

January

2010



Photo: S. Belcher

SUMATRAN RHINO GLOBAL MANAGEMENT AND PROPAGATION BOARD (GMPB) MEETING

Bogor, Indonesia

**SUMATRAN RHINO
GLOBAL MANAGEMENT AND PROPAGATION BOARD (GMPB)
MEETING MINUTES
14-15 JANUARY 2010
SANTIKA HOTEL- BOGOR, INDONESIA**

INTRODUCTION - Widodo Ramono

The vision of the Sumatran Rhino Global Management and Propagation Board (GMPB) is:

1. To develop and manage a Global Sumatran Rhino Propagation Program involving all countries and Institutions maintaining Sumatran Rhino in managed breeding centers and the major sponsors of the Centers and program.
2. To develop and manage a Global Sumatran Rhino Propagation program, involving all the countries and institutions maintaining Sumatran Rhino in Managed breeding centers through the support of the major sponsors of the centers and programs.

Task of the GMPB

1. To recommend and decide on the management of the global Sumatran Rhino (SR) captive population as a truly global population to maximize the options for reproduction and to improve its vitality in a global SR propagation program
2. To prepare and facilitate exchange of animal between all locations if indicated for the purpose of the program
3. To facilitate exchange of experience and transfer of knowledge and technology.

The composition of GMPB

1. The GMPB will consist of:
 - Representatives of the Countries or institutions holding SR in managed Breeding Centers
 - Representative of donor agencies
 - Sumatran rhino expert
2. The membership will be reviewed bi-annually and the GMPB will bi-annually elect a chairman from among the members
3. The SR expert members will form a Technical Committee (TC) that will function as the secretariat of the GMPB

Summary of Primary 2009 GMPB Meeting Recommendations

1. Individual animal recommendations as described in the detailed report from the March 2009 meeting.
2. Bank semen for all mature males.
3. Consult with geneticist to determine genetic diversity of current population and impact of specific pairings on the future of program.
4. Reproductive task force to conduct further assessments and germplasm rescue attempts from non-reproductive rhinos (Torgamba and possibly Gelogob)
5. Hold next GMPB meeting in 2 years in association with the SE Asia AsRSG meeting.

Defining the need for a GMPB meeting in January 2010:

Several important considerations have led to this meeting which is 1 year earlier than planned: (1) the loss of the only reproductive female Emi in Cincinnati, (2) Andalas is now successfully copulating, (3) there are increasing challenges such as global warming, earthquake and volcano.

ANIMAL UPDATES

Status Report on Loss of Emi and Cincinnati Zoo – Terri Roth

A brief history of Emi: she was collected and moved to the Los Angeles Zoo in 1991 and moved to the Cincinnati Zoo in 1995. She first became pregnant in 1997 but the pregnancy was lost. Her pregnancy in 2000 was maintained and Andalas was born in 2001. Suci was born in 2004 and Harapan was born in 2007. Emi died in September 2009. No symptoms were readily apparent before April 2009, when she began to show decreased appetite, lethargy, and she seemed depressed. Veterinarian Dr. Mark Campbell performed the following tests with no abnormal results:

- General exams: teeth, heart, overall physical
- Blood analyses (CBC and comprehensive chemistry) several times including aerobic and anaerobic blood culture
- Urinalysis 4 different samples over a couple months (results normal)
- Ultrasound exam of kidneys, repro tract, bladder, liver, spleen, thyroid (by us and an ultrasound expert from the medical school and an equine internal medicine expert) nothing abnormal identified
- Fecal ova and parasite exam (three times)---all negative
- Fecal culture (4 times)---all negative
- Fecal occult blood test (negative)
- Bile acid analysis (initially same results as back in 2001; subsequent tests demonstrated a marked and consistent elevation)
- Johnne's stool culture (twice) - both negative
- Brucella (negative)
- Leptospirosis test (normal titers)
- TB test July (negative)---administered at base of ear with 0.1 PPD Bovis tuberculin
- MAPIA test two years ago (negative)
- Fungal panel tested (coccidiomycosis, aspergillosis, blastomycosis and Histoplasmosis) all negative---serology test
- Water deprivation test (for renal function – inconclusive)
- ACTH (normal)
- Comprehensive thyroid panel----unremarkable when compared to conspecifics (Ipuh and Suci) and domestic equids

The only abnormal findings were one or two very slightly elevated liver enzymes early on and the consistently elevated later bile acid tests. Emi was treated with:

- Tucoprim (antibiotic) treatment—Trimethoprim and Sulfadiazine
- H2 blocker Gastrogaurd prophylactic
- Sucralfate prophylactic
- Prednisolone

Post Mortem Gamete Rescue Attempt

- Both ovaries contained multiple follicles (5-12 mm)
- 30 oocytes recovered and matured *in vitro*
- 30 oocytes inseminated *in vitro* with frozen-thawed sperm
- No oocytes cleaved
- Staining revealed 2-3 mature oocytes but most were degenerate

Histopathology performed by two outside board certified veterinary pathologists showing significant hemosiderosis and hemochromatosis of the liver, moderate hemosiderosis in a few other organs and the cause of death was determined to be liver failure due to hemochromatosis. Hemochromatosis affects many wildlife species in captivity including black rhino, tapir, bats, many bird species, etc. Early testing of Ipuh, Emi and Rapunzel (and other SRs) suggested iron

overload could be a problem in this species. Analyses were performed at Kansas State University.

Andalas' iron levels have been monitored from the beginning:

Date/Age	Iron (ug/dL)	TIBC	Trans. Sat.(%)	Ferritin	Location
9/14/2001 - 1 day	173	291	59	226	CZBG
10/4/2001 - 3 wk	119	316	37	72	CZBG
11/13/2001 - 2 mo	71	306	23	33	CZBG
03/??/04 - 2.5 y	144	159	91	1082	LA
2/23/2007 - 5.5 y	203	216	94	3981	LA

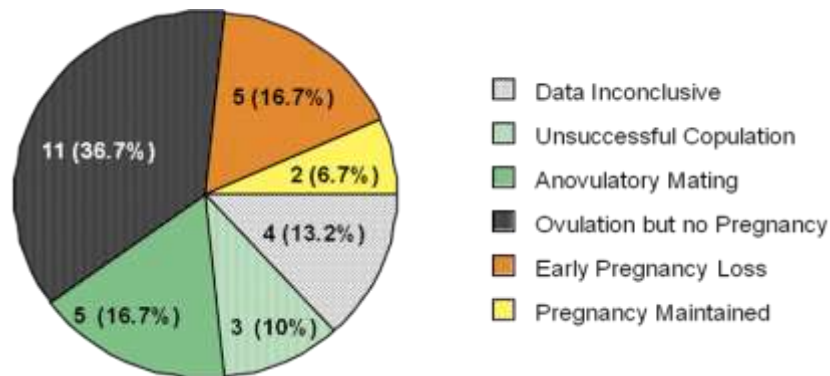
Diets from Cincinnati and Sabah have been published by Ellen Dierenfeld and Cincinnati diets contained lower levels of iron. The proposed follow up on the iron issue is to:

- Analyze serum for iron analytes from captive population
- Suggest quarterly samples from 2009 and collect quarterly in 2010
- Analyze all samples at Kansas State University

One of the most important issues we are dealing with now is whether Suci is sexually mature and what we do with her in terms of breeding. Suci currently weighs 688 kg. From follicle sizes on ultrasound as well as hormonal profile she appears to be mature.

Ipuh is now more than 28 years old. His health is good but his vision is impaired. Semen samples are stored at Cincinnati; seven ejaculates have been frozen in 260 ½ cc straws. Ipuh's sperm concentration is 17 to 55 million/ml and motility post-thaw is 30-45 percent.

We are confident that Andalas will be able to sire offspring soon and urge the group's patience with that process. Dr. Roth reminded the group that out of 30 attempted matings, data from Emi and Ipuh showed the following:



Suci needs to breed soon because she appears to be mature or very close to it. If we wait to breed her, she will start to lose her fertility, based on what we know about other rhino species. And we need to breed as many rhinos as possible as soon as possible to keep the program viable. At the last GMPB meeting, the recommendation was to AI Suci with sperm from Tam or Torgamba. The benefits of that recommendation are that (a) no rhinos need to move; (2) Tam or Torgamba are a good genetic match; (3) this technology could help other rhinos and reduce international rhino moves. The challenge is that Torgamba is no longer an option as he is not producing viable sperm, and government permission to use Tam's sperm has not been forthcoming. Dr. Roth requested the assistance of the GMPB to address this issue.

Sumatran Rhino Sanctuary – Dedi Candra

The goal of the SRS is to successfully breed Sumatran rhinos in sanctuaries for reintroduction purposes. The objective is to establish a centre for semi-in-situ conservation of the Sumatran rhinoceros, and the function of the SRS is as a center for breeding, research and conservation education of the Sumatran rhinoceros. The SRS:

- provides a natural environment with ~10 ha forest enclosure per rhino
- is within rhino habitat that provides natural food, topography and vegetation
- provides for less human interaction which allows rhinos to engage in natural behavioural repertoire (wallowing, exploring, forage for own food, etc)
- staff conduct intensive daily observation on all rhinos to monitor their behaviour pattern as important parameters for early detection of illness
- conducts research on food preferences, reproductive behaviour and hormones, habitat use, and study of Sumatran rhino ecology.

Standard observation and monitoring of SRS animals includes:

Husbandry

- Food intake - daily
- Behaviors monitoring - daily
- Body weight - weekly

Health

- Blood Analysis - monthly
- Mineral assays - Quarterly
- i-Stat testing - quarterly
- Urine and faecal analysis - weekly
- Physical inspection - daily
- Disease surveillance - annually

Reproduction

- Ultrasound 3x/week then daily near estrus
- Faecal sample collection (2-3 samples/week)
- Reproductive morphology and sexual behavioural changes daily

The status of each rhino at the SRS was reviewed:

Torgamba – male, age ~ 30 years.

Weight: 667 kg

Health status: overall good condition for an old male.

- Kidney problem - Low serum phosphorus and high Ureum-Creatinine in the blood observed since 2004
- Chronic Anemia – low hematology
- Less strong compared to females, he tires easily during courtship/
- Missing lower first molar causing history of dental disease (treated with power float)

Reproductive status: oligospermic, infertile

Bina – female, age >25 years

Weight: 728 kg

Health status: good

Reproductive status: irregular estrus cycles

Ratu – female, age >8 years

Weight: 561 kg

Health status: good

Reproductive status: normal reproductive tract

- Clear behaviour of oestrous with approach to centre area, makes sign in the forest especially close the centre area (urine and faecal)
- Clear physical signs of oestrus like vulva redness, swollen
- She has regular cycle of oestrus since 2007 and potential female for breeding
- Many past breedings with Torgamba - no pregnancies
- Breeding with Andalas

Rosa– female, age >7 years

Weight: 622 kg

Health status: good. Monitoring for parasite infestation. Although Rosa shows no evidence of disease associated with these flukes, there may be concern because an elephant from the nearby sanctuary appears to have died from a severe fluke infestation.

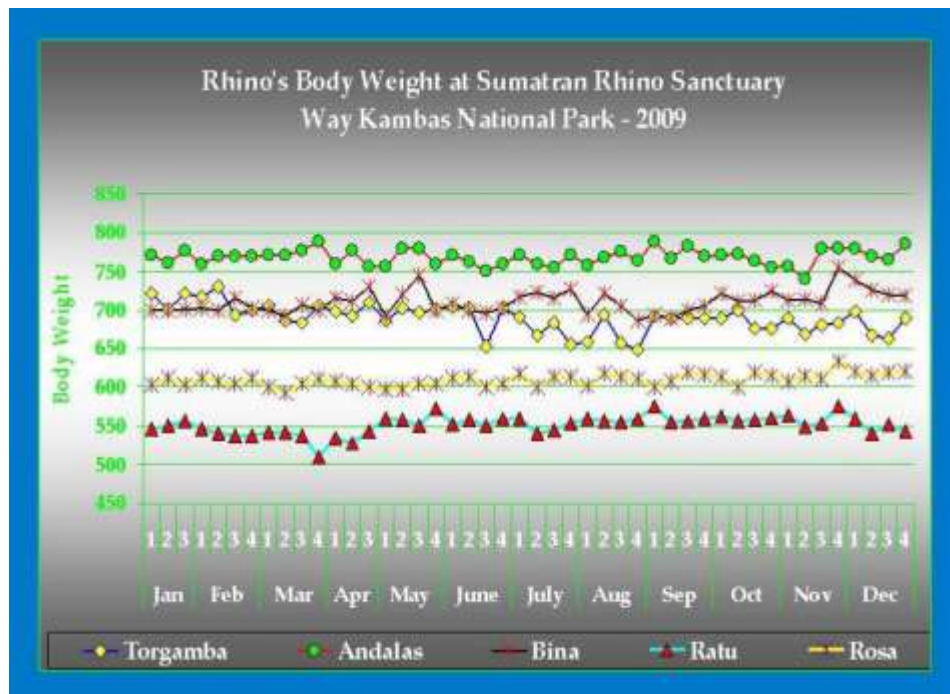
Reproductive status: recently started cycling

Andalas – male, 8 years

Weight: 759 kg

Health status: good

Reproductive status: first copulation December 2009, mature male



Current Reproductive Strategy

Pair Andalas and Ratu in Center Breeding Area: Andalas as primary breeding animal at the SRS. Priority will be to mix Andalas with Ratu since she is an experienced breeder of presumed normal adult reproductive function.

Pair Andalas and Rosa/Bina in Center Breeding Area:
Even as we breed Andalas and Ratu, we will also breed other females.

Pairing Torgamba and Rosa in Second Breeding Area: Rosa is young and maturing inexperienced female and we believe that she may learn valuable courtship lessons by mixing with Torgamba.

Pairing Torgamba and Bina in Second Breeding Area: We need to pair Bina to induce regular cycle. Success is improbable, but we will continue to try to successfully breed Bina.

Sabah Sumatran Rhinos – Junaidi Payne (BORA) and Petra Kretzmar (IZW)

Two rhinos are present in captive conditions in Sabah:

- Kretam (Tam), male, captured August 2008, age roughly 20 years
- Gelogob, female, captured June 1994, exact age unknown, but aged

Reproductive assessments on both animals were performed in November 2009, a collaboration of the Leibnitz Institute for Zoo and Wildlife Research, Berlin / Research Institute for Wildlife Ecology, Vienna / Sabah Wildlife Department.

Tam's assessment results were:

- 21 ml ejaculate collected by electroejaculation; 1.5×10^6 sperm / ml; 55% of sperm progressively motile; 8 % of cells morphologically intact
- 5 ml of semen in 10 straws were cryopreserved and retained by Sabah Wildlife Department
- Concentrations of viable sperm were judged too low for use via artificial insemination or *in vitro* fertilization
- Intra cytoplasmic sperm injection (ICSI) into oocyte may be possible
- Very good prospects for better quality collection in the future

Gelogob was examined using trans-rectal ultrasound examination without chemical restraint.

- Minor lesions were seen in reproductive organs; uterine cysts were present but had not progressed in size or number since 2005
- There was a small tumour mass in the cervix
- Both ovaries were small and inactive; no signs of larger follicles or corpora lutea were detected
- Gelogob is presumed acyclic and reproductively senescence; pregnancy from natural mating or artificial insemination is unlikely
- Hormone treatment to stimulate growth of follicular stock, oocyte production & *in vitro* fertilization was suggested

Other news from BORA is that Tam's weight now stable at around 600 kg. Tam's forest paddock has been divided into two (1.5 ha each) in preparation for receiving new rhino. After much deliberation, the size of the Borneo Rhino Sanctuary size will probably be reduced and developed/managed more along the lines of the SRS. Two rhinos are targeted for capture during 2010.

White Oak Conservation Center – Steve Shurter

White Oak is a 7,400-acre facility in north Florida and southeast Georgia. White Oak's species are linked with programs that improve the survivability of animals in the wild, with each species providing opportunities for training, research and breeding. Some of White Oak's programs provide animals for re-introduction (for ~30% of the species) and support is provided for field conservation programs in the range states, for example for rhinos in Indonesia.

White Oak presently holds black, white, Indian and Sumatran rhinos (Harapan), all in large, naturalistic enclosures. White Oak is a founding member of IRF, hosts IRF's program office and provides administrative support. Through its foundation, Gilman International Conservation, it directly funds efforts in protection and technical support for Indian, Sumatran and black rhinos.

Harapan's weight has been good since arriving at White Oak and he now weighs around 600 kg.



A number of browse items have been offered since his arrival: 12 native or species grown at White Oak or in Florida (FL) and 17 non-native species (grown in California – CA).

Common name	Latin Name	Common name	Latin Name	Source
Sweet gum	<i>Liquidambar styracifula</i>	Ficus	<i>Ficus alii</i>	FL
Wax myrtle	<i>Myrica cerifera</i>	Ficus benjamina	<i>Ficus benjamina</i>	FL
Mulberry	<i>Morus alba</i>	Ficus	<i>Ficus nitida</i>	FL
Red bay	<i>Persea borbonia</i>	Ficus	<i>Ficus mysorensis</i>	CA
Loblolly bay	<i>Gordonia lasianthus</i>	Ficus	<i>Ficus lutea</i>	CA
Tupelo	<i>Nyssa sylvatica</i>	Ficus	<i>Ficus macrophylla</i>	CA
Elm, American	<i>Ulmus americana</i>	Ficus	<i>Ficus rubiginosa</i>	CA
Birch, river	<i>Betula, sp.</i>	Ficus "Florida"	<i>Ficus floribunda</i>	CA
Gallberry	<i>Ilex coriacea</i>	Pittisporum	<i>Pittisporum sp.</i>	WO
Hackberry	<i>Caeltis laevigata</i>	Bradford pear	<i>Pyrus sp.</i>	WO
Grape vine	<i>Vitis munsoniana</i>	Banana	<i>Musa sp.</i>	WO
Willow, coastal	<i>Salix nigra</i>	Bamboo, large leaf	<i>Phyllostachus sp.</i>	WO
		Loquat	<i>Eriobotrya japonica</i>	WO
		Elm, Chinese	<i>Ulmus parvifolia</i>	WO
		Photinia, red-tipped	<i>Photinia globra</i>	WO
		Giant reed	<i>Arunda donax</i>	WO
		Corn	<i>Zea mays</i>	WO

Harapan is in good condition overall and his daily diet is now comprised of:

- Mixed ficus browse (CA) 34 lbs/15 kg
- Mixed local browse 70 lbs/31 kg
- Wild herbivore grain 10 lbs/4.5 kg
- mixed fruit/veggies 5 lbs/2.3
- Vitamin E supplement 12 mls
- mixed hay: timothy, coastal, alfalfa 15 lbs/6.8 kg

Los Angeles Zoo

There was no report from Los Angeles, and Jeff Holland sent his regrets that they were unable to send a representative to the meeting. Los Angeles continues to be interested in participating in the program and in staying apprised of developments and opportunities for future re-engagement.

UPDATE FROM THE IUCN ASIAN RHINO SPECIALIST GROUP MEETING IN BOGOR January 2009 – Bibhab Talukdar

The purpose of the January AsRSG meeting was to:

- encourage networking among managers and researchers working in Rhino Bearing Protected Areas in South East Asia
- share experiences in current state of research on problems faced by small rhino populations, particularly with regard to in-breeding depression and scarcity of habitat
- assess current status threats and challenges in rhino conservation and explore trans-country cooperation on information sharing on rhino poaching as part of Crisis Management
- identify key resource personnel in the field of rhino research and conservation in South East Asia

Much of the meeting's discussions centered on 'doomed' or rhinos living in very fragmented habitats with no possibility of genetic exchange. It was agreed that every effort should be made to protect those wild rhinos that are breeding and not considered 'doomed.' Rhinos living in situations where no genetic exchange is possible should be captured and moved into a secure location (sanctuary or secured habitat). Additionally, it was agreed that all rhinos in "managed breeding programs" (i.e., zoos, sanctuary, breeding center, etc.,) should be managed under the umbrella of the GMPB. Finally, the AsRSG agreed that because of such small numbers, all Sumatran rhinos should be managed as a single population without concern for management at the subspecific level.

Sustainable funding for Asian rhino conservation was also discussed with the specific recommendations to:

- encourage governments to provide adequate budgets for wildlife law enforcement so that NGOs are not the sole source of support for rhino protection.
 - Vietnam: Forest Protection Department
 - Sabah: Director of Sabah Wildlife Department
 - Peninsular Malaysia: Department of Wildlife and National Parks
 - Indonesia: Director of Biodiversity Conservation, PHKA
- investigate the possibility that law enforcement might/should be eligible for support under carbon credit schemes
- determine who is setting up the mechanics of these schemes so that we know how best to influence the process

The AsRSG adopted the following resolution at the January meeting in Bogor:

"We, the participants of the IUCN/SSC Asian Rhino Specialist Group, meeting in Bogor, Indonesia on 2-3 March 2009,

Recognizing the need to strengthen adaptive conservation to further strengthen conservation,

Examining the needs of on-the-ground, intensive management to save the remaining Sumatran and Javan rhino populations,

Recognizing further that Sumatran and Javan rhinoceros are fully protected under national

and international laws and that actions damaging to rhino populations or their habitat are against these laws,

Convinced of the need to take urgent measures to prevent the continued fragmentation and eventual extinction of this Sumatran and Javan rhinoceros populations,

Urge range country government and non-governmental agencies and international donor to implement Sabah, Indonesia and Vietnam rhino action plans and to:

- Increase awareness efforts and resource allocation to protection efforts of all known populations of Javan and Sumatran rhinos in South East Asia
- to urgently set in motion the steps needed to create a second population of Javan rhinos in Indonesia
- to actively use relevant region cooperative initiatives (e.g., ASEAN Wildlife Enforcement Network (ASEAN-WEN) to strengthen information sharing and intelligence to close illegal cross border rhino horn trade,

Recognizing that where populations are seen to be declining, or there is an absence of breeding, that it is necessary to:

- consider all Sumatran rhinos as members of a single global population; individual animals and their germplasm may be exchanged between participating countries for breeding purposes
- consider a formal dialogue between the Governments of Indonesia and Malaysia (Federal and Sabah) and the United States on a possible Sumatran rhino exchange program to strengthen the Sumatran rhino populations
- consider a formal dialogue between the Governments of Indonesia and Vietnam on a possible Javan rhino exchange program to strengthen the Javan rhino populations.

Invite other members of the international community, including donor states, the private sector, the corporate sector, academic and scientific institutions, to provide effective and united support, including funding, to assist these efforts.

We, the participants of the Rhino Specialist Group meeting, pledge to do everything in our power to ensure the long-term viability of the Sumatran and Javan rhinoceros, and to encourage all sectors to assist and support these efforts."

* * *

SETTING THE STAGE FOR THIS MEETING OF THE GMPB – Susie Ellis

In addition to updating the GMPB on individual animal status, this meeting was designed to be a brainstorming session to develop a proactive strategy to address the recent population changes. The SR captive program originally was developed with the aim to contribute to the conservation of the wild population. We need a paradigm shift in order to work through the recent changes and to move the captive population towards optimally supporting the wild population. The main questions are: (1) How do we ensure that the captive population contributes to the wild population and what is needed to make that happen? (2) What are the steps needed to get to the point where we can manage SRs using a meta-population management strategy incorporating the captive and wild population? (3) What are the individual animal recommendations or population needs?

The group brainstormed a variety of ideas and topics:

How do we ensure that the captive population optimally contributes to the wild population?

- Propagate more rhinos – get more rhinos on the ground
- Achieve sustainable growth of population
- Analyze population demographics and genetics
- Technological support and exchange between institutional or countries
- Carry out research that enhances our ability to save the population
 - Monitoring technology (radio telemetry)
 - Fecal DNA analysis for genetic/demographic information
- Assess impact of SRS on surrounding area in Way Kambas
- Promote awareness to raise funds
- Make a realistic linkage between *ex situ* and *in situ* conservation
- Add more animals to captive population from wild population
- Maintain animals short-term in captivity to collect gametes
- Develop/contribute to a genome resource bank for Sumatran rhinos
- Understand genetic differences, if any, between the two subspecies – review/renew previous genetic work
- Understand the breeding situation in the wild
- Develop a material transfer agreement so that it is in place ahead of time when needed
- Obtain government approval/regulations to support these activities

A back-of-the-envelope analysis suggests that the current captive population could possibly expand to up to 17 rhino under optimal conditions with natural breeding (see next page).

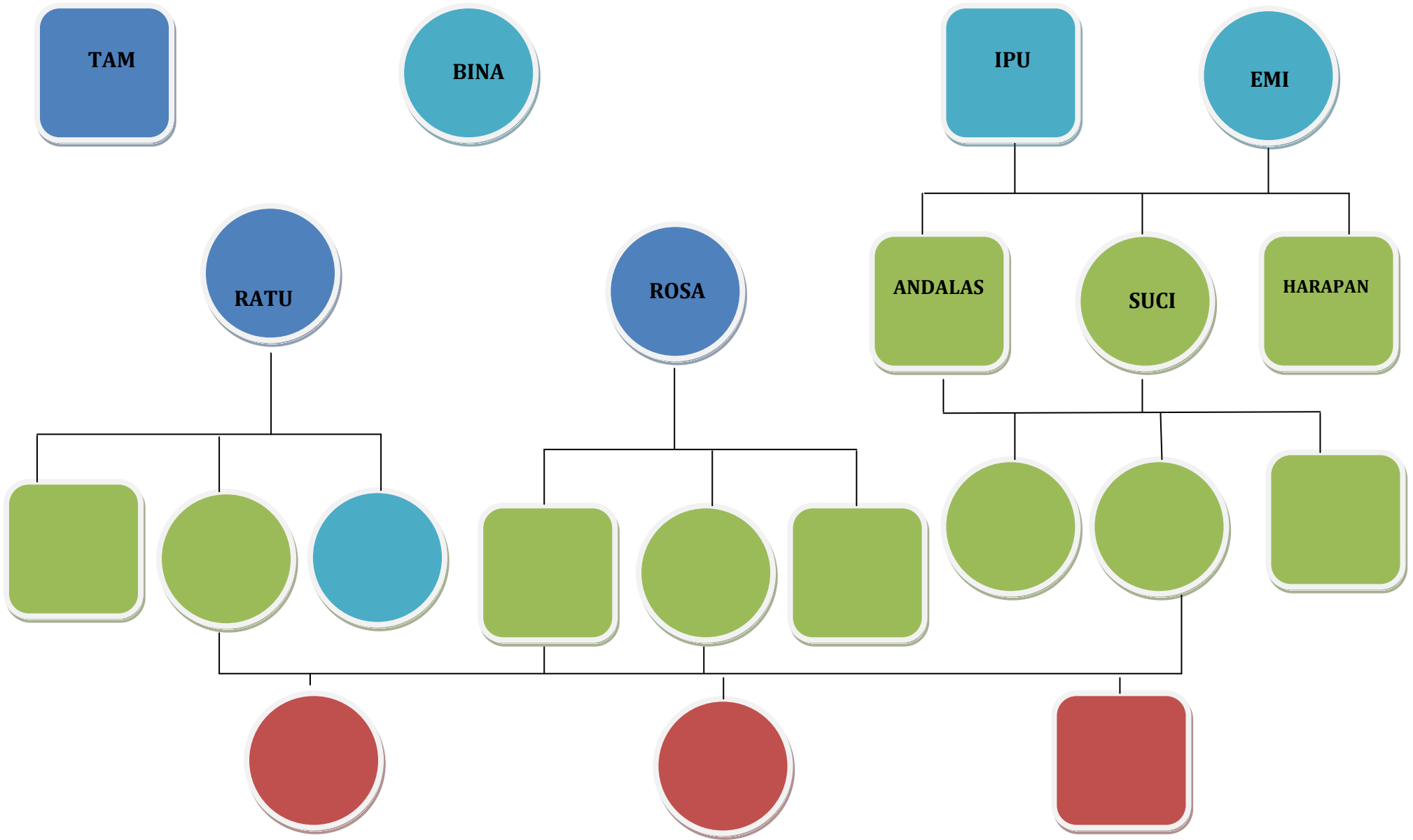
How do we resolve the genetic issues?

- There is concern from both the Indonesian and Malaysian governments about mixing the two subspecies.
- To address this, we need to pull together existing genetic information in a user-friendly manner and to identify what, if any, genetic differences are significant
- Address the political issues within and between the range countries particularly those pertaining to shipping of samples and/or animals.

What are the steps towards developing and implementing a metapopulation strategy?

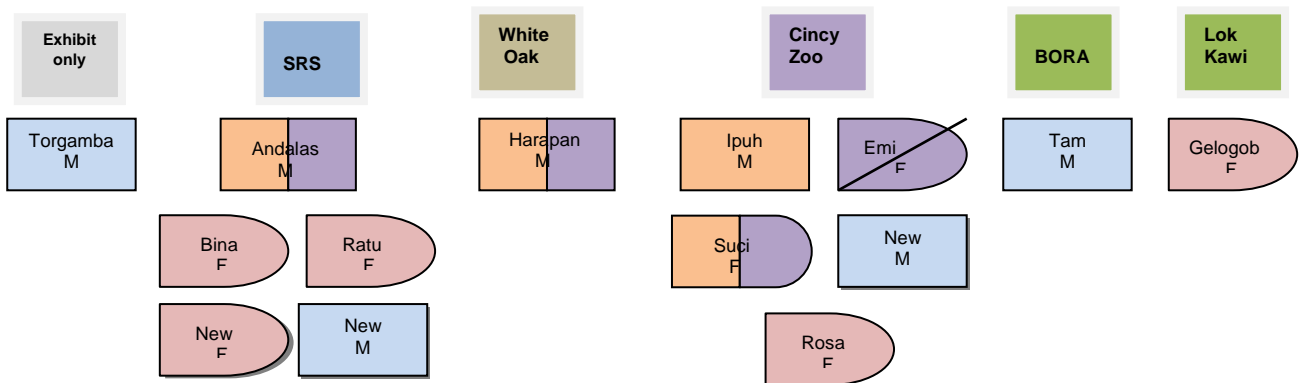
- Document whether SRS population is “safer” than the wild to garner government support.
- Emphasize the use of the SRS population as a genetic reservoir and as a physically “safer” population
- Develop a creative process for management, for example
 - Short-term captivity (bringing animals in from the wild for short-term gamete collection)
 - Short-term wild (temporarily releasing SRS animals into the wild for natural breeding while under close monitoring)
 - Preliminary feasibility studies are needed

**Sumatran Rhinos Potentially Involved in Reproduction
2020**



At least two participants expressed concern that despite the fact that Andalas and Ratu mated in December, the progress with producing a calf is not moving ahead as quickly as desired. (We had not confirmed at this time that Ratu was already pregnant.) These participants desired to re-open the discussion to return Ipuh to Indonesia to breed with Ratu and Rosa. The discussion was then moved to focus on the underlying need, rather than the position. The position is that Ipuh should move; the underlying need is that we need to have a viable male at the SRS producing offspring. With that, the group moved away from the position of moving Ipuh to examine what kinds of actions or strategies could address the need for a viable male. The primary need is that we need more genetic diversity in the population.

Even though under optimal conditions 17 animals could be on the ground by 2020 (see previous page), that still will not be enough to really make the captive population a substantial insurance population for the wild population. The group then discussed what the minimum infusion of new genetic material might be in order to reach that goal. A rough model using post-it notes (see below) was constructed on the wall with existing animals and locations, and then adding additional animals. The group determined that adding two new males and one new female could substantially improve the breeding options for the captive population and likely would add significantly to genetic variability should breeding be successful. **[This model assumes that Tam would not be included in the breeding population (until such time as the subspecies issue is sorted out). Until/unless the subspecies issue is resolved, Sabah has very limited options.]**



Should the GMPB desire to pursue this option, we must make strong case to the Government of Indonesia for collection of new animals.

We then examined all the potential options for each animal currently in the population.

Animal	Option for Action	Note:
Suci	<ol style="list-style-type: none"> 1. Find unrelated sperm 2. Breed with Ipuh 3. Find unrelated male for natural breeding 4. Breed with Harapan 5. Breed with Andalas <p>* Suci cant wait for 2 years Plan A : find unrelated sperm</p>	<ul style="list-style-type: none"> - Assume that we will need to justify to government of Indonesia (Indonesia does not allow parent-offspring matings) - Time consideration; Suci may lose ability to breed if she is not bred soon - There is a risk that mating Ipuh with Suci would present external credibility issues in terms of questions about sound management.
Rosa	<ol style="list-style-type: none"> 1. Change management, decrease intense keeper interaction - socialize with other rhino 2. Breed with Andalas 3. AI with unrelated sperm 4. Release short-term for mating with wild male 5. Breed with Ipuh 6. Get expertise on reversing imprinting 	
Ipuh	<ol style="list-style-type: none"> 1. Mate with Rosa 2. Mate with Ratu 3. Bank sperm 4. Use sperm for Rosa 5. Use sperm for Ratu 6. Breed with Suci 7. Breed with new female 	<ul style="list-style-type: none"> - Assume that we will need to justify to government of Indonesia (Indonesia does not allow parent-offspring matings) - There is a risk that mating Ipuh with Suci would present external credibility issues in terms of questions about sound management.
Andalas	<ol style="list-style-type: none"> 1. Breed with Rosa 2. Breed with Ratu 3. Bank sperm 4. Breed with Bina 5. Breed with new female 6. Continue sperm assessment 7. Breed with Suci 	
Harapan	No change because of age	
Ratu	<ol style="list-style-type: none"> 1. Breed with Andalas 2. Breed with new male 3. Breed with Ipuh 4. Use Ipuh's sperm 	

Animal	Option for Action	Note:
Torgamba	<ol style="list-style-type: none"> 1. Use as ambassador animal 2. Compare data with Sabah Tanjung 3. Continue mating with Rosa, Ratu and Bina for behavioral experience. 4. Radio collar testing 5. Use for ecotourism 	
Bina	<ol style="list-style-type: none"> 1. Breed with Andalas 2. Breed with Torgamba 3. Use as ambassador animal 4. Radio collar testing 5. Collect gametes 6. Share/compare post-mortem protocol (US and German) 	
Tam	<ol style="list-style-type: none"> 1. Collect sperm 2. Find new female in Malaysia 	Assumes for now that exchange not possible between Indonesia and Sabah
Gelogob	<ol style="list-style-type: none"> 1. Hormone stimulation 2. Move to Tabin to be placed into Tam 3. Enrich diet to gain weight 4. Regular health assessment to see if underlying cause for weight loss 5. Obtain organ samples post-mortem to study iron deficiency 6. Mate with Tam 	
Note for ALL	<ol style="list-style-type: none"> 1. Post-mortem frozen organ sample 2. Collect whole reproductive track 3. Collect eyes to evaluate cataract problems, blindness, etc. 4. Add Petra Kretchmar to Technical Committee 	

For all options above, there are some obvious decisions:

1. Harapan *status quo*
2. Keep Andalas and Ratu together
3. Suci : breed with new unrelated male or unrelated sperm (possibly Tam)
4. Rosa: change management to less intensive keeper interaction to minimize behavioral pathologies. Breed with unrelated male (Andalas or new male).

3. BENEFITS AND RISKS FOR THE VARIOUS SCENARIOS SUGGESTED FOR EACH RHINO:

a. Move Rosa to Cincinnati Zoo

<p>Potential Benefits:</p> <ol style="list-style-type: none"> 1. Security 2. Potential for generating more funding from zoos in the US 3. Genetic infusion 4. Conservation networking between countries 5. Could be used as an attention-getting promotion for the whole program 6. Increased capacity building 7. Increase capacity for fundraising from public 8. Space opened up at SRS for other animals 9. Good faith gesture between Cincinnati Zoo and Government of Indonesia 10. Allows addressing Rosa's behavior issues 11. Increases biological information database with data from new animals 12. Increase awareness among government and NGOs 13. Demonstrates that we are managing Sumatran rhinos managing as one population (true metapopulation management) 	<p>Potential Risks/Disadvantages:</p> <ol style="list-style-type: none"> 1. Transport loss 2. May not breed naturally 3. Reduces reproductive options for Andalus 4. Hemosiderosis 5. Local NGOs may express concern about export
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b. Move Ipuh to Indonesia (SRS-YABI)

<p>Potential Benefits:</p> <ol style="list-style-type: none"> 1. Proven breeder 2. High potential for breeding with Ratu and/or Rosa 3. Potential Indonesia donor could be persuaded to pay transport cost 	<p>Potential Risks/Disadvantages:</p> <ol style="list-style-type: none"> 1. Transport loss 2. Older age and potentially blind 3. Genetic variation will be decreased as Ipuh will be over-represented 4. Creates need for new male for Cincinnati Zoo and at SRS. 5. Indonesia donor may only support move, not long-term care/maintenance at SRS. 6. Loss of animal will likely reduce funds from US zoos for Indonesia programs 7. May limit our ability to ability to bring in a new male
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c. Bringing New Animals to SRS

<p>Potential Benefits:</p> <ol style="list-style-type: none"> 1. Demonstrates that we are managing Sumatran rhinos managing as one population (true metapopulation management) 2. Security 3. Infuses captive population with new genes 4. Could be used as an attention-getting promotion for the whole program 5. Increased capacity building 6. Increased capacity for fundraising 7. Good faith gesture among GMPB partners, especially Cincinnati Zoo/Government of Indonesia 8. Increases biological information database with data from new animals 9. Increased awareness among government and NGOs 10. Gets rid of need to inbreed to continue reproductive potential 11. Demonstrate that bilateral TFCA, REDD and DNS funding really contributes to Sumatran rhino conservation 12. Conservation forest ecosystem restoration (new approach in forestry that allows restoration) 13. Implementing the Government of Indonesia's rhino strategy 14. Could release animals back to wild if needed or hold at SRS short-term for breeding 15. Attractive to donors to move animals around 16. May allow rescuing at-risk rhinos from wild 	<p>Potential Risks/Disadvantage:</p> <ol style="list-style-type: none"> 1. Capture or transport loss 2. May not breed 3. Hemosiderosis 4. Possible NGO criticism for capturing new animals 5. If isolated animals are collected and moved to the SRS, it could decrease the incentive for forest protection
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d. Move Torgamba as Ambassador Animal

<p>Potential Benefits:</p> <ol style="list-style-type: none"> 1. Frees up space at SRS 2. Ambassador animal generates more funds for rhino conservation 3. Generating awareness about SRS 4. Reduce financial burden of keeping non-reproductive animal at SRS 	<p>Potential Risks/Disadvantages:</p> <ol style="list-style-type: none"> 1. Zoos may not want older animal 2. Transport loss 3. Old age 4. Disease issues
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|---|--|
| <ul style="list-style-type: none"> 5. If moved to internationally, increased awareness about Sumatran rhinos and potential funding/support 6. Increases capacity building 7. Gesture of international goodwill if moved out of Indonesia | |
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4. ACTION ITEMS

The following action items were developed **to be completed by July 2010**:

- **BORA** (Abdul Hamid, lead) to coordinate/lead analyses of subspecies genetics using samples currently in Malaysia (peninsular vs. Sabah Sumatran rhinos). Molecular genetic study to be carried out. The key issue is obtaining a list/inventory of samples.
- **White Oak** (Steve Shurter, lead) to work with Joe Christman and Jamie Ivey (AZA Rhino Advisory Group) to conduct an in-depth assessment of the global captive population and possible management scenarios.
- **IRF** (Susie Ellis, lead) to contact Bob Lacy (IUCN CBSG) for preliminary PMX and/or other pertinent analyses
- **YABI** (Widodo Ramono, lead) will work with PHKA to facilitate government funding for national parks, including working with the Ministry of Forestry to access the German DNS funds for rhino conservation (available only to the parks, not NGOs)

5. OTHER ISSUES (not in order of priority)

A number of other issues were discussed during the meeting, including:

- a) We need to work together to make a clear case to the governments of Indonesia and Malaysia about the subspecies issue, with a coherent argument for managing the species as one management unit.
- b) More work needs to be done with iron storage issues, including absorption issues, serum analysis, source, indicators, and institutional comparisons. We need to continue to monitor iron load in all animals in the population as an ongoing management measure.
- c) We need to remember that Andalas already represents two founders when making management decisions/breeding recommendations. Ipuh's genes are already well-represented.
- d) One consideration when discussing the options mentioned previously is time, which is running short – is it going to be faster to move animals between countries or collect from wild in Indonesia?
- e) The GMPB needs to work with and build relationships with local NGOs so that they understand the urgency of the problems facing Sumatran rhinos and our need to make rapid and agile decisions
- f) Adding wild-caught animals to the US population would allow for another measure of genetic security in that a (hopefully) viable captive population would exist in two sites.
- g) Animals held in isolation may not be able to breed or may have reproductive pathologies, and we need to continue to keep that in mind as management decisions are made
- h) A strategy for dealing with isolated animals is covered in the Indonesian Rhino Strategy and we should consult the strategy before making recommendations/taking action

- i) Removing isolated animals could have the unintended potential effect of decreasing forest protection
- j) All GMPB members need to seek out additional funding alternatives
- k) We need to determine scientifically the degree of risk between inter-breeding subspecies or allowing inbreeding in the captive population
- l) We need to consider the acceptability of our actions/decisions within the conservation community, while at the same time acting in the best interest of the species. This should not change our recommendations or decisions, but we must be ready to defend them to the broader scientific community.

6. COMPOSITION OF THE GMPB

- a) Chairman: Bpk. Widodo S. Ramono (Unanimous endorsement/approval from all members)
- b) Members: No change, one representative from each holding institution
- c) Technical Committee (experts invited for advice, as needed, based on program and expertise needs)

Meeting Participants and Contact Information



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 Dedi Candra, Indonesia
 Susie Ellis *, US
 Abdul Hamid, Malaysia
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