainuddin, with Dr Rosa Sipangkui of SWD and others participating. In addition to its primary role of assessing the status of captive tapirs, the workshop was arranged to facilitate experience for Malaysian wildlife veterinarians to perform general anaesthesia and artificial insemination that would be applicable to work on Sumatran rhino.

Awareness

A Malaysia media visit to Tabin (13-14 May) resulted in three articles in The Star (2 June) :
<http://www.thestar.com.my/News/Environment/2014/06/02/Raising-hope-for-baby-rhinos/>,
<http://www.thestar.com.my/News/Environment/2014/06/02/Keeping-them-safe/> and
<http://www.thestar.com.my/News/Environment/2014/06/02/Our-fatal-blunders/>

Issues to be addressed

Female Sumatran rhino reproductive tract pathology

After capture, Iman's behaviour, daily bleeding from the vagina and torn ear suggested that she might be pregnant, and an ultrasound examination on 16 March indicated a likely pregnancy. The bleeding (roughly 200 ml daily on average in the weeks post capture) was a source of very serious concern. Blood, mucus and pieces of pathological tissue were expelled daily for the first month after capture, and blood loss eventually stopped by medication (tranaxemic acid). Iman's reproductive condition is poorer than that of Puntung, and her health (due to the tumours and associated toxicity) may decline rapidly at any time. The previous Sabah "wild caught" female Sumatran rhino (killed illegally in Kalabakan Forest Reserve in March 2001, and examined by Dr Sen Nathan, SWD) had severe reproductive tract pathology. The likelihood that any remaining female Sumatran rhinos in Borneo (Malaysia and Indonesia), and possibly some of those in Sumatra, have similar pathology has to be acknowledged, and taken into account when making decisions on all efforts to prevent the extinction of the species.

Difficulties in capture and translocation of Sumatran rhino from remote sites

The Iman trap location represents the most remote site ever for capture of any Sumatran rhino to date. The translocation of Iman to Tabin involved several very significant challenges. Based on experience of BORA staff, she was the most "aggressive" rhino captured in Malaysia, a feature probably linked to discomfort from her pathology. On the date she fell into the trap, the ground monitoring team was minimal (four, the smallest agreed number) and there was concern that she might escape (by 12 March, on-site manpower had grown to 13 BORA, 6 Sabah Foundation, 5 Sabah Wildlife Department, 5 Wildlife Rescue Unit, and 4 WWF-Malaysia). The helicopter lift also experienced problems including (a) lack of clarity over final decision-making on key details (SWD in Lahad Datu or ground staff at trap site), (b) stress and over-heating of Iman in the lift crate on 20 and 21 March, (c) "last minute" changes in the pick-up point for BORA veterinarian and essential staff from the field and the crate landing site at Taliwas, (d) by 21 March, staff at the trap area had run out of food, yet it was not possible to extract them on same day. Taken together, these issues point to the fact that capturing and moving Sumatran rhinos from remote sites is not only a matter of choosing which rhino to capture, based on data and policy, but equally a matter of logistical possibility. It is possible that some remaining wild rhinos simply cannot be removed from the forest because logistical problems are too great.

Interest in advanced reproductive technology for Sumatran rhino

The first attempt at oocyte pick-up was achieved on 9 May, representing an early step in seriously pursuing advanced reproductive technology (ART) for Sumatran rhino under the BRS programme. Undue skepticism exists in whether ART can help save the Sumatran rhino from extinction, even though similar skepticism existed in the years before the birth of the first human “test tube” baby in 1978. Not all Sumatran rhino specialists are sympathetic to ART, but the dire situation of the Sumatran rhino seems still not to be adequately understood globally. Rationally, the correct approach is to either abandon the species to extinction, or accelerate and extend all possible approaches to using ART. A meeting was hosted by WWF-Germany in Berlin (29 April), at which the case for ART was made by IZW and BORA. Letters were sent by BORA seeking the collaboration of zoo associations and zoos with reproductively-compromised Indian and African rhino species, for practising ART procedures that might potentially be useful for Sumatran rhino work.

Solutions and plans for next quarter

(A) Continue to seek additional wild rhinos. (B) Obtain more fresh semen from Tam, along with a second attempt at oocyte harvesting, from both Iman and Puntung. (C) Pursue the possibility for zoos to make available reproductively compromised African and Indian rhinos for practice in rhino ART methodologies. (D) Continue to seek opportunities for collaboration between Indonesia and Malaysia/Sabah on Sumatran rhino.



(left) camera trap image of Iman on hill ridge (3 August 2012), with her characteristic sliced right ear visible, courtesy Andrew Hearn, (right) preparation of materials on roadside at Borneo Rainforest Lodge (8 February) for construction of two additional traps



(left) 11 March, Sabah Wildlife Department senior ranger Mr Herman Stawin examines the pit trap in which Iman was caught (foreground; the same trap as shown on page 8 of the July-December 2013 report), filled with soil, which on night of 10-11 March enabled Iman to scramble out of the pit and run into the crate, (right) side view of the same scene, with Iman held in the crate pending construction of a boma (temporary small stockade).



Construction of the boma, 11 March, collaboration involving BORA, Wildlife Rescue Unit, Sabah Foundation staff and others, (left) placement of sections of hardwood fence into the perimeter trench, (right) Iman inside the crate on the left with fence construction ongoing to the right.



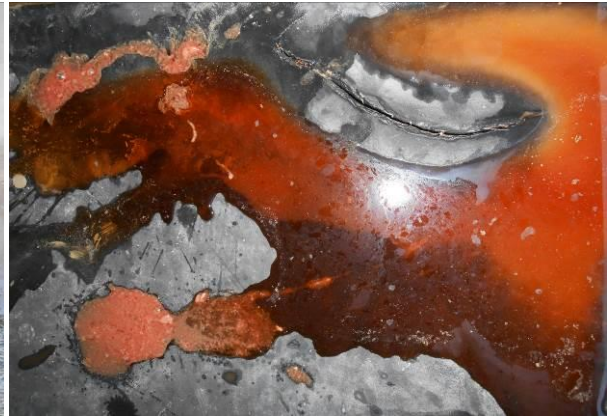
Scenes from the camp built adjacent to the boma to house over 30 personnel, (left) building additional sleeping quarters, (right) preparing for an initial attempt at ultrasound examination of Iman (15 March)



Iman in her boma showing (left) wallowing through hot mid-day hours, (right) her sliced right ear



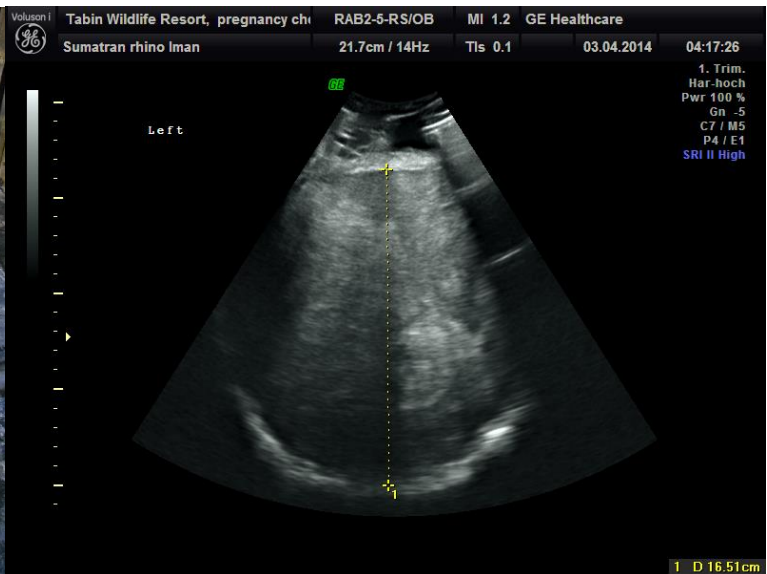
(left) helicopter used for the airlift, (right) Iman inside crate being transferred from truck to her night stall at Tabin (22.30 hours on 21 March).



(left) Iman in night stall, 22 March, (right) continuing daily loss of blood with mucus and tissue from the reproductive tract gave rise to grave concern over Iman's reproductive health (26 March)



Local media reported the capture of Iman (Daily Express, 13 March) BRS rhino facility under construction at Danum Valley 7 March (centre) and 27 March (right)



Iman was examined by ultrasound on 3 April and found to have massive tumours in the uterus, (left) under general anaesthesia during the examination, (right) ultrasound image of the largest tumour



(left) Tam under general anaesthesia for electro-ejaculation to obtain fresh semen (8 May), (centre) Tam recovering after the procedure, (right) media visit to Tabin (14 May)



(left) the oocyte pickup procedure underway, (right) Dr Rosa Sipangkui (Sabah Wildlife Department) (9 May)



DAILY EXPRESS SABAH Suci: Died on Sunday from iron overload. 2 April 14
Death of female rhino casts further doubt on species

Kan Yaw Chong

KOTA KINABALU: Cincinmati Zoo announced the shock death of its only female Sumatran rhino Suci (meaning pure in Indonesian) in a press release dated March 31 and sent to the *Daily Express*.



Dr Terri

The unexpected death of what was hitherto rated as a healthy fertile nine-year-old female casts further doubt on the future of this species generally regarded as living on the edge of extinction as its numbers continue to plummet.

"The loss of Suci is a devastating blow especially to a captive breeding programme dedicated to secure the future of this critically endangered species for future generations," said Dr Terri Roth, Director of Cincinmati Zoo's Linder Centre for Conservation and Research of Endangered Wildlife and Vice President of Conservation.

Dr Terri is widely credited as the brain behind for the Zoo's success in siring the baby rhinos, Andalas (born Sept 13, 2001), Suci (born July 30, 2004), Harapan (born Dec 19, 2008) – all offspring of Emi (mother) and Ipuh before Andalas returned to Indonesia in 2009 and sired Andatu (born June 23, 2012, Way Kambas, Sumatra) – hailed as a feat of the century 112 years after the first recorded captive Sumatran rhino birth recorded in 1889 at the Calcutta Zoo.

For Sabah, it has dashed hope of a recent State Cabinet decision to send Iam, its only captive male rhino to Cincinmati Zoo to mate with Suci by June, if the new female rhino Iman captured on March 10 in Danum Valley, proved infertile.

Suci died Sunday (US time) from hemochromatosis otherwise known as iron storage disease which similarly killed her mother Emi five years ago in 2009, as iron overload tends to affect rhinos in captivity. Although a necropsy was performed Monday, Dr Terri said it will be weeks before the Zoo has the final results.

"Cincinmati Zoo has lost one of its most beloved and charismatic animals," Dr Terri mourned. "Suci was a symbol of hope for her entire species, one that is quickly losing ground in the wild, and her absence will leave a great hole in our hearts," Terri grieved.

"The international community has a great challenge on its hands. If we don't act quickly, and boldly, the loss of this magnificent animal will be among the great tragedies on our time."

"The best way we can remember her and honour her is to work even harder to save this incredible species," Terri said.

"If we let them disappear, the responsibility will rest heavily on all of our shoulders," Terri added.

The latest IUCN estimate puts the world population of Sumatran rhinos at no more than 100 individuals and out of this tiny world population, probably 80 per cent of the females in the wild are cyst-infested and incapable of natural breeding. Widodo Ramono, considered the father of Sumatran rhino in Indonesia, asserted at the International Sumatran Rhino Crisis Summit in Singapore in April 2013, underscoring the widespread concern that the species has arrived at the brink of extinction.

Meanwhile, Director of Sabah Wildlife Department, Datuk Dr Laurentius Ambu, described the death of Suci as "a sad, sad news."

"I am lost for words, I don't know whether we can send Iam in any way now," Dr Laurentius said.

"What we have now are two females and a male in captivity and we want to engage both the German and American experts to help us, work concurrently in Sabah and put our heads together for the sake of the species," said Dr Laurentius.

"Even in the death of Suci, there is a lesson in the diet and we need to compare notes with Cincinmati Zoo why she and her mother died of the same disease – hemochromatosis. This is an experience where Cincinmati can help us on diet planning for captive rhinos," Dr Laurentius noted.



DAILY EXPRESS SABAH Iman being put on a mattress to be further examined via ultrasound after being given anaesthesia. 5 April 2014

Another blow to Sabah's rhinos

KOTA KINABALU: German ultra-sound experts found massive blood-shot tumours as big as footballs have infested the uterus of Sabah's latest female Sumatran rhino Iman captured in Danum Valley on March 10, ruling it out for natural breeding.

This is yet another big blow to the future of the species just days after Cincinmati Zoo announced the death of its only female 9-year-old rhino Suci hitherto rated healthy and fertile, according to a joint press release from the Sabah Wildlife Department and BORA.

The detailed ultra-sound results knocked out the initial ecstasy among the rhino ranks who thought that Iman might be pregnant with a foetus due to its unusually large abdomen and other signs like fleshy behaviour and a torn ear, probably the result of a past tussle with a male.

But specialists from the Leibniz Institute for Zoo and Wildlife Research Berlin (IZW) and local counterparts who examined the animal under anaesthesia on April 3 concluded that what had been suspected to be a foetus is in fact a collection of tumours – a mass with blood vessels inside the uterus, according to the press release. "What we found was a dramatic emotional roller coaster," said IZW reproductive specialist, Dr Thomas Hilderbrand.

"Based on the initial ultrasound images, we came here with the hope that there was a probability that Iman was pregnant but when we did a more thorough examination we learnt that there is no foetus but big, big tumours, some as big as footballs, which means that she has not been sexually active for a long time probably without a male partner for five to 10 years," Dr Hilderbrand said.

"This is very sad news for us, after the serious blow to the Global Sumatran Breeding Programme following the death of Suci in Cincinmati Zoo on March 31," said Culture, Tourism and Environment Minister Datuk Seri Masidi Manjun.

"The cyst infestation is even worse than that of our other female Puntung which was captured in Tabin Wildlife Reserve in 2011 and this is grim news as it seems to confirm our thoughts that rhinos in Sabah might not be breeding any more in the wild," said Dr Senthiven Nathan, Assistant Director of Sabah Wildlife Department and Chief Veterinarian. "The reproductive tract pathology in Iman seems to be very similar to the lesions found not only in Puntung but also in the poached female rhino in Kalabakan in 2001. In fact, the poached female rhino was a very young healthy female but her whole reproductive tract was unviable and full of large tumours as well," Dr Sen recalled. "So, by the looks of this, we might be seeing the last generation of Sumatran rhinos in the wild. Once these few grow old and die, that's it, there would be no more rhinos in Sabah," Dr Sen opined.

"It is very clear how we should proceed which is to embark on a biotechnology approach to save this species, with a focus on techniques such as in-vitro fertilisation," said Director of State Wildlife Department, Datuk Dr Laurentius Ambu.

Meanwhile, Tun Musa Hitam, Chairman of Yayasan Sime Darby, the main funder of the Borneo Rhino Sanctuary Programme (BRS), said he felt devastated to hear the news.

"Our hearts are saddened by the turn of events with Iman but all hopes are not lost yet. We now have to act quickly and boldly to ensure the survival of this critically endangered species," Tun Hitam said.