

MANAGEMENT OF ENDANGERED SPECIES IN PROTECTED AREAS IN SABAH

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1.0 INTRODUCTION

Sabah, occupying the northern portion of the island of Borneo (Figure 1), is one of the thirteen states in the Federation of Malaysia. Land area is about 76,115 square kilometers and the human population is estimated at about 1.5 million. At least 60% of the land area is under forest. Major geographic features are shown in Figure 2.

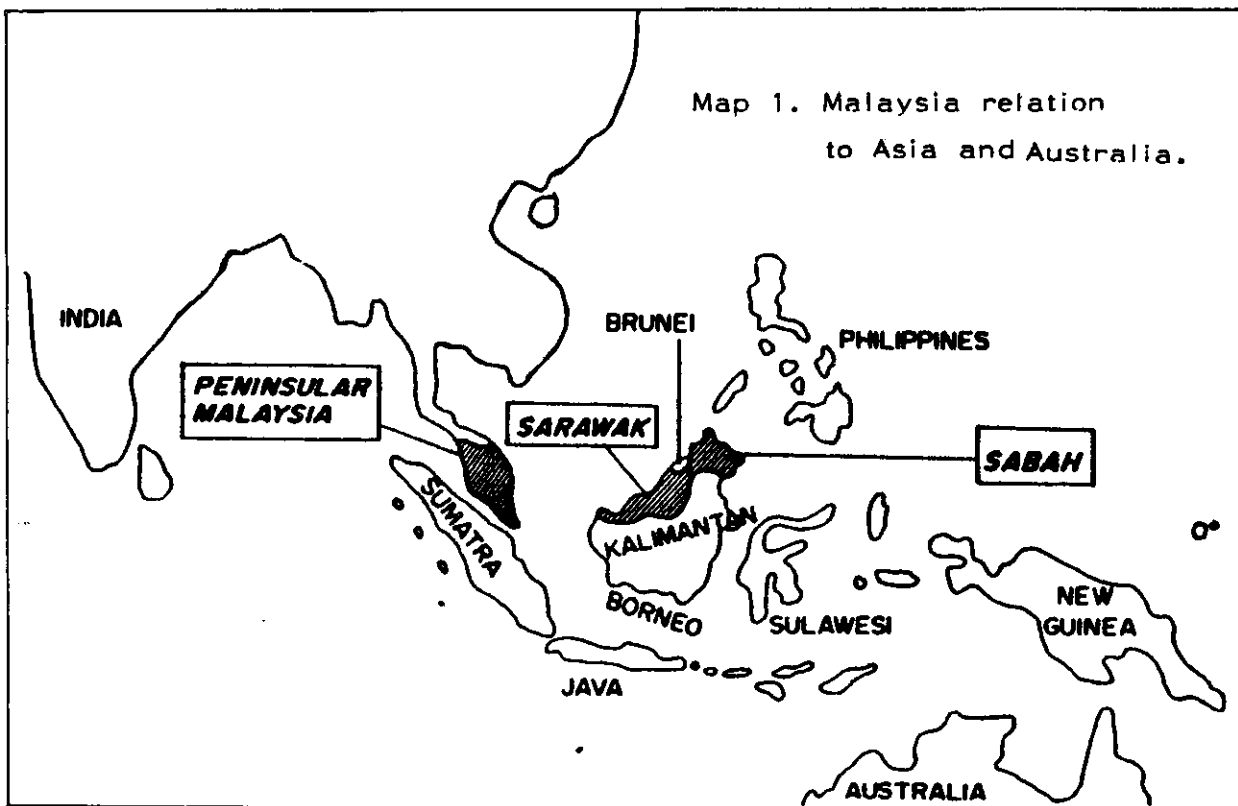


Figure 1: Malaysia in relation to Asia and Australia.

Although concern for endangered species usually are identified initially with the formal enactment of the Fauna Conservation Ordinance in 1963 and later, the formation of the Sabah Rhino and Wildlife Conservation committee in 1985, other and often less heralded actions tracking back into the early years of this century also affected endangered species in one way or the other. Among these was a proposal in 1933 to reserve under the Land Ordinance a considerable area of the Upper Segama and Tingkayu drainages in order to protect the Rhinoceros, but this proposal had to be abandoned due to opposition by timber interests (Davies and Payne 1982). Other areas were suggested subsequently, including a part of the Segaliud-Lokan Forest Reserve, but nothing came of these suggestions. Some ten years later, after the enactment of the Fauna Conserva-

tion Ordinance, two proposals for the game sanctuaries were made: Sungai Lokan (6,700 ha) for Orang-Utan conservation and another (131,300 ha) in Ulu Tugud. These proposals came to nothing. Then in 1984 Tabin and Kulamba Wildlife Reserves were gazetted under the Forest Enactment. In 1988, the former Sabah Rhino and Wildlife Conservation Committee (SRWCC), then under the chief minister's Department, was absorbed into the Sabah Wildlife Department and upgraded from a section in the Forest Department as of 1st Jan 1988.

The paper here deals only with animal species covered in the Fauna Conservation Ordinance which covers only mammals, birds, and reptiles.

2.0 ENDANGERED SPECIES AND THEIR STATUS

2.1 DEFINITION

A broad definition of "endangered species" is : any species facing possible extinction through all or much its distribution. Species may reach endangered status because of one or more of five main factors: natural (non human) causes, hunting, introduced predators, nonpredatory exotics, and habitat modification (Robinson and Bolen 1984). In Sabah, major factors are loss of forest habitat and hunting. Logging is often stated to be a factor endangering wildlife, but available data suggest that this is not the case. Natural causes may operate on large mammals in Sabah. There are no introduced predators or competitors.

Fortunately, no animal species in Sabah (see below) appears to be endangered with extinction during this century.

2.2 RHINOCEROS (*Dicerorhinus sumatrensis*)

The Asiatic two-horned Sumatran rhinoceros is mainly found in the eastern part of Sabah (Figure 3). The eastern lowlands and uplands contain most of Sabah's rhino notably, Tabin, Danum Valley, Kinabatangan and Segama rivers, and other areas. The last known breeding populations of rhinoceros are in Tabin Wildlife Reserve, Danum Valley Conservation Area, and surrounding forest.

The latest estimate of Rhino population in Sabah is a minimum of 30 individuals, of which the greatest known concentration is found in Tabin Wildlife Reserve.

One environmental factor which in Sabah appears to be of great importance to rhino is the availability of mineral salts for consumption, in the form of natural-salt water springs, salt licks, "mud volcanoes", or sea water. The past and present distribution of rhinos in Sabah is correlated closely with the distribution of such salt sources (Figure 4) and is not correlated with habitat type except insofar as rhinos are now absent from areas where there has been long-standing human activity.

Hunting seems to be the major threat to rhino population in Sabah, although loss of forest land to permanent agriculture in eastern Sabah is an additional problem.

2.3 ELEPHANT (*Elephas maximus*)

Elephant are restricted in Borneo to the north-east part of the island. Their present distribution in Sabah can now be fairly demarcated (Figure 5). The latest estimate of elephants in Sabah is between 500-2,000 individuals, mostly in the Sandakan and Lahad Datu areas and the Dent Peninsula.

In Sabah, elephants visit natural salt sources. The presence of these salt sources appears to exert a considerable influence on the ranging behaviour of elephants. Clearly, primary dipterocarp forest is not an ideal habitat for the elephants because the major food types are rare and patchily distributed. Elephants travel substantial distances out of forest only during or immediately after periods of heavy rainfall. They feed in open areas such as roadsides and plantations after dusk, except on cloudy, cool days when they may come out of the forest as early as 1500 hours.

The main threat to elephant populations in Sabah appears to be habitat loss to permanent agricultural plantations.

2.4 **TEMBADAU/BANTENG (*Bos javanicus*)**

In the past, tambadau (also known as banteng) were distributed throughout most of Sabah (Figure 6). Now, banteng are common only in parts of the eastern lowlands and there are small numbers scattered throughout the more hilly central areas of Sabah (Davies and Payne 1982). Three areas where herds of 30-40 have been seen in 1982 were Kretam, Bukit Kumbaun (South side of lower Sugut), and between the Paitan and Sugut rivers. The estimated number of banteng/tembadau individuals are between 300-500 in Sabah.

The Sabah banteng live mainly but not exclusively on flat or gentle sloping terrain. Primarily, they graze on grasses and herbs, but they also browse on bushes and small trees. Banteng depended on man in many areas in the past, living on the grasses and other secondary growth left after cultivated areas had been abandoned. In Sabah, they visit all kinds of natural salt sources to obtain supplementary salt.

The major threat to the banteng population in Sabah is hunting.

2.5. **ORANG — UTAN (*Pongo pygmaeus*)**

The great majority of orang-utan in Sabah occur in the eastern and central regions (Figure 7). Separate isolated populations occur in Crocker Range National Park and Kinabalu Park, both mountain ranges on the West Coast of the state. The total number of orang-utans in Sabah is estimated to a minimum of 2,000 individuals. A recent WWF Malaysia survey put the number higher, at between 10,000 - 20,000 (Payne 1988).

The most preferred habitats of orang-utan are freshwater swamp forest and lowland dipterocarp forests.

Loss of forest habitat through permanent conversion to agricultural plantations is by far the most serious threat to orang-utans in Sabah.

2.6 **CLOUDED LEOPARD (*Neofelis nebulosa*)**

Clouded leopards are distributed widely in Sabah (Figure 8), with faunal survey records from sea level to above 3,500 feet, and both in primary and secondary forests (Davies and Payne 1982). Little can be said of the variation in density with habitat, but it is likely to be correlated most closely with population of prey animals. During the Faunal survey in 1979-81, the findings suggest population densities in the order of one individual in four square kilometers.

It is not known whether logging and habitat loss are threats to the long term survival of clouded leopard, but this cat is usually shot by hunters when encountered.

2.7 **PROBOSCIS MONKEY (*Nasalis larvatus*)**

The species is distributed along the coastline, especially in the mangrove of the northern part of the Dent Peninsula and Sugut and Paitan Rivers, and is found along the large rivers as far as 50 kilometers from the nearest coast on Segama and Kinabatangan (Davies and Payne 1982, Figure 9). The largest numbers were seen on the Trusan Kinabatangan, near Abai, and around Dewhurst Bay. A common feature of ranging behaviour is that groups are always close to large water courses.

Habitat loss and hunting pose a threat to the species survival in some areas, but this monkey is unlikely to be endangered at the present time.

Certainly, there are gaps in the present knowledge of the species mentioned above. For rhinoceros, elephants and orang-utan, the information needed to manage them for long term survival is fairly sufficient. More data are needed for the other species in order to plan for their survival in the long term.

3.0 GOVERNMENT AGENCIES AND LEGISLATION FOR ENDANGERED SPECIES.

3.1 WILDLIFE DEPARTMENT

The Wildlife Department, under the auspices of the state ministry of Tourism and Environmental Development, is responsible for the conservation and management of wildlife in the state. The major roles of the Department are as follows:

1. The enforcement of laws pertaining to the hunting and capture of wildlife (Fauna Conservation Ordinance 1963).
2. The identification, establishment of sanctuaries.
3. Education of the public regarding wildlife.
4. The care and management of animals at Sepilok orang-utan centre and swiftlets at Gomantong caves.

3.2 SABAH PARKS

Sabah Parks, with Parks Enactment, has the following roles:

1. The establishment, protection, and administration of state parks.
2. To preserve natural features such as geological formations, vegetation types, and rare plants, as well as wild animals.
3. To provide recreation facilities for local visitors and tourists, including education centres and educational publications.

The main areas under Sabah Parks Authority are Kinabalu Park (75,370 ha), Crocker Range National Park (139,919 ha), Tawau Hills Park (27,972 ha), Tunku Abdul Rahman Park (1,289 ha), Pulau Tiga Park (607 ha), and Turtle Islands Park (15 ha). No logging or hunting is permitted in any of the areas under Sabah Parks Authority. Of the large rare mammals only orang-utan and clouded leopards are represented in the parks.

3.3 FORESTRY DEPARTMENT

The Forestry Department, with the Forest Enactment, 1968 and 1984, is responsible to ensure:

1. The sound climatic and physical conditions for the safeguarding of water supplies, soil fertility, and environmental quality, and the minimisation of damage by floods and erosion to rivers and agricultural land.
2. The conservation of adequate forest estate for recreation, education, research, and the protection of the state's unique flora and fauna.

Within the permanent forest estate (PFE) legally gazetted under the Forestry Department, all the seven types of forest reserves amount to 3,348,640 hectares (44% of the state), of which 2,674,570 hectares is commercial forest reserves, for harvesting of timber mainly for export. Legally, only two classes of forest reserve may not be exploited: protection forest reserve (99,980 ha) and virgin jungle reserve (88,310 ha). Of the remainder 316,460 hectares is mangrove forest reserve, most of which may be and has been selectively harvested. Forest reserves include two wildlife reserves: Tabin and Kulamba Wildlife Reserves (see below). The rest of the forest reserve is for local "amenity" and "domestic" use. Hunting is not permitted in any forest reserve in accordance to the Fauna Conservation Ordinance 1963 except with forest game licence.

The bulk of unexploited commercial forest reserve is within Sabah Foundation's 100 - year logging concession (which commenced in the late 1960's). The Foundation has set aside two conservation areas, for conservation, education and research, within its concession management plan: Danum Valley and Gunung Lotung/Maliau Basin (which will be discussed later).

4.0 MANAGEMENT OF ENDANGERED SPECIES

4.1 MAIN PROTECTED AREAS (FIGURE 10).

4.1.1. SEPILOK FOREST RESERVE AND ORANG-UTAN REHABILITATION CENTRE.

Sepilok Forest Reserve and orang-utans; Rehabilitation Centre (4,300 ha) is an important area for Orang-Utans; it has a clinic for a host of other wild animals which are surrendered and/or confiscated. At present the estimated orang-utan population size is within the neighbourhood of 55 individuals. However, the centre is unable to support a viable orang-utan population for long term survival.

4.1.2. TABIN WILDLIFE RESERVE

Tabin Wildlife Reserve (120,521 ha) is one of the seven classes of forest reserves (Class VII). Legally, Tabin Wildlife Reserve is under the Forestry Department but wildlife protection is left to the Wildlife Department. The area was gazetted primarily for the conservation of big mammals, notably rhinoceros, elephants, and tembadau/banteng. This area is important, especially to the rhinoceros, because one of the last known breeding populations of rhino is reckoned to occur in the area. A recent study suggested that Tabin supports a substantial number of orang-utan (Payne 1988).

4.1.3. KULAMBA WILDLIFE RESERVE

Kulamba Wildlife Reserve (20,682 ha) is the other of the two wildlife reserves. Kulamba is gazetted for the conservation of tembadau/banteng and swamp forest habitat. The area is also an important conservation area of other wild animals including orang-utan.

4.1.4. DANUM VALLEY FIELD STUDIES CENTRE

Danum Valley Field Studies Centre (42,755 ha.), with a fully established centre and road access, is one of the two areas set aside by Sabah Foundation within its concession area mainly for research, conservation, and education.

4.1.5. GUNUNG LOTUNG/MALIAU BASIN

Gunung Lotung (39,000 ha) is the other conservation area set aside by Sabah Foundation. This area is not significant to any of the endangered species identified except probably the clouded leopard. It is suspected that there is a breeding population for clouded leopard in the area. Generally, Gunung Lotung/Maliau Basin caters for the upper dipterocarp forest (submontane forest) flora and fauna species.

4.2 OTHER AREAS

4.2.1. SABAH PARKS

Orang-utan and clouded leopard occur in both Kinabalu Park and the Crocker Range National Park. However, these orang-utan populations are relatively insignificant due to their low numbers. Clouded leopard populations in both areas are probably low in view of the fact that the densities of prey animals are low.

4.2.2. OTHER FOREST RESERVES

Other forest reserves significant to the endangered species occur mostly in the east coast region. The major one is the Sabah Foundation Concession Area which includes Ulu Segama, Sungai Imbak, Tawai, Segakiud Lokan, and Sungai Lokan Forest Reserves. The areas are important for all the endangered species identified, but the populations are relatively low.

4.2.3. SANCTUARIES

There are five bird sanctuaries but none contain endangered large mammal species (Figure 11).

4.2.4. STATELAND

Most of the forest-covered statelands are in the east coast region. There is an on going project in the Lower Kinabatangan area to look into the feasibility of establishing a new wildlife conservation area which help to protect several endangered species.

5.0 CONCLUSION

The protected areas in Sabah are classified as either totally protected areas or other forest reserves. No logging is permitted in totally protected areas, whereas in other forest reserves, logging is permitted on a selective basis and collection of minor forest produce on a sustained yield basis. A tabulation of the existing totally protected areas is about 470,519 ha in Sabah (Table 1). This would cover about 6% of Sabah's land surface. Other forest reserves cover about 3,256,030 ha which is about 43%. The actual total protected areas in Sabah is summed at 49% of the land mass. The figure agrees with the other sources (for examples, Leong 1987), which placed the figures at 6%. What has been arbitrarily omitted was the fact that forest reserves in Sabah were not counted as protected areas. According to the Fauna Conservation Ordinance 1963, which is enforced by the Sabah Wildlife Department no hunting is allowed in any forest reserves except with a forest game licence.

The recent capture of a female rhinoceros brightens the future of the recovery plan for the Sumatran rhinoceros population in Sabah. If the captive breeding materialises there is a great possibility of this department to cooperate with other institutions in the region to intensify our captive breeding programme. Apart from the captive breeding programme, Tabin and the Ulu Segama areas should be able to support rhinoceros populations for at least a few decades.

For the orang-utan, the recent study suggested that with the combination of the three areas, viz Yayasan Sabah concession area, Tabin, and middle Kinabatangan, the orang-utan population is viable for long-term survival.

Perhaps Tabin Wildlife Reserve is able to support 200 elephants.

Efforts to undertake a captive breeding programme for tembadau/banteng are being studied.

The government has recommended a study in the lower Kinabatangan river for a possible wildlife reserve primarily for proboscis monkey and also as a sanctuary for orang-utan and elephant. If the area is gazetted, it would cover an area of 1.7 million ha (16,800 sq. km).

Table 1: Size of Present Conservation Areas in Sabah

TOTALLY PROTECTED AREAS (in hectares)	ALL FOREST RESERVES OTHER THAN THE TOTALLY PROTECTED AREAS (ha)	LAND AREA (ha)
Sabah Parks (excluding the island) 243,261	Protection F.R 99,980	
Sepilok 4,300	Commercial F.R 2,674,570	
Tabin W.R 120,521	Domestic F.R. 7,350	
Kulamba W.R 20,682	Amenity F.R 20,770	
Danum valley 42,755	Mangrove F.R 316,460	
Gunung Lotung/Maliau Basin 39,000	Virgin Jungle Reserve 136,900	
Total (in hectares) 470,519 6%	3,256,030 43%	7,611,500

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DISCUSSION

According to Mr. Ngui Siew Kong (Malaysia), elephant was not an indigenous species of Sabah. He was curious as to why it was regarded as an endangered species in the State.

Mr. Laurentius Ambu pointed out that no wildlife species are endangered in Sabah. However, they were identified as endangered merely to create awareness among the people before the animals become actually endangered.

Mr. Ngui Siew Kong also pointed out that hunting posed a serious problem in Sabah. He wanted to know the measures taken to curb hunting and whether the Sabah Wildlife Department planned to impose a restriction on the sale of arms.

Mr. Laurentius Ambu said that most wildlife departments in the world face the problems of poaching whenever there is access to forested areas and it would be difficult for the wildlife department to take any action.

Figure 2. Sabah Major Geographical Features

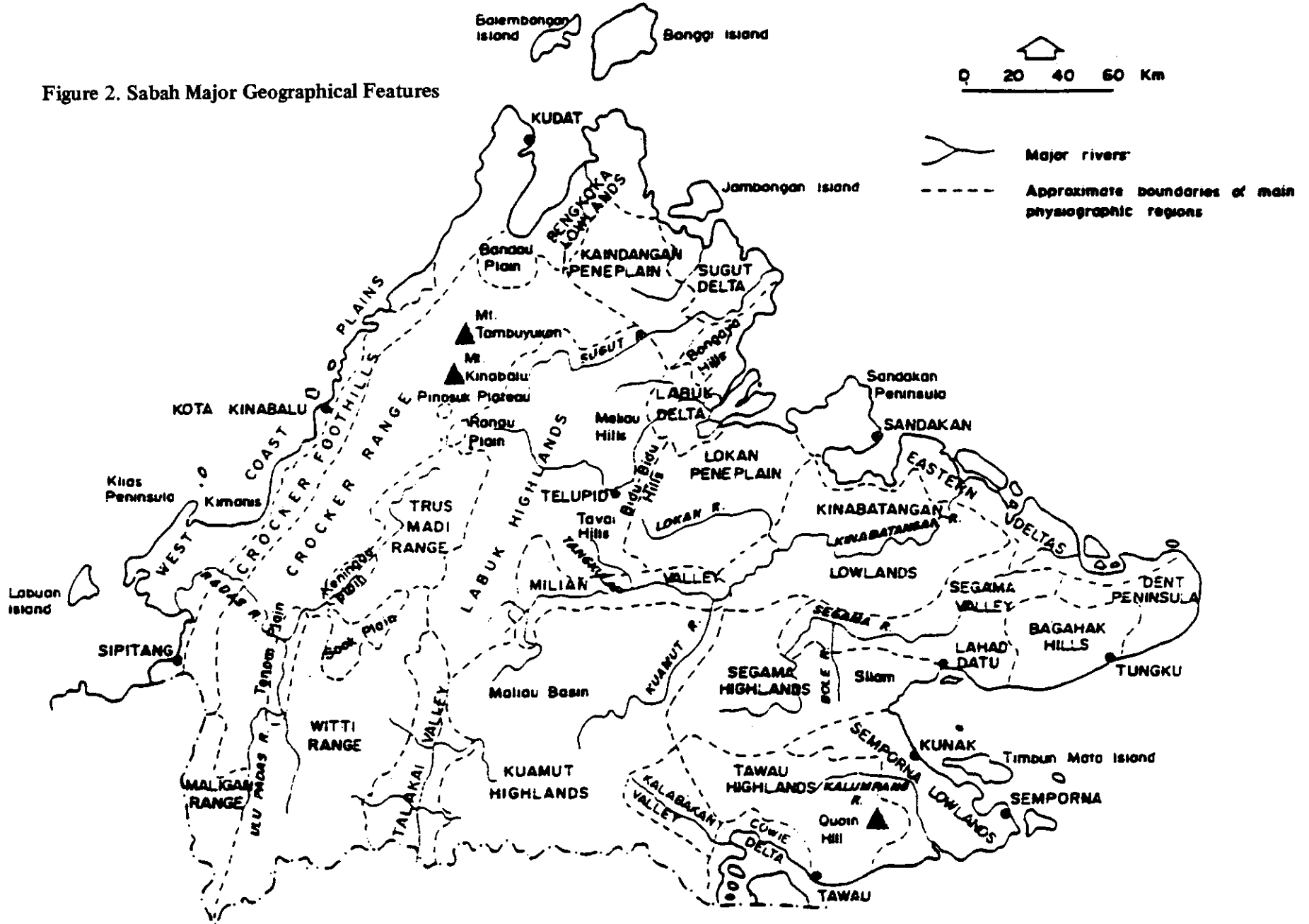


Figure 3. Rhinoceros (*Dicerorhinus Sumatrensis*)

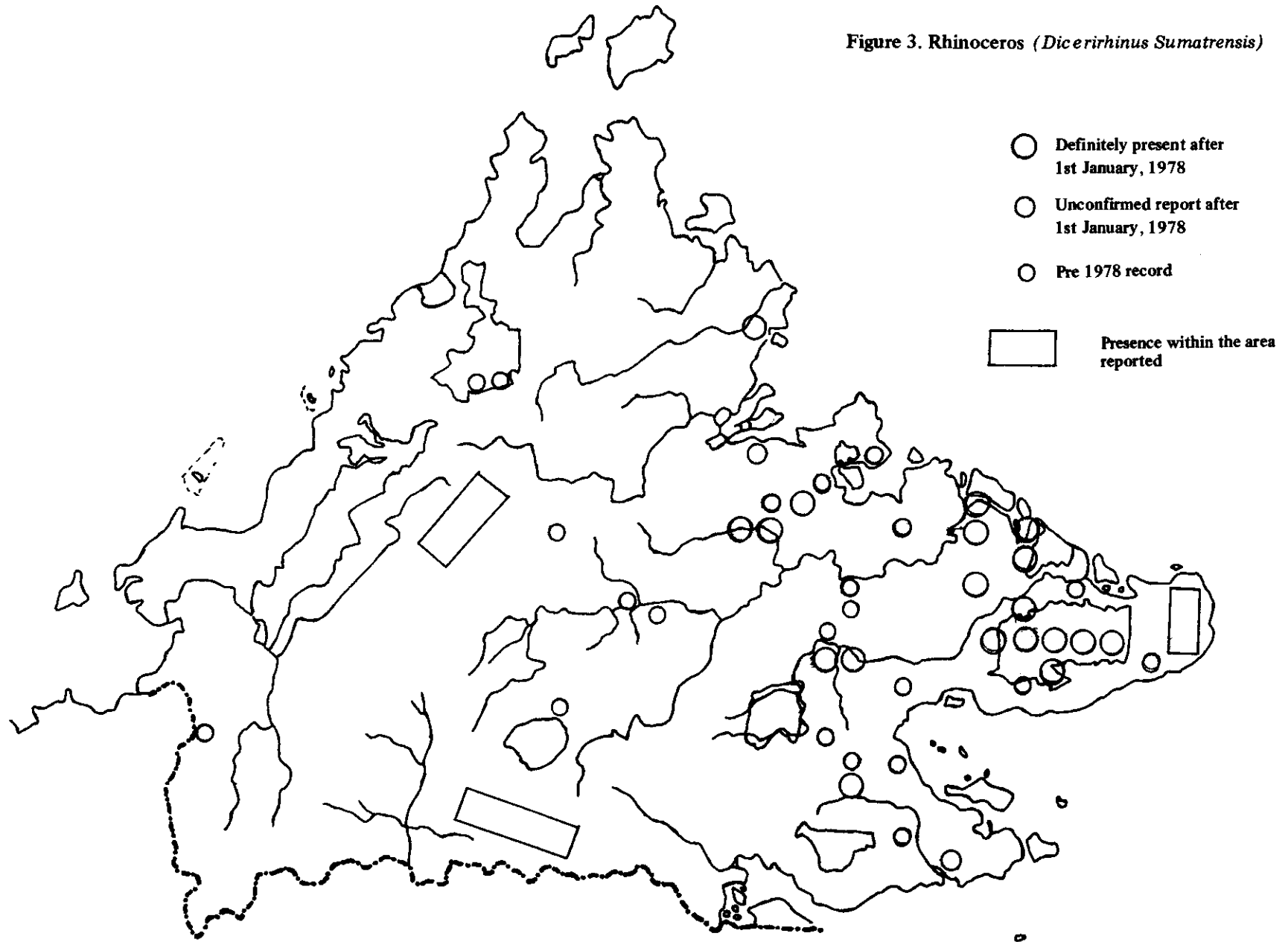


Figure 4. Distribution Of Natural Salt Sources.

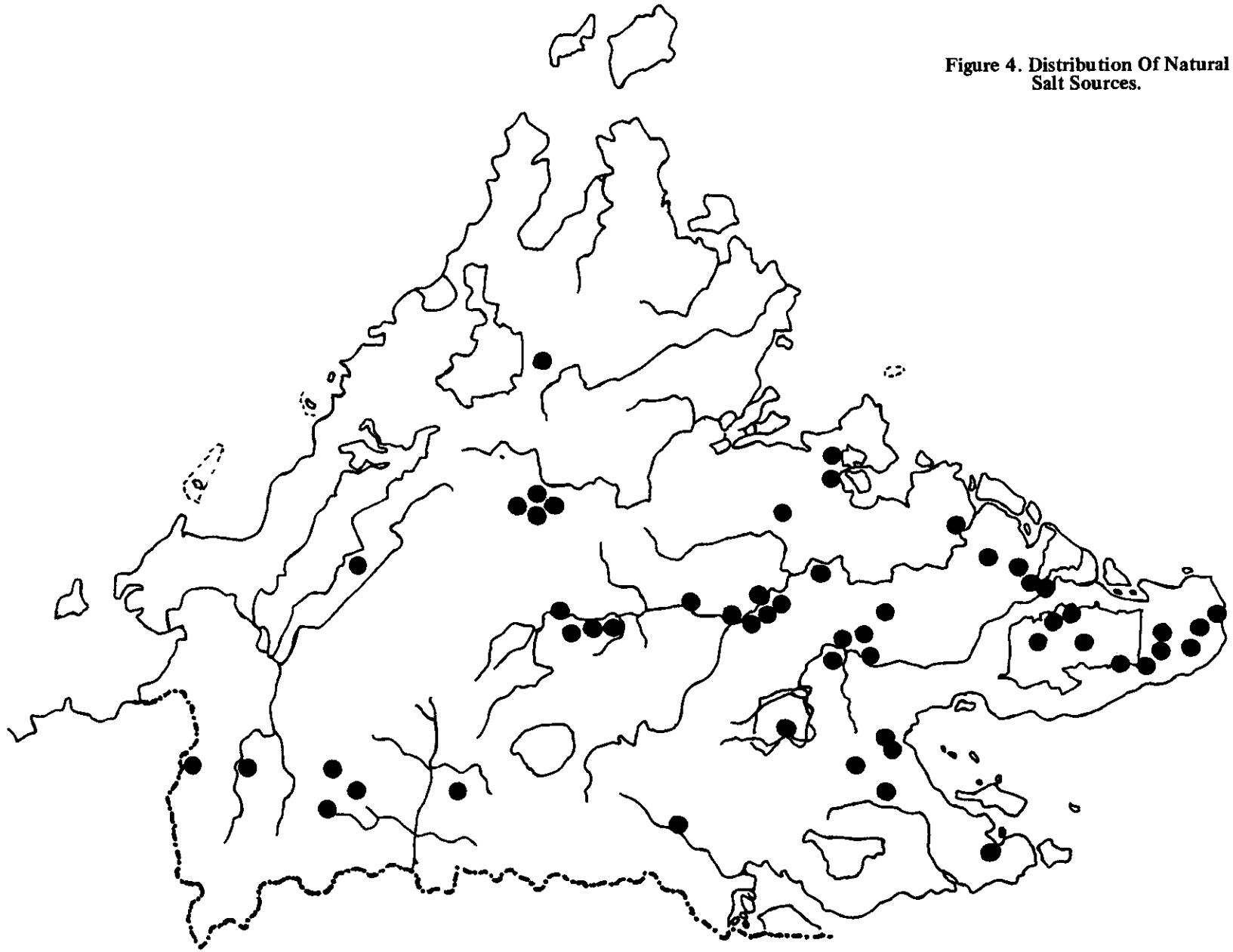


Figure 5. Elephant (*Elephas maximus*)

- Present but rare or abundance unknown
- ◐ Present Intermediate abundance
- Present Common

- Definitely present after 1st January, 1978
- Unconfirmed report after 1st January, 1978
- Pre 1978 record
- ┆ Present limits of distribution

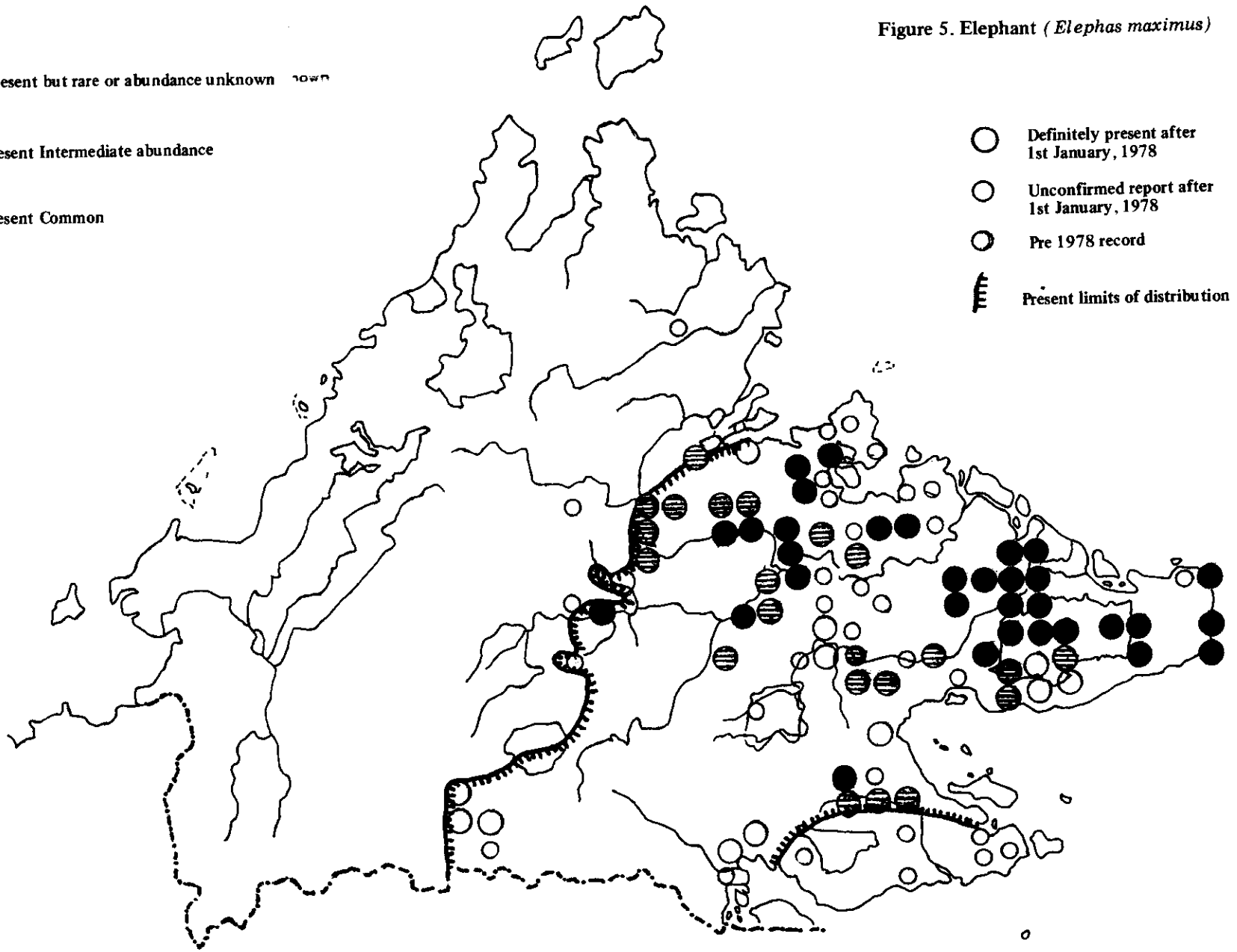


Figure 6. Tembadau/Banteng (*Bos javanicus*)

- Present but rare or abundance unknown
- ◐ Present Intermediate abundance
- Present Common
- ◑ Possible Cattle hybrids

- Definitely present after 1st January 1978
- ◑ Unconfirmed report after 1st January, 1978
- Pre 1978 record

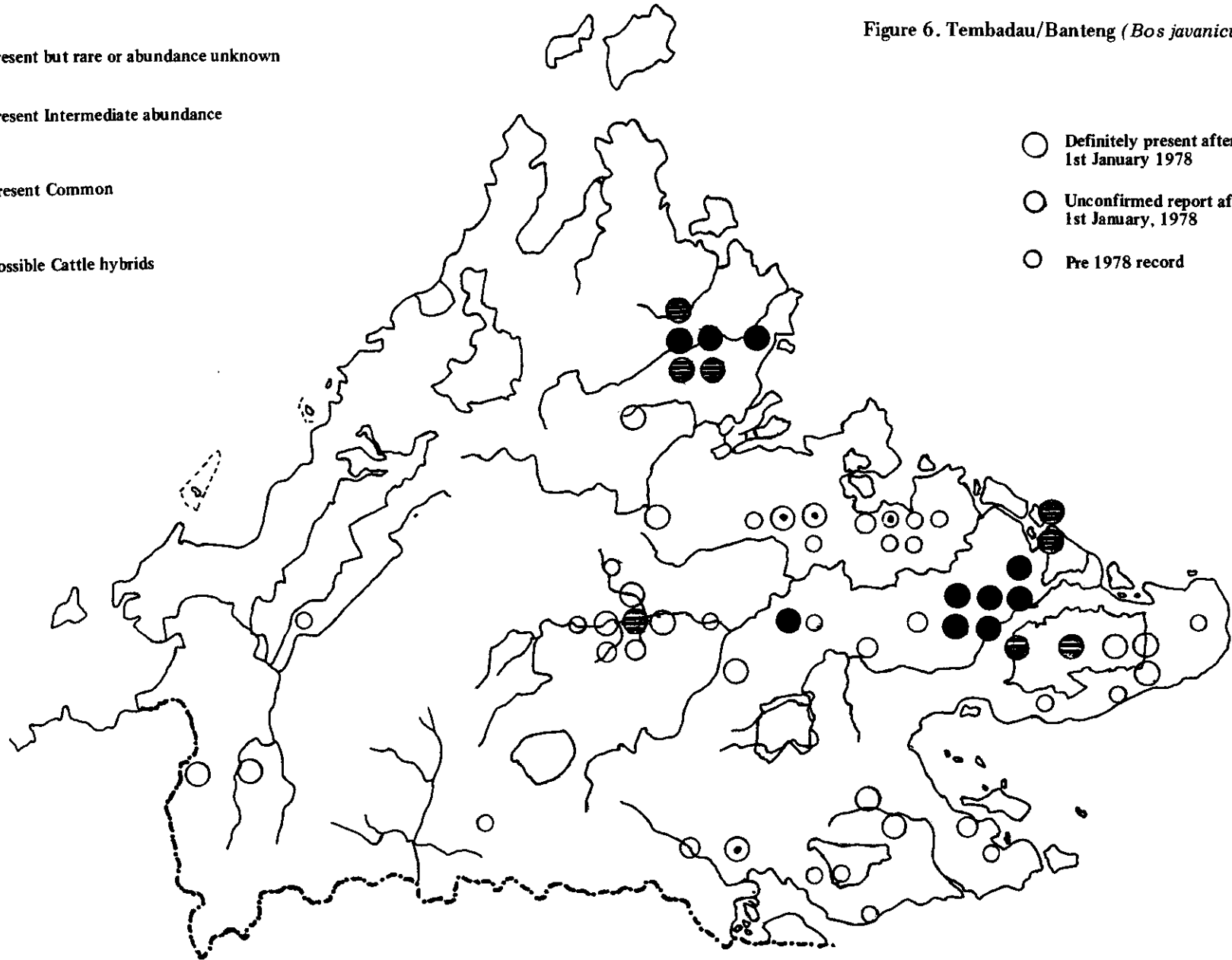


Figure 7 Present Distribution of Orang Utan
(*Pongo pygmaeus*)

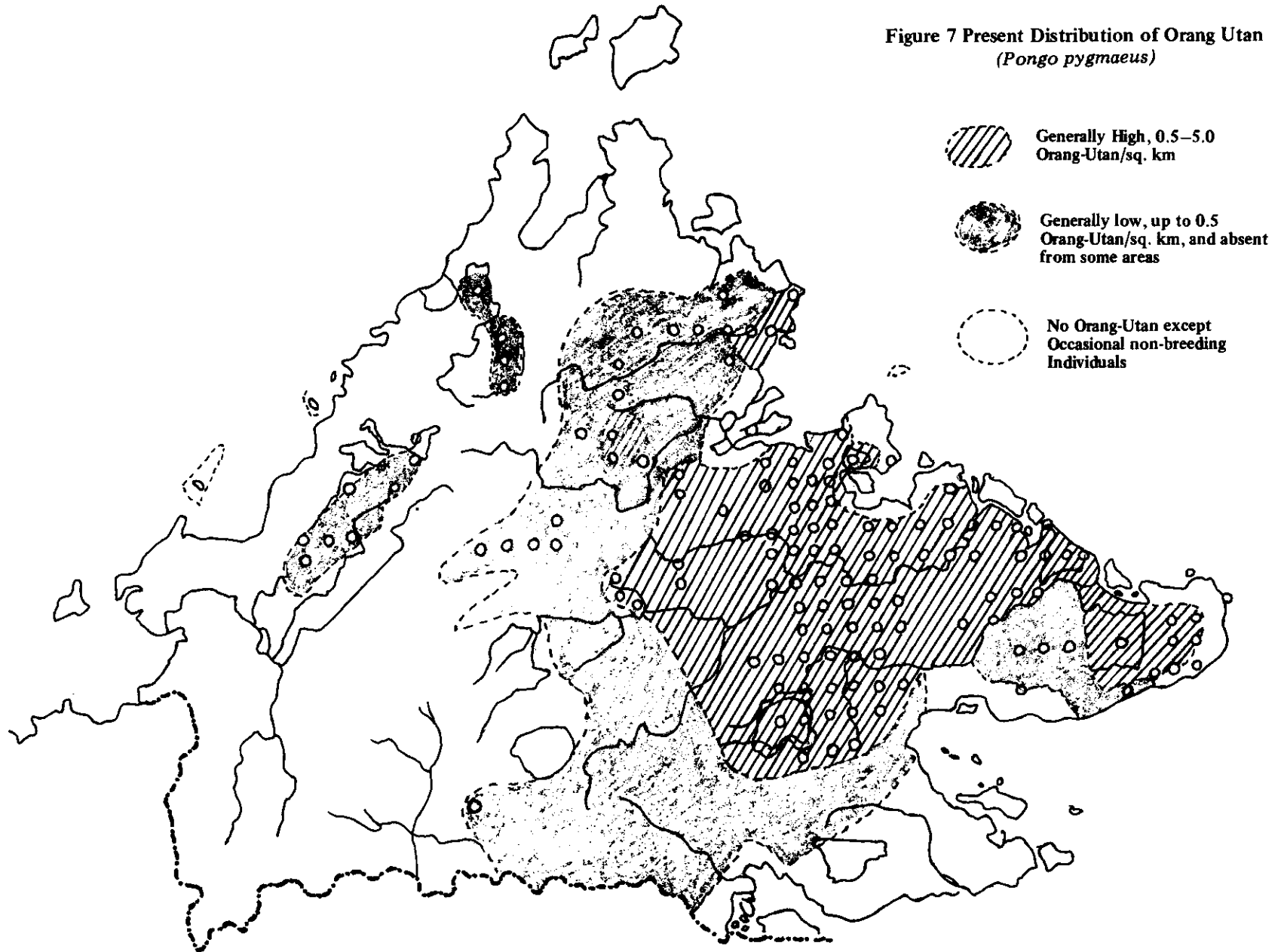


Figure 8. Clouded Leopard (*Neofelis nebulosa*)

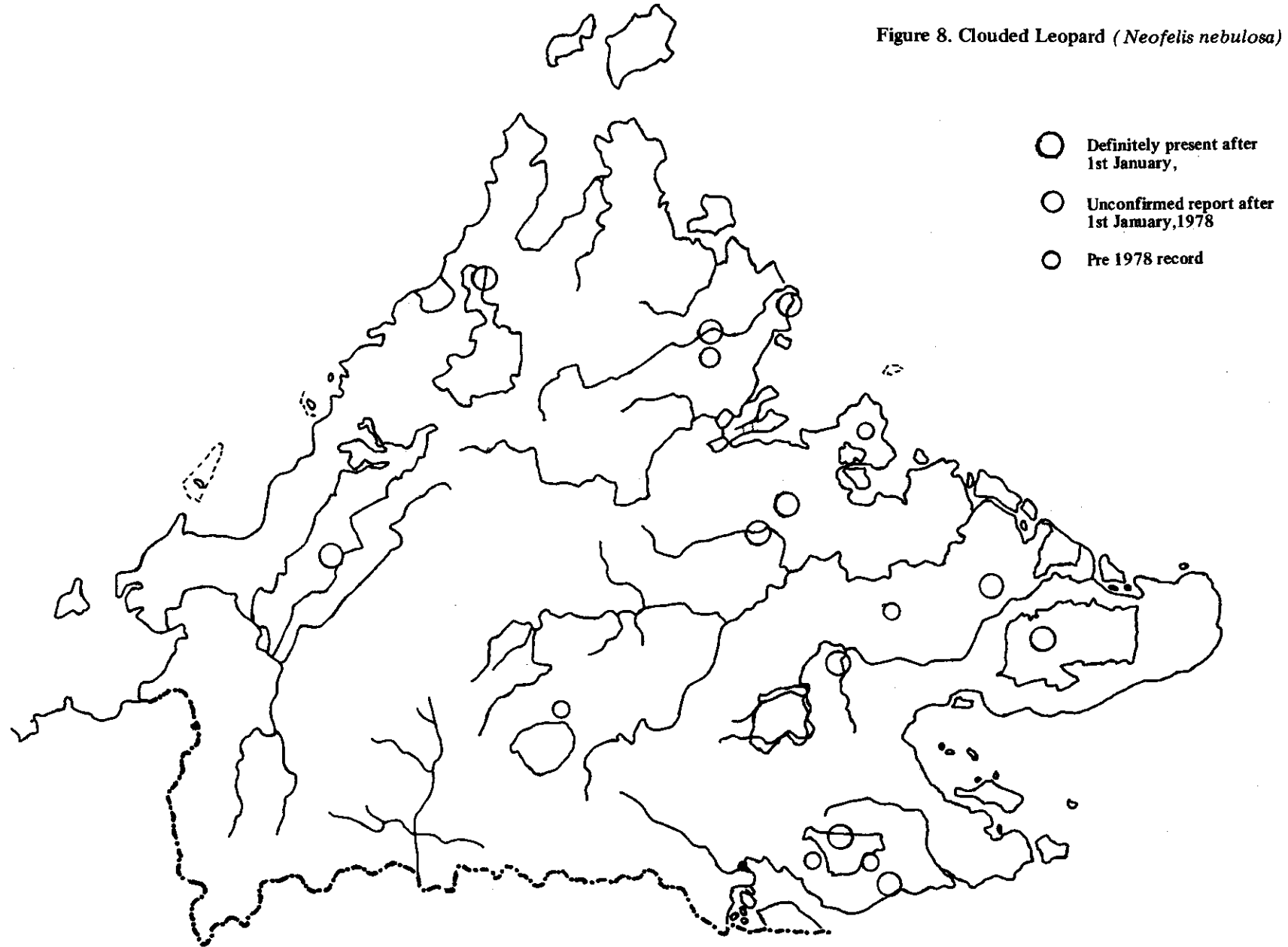


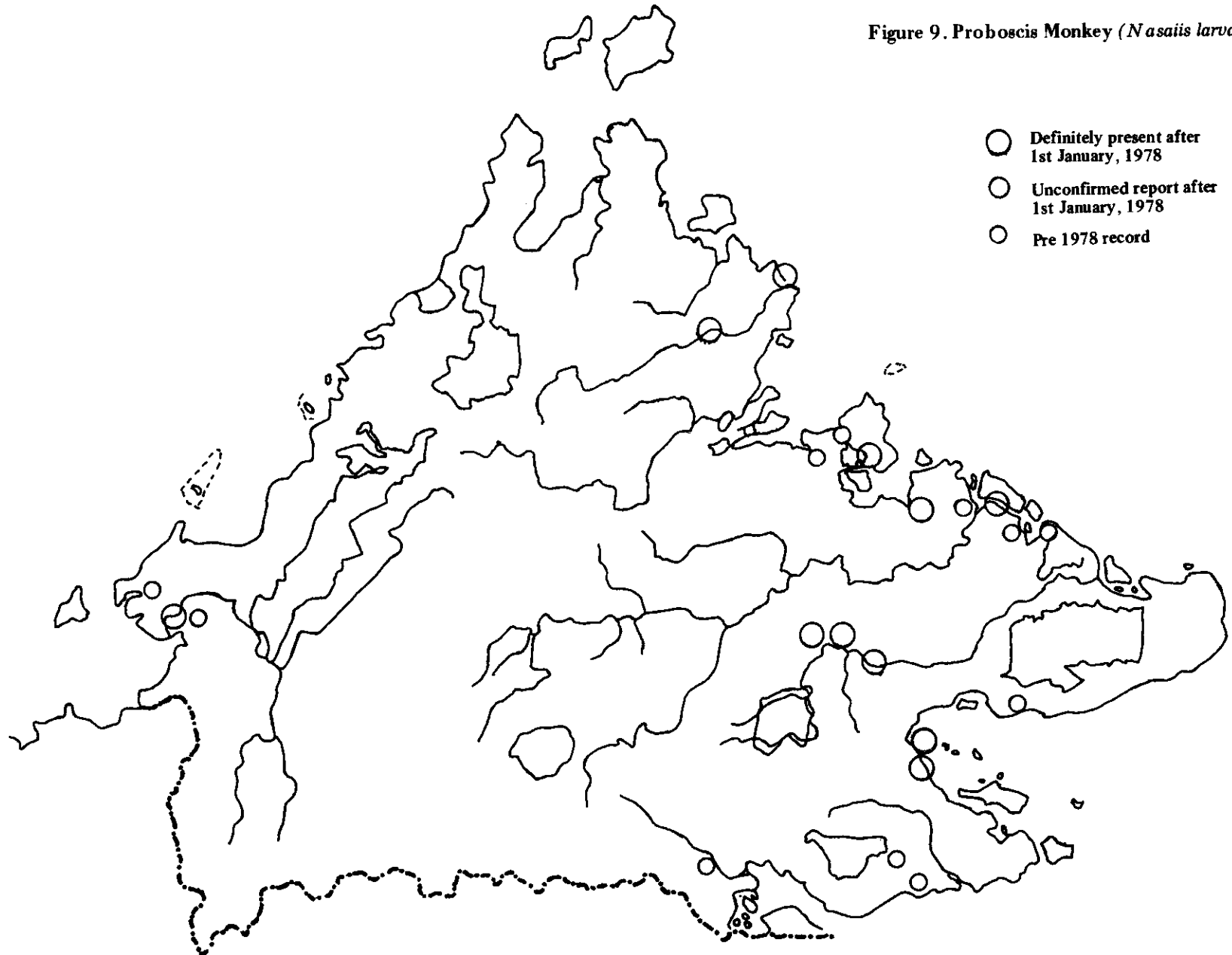
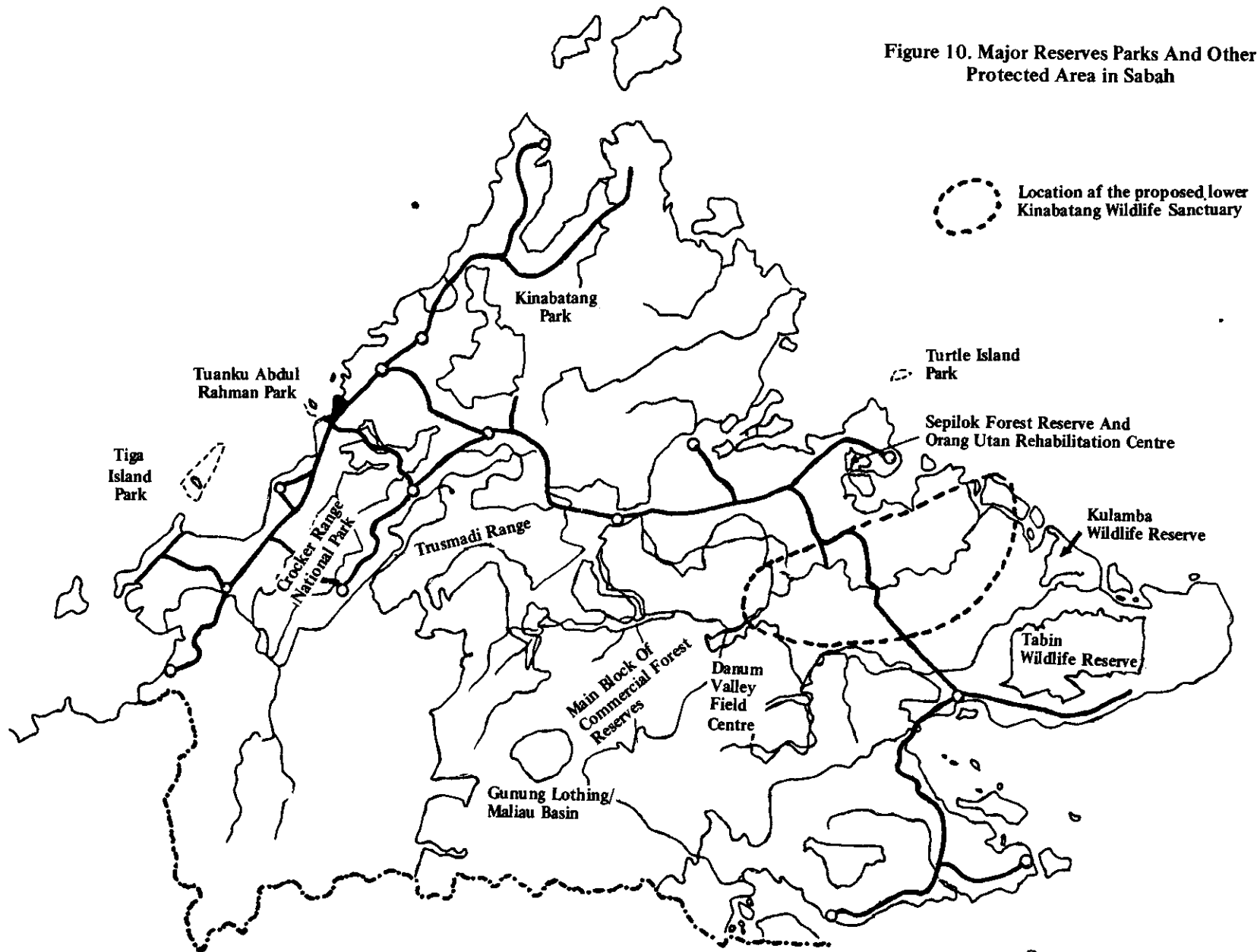
Figure 9. Proboscis Monkey (*Nasais larvatus*)

Figure 10. Major Reserves Parks And Other Protected Area in Sabah



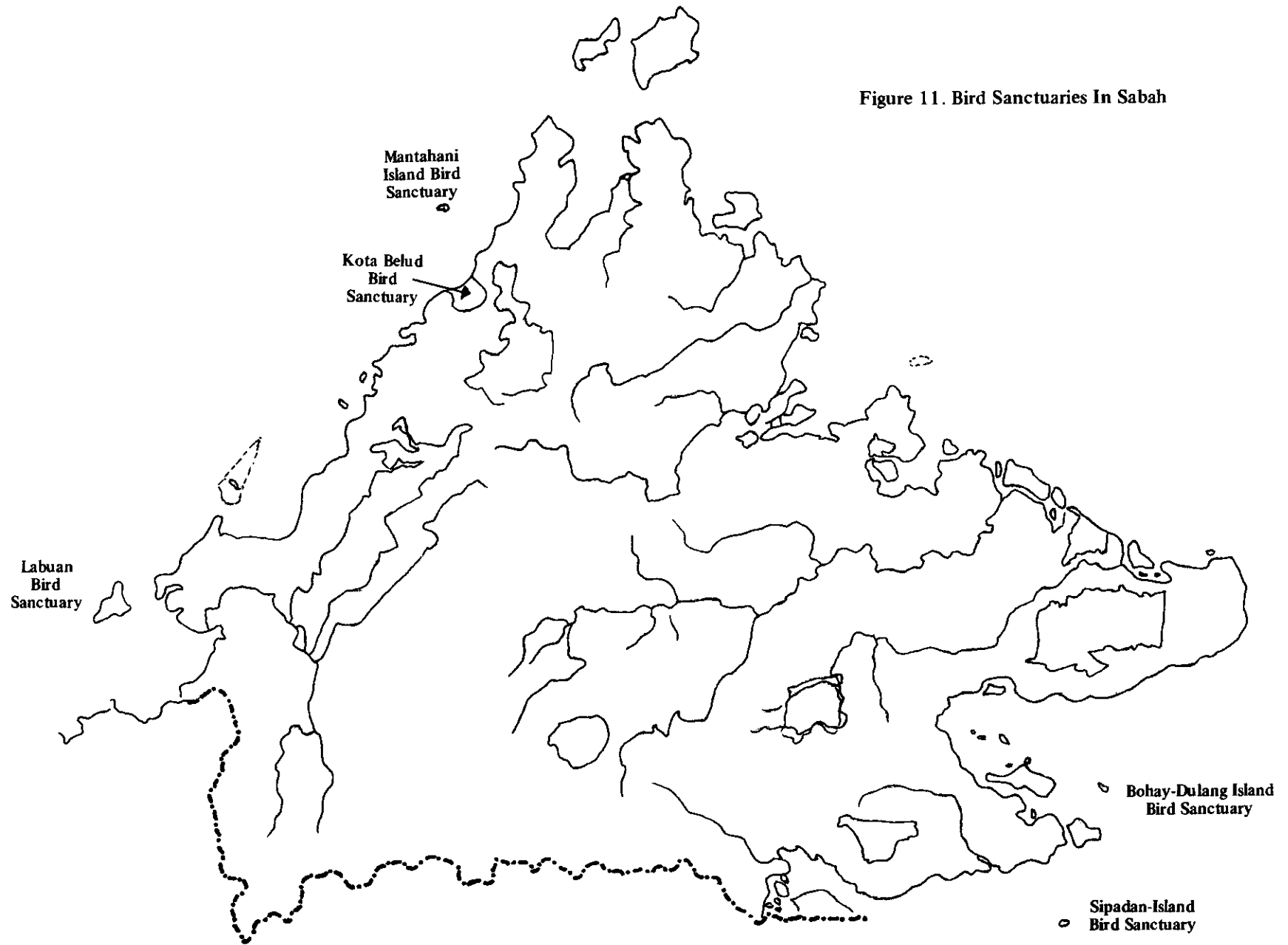


Figure 11. Bird Sanctuaries In Sabah