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ASIAN ELEPHANT: NATURE'S FOUR - WHEEL DRIVE VEHICLE

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The elephant is the largest terrestrial mammal in Asia. Prior to the large scale modification of its habitat by man, the range of Asian elephant extended from the Euphrates-Tigris river systems in the west through Asia south of Himalayas to Indo-China and most of southern China in the east. Today, the Asian elephant occurs in Bangladesh, Bhutan, Burma (Myanmar), Cambodia, China, India, Indonesia (Kalimantan and Sumatra), Laos, Malaysia (Peninsular Malaysia and Sabah), Nepal, Sri Lanka, Thailand and Vietnam. At the turn of the century, it was estimated that there were more than 100,000 elephants in Asia. But today it is doubtful if the wild populations in all the thirteen countries of the species range would add up to 55,000 animals. Although the elephant's present range still extends from the Indian sub-continent in the west to the rim of the Indo-Chinese peninsula, yet the total wild habitat available for it in Asia amounts to only about 500,000 km2 (or about the size of Thailand), which is declining at an average rate of 4,000 km2 per annum. It is therefore one of the most seriously endangered species of large mammals in the world. Indiscriminate hunting and forest clearance are the principal causes for the decline in number of elephants in Asia.

Prior to about 1900, when agricultural settlement in Sumatra first led to a substantial degree of deforestation, most of the island was covered in primary forest. Presumably up to that time, the elephant was more or less continuously distributed throughout the whole area. The island of Sumatra must have had a subs-

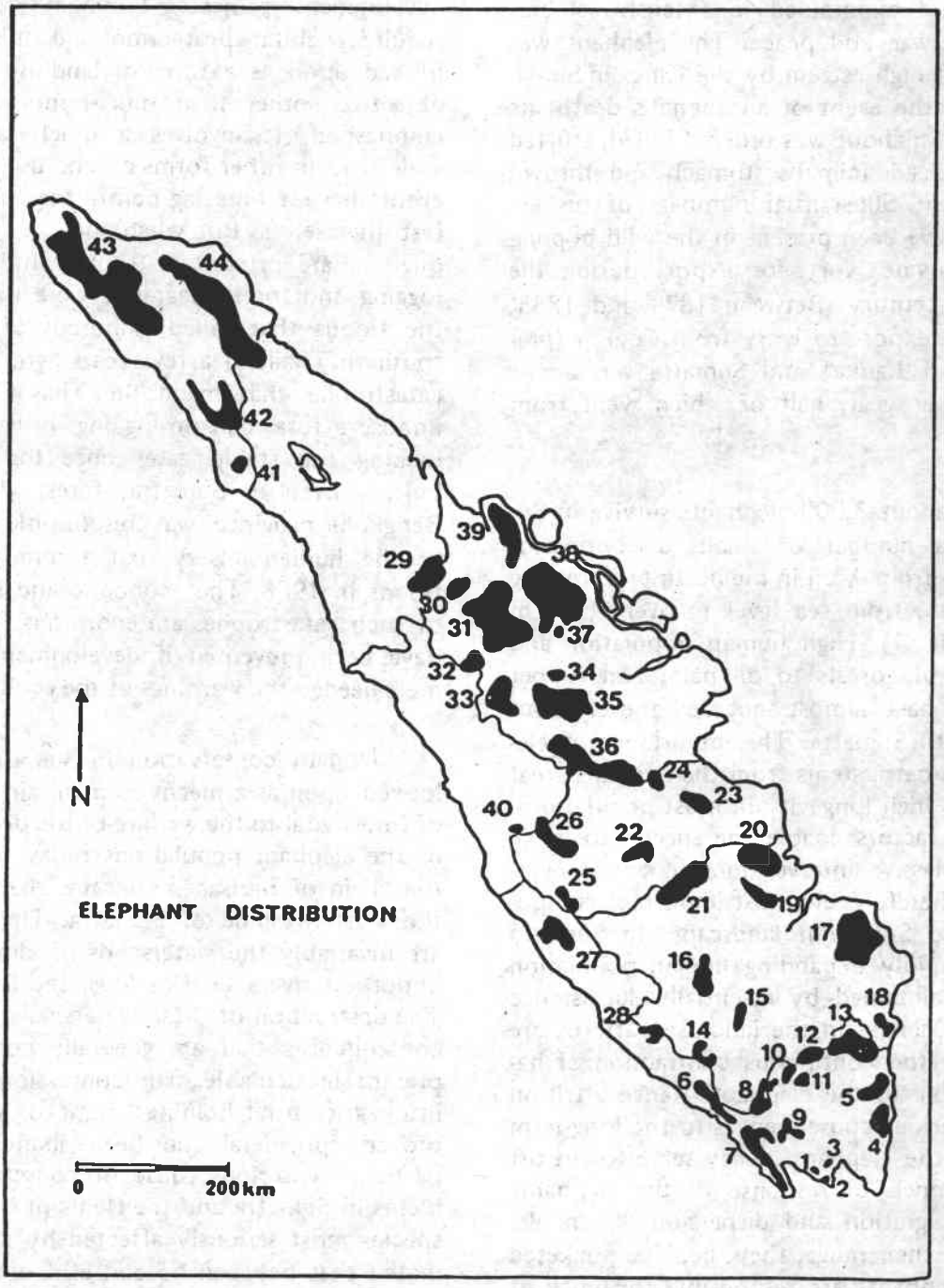


Fig. 1 The distribution of forty-four known populations of elephants in Sumatra.

tantial population of elephants to enable the Acehnese Kings to have them captured in large numbers and trained with the help of Indian mahouts and maintained in extensive stables for use in war and peace. The elephant was held in such high esteem by the Kings in Sumatra that in the event of an animal's death, its unfortunate mahout was ordered killed, stuffed inside the dead animal's stomach and thrown into the sea! Substantial numbers of tuskers too must have been present in the wild population to provide ivory for export during the early 19th century. Between 1879 and 1883, the average export to ivory from Ceylon (present day Sri Lanka) and Sumatra was about 2,000 kg per year, half of which went from Sumatra.

Today about 3,000 elephants survive in Sumatra in a number of small, discontinuous populations from Aceh in the north to Lampung in the south, from sea level to over 1,750 m altitude (Fig. 1). High human population and conversion of forests to oil palm and rubber plantations have almost squeezed the elephant out of North Sumatra. The importance of elephant in Sumatra stems from the animal's great size and its high longevity in most populations. These two factors enable the species to make relatively massive interventions in any ecosystem. It is therefore the most important component of the Sumatran landscape. In Sumatra today, a rapidly expanding human population is being maintained by essentially subsistence economy. Changes in the land-use patterns are resulting in the continuous contraction of habitat available to the elephant. Range attrition can have serious consequences to the long-term survival of the elephants. They serve to cut off certain channels of response of the elephants such as emigration and dispersion. When elephants lose their range, they die. The pocketed herds of elephants are responsible for much of the crop depredations and human-elephant conflicts in Sumatra.

Against this background, elephant conservation is coming under increasing pressure from development agencies and planners to make it justifiable on economic grounds. The World Bank which provides huge loans to assist economic development is ambivalent about elephants and their inherent power to destroy their development projects. Elephant conservation requires habitat protection and this must be looked upon as a form of land-use where the objectives other than short-term benefits are emphasised. It involves a much larger time-scale than in other forms of land-use. Ecological events have a time lag before they could manifest themselves. But when they do, the consequences are often catastrophic. Indiscriminate logging and forest clearance were the cause of the floods that killed hundreds of people in southern Thailand a few years ago. It was this catastrophe that made the Thai Government impose a total ban on logging. It was a case of locking the stable gates once the horse has bolted. Even in Sumatra, forest clearance in Bengkulu province was responsible for much of the human misery that accompanied flash floods in 1988. The economic and social costs of such catastrophes are enormous. They could have been prevented if development programmers heeded the warnings of the ecologists.

Elephant conservation in Sumatra must be looked upon as a means to maintain large areas of forest vital to the welfare of the people. Many of the elephant populations today occur along the chain of Barisan mountains that run along the western spine of Sumatra. These habitats are invariably the watersheds of almost all the important rivers such as Musi and Batang Hari. The destruction of these watersheds would have consequences that are generally considered at present incalculable. The conversion of forsest into agricultural holdings, some of which have proved ephemeral and been abandoned, is a particularly serious cause of conservation problems in Sumatra and the elephant is among the species most seriously affected by it. It is estimated that between 65 and 80% of the species rich lowland forests of Sumatra have already been lost (Fig. 2).

The mountain areas which are the watersheds of the rivers, to date have been less seriously affected, but even here the disruption of continuous cover is already substantial in some cases,

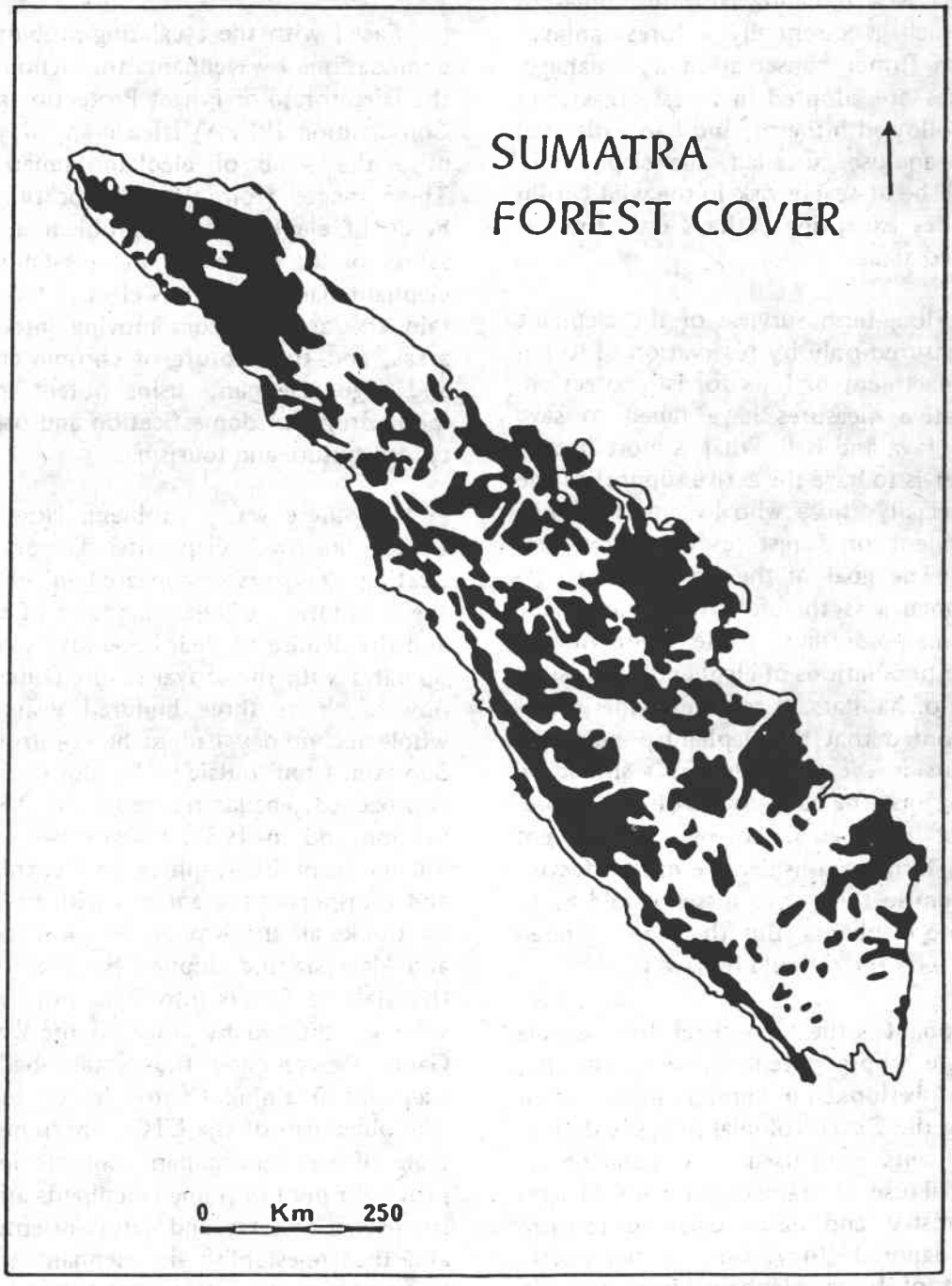


Fig. 2 The extent of forest cover in Sumatra.

and perhaps 15% of their total area may tentatively be estimated as already removed on the scanty information available. The altitude range of the mountains in Sumatra is such that most of their area is rich habitat for the Sumatran elephant which is essentially a forest animal. Unless much firmer conservation and management policies are adopted in forest areas than have been followed hitherto, and badly planned changes of land-use curtailed, the elephant in Sumatra will be at severe risk in the wild within a few decades excepting perhaps only the largest protected areas.

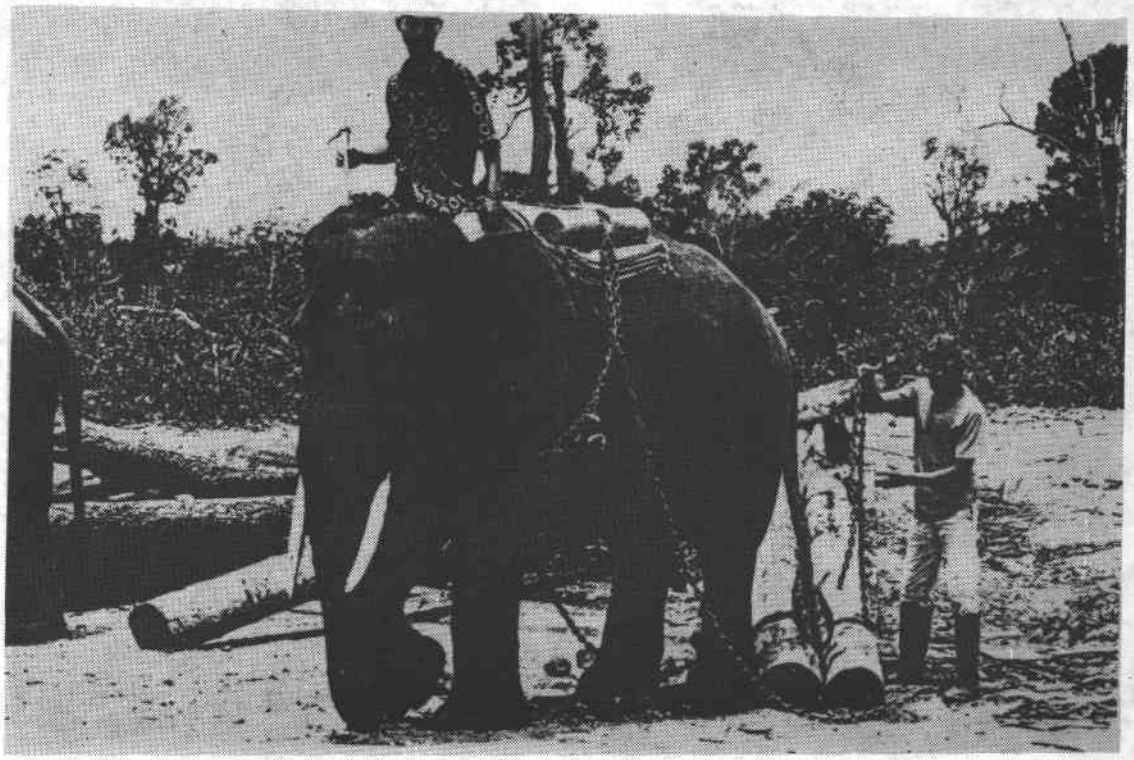
But the long-term survival of the elephant cannot be ensured only by reservation of its habitat and enactment of laws for ist protection. Such legislative measures have failed to save the tiger in Java and Bali. What is more important however is to have the active support of the people, especially those who live in the fringe areas dependent on forest resources for their subsistence. The goal of the elephant management in Sumatra is therefore to minimise the elephant-human conflicts, while conserving as many viable populations of elephants as possible in a variety of habitats. It requires some justification to conted that the elephant populations that live outside the protected areas should be conserved against the background of crop-depredations that have escalated over the recent years. Many farmers consider the most effective way to minimise their crop losses would be to eliminate the elephants. But there are compelling reasons why they should be saved.

The elephant is the four-wheel drive vehicle of the jungle whose potential use to man has been largely overlooked in Sumatra in the recent past. During the Dutch colonial rule, the domesticated elephants were used in war and peace. The potential use of trained elephants in agriculture, forestry and nature-oriented tourism cannot be ignored. In Assam, in the north-eastern part of India, elephants were used in agriculture to plough land and pound the rice. In Thailand and Nepal, trained elephants have been used successfully in nature-oriented tourism generating much needed revenue for the local people. But more importantly, throughout Asia, the elephants have been the backbone of the timber industry. This is nowhere more signigicant than in Burma where today about 5,000 trained elephants are employed in the teak forests.

Faced with the escalating problems of crop depredations by elephants throughout Sumatra, the Directorate of Forest Protection and Nature Conservation (PHPA) tried many ways to minimise the scale of elephant-human conflicts. These ranged from the translocation of entire herds of elephant from problem areas to the safety of the protected areas, establishment of elephant barriers such as electric fences to contain the animals from moving into cultivated areas, and the capture of chronic crop raiders and rogue elephants using potent morphiomimetic drugs for domestication and use in forestry, agriculture and tourism.

But there was a problem. How to domesticated the rogue elaphants? The art of domesticating elephants disappeared in Sumatra with the dissolution of the Kingdoms of the Sultans and the demise of their hegemony over much of Sumatra with the arrival of the Dutch colonial powers about three hundred years ago. The whole technology had to be re-introduced into Sumatra from outside. To do so, the PHPA approached Thailand through its ASEAN connection and in 1987, bought two trained elephants from Chaiyaphum in Central Thailand and transported the animals with their mahouts by trucks all the way across southern Thailand and Malaysia and shipped them by boat across the Malacca Straits into Riau from where they were transported by truck to the Way Kambas Game Reserve and thus established the first Elephant Training Centre (ETC) in Sumatra. The objectives of the ETC were to minimise the scale of elephant-human conflicts in Sumatra, provide a pool of trained elephants and mahouts for use in forestry and nature-oriented tourism and thus re-establish the elephant as a part of Sumatra's myths, history and cultural heritage.

We were particularly careful to emphasize the use of trained elephants not in all forestry operations but only in the extraction of timber from the production forests that have been legally set aside and in the mono-culture planta-



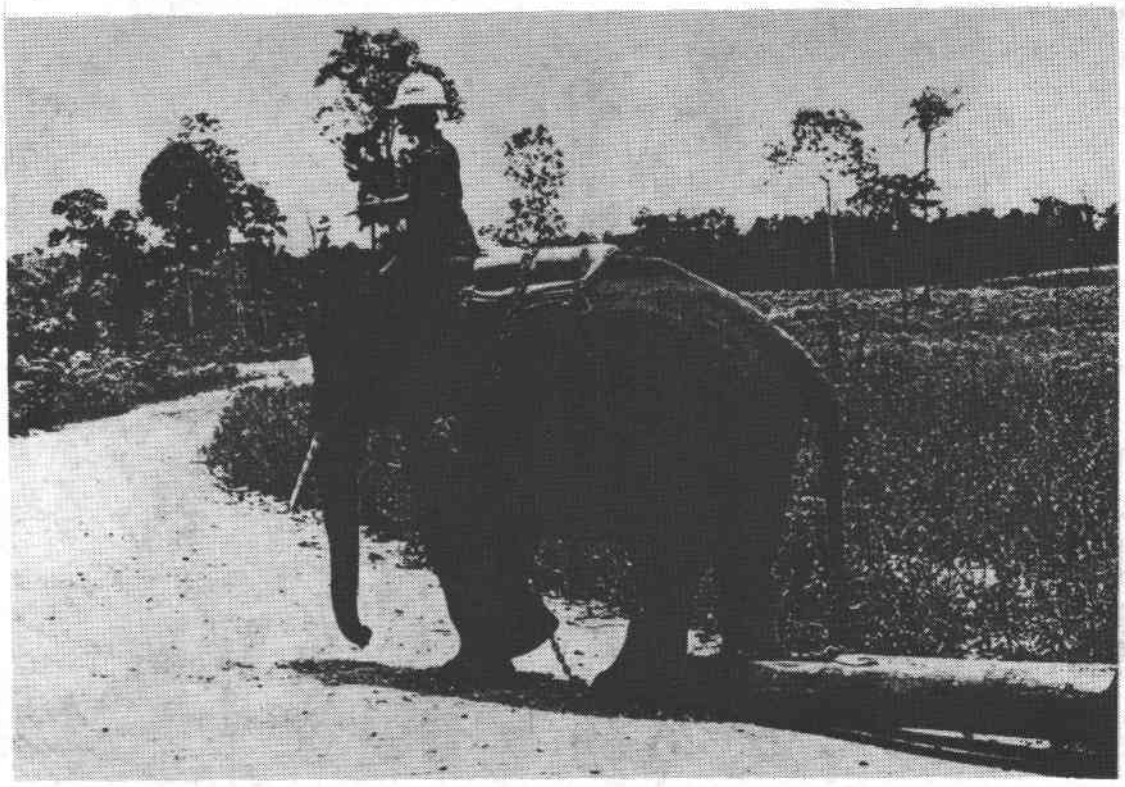
tions of teak, pine or eucalyptus. Teak is particularly suited to grow between altitudes of 2,000 and 3,000 m along steep hills. In such areas, there is no man-made machine that is superior to the trained elephants in hauling timber. According to Lt-Col. J H. Williams (the author of the well-known book "ELEPHANT BILL"), trained elephants can haul a log "twenty-nine feet long and six or seven feet in girth – that is say, over 100 cubic feet of timber, or four tons dead weight."

There was considerable reluctance on the part of the logging companies in Sumatra to consider the use of trained elephants in forestry operations. This is largely due to the economics of logging operations which aim to maximise the extraction of timber within the minimum time period. But at last, the PHPA seems to have successfully demonstrated the potential benefit of the trained elephants to the logging companies in Sumatra. Already one timber company (P.T. Great Andalas Timber) in Lampung province has incorporated two trained elephants in its logging operations (see cover photo). This is a remarkable achievement for the PHPA and marks a turning point in the history of the ETC in Sumatra.

The economical and environmental advantages of using the trained elephants in forestry operations are many. A fully trained elephant is an investment for a lifetime.

1. It costs only about US$ 6,000 to US$ 10,000 to purchase a timber elephant of age 20 years in Thailand. Such an elephant has a working life of 30 years. Compare this with the cost of a crawler tractor which costs about US$ 100,000 to 140,000 a piece, and has a working life of 6 years.

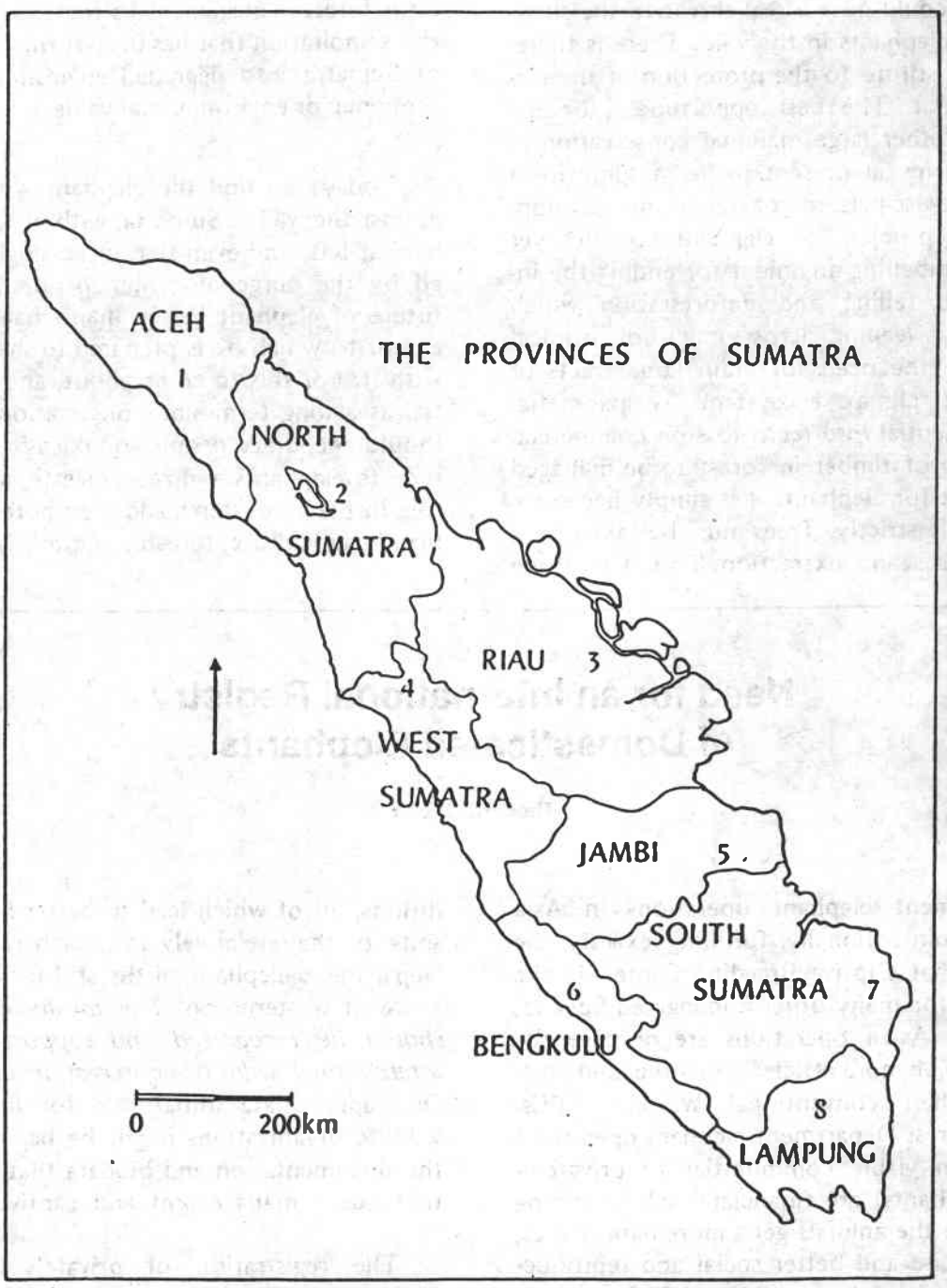
2. The trained elephants are "environment-friendly" and "user-friendly". There is no need to cut expensive logging roads that are essential for the use of heavy machinery. The establishment of logging roads not only destroys much of the forest but more seriously provides the access to many wild settlers and poachers to the interior. The agent of much of the forest destruction is shifting cultivation and so, these access



roads provide avenues for the spread of slash and burn agriculture throughout Sumatra.

3. The trained elephants can ascend steep hills and mountains where no machinery can go. But herein lies the hidden danger of misuse of trained elephants by unscrupulous logging companies in extracting timber from upper reaches of the forests and thus destroying the crucial watersheds. This is the principal reason why we advocate strongly for use in production forests and in mono-culture plantations of teak, pine and eucaplyptus.
4. Trained elephants in theory can work throughout the year under any weather conditions, unlike the heavy machinery. Bull elephants however have a period of "musth" during which time they tend to be aggressive and so are not put to work. But the non-pregnant females can work throughout the year. In the freshwater swamp forests of Sumatra, elephants provide the best and the most cost-effective means of timber extraction.
5. Unlike the machinery, the elephants do not rust, corrode or pollute the environment. They do not depend on expensive spare parts and their dung acts both as a fertilizer as well as an agent of seed dispersal in the forest. Gasoline is a non-renewable resource of limited quantity. As such it will become increasingly expensive in the years to come. Spare parts too will become expensive as labour costs mount. In the end, the trained elephants will become far superior to the machinery.
6. Throughout Asia, the staple food of elephants consists of grass and bamboo, which are found in the undergrowth of the forests. Elephants while feeding in the forest will thin this undergrowth in such a way to enhance the germination and growth of many forest tree seeds.
7. The use of elephants in extraction of timber will greatly reduce the environmental damage caused by heavy machinery and thus prevent excessive soil erosion and soil compaction.

The price paid for using elephants in forestry is that the rate of extraction of timber will be slow and so it may not be economical to the logging companies. But it can be selective and so on ecological terms would be sustainable.


THE PROVINCES OF SUMATRA
ACEH
1
NORTH
2
SUMATRA
RIAU
3
4
WEST
SUMATRA
JAMBI
5
SOUTH
SUMATRA
7
6
BENGKULU
8
LAMPUNG
0
200km

In the final analysis, the human-elephant conflicts cannot be resolved by capturing chronic crop raiders alone. This is only a short-term measure with limited objectives. If carried to an extrene, it could pose a real threat to the survival of the elephants in the wild. There is therefore no substitute to the protection of the elephant habitat. The best opportunity for elephant and other large mammal conservation in Sumatra seems at present to lie in some form of multiple-use-pattern of rangeland development. The problem of elephant provides yet another compelling argument for ending the indiscriminate felling and deforestation which have been sweeping across much of tropical Asia. While the need to retain large tracts of undisturbed climax ecosystems is axiomatic, it is not essential *ipso facto* to stop commercial exploitation of timber in forest to be managed as a habitat for elephant: it is simply necessary to control it strictly. Trees must be taken on a selective basis and extraction limited to those exceeding 50 cm at breast height, leaving the remainder to provide open canopy until saplings grow up to replace trees removed. Such a policy is in any case required to provide sound long-term forest management to replace the destructive expoitation that has been turning large areas of Sumatra into degraded environments of no economic or environmental value.

Today, we find the elephant with his back against the wall in Sumatra, with little remaining habitat left, and even that increasingly threatened by the burgeoning human population. The future of elephant lies in man's hands and the extent to which he is prepared to share the land with it. For this to come about, and it is essential as a long term aim, conservation education should encourage people to take a balanced attitude to elephants and recognize their ecological role in the ecosystems and their potential use to man in agriculture, forestry and tourism.

Need for an International Registry of Domesticated Elephants

Richard C. Lair

Government elephant operations in Asia are now unintentionally fulfilling exactly the same role that Captive Breeding Centers in the West serve for many other Endangered Species, though the Asian operations are or have the potential to be more efficient, flexible, and cost-effective than conventional Western CBCs. Existing Forest Department elephant operations (and certain viable communities of privately-owned elephants) are financially self-sustaining CBCs where the animals get a more natural diet, better exercise and better social and reproductive opportunities than in Western CBCs or zoos. Marshall, who worked for years in the forests of Thailand, wrote. "It is axiomatic that the nearer a captive animal's living conditions can approximate to those of its wild cousin the fitter it will be . . . " and the well managed government elephant operation certainly fulfills these conditions, all of which lead to better breeding. In spite of their relatively low birth rates, Forest Department elephant births still far outnumber those in Western zoo. *This invaluable function should be recognized and supported by the international wildlife conservation community.* One appropriate initial role for international wildlife organizations might be begin to gather the documentation and biodata that is essential to modern management and captive breeding.

The registration of privately-owned elephants will be a very slow and complicated business requiring new legislation, licensing, massive funding, unprecedented inter-agency efforts and tens of thousands of man-hours in the field. A centralized registry for government elephants, on the other hand should be very easy and economical: it could almost be done by