# Borneo Rhino Sanctuary (BRS) Programme
# 2014 Report

## Last chance to prevent the extinction of the rhino in Borneo

The Sumatran rhino (*Dicerorhinus sumatrensis*) is now on the edge of extinction in Malaysia. The old, infertile female rhino Gelugob died in Lok Kawi Wildlife Park on 11 January. Approval to loan the male rhino Tam from Tabin 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 his intended fertile, young mate, Suci, in Cincinnati on 30 March. The death of Suci at age only 9 years represents a major blow to hope for captive natural breeding efforts with captive Sumatran rhino. In August, Indonesia requested Tam to be loaned to the Sumatran Rhino Sanctuary in Way Kambas National Park but discussions subsequently lapsed. Despite several interactions between Sabah and Indonesia, by end of 2014 the anticipated collaboration had not materialized.

A mature female rhino, estimated at about 15 years age and given the name Iman, was captured in a pit trap in Danum Valley on 10 March, and moved from the trap site on 21 March, by helicopter to Taliwas, then by road to Tabin Wildlife Reserve. Soon after capture, it was thought that Iman was likely pregnant. She was examined by Leibnitz Institute for Zoo and Wildlife Research (IZW) specialists in collaboration with Borneo Rhino Alliance (BORA) and Sabah Wildlife Department on 3 April, and found not to be carrying any foetus, but instead to be suffering from massive leiomyoma tumours in the uterus. The presence of the tumours indicates that Iman has never borne a baby, which in turn suggests the absence of a wild male rhino in Danum. Regular ultrasound examination thereafter showed that Iman is fertile, producing oocytes monthly, but unable to bear a foetus.

Despite continuing surveys in Danum Valley, Tabin and other areas by WWF-Malaysia and BORA through 2014, no signs of any wild rhinos were detected. The last camera traps were removed from Tabin in April. BRS Danum Valley rhino facility was completed in July, while the BRS Tabin facility remained uncompleted. An assessment of progress since the Sumatran Rhino Crisis Summit (held in Singapore Zoo, 31 March – 4 April 2013; see 2013 report), based on a draft IUCN Emergency Plan Framework, was submitted in October 2014 to the IUCN Species Survival Commission (which convened the Summit) for further action. With a common perception of the three Sumatran rhinos now in captive conditions in Tabin (male Tam, and the females Puntung and Iman) merely as aging and imperfect representatives of their species, and the status quo settling to a routine, the key role of all remaining Sumatran

Ultrasound image of one of the tumours in Iman's uterus.


Seeking helicopter drop points in the upper Danum river for further rhino surveys, 7 November.


Iman undergoing oocyte pick-up procedure, 9 May 2014, with (background to foreground) Dr Vasil Galat (Stanley Manne Children's Research Institute, Chicago); Alvin Erut (BORA senior field staff); Dr Oliver Ryder (Institute for Conservation Research, San Diego Zoo); Dr Zainal Z Zainuddin (BORA veterinarian); Dr Robert Hermes (IZW); Professor Cesare Galli (Avantea, Italy); Professor Thomas Hildebrandt (IZW); Dr Frank Goeritz (IZW).

Iman wallowing in the temporary stockade during the hot midday hours, 12 March.

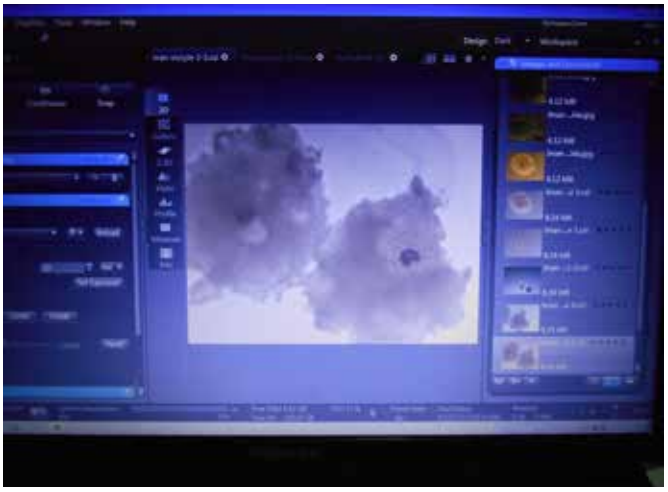

Image of two freshly-harvested oocytes from Iman, in the temporary laboratory at Tabin, 9 May.

rhinos as living sources of gametes tends to be understood only by a few persons involved in this species. Almost every living female Sumatran rhino in Indonesia and Sabah alike produces several oocytes every month, almost all of which are going to waste. The message that Sumatran rhinos might be saved through fusing of their gametes, rather than by simply keeping rhinos alive and hoping for the best, needs to be articulated and repeated by all concerned experts and institutions.

Together, all the above results and thoughts provided strong impetus to prioritise attempts at in vitro fertilization in Sabah during 2014. Attempts to obtain oocytes from Iman were made on 9 May and again on 9 July by Dr Cesare Galli of Avantea (http://www.avantea.it, a private laboratory of advanced technologies for biotechnology research and animal reproduction established in 1991 by Dr Galli and his wife Dr Giovanna Lazzari) in collaboration with the IZW veterinarian team under Dr Thomas Hildebrandt working with BORA and Sabah Wildlife Department. Only six oocytes could be obtained in total, together with sperm from Tam on both occasions. The gametes were taken fresh to Europe, arriving about 24 hours after harvesting. Intracytoplasmic sperm injection (ICSI; whereby a single sperm is chosen and inserted into the egg) was achieved on 11 May in 2 oocytes, but no cell cleavage occurred, while the quality of the other four oocytes proved to be unsuitable. In preparation for a third attempt at oocyte harvesting and ICSI, both Puntung and Iman were administered an oral suppressant of oestrus cycling. However, a combination of factors (including irregular cycling in both females resulting in difficulty in identifying in advance the precise best dates for oocyte harvesting, timetabling of the team from Europe, and high cost of financing of a third attempt) resulted in no further attempt during 2014.

In order to prepare for the worst (in vitro fertilization technique cannot be developed before the death of the BRS rhinos, and in the absence of collaboration with Indonesia) skin and other tissues were obtained from Tam, Puntung and Iman in 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 are to be transferred to IZW for maintenance and development of induced pluripotent stem cells in collaboration with Stanley Manne Children's Research Institute of Northwestern University, Chicago. These stem cells could potentially be used in a variety of ways in the future, such as development of sperm cells and eggs, pending further advances in stem cell technology. To allow for possible alternative experimentation in the future, cell lines were also taken by Dr Oliver Ryder, and are held in liquid nitrogen in San Diego Zoo's Institute for Conservation Research "Frozen Zoo". These pioneering experimental steps at seriously pursuing advanced reproductive technology (ART) for Sumatran rhino under the BRS programme have met with undue skepticism outside Malaysia and Europe, even though similar skepticism existed in the years before the birth of the first human "test

View of the capture site, 11 March. Iman is in the crate on the left, having been walked out of the pit trap the previous night, and pending completion of a temporary small stockade, under construction with sections of hardwood fence placed into a perimeter trench.

Meeting on Sumatran rhino in Bogor, Indonesia, August 2014 (facing towards camera left to right : Dr Novianto Bambang Wawandono, Secretary to Director-General for Forest Protection & Nature Conservation; Sunaryo, Special Adviser to Minister of Forestry, meeting chairman; J. Payne, BORA; Anwar Purwoto, WWF-Indonesia; Dr Noviar Andayani , WCS Indonesia Country Director; Tony Sumampau, Taman Safari Indonesia

Ministry of Natural Resources & Environment and Department of Wildlife & National Parks Malaysia officials visiting the BRS facility under construction in Tabin Wildlife Reserve, August 2014.

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 in the global wildlife conservation community. Rationally, the correct approach is to either abandon the species to extinction, or accelerate and extend all possible approaches to using ART.

As in previous years commencing 2009, the bulk of the costs of implementing the BRS programme in 2014 were provided by Sime Darby Foundation.