Sumatran Rhinoceros Managed Breeding
GLOBAL MANAGEMENT AND PROPAGATION BOARD
GMPB

Date: 8 March 2006
Our Reference: GMPB-CH-001-2006
Your Reference: S. 612/IV-KKH/2005, 6 October 2005

The Director General,
Directorate General of Forest Protection and Nature Conservation,
Ministry of Forestry of the Republic of Indonesia
Ir. M. Arman Mallolongan, MM

Dear Sir,

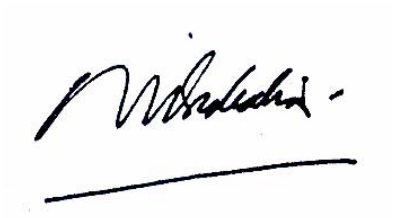
In response to your letter referred to above, we are pleased to inform you that the Sumatran Rhino Managed Breeding GLOBAL MANAGEMENT AND PROPAGATION BOARD (GMPB) in its meeting of 1 March 2006 unanimously endorsed the priority actions recommended in your letter.

In particular the GMPB recommended (a) the transfer of the male ANDALAS from the Los Angeles Zoo to be paired with the young females (ROSA & RATU) currently in the SRS, and (b) the transfer of the female BINA from the SRS to the Cincinnati Zoo to be paired with the male IPUH.

For further details we refer to the GMPB RESOLUTION PAPER No - 1, attached.

Yours sincerely,

GMPB Chair



Drs. Widodo S. Ramono

GMPB-TC Chair

Dr. Nico J. van Strien

Sumatran Rhinoceros Managed Breeding
GLOBAL MANAGEMENT AND
PROPAGATION BOARD (GMPB)

RESOLUTION PAPER

GMPB RESOLUTION PAPER No 1: 2006-2007 Propagation Plan

1 March 2006

SUBJECT

Indonesian Sumatran rhino propagation program two-year action plan that maximizes the potential for reproductive success.

At its meeting on 1 March 2006 at the HOTEL CENTURY ATLET, JAKARTA, INDONESIA the GMPB unanimously approved the recommendations expressed in the GMPB OPINION PAPER No 1 of 10 February 2006 (Attached as APPENDIX 1)

GMPB RESOLUTIONS

1 - Enhance breeding potential at the SRS and provide appropriate mate.

Actions approved:

A: Start breeding new females with existing male at the SRS as soon as possible.
B: Initiate the transfer of Andalas to the SRS as soon as possible.
C: Start the necessary preparations in the SRS for the acclimatization and adaptation process.

2 - Continue breeding with the pair in Cincinnati.

Actions approved:

A: Continue the program in Cincinnati.

3 - Provide older animals that have not reproduced with new partners and/or harvest and preserve their germplasm

Actions approved:

A: Move **Bina** to Cincinnati for pairing with Ipuh for 2 years, or until pregnant.
B: If not pregnant after 2 years gamete harvesting and preservation should be considered.
C: Further actions will be determined by the GMPB at that time.
D: Pair **Torgamba** with the young females (*Ratu* & *Rosa*) in the SRS as soon as possible for at least 1 year, and continue the pairing with Bina if possible.
E: Concurrently evaluate Torgamba's reproductive status, restore fertility if possible,

and collect and preserve sperm.

GMPB ADDITIONAL POINT OF AGREEMENT

1: Applying for the CITES export/import permits and other documents required for the transfer of the male Sumatran Rhino 'ANDALAS' (*Captive born*) from the USA to Indonesia will start immediately.

2: Applying for the CITES export/import permits and other documents required for the transfer of the female Sumatran Rhino 'BINA (*Wild Caught*) from the Indonesia to the USA will start immediately.

3: ANDALAS will move directly from the Los Angeles Zoo to the SRS, if possible before October/November 2006.

4: BINA will be moved to the Los Angeles Zoo for the northern winter period, if possible before October/November 2006, and will move to Cincinnati Zoo in the spring of 2007.

5: Staff and experts from the SRS - Way Kambas will visit Los Angeles Zoo and Cincinnati Zoo prior to the transport of the rhinos to review procedures and conditions and to advise on pre- and post-transport arrangements, preferably mid-2006.

6: Staff and experts from the Los Angeles Zoo and Cincinnati Zoo will visit the SRS - Way Kambas prior to the transport of the rhinos to review procedures and conditions and to advise on pre- and post-transport arrangements, preferably mid-2006.

7: Staff from Los Angeles Zoo will travel with ANDALAS to the SRS, Way Kambas, Indonesia and will be present at the SRS until the adaptation process has been completed and/or the full responsibility can be handed over to the local staff.

8: Staff from the SRS will travel with BINA to the USA and will be present in the USA until the adaptation process has been completed and/or the full responsibility can be handed over to the local staff.

9: SRS staff will be trained on site by visiting veterinarians and reproductive biologists and during internships in Institutions in the USA, Australia and other countries.

10: Veterinarians and other experts from the USA, Australia and other countries will be made available to the SRS through the IRF, with support from the Australian Asian Rhino Program (ARP), in particular during the time that SRS staff is abroad for training.

11: Funding for the transfer of the rhinos ANDALAS and BINA, including the necessary pre- and post-transfer arrangements in the SRS will be provided by IRF, with funding supplied by Peter Hall, Los Angeles Zoo, and Cincinnati Zoo.

APPENDIX 1: GMPB OPINION PAPER 1, 10 February 2006

Sumatran Rhinoceros Managed Breeding
GLOBAL MANAGEMENT AND
PROPAGATION BOARD (GMPB)

OPINION PAPER

GMPB OPINION PAPER No 1:
2006-2007 Propagation Plan

10 February 2006

Subject
Indonesian Sumatran rhino propagation program two-year action plan that maximizes the potential for reproductive success.

This document is drafted in response to the letter of request issued on October 6, 2005 by Ir. Koes Saparjadi, Director General of Forest Protection and Nature Conservation, to Drs. Widodo S. Ramono, Chair of the GMPB and Dr. Nico van Strien, Chair of the GMPB Technical Committee. A copy of this letter is attached in Appendix 2.

Background
The Sumatran rhino captive breeding program was initiated in 1985. A total of 18 Indonesian rhinos were acquired for the program with the last one captured in 1991. Of these rhinos, seven were sent to the US, three to the UK, one to Malaysia and seven remained in Indonesia. Due to husbandry and reproductive challenges, there were numerous mortalities in the first decade and no reproductive success.
In 1997, an intensive research and management effort was initiated at the Cincinnati Zoo & Botanical Garden, with the last three Sumatran rhinos (Ipuh, Emi and Rapunzel) in the US in an effort to learn about the reproductive physiology of the species so that it could be bred successfully in captivity. In 2001, a male Sumatran rhino calf (Andalas) was produced at the Cincinnati Zoo after five previous confirmed pregnancies all ending in early pregnancy loss. This was the first time a Sumatran rhino had been successfully bred and born in captivity since 1889, and the event provided a spark of hope for the Sumatran rhino captive breeding program.
The Cincinnati Zoo repeated its success with the same male/female pair (Ipuh and Emi) in 2004, this time producing a female calf (Suci). This second birth proved the repeatability of the intensive management strategy that had been developed and implemented by the Cincinnati Zoo staff. Currently Emi is a few weeks pregnant.
From the 25 of February 2002, a pair of rhinos (Torgamba and Bina) at the Sumatran Rhino Sanctuary (SRS) in Way Kambas, Indonesia, has mated on numerous occasions but, to date, no pregnancies have occurred. The rhino pair initially encountered challenges that appeared physical in nature (male could not orient appropriately or achieve full intromission and female had a hardened hymen), but these challenges eventually were overcome and successful

matings have been occurring for years, albeit at somewhat irregular intervals.
In Spring 2005, an intensive management protocol similar to that used in Cincinnati was attempted during a 4-month period. This effort confirmed that the female's cycle had become somewhat irregular but that she did ovulate after mating as expected. Unfortunately, she failed to conceive despite several matings during this interval.
Furthermore, attempts to collect semen over the years by manual stimulation, electroejaculation and post-coital sampling have produced mixed results with many samples appearing aspermic or containing largely abnormally shaped sperm cells. Currently, the fertility of both animals is in question.
Recently, two young females were rescued from the wild and moved to the SRS. First, a female rhino (Ratu) wandered outside the Way Kambas National Park into the local villages and could not be persuaded back into the forest. She was finally captured and moved to the SRS. Additionally, a second female rhino (Rosa) in Bukit Barisan Selatan National Park had, for over a year, frequently been found outside of the park boundaries, on roads and in villages. Of further concern was her unusual friendliness with people. Because it was impossible to continue to justify expending resources in support of constant RPU monitoring for one animal, she was recently moved to the SRS to join the captive breeding program. The rescue of these two female rhinos brings the total number of Indonesian Sumatran rhinos in captivity up to eight.
Given the reproductive success in Cincinnati and the addition of two new young female rhinos to the SRS, a thorough evaluation of the population and the recommendation of appropriate next steps (including management strategies and animal transfers) are certainly warranted to ensure that the captive breeding program succeeds.

Short-term goals are to:

- start breeding at the SRS with the new females as soon as possible:
- Initiate the transfer of the male offspring in the USA to breed with the new females;
- Produce more calves by the proven breeding pair in Cincinnati;
- Breed with the older un-bred animals with new partners and/or preserve their germ plasm.

The long-term goal is a self-sustaining, genetically-robust, captive population from which animals could be extracted for reintroduction back into their native habitat.

Reproductive Status of Animals

INDONESIA

Males

Torgamba - >25 yrs old. Has been at SRS since 1998; has mated with Bina numerous (n = 44 successful/full intromission) times since 2000 without producing a pregnancy; semen quality from post-coital collection, manual stimulation and electroejaculation has been variable; fertility is questionable; bloodwork in Spring of 2005 suggested early signs of renal disease. Recently anaemic and lethargic, with loss of body weight (*Sumatran Rhino Sanctuary, Way Kambas*)

USA

Males

Ipuh - >25 yrs old. Currently the only proven male Sumatran rhino in captivity; has sired two surviving calves; is currently being mated with Emi to produce a third pregnancy; current health excellent but corneal scarring is apparent and had major health problems in the past. (*Cincinnati Zoo & Botanical Garden*)

Andalas - 4 yrs old. Male offspring of Emi and Ipuh; should reach reproductive maturity in 1-2 yrs; monthly fecal samples are being collected for testosterone evaluation and determination of puberty; current health is excellent (*Los Angeles Zoo & Botanical Garden*)

Females

Bina - ~20+ yrs old. Has been at SRS since 1998; has mated with Torgamba numerous times (n = 44 successful/full intromission) since 2002; no confirmed pregnancies; cycle is often irregular but she does cycle and does ovulate after mating; no significant pathology detected by ultrasound; fertility is questionable; current health is excellent (*Sumatran Rhino Sanctuary, Way Kambas*)

Ratu - ~4-7 yrs old. From Way Kambas NP. At SRS since 20 September 2005; appears to be nulliparous; currently not pregnant; ultrasound exam revealed active ovaries and no pathology; currently recovering well from acute myopathy (*Sumatran Rhino Sanctuary, Way Kambas*)

Rosa - ~4-7 yrs old. From Bukit Barisan Selatan NP. At the SRS since 26 November; nulliparous; currently most likely not pregnant; being treated for worms otherwise, current health is excellent (*Sumatran Rhino Sanctuary, Way Kambas*)

Females

Emi - ~18 yrs old. Currently the only successfully reproducing female Sumatran rhino in captivity; has two surviving calves; is currently being mated with Ipuh to produce a third pregnancy; current health excellent (*Cincinnati Zoo & Botanical Garden*)

Suci - 18 mo. Female offspring of Emi and Ipuh; should reach reproductive maturity in ~2-3 yrs; current health is excellent (*Cincinnati Zoo & Botanical Garden*)

Important Considerations in the Development of the GMPB Plans

1) The current reproductive potential of each individual rhino in captivity
2) The need to maximize genetic diversity and number of contributing founders
3) The need to produce pregnancies in all young females before pathologies develop
4) The costs and logistical challenges to moving rhinos internationally, including import/export permits
5) The stress of moving and adaptation, especially for older animals
6) The space and facilities available, including climatic and other environmental factors
7) On-site availability of staff with appropriate reproductive and veterinary experience and technical skills

Two-year Goals of the GMPB With Supporting Rationale and Recommended Action Steps

Note: These action steps have been developed based on the assumption that pregnancies are not established in any rhinos other than the proven pair (Emi and Ipuh). If pregnancies are diagnosed at some point in this plan, subsequent action steps are likely to change. Also arrival of additional animals from the wild or death or impairment of animals may require the plan to be modified

Prioritities

Priority 1 - Enhance breeding potential at the SRS and provide appropriate mate

The small USA population is reproducing from a single pair of rhinos (♀ *Emi* & ♂ *Ipuh*) and may be able to continue to reproduce from this pair for at least one or two more calves. Eventually the USA population will require new animals to maintain genetic vitality and the only possible source of such animals is the Indonesian populations in the SRS, as it is highly unlikely that other sources of animals will ever become available.

The Indonesia population is not yet reproducing possibly because of the lack of a fertile male. Currently there are 2, and perhaps 3, potentially reproductive females (*Rosa*, *Ratu*, *Bina*) in the SRS, that could reproduce if a mated with a fertile male.

Therefore the highest priority for the global Sumatran Rhino Captive Population is to start the breeding in the SRS as soon as possible, to utilize the potential of the females housed there. Otherwise the future of the whole captive breeding program is in doubt.

Currently there are two males in the USA population, one an older animal (*Ipuh*) that has produced two calves so far, the other a near-mature young animal (*Andalas*), the offspring of the older male. The young male has not yet bred, but will reach full sexual maturity very soon.

To start the breeding in the Indonesian captive population as soon as possible it is necessary to move one of the two males from the USA to Indonesia immediately, as no other males are or can be guaranteed to become available, and the male currently there (*Torgamba*) may be infertile and/or ailing.

The older male is showing sign of aging and has been in bad health in the past. Moving him from the USA to Indonesia is contraindicated because of his advanced age and the disruption it would cause in the breeding program in Cincinnati.

The younger male has not proven to be fertile, but also has no chance to do that while in the USA, as no potential mate is available. He is young and therefor is more likely to tolerate the long transpacific travel well. When moved to the SRS he will have to undergo a lengthy period of adaptation to the different climate and condition, and will have to gradually develop resistance against the endemic pathogens and parasites.

As the preparations for the travel and the subsequent acclimatization and adaptation process will take at least one year and possibly longer, there is no advantage in awaiting the establishment of his fertility by artificial means in the USA.

Until Andalas can start breeding with the females in the SRS, the pairing of all three females with Torgamba must continue. In the unlikely event that this results in a pregnancy of pregnancies, this Propagation Plan has to be reviewed.

Recommended action : Start breeding new females with existing male at the SRS as soon as possible. Initiate the transfer of Andalas to the SRS, and simultaneously start the necessary preparations in the SRS for the acclimatization and adaptation process.

Priority 2 - Continue breeding with the pair in Cincinnati.

As the only successfully reproducing pair of Sumatran rhinos in captivity, nothing should be done

to disrupt this pairing and the management system that has proven successful.
Recommended action: Continue the program in Cincinnati.

Priority 3 - Provide older animals that have not reproduced with new partners and/or harvest and preserve their germplasm .
The current number of founder animals in the Sumatran Rhino captive population is very small (4 ♀ & 2 ♂) and only one pair has reproduced to date. It is not likely that a significant number of animals from the wild will become available. Therefore it is important to try to reproduce with the two other founders (♀ *Bina* & ♂ *Torgamba*) that have not yet reproduced, naturally or artificially. Or if this is not successful germplasm (Semen or ovae) should be harvested and preserved for future use.
Bina has been in captivity for 14 years without being pregnant, a condition that often leads to pathology and infertility. However, she exhibits no obvious pathology in her reproductive tract and continues to cycle. Since she has only mated with Torgamba in captivity, and his fertility is questionable, Bina should be bred repeatedly by a proven male in an attempt to produce a pregnancy and to better understand her unusual cyclicity, or to determine conclusively that she is no longer fertile.
Considering her advanced age and the continuing disturbances of her cyclicity one must assume that the time remaining to get Bina pregnant is short. Therefore it is contraindicated to continue to pair her with Torgamba and let her wait until she can breed with Andalas in the SRS. There is a considerable risk that this will take too long and that Bina therefore will never breed.
If she was to be paired with Ipuh in Cincinnati sooner rather than later there is a realistic chance for success. Moreover sophisticated fertility enhancement techniques are more easy to apply in Cincinnati Zoo than in the SRS for logistic reasons.
Torgamba has mated only with Bina, a cycling female, but no pregnancies have occurred. Sperm samples collected from this male, show that his fertility is in question. However, he obviously does not lack libido, and there are no gross anatomical abnormalities in his reproductive organs. Because Torgamba has only been mated with Bina, a female of questionable fertility herself, he should be paired with one or more fertile females (*Ratu* & *Rosa*) and mated over several consecutive cycles for at least one year. If the female(s) cycle, mate with Torgamba, and ovulate but never conceive, it may be concluded that Torgamba is subfertile and perhaps infertile.
In the meantime his fertility should be evaluated more extensively for reproductive deficiencies and, if at all possible, restored to better fertility. Concurrently, every effort should be made to collect and bank sperm samples from him.
Considering his advanced age, suspected reduced kidney functions and occasionally poor health lengthy travel and adjustment to new environments as contraindicated. Eventually Torgamba may be retired from the breeding program and may be given a role in a visitor program at the SRS.
Recommended actions: Move Bina to Cincinnati for pairing with Ipuh for 2 years, or until pregnant. If not pregnant after 2 years gamete harvesting and preservation should be considered. Further actions will be determined by the GMPB at that time.
Pair Torgamba with the young females (*Ratu* & *Rosa*) in the SRS as soon as possible for at least 1 year, and continue the pairing with Bina if possible. Concurrently evaluate his reproductive status, restore fertility if possible, and collect and preserve sperm.

SUMMARY

Priority 1 - Enhance breeding potential at the SRS and provide appropriate mate.

Recommended action : Start breeding new females with existing male at the SRS as soon as possible. Initiate the transfer of Andalas to the SRS as soon as possible, and simultaneously start the necessary preparations in the SRS for the acclimatization and adaptation process..

Priority 2 - Continue breeding with the pair in Cincinnati.

Recommended action : Continue the program in Cincinnati.

Priority 3 - Provide older animals that have not reproduced with new partners and/or harvest and preserve their germplasm Recommended actions:

Move **Bina** to Cincinnati for pairing with Ipuh for 2 years, or until pregnant. If not pregnant after 2 years gamete harvesting and preservation should be considered. Further actions will be determined by the GMPB at that time.

Pair **Torgamba** with the young females (*Ratu* & *Rosa*) in the SRS as soon as possible for at least 1 year, and continue the pairing with Bina if possible. Concurrently evaluate his reproductive status, restore fertility if possible, and collect and preserve sperm.

APPENDIX 2

MINISTRY OF FORESTRY THE REPUBLIC OF INDONESIA
DIRECTORATE GENERAL OF FOREST PROTECTION AND NATURE CONSERVATION
Manggala Wanabakti Building, Block I, 8 th Floor Gatot Subroto Road Senayan
Jakarta 10270 Indonesia
Telephone : (021) 5734818 - (021) 5730316, Faximile : (021) 5734818 - (021) 5733437 Jakarta

Jakarta, 6 October 2005

Ref. No. S. 612/IV-KKH/2005

Subject : The Ex-situ Sumatran Rhino Captive Breeding Program

Chairman of the Sumatran Rhino
Global Management and Propagation Board (GMPB)
Drs. Widodo S. Ramono,
JAKARTA, Indonesia

Chairman of the GMPB Technical Committee
Dr. Nico J. van Strien,
DOORN, Netherlands

Dear Sirs,

We would like to request your attention and advise for the following:

1. The ex-situ Sumatran Rhino captive breeding program with the animals from Sumatra has entered a new phase with the rescue of a young (sub) adult female from Way Kambas National Park, and with the planned relocation of another young female from Bukit Barisan Selatan National Park.
2. The current breeding program with Bina and Torgamba in the SRS, Way Kambas NP, has not resulted in a pregnancy despite many years of efforts, assisted by local and international experts and using appropriate modern techniques.
3. Therefore there is an urgent need for revision of the breeding program involving all the Indonesian-owned Sumatran rhinos and for appropriate immediate, mid- and long-term goals and actions.
4. The GMPB through its Technical Committee is requested to place before its members an Opinion Paper with its recommendations for the Sumatran Rhino Breeding Program in Indonesia and abroad. This paper should put in our opinion focus on maximizing the possibilities for each individual to reproduce and on maintaining genetic variation in the captive population by breeding between unrelated animals.

Recommended priority actions, in our opinion, are:

a. Increasing the potential for successful reproduction in the SRS, Way Kambas NP, as a primary center for Sumatran Rhino ex-situ propagation, through temporary relocation of the young male Andalas from Los Angeles Zoo to the SRS, to be paired with the two new young females.
b. Planning for further treatment, most likely abroad, of the female Bina to restore her normal reproductive cycle, followed by breeding with a proven breeder male.
c. Planning for future treatment of the male Torgamba, locally and possibly abroad, if proven to be unable to breed with the new females in the SRS.

We are confident that the GMPB will be able to advise us and the other members at its earliest convenience, and preferably before the end of October 2005.

Yours sincerely,

KOES SAPARJADI
DIRECTOR GENERAL

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