The Plight of the Sumatran Rhinoceros in Sabah

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Introduction:

There are five living species of rhinoceros, two in Africa and three in Asia. One species, the Sumatran or Asiatic two-horned rhinoceros (Dicerorhinus sumatrensis), occurs in Sabah. This is the smallest of the rhinos, and the only species with extensive body hair. Adults weigh about 1500 kg. and stand 1.2m high at the shoulder. Unlike the African and Indian rhinos, the Sumatran rhino is a forest-dwelling species, which belongs to one of the oldest genera of living mammals. There are fossils of a very similar rhinoceros dating from 40 million years ago in Europe (Zeuner, 1934).

Two thousand years ago, the Sumatran rhino was widespread throughout South-east Asia, including Southern China (van Strien, 1974). By one hundred years ago, the species was still fairly widespread and common in some areas, but had disappeared from China. At that time, rhinos were often seen in the Sandakan area and came into the town at night time (Dunn, 1931). Rhino horn sold in Sandakan at $50 per kilo, during the early 1900's (British North Borneo Herald, 1900-1915).

Since then, the Sumatran rhino has suffered a serious decline in numbers both in Sabah and throughout the whole range in Asia. There are two main reasons for this decline. Firstly, both the number and distribution of people have increased throughout South-east Asia. Where forest is cleared, the rhinos do not survive and the amount of land suitable for supporting rhino populations has decreased accordingly. Furthermore, the pattern of human settlement and agriculture has been such that rhino populations are fragmented. Individuals do not come together to breed, and many forested areas are too small to support viable populations. Secondly, and more seriously, the Sumatran rhino has been subjected to intense and continuous hunting throughout its former range. Part of the decline due to hunting can be attributed to indigenous people hunting for food and to early European settlers

or sport. By far the most important cause of extermination by unting however, is the demand for rhino horns and other parts of he body, particularly in Chinese medicine. There is no evidence hat rhino horns have medicinal properties, but illegal hunting for orns is still the greatest immediate threat to the species' survival.

Continuous wide-spread and long-term hunting by men led to the extinction of many large mammals during the Pleistocene period, tens of thousands of years ago (Martin and Wright, 1967). Together with loss of forest over the past few hundred years, such hunting has decimated the Sumatran rhino. There are now only two or possibly three known breeding populations in the world. (1) In Sabah, it has been estimated that at least 7 and possible 12 or more rhinos are still living within the Silabukan and Lumerau Forest Reserves (Sampoladon Pilik, 1981; see Map 1). The extent of the Forest Reserve area currently containing rhinos is probably in excess of 1000 sq.km. In 1980, there were at least two sub-adult rhinos in this population, although one was subsequently killed. (2) In North Sumatra, there are believed to be 50-100 rhinos in the 7927 sq.km. Gunung Leuser Reserve (World Wildlife Fund Yearbook, 1980-81) where they were breeding at least until 1978 (van Strien, 1978). (3) In the Endau-Rompin area of southern Peninsular Malaysia, about 20-25 rhinos are believed to survive in an area of 1700 sq.km. but there is no evidence of breeding (Flynn, 1981). A similar number of Sumatran rhinos as is found in these three areas are scattered through other parts of Sabah, Sumatran, Peninsular Malaysia and mainland South-east Asia. It is highly unlikely that any of these scattered individuals will contribute to the species' survival if they remain in the wild.

The Sumatran rhino is now highly vulnerable to extinction, and if it is intended to attempt to save this species, it will be necessary to take measures urgently to create a minimum of two breeding populations.

ıe danger of relying on only one population to maintain a species s illustrated by the case of the Javan rhinoceros (Rhinoceros ondaicus) in Ujung Kulon Nature Reserve, Java, where the world's last opulation is now being reduced by disease. Sabah has a relatively mall human population density (for example, seven times smaller than eninsular Malaysia) and has the potential, therefore, to spare a ufficiently large conservation area for a breeding population of umatran rhinos.

In this paper, we firstly outline the present status of the Sumatran hino in Sabah, and identify the main immediate threats to its survival. hen we propose a conservation strategy which has the potential to successfully compromise the interests or rhinos, forestry and agriculture.

Present distribution of rhinos in Sabah

A major survey of mammals and birds was conducted throughout Sabah from 1979-1981 by the Wildlife Section, Sabah Forest Department with World Wildlife Fund Malaysia. As a result, the approximate distribution of rhinos in Sabah is now known (Davies and Payne, 1982).

The great majority of rhinos remaining in Sabah are in one of three locations (Map 1), and there are only a very few individuals scattered elsewhere. Firstly there is the breeding population in the Silabukan area. The majority of this area consists of the Silabukan and Lumerau Forest Reserves (area A, Map 1). Secondly, there are rhinos in several of the areas being opened up or due to be opened up for agricultural development (areas B. Map 1). Thirdly, there are rhinos in the extensive, continuous block of Forest Reserve in south/south-eastern Sabah (area C. Map 1). In total there are at least 15 rhinos in Sabah, and the actual number is more likely to be around 30.

Threats to the survival of the rhino in Sabah

There are three major threats to the survival of the rhino in Sabah, which are:-

(1) Hunting

The fact that rhino horns are highly valued and that the number of rhino is critically low means that illegal hunting is the greatest immediate threat to the species. This applies particularly to the Silabukan population where the removal of every individual especially females, adds to the probability of extinction. Unfortunately, there is evidence that females are more prone to hunting than male Sumatran rhinos (van Strien, 1974). Any means of killing may be employed; of the two most recent known deaths, one was by shooting, the other (a juvenile rhino) by noose trap.

(2) Agriculture

As indicated in the introduction, agriculture has the effects of reducing the total area suitable for maintaining rhinos and of fragmenting populations into small groups which are eventually likely to die out due to inbreeding, diease, insufficient resources, or hunting. This is happening in Sabah (Map 1).

(3) Logging

The Sumatran rhino is highly sensitive to forest exploitation, and moves into undisturbed forest during and for some years after logging operations (Flynn, 1981; Faunal Survey of Sabah observation, 1979-81). It appears that rhinos pass through recently logged forest only if forced to do so either through lack of undisburbed forest or when visiting natural salt sources.

Sumatran rhinos in Sabah live almost exclusively in dipterocarp forests and more than one third of the extent of such forest has been logged during the 1970's. The great majority of this logging was done in eastern Sabah, where most of the rhinos occur. During the past two decades, logging operations have undoubtedly disrupted the rhino population and caused a reduction in breeding rate. Research is required to assess how logging affects rhino food supply.

Background to a conservation strategy

Before considering possible approaches to rhino conservation, it is necessary to clarify firstly the ecological requirements of a breeding rhino population and secondly the probable future pattern of land development in Sabah. The following points are pertinent to the requirements of the rhinos:-

(1) It is generally reckoned by biologists that a population of at least several tens of individuals is required for the long term viability of a species (Soule and Wilcox, 1980). With appropriate management, smaller numbers can be conserved, but a wild population of less than about ten must be considered unacceptably vulnerable to inbreeding and disease. The ratio of adult males to females should accord with that normal the species, which for the Sumatran rhino is probably 1 male: at least 1 female where not subject to hunting.

(2) The most detailed study of Sumatran rhinos, in dipterocarp forest, at Endau-Rompin, Johor, indicated maximum population densities of one rhino in about 40 sq.km. (Flynn, 1981). A population of 25 rhinos would thus require at least 1000 sq. km.

(3) Sumatran rhinos are highly sensitive to logging and any conservation area for this species should contain a substantial tract of primary forest.

(4) Sumatran rhinos appear to require supplementary salts in their diet, which in the wild state in Sabah they obtain from natural sources (Davies and Payne, 1982). A rhino conservation area must either contain natural salt sources or be provided with artifical supplies.

The following points concerning present and probable future land use in Sabah are pertinent:-

(1) Sabah's National Parks are too small to support a breeding population of rhinos.

(2) The only two substantial areas likely to remain forested and capable of supporting rhino populations are (a) Silabukan and Lumerau Forest Reserves (area A, Map 1) and (b) part of the Forest Reserve block in South-eastern Sabah (area C, Map 1).

(3) Sabah will continue to experience major changes in land-use for several decades and the nature of the changes can be predicted only in broad terms. Any conservation plan for rhinos must be flexible.

Comparison of the two potential conservation areas:

Silabukan and Danum Valley

(a) Silabukan

This area includes both the Silabukan and Lumerau Forest Reserves. Probably about 1000 sq.km. of Forest Reserve will remain after currently planned and likely excisions have been

made. Except for two, small Virgin Jungle Reserves, the whole area is classified as Commercial Forest Reserve. Approximately 250 sq.km. of the area is currently under primary forest. A large proportion of the Silabukan area, including all the primary forest, lies within Sabah Foundation's logging concession. The Foundation's present intention is to complete their logging operations in the area within the coming 5-6 years and exchange it for equivalent logged-over Forest Reserve in area C (Map 1).

Advantages of Silabukan

(1) A breeding population of rhinos is known to be present.

(2) The logged forest can serve a second function as a reservior to absorb many of the elephants which will be displaced by surrounding agricultural development.

(3) The area is rich in urat mata (Parashorea malaanon; Dipterocarpaceae) and suitable for retention as Commercial Forest Reserve to be logged on a long-term basis. One or more "core areas" of primary forest would serve not only as a refuge for rhinos but as a seed orchard for trees of present and potential commercial value.

(4) Ultimately, the peripheral parts of the Silabukan and Lumerau Forest Reserves could act as hunting reserves for use by surrounding communities.

(5) Sabah Foundation have agreed not to make plans for logging the central 100 sq.km. or so of the Silabukan area until at least 1986, pending a detailed conservation proposal from Wildlife Section, Forest Department.

(6) With its easy accessibility, and wildlife such as rhinos and elephants, the area has potential for tourism.

.sadvantages of Silabukan

.) There are likely to be pressures to log the remaining primary forest after 1986, but this will depend on factors such as timber prices and government policy.

2) There is land suitable for agriculture throughout much of the Silabukan area. Such land is patchily distributed however, and there are vast areas elsewhere in Sabah suitable for agriculture which are likely to take of the order of ten years to develop. Also Sabah has a chronic shortage of mwnpower for agricultural development, so there is no need in the near future to disturb Silabukan.

3) Hunters have easy access to the area along logging roads. However, if Silabukan is accorded top priority in wildlife conservation, as the area deserves, then it will be possible to maintain special protective measures, at least until logging has finished. There are only three motorable access routes into the Silabukan area.

(b) Danum Valley (see Map 1)

The Danum Valley area has for many years been regarded as worthy of protection for its wildlife. The remaining primary forest area (428 sq.km.) lies within Sabah Foundation's logging concession, and it is partly for this reason that the area was never gazetted, as recommended, either as a Game Sanctuary (Thomas et. al, 1976) or National Park (Kiew et al. 1976). Sabah Foundation have expressed a willingness to preserve the remaining primary 428 sq.km. for water catchment protection and wildlife conservation.

The Danum Valley conservation area should be viewed not as a discrete entity but as the core of a much larger forest area.

.vantages of Danum Valley

1) The area is within Sabah Foundation's 100 year concession and so management policy is less likely to change suddenly than is the case with Silabukan.

2) It is part of a much larger tract of Forest Reserve.

3) The parts of Danum Valley suitable for agriculture are sufficiently remote that there is unlikely to be much pressure to excise them.

)isadvantages of Danum Valley

(1) Although rhinos are suspected to occur in Danum Valley, there is no definite evidence that they are present (Kiew et. al, 1976). Furthermore there are no records of rhinos being killed in the region. This implies that the area is inferior for rhinos in some ecological aspect.

(2) The factor(s) limiting the natural abundance of rhinos would have to be identified, a breeding population of rhinos translocated and the area managed to support the population.

(3) The area is believed to contain minerals, notably heavy metals.

Translocation and Captive Breeding

Translocation - that is, the capture and removal to another unenclosed place - of rhinos within Sabah is not recommended for the following reasons:-

(1) Danum Valley and other remote parts of central - Southern Sabah have barely been penetrated by man. If these areas were ideal, we would expect breeding populations of rhinos to be present, but it seems that there are not. A clearer

understanding of the Sumatran rhino is required before translocation should be considered.

2) If a translocation attempt of rhinos from the Silabukan area is not entirely successful, then the breeding population may be irreversibly fragmented thus hastening extinction rather than preventing it.

3) Rhinos may not stay in the area to which they are translocated, and translocation would attract poachers.

(4) No part of Sabah has assured long-term safety from such developments as permanent roads, mineral exploitation, tree plantations etc.

(5) The difficulty and expense involved in catching and translocating rhinos would be great, to be reckoned in millions of ringgit.

The creation of a captive breeding unit from individual rhinos doomed in agricultural areas is a different matter. We estimate that there are at least five and probably more rhinos now living in future agricultural areas in Sabah, and which will not contribute to the survival of the species unless captured and brought together. A captive breeding unit could be found in Malaysia, but finance and expertise are unlikely to be available. Instead, we would recommend that an internationally - recognised zoological society with proven rhino-breeding experience be invited to finance the capture of such rhinos to form a breeding unit in their zoological garden. If successful, future stock could be drawn from this source should any catastrophe befall the rhino population in Sabah.

Outline conservation strategy

(1) Maintain the Silabukan-Lumerau Forest Reserves (area 1, Map 1), as a single unit, with no further excisions for agriculture.

The unit would be managed as Commercial Forest Reserve, with a primary forest core area serving as a rhino sanctuary and seed orchard for native trees. The peripery could ultimately be managed for forest produce for use by surrounding agricultural communities.

(2) Recognising the area as the highest conservation priority, the Wildlife Section, Sabah Forest Department, would maintain a constant guard-force. Further research into the ecology of the Silabukan rhinos is essential.

(3) A competent Zoological Society would be invited to finance the capture of rhinos from future agricultural areas, and maintain a breeding unit.

(4) Should it become necessary in the future to attempt to translocate the Silabukan population, the prior experience gained in managing that population, and during the capture programme for a zoo unit would improve chances of success.

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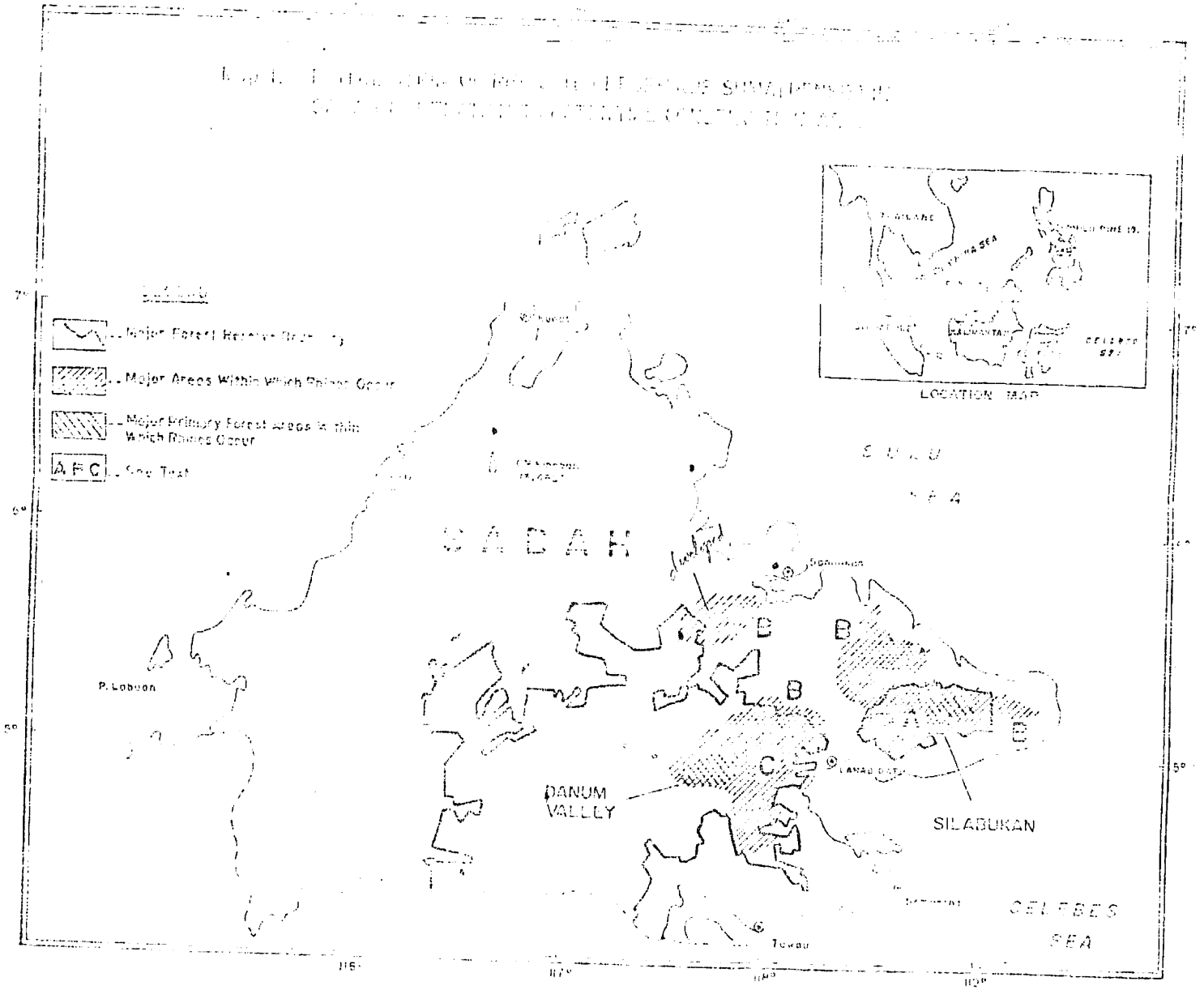
Legend
Major Forest Reserve Boundary
Major Areas Within Which Rubber Occur
Major Primary Forest areas in which Rubber Occur
A F C - Crop Trial
LOCATION MAP
SABAH
P. Labuan
DANUM VALLEY
SILABUKAN
Tawau
SULU SEA
CELEBES SEA
A
B
C