

**REPORT to the  
CONSERVATION MANAGEMENT DIVISION of the  
LEUSER MANAGEMENT UNIT**

## **SUMATRAN RHINO CONSERVATION PLAN**

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# INTRODUCTION

The main task for the Consultant Rhino Conservationist was to provide advice on the overall rhino conservation plan and the integration of the plan within the conservation program, through discussions, field trips, review and reporting.

Consultant started the work with reviewing the current rhino conservation strategies and the documentation that formed the basis for the current status assessment. Also preparatory work was carried out in the form of gathering relevant literature and preparing cartographic materials. A summary of the AsRSG Rhino Conservation Strategy is provided.

Consultant reviewed all field reports from the operational rhino teams for the past two years, to extract relevant information on the status and occurrence of the Sumatran rhino in the Leuser Ecosystem, and to familiarize himself with the current patrol and reporting procedures. Also key team members were interviewed for additional information on locations, procedures and rhino records.

Based on the information gathered from the literature, field reports and interviews, an update on the current status of the Sumatran rhino was produced, as a basis for designing and planning of the appropriate conservation measures.

A comprehensive Rhino Conservation Strategy for the Leuser Ecosystem was designed, based on (1) rigorous protection of the current remnant populations, (2) securing of habitat for initial recovery to viable population levels, and (3) securing appropriate corridors for expansion of rhino into the total area of suitable habitat to be conserved as part of the Leuser Ecosystem.

Additionally recommendations for supervision, training, and field procedures, including navigation, reporting, monitoring, and enforcement were provided to the project staff.

Due to the poor weather conditions in Sumatra and the preoccupation of the project staff with the drafting of the 1997/98 work plan, the proposed field-visits were, in consultation with the project staff, curtailed to a brief visit to the Alas Valley.

# THE SUMATRAN RHINO CONSERVATION STRATEGY

## Background

There are three species of Asian rhino: the Indian or Greater One-Horned Asian Rhino (*Rhinoceros unicornis*); the Javan or Lesser One-Horned Asian Rhino (*Rhinoceros sondaicus*); and the Sumatran or Asian Two-Horned Rhinoceros (*Dicerorhinus sumatrensis*).

Basically, all 3 species of Asian rhinoceros are in a demographic crisis caused:

- (1) primarily by poaching for rhino horn and other products; and
- (2) secondarily by loss of habitat due to expanding and developing human populations

All three species are threatened with extinction, two critically so as assessed by the new IUCN Red List Categories.

TABLE 1: ASSESSMENT OF ASIAN RHINO SPECIES BY IUCN RED LIST CRITERIA

IUCN CRITERIA *	JAVAN RHINO		SUMATRAN RHINO			INDIAN RHINO	
	<i>Rhinoceros sondaicus sondaicus</i> JAVA	<i>Rhinoceros sondaicus annamiticus</i> VIETNAM	<i>Dicerorhinus sumatrensis sumatrensis</i> SUMATRA, MALAYSIA	<i>Dicerorhinus sumatrensis harrissoni</i> BORNEO	<i>Dicerorhinus sumatrensis lasiotis</i> MYANMAR, THAILAND	<i>Rhinoceros unicornis</i> Eastern pop. ASSAM, W. BENGAL	<i>Rhinoceros unicornis</i> Western pop. NEPAL
A. Population Reduction	VU	CR?	CR	CR	-	VU	VU
B. Extent of occurrence	EN	EN	EN	EN	-	EN	EN
C & D. Population estimate	CR	CR	CR	CR	-	VU	VU
E. Probability of extinction	EN?	CR?	EN?	CR	-	VU	VU
<b>OVERALL RATING</b>	<b>CR</b>	<b>CR</b>	<b>CR</b>	<b>CR</b>	<b>EX?</b>	<b>EN</b>	<b>EN</b>

EX = Extinct CR = Critically Endangered EN = Endangered VU = Vulnerable

\* Revised IUCN Categories and Criteria, approved by the 40th Meeting of the IUCN Council, 30 November 1994. Copies of the IUCN Red List Categories are available from IUCN Headquarters

- ❑ The Javan Rhino is the rarest of all rhino species with fewer than 100 individuals estimated still surviving, most in a single protected area in Indonesia; a few in an unprotected area in Vietnam.
- ❑ **The Sumatran Rhino is the most critically endangered of all rhino species with a population of 250-450 distributed fragmentarily in Sumatra, Peninsula Malaysia, and Sabah. Remnants may survive in Sarawak, Thailand, Myanmar, and Laos but their existence is unconfirmed and the viability of any populations unlikely.**
- ❑ The Indian Rhinoceros is the success story in Asian rhino conservation with over 2000 individuals in India and Nepal. This population has recovered from very low numbers

comparable to the current situation for the Sumatran and even Javan. However, threats to this species are significant and only continued and increased protection will enable survival.

The critical situation for Asian rhinos is emphasized by the fact that the number of all 3 Asian species combined is approximately equal to or perhaps slightly fewer than the rarer of the two African rhino species, the black rhino which has received much more publicity over the last decade.

As in Africa, poaching for the horn is the major threat to Asian rhinos. However, habitat degradation is also a significant threat, more so than for the African rhinos since two of the Asian species are denizens of tropical rainforest which continues to decrease in extent.

Immediately, the major requirement for Asian rhino conservation is increased protection *in situ* through core areas similar to the intensive protection zones and sanctuaries that have been successful in Africa.

Managed breeding remains a potential tool for Asian rhino conservation and is successful for the Indian rhino. However, traditional captive propagation methods have not succeeded for Sumatran rhino and have not been tried for Javan rhino. Attempts are under development to establish managed breeding centers in native habitat at least for the Sumatran and perhaps for the Javan rhino to assist in their protection and conservation.

**Ultimately, major requirements for rhino conservation are:**

- **cessation of the illegal trade in rhino horn and products**
- **stabilization, extension, and improvement of rhino habitat**
- **support of local communities for and hence benefit to local communities from rhino conservation.**

Significant funds are required both from governmental and external sources if Asian rhinos are to be conserved from extinction.

The paramount and immediate goal of Asian rhino conservation is to arrest and reverse the decline of rhino numbers due to poaching. This goal will require much more intensive protection of rhino *in situ*. Moreover, the protection must entail surveillance and patrols specifically allocated or targeted to rhino protection not just general maintenance of the protected areas the rhino inhabit. Rhinos are spectacular examples of species that are disappearing much more rapidly than their habitat.

The recent cost-effectiveness study of rhino conservation (Leader-Williams, 1996) has demonstrated that development of **Intensive Protection Zones (IPZ) or Sanctuaries** has proven one of the, perhaps the, most successful method of conserving rhinos. Hence, the identification and defense of such core areas has become the goal of Asian rhino conservation strategies and action plans. The objectives and recommendations of the Action Plan concentrate on development of such improved and intensified protection and improvement of such IPZ's

The cost-effectiveness overview analysis (Leader-Williams, 1996) also indicates that the amount of funds allocated to these intensive protection areas is also a critical factor in determining success or failure. As of 1995, it appears that **at least US\$ 1,000/ sq km** may be required for success. Of perhaps equal importance is the density of active and effective rhino protection staff/sq km. In the protected areas of India and Nepal that have been successful in conserving rhinos this staff density is on the order of **1 person/sq km**. It may not be feasible or necessary to achieve these densities in tropical forest areas. However, a higher density of guards than has previously occurred is needed.

Protection of both animals and their habitat is necessary, indeed imperative, for conservation programs for Asian rhino. However, over the long-term such protection is unlikely to be sufficient. The combined pressures of habitat destruction and poacher activity are both reducing and fragmenting rhino populations in the wild. When populations become small and fragmented, they become vulnerable to extinction for genetic and demographic reasons, in addition to the direct threats of habitat disturbance and poaching. Moreover, the smaller the population, the greater these genetic and demographic threats become.

Therefore, it becomes essential to maintain or recover some target population size or sizes that will be viable in terms of demographic, genetic, and catastrophic challenges. Target numbers of rhino also imply minimum areas necessary to accommodate populations of the specified sizes.

**Some of the major and common conclusions of the Population and Habitat Viability Analysis (PHVA) process for various rhino species are:**

- (1) Any rhino population under 10 individuals is at high risk of extinction even under ideal conditions;**
- (2) To maximize probability of survival under all kinds of identifiable risks, populations of 100 or populations that can be rapidly expanded to 100 or more individuals, seems advisable;**
- (3) To avoid the risks of having "all the eggs in one basket", at least 5 or more populations of 100 or more individuals, including at least one or two of over 500, are recommended for each regional variety of rhino considered distinct enough to be conserved as a separate taxon.**
- (4) For long-term viability a total population of at least 2,000 to 3,000 rhino of each taxon seems highly desirable.**

## The Continental (Asian) Rhino Conservation Strategy<sup>1</sup>

Considering the strategic foundations, a continental strategy for rhinoceros in Asia has been formulated by the range states through the Asian Rhino Specialist Group (AsRSG).

- Concentrate efforts and funds on the 5 major ranges states of India, Nepal, Indonesia, Malaysia, and Vietnam (until or unless new information indicates significant rhino populations still survive elsewhere.)
- Arrest further decline in the Sumatran and Javan rhinos in Indonesia, Malaysia, and Vietnam as the most critical need in Asian rhinoceros conservation.
  - Provide intensive protection of in situ nuclei as the paramount action required at this time.
  - Develop managed breeding centers in native habitat.
- Reinforce the continuing recovery of populations of Indian rhinoceros in India and Nepal.
- In the major range states, accord priority to populations with the highest probability for recovery to viability.
- Establish as scheduled objectives for each of the species:

5 Year Objectives	
Sumatran	No further decline in numbers.
Javan	Increase of 25% in numbers in Indonesia. No further decline in Vietnam.
Indian	Achievement of target numbers.
10 Year Objectives	
Sumatran	Increase of 20 % in numbers.
Javan	Increase of 50% in numbers in Indonesia. Increase of 25% in Vietnam.
Indian	Stabilization at target numbers.

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<sup>1</sup> Foose & van Strien, 1997: *Asian Rhinos. Status Survey and Action Plan.*  
IUCN/SSC Asian Rhino Specialist Group.

## Current Status of the Sumatran Rhino

The Sumatran rhinoceros once occurred from the foothills of the Himalayas in Bhutan and eastern India, through Burma, Thailand, and the Malay Peninsula, and on the islands of Sumatra and Borneo. There have also been unconfirmed reports of the species in Cambodia, Laos and Vietnam.

The Sumatran rhinoceros occurs more widely than the other two species in highly scattered and fragmented populations. All known animals occur in Peninsula Malaysia, Sabah and Sumatra. On Sumatra there are perhaps 100-250 rhino (*185-259 estimated at 1993 PHVA Workshop; 103-151 estimated at the 1995 AsRSG Meeting*). The largest populations are located in Gunung Leuser, Way Kambas, and Bukit Barisan Selatan. The population in Kerinci-Seblat National Park, estimated to be at least 300 individuals a decade ago, has been largely eliminated by poaching.

In Malaysia, the latest estimates are 100-150 rhino distributed more or less equally between Peninsula and Sabah. The main populations in Peninsula Malaysia are in Endau Rompin State Park(s), Belum Wildlife Reserve, the Selama area, and Taman Negara National Park. The main populations in Sabah are in the Yayasan Sabah Forest Concession Area (which includes Danum Valley) and the Tabin Wildlife reserve. Rhinos had been reported from Sarawak in the 1980s but their continued survival has not been recently confirmed. The possibility of a few survivors in Kalimantan is being explored.

A recent survey suggests that the species may still survive in Thailand in extremely low numbers. The latest surveys in Myanmar, especially in the northern part of the country where the possibility of survival was considered most probable, have indicated no recent evidence of rhino.

TABLE 2: OVERVIEW OF CURRENT AND TARGET POPULATIONS AND PROTECTED AREAS FOR SUMATRAN RHINO				
COUNTRY	Population		Areas - Number/Size (km <sup>2</sup> )	
	Current	Target	Current	Target
Indonesia	~ 200	2,000	5 / 22,000	5 / 30,000
<b>Malaysia</b>				
Peninsula	< 100	400	4 / 8,000	4 / 10,000
Sabah	< 75	200	2 / 2,000	4 / 4,000
Sarawak	~10	100	1 / 600	1 / 1,000
Thailand	< 10	200	2 / ?	2 / 2,000
Myanmar	< 10	200	2 / ?	2 / 2,000
Laos	?	200	2 / ?	2 / 2,000
<b>ASIA</b>	<b>&lt; 400</b>	<b>3,300</b>	<b>10 / 37,000</b>	<b>20/50,000</b>

The latest estimates of populations numbers for Sumatran Rhino by country and locality are presented in Table 3.



**TABLE 3: WILD POPULATION ESTIMATES OF THE SUMATRAN RHINOCEROS**

**Note:** Kn/Pr/Po = Known/Probable/Possible

*Known* = The minimum number of animals, each animal distinct from the others. If there is uncertainty whether a set of sign represents one or more animals then only one should be included. *Probable* = Animals for which some evidence of their existence as unique individuals exists. *Possible* = Animals for which there is only limited evidence of their existence or a number based on an extrapolation over an un-surveyed area

Country/ Location	Estimated No. of Rhino		Habitat Availability(sq km)		Protection Status	Potential Carrying Capacity
	AsRSG 1993	AsRSG 1995 Kn/Pr/Po	Presently (% surveyed)	Potentially		
<b>MYANMAR</b>						?
Schwe-u-daung	Small	0 / 0 / ?	207	?	Game sanctuary	
Tamanthi	Small	0 / ? / ?	2150	?	Game sanctuary	?
Lassai tract	6-7	0 / 0 / ?	?	?	Unknown	?
<b>Subtotal</b>	<b>6-7+</b>					
<b>LAOS</b>						
Nam Theun-Nakai		0 / ? / ?				
<b>Subtotal</b>						
<b>THAILAND</b>						?
Hala-Bala	4+	0 / ? / ?	?	?	Wildlife reserve	
Khao Soi Dao	2+	0 / ? / ?	745	745	Wildlife Reserve	35
Phu Khieo	4+	1 / ? / ?	1,560	1,560	Wildlife sanctuary	75
<b>Sub total</b>	<b>10+</b>	<b>1 / ? / ? = 1</b>				<b>110 ?</b>
<b>INDONESIA</b>						
<b>Kalimantan</b>						
Kayan Mentarang		0 / ? / ?			National Park	
Sabah border	Small	0 / ? / ?			Unprotected	
Gunung Belayon		0 / 0 / ?			Protection Forest	
Bentuang Karimun		0 / 0 / ?			Nature Reserve	
Gunung Meratus		0 / 0 / ?	?	?	Unknown	?
<b>Sumatra</b>						
Gunung Leuser	90-120	20 / 20 / 20	1,400	8,000	National Park	140-800
Gunung Patah	10-15	0 / 8 / 4	400	500	Production Forest	40-50
Kerinci-Seblat	64-77	9 / 9 / 10	5,000	10,000	National Park	500-1000
Gng Abongabong	5-10					
Lokop	3-5	0 / ? / ?	?	?	Leuser DP	?
Serbojadi	15-25					
Berbak	1-2	2 / 1 / 1	?	?	National Park	?
Torgamba	3-5	0 / 3 / 1	?	?	Conversion Forest	?
Barisan Salatan	25-60	5 / 10 / 7	700	3,600	National Park	70-360
Bukit Hitam	3-5	0 / 3 / 2	?	?	Production Forest	?
Bukit Tapan	5		?	?	National Park	?
Rokan Hilir	Small	0 / 0 / ?			?	
Way Kambas	3-5	10 / 10 / 15	400	600	National Park	40-60
<b>Subtotal</b>	<b>233 - 341</b>	<b>46/64/60=</b>				<b>790 - 2270</b>
		<b>170</b>				

Country/ Location	Estimated No. of Rhino		Habitat Availability(sq km)		Protection Status	Potential Carrying Capacity
	AsRSG 1993	AsRSG 1995 Kn/Pr/Po	Presently (% surveyed)	Potentially		
<b>MALAYSIA</b>						
<b>Peninsula</b>						
Endau Rompin	20-25	5 / 4 / ?	900 (70%)	1,000-1,600	State Park(s)	110-160
Taman Negara	22-36	15 / 29 / ?	4,400 (25%)	4,400	National Park	220+
Sungai Dusun	1-2	1 / 0 / 0	40	140	Wildlife Reserve	15
Gunung Belulut	3-4	1 / 0 / 0	230	230	Forest land	23
Mersing coast	3-5	1 / 0 / 0	?	100	Secondary forest	0
Sungai Depak	2-4	?	?	?	Secondary forest	0
Sungai Yong	3-5	?	?	?	Secondary forest	0
Kuala Balah	2-4	0 / 0 / ?	?	?	Secondary forest	0
Bukit Gebok	1-2	0 / 0 / 0	?	?	Secondary forest	0
Sungai Ara		1 / 0 / 0				
Krau	1-2	0 / 0 / 0	500	500	Wildlife Reserve	50
Selama	10-15	6 / 1 / 1	1200 (80%)	?	Forest Reserve	?
Gunung Inas	2-4	? / ? / ?				
Belum	10+	10 / 0 / ?	2400 (100%)	?	Forest Reserve	?
Bubu	2-3	0 / 0 / 3	?	?	?	?
Besut	3-5	1 / 0 / 0	?	?	Secondary forest	?
<b>Subtotal</b>	<b>85 - 126+</b>	<b>41/34/4+ =</b>				<b>418 - 468</b>
		<b>79+</b>				
<b>Sabah</b>						
Tabin+extensions	20+	13 / 2 / 5	1,200 (100%)	1,200	Wildlife Reserve	120
Kretam	18-28	1 / 0 / 0	1,000	0		
Yayasan Sabah Forest Conces.	10-20					80
(A) Danum Valley		6 / 2 / 3			Conservation area	
(B) Maliau Basin		1 / 2 / 1				
(C) Kuamat River		2 / 2 / 2				
(D) Ulu Segama & Malua FR		2 / 4 / 2	438 (80%)	2,000 ?	Protection forest	
Damarakot - Tangkulap		1 / 0 / 2				
Lower Kinabatangan		3 / 2 / 3				
Lamag		1 / 0 / 2				
Other		0 / 6 / 0				
<b>Subtotal</b>	<b>48 - 68+</b>	<b>30/20/20=</b>				<b>200</b>
		<b>70</b>				
<b>SARAWAK</b>						
Limbang	10+	0 / ? / ?	600	600	Logging concession	60
<b>Subtotal</b>	<b>10+</b>	<b>0 / ? / ?</b>				<b>60</b>
<b>TOTAL MALAYSIA</b>	<b>143 - 204</b>	<b>71/54/24+ = 149+</b>				<b>678 - 728</b>
<b>TOTAL</b>	<b>392-562</b>	<b>118/118/84+ = 316+</b>				<b>1548 - 3108</b>

\* From the AsRSG 1997 Asian Rhino Action Plan, with some adjustments based on new information

In general until recently the Sumatran Rhino had survived much better in its native habitats than the Javan rhino. This may be partly because it mainly inhabits the mountains and forests of higher elevations which were not so subject to development and logging. In contrast the Javan rhino is a species of the coastal plains and river valleys.

At present the species survives mainly in the Malay Peninsula, on Sumatra and on Borneo. Little is known of its status in Burma which if it survives is the last refuge of the subspecies *lasiotis*. The nominate subspecies *sumatrensis* is now represented by animals in Peninsula Malaysia and in Sumatra with perhaps a few in Thailand. The subspecies *harrissoni* once widespread over Borneo is now confirmed to exist only in Sabah but a few may survive in Sarawak and in Kalimantan. In all areas, Sumatran rhino numbers have continued to decline at a rapid rate with loss of 50% or more of the population over the last decade.

Perhaps the largest number of the subspecies *sumatrensis* now survives on the island of Sumatra. However, only 100-300 rhino are estimated to survive. Moreover, the island is now in a phase of intense development and the habitat available to the species is being rapidly reduced. In addition the sheer size of the island, compared to the available staff for protecting the species, renders adequate protection of all individuals almost impossible. Even in areas where there is a strong presence of protection staff, poaching is active. This fact is indicated by the presence of rhino traps in most of the areas inside National Parks when anti-poaching teams start to operate there.

The rhinos in Sumatra are too widespread and in too many pockets for all of them to be protected adequately in the ranges where they still survive. As a result, they are subject to heavy poaching pressure both from hunters with firearms and from trappers using wire snares and other traps.

An extensive international cooperative program for the conservation of this species is already being implemented with *in situ* activities being conducted with the aid of a Global Environment Facility (GEF)/United Nations Development Programme (UNDP) Project in Indonesia and Malaysia. Under this program 12 anti-poaching teams are deployed in Kerinci-Seblat, Bukit Barisan Selatan, and Way Kambas. The program also provides the coordination capacity to manage and sustain, financially as well as organizationally, the program.

There are also ongoing but reoriented efforts to develop managed breeding centers for the species in Indonesia and in Malaysia (both the Peninsula and in Sabah) as an adaptive modification of the captive programs. Traditional captive methods have proven unsuccessful for this species. A total of 40 rhino have been captured for the captive program between 1984-1995. Of these 19 survive. Mortality has been more than 50%. No reproduction has occurred although one calf was born in captivity to a female pregnant when captured. Attempts at captive breeding continue with the three animals in the United States. The three rhinos of Indonesian origin kept in Indonesian and British zoos will soon be repatriated to the Sumatran Rhino Sanctuary being developed by International Rhino Foundation in Way Kambas National Park.

## **Sumatran Rhinoceros (Asian Two-horned) Action Plan**

### **Introduction**

The Sumatran rhinoceros is a species of rainforest in hilly and mountainous areas. It is much more widely scattered, often in tiny non-viable populations, than the other two species. As a result, it is more difficult to make decisions as to the most appropriate priorities for its conservation, especially since a number of national and state governments are involved. Although the number of animals is not as low as for the Javan rhinoceros, this species is probably experiencing the most serious level of poaching for its horn of all the Asian rhinos. In some areas it is also threatened by habitat destruction.

Currently the Sumatran Rhino is probably the most threatened large mammal on earth, with a critically low and very disperse population, still suffering from loss of areas through development and from loss of individuals through poaching.

## Objectives

The Objectives for the Sumatran Rhino Conservation Strategy as formulated in the recent Action Plan of the AsRSG are:

- ❑ To develop populations of at least 700-1,000 rhinos in each of the major regions of its range: Sumatra, Borneo, Peninsular Malaysia and adjacent mainland, and northern Burma.
- ❑ To preserve, manage and where appropriate expand all populations that have the potential to increase to 100 animals or more.
- ❑ To determine if the populations in each major part of its range as listed above, constitute valid subspecies or Evolutionary Significant Units (ESUs), justifying preservation as separate entities by conservation programs.
- ❑ To locate or establish additional viable populations, especially on the mainland and Borneo.
- ❑ To develop a managed breeding population of 50 rhinos distributed in sanctuaries in South East Asia: notably Way Kambas in Indonesia; Sungai Dusun in Peninsular Malaysia; and Sepilok and Tabin in Sabah.
- ❑ To continue efforts to close down the trade in rhino products.

## Recommendations

The General Recommendations for the Sumatran Rhino Conservation Strategy as formulated in the recent Action Plan of the AsRSG are:

- ❑ Concentrate initial *in situ* conservation efforts on the 10 populations considered to be reasonably viable according to current information and analysis.
- ❑ Develop more effective anti-poaching teams and programs.
- ❑ Calculate the resources currently available and additionally required to provide adequate protection for these populations.
- ❑ Ensure improved legal protection status of all areas with viable, or potentially viable, populations (particular attention to be given to Kerinci-Seblat in Sumatra and Endau Rompin in Peninsular Malaysia).
- ❑ Conduct biochemical genetic studies, initially using blood and tissue from captive animals, to investigate if there is more than one ESU in this species.
- ❑ Organize surveys as soon as possible in Kalimantan (highest priority), Thailand, and northern Burma to ascertain whether appreciable populations of rhino survive there.
- ❑ Continue the capture of isolated animals outside reasonably viable or feasibly protectable areas for translocation to managed breeding centers or intensive protection zones, i.e. sanctuaries.
- ❑ Improve the effectiveness of law enforcement throughout the species' range with respect to anti-poaching measures and trading in Sumatran rhinoceros products. The strictest possible penalties should be applied to offenders.

## Specific Recommendations

The Specific Recommendations for Indonesia for the Sumatran Rhino Conservation Strategy as formulated in the recent Action Plan of the AsRSG are:

### *In Situ* Protection

Better protection is needed of the known possible rhino populations in Gunung Leuser, Kerinci-Seblat, Bukit Barisan Selatan and Way Kambas National Parks in Sumatra as well as in other locations where nuclei of rhino are confirmed. Such improved protection should include the following aspects:

- ❑ a massive increase in anti-poaching efforts;
- ❑ appropriate forms of sustainable development in the buffer-zones around these parks, to enable people to derive economic benefits from the protected areas;
- ❑ a public education and awareness program on the importance of these national parks and their rhinos;
- ❑ a training program for all levels of staff working in wildlife and protected area management. This should include training in captive management of rhino;

### Monitoring

Monitoring should be conducted on as many rhino populations as possible on a regular basis to assess the trends, distribution, threats, movement and habitat preferences of the species.

- ❑ Population estimation should preferably be conducted annually by teams of people employing standardized methods.
- ❑ Surveys should be conducted to assess the distribution and abundance of the species outside the protected areas.

In particular, surveys should be conducted to assess the status of rhino, if any, in Gunung Patah, areas north of Gunung Leuser, and in several areas in Kalimantan which are suspected to have rhino populations, e.g. Kayan Mentarang National Park; Ulu Sembakaung/Sungai Sebuku; Gunung Belayan/Sungai Boh/ Sungai Kayaniut; Sungai Irun; Gunung Meratus; Bentuang Karimun Nature Reserve.

### Capture and translocation

It is important to identify areas that are destined to be converted to other land uses incompatible with wildlife conservation, and hence determine whether it is necessary to translocate rhinos to another, safer area or into the "sanctuary" population. The target area must have adequate habitat to sustain a viable population of rhino which the various PHVAs conducted for rhinoceros recommend as at least 100 individuals.

### Research

Research on rhino should be directly applicable to the problems of conservation biology and management of the populations. Research on rhino populations in the national parks and other protected areas should be conducted with a view to determining their number, breeding performance and habitat requirements. Research is also necessary in order to determine the threats to the animals in each area and to devise appropriate conservation action.

### Trade

Limited information exists on the illegal trade in rhino horn on and from Sumatra. Investigations are urgently required to collect information on prices, trade routes and specific dealers. This information can then be used for law enforcement activities to close down the trade both unilaterally on the part of the government of Indonesia and bilaterally with those countries discovered to be importing Sumatran rhino products.

# **THE SUMATRAN RHINO IN THE LEUSER ECOSYSTEM**

## **The significance of the Leuser Ecosystem for Rhino Conservation**

From the figures presented in table 3 it will be clear that, based on the most recent estimates, Gunung Leuser has probably the highest number of Sumatran rhinos. Only Way Kambas on Sumatra and Taman Negara in Peninsula Malaysia, with estimate population of 20-45 and 45+ respectively, have populations of comparable size.

Considering the potentially available habitat Gunung Leuser scores much higher than most other areas, except Kerinci-Seblat. In these estimates only the available habitat within the boundaries of the Gunung Leuser National Park was taken into consideration. Throughout the Leuser Ecosystem the area that is suitable for Sumatran rhino is much larger, probably about double the current estimate.

Furthermore in Kerinci-Seblat, considering the severely depleted and fragmented rhino population and the continuing severe encroachment both at the fringes and in the center of the National Park, the chances for a recovery of the Rhino Population to a sustainable level must be rated low. At best small populations may be maintained in one or two key areas.

The chances for survival of the rhino in Way Kambas and Bukit Barisan Selatan are much better, but the available habitat is limited by the size of the National Parks, that cannot be enlarged because the area surrounding these Parks are heavily populated. The habitat available for rhino in Way Kambas is enough to support a population of 60, or possibly 100 animals, if the forested areas can be expanded. Barisan Selatan has more suitable habitat, but the park is being fragmented by roads and settlements, prohibiting the establishment of a continuous interbreeding population.

Based on principles of genetics and population biology small populations are extremely vulnerable to becoming extinct, even without increased mortality due to poaching or habitat degradation. According to IUCN criteria a population of less than 50 mature individuals is considered to be critically endangered, while a population of less than 250 mature individuals is considered to be endangered.

Following these criteria virtually all remaining Sumatran rhino populations are currently critically endangered, and facing an extremely high risk of extinction in the immediate future. As a general recommendation the AsRSG therefore adopted an initial target populations of at least 100 individuals, inclusive of young and subadults that do not yet reproduce, for all major rhino areas, and a minimum of 700 - 1000 individuals for each of the major parts of the species range.

At this level the species can be expected to survive without being affected by excessive genetic erosion through inbreeding, for 10 to 15 generations, or probably for at least half a century for a slow breeding species as the Sumatran rhino. For long term survival much larger interbreeding populations, in the range of 500 to 1000, are strongly recommended.

Reviewing the potentials and the threats for all other rhino areas in Sumatra, it must be considered highly unlikely that the total number of rhinos in the wild on Sumatra can increase to more than 300-400 outside the Leuser Ecosystem. Even this will require much more effort from the management and substantial long term funding commitments from national and international sources.

Therefore the conservation of the Sumatran rhino in the Leuser Ecosystem is crucial for the survival of the species on Sumatra, and probably worldwide. Leuser has a sizable remnant population, that is still reproducing, and has sufficient habitat to support a large population of rhinos. With adequate protection it will be possible to reach the carrying capacity of probably up to 1000 rhinos in the next 30 to 50 years.

## Historic distribution

From what is known about the habitat preferences of the Sumatran rhino it can be concluded that the whole Leuser Ecosystem is suitable for rhino, except::

- Areas over 1800 to 2000 m in altitude;
- Permanent swamps;
- Precipitous slopes and rocky areas;
- Non-forest areas.

Within the existing boundaries of the Gunung Leuser National Park there is about 230,000 Ha of land above 2000 m altitude. Excluding also some of the most precipitous areas, the swamps, and the degraded areas, it can be estimated that within the National Park approximately 600,000 Ha is suitable habitat for Sumatran rhino, and undoubtedly this area was at one time inhabited by rhino.

In the whole Leuser Ecosystem, as currently being delineated by the programme, there is about 330,000 Ha of land above 2000 m altitude. Excluding the other unsuitable habitats this would indicate about 1,300,000 Ha of suitable habitat for Sumatran rhino within the ecosystem.

Based on consultant's previous studies on the ecology and the distribution of the Sumatran rhino in Gunung Leuser a standard average density of one Sumatran rhino per 1000 Ha is generally used for population extrapolations.

In conclusion the original Rhino population of the Leuser Ecosystem, probably indicative of the number of Rhino present about 100 years ago, is estimated to have been minimally 1300 individuals, half of which within the current boundaries of the National Park.

## Current status

Based on extensive fieldwork carried out by consultant and Dr. Marcus Borner, the Sumatran rhino population in 1982 was estimated to be between 130 and 200 individuals. The population was divided over two areas, one small population in about 30,000 Ha on the Kapi Plateau and in the upper Lesten valley, a much larger population in about 100,000 ha in the central mountains of Gunung Leuser from the upper Mamas valley to the upper reaches of the Kluet drainage.

During consultant's study in the Mamas area between 1975 and 1981 39 individual rhinos were identified based on the form and size of their footprints. During the same period 12 calves were born in the Mamas population.

In the early eighties rhinos were reported to survive in some of the larger forest blocks north of Gunung Leuser National park, within the current Leuser Ecosystem area. These areas were indicated in the AsRSG action plan with the names Gunung Abongabong, Lokop, and Serbodjadi. Recent surveys in parts of these areas showed that rhinos did occur there until a few years ago, but that there are currently no survivors. It appears therefore that within the Leuser Ecosystem the Sumatran rhino survives only in parts of the Gunung Leuser National Park.

Since then poaching has virtually eliminated the Kapi population and has seriously reduced the population in the Mamas valley and in some parts of the Kluet drainage. A few rhinos in the uppermost reaches of the Lesten drainage may have escaped the onslaught on the Kapi population. Rhinos were almost eliminated in the southern half of the Mamas valley. Less is known about the poaching pressure in the Kluet area.

Although it is difficult, without data from a good census, to draw firm conclusions on the number of rhinos that are currently surviving, an indication of the level of reduction is provided by data on track density from the 1996/1997 anti-poaching patrols in the Mamas area. During consultant's study in the Mamas from 1975 till 1981 360 tracks were recorded in 358 field days, one track every day. During the 1996/1997 anti-poaching patrols in the same area 68 tracks were reported in 139 field days, one tracks every two days. Furthermore, during the study only fresh

and clear tracks, of which plaster casts could be made, were counted, while on the anti-poaching patrols all tracks are counted, even very old and faint ones. Therefore it is estimated that at least 50%, but probably up to 70% of the rhinos were lost from the Mamas population, and that currently not more than 10-20 rhinos survive.

Rhino sign have been reported recently from three areas in the Kluet drainage, though no firm conclusions are possible as yet about the size of these populations. The parts of the Kluet drainage in which the presence of rhino has been confirmed, though probably at reduced densities through poaching, is maximally about 40,000 Ha.

Rhino's may also occur in some of the most remote parts of the Gunung Leuser National Park, that have never been surveyed, and that are probably also out of reach of the poachers. These areas total about 135,000 Ha, but are probably sub-optimal rhino habitat because most of the area is very steep and in the upper parts of the rhinos altitudinal range.

The format for population estimates promoted by the AsRSG, distinguishes between **Known**, **Probable**, and **Possible** numbers. The current estimates for the Leuser Ecosystem are summarized in the table below.

<p><b>Known</b> = The minimum number of animals, each animal distinct from the others. If there is uncertainty whether a set of sign represents one or more animals then only one should be included.</p> <p><b>Probable</b> = Animals for which some evidence of their existence as unique individuals exists.</p> <p><b>Possible</b> = Animals for which there is only limited evidence of their existence or a number based on an extrapolation over an un-surveyed area</p>
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**Table 4: Estimate of current Sumatran Rhino Population in the Leuser Ecosystem**

Area	Known	Probable	Possible
<b>Mamas</b> (50-70% lost)	10	5	5
<b>Lower Kluet</b> (3 areas with multiple tracks known, total <40,000 Ha, density reduced through poaching)	10	10	10
<b>Unsurveyed West</b> (small part with rhinos confirmed 20 y ago, mostly suboptimal habitat, 80,000 Ha)		10	20
<b>Unsurveyed East</b> (A few may survive in the upper Lesten, <20,000 Ha)			5
<b>TOTAL</b>	<b>20</b>	<b>25</b>	<b>40</b>

*The figures in the Probable and the Possible class are higher than the conservative estimate provided in the AsRSG Action Plan (20/20/20). The figure provided for the Possible class is highly speculative, because the presence of rhinos in most of these areas has never been confirmed on the ground. Therefore, until more surveys have been carried out, it is recommended to maintain the AsRSG figure in the documentation.*

## Rhino poaching



Rhino poaching has been going in the Leuser Ecosystem for decades. Already in the thirties when the first expeditions penetrated the interior of the newly established Gunung Leuser conservation area, the rhino was reported to have disappeared from the mountains around Blankejeren, a well-known center of rhino poaching and horn trade, and from the slopes of Mount Leuser. Also in the northern Kapi the rhinos were reported to be very rare.

The rhinos disappeared from the slopes along the Alas valley in the sixties, from the Langkat mountains south of Mount Bandahara and from the Bengkung drainage in the seventies, and in the eighties poachers eliminated the rhino in the Kapi and started to penetrate the Leuser heartland in the Mamas and Kluet area.

Sumatran Rhino poaching is quite different from the hit-and-run type of poaching practiced on the Indian and African rhinos. Stalking and shooting a Sumatran rhino in the very dense forest habitat is almost impossible, especially because the natural density of the species is very low, much lower than in prime Indian or African rhino habitat.

In Sumatra rhino poaching is exclusively done through trapping, traditionally with spear-drop traps or pitfalls, and recently mostly with steelwire snares. Such devices are set on the game trails on the ridges and spurs in the mountains and on the trails that lead to saltlicks. To be successful the traps need to be operational for a considerable period of time, because of the natural low density of the rhino population. Nevertheless the traps, if strategically placed will completely eliminate the rhinos from a particular area. Sumatran rhinos tend to follow fixed routes to and from the saltlicks, and if most of these routes are fitted with traps the population can be exterminated in the course of a year or less.

## The Rhinos impact on the ecosystem

The Sumatran rhino has a considerable impact on the ecosystem and on biodiversity. Van Schaik is ill informed when he states in his report on biodiversity values that the Sumatran rhino is "less likely to affect the structure of biodiversity than the three large mammals [tiger, elephant, orangutan] mentioned earlier". In fact the Sumatran rhino may have a greater influence than the Elephant, certainly in the mid-montane areas.

The Sumatran rhino influences the structure of the biodiversity in several ways:

- ❑ Maintaining an elaborate system of trails throughout the ecosystem;
- ❑ Removing very large numbers of tree saplings during feeding;
- ❑ Dispersing seeds of important fruit trees through feces;
- ❑ Maintaining a dense network of wallows.

Game trails. Throughout the mountainous parts of the ecosystem an elaborate system of game trails, following the major rivers and the main ridges and spurs is maintained by the large herbivores, the elephant and the rhino. The elephant travels over much larger areas than the rhino, but locally has a much more restricted and traditional use of the area. Elephants tend to move through the area along some well-defined routes linking favorite feeding-places. Elephants on their migrations maintain the jungle highways, linking the major drainage systems, and running along the main rivers.

Rhinos have a much more restricted range, but use their area more intensively. They maintain the secondary jungle-roads, that run over every major spur and ridge and link up with the elephant routes along the rivers. These routes provide a means of movement and communication, not only for the rhino and the elephant but also for a large number of other animals.

The main predators, the tiger and the wild dog, use the game trails in their migrations that cover very large areas. Deer, wild boar, and bears use the trails for shorter distances. These animals also leave scats, scrapes or other visual or olfactory markers along the trails for communication with conspecifics.

Without the game trails it will be much more difficult, probably even impossible, for the predators to cover their vast territories in search of prey or mates. The disappearance of the rhino and the elephant from large part of the ecosystem will have a negative impact on the living conditions for other large mammals.

Seedling removal: Rhinos appear to favor feeding on secondary sites, treefalls, landslides, river banks, etc, but also feed extensively on the under story in primary forest. During feeding in primary forest they mainly feed on the crown of small forest trees, by breaking the stems. Many of the broken treelets are seedlings of large forest trees and most will eventually die. Although the rhino does not appear to be very selective in its choice of treelets the removal of several tens of seedlings every day by every rhino has an impact on the structure and probably also on the composition of the forest.

Seed dispersal: Rhinos appear to be fond of wild mango fruits, and probably also of wild citrus fruits. Mango seedlings are often seen to sprout from rhino feces, and citrus trees are quite common along rhino trails. Other seeds are probably also consumed when available.

Wallows: Rhinos spend a fair part of the day in wallows and maintain a dense network of wallows throughout their territory. The rhino's digging and rolling deepens the wallows and compacts the soil, which increases the capacity to hold water. Also other deer and wild boar use these wallows, and through the actions of the rhinos more wallows are available for the forest community during periods of drought.

Disappearance of the rhino will have a marked influence on the biodiversity composition, and may very well endanger the chances for survival of other key elements of the Leuser Ecosystem. In large parts of the Ecosystem the rhino has already disappeared over the last three decades, and game trails are becoming overgrown and wallows filled up with leaf litter and plants.

Restoring the rhino population to a natural level throughout the Leuser Ecosystem will restore the game trails and wallows and other species will benefit by having more possibilities for migration, dispersal and mate encounter.

## **Potentials for the future**

### **Biological considerations**

As has been argued above, the Leuser Ecosystem has by far the highest potential for the recovery of the Sumatran rhino to a safe and sustainable level. But currently the rhino population is reduced to about 5-10% of the number that could live in the Leuser Ecosystem, and it will take many years of rigorous protection of the rhinos and their habitat before the target population of at least 1000 individuals can be reached.

The Sumatran rhino is a slow breeder. Adult females in the wild will get one young every 4 to 5 years, and the chances for survival of the young into adulthood, provided there is no poaching, are high. Nevertheless one cannot expect the population increase to be more than about 7% per year, or roughly a doubling of the population every ten years. With complete suppression of poaching the current population could grow to 500 individuals in 30-40 years, and to 1000 in another 10 years.

Adult rhinos also do not rapidly migrate to other areas. Females have a fixed home range of 10,000 -15,000 Ha, that normally includes a saltlick. Males roam over larger areas, up to 50,000 Ha and may visit several saltlicks. But from the data gathered during the ecological study in the Mamas, it appears that adults normally remain within their home ranges, that are evenly spaced over the area.

The subadults are much more exploratory and appear to travel over larger distances to find a suitable range within the existing population structure. For this reason rhinos are slow to return to areas where they have been eliminated through poaching. As long as an area has a population below carrying capacity, new individuals are most likely to settle in the 'parent area'. Only when

the population it reaching a maximum level, new individuals will be forced to look further afield and settle in adjacent areas.

### **Conditions for population expansion**

Expansion from the current rhino areas into areas where the rhino has been eliminated will be a slow and gradual process, that will only occur once the parent population has recovered to a natural level, and when the adjacent areas offer sufficient suitable habitat for additional home ranges.

Therefore narrow corridors linking potential rhino areas are not likely to be successful, because the very shy rhinos are easily disturbed and the narrow corridors do not allow the rhinos to settle permanently and to establish full home ranges. Migration into other areas will only succeed when the intervening areas offer good habitat for the rhinos to settle and to live permanently in the area. The corridor area must not only provide safe passage, but also provide sufficient habitat for feeding and access to saltlicks. If the rhinos cannot have access to the natural saltlicks in the area the creation of artificial saltlicks could be considered.

### **Establishment of Minimum Viable Population**

The current rhino population is severely depleted and every surviving individual must be considered crucial for the survival of the species. Therefore the first priority should be to put adequate protection measures in place in all areas where rhinos are surviving, irrespective of the numbers of animals estimated to remain in these places.

Secondly a sufficiently wide strip of rhino habitat linking all the current rhino areas should be secured and protected from encroachment and incursion. Thirdly rhino habitats surrounding the existing rhino populations should be secured for added protection and to function as the first areas for expansion of the population. These areas together would provide about 450,000 Ha of prime rhino habitat, with the potential to support a **Minimum Viable Population (MVP)** of about 500 rhinos. Once this MVP has been established rhinos can re-populate other areas at greater distance from the current core areas.

The areas of primary interest for the Sumatran rhino are the larger mid-montane areas where the mountains do not reach over 1500 to 2000 m in altitude. Lowlands are equally suitable for the Sumatran rhino, but there is very little lowland preserved in an undisturbed state in the Leuser Ecosystem.

The main mid-montane areas are in the south and the southwest of the Park - the Mamas, the Bengkung and the Kluet drainage, where most of the surviving rhinos are found - and in the Kapi-Lesten area in the northeast of the Park. Also on the eastern border of the National Park and further north in Central Aceh are large areas of suitable rhino habitat, but these areas are too far way from the existing remnant populations to be of immediate interest.

Most critical for the survival of the species is the linking of the main rhino areas of Mamas-Bengkung-Kluet and Kapi-Lesten. Though a few rhino may survive in the upper Lesten drainage, repopulation of this important rhino habitat will need the migration of animals from the other side of the Alas valley. This is not only of importance for the establishment of a MVP of 500 interbreeding animals, but also for the ultimate goal of the re-population of all suitable rhino habitat in the Leuser Ecosystem.

Re-population of the Kapi-Lesten area is critical for the further expansion of the rhino throughout the Leuser Ecosystem, because from Kapi-Lesten the rhinos can migrate south into the Langkat-Sibolangit mountains, and north into the Central Gayo mountains. Such migration is not possible, or unlikely, from the area west of Leuser mountain or from the central valley between the Leuser and Kemiri mountains, because of the nature of the terrain.

The only available habitat link between the main rhino area in the Mamas and the Kapi-Lesten area is through the lower Mamas valley, the lower slopes of the Gunung Mamas between the Mamas and the Ketambe rivers and the Upper Alas Valley between Ketambe and Kongke. Currently all these areas are subject to massive illegal settlement and forest destruction. Before rhinos can return to these areas the natural environment has to be restored.

## **Rhino Protection Units**

The only effective way to protect the rhinos from being exterminated by rhino poachers is the establishment of **Intensive Protection Zones (IPZ)**, with a strong presence of well-trained and well-equipped and dedicated guards, usually called **Rhino Protection Units (RPU)** patrolling the rhino habitat. This has been the only successful method world-wide, as is also apparent from the cost-effectiveness study referred to earlier (Leader-Williams, 1996).

This is also demonstrated by the success of the UNDP/GEF Rhino Project that is currently operating more than 30 RPUs in the other major rhino areas on Sumatra, in Peninsula Malaysia, and in Sabah. In virtually all areas signs of recent rhino poaching were found when the teams enter new rhino areas, but in all areas the poaching has stopped once regular patrols are established. The main task of the RPUs is to dissuade poachers from entering the rhino areas, because the increased chances of their traps being detected and deactivated will make the operations of the poachers more risky and less profitable.

Also the value of regular patrols, and the dangers of suspension of patrols for some time, is clearly demonstrated by the Mamas rhino population. Before 1975 this population was virtually untouched by poaching and was totally protected by regular patrols till about 1983, first carried out by the research program, later with donor funds. In 1983 the external support for the rhino patrols stopped and the National Park management failed to continue this most basic management activity. Until the patrols were resumed in 1991, again with outside funding and supervision, poachers eliminated 50-70% of the rhino population.

If the protection is stopped for a few years the rhino population can be brought down to a level that will take 15 years or more to recover from. Therefore the deployment of an adequate number of RPUs must be guaranteed at all times. They should never be subject to delays in release of funds or hiring restrictions. Rhino protection work needs to continue until the demand for the rhino's appendages has diminished, and therewith the incentive for the poachers.

Another important condition for success of rhino protection measures is the number of guards per unit of area. The number of patrols and the areas covered should be such that it will be virtually impossible for the poachers to operate without being detected. Since rhino poaching is only possible in areas where rhinos concentrate, on the main ridge trails and near the saltlicks, the RPUs should also concentrate their activities in these areas. Also access to many areas is only possible through a limited number of routes, and these should be checked by the patrols, or the entrance points guarded by ranger stations with a permanent team of guards.

Based on the experience gained with the past and present rhino patrols, the number of patrol personnel needed to provide adequate protection will be from about 1 per 2000 Ha in areas close to settlements and with multiple access routes, to 1 per 4000 Ha in the most inaccessible areas, where access is limited to one or a few clearly defined routes. In addition to the patrol personnel there will be a need for permanent manned stations on key entry points.

# THE LEUSER RHINO CONSERVATION STRATEGY

## Goal

To restore the population of the Sumatran Rhino (*Dicerorhinus sumatrensis*) in the Leuser Ecosystem to a contiguous population at a natural density in all rhino habitats throughout the Leuser Ecosystem.

**In figures: To have at least 1000 Sumatran rhinos in at least 1 Million Hectares of contiguous secure natural habitat in the year 2050.**

## Action Plan

### Phase I

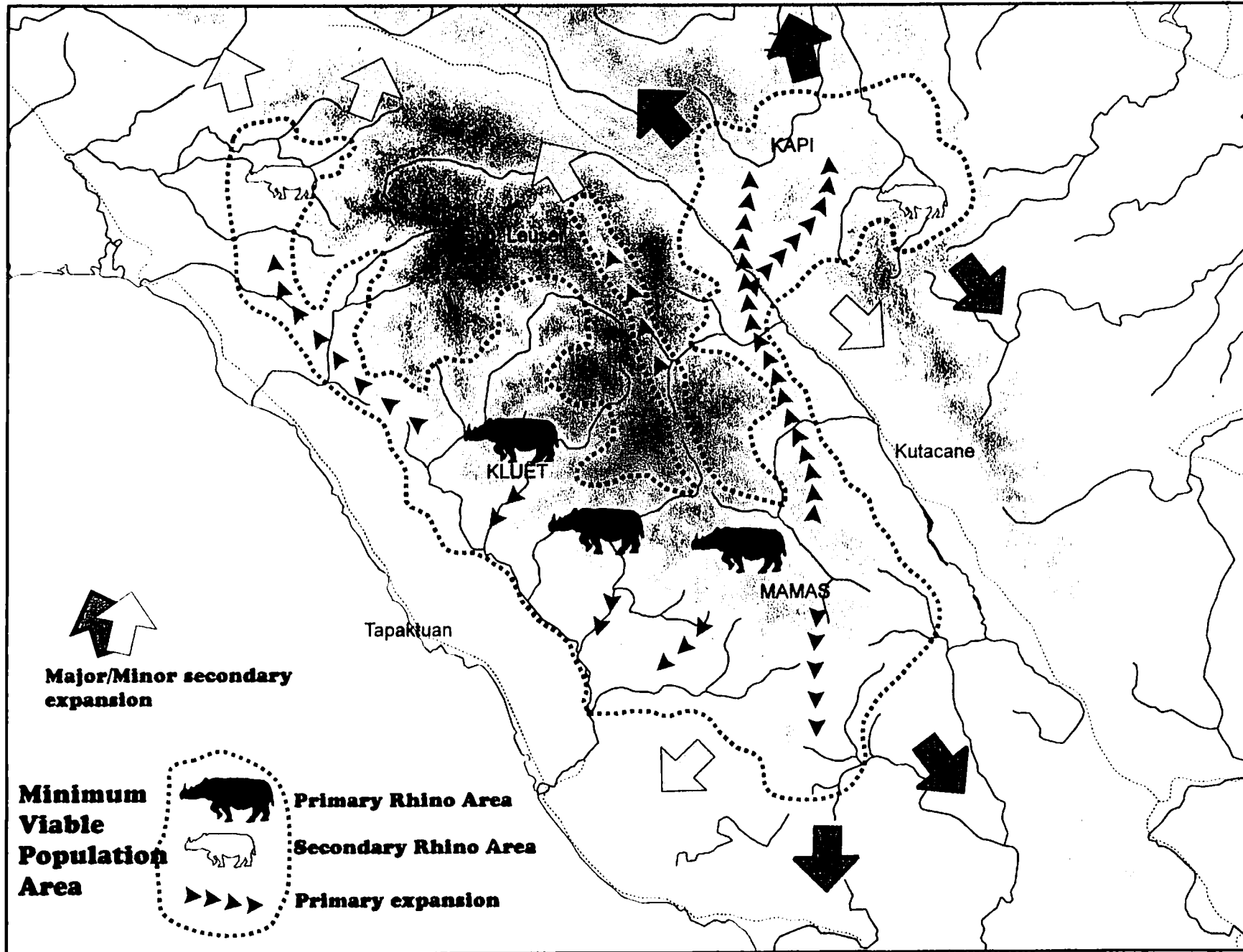
**Consolidation of existing rhino populations and immediately available habitat to create a contiguous *Minimum Viable Population*.**

- ❑ Consolidation of remaining rhino population fragments to prevent any further loss of individuals through poaching.
  - Continue anti-poaching patrols in the areas currently under surveillance.
  - Establish anti-poaching patrols in the areas where rhino-poaching might occur or may be attempted in the future.
  - Upgrade the skills of the anti-poaching patrols to increase their efficiency, especially with respect to reporting and monitoring of the rhino populations.
- ❑ Survey areas where remnant rhino populations are suspected and that might be accessible to rhino poachers to:
  - Assess current status of the rhino population;
  - Investigate poacher presence and likely access routes.
- ❑ Survey areas where remnant rhino populations are suspected and that are most likely not accessible to rhino poachers to:
  - Assess current status of the rhino population;
  - Assess likelihood of poachers gaining access to these areas.
- ❑ Establish additional anti-poaching measures immediately when the surveys indicate a need for additional anti-poaching units or other protection mechanisms.
- ❑ Secure all rhino habitat linking the existing population and population remnants to form a contiguous secure area for rhinos so that the rhino numbers can increase till an interbreeding *Minimum Viable Population* of approximately 500 individuals.

- Prioritize securing of the rhino habitat linking the current Kluet-Mamas population with the Kapi-Lesten area through the lower Mamas valley and the upper Alas valley.
- Secure all suitable rhino habitat within the current conservation area that is contiguous with the existing rhino population and population fragments to allow expansion of the rhinos into these areas and to enhance security in the adjacent areas.
  - Prioritize securing the habitat between the Bengkung river and the Mamas and Kluet drainage.
- Establish an independent trust fund for the operations of the anti-poaching teams, to prevent disruptions of the anti-poaching operations due to bureaucratic or administrative delays in allocation or release of funds for salaries and operational expenses.
  - The fund should be large enough to cover a full year of operations at recommended strength.
  - It is recommended to use funds from donors for the initial capital. Drawings on the fund should be recovered from the annual operational budgets, both from government and from donors.
- The duration of Phase 1 will be 30-40 years under ideal circumstances.

*The concept of Phase 1 - establishment of a Minimum Viable Population - is shown on the map overleaf.*

# Gunung Leuser: Sumatran Rhino Conservation Plan



## Phase 2

**Expansion of the rhino population throughout the Leuser Ecosystem, re-populating all available habitat and ultimately creating a contiguous interbreeding population of at least 1000 individuals.**

- Secure from further degradation at least another 500,000 Ha of suitable rhino habitat, contiguous with the *Minimum Viable Population* area specified under Phase 1.
  - Prioritize areas north of the Kapi-Lesten Plateau, the east-side of the Langkat-Sibolangit Range and the Bengkung Plateau.
  - Prioritize areas below 1500 meters in altitude with gentle to medium gradients.
  
- The duration of Phase 2 will be 10-20 years after the end of phase 1, but some parts could be re-populating in 10-20 years from today, provided the habitat is secured.



# AREA SPECIFIC RECOMMENDATIONS

## General outline

For ease of reference and planning the whole *Minimal Viable Population* area, as defined above has been divided into **Rhino Conservation Blocks**. The blocks are chosen to reflect geographical or ecological units, and to be of a size that allows good coverage by one or two anti-poaching teams.

Boundaries between many areas need further refinement, based on actual field conditions, and for practical purposes boundaries will have to be adjusted and areas will be subdivided.

All the blocks specified below should be regarded as being part of the **Core Area** of the Leuser Ecosystem, and access to any of these blocks should be strictly prohibited for any purpose, except for patrols, surveys and research, and other management support activities. Wildlife tourism may be allowed along certain corridors.

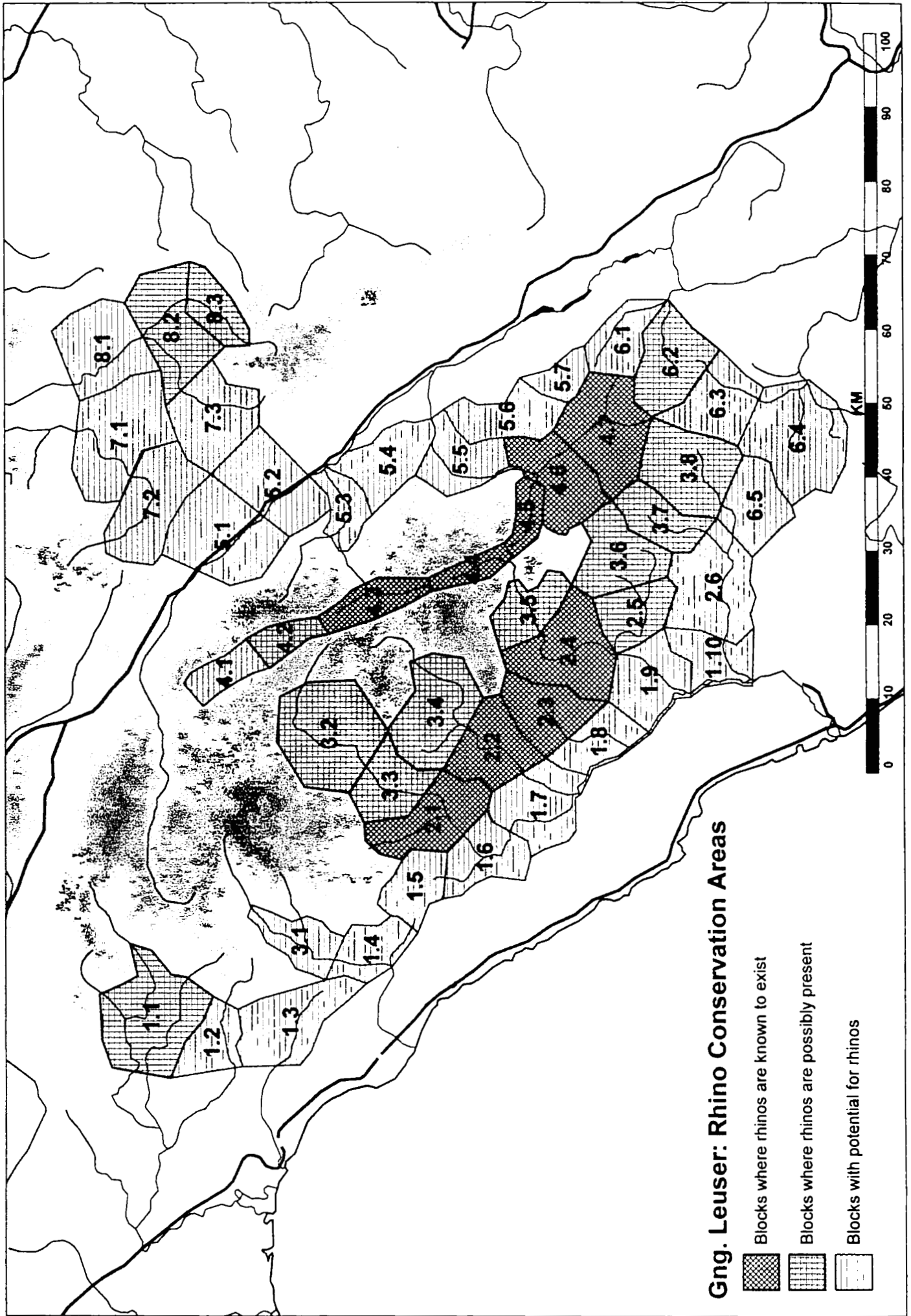
It is recommended to make **Block Management Statements** for each of the area, providing:

- A detailed map of the area in a scale of 1:100,000 or larger, showing:
  - Rivers;
  - Ridges and mountains;
  - Selected altitudes;
  - Camp sites;
  - Main patrol routes;
  - Main game trails;
  - Saltlicks;
  - Previous rhino poaching;
  - Encroachment
  - Helicopter landing spots;
  - Entrance routes, etc.

*The Area Maps should be set up as a computerized GIS system, based on the 1:50,000 topographic maps, and being updated with survey and patrol results. Copies of the maps are to be used to provide patrol instructions and for reporting by the teams.*

- A concise Status Report on:
  - the Rhino population;
  - incursions, in the form of encroachment and intrusion for extractive practices
  - protection, like anti-poaching and other animal and habitat protection activities;
- Recommendations for future action on:
  - surveys;
  - Patrols, and changes in patrol areas, frequency or procedures;
  - Protection infrastructure, like establishment of guardpost, fences, electronic monitoring devices;
  - Incursion control, like removal of encroachment and measures to regulate extractive practices.

*The Rhino Conservation Blocks are show on the map overleaf, and in table 5 a summary of the Blocks and the status is provided. Preliminary Block Management Statements are provided for each of the identified Rhino Conservation Blocks*



**Gng. Leuser: Rhino Conservation Areas**

- Blocks where rhinos are known to exist
- Blocks where rhinos are possibly present
- Blocks with potential for rhinos



Table 5: Rhino Conservation Blocks and Status Summary

AREA			Rhino status	Patrols
No	Name	Size (Ha)	Present Likely Absent / Unknown	Current Priority Survey needed

**Kluet-West Coast series**

1.1	Lama Rayeu	16,630	Present in 1980s. May survive in small numbers	
1.2	Ie Merah	6,170	No information. Close to settlements.	
1.3	Krueng Susoh	11,890	No information. Close to settlements.	
1.4	Krueng Baru	6,520	No information. Close to settlements.	
1.5	Gunung Rotan	6,490	No information. Close to settlements.	
1.6	Alur Ramai	8,120	Not present. Lower A. Ramai patrolled	
1.7	Muara Sibongbong	10,760	No information. Encroachment	
1.8	Muara Malui	6,760	Not present. Patrolled along river	
1.9	Muara Simpali	9,570	Not present. Patrolled along river	
1.10	Muara Mungkap	6,840	No information. Severe encroachment	
<b>Total</b>		<b>89,750</b>		

**Kluet tributaries series**

2.1	Kluet Inong	10,810	Rhino along watershed with 2.2. Monthly patrols	
2.2	Sibongbong	9,500	Rhino along watershed with 2.1. Monthly patrols	
2.3	Hulu Malui	8,370	Rhino along watershed with 2.4. Bimonthly patrols	
2.4	Mentok	13,040	Rhino on watershed and at saltlick. Bimonthly patrols	
2.5	?	7,190	Unknown. Likely to be present.	
2.6	Mungkap	14,070	Unknown. Unlikely to be present.	
<b>Total</b>		<b>62,980</b>		

**Leuser-Simpali series**

3.1	Pawoh Baro	6,430	Unknown.	
3.2	Kelain	16,560	Inaccessible. May be present in low density	
3.3	Tupai	7,690	Inaccessible. May be present in low density	
3.4	Hulu Sibongbong	13,000	Inaccessible. May be present in low density	
3.5	?	6,540	Inaccessible. May be present in low density	
3.6	?	10,050	Inaccessible. May be present in low density	
3.7	Kukuran	6,870	Inaccessible. May be present in low density	
3.8	?	12,540	Inaccessible. May be present in low density	
<b>Total</b>		<b>79,680</b>		

**Central Valley series**

4.1	Blangbeke	4,320	Absent. Surveyed in 1970s	
4.2	Pontan Dedelu	3,650	Very few present in 1970s. May have been eliminated	
4.3	Hulu Ketambe	5,890	Inaccessible. Most likely present in low numbers.	
4.4	Hulu Simpali	3,200	Present in 1970s. Most likely still present	
4.5	Sungai Markus	3,370	Present. Probably no poaching ever.	
4.6	Mamas Aceh	10,130	Present. Heavy poaching in 1980s. Half-monthly patr.	
4.7	Mamas Pawang	13,580	Present. Heavy poaching in 1980s. Half-monthly patr.	
<b>Total</b>		<b>44,140</b>		

**Alas Valley series**

AREA			Rhino status	Patrols
No	Name	Size (Ha)	<i>Present</i>	<i>Current</i>
			<i>Likely</i>	<i>Priority</i>
			<i>Absent / Unknown</i>	<i>Survey needed</i>
5.1	Gumpang	15,240	Absent. Last recorded in 1980s. Heavy encroachment	
5.2	Maluak	11,090	Absent. Last recorded in 1980s. Heavy encroachment	
5.3	Ketambe	4,940	Absent. Last recorded in 1980s	
5.4	Caras	8,820	Absent. Poaching in 1960s. Heavy encroachment	
5.5	Mamas	8,060	Absent. Few present in 1970s. Heavy encroachment	
5.6	Nimber	8,220	Absent. Heavy encroachment	
5.7	Uning Sigugur	3,570	absent. Poaching in 1970s. Patrolled by Mamas team	
<b>Total</b>		<b>59,940</b>		

#### Kompas-Bengkong series

6.1	Lukluk	6,730	Absent. Heavy encroachment	
6.2	Kompas	10,480	Small numbers may survive. Monthly patrols	
6.3	?	9,300	Unknown. Present in 1970s	
6.4	Hulu Bengkong	16,690	Unknown. Present in 1970s	
6.5	Bukitpanji	8,320	Unknown	
<b>Total</b>		<b>51,520</b>		

#### Kapi Plateau series

7.1	Utung	16,000	Presumably absent.	
7.2	Empan	12,590	Presumably absent. Encroachment	
7.3	Panguh	11,750	Absent. Present in 1980s	
<b>Total</b>		<b>40,340</b>		

#### Upper Lesten series

8.1	Lesten	12,070	Presumably absent.	
8.2	Uning Tualang	12,340	Inaccessible. May survive in small numbers	
8.3	Hulu Lesten	5,630	Inaccessible. May survive in small numbers	
<b>Total</b>		<b>30,040</b>		

### All Rhino Conservation Blocks

<b>458,390</b>
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## Block Management Statements

**General:** All blocks should be made part of the **Core Area of the Leuser Ecosystem**, and access should be **strictly prohibited**, except for management support activities.

### Kluet-West Coast series

No rhinos survive in any of these blocks, but most of the area is undoubtedly prime rhino habitat. In general the Kluet drainage system forms the largest block of prime rhino habitat in the Leuser Ecosystem. For the establishment of a Minimum Viable Population it is vital to restore the wildlife values in these areas, not only for the rhino but also for the elephant, tiger, orangutan and other highly endangered species.

#### Block 1.1 Lama Rayeu

##### Status Report

Rhino population: Local reports indicate the presence of rhinos in the 1980s. A small number may survive, though the gradients in this area are very steep and the habitat is probably sub-optimal.

Incursions: No information.

Protection: None to date.

##### recommendations

Surveys: A ground survey should be conducted in 1998/99, using one of the Kluet teams. If positive, a more thorough survey needs to be carried out by a specialist team.

Patrols: Establish after presence of rhinos has been confirmed.

Infrastructure: As above.

Incursion controle: As above

#### Block 1.2 le Merah

##### Status Report

Rhino population: Presence less likely than in the larger 1.1 block to the north. The area is vital for the connection of the rhinos in the northern extremity, if any survive, with the main population.

Incursions: No information.

Protection: None to date

##### recommendations

Surveys: In case the survey of 1.1 proves the existence of rhinos in 1.1

Patrols: Establish after presence of rhinos has been confirmed.

Infrastructure: As above

Incursion control: As above

#### Block 1.3 Krueng Susoh

##### Status Report

Rhino population: The presence of rhino is highly unlikely, because of the nearness to settlements. The area is vital for the connection of the rhinos in the northern extremity, if any survive, with the main population.

Incursions: No information

Protection: None to date

##### recommendations

Surveys: General survey in case the survey of 1.1 proves the existence of rhinos in 1.1

Patrols: Establish after presence of rhinos has been confirmed.

Infrastructure: As above

Incursion control: As above

#### Block 1.4 Krueng Baru

##### Status Report

Rhino population: The presence of rhino is highly unlikely, because of the nearness to settlements. The area is vital for the connection of the rhinos in the northern extremity, if any survive, with the main population.

Incursions: No information

Protection: None to date

#### recommendations

Surveys: General survey in case the survey of 1.1 proves the existence of rhinos in 1.1

Patrols: Establish after presence of rhinos has been confirmed.

Infrastructure: Since the Krueng Baru penetrates very far into the ecologically very important Mount Leuser massive, a permanent guardpost may be needed here, after the area has been surveyed and the threats to the habitat have been assessed.

Incursion control: As above

### Block 1.5 Gunung Rotan

#### Status Report

Rhino population: The presence of rhino is highly unlikely, because of the nearness to settlements. The area is vital for the connection of the rhinos in the northern extremity, if any survive, with the main population.

Incursions: No information

Protection: None to date

#### recommendations

Surveys: General survey in case the survey of 1.1 proves the existence of rhinos in 1.1

Patrols: Establish after presence of rhinos has been confirmed.

Infrastructure: As above

Incursion control: As above

### Block 1.6 Alur Ramai

#### Status Report

Rhino population: No rhinos survive. The area is vital for the connection of the rhinos in the northern extremity, if any survive, with the main population.

Incursions: No information

Protection: The area is patrolled once a month by the Kluet - 1 group.

#### recommendations

Surveys: To establish the most appropriate place for a permanent guardpost.

Patrols: Continue the patrols, because the area is an important gateway to the rhino areas further inland. Occasionally the Kluet -1 group should survey downstream from Muara Ramai. It may be more efficient to the coastal ridge to the Kluet further south and then survey the Alur Ramai upstream.

Infrastructure: A permanent guardpost at a strategic position along the river allowing the control of the access to the 2.1 block is highly recommended.

Incursion control: See under 1.7.

### Block 1.7 Muara Sibongbong

#### Status Report

Rhino population: No recent information. Most likely exterminated in this area.

Incursions: No information.

Protection: No patrols to date.

#### recommendations

Surveys: To establish the most appropriate place for a permanent guardpost.

Patrols: A new anti-poaching group needs to be established to supplement the Kluet - 1 group. The main ridge between the Kluet and the Sibongbong should be included in the patrol routine. Main patrolling areas will be in block 2.2.

Infrastructure: A permanent guardpost at the mouth of the Sibongbong is highly recommended.

Incursion control: A strong contingent of permanent staff should be stationed in this area to completely block the access to the upper Kluet and the Sibongbong. Any form of encroachment in the upper Kluet, along the Sibongbong and on the east side of the Kluet valley below the Muara Sibongbong should be removed.

### Block 1.8 Muara Malui

#### Status Report

Rhino population: No rhinos present.

Incursions: There is encroachment along the lower Malui.

Protection: The area is patrolled along the river about every 2-3 months by the Kluet - 2 group.

#### recommendations

Surveys: To establish the most appropriate place for a permanent guardpost.

Patrols: Patrols to be intensified, especially along the watersheds left and right of the Malui river. The area can be patrolled alternately by the Kluet - 2 group and the new group recommended under 1.7.

Infrastructure: A permanent guardpost to be constructed at a strategic location along the lower Malui

Incursion control: All encroachment along the Malui, and on the east bank of the Kluet should be removed, and access to this block should be restricted to river traffic for legalized settlement west of the Kluet river.

## **Block 1.9 Muara Simpali**

### **Status Report**

Rhino population: No rhinos survive.

Incursions: The little information that is available indicates fishing and timber theft along the river. There is widespread encroachment along the lower Simpali and the Kluet river.

Protection: The river banks are patrolled about once every 2-3 months by the Kluet - 2 group.

### **recommendations**

Surveys: To establish the most appropriate place for a permanent guardpost.

Patrols: Patrols need to be intensified and also cover the watersheds left and right of the Simpali river. A new group to be established to patrol the southeast side of the river and the 2.5 and 2.6 blocks inland.

Infrastructure: A permanent guardpost to be constructed at a strategic location along the lower Simpali.

Incursion control: All encroachment along the Simpali, and on the east bank of the Kluet should be removed, and access to this block should be restricted to river traffic for legalized settlement west of the Kluet river.

## **Block 1.10 Muara Mungkap**

### **Status Report**

Rhino population: No rhinos survive. The habitat may have been degraded so much that most of this area can no longer be considered as potential rhino area.

Incursions: Massive and widespread, including commercial logging and establishment of plantations.

Protection: None to date.

### **recommendations**

Surveys: To assess the situation in this area.

Patrols: As part of patrols covering the block 2.6 inland.

Infrastructure: This area has a road connection and establishment of a regional post at a strategic location to support the staff at the permanent posts upstream along the Kluet river, and to provide support for the anti-poaching teams, is highly recommended. Fast and reliable river transport between this regional post and the guardpost is vital, and it should be investigated whether it is feasible to use a small hovercraft for transport of personnel and goods along the Kluet and some of its side rivers.

Incursion control: Ideally all encroachment along the Mungkap and the east bank of the Kluet, upstream from about the start of the trail to Pucuk Lembang, should be removed.

## Kluet tributaries series

**General:** Rhino are present in most of the blocks in this series, though there is very little information regarding the size of the population. In general the patrol teams have entered these areas along the rivers in the Kluet - West Coast blocks. Travel along the rivers is slow and often restricted by floods. Therefore the teams should develop routes along the watersheds that will allow them to spend more time in the rhino areas by reducing travel time.

Within these blocks the patrols should concentrate on the saltlicks along the rivers and on the watersheds, because that is where most rhino signs will be found and where rhino poaching might occur. Valley bottoms further inland are usually very narrow and rocky and are less attractive for rhino.

### Block 2.1 Kluet Inong

#### Status Report

Rhino population: Rhino have been recorded on the watershed with block 2.2.

Incursions: No information

Protection: Monthly anti-poaching patrols by the Kluet - 1 team.

#### recommendations

Surveys: The patrol team should also survey some of the ridges leading up to Mount Leuser, north of the Kluet Inong.

Patrols: The patrol team should spend more time surveying the watersheds, and a more southerly crossing of the coastal ridge might save considerable travel time.

Infrastructure: None

Incursion control: Incursions should be stopped at the Kluet river.

### Block 2.2 Sibongbong

#### Status Report

Rhino population: Rhino have been recorded on the watershed with block 2.1.

Incursions: No information

Protection: Only in the border with block 2.1

#### recommendations

Surveys: A general survey of the watershed between Sibongbong and Malui is recommended.

Patrols: A new team should be established to patrol this area. See also under 1.7.

Infrastructure: None

Incursion control: Incursions should be stopped at the Kluet river.

### Block 2.3 Hulu Malui

#### Status Report

Rhino population: Rhino have been recorded on the watershed with block 2.4.

Incursions: No information

Protection: Anti-poaching patrol every 2-3 months.

#### recommendations

Surveys: The watershed between Sibongbong and Simpali, above the Malui drainage, needs to be surveyed. There are likely to be important game trails crossing between the two major drainage.

Patrols: Frequency should be increased to monthly.

Infrastructure: None.

Incursion control: Incursions should be stopped at the Kluet river.

### Block 2.4 Mentok

#### Status Report

Rhino population: Rhino was recorded at saltlicks near the river, and on the watershed with block 2.3

Incursions: No information

Protection: Anti-poaching patrols about every two months.

#### recommendations

Surveys: It should be attempted to survey further upstream and to reach the border with block 3.5. A survey will be needed to determine the potentials for the establishment of a permanent guardpost at the Simpang Simpali, on the borders between the blocks 1.9, 2.4, and 2.5.

Patrols: frequency should be increased to monthly



Infrastructure: The Simpali is an important gateway into the heart of the National Park, and a permanent guardpost at Simpang Simpali may prove to be very valuable in protecting the hinterland. In case it is possible to use a hovercraft as far as Simpang Simpali the establishment of a permanent post should be possible.  
Incursion control: Incursions should be stopped at the Kluet river.

## **Block 2.5 [No appropriate name found]**

### **Status Report**

Rhino population: No information, but might be an important area. The area is crucial for the contact between the Kluet and the Mamas population.

Incursions: No information

Protection: None to date

### **recommendations**

Surveys: The area, and block 3.6, should be surveyed by a special survey team, preferably using helicopter dropping in block 3.6.

Patrols: Should start soon as possible, irrespective of the outcome of the survey. The area is of great strategic importance.

Infrastructure: None

Incursion control: Incursions should be stopped at the Kluet river.

## **Block 2.6 Mungkap**

### **Status Report**

Rhino population: No information, but most likely no longer present

Incursions: No information, but likely to be very widespread.

Protection: None to date.

### **recommendations**

Surveys: A general survey of the area is recommended.

Patrols: Initially only incursion control.

Infrastructure: If recommended by the survey.

Incursion control: Incursions should be stopped at the Kluet river.

## Leuser-Simpali series

**General:** The blocks in this series are among the remotest and most inaccessible parts of the Leuser Ecosystem. The rivers in this area are very deeply incised, the slopes are very steep and the ridges high and narrow. Sign of rhino were reported from an unspecified location in block 3.2, 3.3 or 3.4 by geologists prospecting in these areas in the 1970s.

The continued presence of rhino in these blocks is very likely, because of the isolation of the area, but it can be expected that the rhino habitats are fragmentary and that the overall density is low.

Surveying these blocks for the presence of rhino, and other important elements of the ecosystem, is highly recommended. A special team should be dropped by helicopter wherever natural landing sites can be found for general surveys of 4 to 7 days per location. The highest priority should be given to the southern blocks 3.5 to 3.7.

### Block 3.1 Pawoh Baro

#### Status Report

Rhino population: No information. If rhinos survive here it would be a very important area to link other remnant populations further north with the main population.

Incursions: No information

Protection: None to date

#### recommendations

Surveys: A ground survey by one of the Kluet teams.

Patrols: In case rhino presence is confirmed

Infrastructure: None

Incursion control: Incursion should be stopped in block 1.4.

### Block 3.2 Kelain

#### Status Report

Rhino population: No information, but presence at low density likely.

Incursions: Unlikely.

Protection: None to date.

#### recommendations

Surveys: Helicopter dropping survey by specialist team

Patrols: Probably not necessary

Infrastructure: None

Incursion control: Probably not necessary

### Block 3.3 Tupai

#### Status Report

Rhino population: No information, but presence at low density likely.

Incursions: Unlikely.

Protection: None to date.

#### recommendations

Surveys: Helicopter dropping survey by specialist team

Patrols: Probably not necessary

Infrastructure: None

Incursion control: Probably not necessary

### Block 3.4 Hulu Sibongbong

#### Status Report

Rhino population: No information, but presence at low density likely.

Incursions: Unlikely.

Protection: None to date.

#### recommendations

Surveys: Helicopter dropping survey by specialist team

Patrols: Probably not necessary

Infrastructure: None

Incursion control: Probably not necessary

### **Block 3.5 [No appropriate name found]**

#### **Status Report**

Rhino population: No information, but presence at low density likely. It would be very interesting to survey the area between this block and the Central Valley. The rhino population may be continuous.

Incursions: Unlikely.

Protection: None to date.

#### **recommendations**

Surveys: Helicopter dropping survey by specialist team, probably starting from block 4.4.

Patrols: Probably not necessary

Infrastructure: None

Incursion control: Probably not necessary

### **Block 3.6 [No appropriate name found]**

#### **Status Report**

Rhino population: No information, but presence at low density very likely.

Incursions: Unlikely.

Protection: None to date.

#### **recommendations**

Surveys: Helicopter dropping survey by specialist team

Patrols: Probably not necessary

Infrastructure: None

Incursion control: Probably not necessary

### **Block 3.7 Kukuran**

#### **Status Report**

Rhino population: No information, but presence at low density very likely.

Incursions: Unlikely.

Protection: None to date.

#### **recommendations**

Surveys: Helicopter dropping survey by specialist team

Patrols: Probably not necessary

Infrastructure: None

Incursion control: Probably not necessary.

### **Block 3.8 [No appropriate name found]**

#### **Status Report**

Rhino population: No information, but presence at low density very likely. Rhino trails cross into this area from block 4.7.

Incursions: Unlikely.

Protection: None to date.

#### **recommendations**

Surveys: Helicopter dropping survey by specialist team.

Patrols: Probably not necessary

Infrastructure: None

Incursion control: Probably not necessary

## Central Valley series

### Block 4.1 Blangbeke

#### Status Report

Rhino population: No rhinos surviving.

Incursions: No information

Protection: None to date

#### recommendations

Surveys: General survey recommended to assess conservation situation and to recommend on the location for a permanent guardpost.

Patrols: May be required to prevent incursions into the more remote parts of the Central Valley .

Infrastructure: The valleys of the Blangbeke and Alas rivers are very important gateways into the Central Valley and the Leuser massive. A permanent guardpost needs to be constructed at a strategic location to prevent incursions.

Incursion control: Once all settlements along the upper Alas have been relocated the dangers for incursions will be lessened. Nevertheless a strong presence near Blangbeke will be essential to protect the high-altitude ecosystems of the Leuser and the Kemiri mountains.

### Block 4.2 Pontan Dedelu

#### Status Report

Rhino population: Rhinos were recorded in low number in the 1970s, but are most likely exterminated by the rhino poachers from the Blankejeren area.

Incursions: No information

Protection: None to date

#### recommendations

Surveys: A general survey of the area is recommended.

Patrols: Probably not needed if the protection in block 4.1 has been established.

Infrastructure: None.

Incursion control: Incursions should be stopped at the mouth of the Blangbeke river, or better still at the location of the Angusan village, once this area has been reclaimed.

### Block 4.3 Hulu Ketambe

#### Status Report

Rhino population: No information, but most likely present in small numbers.

Incursions: Inaccessible

Protection: None to date

#### recommendations

Surveys: Helicopter dropping survey by specialist team

Patrols: Probably not necessary.

Infrastructure: None

Incursion control: Not needed, if both ends of the Central Valley are adequately covered..

### Block 4.4 Hulu Simpali

#### Status Report

Rhino population: Rhinos present in low density in the 1970s, and most likely still present.

Incursions: There are local rumors that rhino poachers have penetrated this area from the lower Mamas valley. Though this seems highly unlikely considering the nature of the terrain, some caution is recommended.

Protection: None to date

#### recommendations

Surveys: A helicopter dropping survey by a specialist team is highly recommended to establish the status of the rhino and the security situation.

Patrols: Probably not necessary.

Infrastructure: None

Incursion control: Not needed, if both ends of the Central Valley are adequately covered.

### Block 4.5 Sungai Markus

#### Status Report

Rhino population: Rhinos present, but no recent information on density.

Incursions: So far never recorded.

Protection: Only the eastern end is visited regularly by the Mamas teams.

**recommendations**

Surveys: A specialist team should survey the area in conjunction with the surveys of block 4.3. and 4.4, and from 4.6.

Patrols: Probably not necessary, except occasional checks on the entrance routes.

Infrastructure: None.

Incursion control: Not needed, if both ends of the Central Valley are adequately covered.

**Block 4.6 Mamas Aceh**

**Status Report**

Rhino population: Intensively studied in the late 1970s. Population reduced by past poaching, currently probably at below 50% of carrying capacity.

Incursions: Intensive poaching in the late 1980s.

Protection: Anti-poaching patrols twice monthly.

**recommendations**

Surveys: Well-known area

Patrols: Patrols should be extended to the area northeast of the Mamas valley, and into the lower Sungai Markus.

Infrastructure: None

Incursion control: The patrols are effective in controlling incursions.

**Block 4.7 Mamas Pawang**

**Status Report**

Rhino population: Intensively studied in the late 1970s. Population currently very low, and virtually absent from the southern parts because of intensive poaching in the past.

Incursions: Some poaching in the early 1970s, and massive poaching in the late 1980s.

Incursions for wildlife trapping and probably for gun-hunting have occurred recently.

Protection: Anti-poaching patrols twice monthly.

**recommendations**

Surveys: Well-known area

Patrols: Patrols should be extended to the upper Lukluk and to the watershed between the Pinus area and the Kompas drainage.

Infrastructure: None.

Incursion control: The patrols are effective in controlling incursions.

## Alas Valley series

The blocks along in the upper Alas valley and along the west side of the Alas valley are seriously endangered by encroachment and incursions. Nevertheless these blocks are critical for the expansion of the rhino population and therefore for the survival of the species in the Leuser Ecosystem.

Rhinos disappeared from all these blocks before the 1970s, and only occasionally stray rhinos, probably mainly coming down from the Kapi area, where recorded in the 1970s and 1980s.

The valley bottom and the lower slopes have been settled and everywhere the boundaries of the National park have been transgressed for several kilometers. To salvage these areas from total habitat destruction and to preserve them as rhino habitat, large scale evictions of illegally occupied National Park land and large scale resettlement of legal settlers to less ecologically sensitive areas will be needed in the very near future, in particular in the blocks 5.1 and 5.2.

Reclamation of the land and restoration of the habitat to support wildlife will require very large investments in manpower, infrastructure, and resettlement funds. These actions and activities have not been specified below, only recommended actions specifically designed for rhino protection are mentioned.

### Block 5.1 Gumpang

#### Status Report

Rhino population: Last recorded in the 1980s. Considering the topography of the area it was once a very important rhino area. Re-establishment of a resident rhino population is vital for the survival of the species

Incursions: Massive and widespread.

Protection: None to date

#### recommendations

Surveys: Rhino surveys not required.

Patrols: Not necessary until rhinos re-appear.

Infrastructure: See comments under 'general' above.

Incursion control: See comments under 'general' above.

### Block 5.2 Maluak

#### Status Report

Rhino population: Last recorded in the 1980s. Considering the topography of the area it was once a very important rhino area. Re-establishment of a resident rhino population is vital for the survival of the species

Incursions: Massive and widespread

Protection: None to date

#### recommendations

Surveys: Rhino surveys not required.

Patrols: Not necessary until rhinos re-appear.

Infrastructure: See comments under 'general' above.

Incursion control: See comments under 'general' above.

### Block 5.3 Ketambe

#### Status Report

Rhino population: Last recorded in the early 1980s. A critical migration area between the Mamas mountains and the upper Alas valley and Kapi Plateau. There may have been a small resident population, but the area of suitable habitat is very restricted.

Incursions: No encroachment and limited incursions along the river.

Protection: Comparatively well protected by the presence of guards and scientists at the Ketambe Research Station. Additionally the aquatic resources are protected by the guard posts and staff of the fisheries project.

#### recommendations

Surveys: None required

Patrols: Not necessary until rhinos re-appear.

Infrastructure: No new infrastructure required.

Incursion control: To be eliminated by intensified patrolling.

## **Block 5.4 Caras**

### **Status Report**

Rhino population: The ridges leading from the Gunung Mamas to the mouth of the Mamas and to the mouth of the Ketambe were very important migration routes for rhinos and other wildlife, especially elephants, until the rhinos were exterminated in the 1960 or earlier.

Incursions: Large scale all over the lower parts of the slopes.

Protection: None to date

### **recommendations**

Surveys: None required

Patrols: Not necessary until rhinos re-appear.

Infrastructure: See comments under 'general' above.

Incursion control: All activities on the slopes above 500 m altitude should be prohibited.

## **Block 5.5 Mamas**

### **Status Report**

Rhino population: Last recorded in the 1970s. Considering the topography of the area it was once a very important rhino area. Re-establishment of a resident rhino population is vital for the survival of the species

Incursions: Some encroachment along the river and widespread incursions for extractive activities.

Protection: The aquatic resources are protected by the guard posts and staff of the fisheries project.

### **recommendations**

Surveys: General survey to assess the status of the habitat, giving special attention to the saltlicks along the river, is highly recommended.

Patrols: One new patrol group to be established, concentrating on the upstream parts of the area and on potential access routes to blocks 4.5 and 4.6.

Infrastructure: A permanent guardpost at a strategic location, allowing frequent control of the most important saltlicks in the area should be established.

Incursion control:

## **Block 5.6 Nimber**

### **Status Report**

Rhino population: No rhinos present. No historic information. The area is probably less important for rhino conservation than the other blocks in the series, because the terrain does not provide much rhino habitat. nor does it allow easy access to the rhino areas beyond.

Incursions: Massive on the lower slopes.

Protection: None to date

### **recommendations**

Surveys: None recommended

Patrols: Not necessary until rhinos re-appear.

Infrastructure: See comments under 'general' above.

Incursion control: See comments under 'general' above.

## **Block 5.7 Uning Sigugur**

### **Status Report**

Rhino population: No rhinos present. Rhino poaching occurred in the 1960s. At the edge of the valley there are important saltlicks, and this is the only place in the Alas valley where elephants survive. The area contains the vital access route to the upper Mamas, the blocks 4.7 and 4.7.

Incursions: Massive encroachment on the slopes till above 1000 m altitude. Widespread incursions.

Protection: The access route to the mamas is patrolled twice monthly.

### **recommendations**

Surveys: None needed.

Patrols: Adequately covered

Infrastructure: A permanent guardpost should be established at the transition of the bufferzone and core area, once identified, to provide permanent protection to one of the most important routes to the heartland of Leuser.

Incursion control: As above

## Kompas-Bengkung series

All areas had rhinos in the 1970s, and are among the best rhino habitat available in the Leuser Ecosystem. The area is under attack from commercial logging, transmigration, road construction and many other activities.

Encroachment and incursions should be stopped in all these areas by the establishment of a series of permanent guard posts. Anti-poaching teams should be stationed in these blocks, especially to recent incursions into the block to the north where rhinos do occur.

### Block 6.1 Lukluk

#### Status Report

Rhino population: No rhinos present.

Incursions: Massive, in particular on the east side of the river. Several times this area has been identified for settlement, especially for opening up of paddy fields in the swamps on the border with block 4.7. This would greatly endanger the rhino population in the Mamas.

Protection: None to date

#### recommendations

Surveys: None recommended.

Patrols: Because this area forms another potential access route to the rhino areas further inland an anti-poaching team should make periodical checks. It is recommended to add one team to cover the blocks 6.1 to 6.3 with the existing Kompas Team.

Infrastructure: Establishment of a permanent guardpost at the junction of the Kompas and the Lukluk rivers is vital for stopping further incursions in the direction of the rhino areas.

Incursion control: As above

### Block 6.2 Kompas

#### Status Report

Rhino population: Rhinos present in the 1970s. Now probably only occasionally found in the western part.

Incursions: No information

Protection: Monthly patrols along the Kompas river by the Kompas team.

#### recommendations

Surveys: None needed.

Patrols: A new anti-poaching team should be established to assist in the patrolling of the 6.1. to 6.3 blocks. The patrol teams should also inspect the important watershed between the Kompas and the Lukluk rivers, because this ridge is a well-known entrance route to the Pinus-Mamas area.

Infrastructure: See under 6.1.

Incursion control: see under 6.1

### Block 6.3 [No appropriate name found]

#### Status Report

Rhino population: Rhinos present in the 1970s. No recent information. The northern part might still be visited occasionally. An important area for early range extension of the rhino, and for other wildlife.

Incursions: No information

Protection: None to date

#### recommendations

Surveys: General survey to assess the habitat and the conservation status.

Patrols: A new anti-poaching team should be established to assist in the patrolling of the 6.1. to 6.3 blocks.

Infrastructure: None required

Incursion control: Through permanent guardposts covering 6.2 and 6.4.

### Block 6.4 Hulu Bengkung

#### Status Report

Rhino population: Rhinos present in the 1970s. No recent information. An important area for early range extension of the rhino, and for other wildlife.

Incursions: No information

Protection: None to date



**recommendations**

Surveys: General survey to assess the habitat and the conservation status.

Patrols: If recommended after the survey.

Infrastructure: the establishment of a permanent guardpost at the junction of the Bengkung and the unnamed northern tributary is highly recommended.

Incursion control: Through permanent guardpost.

**Block 6.5 Bukitpanji**

**Status Report**

Rhino population: No information. Undoubtedly formerly prime rhino habitat.

Incursions: No information

Protection: None to date

**recommendations**

Surveys: General survey to assess the habitat and the conservation status.

Patrols: If recommended after the survey.

Infrastructure: None

Incursion control: Through permanent guardposts in 6.4, 1.10, and outside the rhino area.

## Kapi Plateau series

The Kapi Plateau was once an area with a very good rhino population, probably higher than average because of the young volcanic soils that occur in this area. The Kapi Plateau has been the hunting area for the Gayo rhino poachers for decades, and now rhinos have been exterminated.

This area provides the best habitat for rhino after the Mamas - Bengkung-Kluet area in the south. Re-establishment of rhino in this area is vital for attaining the Minimum Viable Population and for the future spread of the rhino throughout the Leuser Ecosystem.

If any rhinos survive east of the Alas valley their numbers are most likely not sufficient to form a solid basis for the re-population of the Kapi and Lesten areas in the near future. Therefore the connection with the other rhino populations through the Upper Alas and Mamas Valley is deemed crucial for the success of the Rhino Conservation Strategy.

Elimination of encroachment and incursions in these blocks will require considerable input of infrastructure and manpower, and here only activities specifically designed for rhino conservation have been included.

### Block 7.1 Utung

#### Status Report

Rhino population: No information available. Undoubtedly formerly prime rhino habitat.

Incursions: No information

Protection: None to date

#### recommendations

Surveys: General survey to assess the habitat and the conservation status.

Patrols: If recommended after the survey.

Infrastructure: If recommended after the survey.

Incursion control: Through a network of permanent guardposts.

### Block 7.2 Empan

#### Status Report

Rhino population: No information available. Undoubtedly formerly prime rhino habitat.

Incursions: No information

Protection: None to date

#### recommendations

Surveys: General survey to assess the habitat and the conservation status.

Patrols: If recommended after the survey.

Infrastructure: If recommended after the survey.

Incursion control: Through a network of permanent guardposts.

### Block 7.3 Panguh

#### Status Report

Rhino population: Rhinos present till the 1980s, now exterminated.

Incursions: No information

Protection: None to date

#### recommendations

Surveys: General survey to assess the habitat and the conservation status.

Patrols: If recommended after the survey.

Infrastructure: If recommended after the survey.

Incursion control: Through permanent guardposts in 5.1 and 5.2.

## Upper Lesten series

Access to these blocks is difficult to very difficult, and rhino may have survived in some of the highland valleys.

### Block 8.1 Lesten

#### Status Report

Rhino population: Rhinos present in the 1970s. No recent information.

Incursions: No information

Protection: None to date

#### recommendations

Surveys: general survey to assess the habitat and wildlife situation.

Patrols: If recommended after the survey

Infrastructure: A permanent guardpost further downstream along the Lesten river may be recommended in the future.

Incursion control: As above.

### Block 8.2 Uning Tualang

#### Status Report

Rhino population: Never surveyed, and almost inaccessible over land.

Incursions: Probably none

Protection: None to date

#### recommendations

Surveys: A helicopter dropping survey by a specialist team is recommended.

Patrols: Probably not needed.

Infrastructure: Not needed.

Incursion control: As above

### Block 8.3 Hulu Lesten

#### Status Report

Rhino population: Never surveyed, and almost inaccessible over land.

Incursions: Probably none

Protection: None to date

#### recommendations

Surveys: A helicopter dropping survey by a specialist team is recommended.

Patrols: Probably not needed.

Infrastructure: Not needed.

Incursion control: As above

## Summary of Recommendations

### New Anti-poaching Patrols

New anti-poaching units are recommended for the following areas:

#### West

- ❑ One team to patrol block 1.7, 1.8 and 2.2 (Establish as soon as possible).
- ❑ One team to patrol 2.5 and 2.6 and assist the present team in 1.9 (Establish as soon as possible).

#### Central

- ❑ One team in block 4.1 (and 4.2) if survey establishes need.
- ❑ One team in block 5.5, specifically to cover the upstream areas and potential routes into the Central Valley (Establish as soon as possible).
- ❑ One team for blocks 6.1, 6.2, and 6.3, to supplement the current Kompas Team (Establish as soon as possible).
- ❑ One or two teams may be required for the blocks 6.3, 6.4 and 6.5, once the areas have been surveyed.

#### East

- ❑ Two or three teams may be necessary for blocks 7.1, 7.2, 7.3, and 8.1, once the areas have been surveyed.

### General Ground Surveys

These surveys should be carried out by the anti-poaching teams and the Field Supervisors and Instructors teams, if necessary supplemented with other LDP staff.

#### West

- ❑ Establish state of rhino population in block 1.1, followed by surveys in 1.2 to 1.5 if a resident rhino population is confirmed in 1.1.
- ❑ Establish state of rhino population in block 3.1
- ❑ Survey of strategic locations for permanent guardposts in blocks 1.6, 1.7, 1.8, 1.9, 1.10, and possibly also at Simpang Simpali on the boundary between 1.9, 2.4 and 2.5.
- ❑ Survey main rhino trail system in 2.2 and 2.3.
- ❑ General wildlife and conservation status survey in 2.6.

#### Central

- ❑ General wildlife and conservation status survey in 4.1 and 4.2
- ❑ Survey of strategic locations for permanent guardposts in blocks 4.4 (Alas Angusan), 5.5 (Mamas river)
- ❑ General wildlife and conservation status survey in 5.5, with special attention for the saltlicks and possible access routes to 4.6 and 4.5.
- ❑ General wildlife and conservation status survey in 6.3, 6.4 and 6.5.

#### East

- ❑ General wildlife and conservation status survey in 7.1, 7.2 and 7.3
- ❑ General wildlife and conservation status survey in 8.1.

### Specialist helicopter surveys

These surveys to be conducted by the LDP Specialist Staff and the Consultant Rhino Conservationist, with assistance from selected members of the anti-poaching teams. Teams will be dropped at an appropriate natural landing site and survey the area for 4 to 7 days.

#### West

- ❑ Establish state of rhino population in blocks 3.2 and 3.3.
- ❑ Establish state of rhino population in blocks 3.4.

- ❑ Establish state of rhino population in blocks 3.5, probably in combination with a survey of 4.4 (High priority).
- ❑ Establish state of rhino population in blocks 3.6 and 2.5 (High priority).
- ❑ Establish state of rhino population in blocks 3.7 and 3.8 (High priority).

Central

- ❑ Establish state of rhino population in blocks 4.3, 4.4, and 4.5 (High priority).

East

- ❑ Establish state of rhino population in blocks 8.2 and 8.3 (High priority).

## Permanent Guard posts

West

- ❑ Block 1.6, along Upper Kluet near Muara Ramai.
- ❑ Block 1.7, at Muara Sibongbong
- ❑ Block 1.8, at Muara Malui
- ❑ Block 1.9, at Muara Simpali
- ❑ Block 1.10, Regional Post with road access.

Central

- ❑ At Blangbeke - Alas Angusan.
- ❑ Block 5.5, at a strategic location 2-3 km upstream from the bridge.
- ❑ Block 5.7, at the boundary of the core area to guard the upper Mamas trail.
- ❑ Block 6.1, 6.2, at the junction of the Kompas and Lukluk rivers.
- ❑ Block 6.4, at the junction of the Bengkung and the unnamed norther tributary.

East

- ❑ Block 8.1, or further downstream along the Lesten river, if recommended after survey.