

**REPORT ON SURVEY OF THE ORANG-UTAN AND RHINOCEROS**  
**IN NORTH SUMATRA AND ATJEH - JANUARY TO MARCH 1963**

**World Wildlife Fund Project No. 35**

by

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**Singapore**

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3575(2)

1. This report deals with Phase 1 (two months) of a one year project in Indonesia to study the status of the orang-utan (mawas) and the rhinoceros. The period under review was spent in North Sumatra and Atjeh from January to March 1963 and the work carried out with the close and valuable cooperation of the local Government officers. There was a generous grant from the World Wildlife Fund and also the sponsorship of the Survival Service Commission of the I.U.C.N.
2. The Loser complex appears to be the main and possibly last important stronghold of the orang-utan and rhinoceros although smaller groups of these animals are reported further to the north.
3. The main threat to the orang-utan and rhinoceros is the indiscriminate smuggling carried out by persons in possession of arms and ammunition and this is largely confined to the military as the ordinary civilian does not possess arms.
4. I would venture to estimate a minimum population of 800 orang-utans and a maximum of 1500. Of rhinoceros (Sumatran) there might be 20 animals.

Two of the recommendations which were adopted by the First World Conference on National Parks in Seattle (USA) during July 1962 were :-

1. 'The First World Conference on National Parks recommends the early examination by the I.U.C.N. of a project to create within the natural range of certain gravely threatened species - rhinoceros, orang-utan, Arabian oryx (et al.) one or more special reserves into which individual animals can be moved so as to promote increased reproduction of the species, and further invites the Government concerned and other appropriate agencies to give sympathetic consideration to the project'.

2. 'The First World Conference on National Parks warmly welcomes and endorses the proposed world campaign for rhinoceroses sponsored by the World Wildlife Fund and the Fauna Preservation Society in cooperation with the Survival Service Commission of the I.U.C.N. and recommends that the Government of the nations concerned consider the establishment of additional parks and reserves to incorporate areas in which rhinoceros still survive'.

I submitted to Dr. Harold J. Coolidge an outline for a survey of the rhinoceros and orang-utan in Sumatra and Kalimantan (Indonesian Borneo), which was to be carried out in conjunction with a similar project in Sarawak and North Borneo under the direction of Mrs. Barbara Harrison of Kuching, Sarawak.

After the National Park Conference Dr. Coolidge approached the Government of Indonesia and suggested that I be allowed to carry out such a survey for one year in Sumatra and Kalimantan so that the information gathered on the status of the orang-utan and the rhinoceros might give encouragement in carrying out the above recommendations.

My plan for working in Sumatra was divided into three phases of about two months each:-

- |         |                         |
|---------|-------------------------|
| Phase 1 | North Sumatra and Atjeh |
| Phase 2 | Mid Sumatra             |
| Phase 3 | South Sumatra           |

I was finally granted permission by the Indonesian Government to

In addition to the above persons I am most grateful to members of the Forest Department in Pematang Siantar. Mr. Ranu, Head of the Planning Section, kindly drove me to look at a match and paper factory and also drove me in his departmental car to Parapat on Lake Toba. Mr. Pohan was able to identify some of the food eaten by the orang-utan. In Parapat I met Mr. Tobing and with his assistance I was able to have the Forest Department launch to take me around Samosir Island to Pangu-rutan.

My thanks also go to the Army Commanders in Kotatjane and Blangkedjeren and to the Governor of Kotatjane, all of whom accepted my presence.

Finally and not least to the British Consul, Mr. Frank Culver, and his wife, in Medan for their very kind hospitality during my stay there.

LOSER RESERVE (ATJEH)

The Loser Reserve covers about 1700 square miles and forms part of the great mountainous mass of unexplored primeval jungle in southwest Atjeh. The highest point of the complex is Gunung Loser (about 11,300 feet) at the north end of the Reserve and from the whole range, which decreases in height as it runs in a northwest-southeast direction, numerous streams flow westwards into the Indian Ocean and eastwards into the torrential Alas river. A very rough road runs parallel to the east bank of the Alas river and beyond this another range of densely forested mountains rises abruptly - the Sorbolangit Range.

Kotatjane, 135 miles from Medan, is a small town lying between these two mountain ranges and approximately level with their midway points. Although the road actually continues as far as Blangkedjeren the surface deteriorates to such an extent that trucks and buses terminate their trips at Kotatjane and further travel has to be done by jeep and even these vehicles find difficulty in covering the remaining 65 miles without getting bogged down in the mud or suffering from more serious mechanical trouble.

The boundary of North Sumatra and Atjeh is at Lau Pakam, about 25 miles, south of Kotatjane and here there is a Police inspection post. Between here and Kotatjane the populated areas decrease rapidly except in the immediate vicinity of Kotatjane where there is a string of small villages on comparatively flat ground and most of the land is cultivated

for the production of coffee and marketable fruits such as durian.

rhinoceroses and oranges. Between Kotatjane and Palek, five miles from Blangkedjeren, one could say that the land is almost uninhabited.

After discussions with Simurat we decided to start off from Kotatjane, work northwards along the Alas river camping at suitable spots en route, eventually reaching Blangkedjeren. From here, depending on local information available, I hoped to visit the regions to the northwest, north and northeast where both rhinoceros and orang-utan are reported to exist. Then, if possible, walk eastwards towards Rantauandjang and the Simpang rivers, finally reaching Kuala Simpang from where I would return to Medan by bus. As it happened this plan did not materialise and I only reached Blangkedjeren from where I returned to Medan via Kotatjane.

### FIELD OBSERVATIONS (1)

**Rhinoceros** As opposed to the amount of information I was able to gather about the orang-utan I learnt comparatively little about the status of the rhinoceros. The average native knew practically nothing about their whereabouts and I had to depend for my information on those few persons who had hunted illegally. The informers were therefore rather reluctant to divulge their secrets for fear of being arrested and so their replies to my questions were particularly vague. In Blangkedjeren I had hoped to learn a lot from one man who is reputed to be the rhino expert of the whole area but it soon became apparent that he was not prepared to give away any information that might incriminate himself. He could, he said, take us to a place where he had come across rhino tracks 'a long time ago' or to another place where rhino 'sometimes' passed. As for the location of licks and wallows he merely said that he sometimes came across them but they were all 'very far away'. From other sources I learnt that this man had set up traps and with other persons was engaged in smuggling horn.

In spite of the poaching reports indicated that there are still rhino in quite a number of places in Atjeh. Nine specific places were mentioned to me and at one of these I was able to identify some old tracks near a salt lick. If there are rhino in all the mentioned places and if one estimated one family in each, say, three animals the population is about 30 beasts. However in at least three of the localities they are reported as being "frequent" or "by no means uncommon" and as almost nothing is known about their status in the main Loser Reserve, perhaps there is a population of double, or say 50. At any rate, from

what I gathered, their numbers are by no means small. I was told that

between 1942-59 at least 20 had been shot or trapped.

The price of the horn seems to vary considerably. The lowest price was quoted as 9000 rupiah per ounce (official rate of exchange US\$1 equals 44 rupiah; black market about 1000 rupiah). The highest price was 42,000 rupiah per ounce ... this was about 3 years ago.

## FIELD OBSERVATIONS (2)

### Orang-utan (or 'mawas')

#### Ecological disturbances

Dr. Carpenter was the last person to carry out a survey of the 'mawas' and in his report he reproduces a map of Atjeh showing their reported and observed locations. This represents the position in 1937 and need less to say there have been inevitable changes since then both to the habitat and the conditions under which the 'mawas' have to live.

Two main causes for these changes are (a) the cutting down of forested areas and the opening up of land for rural development and cultivation and (b) the ruthless poaching by persons who have come into possession of firearms and motor transport. This latter has increased seriously during the past 25 years. Dr. Carpenter realised that these factors would be interrelated to the safety of the 'mawas' but a third cause which he could hardly have foreseen was a collapse in the economy of the country. This has had a serious effect on the decimation of the 'mawas' population.

(a) is happening in every country throughout the world. As human population increases at such a stupendous rate and <sup>more and</sup> more land has to be made available for cultivation and development. This means that much of the natural habitat of various species of wildlife is being completely destroyed and the animals are forced to leave their ancestral grounds and seek refuge in other and possibly less agreeable areas. On the recognised principle that 'Man comes first' and when an endangered species lives in an isolated pocket - such as the Sumatran rhinoceros north of Kuala Lumpur in Malaya - one can only hope that the government concerned will agree to set aside an area for the preservation of that species.

(b) is far more serious and yet I am sure that it could be reduced if sufficiently strong action were taken by the appropriate authorities.

I concur with what Dr. Carpenter said when he stated that the people of Atjeh are not hunters. With some diffidence I must therefore state quite clearly that the main threat to the existing population of 'mawas' comes from some members of the Army and Police and other representatives of the government who have access to arms, ammunition and transport. What is more tempting than to obtain one or more of these animals and dispose of it for 20,000 rupiah, thus augmenting one's income manifold? An orang-utan means a little to them and the fact that the species is rapidly becoming extinct causes no concern.

### Illegal trading

The people recognise three types of orang-utan -  
Mawas kuda (Horse mawas). This has little if any marketable value as it is usually an old and lone male of considerable size and weight.

Mawas kambing (Goat mawas) very acceptable and weigh up to 100 lbs.

Mawas perok (Squirrel mawas). The smallest of the types and ranges up to about 50 lbs.

(Note - quite frequently the people refer to the Siamang (Symphalangus syndactylus) as the mawas hitam ... Black mawas).

The type most favoured for capture is one that weighs about 20 lbs. or about one year old; ones larger than this get harder to capture, more difficult to keep in captivity and hide from the authorities during the trip to the coast. Very young ones are merely hidden under the owners coat but the usual practise is to squeeze two or more into a small box which is then placed on a bus or jeep and sent to Medan. A native can send one in a military vehicle if he is prepared to pay about 5000 rupiah while, of course, Army personnel send their own 'mawas' on their own transport.

On account of the terrain the only practicable method by which 'mawas' can be exported from Central Atjeh is by road through Kotatjane. This route seems to form a natural funnel for all illegal traffic to Medan. The various check posts en route cause little trouble because a large sum of money passes hands 'under the counter'. On arrival in Medan the illegal owners keeps the 'mawas' in a secluded spot some distance from his own house and when the necessary arrangements have been completed the animal(s) are sent to Belawan where they are stowed on board one of the many boats going to Singapore or Malayan ports or elsewhere. 'Mawas' caught further north are sent from other smaller ports.

## Capture of 'mawas'

There are two distinct methods. (1) Shooting a female and then taking the young. This is the method employed by persons in possession of arms; it is quick and involves no special technique. (2) The normal way used by unarmed persons is more laborious and time consuming. A 'mawas' is located in a tree and then the surrounding trees are felled leaving the animal isolated. After eating everything available in the tree - leaves, fruit and bark - and suffering from thirst, the unfortunate animal is forced to the ground where his captors have been keeping vigil in a concealed spot. The men dash out, two of them grabbing an arm each while one takes hold of the back of the head. The arms are tied behind the back and the animal is thrust into a sack and removed.

## Maintenance after capture

This is almost negligible. The captured animal is looked on as a source of money and any thought of showing it any kindness seems to be completely lacking. I saw a total of 9 'mawas' in captivity, excluding 6 in the zoo at Pematangsiantar, and nearly all of them were kept imprisoned in a wooden box or crate which was of such a size that it was quite impossible for the animal to stand up. In two instances there were two animals in a box so small that they had to spend the whole time in a crouched position with their arms around each other. Another 'mawas' which stood about three feet high spent the whole time on a wooden shelf in a cage which measured about 9 feet high and three feet square with the front enclosed by 1 inch iron bars.

They are all fed on boiled rice, bananas and perhaps some pineapple. With this unnatural diet their stomachs become very distended and with the inability to move or keep clean, they become sick and as often as not die.

I also saw one Siamang that was kept tied on a short rope in a garage. This smelt of oil, petrol and urine from the adjacent house and the poor animal could walk nowhere except on the oily floor or the smooth drums.

## Prices

There appears to be two values for the 'mawas'. If a person is walking through the jungle not specifically looking for one but finds one and is able to capture it he will probably accept about 10,000 rupiah which is about US\$10 at the Black Market rate of exchange and



about US\$230 at the official rate. However a person going out with the intention of catching one may be away for a week or longer. Several years ago a young 'mawas' might have fetched as much as 37,000 rupiah but now the average price in Kotatjane is about 17,000 while in Medan it is about 24,000 rupiah.

One encouraging point to note is that the prices are decreasing because the wildlife conservation authorities have been confiscating illegally owned 'mawas'. This is a great financial loss to the owner and so people are slowly becoming less anxious to trade in these animals. However there is still a lot to be done to stop the trade completely.

#### Numbers of 'mawas' smuggled out of Atjeh

As the authorities are exercising more control over the possession of 'mawas' the number being sent out to Medan is decreasing but nevertheless it is estimated by the authorities that during 1961-62 no less than 280 orang-utan were sent through Kotatjane to Medan. On arrival many were dead owing to bad handling and the criminally sized boxes in which the animals were kept. One of my porters claimed to have caught himself 8 from October to December last year.

#### Number of 'mawas' in captivity

It is not possible to give an exact figure as the number varies daily but at the beginning of March (1963) no less than 47 'mawas' could be accounted for in captivity in south Atjeh and in general vicinity of Medan. In addition to these three more are known to have died recently and the corpse of one of these was found by two of my porters on 6 February near Meleuwak. It was a largish animal with a rope around its neck and lying on the edge of the river partially decomposed. I strongly suspect that it was one of a pair at Gumbang village a few miles further to the north. I was informed that an Army sergeant threatened the owners with illegal possession. To settle matters 'amicably' the sergeant purchased the smaller of the two for 5000 rupiah and after he left the owners must have killed the large one, as it was too big for the market, and thrown the corpse into the river.

#### Known captive orang-utan at beginning of March 1963 (Atjeh-N.Sumatra)

<u>Place</u>	<u>Male</u>	<u>Female</u>	<u>Sex unknown</u>
Takengon		1	4
Sangir	1	1	

Angusan	1	(old)	
Kotatjane	2	3	1
Kota Pasir	1	1	
Medan			10
Selwan	1		
Sjintaradja			1
Kualasimpang	1		4
Kotaradja			2
Pematangsiantar (zoo)	4	2	
Baherok			1
Brandan			1
Pangkalan Gusu			1
Sungai Musan			1
Sidikalang			1
Kabandjaha			1
	<hr/>	<hr/>	<hr/>
	11	8	28

Total of 47

### FIELD OBSERVATIONS (3)

North of Kotatjane I was only fortunate in seeing 'mawas' on three different occasions; once a lone male and twice a family group of three.

The first time was at Anan. We had packed our belonging and were on the point of moving camp when a man hurried to tell us that he had just seen a 'mawas' further up the road. We hastened to the spot which was about 100 yards from the road on the edge of a small rubber plantation. I had some difficulty in seeing the animal even though it was asleep on a nest about 50 feet from me. With the binoculars however I could make out a patch of reddish hair which protruded above the rim of the mass of twigs and sticks that formed the crude sleeping place. The nest was about 30 feet from the ground in a small tree. As I watched from below I could see an arm (or leg) hanging over the side of the nest and holding on to a branch. One of the men started to climb a nearby tree and this awoke the animal. It walked from its nest along a small branch to an adjoining leafless tree. It remained there for about a minute, examining us, and then urinated before moving to another tree. To maneuver a gap of about four feet it reached out with a foot, grabbed the tip of a branch and pulled it close so that it formed a bridge. At this point the men had spotted a female with a baby in a tree about 60 feet away. The male approached

her, moving through very thick foliage, and they all disappeared into

the dense canopy. The colour of each was reddish and the male had rather an obviously brownish face with a small beard.

The second one I saw was from the road north of Rumah Bandar near Kungko. The guide, Amansar, spotted it from his seat on the back of the jeep that was taking us to Hlangkedjeren. The huge animal was seated in the fork of a tall, almost leafless tree, about 300 yards away. Even without binoculars the animal appeared enormous. It had two large cheek growths, a handsome beard and the whole body appeared covered in long red hair that reminded me of Spanish moss. It was feeding leisurely on the few leaves available and also the flowers of the tree, which Sinurat identified as Zanthoxylum rhetsa. It finally settled down again in the fork of the tree and seemed to go to sleep.

The third occasion on which I saw them was again north of Rumah Bandar; I was walking some way ahead of the porters, stopping frequently to examine the trees. At one point the branches of a huge big tree were almost overhanging the path. As I glanced up I saw, much to my surprise, a 'mawas' walking upside down along a branch. Then I saw a second animal and shortly after that the guide arrived with the porters. The guide and I cut a path through the very dense undergrowth to the base of the tree and with some difficulty we could see one 'mawas' on a nest in a fork overhead. There was no sign of a second one. We called out and tapped the tree hoping to get the one off its nest but it did not move. Then quite suddenly a youngster of about a year (?) climbed out of the nest, walked and swung its way to the top of the tree, crossed to another by brachiating along a vine directly overhead and then disappeared into the foliage.

Eventually the other one on the nest (probably the mother) climbed out, walked up a thick branch, swung to another tree and then brachiated along the same overhead vine. Half way across it stopped to look down at us during which time it was suspended by one arm only. For several minutes both the adult and young were lost to sight but when they reappeared they were accompanied by a second adult ... possibly the male.

Of interest is that all of the 'mawas' I saw were within a few hundred feet of the main track which is used by jeeps. In the jungle itself, far from the track, I saw numerous nests but no orang-utans.

### Nests

I did not see any of these being constructed but saw two 'mawas' on their nests at quite close quarters. Looking at the figures it is

interesting to note that the heights laydurea for the building of nests lie between 30 and 70 feet and this corresponds to the observations made by Schaller in Sarawak.

Heights of orang-utan nests above the ground

<u>Height of nests</u> (in feet)	<u>Number of nests</u>	<u>%</u>	<u>Schallers</u> <u>%</u>
0 - 10	0	.0	.0
11 - 20	0	.0	.8
21 - 30	1	2.3	2.2
31 - 40	6	13.6	15.3
41 - 50	14	31.8	25.0
51 - 60	10	22.7	24.5
61 - 70	6	13.6	17.5
71 - 80	4	9.1	6.1
81 - 90	2	4.6	2.6
91 - 100	0	.0	3.0
101 - 110	1	2.3	.4
	<u>44</u>	<u>100.</u>	<u>100.</u>

Most of the nests were encountered up to an altitude of 3000 feet above sea level although one was noted at 4350 feet a.s.l. The guide reported that they were to be found a little but not much higher than this altitude ..... possibly a maximum of 5000 feet a.s.l.

FOOD

I only observed one mawas actually feeding. This was the lone male at 1500 hours in a Zanthoxylum thassa. There appeared very little foliage on the tree but with the aid of binoculars I could see quite clearly that the animal was eating both leaves and flowers. The guide informed me that they also eat leaves, fruit, flowers and seeds of the following :

Musa spp	Wild and cultivated bananas	Fruit and hear
Ficus spp	Figs (Rambung)	Fruit
Baccaur eae		Fruit
Meraceae	(Bergang)	Fruit
Dicksonia Sorbifolia	(Baharoe)	Fruit
Parkia speciosa	(Pete)	Green pod

Mangifera spp	Managoes (Bakau)	
Salacca edulis	Palm (Salak)	
Pithecolobium Lobatum	(Djering)	
Myristicus spp	Nutmeg (Pala)	Fruit
Durio spp	Durian	Fruit

Of this list the latter is possibly the most favourite if it is available. During the fruiting season the mawas can do considerable to these cultivated trees as their fruit is a source of income to the grower. This is therefore a time when many of them are caught.

In addition to the above list I learnt that they also eat grubs and other insects which they dig out of the bark of trees.

### ESTIMATE OF WILD POPULATION

The method adopted by Schaller and Mrs. Harrison in Sarawak and N. Borneo to reach a rough estimate of the population density of mawas in an area of known size consists of counting the number of nests seen, say within 100 feet on either side of the path, and dividing this by the number of hours (or miles at about 1 mile per hour). It has been assumed that mawas build one nest a day and each remains visible for about 6 months. One mawas would therefore be considered responsible for 180 nests in one square mile.

However my guide informed me that a nest only remained visible for about 4 months and that definitely more than one nest a day was constructed.

In the Alas and Gaje areas their range is known to extend from Lau Pakan to Blangkedjeren on either side of the Alas river. Except in a few places the jungle comes down to the river and the contours rise steeply on either bank. Bearing in mind that mawas are probably not naturally inclined to go above 5000 feet, their range in this particular area could easily extend for 10 miles on either side of the river and would therefore enclose an area of about 1500 square miles. My estimates indicated one orang-utan per square mile but this was based on one nest per day, making an approximate total of 1500 orang-utans in this particular area. However I would prefer to halve this number on the basis of at least two nests per day and the fact that the nests are reported to only last 4 months.

Therefore I would like to suggest that there might be 800 orang-utans in the area in question. In addition however there is an area to the north which I was unable to visit, another area near the coast on the west slopes of the Loser and a third area directly west of Medan,

all of which are known to contain orang-utan. Whatever their numbers might be the total population is dangerously low ... perhaps 1500 or a few more or a few less. If 280 animals are known to have been smuggled out in two years - and this does not include all the one that have certainly died - at the end of ten years there may none left unless some very strong and active steps are taken NOW.

I do not believe there are any groups of any material size in Atjeh - North Sumatra east of an approximate line from Singkel to Pangkalan Brandan.

### CONCLUSIONS AND RECOMMENDATIONS

In Atjeh and North Sumatra as the Loser complex constitutes the main habitat area of the orang-utan and rhinoceros (excepting a smaller area to the north towards Lesten and Lokop which I did not visit but received reports). I suggested that an appropriate part of this magnificent natural mountainous area be selected as a special reserve for orang-utan and Rhinoceros as soon as possible.

But

- as (a) at the present time I do not believe the Government has sufficient funds at its disposal to engage men to patrol such an area, and as (b) the military and other persons are so involved in the capture of Orang-utans for smuggling out of Indonesia, and as (c) the estimated population of Orang-utans in the above area is possibly only about 1000 animals, and (d) in view of the fact that at the recent meeting of the American Association of Zoological Parks and Aquariums the following motion was passed -

'A list of animals to be prepared, whose wild population would be severely endangered by new zoo collection, importation, and/or exhibition; that this list, after annual review and approval by the board of the AAZPA be published as the 'AAZPA Black List' and that members be encouraged to support a policy of non exhibition of such endangered forms' (with special reference to orang-utans)

I would like to recommend

1. The Indonesian Government requests its HIGHEST authority to take urgent and very strong steps to condemn and prevent the smuggling of orang-utans from Indonesia
2. Local Forest Department, Wildlife Conservation and Custom Officials have the authority to arrange for surprise check points along the road leading from the Loser complex to Medan and ports from which vessels might leave for Singapore, Malaya, Thailand etc.,

3. That they have the authority to confiscate any illegal owned orang-utan and ensure that the owner is severely fined.
4. That frequent checks are made by Customs at all airports as many orang-utans are smuggled out by plane.
5. That the Custom, Veterinary and other appropriate Department in Singapore in particular but also in other ports such as Bangkok and Hong Kong be requested to cooperate in a general campaign to end the smuggling of orang-utans from Indonesia.
6. Until such time as an effectively patrolled sanctuary or special reserve is formed the I.U.C.N. assist the Indonesian Government in finding means of disposing those orang-utans confiscated and already known to be in illegal captivity (such as the approximate 45 specimens in the general vicinity of Medan in March 1963).
7. That any of these 45 specimens which have not already died might be possibly sold at a nominal price to approved zoos.
8. That funds outside sources be made available to the Indonesian Government to assist them in developing a special Reserve in the Loser region.
9. That a further study be made of the Loser complex in the near future to determine a suitable area for a special reserve.

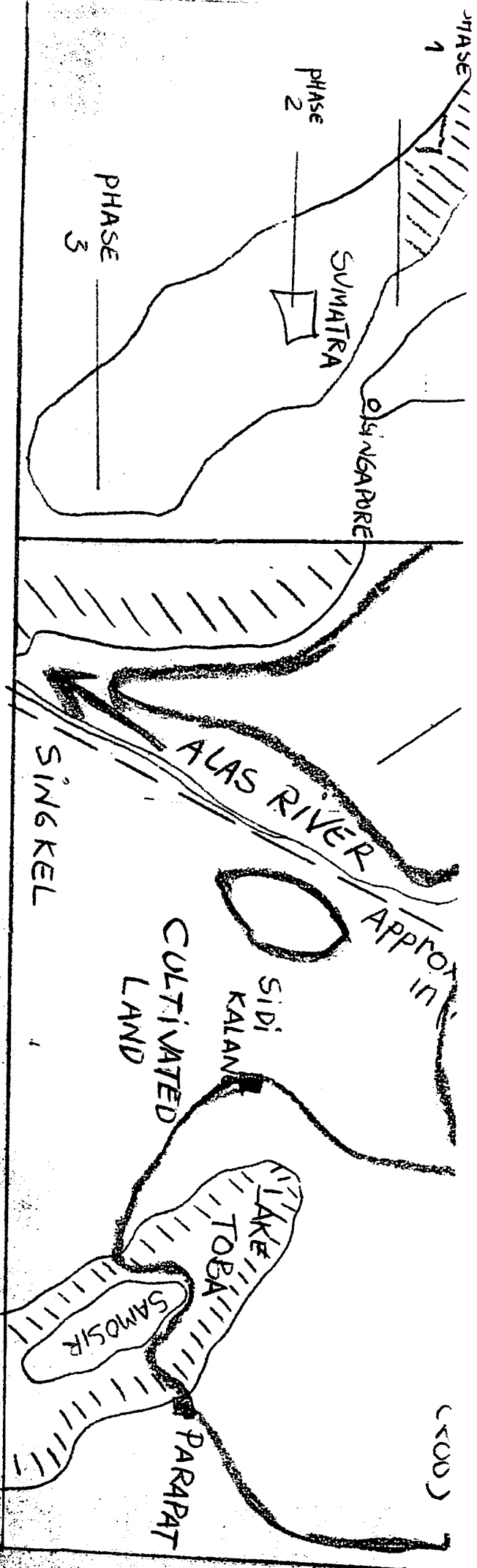
#### REFERENCES

- C.A. Carpenter. "A Survey of wildlife conditions in Atjeh, North Sumatra". Nederlandsche Commissie voor Internationale Natuurbescherming. Mededeelingen 1938.
- B. Harrison. "Orang-utan: what chance of survival?" Sarawak Museum Journal. Vol. x No. 17-18 p. 238 et seq. 1961.
- "Report on recent investigations in North Borneo", World Wildlife Fund. 1962.
- G.B. Schaller. "The Orang-utans in Sarawak". Zoologica Vol. 46 part 2 Sept. 1961.
- A more complete bibliography will be included in the final report.-

Disalin oleh:

PENGATUR MUDA TINGKAT I  
Seksi Perlindungan dan Pengawetan Alam  
Sumatera-Utara Medan,

  
S. Poniran



LEGEND:

Route followed

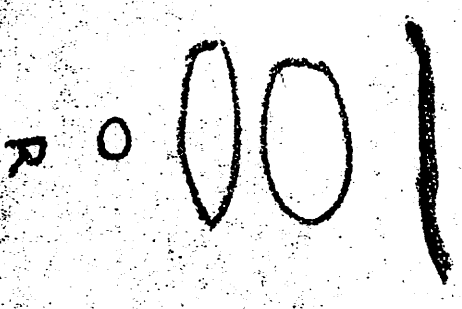
Probably main habitat of orang-utan up to 5000 feet

Reported rhinoceros (Sumatran) habitat

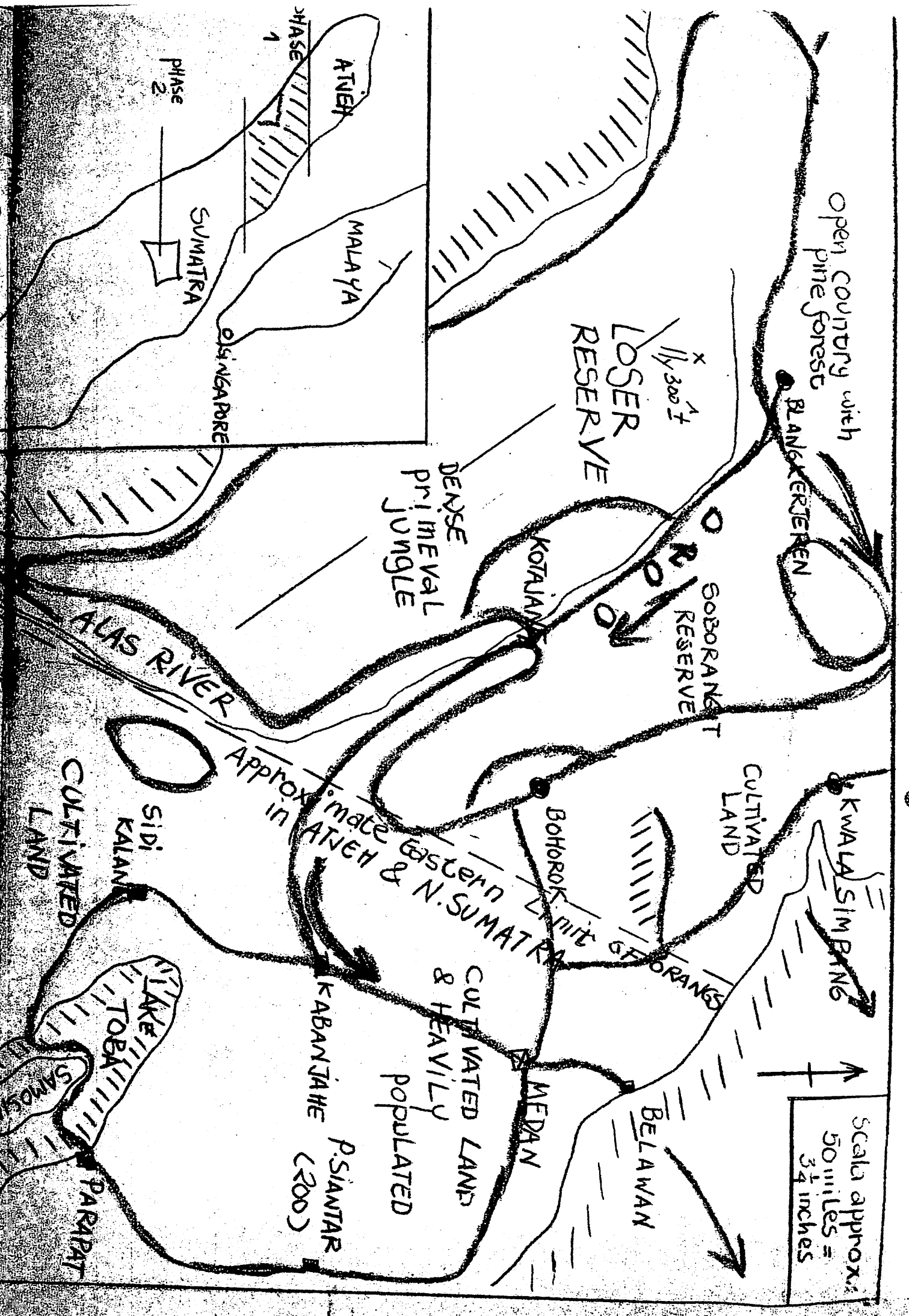
orang-utans been

found tracks been

in smuggling routes







Open country with pine forest

BLANKERTEREN

LOSER RESERVE  
11,300 ft

GOBORANGIT RESERVE

DENSE PRIMEVAL JUNGLE

KOTALIAN

ALAS RIVER

CULTIVATED LAND

KUALA SIMPANG

Approximate Eastern Limit of N. SUMATRA

BOHOROK

STORANGS

CULTIVATED LAND & HEAVILY POPULATED

MEDAN

BELAWAN

KABANJAH (200)

P. SIANTAR

SIDI KALANG

LAKE TOBA

PARAPAT

PHASE 2

PHASE 1

ATIEH

MALAYA

SUMATRA

SINGAPORE

Scale approx:  
50 miles =  
3 1/4 inches