



Borneo Rhino Sanctuary (BRS) Programme 2016 Report

Last chance to prevent the extinction of the rhino in Borneo

Asian Two-horned rhinoceros (*Dicerorhinus sumatrensis*), commonly known as Sumatran rhino, was once widespread through South-east Asia from present-day Bangladesh and southern China southwards to Sundaland. This is the most ancient of the living rhino genera, dating from about 20 million years ago, and now on the verge of extinction in the absence of decisive actions. Habitat loss, poaching and lack of political will remain convenient but incorrect scapegoats. Fewer than 100 *Dicerorhinus* in total remain alive, all in Indonesia except for one male and two females in Malaysia. The problem is not just one of very small numbers but the fact that the rhinos are scattered in at least six locations, and records since 1980s show that over 70% of all adult female Sumatran rhinos have significant reproductive tract pathology. This is linked to lack of breeding, which in turn is linked to not enough young wild rhinos in any one location. Rhinos now in the wild need to be captured and managed as one population, irrespective of nationality, with the objective to boost annual births, by maximizing the potential contribution of every rhino's eggs or sperm to producing babies.



Tam

Sabah Wildlife Department has delegated a non-governmental organization (NGO), Borneo Rhino Alliance (BORA), to manage the three remaining Sumatran rhinos in Malaysia, in fenced facilities in Tabin Wildlife Reserve. BORA's role is to keep the rhinos alive and healthy to help prolong their ability to produce eggs and sperm in order to produce a Sumatran rhino embryo *in vitro*, to help develop local capacity in advanced reproductive technology, and to seek opportunities for collaboration through periodic meetings in Indonesia.

For several reasons, the pace of harvesting gametes from the rhinos continues to be slow. Expertise is still needed from Germany and Italy to carry out the invasive procedure of harvesting oocytes (immature eggs); the experts need to be in Tabin on days when both female rhinos have oocytes available, an issue that can to some extent be resolved by application



Iman receiving hormone implant to stimulate oocyte production.

of synthetic follicle-stimulating hormone; one female, Iman, has to be treated periodically to reduce bleeding from her leiomyoma tumours in her uterus, a procedure that shuts down the oestrus cycle; and there are the issues of cost and logistics of arranging for the gamete harvests and subsequent *in vitro* fertilization attempts. During 2016, the procedures were done in February, June and November. In total, 3 eggs were obtained from Puntung and 4 from Iman. These are remarkable achievements, but not



Veterinarians Dr Symphorosa Sipangkui (Sabah Wildlife Department) & Dr Donny Yawah (PERHILITAN) handling semen samples between collection and laboratory (18 April).

enough when laboratory-based research is at an early stage of trials. In addition, semen collection was done from Tam by an all-Malaysian team on 18 April. In May, the BORA veterinarian received training in Australia in oocyte harvesting and the production and transfer of embryos in cattle. This experience demonstrated that, once a system has been developed with correct protocols in place, there will be no technical barrier to production of Sumatran rhino embryos.

The *in vitro* fertilization attempts, by the intracytoplasmic sperm injection technique, were made by Prof. Cesare Galli

(Avantea laboratories, Italy). In 2016, Prof. Galli for the first time produced two southern white rhino embryos using the same technique (http://www.rhinoresourcecenter.com/pdf_files/147/1479908458.pdf). It is to be noted that this is pioneering work, of potential global significance in efforts to prevent the extinction of the most critically endangered species, where the main biological problem to be addressed is too few fertile adults and too few births. In this context, a landmark paper was published in mid-2016, Rewinding the Process of Mammalian Extinction (http://www.rhinoresourcecenter.com/pdf_files/146/1462686094.pdf).



Dr Cesare Galli, Dr Thomas Hildebrandt & Dr Robert Hermes prepare for oocyte harvesting from Iman (26 June).

The low quality and amount of sperm obtained from Tam through periodic electro-ejaculation since 2011 has been a cause for concern, as his key legacy will be whatever sperm he can contribute to the next generation of Sumatran rhinos. It was suggested in June 2016 by Dr Thomas Hildebrandt of Leibniz Institute for Zoo and Wildlife Research (Berlin; IZW) that Tam

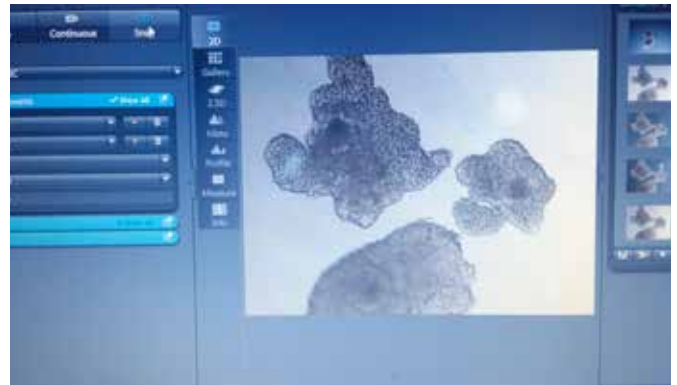


Image of three freshly harvested oocytes from Iman (26 June)

be given a dietary supplement of beta carotene and Vitamin E before the next electro ejaculation. These supplements were fed to Tam from 18 September to 7 November, and showed a remarkable positive response in the form of more frequent erections and the best sperm collection to date in November 2016.

Total rainfall for year 2016 in a plantation near to Tabin was measured at 4,446 mm. Such high amounts presented extra challenges in management of the rhino facilities. The plantation companies neighbouring Tabin provided assistance in periodically lending machinery and staff to repair and improve local roads, facilities and the rhino food garden. Coliform bacteria in the rhinos' water supply was an issue of concern over the second half of the year, a consequence of an uncontrolled growth of the macaque monkey population in the Tabin area. The problem was kept within reasonable limits through diligent attention to biosecurity, notably chlorination and thorough cleaning of water tanks.

Final filming for a documentary on Sumatran rhino was done at Tabin, 27-31 January. The completed documentary, produced by Lydia Lubon and directed by Chris Annadorai for Malaysian company Red Communications, and named "Operation Sumatran Rhino", advocates for ART and collaboration with Indonesia. It was launched in Malaysia on 25 August, and shown on National Geographic channels in Asia and USA in late September.

A request had been submitted prior to 2016 by Government of Sabah to national government for funding under 11th Malaysia Plan (2016-2020) for developing the application of advanced reproductive technology (ART) to Sumatran rhino and other endangered species in Sabah. This was approved and plans



(Left) Documentary film makers interview BORA executive director, John Payne and (right) the film crew enter the forest.





(Left) Initial filming of Tam in 2013 and (right) in the forest of Danum Valley, two days before the heli-lift of Iman in March 2014, with director Chris Annadorai and executive producer Lydia Lubon

were developed during year 2016 to continue all the elements of the rhino work at Tabin, while initiating development of an ART laboratory in Sabah.

Following seven years of very generous support, and in anticipation of incoming governmental funding for the ART programme, Sime Darby Foundation wound down funding for the Borneo Rhino Sanctuary (BRS) programme at end of 2016. The funding commitment since 2009 was accompanied by very close, genuine and sustained interest from the Foundation's office bearers in the BRS programme. Particularly strong and sustained support was given by Chairman Tun Musa Hitam. Without that, Puntung and Iman would already have died childless in the forests of Tabin and Danum Valley, and the species would already be extinct in Malaysia.

Other news

A female Sumatran rhino was captured in Kutai Barat District, East Kalimantan, Indonesia, some 670 km south-west of Tabin, on 12 March, and she died on 5 April at the capture site. BORA was on standby to assist but no request was received.

Senior Wildlife Ranger Mr Herman Stawin, who started work as a teenager in 1987 digging rhino traps, and had played key roles in mentoring BORA field staff and in the capture of Tam, Puntung and Iman, as well as other rhinos in 1980s-90s, passed away on 27 June 2016.



The late Mr Herman Stawin at Kretam in 2012.



Visit of the Sime Darby Foundation Chairman, Tun Musa Hitam, to the rhinos at Tabin, December 2016 (foreground, left to right) Mr Jurimin Ebin, District Forestry Officer; Datu Rusmadi Datu Sulai, Permanent Secretary, Ministry of Tourism, Culture and Environment Sabah; Tun Musa Hitam; Datuk Yusoff Hj. Mohamed Kasim, Chairman, Tabin Wildlife Resort; YB Datuk Hj Kamarlin Hj Ombi, Assistant Minister of Tourism, Culture and Environment Sabah; Dr Zainal Z Zainuddin, BORA veterinarian.