

**SUMATRAN  
RHINO  
SANCTUARY,  
Site Evaluation and  
Work Plan**

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## PREFACE

This report is the result of a Site Evaluation Mission carried out as a follow-up to the Workshop on Establishment of Sumatran Rhino Sanctuary, held at Safari Garden Hotel, Cisarua, Bogor, Indonesia, 15-16 August 1994.

The Workshop recommended the establishment of a Sumatran Rhino Sanctuary in Way Kambas National Park in Sumatra, consisting of a semi-natural confined population of Sumatran Rhino, initially founded upon the rhinos currently in captivity, and a revenue-generating ecotourism facility to ensure long-term sustainability of the Sanctuary.

The whole operation will be conducted as a Nature Tourism Concession, managed by a dedicated private company, with guidance from an international Steering Committee. The establishment of the Steering Committee and the establishment of the Management Company will be based upon a Cooperation Agreement between the Government of Indonesia (PHPA), the International Rhino Foundation (IRF), and the Yayasan Mitra Rhino (YMR).

The Workshop recommended a Site Evaluation and Site Outlay Mission to look in more detail at the suitability of the area and to draft outlines for the future development of the project.

The Site Evaluation mission was carried out from 24 November till 20 December 1994, with funding provided by the International Rhino Foundation.

# 1 INTRODUCTION

The Site Evaluation Mission for the establishment of the Sumatran Rhino Sanctuary (SRS) in Way Kambas National Park (WKNP) was conducted from 24 November till 21 December 1994. The mission consisted of Dr Nico J. van Strien (teamleader), Mr Hearudin R. Sadjudin from Yayasan Mitra Rhino (YMR), and Mr. Pudji S. Pratjihno from the Subdirector Conservation of Flora and Fauna of the Directorate General for Forest Protection and Nature Conservation (PHPA). Additional inputs were given by Dr. Thomas J. Foose and Mr James R. Jackson from the International Rhino Foundation (IRF) and Drs Jansen Manansang from Taman Safari Indonesia.

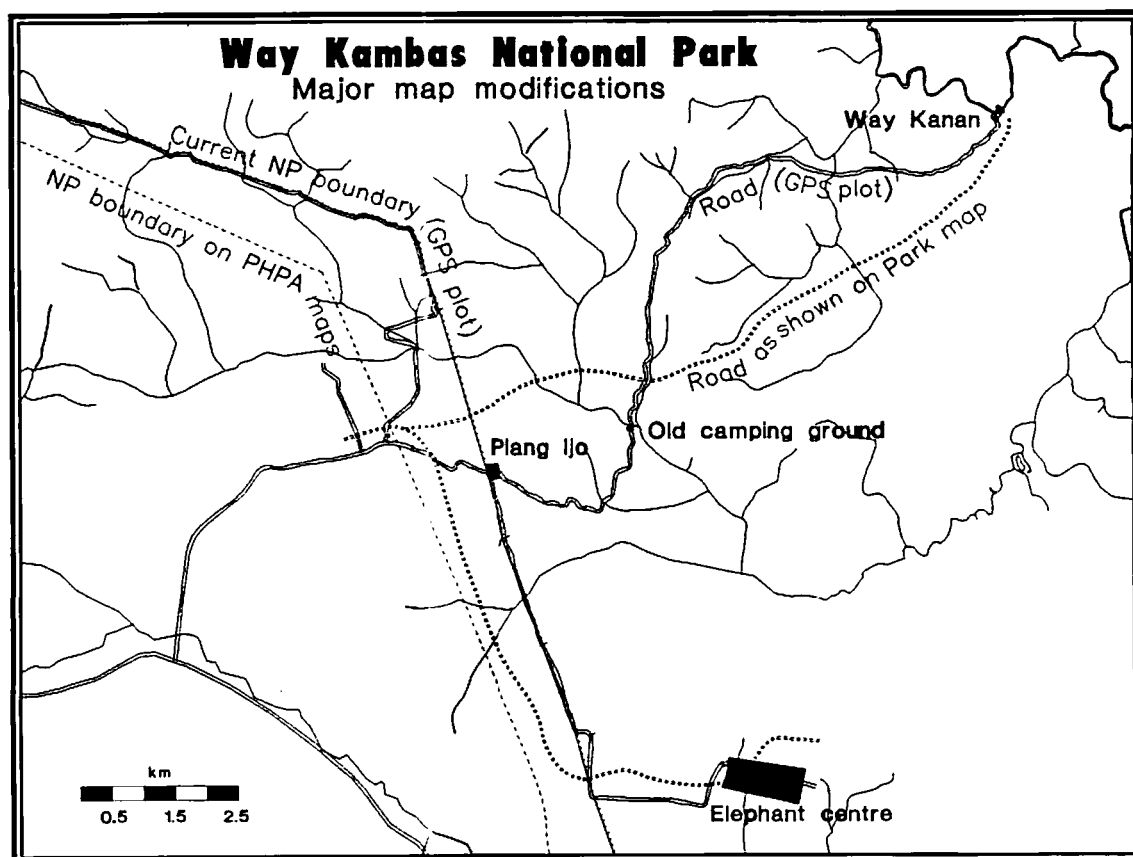
The team made two trips to WKNP: December 3 - 6, and December 13 - 17. In WKNP the potential sites for the SRS and the Ecotourism development were surveyed. In the provincial capital, Bandar Lampung, the district capital, Metro, and the headquarters of WKNP information was collected.

In Bogor and Jakarta the team participated in meetings with PHPA staff on the procedures for the development concession, assisted in the preparation of the Cooperation Agreement. Also on several occasions the members of the team were involved in the preparations for the GEF Rhino conservation project.

## 2 SITE EVALUATION

### 2.1 Maps and air photographs

In the Workshop Report some maps are included showing the vegetation and proposed sites for the SRS. In the field the vegetation map,



**Map A** - Modification to the National Park map based on GPS readings of the Park boundary and the Park roads. Minor changes were made to the drawn alignment of the Way Kanan river.



largely based upon a map produced by Santiapillai and Suprahman in 1984, was found to be outdated or erroneous in several areas<sup>1</sup>.

GPS readings taken along the road from Plang Ijo to Way Kanan and along the southern boundary of the WKNP showed that both the alignment of the road and the southern boundary are not accurate on the existing maps. The southern boundary of the Park is about 1 km further inside than is shown on the maps<sup>2</sup> and the roads follows a strong S-curve from the border to Way Kanan. The map modifications are shown in map A, page 3.

A consequence of the corrected road alignment is that the area of potentially suitable forest, indicated in the map in the Workshop Report as Way Kanan upper, is much smaller than was initially estimated, and no longer suitable for the SRS. Therefore the preliminary selection of this area for the SRS, as shown on the Proposed SRS Concession map in the Workshop Report is no longer valid.

For ease of access the SRS should be located close to the existing road and not too far from the potential tourism areas at Way Kanan and Way Negara Batin. Therefore the forest block indicated as Way Negara Batin is considered not suitable for the SRS.

### 2.1.1 AVAILABLE AIR PHOTOGRAPHS

There are no recent air photographs of the area. The only runs available at BAKOSURTANAL (National Coordination Agency for Land Survey) were made in 1976. Air photographs for the existing 1:50,000 topographical maps were made in 1969, and are presumably only available from the military mapping division.

<sup>1</sup> Also the LANDSAT vegetation interpretations that were seen are not very accurate. One map shows a large area of rice-fields where there are grass-swamps, another shows the extensive Nipa-mangroves in the north as Coconut plantations.

<sup>2</sup> Measured on a GIS map. based on the 1:50,000 topographic maps shows that the area of WKNP, with the boundaries as currently marked in the field, is 127,276 Ha. At establishment the size of the Park (then Wildlife Reserve) was set at 130,000 Ha.

Though rather old, and of poor quality because of partial cloud cover, the air photographs are valuable because they will clearly show the alignment of the roads made by the logging companies that were allowed to operate in WKNP in the sixties.

The 28 frames that cover WKNP (Run 62A/8283 frame 17-28; R 62/8282, frame 54-63; R 61/8299 will be ordered by YMR, with the assistance of PHPA for obtaining the security clearance.

### 2.1.2 AVAILABLE MAPS

During the survey the team collected maps of the area from the Forestry offices and from BAKOSURTANAL (National Coordination Agency for Land Survey) and copies of all maps are stored at the YMR Office in Bogor.

#### Topographic maps

Topographic maps, 1:50,000, were issued in 1974/75, based on the 1969 air photographs. Most of WKNP is found on the sheets Braja Luhur 8/XII-d; Sukadana 2314-IV; Cabang 2315-I; Tanjung Pulau Sekoping 8/XI-x; Rumbia 8/XI-w. Small parts of the Park are on sheets Seputih Surabaya 2315-IV and Labuhan Maringgai 8/XII-K. The SRS concession area is entirely covered by the sheets Sukadana and Braja Luhur<sup>1</sup>. Earlier topographic maps, 1:100,000, were published in 1945, based on field surveys carried out in 1915. In 1986 a 1:250,000 topographic map was published, based on the 1974/75 maps.

#### Vegetation maps

Landsat satellite interpretation maps (*Peta Penafsiran Tingkat Tinjau Citra Landsat*) was made by the Ministry of Forestry in 1987, based on 1985 material. Inside the WKNP the map shows mangrove, Nipa-forest,

<sup>1</sup> The maps produced in this report are based on a GIS map based on the 1:50,000 topographic maps, and originally made for the World Bank National Parks Project.

swamp, swamp-forest, dry-land forest, young and old secondary forest. The reliability is questionable, because in the center of the Park a large area on rice-paddy is shown, where there are extensive grass-swamps. Another Forest Vegetation and Landuse Map (*Peta Vegetasi Hutan dan Penggunaan Lahan*), based on 1986 and 1989 Landsat imagery shows mangrove forest, swamp forest, unproductive wetland, unproductive wetland, lowland forest, an area of agricultural land along the north-western boundary and a coconut estate where there are Nipa-swamps. All vegetation maps seen vary considerably in details and have obvious errors. For the planning and implementation of future developments in WKNP a reliable, detailed vegetation map is urgently required, and it is strongly recommended that an aerial vegetation mapping is carried out as part of the SRS development.

### Boundary maps

The southern boundary was marked in the field in 1983 and a boundary map, 1:25,000 was issued<sup>1</sup>. The boundary maps for the rest of the boundary of the WKNP were produced in 1986. Six sheets, 1:25,000, cover the northern, eastern and western boundary. All boundaries, except the southern boundary, are natural and follow rivers or the coastline.

### Miscellaneous maps

The forest exploitation maps from the past logging operations, that contain important information on the extent of the logging and on the location of roads, camps etc, are not available at WKNP headquarters, nor at the provincial office of PHPA. PHPA and YMR will try to locate these maps at the Forestry Planning Department in Bogor.

Other maps seen, like the Forest Utilization Maps, show little or no detail inside the WKNP area, and are of little use for planning.

<sup>1</sup> This part of the boundary has recently been revised in the field and the current position of the boundary deviates from that shown on the existing maps (See Map 1). A new boundary map will be issued.

## 2.2 Suitability for Sumatran Rhino

During the second field trip to WKNP the forest was inspected for suitability for Sumatran rhino. Important aspects are closeness of canopy, density of undergrowth, availability of foodplants and water for wallows and bathing.

At various places long the road from Plang Ijo to Way Kanan short incursions were made into the forest. Initially concentrating of the area indicated in the Workshop Report, but when it was discovered that the alignment of the road needed to be modified, and when this part of the forest was found to be less suitable, also the forest on the east side of the road and near the Way Negara Batin, was inspected.

Virtually all the forest in WKNP has been logged intensively in the sixties. In large parts, mainly in the west of the Park, the forest has disappeared completely and is replaced with dry grasslands (Alang-fields) and shrub. Forest regeneration has been influenced by fires spreading from the dry grasslands and shrubs.

Sumatran rhinos feed mainly on the leaves of small trees (saplings of forest trees, stem diameter 2-5 cm) and on soft undergrowth shrubs and herbs. These plants have large soft leaves and thick fleshy stems and are mainly found in mature forests where the closed canopy maintains low-light and high-moisture conditions.

Therefore Sumatran rhinos prefer dense moist forest with a closed canopy. They also need regular mudbaths and therefore in the area there should be permanently moist, muddy pools year round, in particular during the dry season.

### 2.2.1 SUITABILITY OF THE VEGETATION

Contrary to the earlier expectations, that were based on the available vegetation maps, the forest on the west side of the Plang Ijo - Way Kanan road is not very mature and does not offer ideal conditions for

Sumatran rhino. There are still many small area of young secondary forest with dense thorny undergrowth and without a high closed canopy. Also where forest regeneration has progressed further the undergrowth is meager and does not contain a large quantity of the preferred foodplants.

It appears that the rather poor regeneration of the forest west of the road is caused by more severe fire damage in the seventies. The fires spread from the west and were prevented from spreading too far east by the road and by swamps. Though the forest west of the road is not entirely unsuitable for Sumatran rhino, it is definitely less than ideal.

The forest east of the road, especially near the Way Negara Batin, has regenerated much better and looks very much like undisturbed forest. The best forest is south of the Way Negara Batin, between this river and Rawah (=swamp) Binjai. This area was probably one of the first to be logged and was protected from fires by the river and the swamp (On the vegetation maps this is usually shown, erroneously, as young secondary forest).

Also further north the forest east of the road has regenerated very well and offers a dense closed canopy, with a very dense undergrowth with many rhino foodplants.

There is sufficient good quality habitat for Sumatran rhino available, both for the SRS enclosures, as well as for larger enclosures that may be desired in the future for a semi-free-ranging rhino population.

Considering the quality of the forest the SRS is best located east of the Plang Ijo - Way Kanan road, and not west as was proposed in the Workshop report. Because at least 1000 Ha will be needed, and the area should not go across rivers or large swamps, a location about half-way between Plang Ijo and Way Kanan seems most appropriate.

Consequently also the site of the concession for the SRS and the tourism development must be altered to accommodate for the relocated SRS. Instead of taking the road as the eastern boundary, as proposed in the Workshop report, it is more appropriate to use the Way Negara Batin as the eastern boundary. This ensures that a sufficiently large area of habitat suitable for Sumatran rhino is included, also for future enlargement of the enclosures (See map D).

### 2.2.2 SURFACE WATER

In the dry season (July till November) all rivers in the proposed site, except the Way Kanan and Way Negara Batin, are dry. In the dry season the flow in the Way Negara Batin is very small, and the water is likely to be polluted with household and pesticide residues from the catchment outside the WKNP. The Way Kanan is tidal and brackish till a few kilometers upstream from Way Kanan camp.

Also the swamps dry out completely during the dry season and in large parts of the Park there is no fresh surface water during several months of the year.

All side rivers of the Way Kanan and the Way Negara Batin, shown on the map, are in fact strips of swamp. They are a few tens of meters wide and 2 to 5 meters lower than the surrounding area, often with a rather steep edge. The vegetation is mainly composed of low, thorny palms. In the dry season the soil is hard and cracked, in the wet season the soil is soft and muddy, with numerous pools. It appears that flowing water occurs only immediately following a rainstorm.

For the SRS the water from the rivers cannot be used, because of the poor quality during the dry season. Even during the wet season in many of the proposed enclosures there may not be sufficient natural pools for bathing and wallowing.

### 2.2.3 WATER REQUIREMENTS FOR THE SRS

Water will have to be pumped, possibly year round, to the occupied enclosures. The safest and most reliable source of water would be a number of boreholes drilled around the SRS area. There are no deep wells in the area, but a 12-meter deep well at the Elephant center produces water year round. The absence of pools and permanent rivers indicates a very permeable soil and one can expect a high groundwater table and good borehole productivity.

Boreholes could be made along the SRS periphery road, for ease of maintenance, and be equipped with solar pumps and storage tanks.

From the water tanks a pipe system is needed to bring the water to a high place in each of the enclosures.

In each enclosure there should be a deep pool, at least 1.5 meters deep, for bathing. To reduce loss of water it may be necessary to line the pool with concrete. If the pool is constructed at a high point in the enclosure, the overflow can be directed to a series of wallows. As there is very little gradient it may be necessary to dig an artificial channel though the enclosure.

It is difficult to estimate how much water is needed to keep the pool filled and to maintain a number of wallows. Considering the permeability of the soil one should plan for a rather high usage of water, possibly 50 cubic meters or more per rhino per day. Additional supplies will be needed for the tourism facilities.

#### **2.2.4 FOOD FOR THE SUMATRAN RHINOS**

Though the proposed area for the SRS has a good undergrowth with abundant rhino foodplants, it is unlikely that a 10 Ha plot will provide sufficient fodder on a sustainable basis. Therefore the state of the undergrowth should be monitored regularly with a number of permanent plots in each enclosure.

Additional food should have approximately the same composition as the natural fodder and should be collected in other parts of the forest. A system of food collection blocks and a rotation scheme should be designed to ensure sustainable use of the resource.

#### **2.2.5 SWAMPS**

Strips of palm swamp intersect the area. Fencing across a swamp will be difficult in the wet season, and the swamps are the areas where the elephants feed. The swamps are not necessary for the water provision, because they are dry during several months of the year and an artificial water supply is needed anyway. Therefore it is recommended to avoid the swamps for the SRS enclosures.

The blocks of SRS enclosures are best situated parallel to a swamp area to have sufficient drainage during periods of heavy rain. The locations as shown on map G, page 38, are most appropriate, considering forest quality, drainage and ease of access.

### 2.2.6 ELEPHANTS

Way Kambas has a healthy elephant population of possibly about 200 or more. Elephants occur throughout the Park, but they do not utilize all areas equally. Although there are numerous elephant trails through the dense parts of the forests, their main feeding areas are the more open parts of the Park and the swamps.

Though the elephants may not feed regularly in the areas that are to be reserved for the SRS, they will travel through the area towards the swamps. Elephants are very persistent in following their traditional routes and will undoubtedly damage the fences of the SRS, if built across an elephant trail.

Therefore it is imperative that elephants must be excluded from the SRS area, through the construction of an elephant barrier around the enclosures. Such a barrier, with the patrol/service road, will also function to discourage uninvited people from entering the SRS.

Along the southern boundary a elephant ditch has been constructed by the Delmonte banana plantation, where it borders the Park. This ditch is 1.5 meters wide and 1 - 2 meters deep, and so far appears to function very good. The soils are stable enough to maintain steep sides, even during the rains.

A similar ditch will suffice for the SRS in the higher areas. Other systems may have to be used where small swamps are crossed, or where the soil is unstable. For maintenance, inspection and security patrols a road will have to be constructed on the inside of the elephant barrier.

To allow the construction of 48 enclosures (10 Ha each, enough for 20-24 rhinos) an area of about 1100 Ha will have to be enclosed with an elephant barrier (See map G, page 38).



The SRS, situated in the densest parts of the forest, does not form a serious habitat reduction for the elephants, because this type of vegetation is rarely used for feeding. The SRS will be constructed with minimal inclusion of swamp area and will not significantly reduce the prime elephant habitat.

### 2.2.7 TIGERS

In the Workshop report the tiger is identified as a possible risk factor for the Sumatran rhinos in the SRS. Tigers do occur in WKNP, but sign of tiger are not very frequently encountered, at least not in the area where the SRS is planned. Possibly the density is low.

So far there has been no predation on the young elephants in the Elephant center and there are no reports on tiger predation on cattle near the Park. Though it is highly unlikely that a tiger will kill a free-ranging adult rhino, young rhino run a much greater risk, especially if they become separated from the mother due to disturbance.

If undisturbed young Sumatran rhinos stay very close to the mother and therefore the chances for a tiger to kill a young are considered very small. Though it cannot be excluded that tigers enter the SRS, and vigilance will always be needed, especially when there are small young, no special precautions are recommended. If over time tigers become more numerous and more habituated, it may be a good precaution to move mothers with a young calf to specially protected enclosures.

### 2.2.8 FIRE

Nowhere in the forest, on both sides of the road, sign of recent fires were seen. Only along the upper reaches of the Way Kanan, freshly burned areas were found.

The forests where the SRS is planned have regenerated sufficiently to be safe from 'natural' fires, even in exceptionally dry years. The periphery road and elephant barrier will form an additional protection against fire.

Nevertheless one cannot rule out the possibility that the forest, in very dry years, is deliberately set on fire by horn thieves to drive up the rhinos or to cover their tracks. Especially when a very large enclosure for semi-free-ranging rhinos is established one or more good fire-towers, manned day and night, may be necessary to spot fires in an early stage.

### 2.2.9 DISEASES

There are two potential sources for contagious diseases that could effect the rhinos in the SRS: cattle in or adjacent to the Park; and, the tame elephants at the Elephant Center.

There is no cattle in the Park, and few in the areas adjacent to the Park. The risk of diseases spreading from cattle to the rhinos is minimal, because of the large distance between the SRS and the village areas. Most of the land south of the WKNP is occupied by an industrial banana plantation, where there is no cattle. Elsewhere the park is bordered by rice and cassava fields, that are outside the growing season occasionally used for grazing cattle.

Currently the elephants do not pose a risk for the rhinos, also because of the distance between the Elephant Center and the SRS. When in the future the elephants will be used to carry tourists, they could become a source of infection. Also care should be taken if water from the proposed dam is used both for bathing elephants and supplying the SRS.

Currently the main health problem of the tame elephants is intestinal worms and skin sores. Serious outbreaks of contagious diseases have so far not occurred in the elephant population.

The center has veterinary unit, but no test equipment, and does not perform routine veterinary tests. When animals show sign of disease faeces screening and other tests are carried out by the veterinary service in Bandar Lampung. Recent health records were not available because of the absence of the resident veterinarian.

Elephants that are to be utilized for visitor transport, especially when they are entering a rhino enclosure, should be closely monitored for

endo- and ectoparasites and for infectious diseases. A system of routine veterinarian monitoring should be developed and the facilities on site should be brought up to standard.

### **2.2.10 SECURITY**

Sumatran rhinos are still very valuable animals, and it is widely known that their horns bring in a fortune. The large enclosures with dense forest make it easy to hide inside the SRS and to wait for an opportunity to kill one of the rhinos. Locating the SRS away from the boundary of the Park will make it more difficult to reach.

To make intrusion more difficult, the SRS should have a good all-weather periphery road for service of the facility and for security patrols. The SRS must have a 24-hour guarding system, with frequent patrols along the periphery. Appropriate facilities must be provided for the guard force.

A good patrolling system must be developed, consisting of both motorized and silent patrols on foot. Strict discipline and supervision are vital for the effectiveness of the security system.

An electronic surveillance system, with infra-red or radio beams, along the periphery will greatly improve the effectiveness. It should also be considered to use trained dogs for patrolling and for tracking of intruders.

### **2.2.11 EXISTING FACILITIES TO SUPPORT THE SRS**

There are no facilities, except the veterinary facility at the Elephant Center, that could support the SRS. The veterinary facility is directed by a qualified veterinarian, but the facility does not have any instrumentation.

### **2.2.12 CONCLUSIONS**

- The habitat of Way Kambas National Park is suitable for the Sumatran Rhino Sanctuary, provided that an artificial permanent water supply of sufficient capacity is installed.
- Elephants must be excluded from the SRS area, with a peripheral elephant barrier, preferably a ditch, and a service/patrol road.
- For females with young calves it may be necessary in the future to construct tiger-proof enclosures.
- Elephants that are to be used in or near the SRS should be subject to a rigorous veterinary monitoring to reduce the risk for transmission of contagious diseases.
- Special foodplant plots and a cropping system must be established for sustainable harvest of supplementary food.
- An early warning system for forest fires should be developed when very large enclosures are being developed.
- Security should be maintained at the highest possible level, with patrols and electronic surveillance. Discipline, supervision and adequate facilities are vital.

### 3 ECOTOURISM

#### 3.1 Current tourism

##### 3.1.1 TOURISM TO LAMPUNG PROVINCE

The number of tourists visiting Lampung Province is rapidly increasing, though the total number of foreign tourists that go to the province is still a very small fraction of the ca 4,000,000 foreign tourists that yearly come to Indonesia. Table 1, page 16, shows the number of visitors, both domestic and foreign that visited Lampung from 1988 till 1992. In Table 2, page 17, the home countries of the 1992 foreign visitors are listed (Source: *Data dan Statistik Keparawisataan Daerah Lampung Tahun 1992* - the most recent tourism statistics available).

**Table 1** - Yearly totals of visitors to Lampung province.

<u>Year</u>	<u>Domestic</u>	<u>Foreign</u>
1988	136,962	2100
1989	97,429	3327
1990	139,590	10,323
1991	175,666	12,201
1992	228,776	19,311

The Lampung Tourism Department (*Dinas Parawisata Propinsi Daerah Tingkat I Lampung*<sup>1</sup>) is currently finalizing a tourism masterplan for the province. After approval by the Governor this plan will come into effect. In the masterplan Way Kambas is identified as the first priority for development of tourism in Lampung province. Therefore a tourism development as envisaged for the SRS will undoubtedly be given all

<sup>1</sup> Contact: Drs M. Hisyam Siswoyo. Jl. Wr. Supratman 39, Gunung Mas, Bandar Lampung.

necessary support by the local government and the Lampung Tourism Department.

**Table 2** - Home countries of foreign visitors to Lampung Province.

<u>Home country</u>	<u>Number</u>
Netherlands	2270
USA	2106
Japan	1776
Australia	1776
Singapore	1716
UK	1354
Canada	1249
Malaysia	769
Germany	742
Philippines	667
Finland	572
France	558
All other countries less than 500	

The other priorities for tourism development in Lampung are:

- 2 - Krakatau (Active volcano)
- 3 - Legundi (Marine resort)
- 4 - Kota Agung (Bukit Barisan Selatan NP)
- 5 - Krui (Bukit Barisan Selatan NP)
- 6 - Pematang Panjang (Beach)

Currently there are 56 companies that invest in tourism development in Lampung, but so far none has invested in Way Kambas. There are also no existing or pending tourism development concessions in Way Kambas National Park.

**Table 3 - Number of domestic and foreign visitors to Way Kambas NP.**

YEAR	Recreation		Research		Other		TOTAL	
	Dom.	For.	Dom.	For.	Dom.	For.	Dom.	For.
1984	234	21	103	34	242	6	579	61
1985	934	43	24	11	489	6	1447	60
1986	1975	35	22	2	786	3	2783	40
1987	7251	79	5	6	461	-	7717	85
1988	10501	101	-	9	206	-	10553	110
1989	10501	359	-	35	1	-	10502	394
1990	35084	755	8	-	-	-	35092	755
1991	68311	1225	40	-	-	-	68351	1225
1992	70451	1669	-	-	-	-	70467	1669
May'93	25607	649	-	-	-	-	25607	649
TOTAL	230690	4958	218	97	2185	15	233093	5070

Source: SB-KSDA, Way Kambas, June 1993

### 3.1.2 Tourism to Way Kambas National Park

The number of visitors to WKNP has increased rapidly over the years (See Table 3, page 18). Way Kambas, and in particular the Elephant Center (PLG), is now a well-known and popular destination for family and group outings for the population of west Java and south Sumatra. Also the number of foreign visitors is increasing, though it is still a minor portion (ca 2 %) of the total number of visitors.

Most visitors come for the day and only go to the Elephant center. Some go also to Way Kanan, for a picnic or a boat trip on the river. Only few people spend the night in the Park, usually at Way Kanan.

The yearly visitor numbers to Way Kanan (presumably mainly day visitors) is shown in table 4, page 20.

It is interesting to note that a comparatively larger proportion of the foreign visitors visits Way Kanan, while the vast majority of the domestic visitors only goes to the circus-like attractions offered at the Elephant Center. Between 1987 and 1992 less than 1 percent of the total number of domestic visitors to WKNP came to Way Kanan, while for the foreign visitors the percentage is almost 33.

## 3.2 Accessibility

Part of the popularity of Way Kambas comes from its nearness to the population centers and the comparatively good accessibility. The population of Lampung province and its capital Bandar Lampung is increasing rapidly because of migration from Java. The road system in this part of Sumatra is good and the Park can be reached in about 2 hours from Bandar Lampung.

The motor way from Jakarta to the Sumatra ferry at Merak is almost completed. The ferries across Strait Sunda go very frequently and overland travel from Jakarta to WKNP takes between 6 and 8 hours. With the completion of the motor way the travel time will be even less.

There are several flights per day from Jakarta to Bandar Lampung, both from the main airport and from the old international airport (Halim). From a Jakarta hotel WKNP can be reached in about 5 hours by air and road.

Recently a fast boat service between Jakarta (Ancol) and Bandar Lampung has opened. The overseas travel time is about 4 hours. Though travel time to WKNP will be about the same as when using the overland route, the boat service is much more comfortable.

For the future it should be investigated whether visitors can be brought directly to the park by boat or plane from Jakarta or by boat from Merak.



**Table 4** - Number of domestic and foreign visitors to Way Kanan camp.

Year	Domestic	Foreign
1987	232	76
1988	254	82
1989	178	141
1990	193	108
1991	453	125
1992	394	435
1993	509	420
1994/Jun.	117	222
TOTAL	2330	1609

Source: Rayon Way Kanan

With a fast boat it will be possible to reach Kuala Kambas in about 3 hours from Jakarta and in about 2 hours from Merak. Smaller craft may even be able to go directly up the river to the Way Kanan camp.

At the Delmonte banana plantation there is a simple 1000-meters airstrip, about 10 km from the Park entrance. With some upgrading the strip could be made suitable for small aircraft to bring in passengers directly from Jakarta airport to the Park.

### 3.3 Existing tourism facilities

Apart from the day-recreation facilities at the Elephant Center WKNP offers few facilities for visitors.

At the entrance gate, in Plang Ijo, there is a visitors center, with an educational exhibition, and a three room guesthouse. The guesthouse has not been used so far because it lacks water and other facilities.

Near the bridge over the Way Negara Batin, about 2.5 km inside the Park there is a disused camping area. The camping area has never been used, because the frequent passage of wild elephants makes the area unsafe for outdoor camping.

At Way Kanan, the main camp about 13 km inside the Park, there are two guesthouses with 2 and 4 bedrooms, and some emergency accommodation in the other buildings. From Way Kanan guided boat trips can be made over the Way Kanan river.

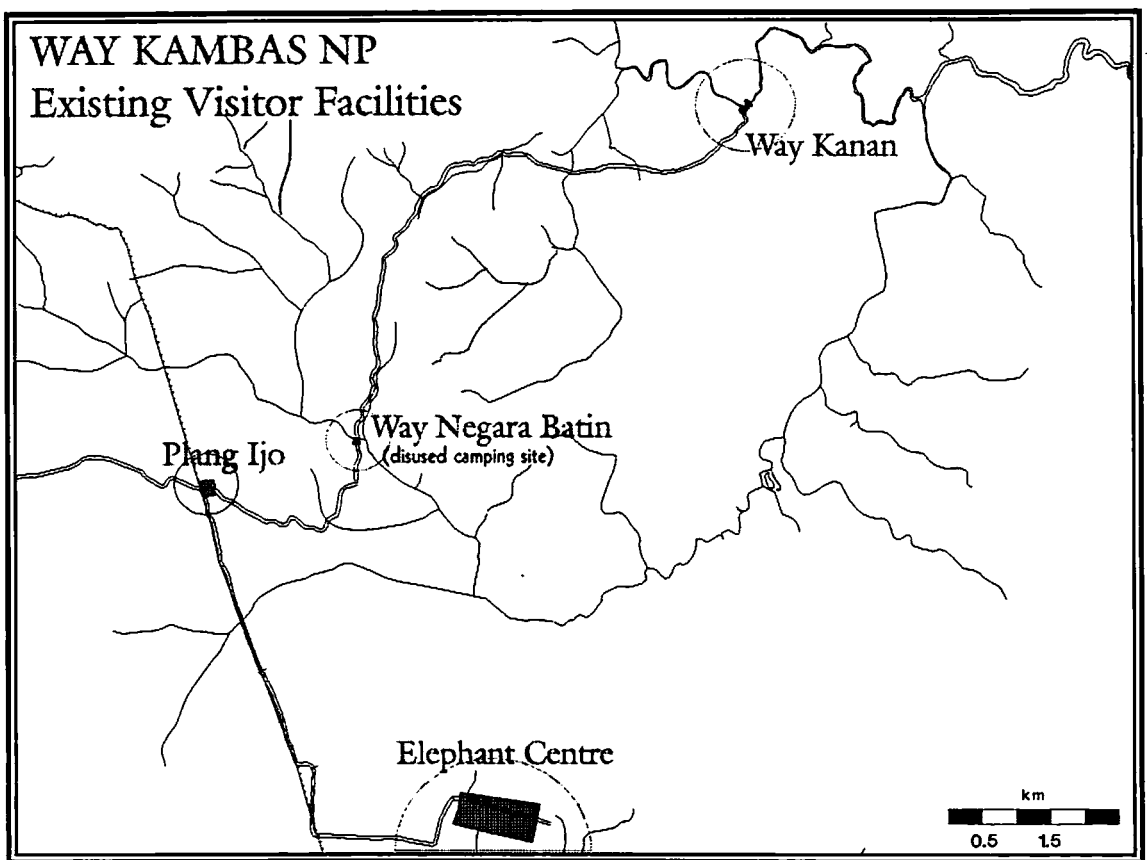
All facilities are exploited by Park staff and the proceeds are used to supplement their salaries. Apparently very little of the proceeds is used for maintenance and improvement of the facilities.

The current areas with visitor facilities are shown on map B, page 21.

### 3.4 Potential tourism areas

#### Way Kanan

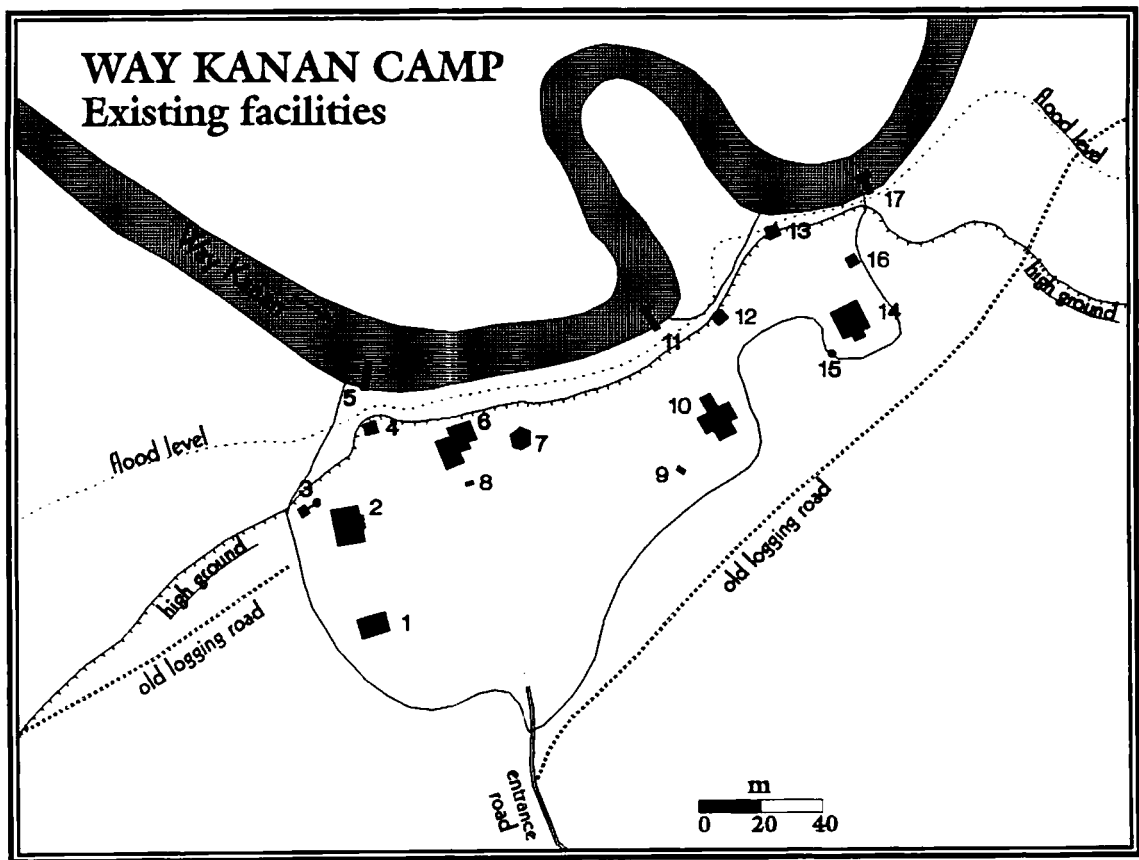
The Way Kanan camp is undoubtedly the prime location for ecotourism.



**Map B** - Areas with visitor facilities.

The location along the river makes for a very attractive landscape and allows various activities on and along the river. The camp can be reached easily from the public road and its central location offers access to the various habitats represented in the Park.

The present Way Kanan camp is also the only place along the river that offers a good location on the bank of the river. Both up and down stream of the camp the river banks are low and swampy and subject to flooding in the wet season (when the water table can rise 3 to 4 meters). Nowhere else high ground is found right on the river, suitable for the development of visitor facilities that are safe from flooding year round.



Map C - Site map of Way Kanan camp.

**Table 5** - Existing buildings and constructions in Way Kanan camp.

No	Description	Area (m <sup>2</sup> )	State
1	Guards house	70	fair
2	Research lab.	110	fair
3	Well & watertank		good
4	Shelter	16	fair
5	Jetty		bad
6	Rayon office	80	fair
7	Generator shed	20	fair
8	Signboard	4	good
9	Foundation	12	ruin
10	Guesthouse (4 room)	120	bad
11	Jetty	20	bad
12	Shelter	16	fair
13	Shelter	16	fair
14	Guesthouse (2 room)	100	good
15	Well		good
16	Shelter	14	ruin
17	Jetty	15	ruin

Currently most of the high ground along the river is occupied by a variety of buildings and constructions on a clearing of 1.45 Ha. The current situation is shown on Map C, page 23, and the present buildings and constructions are listed in Table 5, page 24.

To develop an attractive high-class tourist lodge in a safe location, most of the high ground at the Way Kanan campsite will be needed (See Map ?, page 42). There is no other area available that offers the same excellent conditions. Therefore it is recommended to move the Rayon office and the other facilities currently occupying the site to another location (See below).

### Way Negara Batin

The camping ground at Way Negara Batin is disused because of elephant danger. Nevertheless the area offers some of the best forest in WKNP, and is a good site for the development of a budget class facility, because of its nearness to the entrance.

The presence of wild elephants precludes outdoor camping, but simple cottages on 4 to 5 meter stilts, connected to a central lodge with walk bridges, would offer safe and comfortable overnight accommodation.

A suitable area, where there is high ground for the lodge and a walled parking place near the river, is located about 500 meters upstream from the bridge (See Map F, page 37, and Map ?, page 44).

### Plang Ijo

There is limited, and unfinished, visitor accommodation at Plang Ijo. The three bedroom guesthouse, if completed, could be used as overflow accommodation for the other facilities and for late arrivals. The area is not attractive, and therefore visitor accommodation need not be extended.

Because of the nearness of Plang Ijo to the village outside the Park, this location is very suitable for staff housing and service facilities. To limit disturbance only on-duty staff should be present at the Way Kanan and Way Negara Batin locations. The Plang Ijo housing area will accommodate professional staff recruited from outside.

### Beach Station

The mouth of the Way Kanan/Way Kambas river (Kuala Kambas) is an area that is recommended to be included in the SRS concession for several reasons.

- A trans-shipping point may be needed for visitors that come to the Park on boats that cannot enter the river.

- A small marina at Kuala Kambas would attract private yachts with potential visitors.
- A permanent guard post is needed at Kuala Kambas to be able to control access of the river from the sea. Private boats have entered the Park without authorization over the river from the sea.
- The area can be developed for angling, both on the river and on sea.
- Though the beach is not very attractive limited beach recreation can be developed.

### Rayon Office

When the main lodge is being developed at Way Kanan the current Rayon office and the other building will gradually have to be relocated at another site. The visitors will require guides and also trained elephants should be stationed at a location near the lodge.

Therefore it is recommended to move the existing facilities to a new location at a dam to be made in the first southern tributary to the Way Kanan (See Map F, page 37). At this location an office and house for the Rayon Head and his staff, and quarters for the guides need to be made.

Also a group of tame elephants for use by the visitors to the lodge will be stationed here, to avoid excessive damage to the vegetation by the browsing elephants in the vicinity of the lodge. Facilities for the elephants and their keepers are to be developed.

The function of the proposed dam is mainly to provide sufficient water for the bathing of the elephants and to create additional feeding areas on the banks of the artificial lake. If the lake holds enough water throughout the dry season, it could also be used to supply the rhino enclosures. A permanent lake is attractive for water life and would add an interesting natural feature to the area.

The proposed location is near enough for the guides and elephants to travel to the lodge when required, yet far enough to preserve the habitat and tranquility around the lodge.



## **4 WORK PLAN**

### **4.1 Status of the Cooperation Agreement**

During the survey the text of the proposed Cooperation Agreement for the establishment of the SRS in Way Kambas National Park was further refined, and discussed with PHPA. It was recommended that first a abbreviated version, without the operational details, is presented to BAPPENAS (National Development Coordination Board) and SETKAB (Secretariat of the cabinet) for approval.

SETKAB approval will facilitate the further development of the SRS by enabling the project to import tax-free goods and to employ foreign personnel. A draft version was prepared and signed, under the title of 'Letter of Intent' by the Director General of PHPA on December 9th 1994.

It was agreed that YMR will prepare the Cooperation Agreement for submission to BAPPENAS and SETKAB, based on the Letter of Intent. After SETKAB approval, which may take about 2 months, the full Cooperation Agreement can be signed by the parties.

PHPA expressed concern about an imbalance between the duties and obligations for the partners in the draft Agreement, and requested a revision of the document. The duties for the Government of Indonesia are many and specified in detail, while the commitments for funds and other inputs from the other partners are not specified in any detail.

IRF indicated that more details on the extent of their financial and other commitments to the project will be available after the next board meeting. YMR is currently preparing a major fund-raising campaign and will provide more details on their inputs and commitments.

In particular the provision m, n and o under article 5, point (1) concerning compensation for investors in case the agreement is terminated, are contentious and inclusion in the Cooperation Agreement is less appropriate.

Compensation for investors relates to the official Tourism Development Concession, and not the Cooperation Agreement. The Concession, if granted, will be issued to the Management Company, on the form of a Decree of the Minister of Forestry. Unless the holder of the concession violates current legislation or the conditions of the concession, a concession cannot be unilaterally terminated. A concession can run for 30 years and can be extended. This is the security that the investors have.

The legislation specifies that no compensation will be paid for infrastructure and other assets after the termination of the Concession. Termination of the Cooperation Agreement will have no influence on the duration of the Concession, but may have consequences for the management of the company.

Therefore special regulations for compensation of individual investors are better dealt with in the context of the formation and governing of the Management Company, and can be removed from the Cooperation Agreement.

## 4.2 Procedures for ecotourism concession

Legislation for the granting of nature tourism development in National Parks is almost complete now, except for the manual for the concession workplan, that exists in draft form only. A detailed review of the provision in the law, and the relevant government, ministerial and directoral decrees is provided in a separate report (Summary of regulations for Ecotourism Development Concessions in National Parks in Indonesia)

For most steps in the process the legislation gives maximum periods in which the action must be completed. There are 5 successive procedures between the application for the concession and the granting (between brackets the maximum number of working days that is specified for each procedure, and an estimated minimum period):

- 1 ● Preliminary review,  
Recommendations of Tourism and Governor,  
Acceptance of the application  
( **max 84 - min 65 working days**)
- 2 ● Preparation of complete work plan,  
Environmental Impact Assessment,  
Physical design  
(**max 75 - min 30 working days**)
- 3 ● Review of complete documentation,  
Approval of application,  
Issuance of the instruction to pay the concession fee  
(**68 working days**)
- 4 ● Payment of Concession Fee  
(**max 60 - min 10 working days**)
- 5 ● Issuance of the Ministerial Decree for the concession  
(**28 working days**)

The total procedure may take a maximum period of **315 working days** (approximately 15 months). With good planning and preparation (See the notes below) it may be possible to finish the procedures in **210 working days** (approximately 10 months)]

#### Notes

Though most of the periods set are maximum periods, it is not likely that all the various steps can be expedited significantly. Some of the procedural steps within the Ministry of Forestry may not require the maximum period, and PHPA and YMR will be able to expedite these procedures.

- 1 ● The length of procedure 1 will depend largely on the time needed to receive the recommendations of the Tourism Department, the Governor and the Provincial Head of Forestry. A special meeting of PHPA, IRF, and YMR with these agencies will expedite the process.

During this period the partners in the SRS should discuss with the Ministry of Forestry the terms of reference and execution modality of the Environmental Impact Assessment (EIA). The SRS itself is a conservation project with breeding enhancement and research aspects, and would as such not require a EIA. Only the tourism development need to be assessed.

The partners should meet with the Ministries of Forestry and Finance to explore the possibilities for adjustments of the Concession Fee and the Concession Tax to enable optimal recycling of revenue between the project components.

- 2 ● Considering the active interest of PHPA in this project it can be expected that procedure 1 will result in a positive recommendation and a preliminary permit. To save time the final drafting of the workplan, the design and the EIA can start immediately upon completion of the preliminary workplan and the application documents. This will reduce the time needed.
- 3 ● Procedure 3 involves detailed study of the application and the EIA, and will require the period set, if not more.
- 4 ● Requires transfer of the set fee only. For the donors and investors it is important to know the precise amount at an early stage. See the recommendation under point 1.
- 5 ● Will require the period set.

### 4.3 The concession area

Based on the results of site inspection and on the improved map of WKNP it is proposed to move the concession area further east than

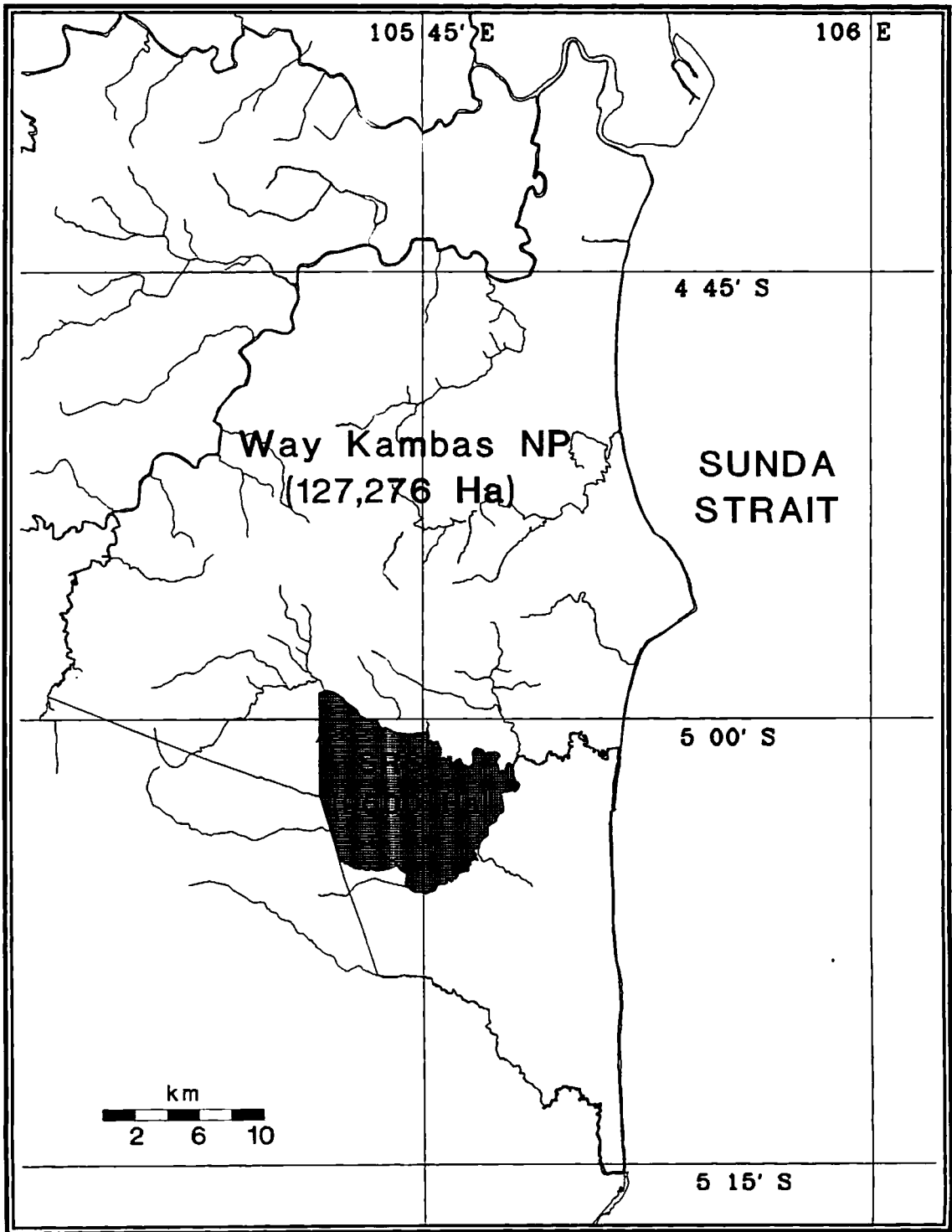
shown on the map in the Workshop report. The alignment of the proposed boundaries of the SRS Concession are chosen based on the following criteria:

- Total size approximately 10,000 Ha;
- Where possible with natural boundaries;
- Incorporating enough good forest for possible expansion of the rhino range;
- Incorporating prime areas for nature tourism;
- Providing maximal security for the rhinos.

A small area at the mouth of the Way Kambas (Kuala Kambas) has been incorporated to:

- Develop as a beach/angling location;
- To provide docking facility for boats unable to navigate the river
- To allow control of the traffic on the whole length of the Way Kanan river.

The location of the main concession in WKNP is shown on map ?, page ?. On map E, page 35, the two areas proposed to form the SRS Concession are shown in more detail.



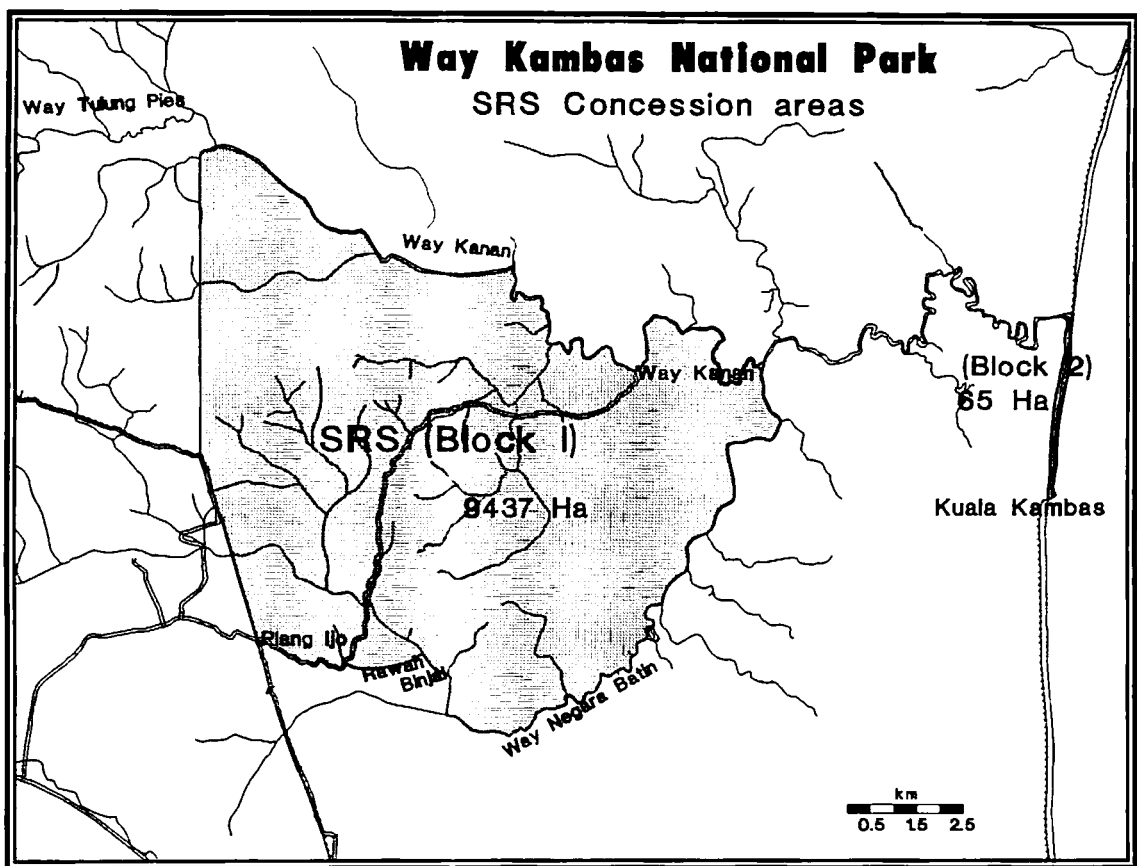
Map D - Location Map.

The proposed boundary of the main part of the SRS Concession (Block 1) is as follows:

- West* From Plang Ijo along the Park boundary till the bend in the boundary (approximately new boundary marker 64B), and thence along a north-south line till the Way Tulung Pies (The main tributary of the Way Kanan).
- North* Following the north bank of the Way Tulung Pies and the Way Kanan downstream till the confluence with the Way Negara Batin.
- East* Following the east bank of the Way Negara Batin upstream.
- South* Further following the east/south bank of the Way Negara Batin till the confluence with Rawah Binjai, and from there following Rawah Binjai till the Plang Ijo - Way Kanan road. From there following the road till Plang Ijo.

The small block at the mouth of the Way Kanan (Block 2) has the following boundary:

- East* From the mouth of the Way Kambas (Kuala Kambas) along the east bank of the Way Kambas, upstream till the point where the river bends inland.
- North* From the end of the east boundary in an east-west line till the low-tide line on the beach.



**Map E** - Proposed SRS-Concession. The main block (1) covers the area between the Way Kanan, the Way Negara Batin and the southern boundary of the Park. A small block (2) covers the coastal sandbar at the entrance of the Way Kanan.



- West* Following the low-tide line<sup>1</sup> southward till the mouth of the Kambas river.
- South* a straight line between the ends of the east and west boundary.

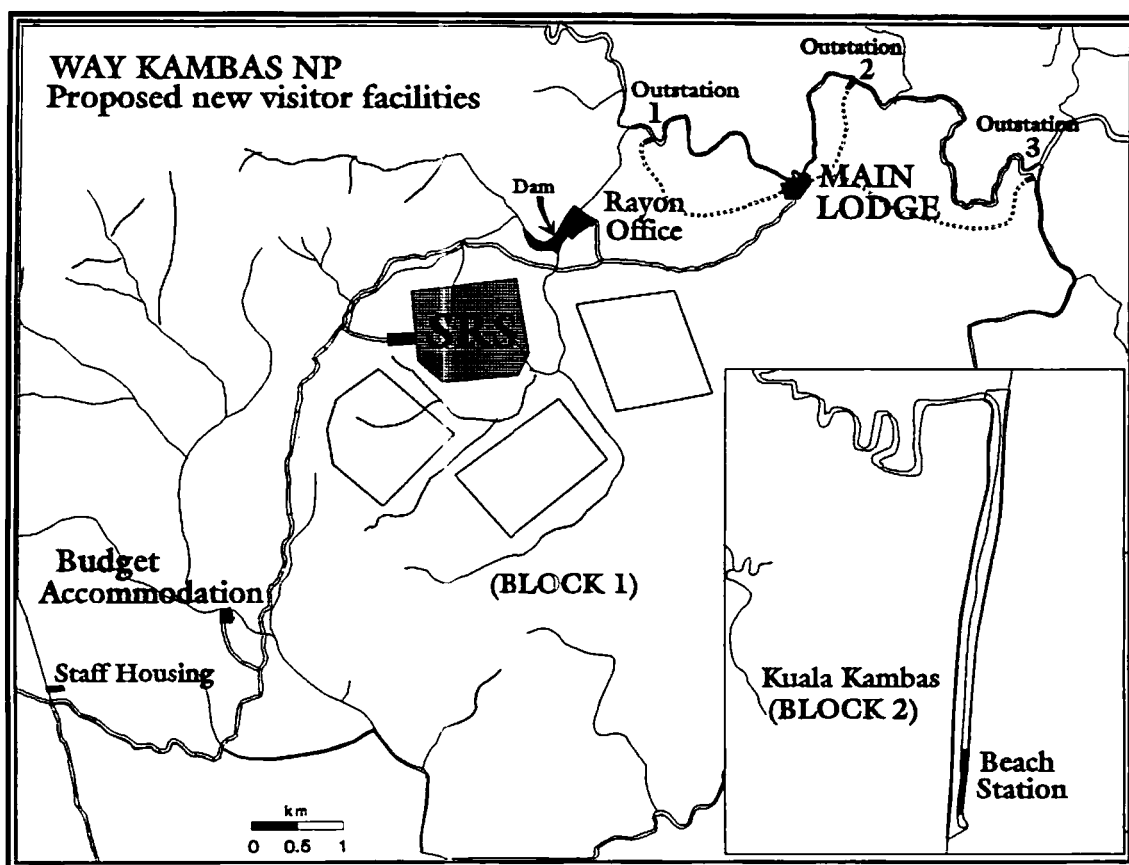
## 4.4 Facilities needed for the SRS

An overview of all proposed new locations to be developed for the SRS and the ecotourism facilities in Way Kambas National Park, based on the considerations given in chapter 3.4 , is shown on Map F, page 37.

<sup>1</sup> The precise boundaries of conservation areas on the seaward side are usually not clearly defined. The boundary follows 'the coast', but on the boundary maps a line some meters inland is shown. As a standard it is recommended to extend sea boundaries of conservation area till 500 meters seaward of the low-tide line.

4.4.1 RHINO ENCLOSURES

Conform the recommendations of the Workshop for each Sumatran rhino two 10 Ha enclosures will be available, to allow strict separation of the individuals and the sexes and to allow for recovery of the natural



Map F - Overview of proposed new visitor locations.

vegetation inside. 10 to 14 enclosures, housing 5 to 7 rhinos, form a convenient unit allowing a choice of breeding partners.

Six Sumatran rhinos are immediately available (1 from England, 5 from Indonesia) to occupy the first unit. One unit will suffice for the first few

years, but when more rhinos become available and the center is operating successfully other units can be added as required.

To allow for an ultimate breeding population of 20 to 30 rhinos a total of 3 or 4 enclosure units may be needed.

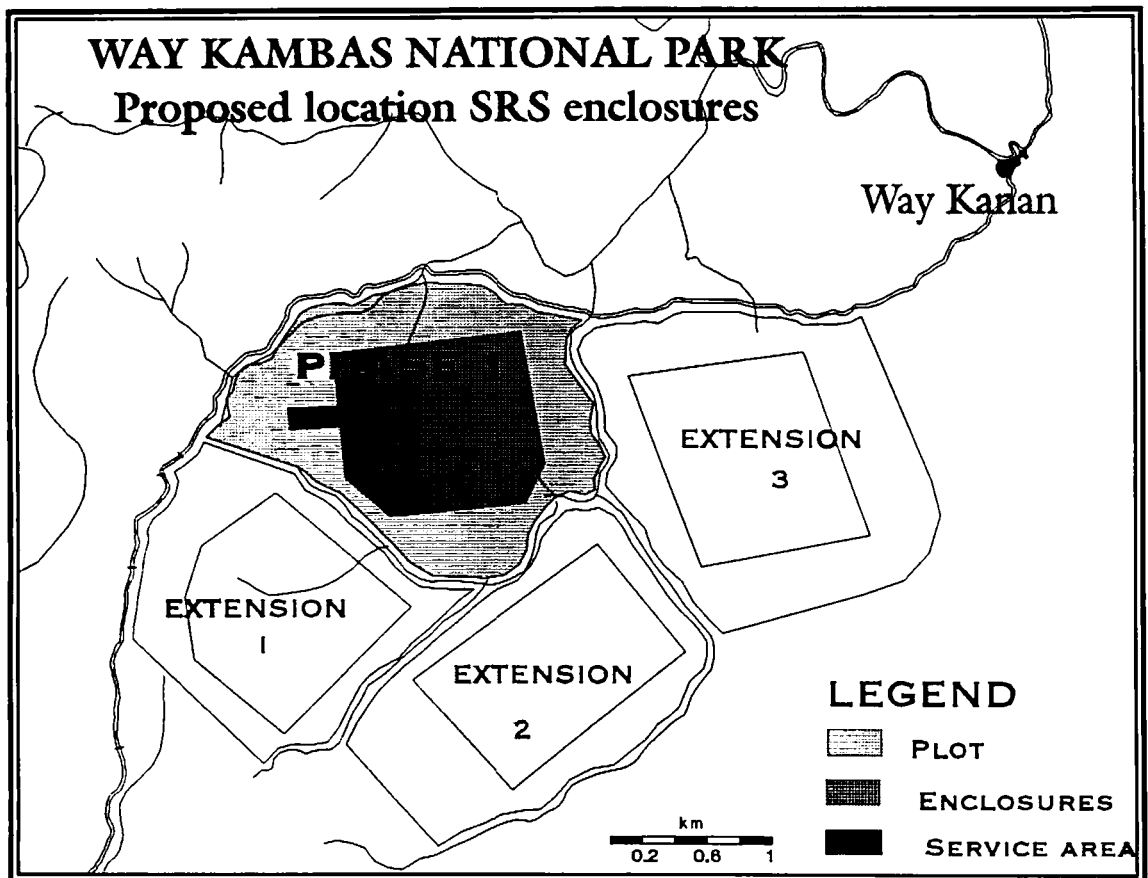
The proposed location of the first enclosure unit, with potential locations for three additional units, is shown in map G, page 38.

Phase 1 area is 291 Ha;

Extension 1 is 230 Ha;

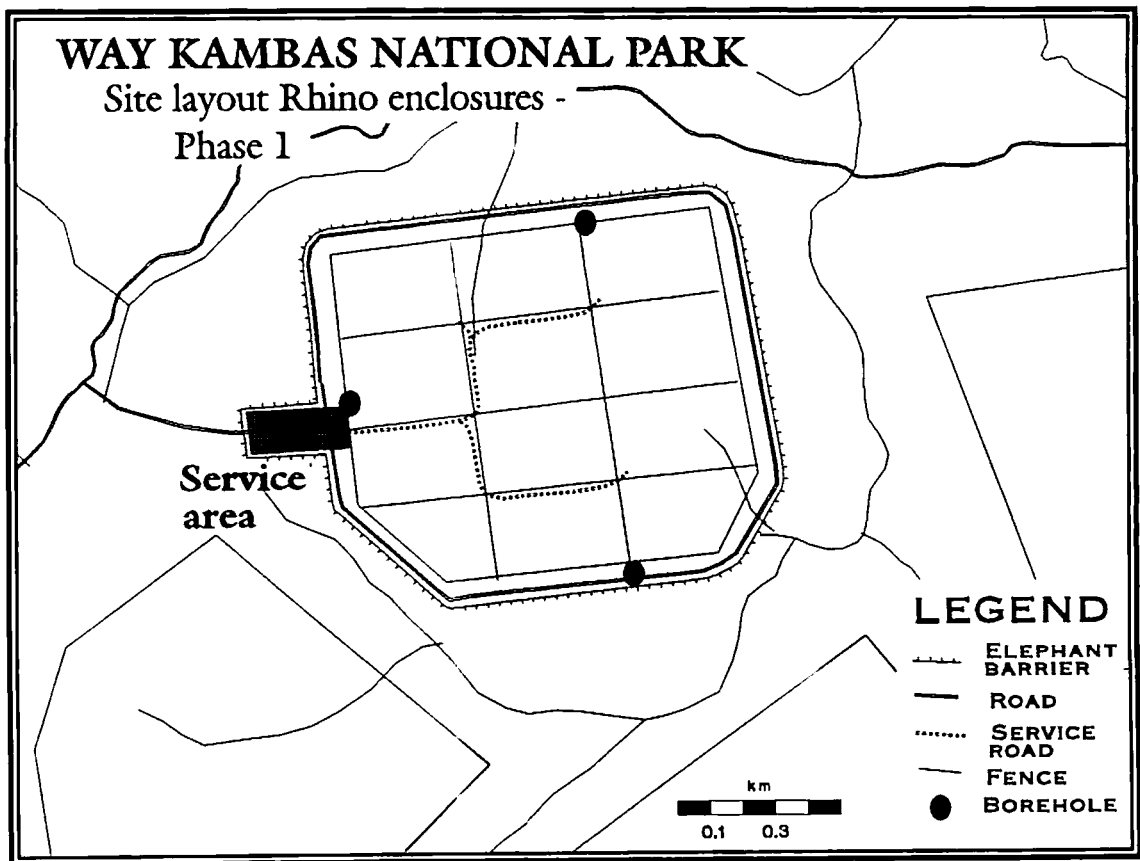
Extension 2 is 255 Ha;

Extension 3 is 321 Ha.



Map G - Proposed location of the Sumatran Rhino enclosures.

A more detailed site layout for the phase 1 rhino enclosure is shown on Map H, page 39, and a list of constructions is given in Table 6, page 40.



Map H - Tentative site layout for the first Sumatran Rhino enclosure.

Table 6 - Estimate of constructions needed for phase 1 enclosure.

	<u>length (m)</u>
Entrance road	760
Periphery road	4600
Elephant barrier	4700
Periphery fence	4280
Internal fence	5725
Service roads	1900
8 units of gates, shelters and pens	

#### 4.4.2 SERVICE FACILITIES

Table 7 - Constructions needed for SRS service facilities.

	<u>building (m<sup>2</sup>)</u>	<u>land area (m<sup>2</sup>)</u>
Keepers quarters (4)	400	8000
Guards mess	200	2000
Research/lab. building	100	2000
Guest house	200	3000
Mosque	25	500
Storage	50	500
Generator house, fuel storage	15	1000
Watertank		500
Gate		
Observation paddocks (2)		1000
Acclimatization yards (2)		10000
Roads, parking etc		<u>10000</u>
TOTAL		38500

The service facilities for the SRS should be built close to the enclosures to facilitate guarding and monitoring. An estimate of the constructions needed for the service facilities for the complete SRS are given in Table 7, page 40.

## **4.5 Facilities needed for Ecotourism**

The Tables below are a preliminary inventory of facilities needed for the various ecotourism and support facilities in WKNP. For each unit a separate list is provided, and for the main facilities at Way Kanan and Way Negara Batin a suggested site layout is presented.

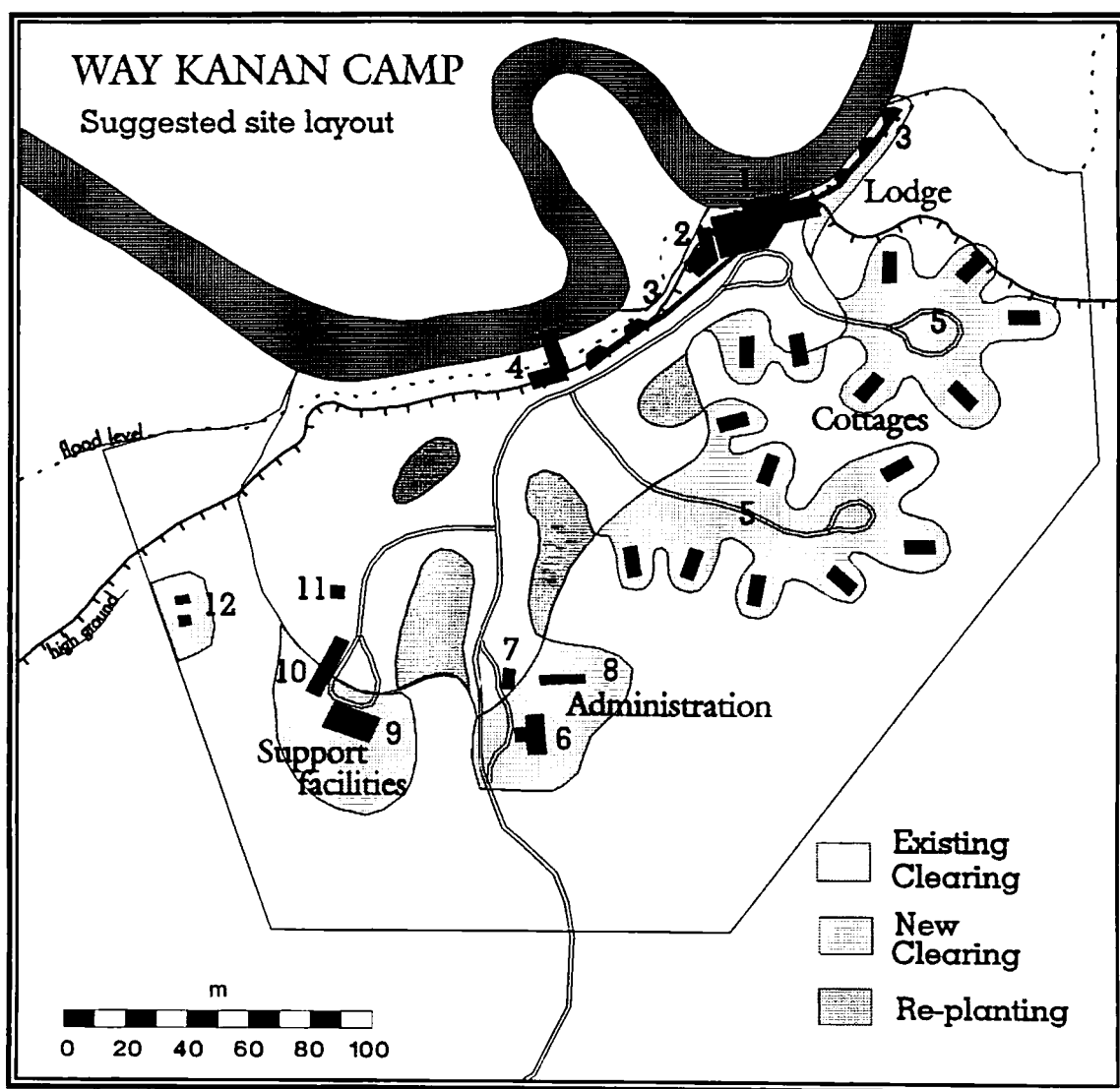
For each facility the size of the build-up area and the total land area needed is estimated. The land areas needed for the various parts of the SRS Concession are summarized in Table 13, page 49.

### **4.5.1 WAY KANAN LODGE**

The Lodge at Way Kanan is the main facility in Way Kambas, providing high-class accommodation for 30 to 40 visitors. The lodge with the dining and recreation facilities, with the kitchen and storage, is located on the bank of the river. This location provides a splendid view over the unspoiled river and forest on the other side. Covered catwalks and shelters along the bank of the river allow the guest to enjoy the scenery. The boathouse and jetty is located at the other side of the river bend to minimize disturbance in front of the lodge. The guest cottages are located in small clearings in the edge of the forest. The administration and support facilities are located on the other side of the area, near the entrance road, out of view from the lodge.

Three outstations, with accommodation for 2 - 4 guests, are planned at attractive places along the river (See Map F, page 37). The outstations will have to be built on stilts, because of the wet-season floods, and service roads or elephant tracks needs to be made from the lodge to the outstations.

One station is located near Ulung-ulung, upstream from the lodge, where there good conditions for hiking (in the dry season). The second



Map I - Site layout for the Way Kanan Lodge.

43

station is planned at an abandoned logging camp (D1) where wild elephants are regularly seen. The third station is located at the confluence of the Way Kanan and the Way Negara Batin, allowing access to the interesting swamps along the Way Negara Batin.

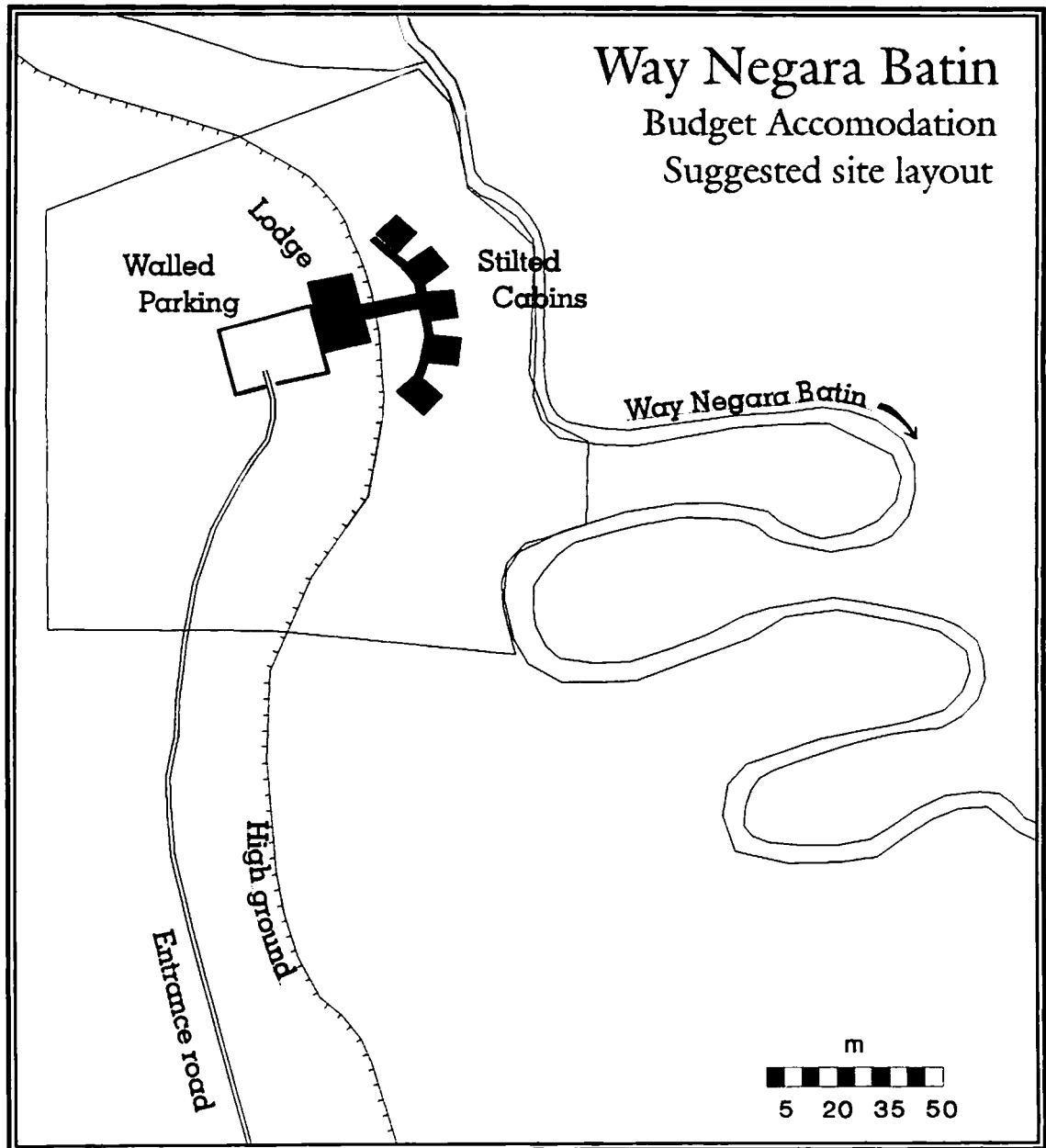
**Table 8** - Constructions needed for the Way Kanan Lodge.

	building (m <sup>2</sup> )	land area (m <sup>2</sup> )
Guest accommodation		
Lodge		
(dining, recreation, shop)	350	5000
Cottages (15 units @ 50 m <sup>2</sup> )	750	37500
Boardwalks	250	500
Kitchen/store	80	1500
Boathouse	50	500
Jetty	40	
Administration		
Director's house	100	1500
Office	60	1000
Guesthouse	60	1000
Support facilities		
Workshop/garage	150	2000
Staff mess	60	1000
Mosque	25	500
Watertanks		1000
Generator/fuel store	15	1000
Roads	640 m	
Outstations (3)		
Guesthouse (60 m <sup>2</sup> )	180	9000
Guide/servant quarters (20 m <sup>2</sup> )	60	1500
Service roads to outstations	6100 m	
<b>TOTAL</b>		<b>64500</b>



**4.5.2 WAY NEGARA BATIN BUDGET LODGE**

The Way Negara Batin lodge will provide simple and cheap accommodation for budget travellers. The location is at walking distance from the entrance, and offers very good access to mature tropical forest. Attractive trails exist and can be extended and the visitors can walk to the elephant center and to the SRS.



Map J - Site layout for the Way Negara Batin Budget Lodge.

Because the area is frequently visited by elephants, it is recommended to build the cottages on platforms on 4 - 5 meter high stilts. This not only provides complete safety from inquisitive elephants, but also allows a good view into the upper story of the forest.

The cottages can be connected to the lodge, on the edge of the high ground, with elevated walkways. The lodge provides food, drinks and bathing facilities. A walled parking place protects vehicles from unruly elephants.

A checkdam in the river is necessary to maintain the waterlevel in the dry season.

**Table 9** - Constructions needed for the W. N. Batin Budget Lodge.

	building (m <sup>2</sup> )	land area (m <sup>2</sup> )
Lodge (Registration, food stalls, washing)	200	15000
Cottages (5 4-room units @ 60 m <sup>2</sup> )	300	4000
Walled in Parking place		500
Checkdam		
Entrance road	760 m	
<b>TOTAL</b>		<b>19500</b>

#### 4.5.3 BEACH STATION

The beach station will mainly, at least initially, function as a guard post to control access into the Park over the river. Later a trans-shipping facilities and beach recreation and angling facilities could be developed.

**Table 10 - Constructions needed for Kuala Kambas Beach Station.**

	building (m <sup>2</sup> )	land area (m <sup>2</sup> )
Guesthouses (4 @ 50 m <sup>2</sup> )	200	6000
Guardpost	60	1000
Guides/servants quarters	40	1000
Jetty/marina	100	
TOTAL		8000

#### 4.5.4 RAYON OFFICE AND ELEPHANT YARDS

**Table 11 - Constructions needed for Rayon Office and elephant camp.**

	building (m <sup>2</sup> )	land area (m <sup>2</sup> )
Rayon Office	80	1000
Staff mess	100	1000
Elephant keeper's house	60	1000
Mahout mess	100	2000
Research lab.	150	3000
Mosque	25	500
Garage/storage	50	500
Generator/fuel store	25	500
Elephant sheds	80	500
Elephant yards		15000
Roads, parking		2000
Entrance Road	580 m	
Dam		
TOTAL		27000

The facilities planned for the Rayon office are in replacement of those currently existing at Way Kanan. In the same location a small group of

trained elephants and their keepers, to service the guests at the Way Kanan Lodge, will be housed.

A small dam in the river will provide bathing for the elephants, and possibly water for the Rhino Enclosures. Permanent fresh water will be beneficial for wildlife and will diversify the ecology of the area.

#### **4.5.5 STAFF HOUSING**

Only staff on duty should be allowed to stay at the tourist locations. Other non-local staff can be housed at Plang Ijo, near to the village just outside the Park gate.

**Table 12 - Constructions needed for Plang Ijo Staff Quarters.**

	building (m <sup>2</sup> )	land area (m <sup>2</sup> )
Mess	300	7000
Gate/registration	30	500
Storage/service	100	2500
TOTAL		10000

Table 13 - Summary of areas needed for the SRS facilities.

	Subtotal	Total
<u>Way Kambas National Park</u>		1,272,760,000 m <sup>2</sup>
<u>Concession</u>		
Block 1 (Plang Ijo-W. Kanan)	94,370,000 m <sup>2</sup>	
Block 2 (Kuala Kambas)	650,000 m <sup>2</sup>	
		95,020,000 m <sup>2</sup>
		(7.4 % of National Park)
<u>Rhino Enclosures</u>		
Phase 1	2,910,000 m <sup>2</sup>	
Extensions	8,960,000 m <sup>2</sup>	
		11,870,000 m <sup>2</sup>
		(12.5 % of concession area)
<u>Development areas</u>		
Way Kanan Lodge	53,000 m <sup>2</sup>	
Outstations	11,500 m <sup>2</sup>	
W. Negara Batin Lodge	19,500 m <sup>2</sup>	
Beach Station (K. Kambas)	8,000 m <sup>2</sup>	
SRS Service facility	38,500 m <sup>2</sup>	
Rayon Office	27,000 m <sup>2</sup>	
Staff Housing	10,000 m <sup>2</sup>	
		167,500 m <sup>2</sup>
<u>Roads (outside development areas)</u>		
Service roads (610 m)	3660 m <sup>2</sup>	
Rayon office (580 m)	3480 m <sup>2</sup>	
W. N. Batin Lodge (760 m)	4560 m <sup>2</sup>	
(Total length 1950 m)		11,700 m <sup>2</sup>
	TOTAL	179,200 m <sup>2</sup>
		(0.19 % of concession area)
<u>Miscellaneous</u>		
Dam at Rayon office (ca 10 Ha)		100,000 m <sup>2</sup>
Checkdam at W. Negara Batin		5,000 m <sup>2</sup>

## 4.6 Schedule of operations

Before further operational actions towards the establishment of the SRS can be started the following actions must have been completed:

- The **Management Company** be established with a provisional charter and an interim director appointed.
  - ⇨ IRF, YMR
- The general **Cooperation Agreement** be approved by BAPPENAS and SETKAB.
  - ⇨ PHPA, IRF, YMR

Both procedures have been started but it is not possible to estimate when the procedures can be finished.

The Management Company will be a foreign investment company, set up as a joint venture between a US company controlled by IRF and an Indonesian company controlled by YMR. It may take several months before the Management Company is operational.

YMR is currently drafting the text of the general Cooperation Agreement for BAPPENAS and SETKAB approval. Parties are advised to agree on the draft text as soon as is possible, so that PHPA can submit the Agreement to BAPPENAS.

Assuming that both procedures will be finished by the end of April 1995, operation of the SRS, including the first rhino movements, can start in February 1996 (See the detailed schedule of activities below).



WEEK	ACTIVITY	ACTION
1	<u>Steering Committee</u> Selection of Members Invitations <u>Management Company</u> Draft charter Selection Director Banking, etc <u>Concession application</u> Draft application <u>Cooperation Agreement</u> Final draft	PHPA,IRF,YMR PHPA IRF,YMR IRF Int. Director YMR+Consult. PHPA,IRF,YMR
2	As week 1	

WEEK	ACTIVITY	ACTION
3	<u>Cooperation Agreement</u> Final discussion Signing ceremony <u>Steering Committee</u> First meeting, approve: ManCo Charter ManCo Board ManCo Director Draft application <u>Management Company</u> Installation of Board Installation Director Office, banking, etc <u>SRS Design</u> Meeting Parties/Forestry on the Env. Imp. Assessment needs.	PHPA,IRF,YMR DirGen PHPA  Chairman IRF,YMR IRF,YMR IRF YMR+Consult.  IRF,YMR IRF,YMR ManCo Dir  ManCo Dir
4	<u>Concession application</u> Final draft Official application <u>SRS Design</u> Selection of consultants for de- sign and EIA	YMR+Consult. ManCo Dir  ManCo Dir
5	<u>SRS Design</u> Data collection	Consultants
6	As week 5	

WEEK	ACTIVITY	ACTION
7	<u>SRS design</u> Informal meeting of consultants with Forestry evaluation team for preliminary comments on application.	ManCo Dir, PHPA
8	<u>SRS Design</u> Meetings with Tourism Dpmt, Governors Office, Provincial Forestry for comments and recommendation	ManCo Dir, PHPA, YMR
9-15	<u>SRS Design</u> Survey permit Land survey Hydrological survey Air survey Physical design and EIA Hydrological survey <u>Animal Management Plan</u> Draft <u>Tourism Management Plan</u> Draft	PHPA, WKNP Consultants UNILA, Consult. IRF, YMR Consultants Consultants  Parties, AsRSG Parties + Consult.
16	<u>Application</u> Provisional permit	Ministry, PHPA

WEEK	ACTIVITY	ACTION
17	<u>Steering Committee</u> Second meeting, review: Provisional permit approval: Physical design EIA Animal Management Plan Tourism Management Plan Operating Company  <u>Application</u> Informal meeting Parties with Forestry and Finance on fees and taxes.	Chairman  Consultants Consultants Parties, AsRSG Parties+Consult. ManCo Dir  ManCo Dir, PHPA
18	<u>Application</u> Final design Submission of design and EIA	Consultants ManCo Dir
18-30	<u>Construction</u> Pre-selection of contractors Detailed costing and phasing  <u>Operation</u> Draft 5-year, 1-year work plans	ManCo, OpCo ManCo, OpCo  ManCo, OpCo, AsRSG
31	<u>Application</u> Settlement of concession fee	ManCo Dir
32-37	As week 18-30 <u>Rhino movement</u> Provisional schedule and information to holders	ManCo, PHPA, AsRSG

WEEK	ACTIVITY	ACTION
38	<u>Concession</u> Issuance of Ministerial Decree <u>Steering Committee</u> Third meeting, review: Conditions of permit approve: Workplans  <u>Operation</u> Start of 1st year of operation	Forestry, PHPA  Chairman  ManCo, OpCo, AsRSG
39-60	<u>Construction</u>  Phase 1 Rhino enclosure New Rayon location Way Kanan Lodge	OpCo, Contract. OpCo, Contract. OpCo, Contract.
61-91	<u>Operation</u> Movement and management of rhinos Way Kanan Lodge	PHPA, Holders, OpCo OpCo
92	<u>Steering Committee</u> Fourth meeting, approve Year-1 reports Year-2 work plans	Chairman ManCo Dir ManCo, OpCo, AsRSG
93	Start of second year of operation	

## APPENDIX 1 Hydrological survey

The Workshop report recommends a hydrological survey to test the productivity and water quality of boreholes in the proposed SRS location, and to test the water quality of the rivers. During the field survey Lampung University and the Manpower Development Center for Mines were contacted for information.

The costs for a borehole (150 m deep, estimated capacity 180 m<sup>3</sup>/hour, including pipe and pump<sup>1</sup>) are estimated at 35 million Rp (ca \$ 16,000).

The Research laboratory of Lampung University (UNILA) was contacted for water quality analysis. They can do water quality assessments (minerals, heavy metals, pesticides and residues) and proposed to monitor the rivers through monthly sampling for one year. Each river with 3 sampling stations and 3 sampling points per station.

Costs for monitoring two rivers (Way Negara Batin, Way Kanan) and 2 boreholes are estimated to be Rp 14 Million (ca \$ 7000).

Water quality assessment of the Way Negara Batin is important because of the proposed tourism facilities along this river. Way Kanan, originating from inside WKNP, is not polluted and the water cannot be used for drinking water or for the rhinos. Therefore there is no urgent need to monitor the water quality of this river.

Since there are currently no boreholes anywhere near the proposed SRS locations it will be necessary to make at least one borehole, along the road near the proposed rhino enclosures, to be able to assess the productivity and to analyze the water quality. For the water supply for the rhinos the water should not contain unusual high concentrations of lime, gypsum or other minerals.

The costs for the hydrological survey, is estimated to be \$ 20,000.

1

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## APPENDIX 2 Electricity and telephone

Currently the WKNP is not connected to the electricity or the telephone grid. During the survey in Lampung information was gathered on the costs of connection to the grids.

### Electricity

The main PLN (State electricity company) grid can be tapped into at Rajabasalama. A connection to Way Kanan would require 7.4 km of overhead wiring and 12.7 km of underground cable, inside the Park.

Costs for overhead wiring are Rp 3 million per km, for underground cable Rp 4.8 million per km. Total costs for a connection to the PLN grid are estimated to be ca 100 million Rp (ca \$ 50,000).

### Telephone

The nearest telephone exchange is in Metro, the district capital. A telephone connection would require wiring from Metro, partly on an existing line, and from Rajabasalama on a new line. The total costs for three lines are probably about 200 million Rp (\$ 100,000).

Radio link telephone systems are available from the state telephone company or from private traders. The costs for a 12 line system are between 300 and 800 million Rp (\$ 150,000 - \$ 400,000).