

informed that the "Badak" boat was finally repaired. However, major repairs will soon be inevitable and in the long run it will be more economic to replace the boat by a new – preferably locally-made – boat for which spare parts are available in Jakarta.

#### General remarks

We are convinced that since 1967, when we started our mission, the situation in Ujung Kulon has steadily improved. Protection and management are increasingly effective and the rhinos are by now more numerous. However it is obvious that the continued interest and the assistance by WWF will still be needed to provide an impulse for the continuity of the present development.

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and  
Dr Lotte Schenkel-Hulliger

#### Project 884 Sumatran rhinoceros – conservation

WWF GRANT 1973 – \$ 12,806

For previous reports see  
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At the request of the rhino group of IUCN a project for the conservation of the endangered Sumatran rhinoceros was worked out. The aim of the two-year project is to determine the present range of *Dicerorhinus sumatraensis*, to collect data on its status and ecology and to evaluate possibilities for its conservation.

Work was started in November 1972 in the province of Aceh at the northern tip of Sumatra. The Gunung Leuser Reserve was considered to be one of the most important areas left in the rapidly-shrinking range of the Sumatran rhinoceros. During the first seven months special attention was given to this unique nature reserve. As no maps exist of the area and some 80% is completely unexplored and even unknown to local hunters, working conditions proved to be sometimes extremely difficult. Expeditions of two to four weeks were carried out, penetrating the mountainous forest areas where man has never been before. The rhinos had vanished from the peripheral areas of the Reserve, but in the valleys and mountains of the central part, reachable only by a week's march or by helicopter a surviving population of the Sumatran rhino was found. Trails, wallows and saltlicks indicated that the region is still regularly used by rhinos.

It was here that the investigator Markus Borner was able to make the only direct observation of a Sumatran rhinoceros. The animal, a young female, almost walked into his field camp and then

dashed off through the thick undergrowth. As the visibility in the tropical rain forest seldom exceeds 20 metres, direct observation of big game is very rare. The analysis of all kind of tracks is therefore of great importance.

In addition to defining the range of the rhino in the Gunung Leuser Reserve and to studying some ecology, the Reserve was surveyed for the Orang-utan and other big game. Former surveys indicated that the favourite habitats for most of the larger mammals do not exceed an altitude of 1500 m. It was assumed that the centre of the reserve consisted of high mountains, thus limiting the distribution of the larger mammals to the western and southern boundaries. The recent survey into the interior of the Reserve showed, that this assumption was wrong. A valley with a length of about 100 km transverses the centre of the reserve from North to South and is difficult to penetrate. Large areas of the bottom of this valley are below 1500 m and therefore suitable for large mammals.

Beside the Sumatran rhinoceros, and the Orang-utan, the occurrence of Rusa deer *Cervus unicolor*, Barking deer *Muntiacus muntjak*, Serow goat *Capricornis sumatraensis*, Mouse deer *Tragulus napu*, Tiger *Panthera tigris sumatraensis*, and others could be confirmed. No evidence was found on the occurrence of the Javan rhinoceros *Rhinoceros sondaicus*.

Recommendations were given on how the conservation of the reserve in general and especially the situation of the rhino could be improved. These suggestions have been taken up by the Nature Conservation Department of Indonesia and the Gunung Leuser Committee of WWF.

In the succeeding months investigation was extended to other provinces. In West Sumatra, one of the most densely populated provinces, rhinos died out some years ago. The province of Riau in central Sumatra was surveyed for two months. The hills and swamps of the large alluvial plains covered with tropical rain forest were once described as "rhino country". It was here that three female rhinos were caught in 1959/61, and the population was estimated from 25 to several hundred animals. Due to an incredible boom in timber logging and oil drilling in the last few years most of the vast virgin jungle has vanished. Timber and oil roads lead to the remotest wilderness, opening the country to human intrusion. The results of the survey indicate that the rhinoceros is extinct in this area by now.

In the province of North Sumatra, fresh rhino tracks were found in the mountainous centre of the Langkat reserve and in the lowlands bordering the province of Riau. Poorly maintained rhino trails in the Langkat reserve suggest that only very few animals still occur. In the lowlands at the boundaries between North Sumatra and Riau the survival of the remaining few rhinos is threatened by timber exploitation, and plantation projects.

To date about 1500 km have been covered on foot in the forest, 12,600 with a Toyota Jeep, 250 km with trucks and logging tractors, 650 km by prahu (local boat) or speedboat, 1200 km by plane and 550 km by helicopter.

BORNER

The proposed survey in the southern part of Sumatra will clarify the situation in these provinces.

Rhino trails, wallows and saltlicks indicating that the region is still regularly used by rhinos could be found only in the Gunung Leuser Reserve. However the animals are thinly scattered over the area. (A minimal estimate of eight animals could be given.) As human disturbance seems to be one of the reasons for the vanishing of the rhino, the reserve needs strict guarding.

With the help of WWF to protect this unique nature reserve, the surviving population of rhinos might have a chance of survival.

Markus Borner  
Medan, Sumatra

### Project 1015 Conservation of the Javan Tiger

WWF GRANT 1973 - \$ 5,555

The Javan tiger (*Panthera tigris sondaica*) is threatened with extinction. Various surveys indicate that less than 15 still exist in the Meru Betiri Forest Reserve and its environs in eastern Java. This subspecies is listed in the IUCN Red Data Book as endangered and is totally protected by Indonesian law, but protection is not enforced, and unless immediate measures are taken to save the remaining population it might become extinct within the next years.

Formerly the Javan tiger ranged throughout the island. Over-hunting has probably been the major cause of its decline, but clearance of its forest habitat and depletion of prey rapidly restricted its range. At present the tiger occurs only in two areas of south-east Java in the Meru Betiri Reserve and possibly in remote parts of the southern half of the island below 800 m. altitude.

The tiger most likely inhabits densely forested areas or secondary forest where human penetration is limited and ungulate and primate prey species are still relatively numerous. However, forest clearance, depletion of prey species and human penetration into former wilderness areas is rapidly restricting the remaining range of the tiger.

To safeguard the most important of the residual tiger habitats, the Meru Betiri reserve was established by resolution of the Minister of Agriculture of 6 June 1972. At the request of the Netherlands Commission for International Nature Protection, A. Hoogerwerf visited the area in the period 24 August - 14 September 1971, and reported on the fauna, notably the occurrence of the Javan Tiger. Hoogerwerf did not see tigers, but he found foot prints and collected data on sightings by other people. He concludes that the species still occurs in an around Meru Betiri, but probably only in a small number. He reported also that wild

boar and Muntjan (Kidang) occur in the Reserve, but that deer and banteng were absent. It seems that the density of prey species in Betiri forest is unlikely to be sufficiently high to maintain a permanently resident group of tigers. Panther appear to be more numerous than tiger and, together with the wild dog (adjag), are likely to be competitors as far as prey animals are concerned.

#### Project details:

(a) A survey is required to determine the status of the surviving tiger population. The ecology and the basic behaviour pattern of the tiger must be investigated, distribution and movements, feeding habits and reproductive potential in particular. This research should provide the scientific basis for the proper management of the reserve and for a long term programme aimed at rebuilding the Javan tiger population. A wildlife biologist has to be employed for at least one year, if possible two years. He will undertake this research and elaborate a management plan for the reserve in close cooperation with PPA and local universities. Whenever possible Indonesian students will be invited to participate (tiger census, other surveys).

(b) To enforce existing laws the guard system has to be improved immediately. Five guard posts have to be established and manned at strategic points in and around the reserve. In addition to a head game warden 10 guards must be engaged. Salaries will be paid according to Government standards but supplements are necessary to attract personnel of the necessary standards of efficiency and reliability. The duties of the guards are: to control poaching, stop livestock grazing, control of burning, wood collection and other detrimental activities.

(c) Supply of essential equipment for the game guards and the investigation. For each guard post a motor cycle is needed. For the investigator a 4-wheel-drive vehicle (later to be handed over to the chief game warden). PPA will take care of construction of guard posts, maintenance of the posts and of the vehicles.