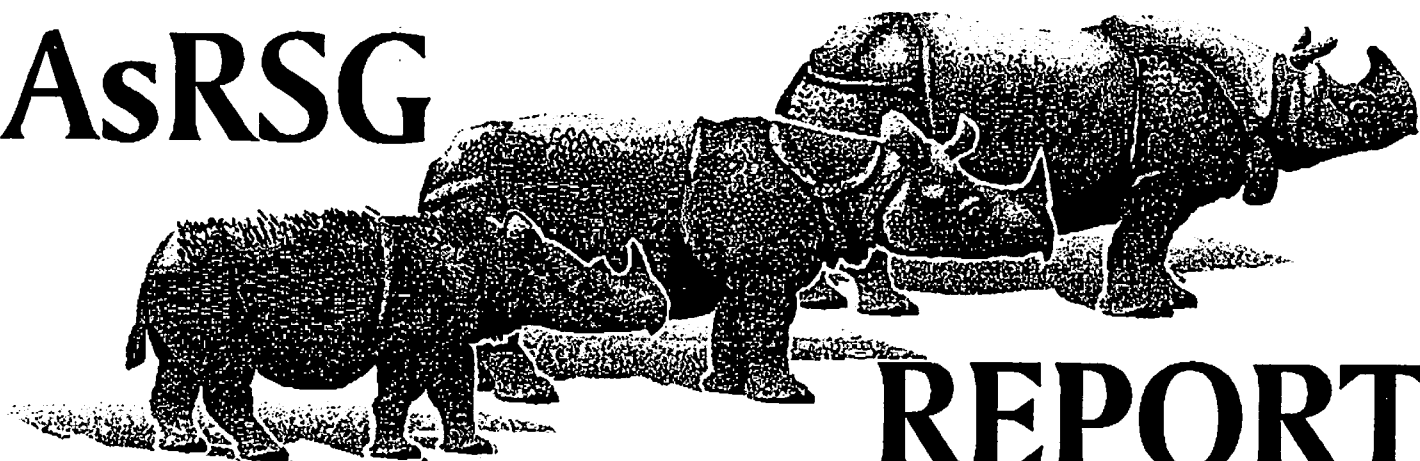


AsRSG



REPORT

UJUNG KULON NATIONAL PARK Javan Rhino - Current Status, Protection, and Conservation Management

**Dr. Nico J. van Strien
Drs. Haerudin R. Sadjudin**

November 22, 1995

AsRSG

IUCN SSC Asian Rhino Specialist Group

**UJUNG KULON NATIONAL PARK
Javan Rhino - Current Status, Protection,
and Conservation Management**

**Dr. Nico J. van Strien
Drs. Haerudin R. Sadjudin**

**IUCN SSC Asian Rhino Specialist Group Report,
November 22, 1995**

CONTENTS

1	BACKGROUND	2
2	OBSERVATIONS AND RECOMMENDATIONS	5
3	DEVELOPMENT OPTIONS	14
3.1	ISTHMUS PROTECTION ZONE	14
3.2	INTENSIVE PATROL ZONE	20
3.3	COASTAL ZONE MONITORING SYSTEM	20
3.4	GUN CONTROL AND LAW ENFORCEMENT	21
4	COST ESTIMATES	22
	APPENDIX 1 JAVAN RHINO ACTION PLAN	24
	APPENDIX 2. EVALUATION OF ACTION PLAN RECOMMENDATIONS	29

PREFACE

At the suggestion of the Indonesian Rhino Conservation Officer (RCO), Drs. Widodo S. Ramono, and with the permission of the Director General of Forest Protection and Nature Conservation (DirJen PHPA), Ir. Soemarsono, and assisted in the field by the Head of Ujung Kulon N.P., Ir. Agus Sriyanto, two members of the Asian Rhino Specialist Group (AsRSG) conducted a short reconnaissance mission to the Ujung Kulon National Park (UKNP), West Java, Indonesia.

The purpose of the mission was to gather information on the current status and protection of the Javan Rhino in UKNP in preparation for the 1995 AsRSG Meeting, at Sandakan, Malaysia, 29 November - 2 December, where an updated Asian Rhino Action Plan will be discussed. The status and conservation of the Javan Rhino, the rarest of the rhino species, will be an important topic of discussion, and special attention will be given to the prospects for the establishment of additional populations outside UKNP.

Dr. Nico J. van Strien (AsRSG Programme Officer) and Drs. Haerudin R. Sadjudin (AsRSG Member and Programme Officer of *Yayasan Mitra Rhino - YMR*) visited UKNP on 3-5 October 1995, to meet Park Staff, to visit the Park Headquarters at Labuan, and guard posts at Tamanjaya, Handeuleum, Karangranjang and Kalejetan.

During the past 18 years both Dr. van Strien and Drs. Haerudin have frequently visited UKNP for short and long term assignments, and have been intensively involved with the design and implementation of the Indonesian Rhino Conservation Strategy and various Rhino Conservation Projects in Indonesia and in South-East Asia.

1 BACKGROUND

The Javan (or lesser one-horned) Rhino (*Rhinoceros sondaicus*) is the rarest Rhino species. World wide only about 70 individuals survive, 50 of which are in UKNP, the remainder in Vietnam.

Ujung Kulon National Park is a long established conservation area and its topography makes protection of the rhinos against poaching comparatively easy.

The Javan Rhino has found a safe refuge in UKNP for many years, but the area is too small for a large population, and the Park cannot be expanded on the densely populated island of Java.

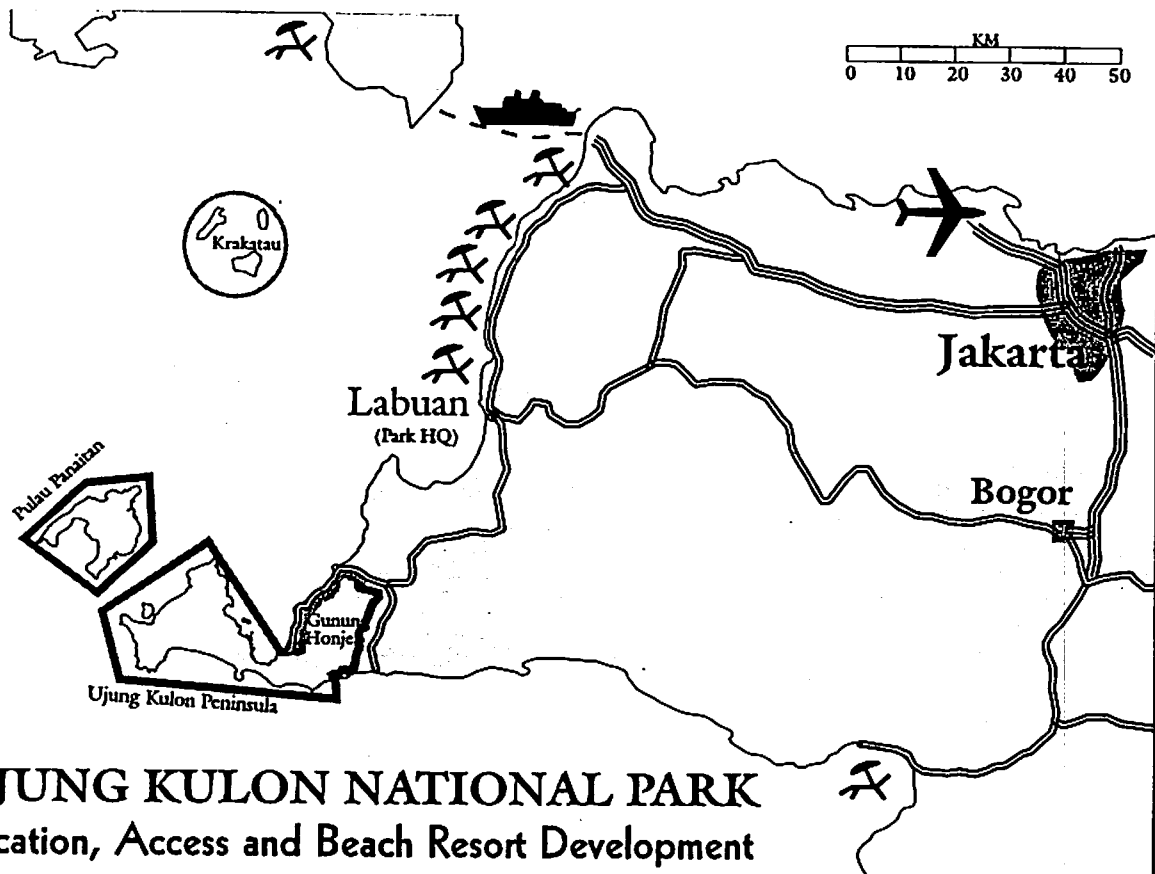
To enhance the long term survival of the Javan Rhino the world population should be allowed to expand, which can only be done through the establishment of other populations within the historical range of the species.

Since UKNP it is the only source of animals for the establishment of other populations, protection of this unique resource has the highest priority. Achieving the best possible protection for this population is the primary objective of the Javan Rhino conservation strategy.

UKNP is one of the most famous conservation areas in Southeast Asia. The Javan Rhino and the pristine landscape of UKNP, located near one of the fastest growing population centres of SE Asia, are very valuable assets and should be utilized sustainably to generate income for conservation through ecotourism development.

Northwestern Java is rapidly developing into a centre of industry with many new population centres, and a highway link to Jakarta. The West coast of Java is being developed for beach recreation on a very large scale, with several very large resorts currently under construction.

These developments will lead to a growing number of tourists and recreationists that are interested in visiting UKNP, and the prospects for revenue generating ecotourism are very good. Well-guided ecotourism development could become a major source of income for the Park.



UJUNG KULON NATIONAL PARK

Location, Access and Beach Resort Development

The Indonesian Rhino Conservation Strategy, drafted at an international Rhino Conservation Workshop in 1991, gives detailed recommendations for the protection of the current Rhino population in UKNP and provides the protocols and preconditions for the establishment of additional populations elsewhere. The **Javan Rhino Action Plan** in the Rhino Strategy (See Appendix 1 for the complete text) contains the following elements:

- I. **CONSERVATION OF THE JAVAN RHINO IN UJUNG KULON**
 - A. *Strengthening of Park management and administration unit.*
 - B. *Park protection and intensive patrolling.*
 - C. *Law enforcement.*
 - D. *Education and awareness programme.*
 - E. *Rhino units.*
 - F. *Wildlife tourism.*
 - G. *Development of Gunung Honje as Javan Rhino habitat extension.*
 - H. *Research programme for Ujung Kulon.*

1. *Population survey and trend of Javan Rhino in Ujung Kulon National Park.*
2. *Research on biology and ecology of Javan Rhino in Ujung Kulon.*

II. **TRANSLOCATION OF JAVAN RHINO TO ESTABLISH A SECOND POPULATION**

A. *Preconditions.*

1. *Source population - Ujung Kulon.*
2. *Potential areas for translocation.*
3. *Feasibility study on suitability of habitat at re-introduction area/site.*
4. *Develop the management structures for a second population.*

B. *Javan Rhino capture management programme.*

2 OBSERVATIONS AND RECOMMENDATIONS

Observation

Recommendation

Rhino Conservation Coordination

As recommended in the Rhino Strategy the Indonesian Government has appointed a Rhino Conservation Officer (RCO) from PHPA staff in 1994. The position is mainly titular, without a functional and structural embedding in PHPA structure.

To improve the effectiveness of the RCO position, establishment of a functional and structural complement at an appropriate level within the regular PHPA structure.

The RCO has no formal presence in the management structure of the various Rhino Conservation Areas.

Establishment of a formal link between the RCO and the Management of the Rhino Conservation Areas, with participation in meetings and workshops, and with exchange of reports and workplans.

The Rhino Strategy recommends the establishment of 'The Advisory Board of the Indonesian Rhinoceros Foundation' [= YMR]. An Advisory Board has been incorporated in the statute of YMR, but the Board has not yet been inaugurated.

Establishment of the YMR Advisory Board as prescribed in the Statutes. Nominated members to be invited for a inauguration meeting.

Javan Rhino Status

The comprehensive population survey of the Javan Rhino in UKNP with photo registration, conducted by WWF Indonesia Program, has been completed in 1993. The study estimated the number of rhinos present to be between 37 and 58, with a median of 48 and approximately even sex ratio. The carrying capacity was estimated to be 80.

The track measurement technique currently employed and the evaluation method could be refined to improve accuracy. A workshop with national and international experts, followed by a field test and training session, is recommended to design the improved standard census method.

Since the photo census no regular track count census has been conducted, though one is planned in the current financial year.

Monitoring of the Rhino population should be done minimally on a bi-annual basis, using standard procedures and techniques.

Observation

The JAVAN RHINO ACTION PLAN was drafted in 1991. Some of the recommendations, with respect to studies and management of the existing UKNP, have been implemented. On others limited action has been taken.

The small size of the population and the lack of further data on the population trend since early 1993 precludes a translocation program at present. Removal of 5 to 10 animals from the population would be considered to be an unacceptable drainage of the founder population. Nevertheless the problem of a too small population in too small an area is real and the international conservation community needs to continue to look for realistic and practical solutions

A Javan Rhino Population Viability Analysis (PVA) was last conducted in 1989. The recommendations, including the removal of 18-26 individuals from UKNP, were not well received.

Recommendation

Evaluation of the effect of the strategies, policies and action plans, and assessment of the progress made to achieve the objectives are essential elements in the conservation planning process.

It is recommended to review the Action Plan during the AsRSG Meeting to evaluate the progress to-date. For this purpose an evaluation matrix is presented in APPENDIX 2.

As an alternative to direct translocation to a new site, the establishment of a JAVAN RHINO SANCTUARY (JRS) in UKNP can be considered. The presence of the sanctuary would enhance the protection of the Rhinos, would allow expansion of rhino population in a part of the Park that is currently under-utilized, and could produce offspring for translocation, with minimal risks for the founder population. For more details see Chapter 3.1 , page 14.

During the AsRSG Meeting in Sandakan, Malaysia, the PVA should be reviewed, using the most recent figures for the UKNP population, and including the JRS option.

Observation

Recommendation

Javan Rhino Population and Poaching

The available data on the size of the rhino population in UKNP indicate a stabilization of the population at a level of about 50, since the mysterious disease episode of 1982. Before 1982 the population increased gradually to a number of 65 or even more. The population appears not to have recovered well from the setback in 1982.

Poaching of Javan rhino in UKNP has occurred over the past years. The most recent case, that became known, occurred in 1994. At least one rhino was killed and its horn was sold, and there have been numerous cases of illegal entry into the Park. No illegal entry and poaching of rhino have reported in 1995.

A (unknown) number of rhinos has been lost to poaching over the last 10 years, certainly contributing to the bad recovery of the population. Nevertheless the improved infrastructure and management of UKNP appears to have succeeded in reducing the poacher's chances.

The perceived poor recovery of the population could be caused by a number of factors like: inaccuracies and inconsistencies in census methods; continued poaching; habitat changes; imbalance in sex and/or age structure; disease, etc. None of these can be indicated as the sole or leading cause.

It is recommended to encourage research programmes on the rhino in Ujung Kulon and to intensify monitoring of the population. Also more accurate census methods should be developed.

It is still possible for the determined poacher to enter the UKNP unobserved and to operate inside the Park undetected. The current system of guard posts and patrols is not sufficient to eliminate illegal entry and needs reinforcement.

A healthy, expanding population in UKNP is required for the fulfillment of the long-term action plans, in particular for the establishment of new populations elsewhere. Emphasis should be placed on:

- Elimination of poaching;
- Habitat management after thorough pilot studies;
- Expansion of available habitat in Honje area.

Observation

Factors that are important in the control of rhino poaching are:

- (A) Access to the Park via
 - (1) the Isthmus between UK and the mainland,
 - (2) the Selamat Datang bay between UK and the mainland;
- (B) Limited presence of guards in the area most vulnerable to poaching (the south-eastern quarter);
- (C) The availability of locally produced guns and ammunition.
- (D) Outsiders offering incentives to villagers to poach rhinos.

It appears that poachers, usually from villages near to the Park, prefer to enter the reserve over land across the isthmus. Though the isthmus is less than two km wide, it is heavily forested and poachers can easily avoid the guardpost. The patrol path across the isthmus is not optimally utilized allowing trespassers to enter the park undetected.

Cases of rhino poaching are rarely brought to justice, usually because of lack of strong evidence. In 1994 the Park staff collected a large amount of rhino bones, presumably from a poached rhino. In cooperation with the army and police a number of suspects were interrogated, but those responsible were not identified and no prosecution was made.

Recommendation

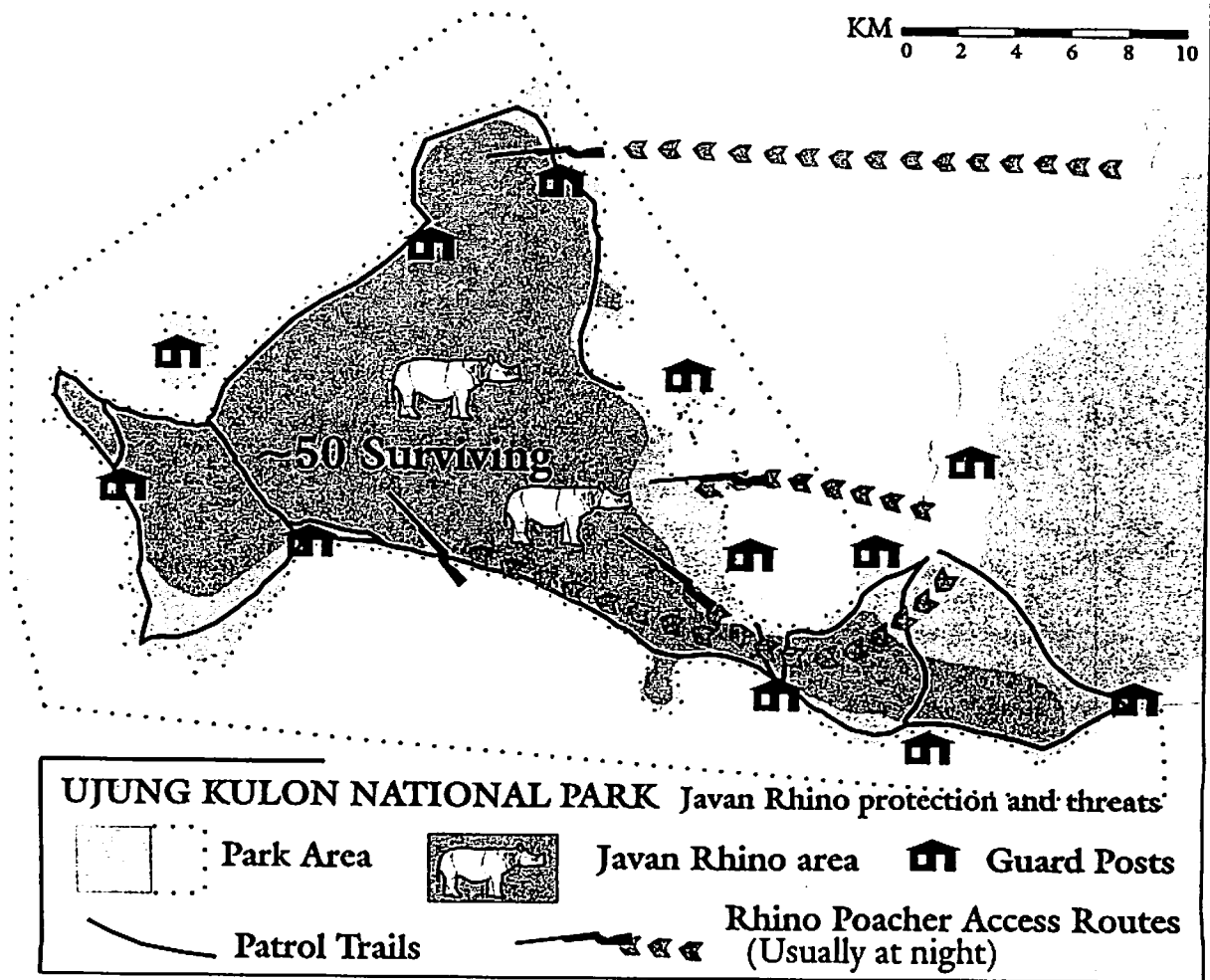
To improve the protection of the rhinos against poaching the following programmes are recommended:

- 1- Isthmus Protection Zone, to prevent access over land;
- 2- Coastal Zone Monitoring System, to prevent access over sea;
- 3- Intensive Patrol Zone, to Control the main poaching area;
- 4- Gun Control and Law Enforcement, to reduce the availability of firearm for potential poachers, and to ensure prosecution of offenders.

Details of the 4 programmes are given below.

Better protection of the isthmus, and the potential rhino habitat in the Honje area, has the highest priority. Because protection measures will have ecological consequences for the habitat and the rhinos, three options, providing varying degrees of protection, in combination with other benefits, are proposed.

Lax law enforcement and lenience towards poachers will encourage new ventures. Park staff, with assistance of the legal departments of PHPA and Forestry, should press for charges against poachers, whenever possible.



Observation

Recommendation

Park Management and Infrastructure

Park Headquarters are located in Labuan, several hours travelling from the Park. Although radio communications are excellent, the large distance limits the possibilities for the Management Staff to be present in the Park for guidance and supervision.

To improve communications between field and HQ staff and to intensify guidance and supervision it is recommended to establish a Mobile Team (MT), from among the senior staff of the UKNP. The MT would function directly under the Head of the National Park and would be his 'eyes, ears and voice'.

Observation

Several new Guardposts have been established in recent years, and facilities in the locations are gradually being brought up to standard. In the area of concern only the Cangkudu guardpost has not yet been established. In general the facilities for the guards have improved greatly, though some are not fully utilized.

Recently the Park boundary in the bay between UK and the mainland has been relocated to a new location further away from the shore (See the map on page 13). Part of the boundary has been marked with a light and boys. Control of the sea boundary is mainly the task of the post on Handeuleum island. The post is equipped with a fast boat, but there are no night time patrols.

Patrol trails exist around most of the peninsula. But in the area where rhino poaching and illegal entry is most likely to occur (between Cigenter and Cibandawoh) there is no patrol trail. (See the map on page 9)

Recommendation

The MT could consist of three persons with complementary expertise. The MT members would be stationed fulltime in the Park, be free to travel in all areas inside and outside the Park, and be responsible to the Head of UKNP only. The RCO will provide technical assistance to the MT.

For a better protection of the rhino area the establishment of the Cangkudu guardpost is urgently needed. It is essential that all posts are manned continuously.

There is still illegal fishing, including dynamite fishing, inside the Park boundary, usually at night. Also poachers can easily cross the bay at night. Therefore it is necessary to increase the capability to monitor traffic inside the sea boundary, especially at night time. Fast patrol boats, with strong search lights, should be on standby 24-hours to prevent illegal entry across the seaward boundary (See chapter 3.3 for details).

To be able to patrol the rhino poaching area more effectively it is recommended to establish a new patrol trail between Cigenter and Cibandawoh as part of the development of the Intensive Patrol Zone. See also Chapter 3.2 page 20)

Observation

There are only two functioning firearms in UKNP and it is difficult to obtain ammunition.

Rhino poaching and game hunting is done with locally made front-loader guns. Confrontations of armed poachers and unarmed guards have taken place.

Recommendation

Game guards should be able to carry arms, when they are likely to encounter armed intruders.

It is recommended that the Park acquires a sufficient number of light guns and ammunition to issue to patrols when needed.

Ecotourism

Currently small-scale ecotourism is being developed and run by a private company that is operating under an informal agreement. Though reporters did not make an in-depth study of all the facilities it appears that:

- (a) the full potential of UKNP is not being developed; and
- (b) there is no direct benefit for the Park in the form of sharing of revenues.

The new beach resort development on the west coast of Java will vastly increase the number of tourists and recreationists, and therewith the number of potential visitors to UKNP.

There is a vast potential for sustainable ecotourism in UKNP, but more attention should be given to development with direct financial benefit for the Park. Only then will development be sustainable and beneficial for conservation.

The JAVAN RHINO SANCTUARY, proposed as one of the options for the Isthmus Protection Zone (See page 14) could become a major attraction and generator of revenues for rhino conservation.

It is recommended to evaluate the effects, the benefits and the institutional basis of the current ecotourism development. The AsRSG could be requested to carry out an independent review.

The Park and the investors should anticipate the increased demand and produce a comprehensive ecotourism development plan, aiming at sustainable high-class developments and a high return of earnings for conservation and resource management. It is recommended to involve a reputable international ecotourism developer to ensure that the planned developments can compete on the international market.

If accepted the JRS could be developed in a similar fashion as the Sumatran Rhino Sanctuary in Way Kambas, in partnership with national and international conservation bodies, and with dedicated ecotourism facilities to enable financial self-support.

Observation

There are currently 116 employees in UKNP, of which 31 are stationed in Labuan (Park HQ). The office/field ratio is 1:2.7, very good in comparison with other Parks in Indonesia. Facilities are adequate to good in most locations and the field staff receives considerable incentives in the form of hardship and field allowances.

The functional status of the majority of the field personnel is still comparatively low. So far only two guards have attained the highest grade (PPNS). Two more are in process of being upgraded

It appears that work attendance at the guardposts is less than optimal. Officially each post is manned with 5 employees, but during the survey the number actually present at the duty station varied between 2 and 0. The other were absent on assignments outside their area of duty or were on scheduled or unscheduled leave.

The communications system between HQ and the field posts is excellent, and gradually all stations are being converted to solar power.

Patrols are seen as the main duty of the personnel at the various guardpost, and in theory each week two to three days are spent on patrols. Though the guards are obviously much more active outside the guardpost compound than previously, patrolling is still largely routine, following the existing patrol trails. It appears that areas away from the trails along the coast are infrequently patrolled.

Recommendation

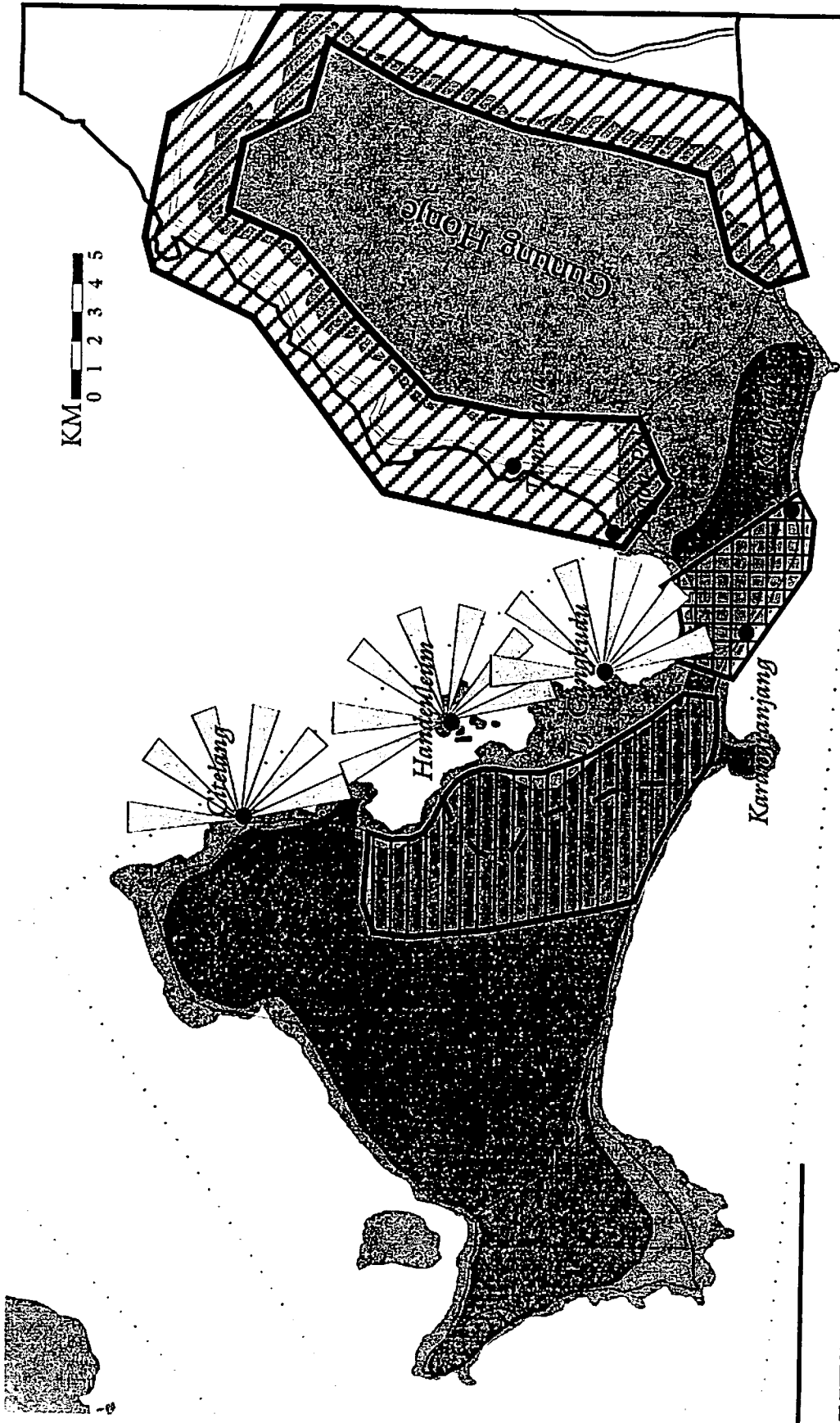
There is a danger that the new, spacious office in Labuan will be a stimulus for increase in HQ staffing. It is recommended to increase the number of field staff and to decentralize facilities and responsibilities as much as possible. Ideally the office/field ratio could be 1:5 or better.

It is recommended that the training of guards is accelerated. Ideally each guardpost should have at least one fully authorized guard.


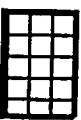

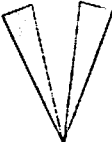
It is recommended that guardposts are properly manned at all times (minimal 3 at any time), to enable the guards to carry out their patrols. Good rosters for leave and holidays and strict controls are essential to control absenteeism.

The communication facilities for the field patrols should be optimized.

Patrols can only be effective if they cover all the vulnerable areas, and are not limited to walking along the well-known trails. It is recommended to establish a good patrolling roster, with a random selection of areas to be covered, both near and far from the posts and trails. Priority should be given to the area most vulnerable to poaching, the Intensive Patrolling Zone (See the map on page 13)



UJUNG KULON NATIONAL PARK - Proposed Rhino Protection Measures

-  Intensive Patrol Zone, with new Patrol Trail
-  Isthmus Protection Zone
-  Gun Control and Law Enforcement
-  Coastal Zone Monitoring System

3 DEVELOPMENT OPTIONS

To improve the protection of the rhinos against poaching the following programmes are recommended:

- 1 **Isthmus Protection Zone**, to control access over land;
- 2 **Coastal Zone Monitoring System**, to control access over sea;
- 3 **Intensive Patrol Zone**, to monitor the main poaching area;
- 4 **Gun Control and Law Enforcement**, to reduce the availability of firearm for potential poachers, and to ensure prosecution of offenders.

3.1 Isthmus Protection Zone

Better protection of the isthmus, and the potential rhino habitat in the Gunung Honje area, has the highest priority. Any protection measure in the Isthmus area will have ecological consequences for the habitat and for the rhinos. Therefore three options, providing varying degrees of protection, in combination with varying ecological consequences and side-benefits, are proposed.

Also combinations of elements of the options could be considered, though the ones presented here appear to be the most practical and cost-effective solutions.

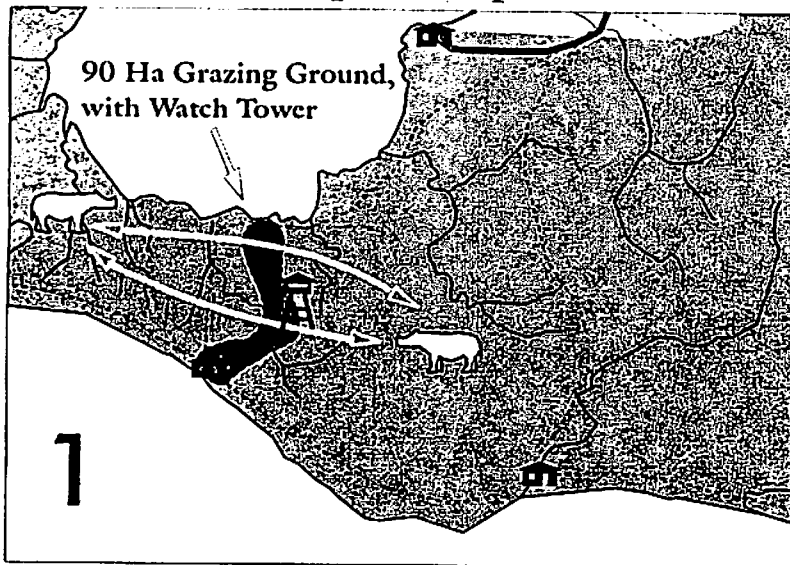
The proposed protection measures for the Isthmus Protection Zone are:

- 1 Establishment of a grazing ground across the peninsula, with watch towers at strategic locations.
- 2 Erection of an electric fence across the peninsula, with a small grazing-ground in the middle, with a watch tower, to allow animal movement.
- 3 The establishment of a Javan Rhino Sanctuary in the area east of the Isthmus, enclosing the good rhino habitat east of the Isthmus

Maps with a short description of the three options are shown on page 15. An evaluation matrix of the three options is presented on page 19.

ISTHMUS PROTECTION ZONE

Suggested Development Options



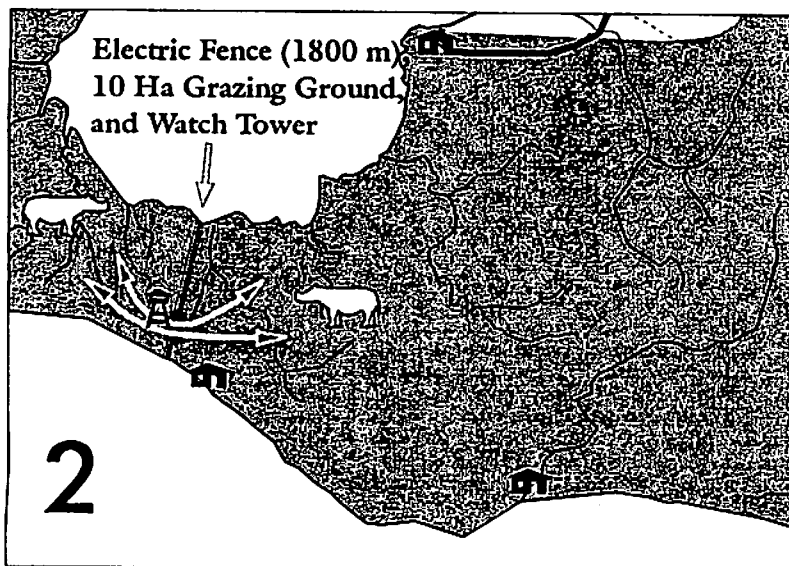
OBJECTIVES:

- Restriction of poacher access.
- Expansion of Rhino area.
- Expansion of Rhino population
- Wildlife (Rhino) viewing.

1

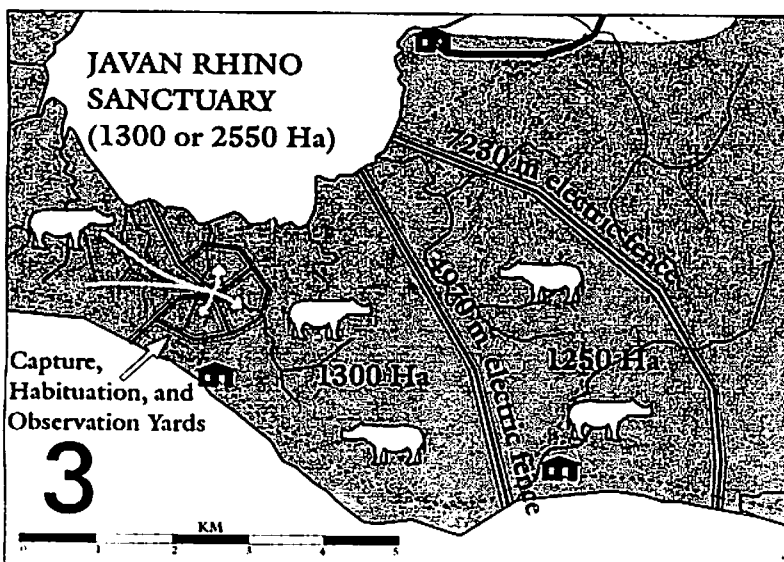
Opening of a grazing area in the Isthmus, with a watch tower (24-hour guarding with night vision equipment) will make it more difficult for poachers to enter the rhino area. Movement and natural re-population of the area East of the Isthmus can occur. The grazing ground would provide good opportunities for wildlife viewing.

2



An electric fence across the Isthmus would provide good security and would be easy to manage. A small opening in the fence, with a watch-tower, on a grazing ground in the centre would allow free rhino movement. No opportunities for wildlife viewing and no added protection for rhinos East of the Isthmus.

3



Construction of a JAVAN RHINO SANCTUARY in the area East of the Isthmus, with two electric fences enclosing a large area of good rhino habitat, would provide maximum security. Rhinos moving naturally across the Isthmus will be contained, after habituation, in the SANCTUARY, providing a safe expansion of the rhino area and population. Offspring of the Rhinos in the Sanctuary could be used to start the establishment of other Javan Rhino populations, with minimal stress for the animals and without draining the founder population. The Rhinos in the SANCTUARY would provide good opportunities for wildlife viewing and could become a valuable source of revenue for future management and development.

GRAZING GROUND

The grazing ground will make it more difficult for intruders to cross the Isthmus unnoticed. Everyone crossing will be clearly visible for the guards and the animals on the grazing area will assist with alarm calls when people are entering.

A large watch tower will have to be made somewhere in the middle, overlooking the whole grazing ground. Most intruders will try to enter at night and 24-hour guarding will be necessary. The guards should be equipped with binoculars and with appropriate night vision equipment.

Protection will depend largely on the continuous presence of guards, and it will be difficult to maintain a good levels of vigilance, especially during the night shift.

Opening of a strip of forest between the Indian Ocean coast and the Selamat Datang Bay will allow the strong ocean winds to blow across and this could have serious consequences for the vegetation around the grazing area and for the bay ecology. This effect could be reduced by designing the grazing area in an angle (See the map).

The precise form and location of the grazing area should be determined after an ecological investigation of the area, to minimize damage to important habitats.

ELECTRIC FENCE

An electric fence, with circuit-break alarm, will form a very good deterrent for potential poachers. A totally closed fence would restrict all wildlife, including rhino, movements over the Isthmus. Therefore somewhere in the centre an opening of at least 100 m should be left to allow wildlife movement.

To be able to guard the wildlife gate a small watchtower with lights should be made, and the vegetation in the area should be kept open. Alternatively video cameras could be used to monitor wildlife and human traffic through the gate.

The small gate is easier to monitor than the large grazing area, and it will be much less demanding for the personnel on duty.

JAVAN RHINO SANCTUARY

The Javan Rhino Sanctuary concept would provide excellent protection of the rhinos in UKNP, with a double electric fence, and would allow the establishment of other Javan rhino populations, with minimal influence on the existing population. A large area of under-utilized rhino habitat in the Gunung Honje area (two possible areas are shown on the map) would be enclosed by electric fences. One across the Isthmus, the other further east between the bay and Indian Ocean beach, with a 4-wd patrol track.

Unobserved entry into UK over land would be almost impossible, but the rhinos confined inside the Sanctuary would be easier prey for poachers. Therefore the outside fence needs to be patrolled and the rhinos inside need to be monitored closely.

The precise location of the eastern fence must be determined in relation to the habitat condition, especially since in some parts fields have been established.

Rhinos occasionally still move over the Isthmus. The isthmus fence and capture yards are meant to confine rhinos that move naturally towards the Gunung Honje area. The funnel shaped fence will force to rhinos to enter the capture yard. The capture yard need to be monitored by (night vision ?) video.

Once a rhino is inside the outside gate closes and the rhino, if wanted for the Sanctuary, is allowed to move into the habituation and observation yards (ca 30 Ha each).

To allow monitoring of the rhinos it is important to habituate them to the presence of humans. This can occur while in the observation yard. During that period it can be decided whether the rhino has the right age, sex and character to be allowed into the Sanctuary proper.

Initially a small number of rhinos (2-4 females, 1-2.males) would be allowed into the Sanctuary to breed. Offspring can be used, depending on the circumstances and needs, be kept in the Sanctuary, released back into UK, or be used for a translocation program.

After some time the founders could be released back into UK and other animals taken into the Sanctuary, to increase the genetic basis of the sub-population.

Currently only few (1-2) rhinos use the Kalejetan area, and it may be that a ballanced population cannot be formed from the rhinos that

enter the Sanctuary 'naturally'. In that case it can be considered to move animals in through capture and release, but this will increase the costs and risks.

It would be prudent to start the construction with the capture and habituation yards, and only commence with the construction of the large fence once the method is found to be successful.

The Sanctuary concept would allow the staged establishment of new populations, without draining the gene pool of the founder population, and with minimal risks and stress for the founder animals. No animals will be captured and no animals will be taken out permanently from the UKNP population.

Once established with habituated rhinos the Sanctuary, or parts of it, could be used for viewing of Javan rhinos in natural habitat. This would form a major tourist attraction and will increase the potential of UKNP for sustainable development of ecotourism.

The establishment and running of the Sanctuary will require substantial financial inputs for at least 20 years, and therefore it is recommended to establish the Sanctuary in the same fashion as the Sumatran Rhino Sanctuary in Way Kambas NP. Ecotourism with a direct link, also financially, to the Sanctuary would ensure the long-term sustainability of the Javan Rhino conservation programme.

	1 Grazing Ground	2 Electric Fence	3 Javan Rhino Sanctuary
Protection for rhino in UK	Modest. Depending on guard's vigilance.	Good. Less dependant on guards.	Very good. Double barrier.
Expansion of rhino area	Natural expansion unobstructed	Natural expansion unobstructed	Expansion stimulated in secure area
Protection for rhino in Honje area	None	None	Very good. Large high security area
Expansion of rhino population	Reduced poaching	Reduced poaching	Reduced poaching and potential breeding enhancement
Biological effects on rhino	None	None	Temporary gene pool reduction
Habitat effects	Considerable change in vegetation, with effects on bay ecosystem (strong winds)	Small change in vegetation	Only natural effects of increased rhino population on forest
Manpower requirements	Large. Short-term for development and maintenance. Additional guards for 24-hour guarding.	Modest. Additional guards for 24-hour guarding.	Large. Considerable staff requirements for guarding and management.
Investment costs	Modest. Opening of area, watchtower, night vision equipment	Moderate. Electric fence, watchtower, night vision equipment	Very large. Long fences, telemetry equipment, management facilities
Ecotourism benefits	Wildlife viewing	None	Viewing rarest rhino; potential for high-class facilities
Javan Rhino Action Plan implementation	Increased protection of UK rhinos	Increased protection of UK rhinos	Greatly increased protection of UK rhinos. Highly secure sub-population for managed breeding for re-introduction.

3.2 INTENSIVE PATROL ZONE

Access to the area most vulnerable to poaching, the southeastern quarter of UKNP between Cigenter and Cibandawoh, for preventive patrols is limited, because there is no patrol trail through this area. Therefore guards seldom, if ever, patrol this area, giving free play to the poachers.

To increase the frequency of the patrols in the Intensive Patrol Zone, and to allow guards to move swiftly to all parts of the Zone, the establishment of a permanent patrol trail between Cigenter and Cibandawoh, roughly following the Cibandawoh, is highly recommended.

With regular patrols in the area, and increased vigilance on the entrance areas, there is no danger that the new trail will in fact benefit the poachers.

Patrolling of the IPZ will be mainly the task of personnel of the Resorts of Karangranjang and Cigenter, but it may be beneficial to establish a special patrol core-team of three experienced forest surveyors, working full time in the IPZ, with assistance of the Resort guards.

The patrol(s) should have GPS, hand radios, cameras and firearms. The patrol leader should be fully qualified to arrest intruders. The MT and the RCO will provide technical assistance.

Besides patrolling the IPZ teams should also carry out continuous monitoring of the rhinos in the area, using standardized techniques. Team members will need to be trained in observation and monitoring.

Since the new trail will transect an important rhino habitat access for tourists and visitors should be restricted.

3.3 COASTAL ZONE MONITORING SYSTEM

The three guardposts on the Selamat Datang Bay side of the UKNP need to be better equipped to monitor to traffic across the sea boundary of the Park, especially during night time. There is still

illegal fishing inside the park boundaries and rhino poachers can sail across the bay at night.

In all three posts a tall watchtower need to be constructed that offers a good view over the bay. There should be a 24-hour watch, with binoculars during daytime, with night vision equipment during night time.

All vessels observed to cross the sea boundary, that is clearly marked with buoys, should be stopped and instructed to leave by guards with a fast patrol boat. The patrol boats and crew need to be on 24 hours stand-by. All posts will need a fast patrol boat and sufficient personnel for a 24-hour roster.

3.4 GUN CONTROL AND LAW ENFORCEMENT

Rhino and game poaching is usually done with locally made front-loader guns. These guns are widely available and are made in a village called Situpotong, near Binuangeun.

It is recommended to liaise with the internal security agencies at a high level, to develop a cooperative effort to stop the production of guns and to make a programme for the confiscation of guns available in the villages around UKNP.

A small compensation for those that voluntarily hand in their guns during a grace period, could be considered. After the grace period PHPA should work together with the security agencies to collect the remaining guns and to prosecute holders of illegal firearms.

4 COST ESTIMATES

Below a preliminary estimate of investment costs for the various programmes and options. Costs are in 1000 Rp and US\$, and do not include costs for regular personnel salaries and allowances and for housing and office facilities.

ISTHMUS PROTECTION ZONE	Rp x 1000	US\$
Option 1 - Grazing ground		
Opening of grazing ground (~ 90 Ha)	4,000	1,800
Watchtower	20,000	9,100
Binoculars, radios, night vision	15,000	6,800
TOTAL	39,000	17,700
Option 2 - Electric fence		
Fence (~ 1880 m @ 60,000/m), power	120,000	54,500
Watchtower and lights	20,000	9,100
Optional: Video equipment	10,000	4,500
TOTAL	150,000	68,100
Option 3 - Javan Rhino Sanctuary		
Fence and gates - Isthmus	600,000	272,700
Fence and track - outside	350,000	159,100
Video equipment	10,000	4,500
Telemetry	15,000	6,800
Management facilities	100,000	45,500
TOTAL	1,075,000	488,600
INTENSIVE PATROL ZONE		
Clearing patrol trail (~ 10 km)	1,500	680
Regular field equipment	500	230
GPS, radio, camera, gun	5,000	2,270
TOTAL	7,000	3,180

COASTAL ZONE MONITORING SYSTEM		
Watchtowers(3)	60,000	27,300
Binoculars, night vision, radios(3X)	45,000	20,500
Patrol boats(3)	90,000	40,900
TOTAL	195,000	88,700
GUN CONTROL AND LAW ENFORCEMENT		
Operational	20,000	9,100
Compensation	3,000	1,360
TOTAL	23,000	10,460

APPENDIX 1 JAVAN RHINO ACTION PLAN [Extracted from the Indonesian Rhino Conservation Strategy]

I. CONSERVATION OF THE JAVAN RHINO IN UJUNG KULON

The Ujung Kulon National Park is the only place, except for a small population just outside the Nam Bai Cat Tien National Park in Vietnam, where the Javan Rhino is known to survive. The Ujung Kulon peninsula is a long established conservation area and its topography makes protection of the rhinos comparatively easy. The area is too small for a large population of Javan rhinos and it cannot be expanded. Since it is the only source of animals for the establishment of other populations, protection of this unique resource has the highest priority. Immediate actions should be directed towards achieving the best possible protection for this population.

A. Strengthening of Park management and administration unit.

It is recommended that the management structure of the Park be re-examined and that a strategic planning exercise be carried out to ensure the effective deployment of staff. Special attention should be paid to:

- (1) The location of the Park Headquarters.
- (2) Implementation of activities in the Park.
- (3) Time demands on the Park Superintendent.
- (4) The need for an Operations Manager.

B. Park protection and intensive patrolling.

A good patrolling system to prevent poaching and to monitor the rhino population should be developed. Guards should be trained in monitoring techniques.

C. Law enforcement.

Regulations should be amended or developed to empower Park guards to enforce the law when apprehending offenders. Serious consideration should be given to provision of fire arms to make this possible. The establishment of an efficient communications network both within the park and its head office, and between head office and Jakarta, is essential for good and efficient management of the Park.

D. Education and awareness programme.

Education (formal or informal, but involving schools and children) and awareness (informal, aimed at the broad public, mainly adult) campaigns are a vital part of the Park work and implementation should begin at a very early stage.

Specific education programmes should be developed for:

- (1) School level (village, public and private schools)
- (2) Park level. Interpretive plans need to be designed for each rhino area.
- (3) Zoos and Safari parks.

Park interpreters need to be given support and training to provide information to villagers and park visitors.

Conservation awareness programmes should be developed for all levels of society:

- (1) Central Government level especially aimed at the legislature and the law-enforcement authorities.
- (2) Regional Government level with specific reference to:
 - (a) Obtaining the support of the Bupati of Pandeglang.

- (b) Providing an information kit for the use by the Park Superintendent when meeting with other government departments such as agriculture, fisheries, etc.
- (3) Local communities. Develop support materials for use with local communities and conduct an awareness programme in conjunction with law enforcement and buffer-zone activities.
- (4) Tourists. Develop an interpretation programme for tourists. This should be broad-based but have rhino conservation as a major component. It should also:
 - (a) Be bilingual (Bahasa Indonesia and English).
 - (b) Be integrated with a system of bilingual guides.
 - (c) Be pro-actively distributed to the tourism servicing industry.
- (5) Private sector. Prepare information materials to attract funding from the private sector.

E. Rhino units.

The rhino protection units will primarily operate in Sumatra for the protection of the Sumatran rhino (see Sumatran Rhino Action Plan). Special rhino units are not necessary in Ujung Kulon, but the regular guards should receive training in rhino protection and monitoring.

F. Wildlife tourism.

Tourism will enable the Park to realise certain economic benefits.

For the development of tourism it is necessary to conduct an evaluation of how tourism can be managed within the constraints of the long-term interests of the conservation of the species and habitat within the park.

G. Development of Gunung Honje as Javan Rhino habitat extension.

The size of the rhino population in Ujung Kulon is limited by the comparatively small size of the National Park. Some habitat could be made available by the expansion of the rhino population into the Gunung Honje part of the Park, part of which is suitable for rhinos.

The Gunung Honje area is under heavy pressure from the communities living around the Park and buffer zone development and other programmes will be needed for the consolidation of the conservation status of this area.

Park boundaries should be resurveyed and clearly delineated around Gunung Honje and the degree of protection provided by the Park guards should be increased.

A survey and evaluation of the Gunung Honje area should be conducted to assess its potential and needs for the re-establishment of rhino habitat.

"Traditional use" zones within the Park boundary and in the vicinity of villages should be identified. These zones would be for the controlled use of minor forest products (non-timber) by the villagers.

Agricultural extension work should be carried out in the villages of the buffer zone surrounding the park. This work should promote the establishment of intensive, settled and profitable agriculture. Full use must be made of the environmental services provided by the Park.

Families living inside the park boundary should be identified. Their situation can be reconciled either by relocation and compensation, or by re-aligning the park boundary. Arbitration can be carried out on a case-by-case basis.

It is recommended that Gunung Honje be re-populated by rhinos through natural migration and increased protection, rather than by a managed translocation.

H. Research programme for Ujung Kulon.

1. Population survey and trend of Javan Rhino in Ujung Kulon National Park.

For the future management of the Javan rhino population in Ujung Kulon and for the preparation for the translocation of rhinos from Ujung Kulon it is of vital importance to know the composition of the rhino population and to be able to monitor the population trends.

Before any translocation programme can commence the current status of the Ujung Kulon rhino population must be known. Current data on the rhino population in Ujung Kulon are not sufficiently accurate and consistent to form a basis for an evaluation of the effects of removal of rhinos for a translocation programme.

Therefore the new survey technique being carried out in Ujung Kulon with automatic photo registration should be continued and expanded, until a satisfactory result has been obtained. The current census programme could be speeded up and refined by the use of more equipment and by using other census techniques in conjunction with the photo registration.

For the continuity of the population monitoring a standardized census should be done yearly by the Park Staff. The census techniques to be used should be simple, accurate and consistent, aiming at continuity of existing methods to enable long-term comparison of data, while incorporating new techniques to improve accuracy with time.

Guards should be trained to carry out the censuses and staff at Headquarters should be trained in the evaluation of the results.

2. Research on biology and ecology of Javan Rhino in Ujung Kulon.

Research on the ecology of the Javan rhino will provide the baseline information for management decisions and for the preparation of the education and awareness programmes. It will also enhance the profile, credibility and importance of the Park.

Based on a thorough review of available information and identification of needs, baseline studies on the Javan Rhino and its habitats should be undertaken to give a comprehensive picture of the ecology of the species. The following is a non-exclusive list of some priorities :

- (1) Habitat preferences and carrying capacity.
- (2) Feeding studies (available resources and opportunities for supplementation of preferred habitat).
- (3) Population structure and dynamics.
- (4) Competition and social interactions.
- (5) Sociobiology (daily range through radio-tracking, effective sex-ratio, breeding behaviour, etc.).
- (6) Monitoring the distribution of vegetation types and changes over time.
- (7) Studies on other important plant and animal species.
- (8) Study of the competitive interactions (if any) between the Javan Rhino and the banteng.

The mechanism for this research should be a Rhino Research Coordination Desk, established as part of the Rhino Unit based in PHPA, which would draw upon personnel and expertise both from Indonesia and from overseas. One of the tasks of such a desk could be the production of a comprehensive annual report on research activities in Ujung Kulon and in other rhino areas, in conjunction with the education and awareness programme.

For aspects of Javan Rhino biology relevant to Population Viability Analysis (PVA) see appendix 2 (*Not included here*).

II. TRANSLOCATION OF JAVAN RHINO TO ESTABLISH A SECOND POPULATION

The recommendations are based on PHPA's decision that the first additional population will be established through translocation to secure natural habitat within the species' former range.

No analysis has been carried out of the relative merits of captive breeding versus translocation as the optimum means for establishing the second Javan Rhino population (see the 1989 PVA report).

A. Preconditions.

These preconditions relate to information required before making a final decision to proceed with a translocation programme. They refer to the situation in the source site, well as those in the receiving site.

Both the receiving site and source population should be fully secured as National Parks with well established boundaries. Specifically, Way Kambas should be legally gazetted as a National Park. Park staff should receive adequate resources to carry out their duties.

The behaviour, diet and habitat of the Javan Rhino in Ujung Kulon, and the habitat in the proposed release site should be studied in depth before any rhinos are moved.

Genetic management of the translocated population should be planned carefully to ensure that sufficient founders are represented (if necessary through staggered releases).

I. Source population - Ujung Kulon.

A thorough investigation into the source population's size and structure, the habitat and food sources of the rhinos, based on a literature review and field surveys, and an evaluation of the potential risks of removal of animals should precede any translocation operation. The research should be supervised by an expert panel and be completed by the end of 1992. For details see appendix 3 (*Not included here*).

The expert panel should also consider the recommend number of rhinos, specified to gended and age, that should remain in UK to ensure the survival there.

2. Potential areas for translocation.

Potential areas for the first translocated population and other sites for subsequent translocation were evaluated according to criteria of suitability and security. For details see appendix 4 (*Not included here*).

In comparison to the other sites reviewed, Way Kambas emerged as the best site for the first translocation. Way Kambas has the potential to hold more rhinos than Ujung Kulon, is relatively accessible for transporting rhinos, and its current level of protection and potential for future improvements are better than any of the other sites. Barisan Selatan, Berbak, and Seberida were considered as possible sites for re-introductions in the future.

Based on the information available Way Kambas is the best site for the first translocation of Javan rhinos, pending the results of necessary feasibility studies. It is recommended that steps be taken immediately to prepare Way Kambas as a potential site for translocation. These include a detailed study of the suitability of Way Kambas and a survey of for evidence of an existing Javan rhino population.

3. Feasibility study on suitability of habitat at re-introduction area/site.

Suitability of an area for re-introduction of Javan rhinos should be evaluated in a feasibility study. The feasibility study should investigate the suitability of the area both from a biological and a managerial perspective. The area should not only be able to provide sufficient food, water, wallows, etc for a large population of rhinos, but it should also have management structures that ensure the safety of the rhinos and their habitat.

A list of requirements for a release area is provided in appendix 5 (*Not included here*).

4. Develop the management structures for a second population.

Increased protection should be put in place for Way Kambas as a matter of priority on the basis of a well developed coherent management plan that included buffer zone development.

Increased protection should begin for other potential re-introduction sites, particularly Berbak and Barisan Selatan, and surveys should be carried out to assess the possible survival of Javan rhinos in these and other areas on Sumatra.

B. Javan Rhino capture management programme.

Translocation and re-introduction of rhinos is a costly and risky undertaking. The entire capture and translocation operation needs to be supervised by the most experienced personnel.

Once the preconditions for the extraction from the source population have been met and the preparations needed for the release have been done, a capture programme can be started. Capture should be selective, to attain a balanced sex-ratio in the founder population and to avoid the unnecessary harassment of unsuitable animals. Unwanted animals should be equipped with telemetry devices and be released immediately at the capture site.

The animals that are to be moved should be closely supervised by experienced personnel and all necessary personnel and equipment should be available at all times. The animals should be carefully conditioned before being transported and the duration of the transport should be as short as possible. In the receiving site appropriate enclosures and all necessary personnel and equipment should be prepared beforehand.

Animals should only be released after a sufficient acclimatization in the new area and they should be closely monitored by radiotelemetry after release.

It should be noted that acclimatisation hasn't proven necessary in the Nepalese translocation of Indian rhinos. A long period of acclimatisation would require more expenses and personnel and would have a taming effect on the rhinos, making them more vulnerable for poaching. It is probably best to keep the period between capture and release as short as possible, to avoid complicating situations. Information on the behaviour of the rhinos during capture, transport and after release in the Nepalese translocation would be very useful to decide on the best strategy.

For detailed recommendations see appendix 6 (*Not included here*).

APPENDIX 2. EVALUATION OF ACTION PLAN RECOMMENDATIONS

I. CONSERVATION OF THE JAVAN RHINO IN UJUNG KULON

RECOMMENDATION	ACTION	STATUS ↓
		[1-4 (1 = no action, 4 = completed)]
A. Strengthening of Park management and administration unit.	<i>[EXAMPLE]</i>	
Strategic planning for effective staff deployment	New Management Plan in preparation.	3
B. Park protection and intensive patrolling.		
Patrolling system against poaching	Under development, but needs intensification.	2
Good Rhino monitoring system	Current system can be refined to improve accuracy.	3
Training in monitoring techniques	Should follow on improvement of system.	1
C. Law enforcement.		
More power for law enforcement by guards	Being developed, but there is a shortage of guards with full status.	2
Provision of fire arms	Few guards are entitled to carry arms and arms are not available.	1
Efficient communication system	Present and functioning effectively.	4
D. Education and awareness programme.		
Education programmes		
Development of school programmes		
Development of Park based programme.		
Development of Zoo based programmes.		
Training of Park interpreters		
Awareness programmes		
Aimed at Central Government		
Aimed at Regional Government		
Aimed at local communities		
Aimed at tourists		

RECOMMENDATION	ACTION	STATUS ↓
[1-4 (1 = no action, 4 = completed)]		
Aimed at the private sector		
E. Rhino units.		
Guard's training in Rhino protection and monitoring		
F. Wildlife tourism.		
Evaluation of sustainability		
G. Development of Gunung Honje as Javan Rhino habitat extension.		
Buffer zone development for consolidation		
Resurveying and delineation of boundaries		
Evaluation of suitability for rhino		
Establishment of 'traditional use' zones		
Agricultural extension work		
Resolution of trans-border occupation		
H. Research programme for Ujung Kulon.		
1. Population survey and trend of Javan Rhino in Ujung Kulon National Park.		
Study of current population status (Photo census)		
Yearly standardized census		
Development of simple, accurate and consistent standard census method.		
Training of guards in census method		
Training of staff in evaluation method		
2. Research on biology and ecology of Javan Rhino in Ujung Kulon.		
Habitat preferences and carrying capacity		
Feeding studies		
Population structure and dynamics		
Competition and social interactions		

RECOMMENDATION	ACTION	STATUS ↓
Sociobiology Distribution and dynamics of vegetation types Other important plant and animal species Competitive interaction with banteng Establishment of Rhino Research Coordination Desk Annual Research Report		[1-4 (1 = no action, 4 = completed)] <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>

II. TRANSLOCATION OF THE JAVAN RHINO TO ESTABLISH A SECOND POPULATION

RECOMMENDATION	ACTION	STATUS ↓
A. Preconditions. Ujung Kulon legal status and boundaries Receiving site (Way Kambas) legal status and boundaries Ujung Kulon staff provisions Receiving site (Way Kambas) staff provisions Studies of receiving site (Way Kambas) habitat Planning of genetic management of new population		[1-4 (1 = no action, 4 = completed)] <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
I. Source population - Ujung Kulon. Population size and structure Habitat and food sources Risk evaluation of removal of animals Recommended minimal number to remain in UKNP Supervision by expert panel		<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>

RECOMMENDATION	ACTION	STATUS↓
		[1-4 (1 = no action, 4 = completed)]
2. Potential areas for translocation.		
Preparation of Way Kambas as potential reintroduction site		
Survey of existing rhino population		
3. Feasibility study on suitability of habitat at re-introduction area/site.		
Suitability from biological perspective		
Suitability from a managerial perspective		
4. Develop the management structures for a second population.		
Increased protection of Way Kambas NP		
Development of a Management Plan		
Buffer Zone development		
B. Javan Rhino capture management programme.		
Development of a capture program		
Availability of expert personnel and equipment		
Radiotelemetry equipment		