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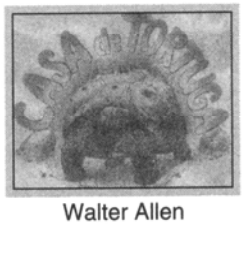

Walter Allen

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Identifying Areas of High Herpetological Diversity in the Western Ghats, Southwestern India

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ABSTRACT: **The Western Ghat forests in southwestern India harbour the last intact tropical rainforest in peninsular India. Species diversity and endemicity are high and the region is biogeographically closer to Sri Lanka than to continental Asia. An analysis of the distribution pattern reveals that many species are localised; however, the distribution and diversity of the region's herpetofauna is highly heterogenous over the Western Ghats. Human pressures on these forests, including logging, agriculture, and settlements are considerable, and vast tracts of once-contiguous forest have been lost.**

To detect areas of high diversity and endemicity within the Western Ghats, data are being collected from the literature, museum records, and by recent field work. Many key areas identified presently receive minimal legal protection, lying within Reserve Forests (the lowest category of forest-land protection in India) or even as fragments within tea, coffee, and cardamom estates. This paper presents a strategy for identifying the remaining pockets of high herpetological diversity within the Western Ghats and recommends measures for their protection.

India supports the fifth-largest area of rainforest in the world, with a closed tropical forest area estimated at 51,841,000 ha (Office of Technology Assessment, 1984), most of which is located in the northeastern region (Collins et al., 1991). However, significant areas of unlogged forest, known as the Western Ghats, run parallel to the Malabar (western) coast of peninsular India. These are composed of a series of hill ranges that may exceed 1,000 m, which are separated by low altitude gaps, and extend north to south for a distance of approximately 1,600 km between 8°and 21° north latitude. The highest peaks, which exceed 2,000 m, are found in the southern parts of the Ghats and include the Nilgiris, Palnis, and Annamalais. Because these hill ranges are ecologically distinct from the intervening 100–150 m flat savanna, they serve as "islands." Regional endemism on these often-isolated islands is suspected to be an important aspect of the high diversity of the region (Inger et al., 1987).

OBJECTIVES AND METHODS

While the extensive clear-cutting of primary forests for timber export, evident in much of southeast Asia, is not prevalent in the Western Ghats, fragmentation of the forests through "swidden" (slash-and-burn) agriculture, logging for firewood, establishment of dams and human settlements, grazing, and forest fires have greatly reduced both the extent and quality of the majestic dipterocarp forests.

The impact of these anthropogenic changes upon the fauna is largely unknown. However, a large number of species that are recognised as threatened dwell in these mesic forests. Among amphibians and reptiles are *Geoemyda silvatica*, *Indotestudo forstenii*, *Python molurus*, *Ophiophagus hannah*, *Crocodylus palustris*, *Pedostibes tuberculosus*, and *Melanobatrachus indicus*. In addition to the poikilothermous vertebrates, important populations of many large mammal and bird species that are listed as "Threatened" occur in these hill ranges. These include the Nilgiri tahr, Malabar civet, tiger, leopard, gaur, elephant, and the great pied hornbill. Of the ten physiographic zones within the Indian Subcontinent identified by Das (1994, 1996), the Western Ghats, apart from the northeast, is the only zone with endemic species of Testudines—*Geoemyda silvatica* and *Indotesduo forstenii*.

The Western Ghats fauna is unique with many endemic species. Because it is linked to the rapidly shrinking hill forests, the fauna is restricted to a few existing reserves and is threatened with extinction. Rodgers and Panwar (1988) have proposed a network of protected areas for the whole of India; the current mapping and analysis project will, it is hoped, contribute to that goal.

The working hypotheses here are as follows: Each area that is defined by non-historic events (e.g., mountains high enough to be refugia) is likely to support endemic species. Areas of high herpetological diversity outside existing protected areas will be recommended for protection. Since relatively more species are known to occur on larger "islands" than small ones, the former type of sites will be favoured in case of trade-offs for developmental and forestry requirements. Because extinction is area-dependent, larger parks will also support more species than smaller ones as well as