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ON THE STATUS AND CONSERVATION OF THE LEOPARD (Panthera pardus)
IN SRI LANKA

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Introduction

The leopard, Panthera pardus, is the largest mammalian carnivore in Sri Lanka. Once widely distributed throughout the island from sea coast to the hills (Phillips, 1935), today both its range and numbers have declined following the large scale modification of its habitats. Although the disruptive processes began their effects on the leopard and other large mammal populations by the turn of the century when large areas of forests, especially on the hills, were cleared to establish plantations of coffee and tea, the leopard was, until recent times, still relatively common in the lowlands. The serious decline in numbers started with the accelerated development of the island's largest and hitherto least exploited river (the Mahaweli Ganga) to bring under irrigation 363,000 ha of lowland forest in the northern, eastern and central parts of the dry zone. Furthermore, the widespread use of firearms and ammunition in the continuing communal conflict in Sri Lanka has meant an increase in the level of poaching on animals such as the spotted deer, Axis axis, sambar, Cervus unicolor, and wild pig, Sus scrofa, which constitute key prey species of the leopard. The animal itself is vulnerable to poaching on account of the high commercial value of its skin. The conversion of forests in Sri Lanka to other land uses is perhaps the most serious cause for the decline in number of the leopard. It is estimated that between 1956 and 1981, the forest cover fell from 44% of the total land area to 25% (IUCN, 1986).

Sri Lanka is basically an agricultural country where people derive their livelihood from the land. The human population (currently estimated at about 15 million) is likely to double itself within the next 40 years, and so the limitations imposed by man are bound to increase significantly in the future. The land set aside for conservation must therefore be seen in this context (Lusigi, 19891). The current political turmoil and the breakdown of law and order in Sri Lanka raises serious doubts about the long term survival of the leopard (and other large mammals) outside the protected areas such as Strict Natural Reserves, National Parks, Nature Reserves, and Jungle Corridors. This paper is an attempt to assess the current status and survival prospects of the leopard in Sri Lanka in the light of this island's major development program.

Number and Distribution

There never has been any census of the number of leopards in Sri Lanka. However, using an average leopard density of one per 20 to 30 km², and the extent of forest cover remaining at that time, the number of leopards was estimated to be anything between 400 and 600 in Sri Lanka (Santiapillai *et al.*, 1982). Today, as a result of the protracted civil unrest, the leopard is likely to have declined in numbers even farther.

Land-use activities on the part of man have greatly reduced the leopard's range in Sri Lanka. The conversion of enormous areas of forest for agriculture and human settlement in the low country dry zone, under the Accelerated Mahaweli Development Programme, has led to the local extinction of the leopard in a number of areas. The current distribution of the leopard is discontinuous (Fig. 1). Moreover, almost all the semi-isolated leopard populations are near the minimum size, thereby making them vulnerable to the effects of inbreeding, loss of genetic variability, and random ecological and demographic events. But as Schaller, (1986) points out, small populations of large carnivores are not necessarily doomed, and so should be considered in the overall conservation of the species. Since the leopard population in Sri Lanka currently exists as a number of semi-isolated breeding units, the long term survival of the species will be determined by the survival of these separate breeding units, the most important of which occur inside protected areas.

Being an extremely adaptable carnivore, the leopard occurs in a variety of habitats that range from the montane forests to lowland scrub, but it prefers ecotonal areas and subclimax stages of vegetation. Distribution is not however, a function of vegetation alone; the availability of prey species and competition from other carnivores are important limiting factors as well (Myers, 1976). In Sri Lanka, the leopard is reliably known to be present, albeit in small numbers, in the following areas (Fig. 1): (a) Wilpattu National Park (131,692 ha), (b) Ruhuna National Park (126,781 ha), (c) Maduru Oya National Park (51,468 ha), (d) Wasgomuwa National Park (33,765 ha), (e) Uda Walawe National Park (30,821 ha), (f) Gal Oya National Park (25,900 ha), (g) Yala East National Park (18,148 ha), (h) Sinharajah Forest Reserve (8,864 ha), (i) Horton Plains Nature Reserve (3,160 ha), (j) Lahugala-Kitulana National Park (1,554 ha), and (k) Hurulu-Forest Reserve (25,500 ha). In addition, isolated populations of leopard are likely to exist in other areas in the low country dry zone, particularly in: (l) the proposed Somawathiya National Park (52,000 ha), (m) the Flood Plains National Park (17,350 ha), (n) the Trikonamadu Nature Reserve (28,000 ha), and (o) the Minneriya-Giritale Nature Reserve (42,000 ha), but scant information impairs a proper assessment of their current status.

Conservation

The primary objective is to maximize the survival probability of the leopard in its natural habitats. In principle, this can be achieved by maintaining as many individuals of the species as possible in as wide a range of its habitats as is feasible. Equally important is the maintenance, of high genetic diversity among the wild populations.

As in the case of any large predator, the basis for the conservation of leopard in Sri Lanka in the wild must be in terms of keeping the human settlements well separated from the wildlife refuges (Ashby & Santiapillai, 1987). Given the small size of the country, the pace of current development programs, and the proposed plan to settle nearly one million landless people in the Accelerated Mahaweli Development Area, wildlife refuges are no longer going to be very remote from the centers of human activity, and so will be subject to the influences of the human populations in their vicinity. Fuel wood gathering is a serious problem in Sri Lanka. The total fuel wood consumption in the island by peasants is estimated to be 8.3 million m³ per year (Brotoisvoro, 1986). As the human population increases in number, so would the demand for fuel wood. Ultimately such habitat modifications would constrict the life support systems of the leopard.

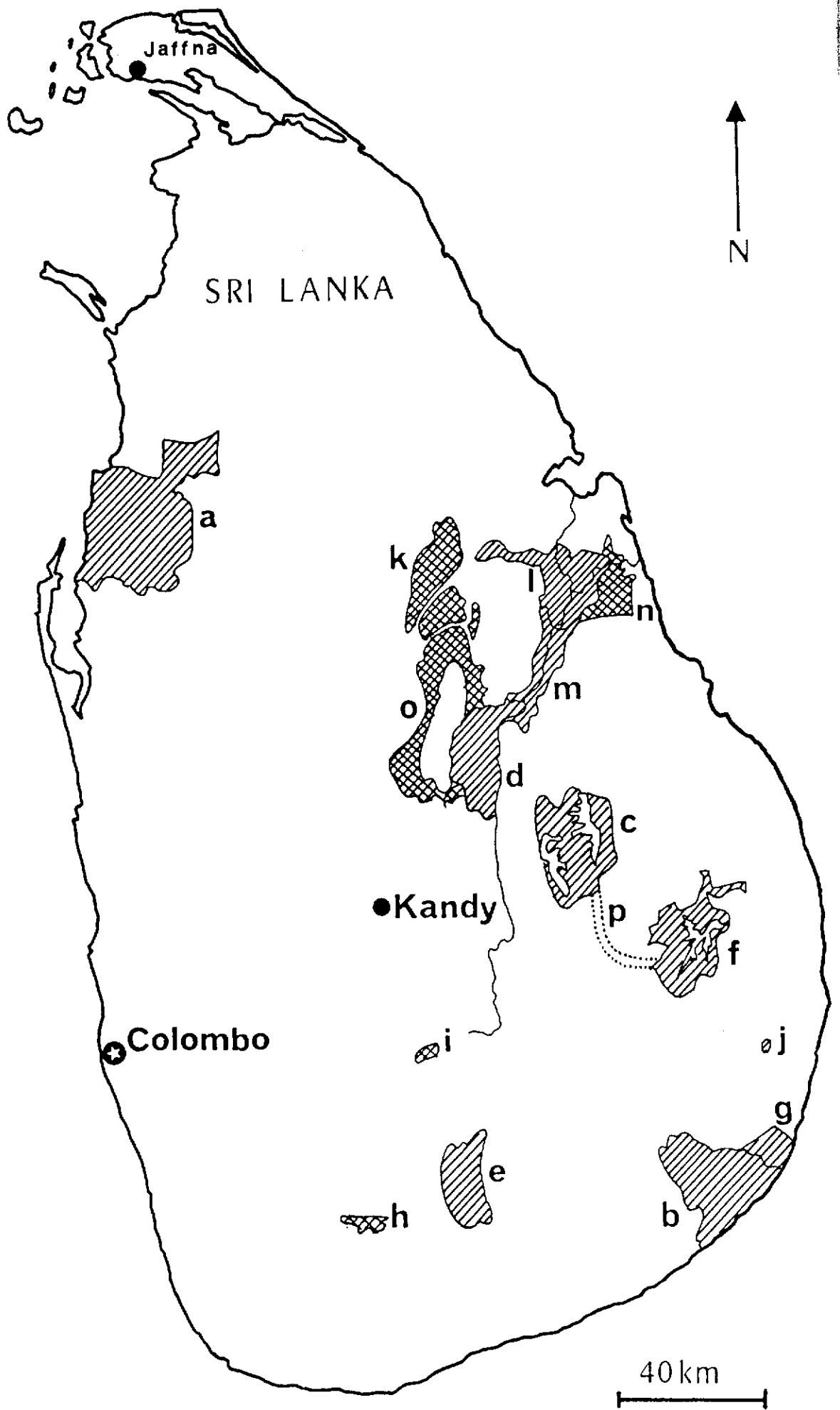
In an effort to mitigate the deleterious effects of the Accelerated Mahaweli Development Programme on wildlife, the government of Sri Lanka has taken a number of measures which range from reserve expansion, establishment of new reserves to tighter legislation. Of the total 460,000 ha of land in and around the Accelerated Mahaweli Development Area, 55% is reserved for agricultural development and human settlements, while 45% is to be set aside for the development of a series of protected areas (Jansen, 1986). The Wasgomuwa Strict Natural Reserve (33,765 ha) has been upgraded to National Park status, while the Somawathiya Sanctuary is to be expanded from its present size of 22,274 ha to 52,000 ha and upgraded to National Park status. This, together with the adjoining 28,000 ha Tirukonamadu Nature Reserve, would greatly increase the area for wildlife conservation. Two new national parks, namely the Flood Plains National Park (17,350 ha) and the Maduru Oya National Park (51,468 ha), have been established. The Flood Plains National Park links Wasgomuwa National Park to the south with the proposed Somawathiya National Park, while the Maduru Oya National Park is to be linked to the Gal Oya National Park to the south through the proposed 10,360 ha Nilgala Jungle Corridor (IUCN, 1986). In addition, further expansion of reserve area is possible by linking the proposed 42,000 ha Minneriya-Giritale Nature Reserve with the 25,500 ha Hurulu Forest Reserve, of which 512 ha constitute a Biosphere Reserve (IUCN, 1986).

These measures will no doubt provide a diversity of habitat types for the leopard. Being an extremely adaptable predator, the animal might respond well to careful management even in small reserves. Its management in the wild therefore calls for action to establish "buffer zones" around the reserves to minimize the problems caused by the presence of human settlements nearby. Some form of multiple-use of the peripheral areas is needed to keep human encroachment on the protected areas to a minimum. Livestock depredation by leopard should be offset by prompt and adequate compensation in order to ensure the goodwill and support of the cultivators, without which the conservation programs are unlikely to succeed in the long run.

In the past, when substantial areas were under forest cover, much of the management of leopard and other wildlife was carried out largely on intuitive grounds. But today, the need for systematic research as a basis for improved management of wildlife is being increasingly accepted (Sale, 1985). The leopard is linked to many other species through predation, and so its survival is important for the preservation of an intact ecosystem. Although a number of studies on the leopard in Sri Lanka have been carried out in the past (see Eisenberg & Lockhart, 1972; Muckenhirn & Eisenberg, 1973; Santiapillai *et al.*, 1982; and Chambers *et al.*, 1984) many aspects of leopard ecology and behavior, such as home range size, dispersal, breeding rates, etc., vital to its conservation remain unstudied. The existing protected areas represent but a fraction of the habitat once available to the leopard and so are unlikely to support more than 600 animals, even assuming an overall average density of 1 per 10 km². The status of the leopard in Sri Lanka is clearly endangered and unless firm action is taken now, its prospects for long term survival look pretty bleak indeed. Legal protection alone cannot ensure the survival of the leopard in Sri Lanka, in the face of rapid conversion of forests to agriculture and human settlement.

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LEGEND

Fig. 1 Map of Sri Lanka showing the areas inhabited by the leopard. Areas c, d, k, l, m, n, and o come under the Mahaweli Development Programme.

- a. Wilpattu National Park
- b. Ruhuna National Park
- c. Maduru Oya National Park
- d. Wasgomuwa National Park
- e. Uda Walawe National Park
- f. Gal Oya National Park
- g. Yala East National Park
- h. Sinharajah Forest Reserve
- i. Horton Plains Nature Reserve
- j. Lahugala-Kitulana National Park
- k. Hurulu Forest Reserve
- l. Somawathiya National Park
- m. Flood Plains National Park
- n. Tirukonamadu Nature Reserve
- o. Minneriya-Giritale Nature Reserve
- p. Nilgala Jungle Corridor

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