

## LETTERS TO THE EDITOR

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### Urgent appraisal needed of Sumatran rhino conservation efforts

Dear Chair/Editor,

This letter represents the views of Borneo Rhino Alliance, a not-for-profit company dedicated to taking all necessary steps to prevent the extinction of the genus *Dicerorhinus*, and does not necessarily reflect the views of any other party. The authors have about one hundred years of experience in detection, surveys, capture, translocation and husbandry of Sumatran rhinos, between them. Furthermore we invite urgent debate on this issue for the purpose of securing the Sumatran rhino.

The most ancient surviving rhinoceros genus is *Dicerorhinus*, represented by a species commonly known as the Sumatran rhinoceros. A glance through the sparse literature on Sumatran rhino from the 1930s to 1970s clearly shows that the species was by that time in deep trouble: very few animals, widely scattered in separate forest blocks in four or five nations, generally with fewer than ten or so individuals in any one place. A prior millennium or more of hunting to supply horns for Traditional Chinese Medicine (TCM) was the main reason for this accelerating decline. Clearly, the problem to be addressed by the 1980s was not of excessive mortality, which had already happened, but of the Allee effect: very low Sumatran rhino population density everywhere, very few rhinos, and not enough breeding to reverse the trajectory towards extinction. The answer should have been obvious: launch a single programme of captive breeding in managed, fenced facilities to increase population density of fertile adults, boost birth rate and address the inevitable inbreeding depression developing in each isolated cluster. Similar concepts had worked for the white rhino in South Africa, for both species of bison and for the musk-ox, many decades earlier. But what should have been obvious was not to be. Only a few people wrote about the situation clearly, notably Tom Foose, Conservation Coordinator of the American Association of Zoological Parks and Aquariums from 1981 to 1990.

1981 marked not only the beginning of Foose's prescient tenure, but also the beginning of the era of "sustainable development", when erosion of the profession of wildlife management began, in favour of justifying wildlife conservation in terms of human benefit and, paradoxically, a more emotional approach to wildlife. Surely, in 2019, we cannot continue to believe that small pockets of forest in protected areas, typically marginal for large mammals in terms of soil fertility, steep terrain and access to limiting resources, will be adequate to sustain tiny, unmanaged wild large mammal populations in the long term in the absence of specific human interventions? The late twentieth century also marked the beginning of the stakeholder consultation approach to wildlife management, which may work in some circumstances but can also lead to indecision or ineffective compromise. Most importantly now, the Sumatran rhino may be doomed by lack of leadership, and the accompanying need to make hard decisions, as well as the continuing failure to understand that the paramount need is to boost birth numbers.

To one of us (JP), having surveyed Sabah, the northern tenth of the island of Borneo for Sumatran rhinos from 1979 to 1983, as a WWF-Malaysia staff member in collaboration with Sabah Forestry Department, it was very clear that the species would soon be extinct. Foose visited Sabah in 1983, and the government at that time was warm to collaboration within the context of an international capture and meta-population management programme. It was our hope in 1984 that a single programme to boost Sumatran rhino births,

prioritising capture of wild rhinos for ex situ management, would be realised.

The fate of *Dicerorhinus* was sealed on 4 October 1984, however, when a compromise was reached among 20 of the world's designated Sumatran rhino experts. At an IUCN-brokered meeting in Singapore on Sumatran rhino at which John Payne was participating, Robert Scott, the then executive director of the Species Survival Commission and meeting facilitator valiantly and diplomatically did his best to reach a strong conclusion. Unfortunately, among the 20 persons present, there was a body of opinion, led vociferously by Professor Rudolf Schenkel, that all Sumatran rhinos should stay put in the wild. The compromise reached was that where rhinos were in protected areas, or anywhere showing signs of breeding, they should be left alone, and only "doomed" rhinos would be captured for *ex situ* breeding purposes. The fatal flaw in this compromise became apparent in 2000, when Nan Schaffer of SOS Rhino pointed out that at least 70% of the 23 females captured between 1984 and 1994 (11 in Sumatra, 10 in Malaya and two in Borneo) suffered from reproductive tract pathologies at or soon after the time of capture, a feature that prevented or hindered pregnancy. The subsequent scattering of captured rhinos between facilities in five barely-collaborating regions added to the inevitable failure of this programme. It is essential to understand that this first captive breeding programme failed because of a fatal constraint in the criteria for capture (namely selection of old, infertile and sub-fertile breeding stock), coupled with multiple weaknesses in execution, and not because the original concept was wrong.

The imperative to persist with a managed meta-population approach was dealt a major blow by the late Alan Rabinowitz in his 1995 essay *Helping a species go extinct: the Sumatran rhino in Borneo*. Despite having participated with the authors in a survey for rhinos in Danum Valley, Sabah, in September 1992, and concluding that only four to seven rhinos remained at that time, Rabinowitz persisted in the view that leaving the rhinos in situ was the best way forward.

By 2011, all except four of the forty Sumatran rhinos captured in the 1984-1994 IUCN-brokered programme were dead and only the young, compatible pair of Sumatran rhinos in Cincinnati Zoo had fulfilled Tom Foose's dream. In 2011, two things were initiated in Sabah. Backed by Sabah government policy and funded by Sime Darby Foundation, Professor Thomas Hildebrandt and a team from Leibniz Institute for Zoo and Wildlife Research in Berlin, commenced in earnest, a programme to focus on use of advanced reproductive technology to make Sumatran rhino embryos. This was initiated because it was clear that there would never be enough fertile Sumatran rhinos in captivity to be able to rely on natural breeding to save the genus. In 2011, too, the government of Sabah initiated contact with the Ministry of Forestry, Indonesia to collaborate on a programme for Sumatran rhino breeding.

On 15 March 2012, a Letter of Intent for Collaboration on Ensuring the Survival of the Sumatran Rhinoceros was signed in the office of the Director-General for Forest Protection and Nature Conservation (Indonesia), by the Indonesian and Sabah authorities, the IUCN/SSC Asian Rhino Specialist Group and others. The objectives were: to "collaborate .. and endeavour to acquire additional fertile rhinos of both sexes from the wild for our managed breeding programme .. and share biological materials (including sperm and embryos) .. and share information, in particular concerning husbandry and reproduction ..". This worthy intent still needs to materialise.

In November 2012, former Malaysian Deputy Prime Minister Tun Musa Hitam visited key people in Indonesia with the intention to drum up support for the intended Indonesia-Malaysia collaboration on the species. For several years, however, Indonesia seems reluctant to talk with Sabah directly, thinking incorrectly that the national government of Malaysia has policy-making authority over Sumatran rhinos in Sabah.

In April 2013, a three-day Sumatran Rhino Crisis Summit was held, initiated by Borneo Rhino Alliance, taken up by IUCN, and hosted by Wildlife Reserves of Singapore. Perhaps inevitably, there was much divergence in the views of the 100 people present, and the summit ended with expensive plans to "conduct more surveys" instead of the necessary immediate initiation of capture of fertile Sumatran rhinos for breeding.

In October 2013, the first Asian Rhino Range States meeting was held in Indonesia involving Governments of Bhutan, India, Indonesia, Malaysia and Nepal, under purview of IUCN, with the five Asian rhino range

states committing to managing all the Asian rhino species to achieve at least 3% annual population growth rate through implementation of the actions outlined in the meeting's Declaration. In February 2019, the second Asian Rhino Range Countries Meeting was held in India. Malaysia's request to insert into the final Declaration the possibility to "pursue the application of advanced reproductive technology to make best use of infertile and sub-fertile Sumatran rhinos" was rejected in favour of rather bland wording that allows conservative elements involved in the species to do nothing new.

On 24 August 2014, Indonesia proposed that Sabah provide its sole male rhino, Tam, to Indonesia. The request was agreed to within 10 days, but then Indonesia backed down, seemingly shocked that Sabah had responded so positively.

The problem of Indonesia requiring engagement with the national government of Malaysia seemed to have been solved on 4 June 2015, when the National Biodiversity Council of Malaysia endorsed a proposal from Sabah. The proposal was to use advanced reproductive technology to help prevent the extinction of the Sumatran rhino, and that Malaysia should invite Indonesia to collaborate on Sumatran rhino conservation work. Since then, a consistently supportive national Ministry in Malaysia, right up to today, has done its best to attract interest in collaboration to save the genus. But all approaches from Malaysia have been stalled by Indonesia, both at governmental and NGO levels. An increasingly outdated Memorandum of Understanding, initiated in 2012, has yet to be finalised and signed at the time of writing this paper. Collaboration does not necessarily have to be on the application of reproductive technology but can be on topics as diverse as sharing experience on safe capture, translocation by helicopter from remote areas, husbandry, treatment of reproductive tract pathologies, anaesthesia and so on.

Of the last four Sumatran rhinos captured in Sabah (female Gelogob in 1994, male Tam in 2008, female Puntung in 2011 and female Iman in 2014) two females and the male have died, leaving only Iman alive today. Puntung was euthanized in 2017 due to the pain she was suffering from squamous cell carcinoma. Tam died on 27 May 2019 of the effects of end stage renal failure. Both deaths drew widespread sympathy and comment both on social media and on supposedly reliable news feeds. The sympathy is touching to those close to the rhinos, but all the reporting from outside Malaysia demonstrates well the shifting baseline syndrome. There is a universal lack of understanding that the species' current situation is the end stage of thousands of years of history and that extinction will be prevented only by decisive human intervention. Most of these recent authors continue to refer to poaching and habitat loss, unaware that it is not simply the overall small rhino numbers that has been the threat to the species for the past century, but instead the very thin scattering of individuals on the ground and the accompanying tendency for female reproductive pathologies.

Potentially good news is that the living genomes of all four of the last Malaysia-born Sumatran rhinos are sustained in cell cultures. At some time in the future, when the technology and politics are right, gametes can be made from these cell lines. But surrogate mothers will be needed for emplacement of the embryos. This is where Indonesia's role is critical, but there has been no real commitment from government, and specialist rhino NGOs alike on the dire need to secure and manage the last few wild fertile females as the primary means to maximise rhino births.

Throughout the year 2018 up to now, BORA has waited for the signal from Indonesia to arrange from the Malaysia side the sending of oocytes from Iman for in vitro embryo production attempts using sperm from Andalas (the proven fertile bull rhino at Way Kambas). This procedure can be performed by Indonesian specialists in the Bogor Agricultural Institute in Indonesia. The Government of Indonesia seems to be under the false impression that, because Iman is periodically sick with her leiomyoma tumours, she has stopped producing eggs. Among the impediments that have been applied are the need to ensure that the provisions of the Nagoya Protocol on Access and Benefit Sharing are fulfilled and the non-issuance of a CITES import permit.

A strong and pervasive spirit of patriotism pervades all elements of Sumatran rhino work. It is difficult to know what a Malaysia-based NGO can usefully say at this juncture to dispel this insidious threat to action on Sumatran rhino. Millions of dollars have gone into Indonesia in recent years, with the only obvious result being two female Sumatran rhinos captured, one dead, the other unsuitable for reproduction. Apart from

generous but small donations from individuals, almost all funding of Sumatran rhino work in Malaysia over the past decade has come from Malaysian sources. A Malaysian team and a German team respectively have offered to harvest sperm and oocytes from Sumatran rhinos in Indonesia (both having done this successfully in Sabah); but approval has not been forthcoming. Those in Sabah are disappointed that the Sumatran rhino rescue programme launched in September 2018 by National Geographic together with IUCN, WWF, International Rhino Foundation and Global Wildlife Conservation, focuses exclusively on the Indonesian populations, rather than the Sumatran rhino as a genus.

If the government of Indonesia, for whatever reason, does not want collaboration with citizens of Malaysia or Germany, we urge the authorities and their donors to implement the necessary urgent and over-due measures within Indonesia. In other words, forget about Malaysia and do what needs to be done independently.

At some time in the very near future a point will be reached when the sheer technical and logistical inability to capture and translocate the last rhinos from remote sites, coupled with the reproductive condition of all those remaining rhinos still able to mate, and bureaucracy amongst the indecisive decision-makers, will together conspire to condemn the 20 million year old genus *Dicerorhinus* to inevitable extinction. The precise week on which that will happen will, of course, forever remain unknown. Perhaps it has already occurred, but we must either assume not, or stop all further wastage of funds on the genus.

BORA entreats the conservation body that what is needed now (and what has been needed since the 1970s) is: (1) high level leadership, which has to come from within Indonesia, (2) one meta-population programme, (3) one team of competent and dedicated people, led by a capable implementation leader, (4) capture of as many Sumatran rhinos possible, while there is still time to do so, immediately, and consistently prioritising capture of fertile (not old or infertile) individuals, (5) minimise the birthing interval of all captive females that are not reproductively compromised, (6) ensure that every remaining Sumatran rhino, including the reproductively compromised individuals,—contributes its gametes towards making embryos through the application of assisted reproductive technology.

And, equally important, it is important to dispense with time and money wasting distractions that are not needed, including (1) “surveys”, (2) superfluous staff with no experience and overly-specific tasks, (3) excessive camera trapping, which cannot tell a rhino’s reproductive status and is not necessary to decide where to place traps, (4) “awareness” and (5) “stakeholder consultation”.

These needs are not impossible to achieve. But they are impossible within the current scenario. The alarm bells are ringing, we should all be awake and move forward.

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