Status and Perspectives of the Sumatran rhino in Borneo

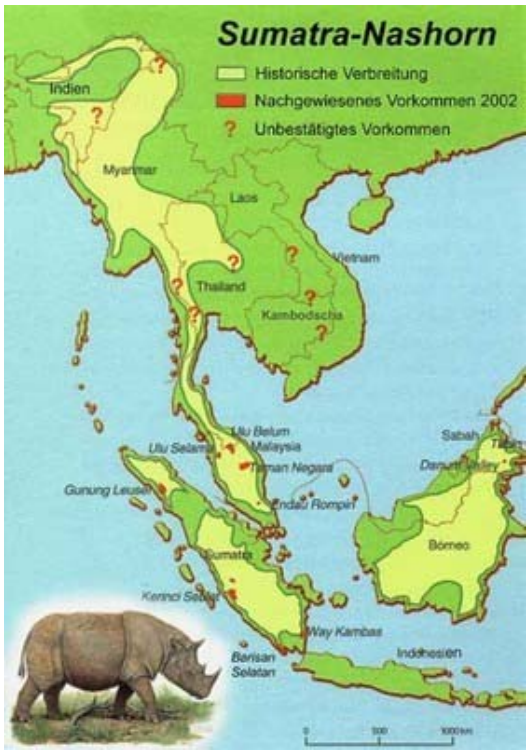
The following text is about the current status of the Sumatran rhino in general and the Borneo rhino in particular, the threats which have lead to its near extinction and possible countermeasures.

Borneo rhino; Petra Kretzschmar

The current status of the Sumatran rhino

In the early 1980's, the total number of Sumatran rhinos was estimated to be between 800 and 1000 individuals left in the wild[1]. Today, about 25 years later, not more than 200 to 300 seem to be left. That means that the global population has reduced by up to 80 % during the last 25 years. This is the sad result of decades of deforestation, poaching and habitat fragmentation. One of the three subspecies of the Sumatran rhino, the Western Sumatran rhino (Dicerorhinus sumatrensis sumatrensis), still counts between 200 and 270 specimen in the wild[2]. The Bornean rhino (Dicerorhinus sumatrensis harrissoni) has been reduced to 30 to 40 surviving individuals[3] all restricted to Sabah in the North of Borneo. The Northern subspecies (Dicerorhinus sumatrensis lasiotis) is probably extinct. In captivity there are just 10 specimens worldwide[4]. For the moment the Bornean subspecies is one of the rarest animals at all. To prevent its extinction is a question of *now or never*.

in yellow: former range; in red: last remainig populations



Source: Nico van Strien

„The Sumatran rhino is probably the most critically endangered of all rhino species. Only immediate and drastic action can prevent its extinction during the next decade.“[5]

Facing the fact that maybe no more than 30 Borneo rhinos are left and considering that they have quite low reproduction rates[6], it is legitimate to ask:

Does it make sense to fight for the last Borneo rhinos?

There has always been a discussion about defining the point of no return concerning so called „doomed“ populations. People who study biology usually learn that you need quite high numbers of specimens to secure a viable population of mammals. But the question is:

How many individuals are *really* necessary to build the stock for a viable population, or even a whole species?

A recent study suggests that, for example, the Bornean pygmy elephants are in fact the descendants of just a few individuals (maybe even just one couple) of the Javan elephant that had been brought to Sabah a few hundred years ago[7]. If the theory is right, these few individuals have been sufficient to build up a population of more than 1,000 individuals.

More than a theory is the fact that all living European buffalos descend from just 12 individuals[8] that were used for a captive breeding programme after the extinction of the species in the wild.

And, coming back to rhinos: the history of the more than 14,000 White rhinos[9] in Africa descending from a population of less than 100 individuals, which is due to the intensive protection of the remaining individuals. The same applies for the Indian rhino that recovered from less than 200 individuals back to more than 2,800[10]. These examples encourage us to say: **yes, it is possible to safe the Borneo rhino from extinction**!

Facing the major threats to the Borneo rhino

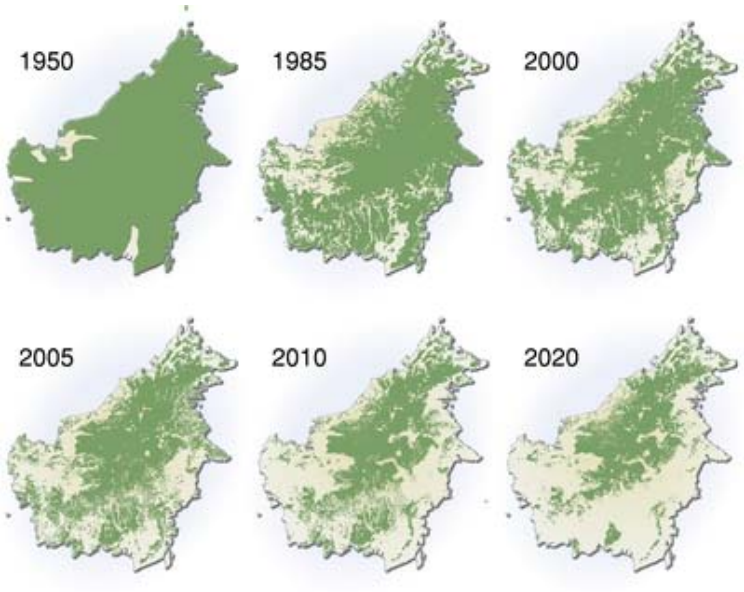
To be able to identify priorities concerning urgently needed additional efforts, we need an analysis of the current situation of the Borneo rhino, the major threats, and the possible measures to be taken.

Namely: habitat loss, habitat fragmentation and poaching, and how to tackle these threats.

a) Habitat loss and habitat fragmentation

The biggest problem in Borneo is the shrinking habitat. Until the year 2000 already around 90 % of Malaysia's primary forest[11] and around 75% of Indonesia's primary forest[12] has been destroyed – a process that is still going on[13].

Extent of deforestation in Borneo



source:

Extent of deforestation in Borneo 1950-2005, and projection towards 2020. (2007). By Hugo Ahlenius, UNEP/GRID-Arendal; data sources: Radday, M, WWF Germany. 2007. In UNEP/GRID-Arendal Maps and Graphics Library:

So legal and illegal logging and land conversion are the main threat to the last rhino habitats. Even if the rhinos can cope with certain kinds of secondary forest they need at least a closed canopy and are extremely vulnerable to human activities in their neighbourhood. Sumatran rhinos avoid significantly damaged forest land and regions with frequent human encroachment. If there is no escape to large undisturbed areas, they are likely to stop breeding and die without offspring.

The remaining individuals of the Borneo rhino can be found in the Tabin Wildlife Reserve and in the Danum Valley Area in Sabah. Danum Valley consists mostly of primary forest and is surrounded by production forest and selectively logged forestland which is also partly habitat of Borneo rhinos. The Tabin Wildlife Reserve is 120,500 hectare in size and only the core area still consists of primary lowland rainforest. More than 80 % of the reserve have been logged between 1969 and 1989[14]. The Tabin Wildlife Reserve also holds a variety of other species such as the Borneo pygmy elephant (*Elephas maximus borneoensis*), the Bornean

clouded leopard (*Neofelis diardii*), the Tembadau (*Bos javanicus lowi*) an indigenous wild ox, and a variety of primates such as orangutan (*Pongo pygmaeus*), proboscis monkey (*Nasalis larvatus*), Bornean gibbon (*Hylobates muelleri*), langurs (*Presbytis sp.*), macaques (*Macaca sp.*) and the Sunda slow loris (*Nycticebus coucang*)[15]. But Tabin is surrounded by enormous oil palm plantations separating it from the forestland adjacent to the Danum Valley area. So the fragmentation of formerly connected habitats is a serious problem which threatens the survival of the Bornean rhino too:

the separation of individuals leads to inbreeding, and to the loss of genetic variety which is known to result e.g. in breeding problems, high mortality of young animals and infertility. The probably largest population of Borneo rhinos is living in Tabin. This already very small population of maybe 10 – 15 animals is genetically isolated from the remaining population in the Danum Valley area.

Another risk for isolated rhinos living in small forest pockets is that in order to search for food or mating partners they often enter adjacent oil palm plantations, where they are very vulnerable to poachers.

b) Poaching

One ounce of rhino horn costs up to US$ 2,000[16], surely enough to encourage criminals to make big investments to find and kill the last rhinos.

Poaching is a serious problem, especially in Sumatra and Peninsular Malaysia. In Borneo, poaching used to be the dominant problem[17], but seems to be much less urgent now. There has been no recorded evidence of specific rhino poaching in Sabah for many years. Nevertheless there is hunting and trapping, and snares put up to catch deer which are also dangerous for rhinos; and hunters who come across a rhino by coincidence may also be tempted to shoot this animal. In Sabah you can find evidence of hunting and trapping so the danger for the rhinos is not just hypothetical.

In Way Kambas, Gunung Leuser and Bukit Barisan Selatan National Park in Sumatra we can see that Rhino Protection Units contribute significantly to the prevention of rhino poaching[18]. Especially if we compare the situation with less protected areas like Kerinci Seblat National Park in Sumatra where the estimated numbers of rhinos went down from around 500 in the 80's to around 20[19] today, or the Royal Belum Forest Reserve in Peninsular Malaysia where perhaps all rhinos seem to have been killed during the last few years[20]. So we can say that Rhino Protection Units are crucial for rhino conservation in Sabah as well.

Actions to be taken to avoid that the Borneo rhino goes extinct

1. Habitat protection and educational work
2. Creating economical alternatives to further habitat conversions
3. Translocation of isolated rhinos for breeding schemes
4. Restoring rhino habitat

1. Habitat protection and educational work

The economy in Sabah is driven by non-sustainable extractive industries. Sabah´s major primary commodities are palm oil, cocoa, rubber, crude petroleum, sawn timber and plywood. Palm oil is the largest contributor to the State's export earnings, accounting for about 33 per cent of the total export revenue[21] The increasing demand for palm oil on the international market, mostly for the production of agrofuels, has led to a high pressure on the remaining forest areas. So forest areas with a very low protection status, such as secondary forests, are more and more likely to be converted into new plantations. However these areas are very important for endangered animals such as the rhino and the elephant. They are buffer zones between agricultural land and primary forests, they are corridors for large animals, connecting different rainforest areas, and they could even be restored by renaturation measures.

Protecting rhino habitat means also to protect all species living in the same forest. The Sumatran rhino is a so called indicator species; its presence indicates that the area has been relatively little disturbed. The protection of its habitat will at the same time protect a large variety of other species which are using the

same habitat[22]. Protecting the forests also means maintaining the functions of the forest concerning water supply, livelihoods for local people and the prevention or mitigation of erosion, land slides, droughts, storms and climate change on both a local and a global level.

Raising public awareness for the importance of the concerned areas and the protection through ranger patrols combined with educational work in schools and villages are essential elements of any strategy to protect the still existing rhino habitats.

2. Creating economical alternatives to further habitat conversions

To build up and to promote economical alternatives to further forest conversions is decisive for both

Sabah's ecological *and* economical future. Tourism, particularly eco-tourism, can help to protect the environment and would provide jobs for indigenous people and people living in rural areas. The local communities residing next to the rhino habitat are almost entirely Tidung people. Most of them are fishermen who are adversely affected by any decline in environmental quality. The Tidung community wants to retain the forest in order to maintain their quality of living[23].

Supporting alternative agricultural and forestry methods which are more compatible with wildlife than industrial monocultures are an other key element for a sustainable future and poverty reduction in Sabah.

3. Translocation of isolated rhinos for breeding schemes

In July 2007, the government of Sabah and local and international NGOs agreed on the necessity to take action in order to save the remaining Bornean rhinos from extinction. It was decided to capture and translocate isolated individuals to a large fenced area within the Tabin Wildlife Reserve to promote mating. In August 2008 the first isolated individual was caught wandering through an oil palm plantation[24]. The rhino was brought to a new build fenced forest area in the Tabin Wildlife Reserve that shall be upgraded to a breeding facility in natural environment.

Source: SOS Rhino

The new semi-captive breeding programme raises hope that there will be a recovery of the population during the next decades.

The need to focus on *semi-captive* breeding programmes in natural habitat is a point that should be emphasized, because there used to be several captive breeding programmes in the past that separated the rhino from their natural ecosystem. Accordingly, nearly all of the 40 rhinos that have been caught for *captive* breeding between 1984 and 1996 died in their unsuitable enclosures without having offspring[25]. The only exception was the successful breeding programme of the Cincinnati-Zoo in the US were three calves

have already been born in a zoo environment[26]. But if we understand an animal as a part of its ecosystem it is not a satisfying strategy to save a species separate from its natural habitat.

4. Restoring rhino habitat

The necessity to restore degraded forest land

Some protected areas where the last rhinos live also include extremely degraded areas without a closed canopy. Due to forest degration the carrying capacity of significantly logged forest land is much smaller than in undisturbed natural habitat. For example in Tabin you can find large regions where the closed canopy has been destroyed and could not regenerate in a natural way. Restore these areas by reforastation measures would extent Tabin's carrying capacity for rhinos and other wildlife.

Degraded forest in the Tabin Wildlife Reserve

secondary growth hinders new trees to grow

Source: Rhino & Forest Fund

open canopy

Source: Rhino & Forest Fund

The necessity of buffer zones

If Sumatran rhinos become disturbed due to human activities in their habitat they often avoid the concerned areas for years. To minimize human presence in the rhino habitat is absolutely important, because rhinos who are permanently busy to avoid stressful contacts with humans are less likely to breed. To prevent conflicts between rhino conservation and the interests of local communities, offering alternative areas where local people have the possibility to use the forest for fishing etc. should be part of any strategy to reduce the pressure on the last rhino habitats.

But easy physical access to the forest due to logging means also that agrochemicals from adjacent plantations can penetrate into deeper forest areas, what might reduce the fertility of the rhinos.

Reforestation measures can help to reduce human encroachment and to mitigate the concentration of agrochemicals inside the forest. Therefore the areas between the core area and the plantations are of extraordinary importance.

Border area of the Tabin Wildlife Reserve

Source: Rhino & Forest Fund

Source: Rhino & Forest Fund

The remaining rhino habitat might become too small

If the programmes in order to enhance the number of Bornean rhinos succeeded, another problem will become evident. According to population and habitat viability analysis guidelines for rhinos, the recommendations for numbers argue for a minimum global population of 2,000 individuals separated in at least five different protected areas with at least 100 individuals each in order to secure the species` existence on a long-term run. At least one area should offer enough habitat for 400 – 500 rhinos[27]. That would be a reasonable target to ensure genetic and demographical security for this species. Each rhino needs at least between 800 and 1,000 hectare of habitat[28]. That means 2,000 rhinos would need at least 1.6 million hectare of adequate forest. A single viable population of 100 individuals needs 80,000 - 100,000 hectare. Taking in to account that only a part of the protected areas that still contain rhinos is actually used by the rhinos, the real rhino habitat is in fact much smaller than the corresponding national park or wildlife reserve. For example Tabin has just around 120,000 hectare and due to logging only a part of this area is still suitable rhino habitat. That means in a long-term scenario the remaining rhino habitat is too small to allow its population to grow up to a viable size. We will maybe succeed in enhancing the number of individuals by semi-captive breeding and protection measures but will we be able to find enough remaining habitat to support a growing population?

Taking into account the problems mentioned above, it is obvious that restoring degraded forest is one essential element of any global strategy to save the Borneo rhino from extinction.

Appropriate measures are accordingly:

the improvement of highly degraded forest by reforestation measures, with one focus on the creation of a buffer zone at the border area and the enrichment of the area with rhino food plants to enhance the carrying capacity of the available rhino habitat and to minimize external disturbances.

Natural rhino habitat in the untouched core area inside the Tabin Wildlife Reserve:

Source: Rhino & Forest Fund

1 Tom Foose, Nico van Strien & Kees Rookmaaker (editors) 2000: Newsletter of the IUCN SSC Asian Rhino Specialist Group No 3, March 2000, p. 14: http://www.rhinoresourcecenter.com/ref_files/1178935948.pdf

2 Beside the counted individuals there are probably a few more scattered over Peninsular Malaysia, several other forestpockets in Sumatra, Borneo, Thailand and maybe Myanmar, Laos, Cambodia, and Vietnam. But these doomed individuals will probably die without having offspring because they are isolated without mating possibilities and without protection. To save their genetic information for the genetic pool by translocations of doomed individuals to an SRS or to protected areas with bigger populations would be an important task for the next decade.

3 http://www.panda.org/about_our_earth/best_place_species/current_top_10/sumatran_rhinoceros.cfm?uProjectID=MY0227 andhttp://www.dailyexpress.com.my/news.cfm?NewsID=63523

4 Eight western Sumatran rhinos: five (Torgamba, Andalas, Bina, Ratu and Rosa) in the Sumatran Rhino Sanctuary (SRS) in Way Kambas, Sumatra, Indonesia, and three (Iphu, Suci and Harapan) in the Cinncinati Zoo, USA and just two Borneo rhinos: one old female (Gelugob) in the zoo near Kota Kinabalu, Sabah, Malaysia and one young male (Tam) in the new SRS (or BRS) in Tabin, Sabah, Malaysia.

5 Foose, T.J. and Nico van Strien (editors). 1997. Asian Rhinos - Status Survey and Conservation Action Plan. IUCN,

Gland & Cambridge, P. 27: http://data.iucn.org/dbtw-wpd/edocs/1997-005.pdf

6 Sumatran rhinos have very low reproduction rates with a gestational period of 15 to 16 months and offspring

produced just every three to five years: http://www.rhinoresourcecenter.com/species/sumatran-rhino/

7 Earl of Cranbrook, J. Payne & Charles M.U. Leh 2008: Origin of the elephants elephas maximus I. of Borneo:

http://assets.panda.org/downloads/pages_from_originofelephants_in_borneofinal2oct07_2.pdf .

8 http://www.waren.de/wisente.htm

9 http://www.rhinos-irf.org/southernwhite/

10 http://www.rhinos-irf.org/indian/

11 http://rainforests.mongabay.com/deforestation/2000/Malaysia.htm

12 http://rainforests.mongabay.com/deforestation/2000/Indonesia.htm

13http://www.wwf.de/presse/details/news/dramatische_situation_auf_borneo_und_sumatra/

14 Sale (1994). Management plan for Tabin Wildlife Reserve. Wildlife Department, Ministry of Tourism and

Environmental Development, Sabah, Malaysia, Kota Kinabalu, Sabah.

15 Wilting 2007. Phylogeography of clouded leopards (*Neofelis nebulosa*, Griffith 1821) and their ecology and

distribution in Sabah, Malaysia.

16 http://www.planetmole.org/indonesian-news/sumatran-rhino-population-increases-lampung-sumatra.html

17 Nico van Strien: The Sumatran Rhinoceros – Dicerorhinus sumatrensis (Fischer, 1814) - in the Gunung Leuser National Park, Sumatra, Indonesia; its distribution, Ecology and Conservation. Dorn 1985.

18 Ministry of Forestry of the Republic of Indonesia. 2007: Strategy and action plan for the conservation of rhinos in

Indonesia. Rhino Century Program, Jakarta, S. 68: http://www.dephut.go.id/files/badak_1.pdf

19 http://www.thejakartapost.com/news/2008/09/16/arief-rubiyanto-protector-sumatran-rhinoceros.html and http://www.planetmole.org/indonesian-news/sumatran-rhino-population-increases-lampung-sumatra.html

20 http://www.wwf.org.my/media_and_information/newsroom_main/?4360 and http://www.rhinos-irf.org/en/art/22/

21 Sabah State Library (2008). Sabah Agriculture: Oil palm.

http://www.sabah.org.my/bi/know_sabah/economy_agriculture.asp , 2008.

22 Nico van Strien: The Sumatran Rhinoceros – Dicerorhinus sumatrensis (Fischer, 1814) - in the Gunung Leuser National Park, Sumatra, Indonesia; its distribution, Ecology and Conservation. Dorn 1985.

23 Ministry of Culture, Environment and Tourism (1998). Sabah Biodiversity Conservation Project. Lower Segama

final report and recommendations for biodiversity conservation:

http://www.sabah.gov.my/jpas/programs/biodiversity/segama.pdf .

24 http://sosrhino.org/news/fieldreport_rhinorescued.php

25 Foose, T.J. and Nico van Strien (editors). 1997. Asian Rhinos - Status Survey and Conservation Action Plan. IUCN,

Gland & Cambridge, P. 16 and 24: http://data.iucn.org/dbtw-wpd/edocs/1997-005.pdf .

26 http://www.cincinnatizoo.org/earth/CREW/sumatranrhino.html . Emi, the mother of the three calves died in September 2009.

27 Ministry of Forestry of the Republic of Indonesia. 2007: Strategy and action plan for the conservation of rhinos in

Indonesia. Rhino Century Program, Jakarta, p. 58: http://www.dephut.go.id/files/badak_1.pdf and Foose, T.J. &

Nico van Strien (editors). 1997. Asian Rhinos - Status Survey and Conservation Action Plan. IUCN, Gland &

Cambridge, p. : http://data.iucn.org/dbtw-wpd/edocs/1997-005.pdf

28 Nico van Strien: The Sumatran Rhinoceros – Dicerorhinus sumatrensis (Fischer, 1814) - in the Gunung Leuser National Park, Sumatra, Indonesia; its distribution, Ecology and Conservation. Dorn 1985, p. 105 - 107 and 155.