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Do we really want to save the Sumatran rhinoceros? (commentary)

21 April 2016 / Commentary by Francesco Nardelli

Biologist Francesco Nardelli offers his perspective on what it will take to save the Sumatran rhino from extinction. Nardelli worked on early efforts to breed the species in captivity. The views expressed in this commentary are his own.

At present rates of destruction, in about 25 years there will be no rainforests outside protected areas in Malaysia, already void of Sumatran rhinoceroses, nor in Indonesia. Many fewer than 100 Sumatran rhinos remain in fragmented populations in Sumatra and Borneo. In addition to the wild populations, there are nine Sumatran rhinos in captivity (six in Indonesia and three in Sabah). Half of them are actually non-reproductive individuals because of degenerated physical conditions: long term isolation and lack of breeding has caused their reproductive organs to deteriorate.

Recently, two main recommendations emerged from the countless (inversely proportional to actual results) meetings:

- new genetic material is needed to decrease the species' risk of extinction and enhance its viability;
- the populations need to be managed under a truly global management system.

Custodial conservation is failing almost everywhere without conservation management. In situ conservation 'as is' has proven insufficient and the residual time is shrinking rapidly. It is the instant for various ongoing activities to be improved and others resumed, like capture of rhinos, or started anew such as artificial reproductive technology (ART). No initiative should be discarded a priori or without valid, proven reasons.

John Payne, in a commentary published online in Mongabay.com, aptly names cognitive biases of various estimations and strategies taken by experts and decision takers, and concludes that ART is the only option available to save the last rhinos in Sabah.

My opinion has remained the same since the early 80s: there is no "silver bullet" to save the Sumatran rhino, but only joint coordinated efforts to implement more than just a few strategies. Too often policy and funds managers support, in bona fide though obstinately, what they consider the only way to follow, rather than having the wisdom or inclination to apply other feasible solutions. (This attitude may arise from personal controversies or the priorities of their organizations).

The latest developments of the Sumatran rhino (*Dicerorhinus sumatrensis*) saga give further opportunity and impetus to discuss some of these topics. Decisions at this time will fix the future of this exceptional species. They are not easy resolutions to make and we must expect and tolerate both the occasional mistake or accident along the way. But time is extremely short — the traffic lights, now hovering at amber, will change to red very soon. Decision takers should clear their heads, make up their minds and unite several alternatives for the common purpose of saving the Sumatran rhino, if we are to be in time to achieve something worthwhile.

The author with Torgamba, the male a team captured on September 25th 1985, the first of 18 until 1993. No rhinos died during capture, acclimatization at base camp or transport to zoos. The author with Torgamba, the male a team captured on September 25th 1985, the first of 18 until 1993. No rhinos died during capture, acclimatization at base camp or transport to zoos. A little more than thirty years have passed since the Singapore Sumatran Rhino Meeting (1984) that launched the first Sumatran Rhino Conservation Project. The opinions on that mission have been controversial, mainly due to disappointment over the deaths of a number of animals once moved to zoos in the U.S.A., Great Britain, Malaysia and Indonesia; as a consequence of confusion as to their particular feeding requirements (poorly known at the time), these individuals in any case had no hope of survival due to the soon-to-be-logged forest areas.

The capture of doomed rhinos in Torgamba forest in Riau Province, Sumatra, was carefully planned and competently executed.

Among other things to ponder: the project has already accomplished the birth of four rhinos and improved the skill of Indonesians in properly capturing, caring for, breeding and transferring these animals.

Among others, the following relevant facts were unknown until the project permitted us to ascertain first that:

- The Sumatran rhino is a folivore: about 95% of their diet is composed of arboreal leaves, twigs, and saplings. Grass (hay) is not part of the food material that its specialized digestive tract bacteria can process;
- Unlike the other rhino species (except for the poorly known Javan rhino?), the Sumatran females do not have a set cycle, ovulating only as a consequence of pairing, named induced ovulation.

While Sumatran rhinos are still imperiled by habitat loss and poaching, the gravest concern nowadays is that the populations are too small and scattered to maintain healthy breeding rhinos. The primary cause of the declining trend has become the lack of genetic diversity and breeding opportunities, causing deterioration of the reproductive tract, and thus a very low breeding rate, in situ and ex situ.

The worst aspect is that the Sumatran rhino suffers from anthropogenic Allee effect, i.e. populations are enduring human exploitation, a tricky situation not documented at any time until very recently. The effect exhibits negative population growth rates at low densities, which drives them to even lower densities and ultimately precipitates into an extinction vortex. The problem remains unsolved and it is likely the major threat to wild and captive populations of D.

sumatrensis. No doubt a number of both males and females were already infertile at the time of their capture, as autopsies on the ones that died revealed.

The solution to this problem may not been given the highest priority.

Photos, never published, of the first Sumatran rhino project in 1984. Photo courtesy of Francesco Nardelli
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Nowadays, Sumatran rhinos are breeding in large enclosures where they can be carefully monitored and protected. Such a place is the Sumatran Rhino Sanctuary at Way Kambas National Park on the island of Sumatra, which made headlines by producing its first offspring on June 23rd, 2012; a second is expected in May this year.

Although capture of rhinos would contribute to the increase of the Sumatran rhino numbers (the primary rationale at this time), the procedure continues to be avoided and discarded with misleading motivations. To confirm John Payne's assertions, the conservationist movement is still split on this issue in so far as it is discussed at all, which it often is not.

One school of thought clings stubbornly to the idea of preserving the species in the wild habitat and its entire ecosystem.

What, asks this faction, is the meaning of a wild animal divorced from its natural environment?

In Center for Humans and Nature, Jenny Gray has nicely highlighted a further positive aspect for good zoos to exist: "emotion is a good indicator of what we value, therefore the love of any animal is a positive step toward innately valuing animals and creating a culture of care and compassion for them. Well-run modern zoos are able to facilitate emotional connections between visitors and zoo animals. By fostering these connections, zoos may motivate visitors to change their behaviors and act in ways that can protect animals".

Shortly after the birth in 2001 of Andalas at the Cincinnati Zoo – the first Sumatran rhino calf in history to be conceived, born, mother raised and become breeder in 2012 – Dr. Terri Roth, principal architect of the three births at Cincinnati zoo, was asked in an interview by a New York Times reporter, "With only about 300 Sumatran rhinos left, is it possible to bring them back from the brink of extinction?" Her response is as relevant today as it was in 2001: "Absolutely. And there are examples of other species that dwindled down to close to 20 animals and they were brought back. If you look at the Bison, the Black Footed ferret, the Arabian oryx, even the Wyoming toad, they've come back".

To leave ex situ breeding too late is naïve and selfish, a clear sign of failure and fear of liability. Species bred ex situ and reintroduced into the wild are so numerous that managed breeding has today become a priority, not a last resort.

Considering the high mortality rate of the captured Sumatran rhinos in some of the zoos, it was decided to discontinue the capture of isolated (aka doomed) rhinos and never to resume it, despite the fact that the species status has been on the way out for decades.

The rescue of isolated rhinos was never reconsidered despite successes.

Hence, the question remains without answer: Why was capture of doomed animals not resumed for 23 years (1993–2016)?

In less than ten years (1984-1993), eighteen *D. sumatrensis* were captured safely in skillfully constructed and leaves crammed pit-fall traps. All the rhinos arrived at their destinations in perfect condition. Under today's status, eighteen Sumatran rhinos can make the difference between life and death of the species.

This is a fact never mentioned nor accepted.

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The continuous presence of a qualified veterinarian at the base camp in Torgamba proved particularly useful as four of the captured rhinos had infected lesions from wire snares deeply embedded in their legs. These animals were literally saved 'at the very last moment' by the well equipped and experienced veterinarian on duty.

If today we have six Sumatran rhinos in Way Kambas Sumatran Rhino Sanctuary (SRS) to work with, it is because of the positive results of the 1984 field project. In fact two individuals out of the six in SRS were born in captivity in Indonesia and in the USA, and another pregnancy is on its way.

Despite the positive trend, population viability analysis (PVA) demonstrates that the present captive rhino population number is heading for extinction unless at least two viable pairs are added to the present group. Again and again we have moved into captive breeding only at the eleventh hour, when the species concerned was already on the verge of extinction, with very poor chances of reproducing.

This is but one example of an old pattern of worldwide political coverup of longtime neglect.

The situation of the Bornean rhinoceros (*Dicerorhinus sumatrensis harrissoni*) is worse. In Sabah, where they are most likely extinct in the wild, there are only one male and two females in captivity. ART is rightly being performed on those rhinos.

San Diego Safari Park too started ART to save the Northern White rhino. The Park's researchers estimate 10 to 15 years for these technologies to also be applied to other rhino species, including the critically endangered Sumatran and Javan rhinos.

Therefore the time has come to capture the few surviving Bornean rhinos in Kalimantan in order to unite them with the three present at the Borneo Rhino Sanctuary (BRS) in Sabah.

Lately the news has come of a young female's being captured, though she suddenly died of a gangrenous leg caused by a poacher's snare.

"Serious soul searching needed. How could this have been prevented?", Erik Meijaard, a Jakarta-based conservation scientist tweeted. "Catching rhinos and keeping them alive needs skills."

In Sumatra the situation is not yet as critical as in Borneo. Sumatran rhinos (*Dicerorhinus sumatrensis sumatrensis*) are still present in just sufficient numbers to be able to pinpoint isolated rhinos to capture and transfer to Way Kambas (SRS) for managed breeding, through both natural means and ART.

To focus on a few actions only, in Sumatra, would exhibit what Payne himself recommends not to do referring to 'cognitive biases'?

With so few rhinos available in captivity, is there sufficient time still at hand and taken as known San Diego Safari Park estimate? Is it not vital to start immediately with capture?

Besides, is it possible that human high technology gives a general wrong impression that even if extinct, the Sumatran rhino could be brought back to life at any time, "bred back" from cells?

This is a fascinating idea, on condition that it is not considered an alternative to natural processes but of support, in the same way as ex situ natural breeding and ART.

Habitat devoid of animals may seem as incongruous as the reverse situation, but we should save these animals (if only for being sentient, conscious living creatures) for a future unknown time when we may be able to reintroduce them somewhere. We simply do not know if, when, or where that will be, but we owe it to future generations at least to try to accomplish this.









