



12 October 1984

To: Participants in ad hoc Sumatran Rhinoceros Meeting  
convened 3-4 October 1984 by the SSC/IUCN in Singapore.

Subject: Draft minutes and supporting documents.

The enclosed draft mminutes are for your review and  
revision. If you do have changes please communicate to me  
by 15 November or I will assume you have no changes.

I have forwarded a copy to Robert Scott and Gren Lucas for  
their information and to assist in the endorsement process  
of the IUCN.

My apologies for the impersonal form of this memo but this  
format is faster.

My best regards and thanks to each of you.

U. S. Seal  
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AD HOC SUMATRAN RHINO MEETING

SINGAPORE 3 & 4 OCTOBER 1984  
SUMMARY REPORT

The meeting was convened at the request of the SSC/IUCN, by U.S. Seal Chairman of the Captive Breeding Specialist Group, for the purpose of resolving issues concerning strategies for the conservation of the Sumatran Rhinoceros in its native habitat and to consider proposals for removal of animals for establishment of a captive breeding program. Invited participants included representatives of the wildlife departments of West Malaysia, Sabah, and Indonesia; the Asian Rhino Specialist Group; and representatives of Howlett's and of the AAZPA Sumatran Rhino Trust who have made proposals for captive breeding programs. The meeting was chaired and minutes prepared by U.S. Seal. Consensus was reached on all of the major points contained in this summary report.

OUTLINE SUMMARY

(1) The fundamental tenets of a conservation program for the Sumatran Rhinoceros include: (A) Primary support for a program of conservation of the Sumatran rhinoceros as viable populations in sufficiently large areas of protected native habitat. (B) Develop an educational program to enhance public awareness and support for the Sumatran rhinoceros, and (C) Establish a captive propagation program for the preservation of the genetic diversity of the Sumatran rhinoceros in the countries of origin and in North America and Europe using animals with no hope of survival in the wild.

(3) Current situation of the Sumatran rhinoceros in the countries of origin was summarized in detail by members of the game departments. Further information was provided by N. van Strien.

(4) A concept of "viable population" emerged in terms of (A) number of breeding males and females in the population [50 for short-term up to 500 for long-term survival], (B) starting numbers in the population, (C) can expansion of numbers occur?, (D) available area with carrying capacity approximated at 1 Sumatran rhinoceros per 1000 hectares. Thus a minimum of 700 sq km or 70,000 hectares is necessary for a viable population of 70 animals including adults and young. Six reserves were identified which meet this requirement.

(5) There are 3 nominate subspecies of the Sumatran rhinoceros. It was agreed that any captive breeding or translocation program should not mix these subspecies until further work was done on their taxonomy.

(6) Proposals were presented by Dr. T. Foose (Conservation Coordinator of the AAZPA) and representatives of the AAZPA Sumatran Rhino Trust and by J. Aspinall and F. Nardelli of Howlett's, UK. These presentations served as the basis for detailed discussions between (1) the AAZPA and the Malaysian and Sabah game department officials and (2) Howlett's and the Indonesia game department officials. Copies of the joint proposals are attached. These were reviewed in detail and approved by the full committee before the final formulation presented here.

(7) The need for an oversight and coordination structure was stressed many times. Dr. van Bree suggested a foundation structure which would have as members of its board representatives from the Malaysian and Indonesian Game Departments, from the AAZPA and Howlett's, and from the SSC Asian Rhino SG. Suggested terms of reference are given below. A coordinator would need to be hired who would be responsible for construction of a masterplan for conservation of the Sumatran rhinoceros which would include captive propagation and selection of animals from the wild for this purpose.

(8) It is intended that this summary, the attached documents, and the detailed minutes to follow would provide the necessary information to obtain SSC/IUCN approval and endorsement of the captive propagation project as part of a conservation plan.

(9) It was agreed by the committee that U.S. Seal would serve as temporary coordinator of the group during this interim phase until a formal organization is created. He will be the contact person for R. Scott and the representatives of the various parties involved.

#### SUMATRAN RHINOCEROS CONSERVATION FOUNDATION

##### Terms of Reference

Coordinate and oversee the implementation of a multinational collaborative comprehensive conservation masterplan for the Sumatran Rhinoceros which includes (1) conservation and protection of the species in viable populations in its native habitat, (2) education and enhancement of public interest in the species, and (3) the establishment of a captive propagation program as a means of preserving the genetic diversity of the species.

PROPOSAL FOR A COOPERATIVE PROJECT  
BETWEEN MALAYSIA AND THE AAZPA SUMATRAN RHINO TRUST  
FOR CONSERVATION OF THE SUMATRAN RHINO

As part of a global masterplan for conservation of the Sumatran rhino, the Wildlife Departments of West Malaysia and Sabah and the AAZPA Sumatran Rhino Trust propose a cooperative project that will incorporate attempts at both (1) improved protection of natural populations and habitat and (2) captive propagation through two approaches.

Specifics of the project include:

(1) Technical and financial assistance from AAZPA Sumatran Rhino Trust to enable reinforced protection of viable natural populations and sanctuaries. The highest priority in this regard will be accorded to the Silabukan (Tabin) Wildlife Reserve in Sabah.

(2) An attempt to develop the "gene pool" as described in the proposal by Mohd. Khan and Louis Ratnam. Such a gene pool will entail enclosure of a reasonably large area of natural habitat inside a fence. The purpose will be to create a situation where animals can propagate in a more controlled yet still semi-natural environment. The area where the gene pool will be tried will be selected in West Malaysia by the Wildlife Department. One possible location that has been discussed is in the Sungai Dusun area.

(3) Captive propagation programs will be developed in West Malaysia, Sabah, and North America.

(A) Field operations to collect appropriate rhinos will be simultaneously initiated in West Malaysia and Sabah. Tony Parkinson will coordinate and facilitate these efforts.

(B) In West Malaysia, there will be immediate attempts to capture rhinos to establish a breeding nucleus of 3 to 4 females and at least 2 males at the Malacca Zoo. The Wildlife Department will identify which animals are candidates for capture using the criteria for "doomed" animals formulated by the SSC sponsored masterplan.

(C) In Sabah, much initial activity will be devoted to locate animals for capture. Rhinos outside the Silabukan (Tabin) Wildlife Reserve will be considered appropriate candidates. There may be attempts to immediately capture a few known animals believed to be in imminent danger. Of the animals captured:

(a) the first pair will be placed in a captive facility to be developed with AAZPA Sumatran Rhino Trust assistance at Sepilok.

(b) Subsequent rhinos captured will be moved to captive facilities in North America. These animals will be on breeding loan to the AAZPA zoos.

(D) AAZPA will provide various technical assistance as determined appropriate through consultation with the Malaysia Wildlife officials. Among the items identified so far:

(a) qualified keepers and veterinarians on a continuous basis for several years at the captive facility to be developed at Sepilok.

(b) veterinary support for actual capture operations.

(c) curatorial and veterinary assistance as needed for the captive facility at Malacca.

(d) training both in Malaysia and at appropriate AAZPA zoos for Malaysian curators, keepers, and veterinarians.

(4) All animals placed in captivity will be managed cooperatively as part of a "world population" under coordination of the Sumatran Rhino Advisory and Oversight Panel developed under IUCN SSC auspices.

(5) This proposal can be amended by mutual agreement only of the Malaysian Wildlife Departments and the AAZPA Sumatran Rhino Trust to adjust to changing situations.

#### HOWLETTS AND INDONESIAN GAME DEPARTMENT PROPOSALS

1) That the IUCN should through a separately constructed panel overlook and advise the whole S.E. Asian Sumatran Rhino enterprise.

2) That Howlett's and Port Lympne Foundation should provide funds to protect the Sumatran Rhino in its wild state within Indonesia. Current thinking of Messers Manan and Widodo is that the Barisan Selatan reserve would best qualify for support though they are taking other areas into consideration.

3) Advice from experts like Raleigh Blouch and others will be taken and a survey made as to which area outside the parks can be considered as 'doomed' and thus eligible for the extrication of Rhino. A strong candidate at the moment is the Gunung Patah area though other areas will also be considered. Howlett's and Port Lympne Foundation will rest on the Indonesian Game Department decisions on the assignation of these areas.



AGENDA

SSC AD-HOC MEETING ON SUMATRAN RHINO  
SINGAPORE - 3 & 4 OCTOBER 1984

General Objectives:

- (1) Consider critically and comprehensively various possibilities, proposals, and problems for captive propagation of Sumatran rhino.
- (2) Attempt to formulate and hopefully finalize an acceptable plan for a captive propagation project as part of an overall strategy for conservation of the Sumatran rhino. Aspects to consider:
  - (A) Relation of captive propagation to conservation of wild populations.
  - (B) Criteria to identify animals as possible candidates for capture.
  - (C) Specifics of number of animals to be captured and of where they are to be placed in captivity (S.E. Asia, North America, United Kingdom).
- (3) Develop coordination and oversight through some IUCN SSC committee for implementation of any plan or plans approved.

Presentations

- (1) General discussion of fundamental issues in captive propagation as a part of conservation strategies and its application and merits for the Sumatran rhino. (Seal)
- (2) The AAZPA proposal. (Foose et al.)
- (3) The Howletts initiative. (Nardelli and Aspinall)
- (4) Current activities, strategies, and status of SSC Asian Rhino Specialist Group. (Schenkel)
- (5) The situation in West Malaysia. (Khan et al.)
- (6) The situation in Sabah. (Andau et al.)

AGENDA  
SSC AD HOC MEETING ON SUMATRAN RHINO  
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- (7) The situation in Indonesia. (Syafii and Widodo)
- (8) Comments from other SSC members. (Scott, Van Bree, Van Strien et al.)
- (9) Technical aspects of capture. (Parkinson)
- (10) General discussion and negotiation of objectives, proposals, strategies, questions.

LIST OF ATTENDEES

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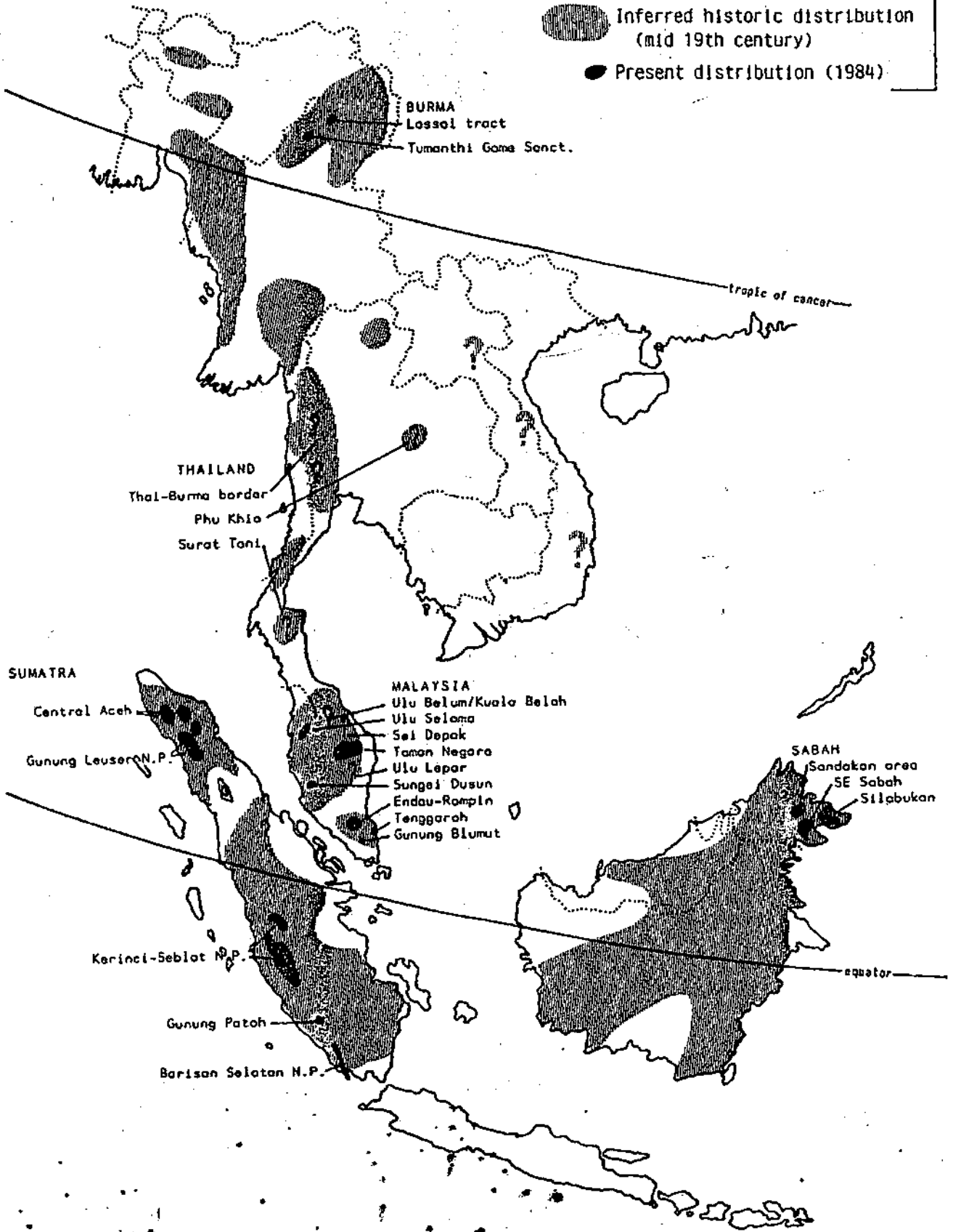


VAN STRIEN MAP OF RHINO DISTRIBUTION

*Dicerorhinus sumatrensis* - Sumatran rhinoceros

● Inferred historic distribution (mid 19th century)

● Present distribution (1984)



# VAN STRIEN SUMMARY OF SUMATRAN RHINO NUMBERS BY AREA

Table N: Summary of the present status of the Sumatran rhino.

## Sumatra (Summary of chapter 2)

|                    |  |
|--------------------|--|
| Kerinci-Seblat     | Probably the largest contiguous population. Imperfectly known, but estimated at between 250 and 500 individuals. |
| Gunung Leuser      | The best known population. Estimated at between 130 and 200.   |
| Barisan Selatan    | Rhino survives in at least two parts. Imperfectly known. Estimated at between 25 and 60 individuals.             |
| Gunung Patah       | Rhino surviving in unknown numbers   |
| Gunung Abong-abong | Unknown. Rhino surviving in unknown numbers.   |
| Lesten - Lukup     | Unknown. Rhino surviving in unknown numbers.   |
| Torgamba           | Unknown. Probably a few surviving, but habitat threatened  |
| Berbak             | Last report 1976, now almost certainly extinct.  |
| Total Sumatra      | 400 to 750 rhinos surviving in reserves and an unknown number in two or three other locations.                   |

## Borneo (Summary of chapter 3)

|                  |  |
|------------------|--|
| Sarawak          | Extinct many years ago.  |
| Kalimantan       | Extinct over most of the area. Probably some surviving in the Kalimantan - Sabah border area and scattered remnants here and there. Possibly a larger number on the Kalimantan - Sarawak border. |
| Sabah            | 15 to 30 individuals, mainly in the Silabukan area and in southeast Sabah.   |
| Total Kalimantan | One viable population in the east of Sabah and possibly some in the centre of the island. Insignificant remnants elsewhere. Extinct over most of the area.                                       |

## Malaysia (From Flynn & Abdullah, 1984 and Khairiah Mohd Shariff, 1983. Status and distribution of Sumatran rhinoceros (Dicerorhinus sumatrensis) in Peninsular Malaysia. The journal of wildlife

|                                     |   |
|-------------------------------------|---|
| and parks, Kuala Lumpur, 2, 91-102) |   |
| Endau-Rompin                        | Probably the largest population in Malaysia. Estimated at between 20 and 25, but could very well be more.   |
| Taman Negara                        | Second largest population. Estimated 8 to 12, but might be more. Imperfectly known.   |
| Sungei Dusun                        | Small population. 4 to 6 individuals. See also: Mohd Zuber bin Mohd Zain, 1983. A review of the status and approximate range of Sumatran rhinopopulation in Sg. Dusun game reserve and surrounding areas. The journal of wildlife and park 2, 1-35. |
| Mersing coast (Tenggaroh)           | At least two left in an isolated patch of forest. One trapped in 1983 (pers. com. Mohd Khan)  |
| Gunung Belumut                      | Latest report 1980. Small surviving population. Imperfectly known. Estimated 2 - 3.   |
| Bukit Gebok                         | Latest report 1980. One or two animals in a small isolated patch of forest, that has since been cleared. Probably extinct now.  |
| Sungei Lepar                        | Latest report 1979. Unknown, 3 to 5 may survive.  |
| Ulu Selama                          | Latest report 1983. Unknown, 3 to 5 may survive.  |
| Kuala Balah                         | Latest report 1977. Unknown, 3 to 4 may survive.  |
| Sungai Depak                        | Latest report 1976. Unknown, 3 to 5 may survive.  |
| Ulu Belum                           | Latest report 1972. Unknown, 3 to 5 may survive.  |
| Krau-Reserve                        | Latest report 1963. Unknown, probably extinct now.  |
| Kedah Border                        | Entirely unknown. A few might survive.  |

## Thailand (From McNeely, J.A. & A. Laurie, 1977. Rhinos in Thailand. Oryx 13(5), 486-489)

|                     |  |
|---------------------|--|
| Phu Khio            | Latest report 1976. Unknown. McNeely & Laurie found tracks at four different places in four days in the field. This could indicate that more than a few survive. |
| Khao Soi Dao        | Latest report 1974. Species uncertain. Unknown.  |
| Surat Tani province | Unconfirmed reports.   |
| Thai-Burma border   | Some may survive (pers. com. Pong Leng-Ee, 1979).  |

## Burma (From Tun Yin, U, 1980. Present status of the Asian two-horned rhinoceros in the socialist republic of the union of Burma. Hornbill, Bombay, 1980(3), 13)

|                             |                  |
|-----------------------------|------------------|
| Shwe-u-daung game sanctuary | Probably extinct |
| Tumanthi game sanctuary     | 4 may survive    |
| Lassai tract                | 6-7 may survive  |

## Indochina (From Rookmaaker, L.C., 1980. The distribution of the rhinoceros in eastern India, Bangladesh, China, and the Indo-chinese region. Zoologischer anzeiger 205(3/4), 253-268)

The presence of the Sumatran rhino in the Indochinese region cannot be confirmed and the few animals that might survive (e.g. south Laos) are most likely Rhinoceros sondaicus.



DRAFT

AD HOC MEETING ON SUMATRAN RHINOCEROS

SINGAPORE 3-4 OCTOBER 1984

MINUTES

The meeting was opened at 9 AM by US Seal the chairman of the Captive Breeding Specialist Group IUCN/SSC.

A list of those in attendance with their addresses is attached. Each person introduced themselves.

The agenda was opened for comment and additions.

SCHENKEL (written summary): Three parties are involved: (1) the governments of Indonesia and Malaysia who "own" Sumatran rhinos. (2) AAZPA who wants to acquire and breed these rhinos. (3) IUCN who is acknowledged by the governments involved as an institution to give competent advice as to the conservation issues. AAZPA takes the standpoint that its projects are serving nature conservation, that they are even essential to save the species. They expect IUCN/SSC to back this position. This situation calls for a modification of the agenda proposed by the chairman: -1- to point out the ultimate aims of nature conservation. -2- to present the alternative pathways meant to lead to those aims in the case of the sum. rhino. -3- to discuss and eventually evaluate these pathways.

GENERAL: There was concurrence by several people on these points.

VAN BREE: stated that situation or habitat is of primary importance for preservation. Again seconded and amplified by several people.

SCOTT (written summary): On behalf of IUCN, SSC asked U. S. Seal Chairman of its CBSG to organize this meeting. The meeting was also requested by the Chairman of its other concerned group, the Asian Rhino Specialist Group. This was the result of SSC being asked to endorse proposals for captive breeding of Sumatran rhino. If we were not asked to do so, IUCN would eventually be forced to pass judgement on the proposals by request of its members, etc. after reports appeared in the public media, as they invariably do.

SCOTT contin.

The question of objectives has been raised. IUCN is guided by the World Conservation Strategy, whose 3 objectives are (paraphrasing):

1. To conserve life support systems--ecosystems.
2. To preserve biological and genetic diversity.
3. To foster sustainable use of living resources.

These are not controversial because they are so general. It is in the application to specific situations that controversy arises. Many different points of view are represented in this room. IUCN agrees, individually, with each and all of them. But where conflicting views are in question over the Sumatran rhino, it will be up to this meeting to hammer out a consensus and devise compromises where necessary for the good of the species and in the public interest. We at IUCN consider this a most important occasion, where precedents may be set for other species and other regions of the world.

The SSC position is that it will not endorse any proposals unless they are part of a coordinated approach to the conservation of the species. That is the challenge to this meeting, and we wish you every success.

IUCN is not here to tell this group what to do; rather, it is here to be told by a group consensus what should be done.

PARKINSON: Seconded Scott on the importance of this meeting on issues of use of captive propagation for preservation of species.

KHAN: Agreed with Scott that IUCN is an important body for guidance on wildlife issues. Association with IUCN has been enlightening and helpful. Concerns about extensive publicity on the Sumatran Rhino issues. Emphasized that the Sumatran Rhino is located in SE Asian countries and that the countries of origin are responsible for the final decisions on the management of this species.

MANAN: Stated that Indonesia uses the World Conservation Strategy as guidance for wildlife conservation and this has a high priority. Noted that in Sumatra there are many problems associated with a country in the process of rapid development. There is also a shortage of data on the population size, distribution, and ecology of the Sumatran rhinoceros. Sanctuaries have been established for the Sumatran rhinoceros but land use problems are pressing. The final responsibility for Sumatran rhinoceros conservation matters rests with the countries of origin.

SCHENKEL (written summary): Addendum to aim 1 as defined by Bob Scott (Preservation of ecosystems): Every species is the result of evolution. This evolutionary process is co-evolution of the species together with all the components forming the ecosystem as a self regulating system. Isolated from the ecosystem the species loses the functional connections which have shaped it and loses its "meaning" and "dignity".

SCHENKEL: Stated that natural ecosystems are self-regulating and can regenerate given the support of man. Genetic and biologic diversity are a product of evolving ecosystems and individual species lose many of their values when extracted from these natural systems. The human species must restrict its exploitation and impact on nature or we have no future ourselves. Agrees that the final responsibility rests in the countries of origin. The role of the IUCN and this committee is to provide advice.

FOOSE: Outlined the commitment of the AAZPA and its member institutions to conservation through management of captive populations. These populations can have a role in reinforcing the natural populations. Natural populations becoming fragmented and diminished in size with result that gene pools are becoming gene puddles - too small for survival. The commitment of the AAZPA to this family of mammals is indicated by the fact there are 4 SSP programs for rhinoceros species. Captive breeding is a necessary resource for conservation.

SEAL: Outlined responsibility of CBSG to bring together captive breeding experts to assist use of these resources for preservation of species. Selection depends on work of other Specialist Groups and their suggestions for priorities and on Red Data Books. Many suggestions have been received. This role for zoos is new and requires collaborative programs which are emerging rapidly.

VAN BREE: Suggested that this group needed to evaluate the need of the Sumatran rhinoceros for such a program based upon evaluation of its current population numbers status in relation to numbers necessary for survival.

ANDAU (written summary): Described situation in Sabah with emphasis that as part of Malaysia the positions of Western Malaysia and Sabah are the same. The status of the Sumatran rhinoceros in Sabah is serious with an estimated 28-38 animals surviving scattered in small groups. Breeding group in one area. Wrote IUCN in 1980 requesting advice and possible use of translocation, but no positive action materialized. Through the help of Mohd. Khan, WWF.

international provided 2 vehicles to assist in the fight against poachers. Currently it is estimated that at least 2/year are poached. Sabah Forest Department submitted a proposal to the government giving 3 options for isolated doomed rhinos: (1) translocation in Sabah, (2) captive project in Sabah, (3) establishment of captive breeding program with utilization of outside expertise and funding. Government may agree to project depending on outcome of this meeting.

THOMAS: As Species Coordinator for proposed AAZPA SSP on Sumatran rhinoceros summarized position of AAZPA. All present have same interest and are proceeding in the same direction for survival of endangered species. Primary concern is for the animal in its environment. Captive breeding not an end in itself but as a means to protect against loss of genetic diversity. The concern is to make use of fragmented remnants for this purpose and therefore no reason to capture animals in larger well protected populations. Concerns about use of translocation and its effectiveness. Noted that zoos actions as consumers and exploiters is past. Zoos do have a responsibility as exhibitors of wildlife and are working to use these resources for conservation of endangered species. Recognize and accept the responsibility of countries of origin for the species but AAZPA wishes to assist countries in their role when species decline in numbers and available habitat suitable for long term survival. All of the captive animals would be managed as a single biological population.

ASPINALL (written summary):

It is essential to comprehend fully the desperate plight of the Sumatran Rhino. This conference must come to the right decisions and advise the two relevant governments of what should be done. We must bear in mind the fate of the Kouprey, everyone's favorite to be the next on the extinction list. There were many conferences held since the animal was discovered in the '30s' attended by experts and zoologists of a similar kind to those we see here today. These meetings over the Kouprey all came to one conclusion that 'something must be done'. Nothing ever was. The Kouprey is now reduced to 10-20 and only a miracle can save it.

Rain forest is disappearing at the rate of 40 hectares a minute (Norman Myers). In Indonesia 400,000 hectares of forest are demolished per annum. More than are planted (Manan and Widodo Pers. Comm.) The population of Indonesia is 160 million and leaping upwards. The overspill from Java 100 million into Sumatra 25 million is inevitable. These awesome facts are recognized and feared by the government in Djakarta. Chain saws are now banned in Indonesia except

under permit but the people believe that even their permissions won't make much difference to forest destruction.

In view of this grim picture it is naturally obvious that the Sumatran Rhino should be given a 'second chance' of survival, or to borrow an expression from Dr Schenkel an 'alternative pathway'. In other words captive breeding.

The Mongolian Wild Horse--The European Bison--The Arabian Oryx--Pere David's deer--Mohrs Gazelle--all these have been saved from extinction by captive breeding alone, and two of these, the Arabian Oryx and the European Bison, have been returned to the wild state. Arrangements are going forward now to negotiate with the Russians and Mongolians to return some wild horses to the Altair Plains of W. Mongolia (Robert Scott).

I do not hold with the opinion put so forcefully by Dr Schenkel that it would be 'impossible' to return woodland species. The European Bison is entirely a woodland species and I have little doubt that the Sumatran Rhino along with the Bongo and Okapi could be successfully rehabilitated at some future date to its natural habitat.

We believe that the extrication of several pair of Sumatran Rhino from certain 'doomed areas' is vital if we are to give this wonderful species a second chance. Such a course would be extremely difficult thanks to the nature of the terrain but possible with the use of a heavy duty helicopter and experienced animal catchers.

It goes without saying that in the event of such a operation being successful Howletts, Port Lympne, and Djakarta Zoo respectively will cooperate with the AAZPA group of Zoos concerning sex ratios and gene lines. We at H,PL have proved our willingness to cooperate in the past with our large colony of lowland Gorillas (8-16 over at H). We have swapped or loaned no less than six of our Gorillas with other zoos.

SIRIMANNE: Agreed with previous comments and Aspinall, but noted several corrections in numbers concerning population sizes and rate of growth. Remarked that all proposals talk of conserving in natural habitat but none address the specifics of this need. Disagrees with proposals to take the Sumatran rhinoceros out of the countries of origin for breeding and return. Need to preserve Sumatran rhinoceros in countries of origin.

VAN STRIEN: Noted that as soon as animal is removed from its native habitat then it has no special biological link to

its country of origin in terms of captive breeding. The question for captive breeding is political not biological.

RAMONO: Noted that animals do not recognize political boundaries and there is a need to protect the best areas remaining. Move outsiders into protected areas. Study of these animals in wild is difficult and study of captive animals can be an important contribution to their conservation and survival. The number of rhinos has increased from 22 to 57 in 10 years in the Ujung Kulon National Park in Indonesia.

SCHENKEL: Reemphasized 3 points. (1) First choice is to preserve the Sumatran rhinoceros in its native habitat wherever possible. (2) Captive breeding is not a simple tool but has many potential complications. (3) Some species cannot be bred in captivity and used for reintroduction into the wild because of complex behavioral requirements for living in highly diverse environments. Especially true of tropical living forest animals as opposed to grassland or steppe species. Does not believe reintroductions into wild possible for Sumatran rhinoceros and others such as tiger, lion, etc. Believes that logging activity in Sumatran rhinoceros areas compatible if refuges and protection for the animals are provided.

FOOSE (written summary): Reiterated that the major objective of captive propagation was to reinforce wild populations. Noted that AAZPA proposal emphasized captive propagation because this is zoos' primary area of expertise. Other experts (such as the Asian Rhino Specialist Group) have the expertise and responsibility to assist in matters of conservation in countries of origin. Further emphasized there is a need to apply scientific principles to evaluate which areas provide sanctuaries to support populations sufficiently large for survival of the species. In response to skepticism that captive-bred rhinos could ever be successfully returned to the wild, suggested that reintroduction of entire adult animals not only method for providing gene flow and augmentation between captive and wild populations. Possible to use artificial insemination and embryo transfer as a means of increasing genetic diversity.

SCHENKEL (written summary): Re: "Captive propagation will enforce conservation of wild populations". By (a). Reintroduction of animals bred in captivity into natural habitat. (b). Artificial insemination (donor captive bull, receptor wild female).

(a): is easily possible in some mammal species, especially social ungulates of open country--grass eaters--, adapted to great seasonal changes of habitat and to large migrations.



In contrast a solitary forest dweller as the sumatran rhino, which in the wild shows a permanently changing food preference, i.e. has probably to change his food plant species in order to have an balanced diet, is difficult to rehabilitate. In addition, each individual lives in a almost stable home range, into which's resources it has been introduced by its mother. (this however does not exclude individual exploration activity.) (b): In order to achieve artificial insemination so many prerequisites have to be covered that the method is technically out of consideration.

VAN STRIEN: Agrees that reintroduction of Sumatran rhinoceros not feasible rather preservation of wild areas necessary, but not always possible need to allow 5% of the country for wild animals and 95% for humans. Can not give up hope or will fail.

BREAK.

VAN STRIEN: Distributed map and list of areas (attached) with status of Sumatran rhinoceros populations. Reviewed each of the countries, reserves, and areas with known and suspected populations of the Sumatran rhinoceros. Provided his evaluation of status. Noted frequency of Sumatran rhinoceros in small separate patches because of fragmentation of habitat. Recommended: (1) Need to do an area by area analysis for population numbers and habitat availability. (2) Protect Sumatran rhinoceros in areas where numbers are adequate and can protect habitat and against poaching. (3) Small remnants can be defined in terms of size of population, size of current area, and planned future use of area in terms of land use and political intentions. Suggested actions would be to (1) Remote areas - protect and establish reserves, (2) Others - can let vanish or can take out and either translocate (does not favor this option) or put in a captive breeding program.

KHAN (written summary):

In Peninsular Malaysia we are very serious about conservation, particularly of the Sumatran rhinoceros and regard this species in the country as our very special responsibility. A brief look at the Department should serve to prove this. We have a number of teams whose sole responsibility is the protection and monitoring of sumatran rhinoceros populations. The size of these groups vary between three and eighteen rhinos depending upon size of population and area to be covered. One of these areas is the Sungai Dusun Game Reserve where we have a small ranger post. You have seen Jeram the young captive female in the Malacca Zoo. We have been aware of this animal from the time she was a calf and observed with some apprehension when she separated from her mother and took to wandering around.

She had given us some anxious moments when she was found in plantations far from the reserve where we had to mount special and intensive protection measures to see that she was not harmed and was allowed to return to the protected area. The area where she was captured was so far away from the reserve that we were taken by surprise. A sudden call minutes before another important meeting was received one morning from the P office station at Jeram on the Selanger coast saying that a rhino was in the area. I rushed to the place half expecting to find that was a tapir. To my utter shock I found a young female Sumatran rhinoceros tied to an oil palm tree surrounded by nearly 200 people. The animal was down, exhausted and bleeding from the nostrils. Then began the most desperate efforts to relieve the animal of its trauma and remove it to less stressful conditions--beginning with dispersing the crowd. Over the next week we worked practically around the clock to move the animal to Malacca and construct a small holding paddock. We worked without knowing the final outcome of our efforts and you can imagine our relief when Jeram got over her initial trauma and began to settle down to captivity in Malacca..

We are not in agreement with the view that translocation is not a good alternative and we wish to make a plea that this pathway be given a chance. Our experience with elephants may be cited as an example. Previously the method of reducing elephant damage was to drive problem herds and when this failed to begin culling the herds. We realized that this could not go on and that measures had to be adopted that did not involve killing the species. One method adopted with success was the elephant proof electric fence pioneered by the Departments research and today achieving more than 1,000 km of electric fence in the peninsula. Where such a preventive was not possible due to limitations of the habitat we have had to translocate animals which we have done with fair success. Another successful elephant translocation recently involved animals marooned on an island created by the rising waters of the Kenyi Dam in Trengganu. These animals were successfully taken off the island and released into the National Park. A further case of successful translocation involved a few deer that were taken to Kuala Tahan where they bred including with wild deer in the area until today there are more than 100 animals in the Kuala Tahan group. Therefore we are of the opinion that the alternative of translocating isolates and 'non viables' if Sumatran rhino should be kept open.

Our position in regard to the sumatran rhino is amply set out in the position paper circulated to this meeting. The primary efforts and energy available must be aimed at preserving, enhancing and protecting natural populations in natural habitats. Where it becomes necessary to remove

isolated or otherwise non-viables they should primarily be put into what we have loosely referred to as gene pool areas where the animals are kept in some semblance of their natural habitats from which they can be reintroduced into the wild far more easily than from typical zoo conditions. Captive breeding in zoos should be the final alternative only when the preceding two alternatives are not possible.

ANDAUI: Summarized situation in Sabah. Noted (1) Limited resources and manpower are available (2) Lack of conservation consciousness in Sabah (3) Land development is necessary. There is one Wildlife Reserve in Sabah with a small breeding population: Tabin W.R. (122,00 ha.) - formerly known as Silabukan. There are existing commitments to selective logging until 1986 in the Reserve, but this in itself is not considered a problem to rhino survival. Difficult to protect Sumatran rhinoceros against poachers. What is to be done for doomed animals? There is a lack of expertise and funds. Estimates 10-15 Sumatran rhinoceros will be lost if nothing done.

RAMONO (written summary): Remarks concerning conservation of Sumatran Rhino in Indonesia.

1. In Sumatra there are three National Parks harbouring Sumatran rhino namely: Gunung Leuser (1,100,000ha), Kerinci-Seblat (1,400,000 ha) and Bukit Barisan Selatan (350,000 ha formerly Game reserve SS.One). Beside those three there is Gunung Patah--Rajamendara protection-forest which also harbours some rhinos. Kerinci Seblat is newly declared as a National Park following one of the eight Indonesia Nature Conservation Programs. The National Park status gives better access to protect the rhino as well as its natural habitat.

2. There are various conditions and problems which are not in favour of the case of rhino conservation.

--Demands on land for agriculture. For the island of Sumatra it is decided that a total area of 10 million hectares will be and is on the way to be developed into cultivation in order to promote better food supply to the country. The area of Torgamba and Siak river (the former habitat of Sumatran rhino), at present becomes oil palm plantation and "nucleus small holder" estates.

--The lack of efficient safe guarding of the rhino due to not enough personnel, equipment and funds (not more than 300 personnel for the whole of Sumatra).

--Lack of expertise in this field.

--Evergrowing population of Sumatra due to a better access (mainly trans-Sumatran highway). It is already now 25 million people in Sumatra.

--The continuous demand for rhino horn, blood, etc. for special medicine.

3. Considering that co-evolution is the only natural way of species survival but it is so idealistic at the moment, some alternatives have to be thought about namely:

--Selecting a viable natural ecosystem and put it into a sound protection and into which translocated rhino can be put in (from scattered and non-viable places) to strengthen the natural population viability.

--Welcoming captive breeding method to save the scattered nonviable population originated from areas outside of conservation areas or National Parks, at the same time developing rhino natural habitat (as to candidate of this area the southern end of Bukit Barisan Selatan seems to be a possibility).

--promoting a careful study of captive bred animals in order to help the protection in natural habitat.

4. Considering the lack of expertise, equipment and funds, help in promoting conservation in protecting natural ecosystem is welcomed (Such as WWF project: Big mammal survey).

5. A continuous monitoring has to be conducted both of the protected natural ecosystems and the areas suspected of being occupied by Sumatran rhino.

NARDELLI: Emphasized different futures for animals outside vs inside parks and that Schenkel's ideas apply to animals inside protected areas. Reviewed possible strategies for these animals and useful contributions of captive breeding including: possible use of animals for reintroduction, doubling of numbers in 10 years. Learn more about biology and behavior of species, provide technical exchange useful for management of wild populations, assist in developing financial support for conservation of wild populations. Proposed capture of animals from scattered populations with specific areas named. Would not affect viable wild populations.

FOOSE (written summary): Slide presentation. Much of this material is in the document on the AAZPA Trust plan distributed prior to the meeting. Presented AAZPA proposal with its recommendations for a conservation strategy for the Sumatran rhinoceros. Emphasized the strategy consisted of two main components: (1) concentrate and intensify efforts to conserve the few natural populations and sanctuaries that are large and secure enough to be viable for the long term; (2) employ animals outside these populations and sanctuaries for captive propagation and perhaps careful translocation to reinforce conservation of the species in the wild. Presented

a table summarizing known distribution of Sumatran rhinoceros populations and location of small populations suitable for capture program. Reviewed genetic consequences of small population size in terms of inbreeding and drift and importance of maintaining genetic diversity for survival. Noted that population sizes of less than 50 to 100 animals are not viable in the long term. Thus relatively few areas are suitable for the long term without continuing genetic management. If outliers are not rounded up and used for a captive population then their genes will be lost to the future. Many available. The minimum desirable number for establishing a captive population is 5-10 pairs of breeding animals. Thus the AAZPA proposal recommends the attempted capture of 6 to 12 pairs of rhino for each subspecies that is to be maintained separately in a captive population. The AAZPA proposal also strongly suggests that animals be equally distributed between countries of origin, North America, and Europe - but managed as a single population. Finally, the AAZPA plan advocates continuing IUCN/SSC oversight of the program.

SEAL: Suggested need to provide definition of minimum viable population for this analysis.

LUNCH.

SEAL: Review of consensus on fundamental points given that conservation programs are long-term: (1) Need to identify populations (2) Need to identify areas and animals suitable for removal for captive propagation.

SCHENKEL: Emphasized importance of educating local populations and suggested the possible establishment of networks of interconnected small areas to conserve some of the small populations. People should adapt their behavior to accommodate the animals. Maintain breeding units in country of origin. Considers the genetic diversity discussion as "cosmetic".

VAN STRIEN: Delineation of concept of viable population: (1) Number of breeding males and females in population (50 for short-term, 500 for long-term), (2) Starting numbers in population (3) Can expansion of numbers occur? (4) How much available habitat now and in the future? The area requirement may be estimated at 1 Sumatran rhinoceros/10 sq km or 1 per 1,000 hectares. Thus an area of 700 sq km or 70,000 hectares is needed to support a minimum population of 70 animals (50 breeding animals and their young). Approximately 6 reserve areas meet these requirements.

SCOTT: Initiated a discussion of the term "viable" in terms of the genetic composition of the population. The effects

of inbreeding were noted in terms of possible extinction and bottlenecks. Importance of time scale and the need for genetic diversity if the species is to respond to changes in its environment by natural selection and survival is to occur.

GENERAL: This lead to consideration of the nominate subspecies of Sumatran rhinoceros and how they would need to be handled in a captive breeding program. The consensus was that they should be maintained separately and that any translocations should not mix animals of different subspecies.

Agreement was reached that Van Strien's proposed criteria for long-term survival were suitable guidelines for evaluation of suitability of Sumatran rhinoceros areas and populations as candidates for removal and captive propagation. Translocation as possible use for doomed animals was agreed as primarily suitable only for areas not containing a sufficient start up population. Wherever possible local population should be allowed to expand to fill available protected habitat.

PARKINSON: Noted multiple difficulties of translocation strategy. Much care and follow up necessary for this technique to be successful based on his experience with multiple species transfer from Africa to Philippines.

Several participants mentioned areas in their countries that might be suitable for translocation efforts. KHAN reviewed story on elephants in Malaysia and the use of translocation to conserve these animals. All agreed that this should be explored further in selected cases, but not sufficient to absorb all available animals. Care should be taken to establish size of local population, if any, and to assure protection of introduced animals. Avoid mixing of subspecies.

Additional work needs to be done on subspecies designations of Sumatran rhinoceros but they should be respected for the present in terms of translocation and captive breeding. Van Bree noted that mixed animals could be used for reintroduction to an area devoid of any Sumatran rhinoceros.

BREAK.

PARKINSON: And others commented on experiences with translocation of a number of species. Special note was made of the fact that animals tended to range long distances

unless constrained by barriers until acclimated and this might take several years.

GENERAL: General agreement that letting isolated animals simply die or be poached was not a suitable choice. An effort must be made to use for captive propagation to conserve the genetic diversity and contribute to our knowledge of the species.

ASPINALL: Noted that important not to simply propose another conference - there were 9 conferences on the kouprey to no avail for the species. Easy to lose sight of the species.

PARKINSON: Kouprey researched to death - literally.

SEAL: Noted that it was important to not follow the example of the California Condor and wait to the last possible minute to initiate action. Need to follow a safe-to-fail strategy which allows making many mistakes without losing the species. Establish captive populations now. State of art in the zoo community now that of breeding for captive propagation of species gene pools.

RECONVENED at 1600.

Presentation of proposals for captive breeding.

PARKINSON: A short presentation on translocation experiences to Philippines from Africa. For success, requires long-term commitment (1-4 years).

SCHENKEL (written summary): "Under what conditions might capturing and translocation be successful?"  
Of no use: translocation into an area inhabited by a viable population! Possibly useful: Due to harassment by man a local population can become very small. It might be strengthened by careful introduction of additional individuals if combined with establishing efficient protection.

SEAL: Introduced safe-to-fail concept as guide for strategy for conservation of a species. Sufficient animals and resources should be available to allow repeated failures in establishing captive populations or in reintroduction or in managing small reserve programs. The examples of the California Condor, Whooping crane, Black-footed ferret, etc must not be repeated.

**RATNAM (written summary):**

The discussion on captive breeding so far has tended to consider this possibility from the point of view of captive breeding in typical zoos. As a result it has been proposed for genetic reasons that for success such a plan needs between five to ten pairs of animals and double that number if we wish to consider subspecies as the target for the effort. However the alternative that has been proposed in the Peninsula Malaysia paper referred to loosely as gene pools, does not labor under such a need. The concept calls for the fencing of and intense protection of large areas of more or less natural type habitat in which animals will be released and allowed to form a tight group but with sufficient space in that each individual can remain solitary and establish its own little niche but at the same time the increased contact should allow for enhanced breeding.

This alternative proposal has several advantages over captive breeding in zoos.

(1) Animals in such system can be kept in as natural a habitat situation as possible and as such will be far better candidates for reintroduction into the wild. This is particularly important because as strong opinion has already been expressed at this meeting that Sumatran rhino kept in zoo conditions may not be suitable for such reintroductions. As saving the species means doing so in its natural environment, then our efforts and decisions should be ultimately guided by such considerations. I would like to point out as an example that Sabah, where the situation is particularly critical is an excellent example where the gene pool alternative appears particularly appropriate. The present problem in this rapidly developing state is that the emphasis given to conservation is relatively low. However this situation is certain to change within the decade at the outside and probably within five years. This change will bring about an increase in the numbers of personnel and allow for adequate protection measures of the Sumatran rhino in the natural habitat. If at that time there exists one or more such gene pools these animals can then be used to reestablish wild populations in areas once known to harbor the species.

(2) With this proposal we do not start with a pre set condition as to the number of animals that have to be taken from the wild. Rather we remove only those animals that it becomes necessary to remove. Thus we are maximizing the number of animals left in protectable viable natural populations.

(3) This alternative is also feasible for animals in such pools can also be moved into zoos at a later date should circumstances so dictate.

**THOMAS:** Made a preliminary statement on the history of captive breeding in zoos and a delineation of its essential



role in the zoos of today. He noted that historically zoos depended upon wild caught animals for exhibit and that breeding was accidental rather than a continuing source of replenishment. He stressed that cooperation between zoos in the breeding of animals is the practise now. Animals from endangered species or in SSP plans are moved on the basis of a propagation plan for the species developed by a committee rather than sale or the decision of the zoo director. Captive management is not a precise science and time is required to learn with each species. We need to start now. Zoos have been successful with the white rhino, black rhino and now the Indian Rhino. There are 7 pregnant of 10 possible female Indian Rhinos in North America. Zoos are seeking to build a relationship of trust with those responsible for conservation of endangered species in the wild.

FOOSE: Showed a copy of the AAZPA SSP Booklet with an offer to distribute copies to those wanting one. He noted this program had now been initiated for 34 species. Stated that gene frequencies can be frozen by genetic management of captive population to preserve the genetic diversity present in the wild population. The need for new blood from the wild depends upon the number of animals in the starting population and then how they are managed. Indicated that interactive management of captive and wild populations would be feasible and probably necessary for many species.

SCHENKEL: Expressed concern about deterioration of animals as they adapt to captivity. Noted that the motivation for protection of its fauna was now high in SE Asia. Raised question of the scope of actually available reproductive technology for use in exotics.

ASPINALL: Agreed with remarks of Thomas. Pressures on animals in wild are severe. Zoos are breeding many species.

SCHENKEL (written summary): Re: "We wait to start captive breeding and investigate until the species has disappeared". We should not wait, but improve protection, make effort to gain understanding and support by the human population and maintain a monitoring system in order to know the trends of development.

Much discussion of possible limitations and applications of artificial insemination and embryo transfer. Possibilities of transfer of genetic material into a wild population without introducing an intact animal described. Seal noted our lack of knowledge on individual species is the limiting factor in application of these methods and suggested that this discussion could continue the next day with a

presentation from the Foose and the AAZPA group on ongoing work in several of their zoos. Agreed.

VAN BREE: Initiated discussion on selection of wild animals for capture and in particular how is a 'small' population to be defined?

FOOSE: Suggested carrying capacity of less than 50 was a criterion for evaluation of an area and its animals, as appropriate candidates to capture for captive propagation or possibly translocation whatever the current estimated population size.

Much discussion.

KHAN: Noted that only 50-100 Sumatran rhinoceros were known in all of West Malaysia and thus nearly all areas might fit this criterion.

SEAL: Suggested that the time scale for viability is important for the initial survey. Areas with 10 or fewer animals require immediate attention for even short term viability whereas larger populations, but below 50, may require long-term management for genetic viability. This might mean exchange of one animal or equivalent genetic material per generation (perhaps every 10 to 15 years). Demographic survival will depend on age and sex structure of the population in conjunction with mortality and fecundity. Long-term monitoring would probably be necessary.

SCHENKEL (written summary): "Viable populations in protected areas". We should not only think of large continuous protected areas. Another, additional possibility should be considered: A system of habitat patches surrounded by plantations, which are not harmed by rhinos (oil palm, rubber plantation). Then education of the human population to be proud of those animals as "national heritage" and to tolerate their presence is essential.

MANAN: Noted that rhino habitat is also habitat for other large and small species - how to evaluate this habitat - presumably in terms of these other species as well.

SEAL: Noted that there are 2 subspecies in the areas being discussed it will be necessary to maintain to 2 captive populations if both to be preserved. Need to be kept separate wherever maintained. Since 5-10 pairs are needed for an adequate startup population it will be necessary to consider this goal for both subspecies. van Bree noted that it may be necessary to mix the subspecies in captivity if very limited numbers are captured.

SCHENKEL: Stated that equal number of males and females not needed for a breeding group. Important to protect animals in the wild and use surplus for captive population. Use only 'doomed' animals for captive breeding at this time.

SCHENKEL (written summary): Re: "Genetic diversity and minimum numbers of individuals". When small population is able to breed and multiply, genetic diversity will increase (due to crossing over in meiosis and gene-mutation). Essential: the outside conditions enable the population nucleus to grow. Essential: size of suitable area.

FOOSE: Pointed out that equality of sex ratio was for most efficient and effective genetic management not for convenience of providing pairs to zoos. We cannot readily mimic natural selection process but must strive to maintain genetic diversity through management designed to minimize change in gene frequencies.

RATNAM: Suggested usefulness of 'gene pools' or large fenced areas for maintaining small groups of animals under near natural conditions. These animals would be more suitable for reintroductions since fewer captive changes imposed.

SEAL: Summarized the discussion and suggested that it was time to hear a overview presentation of the proposals for captive propagation from the principal parties.

THOMAS (AAZPA Sumatran Rhinoceros Propagation Trust): 4 major zoos have pooled resources and developed a broad plan for the conservation and captive propagation of the Sumatran rhinoceros with the intent of establishing captive groups within and outside of Malaysia in collaboration with the programs of Malaysia. Will provide assistance with fieldwork with wild populations and with establishment and maintenance of captive breeding groups.

KHAN (Chief, Wildlife Dept. Malaysia): Is concerned that there are not many animals in peninsular Malaysia, if the suggested criteria are followed. Carrying capacity is a problem in a number of areas and the number of animals are few. Captive breeding, if successful animals could be used for translocation and put into zoos also. Requests further information on why it is necessary to establish captive populations inside and outside of Malaysia?

ASPINALL (Howlett's & Lympne): As a results of time spent at Jakarta Zoo and the swapping of people between Jakarta and Howlett's for training and experience, it was suggested that a joint attempt be made to remove doomed Sumatran rhinoceros from the wild and start a captive breeding program. The animals would be jointly owned by Jakarta Zoo

and Howlett's. Some animals would go to both institutions. The operation would be financed by Howlett's. A donation would be made to Indonesia Wildlife Department for protection of preserves. One area with 5 or 6 doomed rhinos has been identified. The blessing of IUCN is needed to proceed. Details of plan later. Feels has good relationship with Indonesia.

MANAN (Indonesia Wildlife Dept.): Described background of Rhino conservation in Indonesia and the effects of continuing population growth and development. There are problem areas outside of the parks they wish to save all of these animals in areas of development. The requisite experience, personnel, and funds are short and would like to cooperate with those who can help the animals. In principle agrees with a captive breeding program for outlying animals. Final goal is conservation of the species.

Closing discussion on importance of focusing conservation efforts on the animal within Malaysia (Sirimanne) with strong emphasis on protecting the animals in the wild (Schenkel) and noting that captive breeding is a short term measure as alternative for animals doomed in the wild.

SCHENKEL (written summary): Re: "At present the rhino habitat is progressively destroyed and captivity the only way to save the species". Once the habitat is destroyed, there is no possibility of reintroduction. Large scale destruction of primary tropical forest is practically irreversible. Conclusion: Every possible effort should be made to preserve ecosystems, in this case self regulating primary forest areas. Development of the human population should not lead to complete destruction of natural ecosystems. We have to put limits to development not only in the interest of nature but also the future of mankind.

SEAL: Closed the day's session with thanks to the participants for their careful and succinct statements. Clear that all have the welfare of the Sumatran rhinoceros as their primary objective. Each person making a statement during the day was requested to provide a written summary or extract to assure full and accurate presentation of their views in the minutes of the meeting. Data are important. The first part of the next days agenda to be a presentation by Foose and the Sumatran rhinoceros Trust concerning details of reproductive technology research in North American zoos and the logic for dispersed captive populations including groups in NA and Europe.

4 OCTOBER 1984 DAY 2 SUMATRAN RHINOCEROS MEETING

SIRIMANNE: Opened the day with a statement expressing his concerns that the previous days discussions were more concerned with animals leaving the country rather than conservation of the Sumatran rhinoceros. A stock exchange. Concerned that animals leaving will never return nor contribute to the conservation of the species. Prefer to see captive born young used for export. Very interested in the expertise and sharing the knowledge available.

FOOSE: Noted in response to Sirimanne that the AAZPA is currently involved in 3 reintroduction projects (Golden Lion Tamarin - Brazil, Bali Myna - Indonesia, and Arabian Oryx - Oman) so return to wild is a goal and reality. Agrees that cooperative management of all Sumatran rhinoceros is necessary with IUCN/SSC oversight.

FOOSE (written summary): Made a presentation with slides describing 4 reasons for dispersed captive populations including some in North America. (1) It is risky to place all animals in one location because of risk of catastrophe [disease, weather, priorities]; (2) Zoos in North America and Europe have experience and expertise in the management and breeding of 3 Rhinoceros species, Indian, White, and Black Rhino. They have active research programs on exotic species in reproductive technology including artificial insemination, embryo transfer, and cryopreservation. Transfer of this technology is possible but will take time; (3) Self-interest of zoos in terms of tangible return on investment within a visible time period; (4) Wider recognition and support for the species by public exposure and education.

The discussion during this presentation included: (1) comments on dietary diversity in the wild vs captivity with the note that all of the species appear to do well on captive diets. FOOSE: Noted that diversification of diet by Sumatran rhino in wild is more to avoid secondary compounds (for the most part absent in captive foods) than to obtain balance of nutrients. Noted Jeram doing well on less diverse diet than in wild. (2) Specific illustrations of superovulation and embryo transfer techniques with a graphic illustration of a Bongo calf from an Eland surrogate mother. Noted application to rapid expansion of a population to carrying capacity possible with this technique if surrogates are available. Similar rhino work is being started. (3) Noted that it is possible to provide indefinite (>50 years) preservation of gametes and possibly embryos with low-temperature techniques.

THOMAS: Elaborated on reasons and realities why self-interest of zoos must be considered.

NARDELLI (written summary): Conservation of the sumatran Rhino in Sumatra--two different situations.

I. Viable populations living in areas protected with a large carrying capacity (e.g. Gunung Leuser-Kerinci-Seblat)

Conservation measures:

--Better supervision and protection by the guards.

--Periodical surveys of areas for census and study of the populations.

II. Not viable populations living in areas unprotected with small carrying capacity (e.g. Gunung Patah-Torgamba).

Conservation measures:

--Captive breeding as an "Holding Operation"

--Translocation into protected, larger areas.

--Captive Breeding give us more guarantees of success (constant supervision, veterinary care etc.) and helpful for the population in the wild.

--As there is lack of knowledge of this species captive breeding could be very beneficial for the wild population. (Study on the behavior, reproduction, diet can be easily carried on in captivity).

--A nucleus of animals (kept under the most natural conditions as possible) can be reintroduced one day where formally existed.

--Financial support from the Western Agencies to the local government for a better enforcement of the protection of the populations in the wild.

--Transfer of modern technology from the western agency to the local ones.

#### QUESTIONS AND DISCUSSION OF PROPOSALS:

VAN STRIEN: Queried Aspinall concerning time schedule for survey and capture operations. Aspinall indicated they are ready to begin immediately since they have reached agreement with Indonesia wildlife people on the areas to begin. Needs to hire a good trapper.

VAN STRIEN: Suggested that careful survey work will be necessary to evaluate other areas.

SCOTT: Stated that for IUCN to endorse they would need assurance of conservation effort for benefit of the species. IUCN wants no responsibility for management of the species but wants the mechanism in place.

TEA (1030-1055)

RATNAM: Thanked Thomas for frank exposition of position. Appreciates constraints that exist for zoos. The primary goal here is to search for best pathway for conservation of the species. Match other constraints later.

SCHENKEL: As Chairman of the Asian Rhino Specialist Group has primary interest in the whole strategy for conservation of the species. Single aspect such as captive breeding must serve whole. Concerned that doomed individuals be identified by 'unbiased' survey effort. (Aspinal: the choices were made by Indonesians not his bias). Schenkel reemphasized the importance of monitoring the populations, the need for surveys, education, and the need for the surveys to be done independently of the parties wanting the animals. The removal of animals from the habitat is only a stop gap since can not put the whole ecosystem in a freezer. Species are a product of evolution and coevolution in a community of organisms. Need to avoid domestication. Question raised concerning imprinting with surrogate parents and possible effects on future species specific behavior. Doomed animals should not be wasted.

SCHENKEL (written summary): Re: "Selection and identification of individuals for capturing".  
Criteria for short term decision: "Doomed individuals" i.e. individuals of areas where no evidence of breeding was observed for years. Individuals living in habitat patches which undoubtedly will be destroyed in the nearest future.  
Long term decisions: are to be taken on the basis of the development of the local populations which have to be protected and monitored, and of the results of capturing doomed individuals and follow-up measures i.e. translocation only under very special premises,, captive breeding either in agreement with proposal by M.Khan, or in accordance to AAZPA proposal in selected zoos. If protection measures result in population growth, individual rhinos might be caught in the wild in order to build up a captive population able to survive under the conditions of human management.

SCHENKEL: Emphasized that any remarks made here are meant as contributions to recommendations and advice from IUCN/SSC to the governments of Indonesia and Malaysia.

Several people reviewed evidence concerning imprinting in birds and mammals reared by surrogates. DOHERTY: Noted that the male Gaur from the Holstein surrogate dam has sired a Gaur calf naturally with a Gaur dam.

VAN BREE: Suggested masterplan for Sumatran rhinoceros is needed to bring together habitat preservation, reserves for gene pool, identification of doomed animals, and establishment of a captive propagation program.

FOOSE: Concurred and indicated the process should begin at this meeting. Noted that large mammals disappear before the habitat is destroyed, therefore it is possible to have an opportunity for reintroduction if habitat is stabilized.

HARRISON: Noted his role as neutral host. Understands zoos and wildlife conservation. Feels Trust and zoos have to prove their intent. Expertise is especially needed. Initial propagation needs to be in country of origin, but dispersal of captive-born young too long term for meeting zoo needs. Perhaps a board for the Sumatran rhinoceros should decide.

SEAL: Summarized and suggested that an independent coordinator position be developed perhaps through the IUCN to provide independence but with funding from the respective participants. Discussion followed with suggestion laid over until next afternoon session. Scott indicated no IUCN problem with the suggestion.

General agreement that the masterplan approach is sound and necessary. (Khan and Andau).

SEAL: Suggested that the general meeting adjourn until after lunch while the respective plans and proposals are worked out in detail in a smaller session (AAZPA-Malaysia; Howlett's-Indonesia) and the results brought back to the entire group in the afternoon meeting. AGREED.

#### WORKING SESSIONS and LUNCH (1145-1415)

1415 - Reconvened.

SEAL: Reports from the groups requested.

FOOSE (written report): Read the following proposal by the Malaysian Game Department and the AAZPA Sumatran Rhino Trust which has been agreed to by both parties.

As part of a global masterplan for conservation of the Sumatran rhino, the Wildlife Departments of West Malaysia and Sabah and the AAZPA Sumatran Rhino Trust propose a cooperative project that will incorporate attempts at both (1) improved protection of natural populations and habitat and (2) captive propagation through two approaches.

Specifics of the project include:

(1) Technical and financial assistance from AAZPA Sumatran Rhino Trust to enable reinforced protection of viable natural populations and sanctuaries. The highest



priority in this regard will be accorded to the Silabukan (Tabin) Wildlife Reserve in Sabah.

(2) An attempt to develop the "gene pool" as described in the proposal by Mohd. Khan and Louis Ratnam. Such a gene pool will entail enclosure of a reasonably large area of natural habitat inside a fence. The purpose will be to create a situation where animals can propagate in a more controlled yet still semi-natural environment. The area where the gene pool will be tried will be selected in West Malaysia by the Wildlife Department. One possible location that has been discussed is in the Sungai Dusun area.

(3) Captive propagation programs will be developed in West Malaysia, Sabah, and North America.

(A) Field operations to collect appropriate rhinos will be simultaneously initiated in West Malaysia and Sabah. Tony Parkinson will coordinate and facilitate these efforts.

(B) In West Malaysia, there will be immediate attempts to capture rhinos to establish a breeding nucleus of 3 to 4 females and at least 2 males at the Malacca Zoo. The Wildlife Department will identify which animals are candidates for capture using the criteria for "doomed" animals formulated by the SSC sponsored masterplan.

(C) In Sabah, much initial activity will be devoted to locate animals for capture. Rhinos outside the Silabukan (Tabin) Wildlife Reserve will be considered appropriate candidates. There may be attempts to immediately capture a few known animals believed to be in imminent danger.

Of the animals captured:

(a) the first pair will be placed in a captive facility to be developed with AAZPA Sumatran Rhino Trust assistance at Sepilok.

(b) Subsequent rhinos captured will be moved to captive facilities in North America. These animals will be on breeding loan to the AAZPA zoos.

(D) AAZPA will provide various technical assistance as determined appropriate through consultation with the Malaysia Wildlife officials. Among the items identified so far:

(a) qualified keepers and veterinarians on a continuous basis for several years at the captive facility to be developed at Sepilok.

(b) veterinary support for actual capture operations.

(c) curatorial and veterinary assistance as needed for the captive facility at Malacca.

(d) training both in Malaysia and at appropriate AAZPA zoos for Malaysian curators, keepers, and veterinarians.

(4) All animals placed in captivity will be managed cooperatively as part of a "world population" under

coordination of the Sumatran Rhino Advisory and Oversight Panel developed under IUCN SSC auspices.

(5) This proposal can be amended by mutual agreement only of the Malaysian Wildlife Departments and the AAZPA Sumatran Rhino Trust to adjust to changing situations.

KHAN (written summary):

Response to 1982 SSC Rhino Specialist Group meeting recommendations in respect to Peninsular Malaysia.

Endau Rompin

The population in the area continues to be protected/monitored and remains stable, and continues to show signs of breeding. Agreement has also been obtained from the states Pahang and Trangganu governments for the establishment of the Endau Rompin National Park.

Taman Negara

The Tembeling Hydroelectric as been shelved and for the present the inundation to the Ulu Tembeling valley including rhino habitat removed concerted survey efforts have revealed that Taman Negara has a very significant rhino population presently estimated at about 25 animals mostly in remote and seldom visited areas of the Park. This puts this population as second in importance to the Endau Rompir rhino population in the Peninsula. Farther work may reveal even farther animals here.

Sungei Dusun

This small reserve has been and its environs have been extensively investigated recently and two facts have emerged. Firstly that there is at least 5 to 6 animals in the overall area possibly more and that in the last seven years to 9 years this small group has produced at least 3 young. Jeram the young captive female comes from this group as does the abandoned baby male that died earlier this year.

Other areas

Ulu Selama has also been investigated and a sharp evidence of at least four animals. Some acceptable photographs of rhino were recently taken at one of the salt licks. At present the area remains a viable rhino habitat.

The department has also investigated the reports of a possible Javan rhino in the Sungei Depah Kelantan. We are of the opinion that this 23 cm footprint animal is a Sumatran rhino. Investigations of this individual have revealed a further 3 animals in this area.

Two area have appeared to hold animals that may be considered doomed. The first was the merseeing coast at Tenggaroh In the second half of 1983 a trap was built and

actually caught and held a male rhino for 35 hours. The animal managed to break out through a weakness in the palisade. Since then the forest of the area has been cleared and the two known rhinos have moved north into a fairly large remnant of the Tenggara forest Reserve. These animals are still being monitored and protected. The other area with an isolate is Bukit Gebbot in Pahang which is also being monitored and protected.

ANDAU: Sabah review and plea for urgency

PAINE: Silibukan reserve history

ASPINALL (written report); The Howletts/Port Lympne Foundation and Indonesian Game Departments Proposals.

1. That the IUCN should through a separately constructed panel overlook and advise the whole SE Asian Sumatran Rhino enterprise.
2. That H&P.L.F should provide funds to protect the Sumatran Rhino in its wild state within Indonesia. Current thinking of Messers Mannan and Widodo is that the Barisan Selatan reserve would best qualify for support though they are taking other areas into consideration.
3. Advice from experts like Raleigh Blouch and others will be taken and a survey made as to which areas outside the parks can be considered as 'doomed' and thus eligible for the extrication of Rhino. A strong candidate at the moment is the Gunung Patah area though other areas will also be considered. Howlett's/Port Lympne foundation will rest on the Indonesian Game Dept. decisions as to the assignation of these areas.

MANAN (written summary):

The base of Sumatran Rhinos in the island of Sumatra, Indonesia: Due to rapid increase of our population in Indonesia (160 millions in 1984), many once forested areas have to be converted into other land uses, such as agriculture, estates, settlements, etc. In Sumatra, with a population of almost 25 millions, a rapid change in land uses are taking place now.

However, the government of Indonesia is already setting aside large areas as protected forest and nature reserves along the Barisan Mountain Ranges. National Parks such as Gunung Leuser, Kerinci Seblat, Barisan Selatan, and Wai Kambas have been established. Sumatran big mammals such as elephant, tiger, tapir, rhino, bear, orangutan etc. are strictly protected in those areas.

On the other hand, especially in the lowland areas, large areas of land are now being logged and converted into agriculture and estate plantation such as oil palm, rubber trees and timber estates.

The base of wildlife in these areas are uncertain and in the future most of them will be doomed to extinction, including Sumatran Rhinos. Therefore, steps and measures should be taken to save those animals by way of translocation to sanctuaries and national parks. Other alternative is to catch them and study the possibility of captive breeding in zoos and later on release their offspring into the wild again.

Increased management and protection of our nature reserves and wildlife sanctuaries will require intensive effort including expertise, trained personnel, and adequate funds,--a long term undertaking.

RAMONO: Reviewed 1982 Asian Rhino SG Action plan activities in Indonesia.

VAN BREE: Proposed structure for single coordinating body for Sumatran rhinoceros project with representatives from each of the participants including Asian Rhino SG. Responsibilities to include hiring of a coordinator who would undertake preparation of masterplan and serve as an advisor. Funding for the position to come from the participants. Mechanism to receive endorsement of the SSC/IUCN.

Terms of reference?

Brief discussion followed on several questions of detail. The reports presented were accepted by the full committee and then discussion followed on time schedules for IUCN approval, obtaining concurrence of governing bodies, establishment of a coordinating body, and an interim coordination until a permanent structure is achieved.

SCOTT: Indicated that if a short summary high lighting essential points of the meeting and terms of reference for the coordinating body were provided then he would take them to the SSC for review and recommendation to the IUCN. He indicated this could be accomplished by mid-November. SEAL agreed to provide the synopsis with recommendations and the statement of terms prior to departure. This was done and these documents are appended.

Other participants indicated they could have concurrence of their governing bodies within 4-6 weeks.

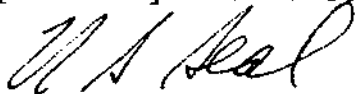
TEA BREAK 1530-1625.

SEAL: Summarized main points of earlier discussion and noted there was a consensus that it was important there be continuity during the interim until a formal structure is established. Seal had been asked to serve for a few months as interim coordinator for communication between Scott and the participants in the proposals. He agreed. This was approved with no objections by the committee on a motion by Schenkel and second by van Bree.

SCOTT: Indicated his delight with the results of the meeting and offered congratulations to everyone for their work.

FINAL ADJOURNMENT AT 1635.

Respectfully submitted 12 October 1984,



U. S. Seal  
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