Finding Cinderella
Selecting a Conservation Surrogate Species for Sri Lanka’s Endangered Wildlife

**Introduction**

Sri Lanka is an island nation geographically isolated from the Asian mainland by a shallow straight between its southwestern corner and southern India. The surrounding coastline is bordered by the Bay of Bengal and Indian Ocean whose seasonal changes in atmospheric pressure bring about heavy monsoon winds that influence rainfall over the entire country. As a result, Sri Lanka’s terrain is divided into two main ecological zones shaped by annual precipitation levels. The majority of Sri Lanka’s northern and southeastern regions are designated as a dry zone since the area receives comparatively less rainfall than the southwestern wet zones. Despite the smaller proportion of wet zones, they harbor immense biological wealth due to the formation of highly productive moist and wet forest types.

Many of the resident flora and fauna found in these wet forest habitats are evolutionarily distinct from their mainland counterparts and, subsequently, Sri Lanka is home to one of the greatest levels of endemic species worldwide. Sri Lanka along with portions of India’s Western Ghats is currently listed as one of the twenty-five global biodiversity hotspots due in part to the high level of imperiled species. Fourteen of its sixteen endemic terrestrial mammals are presently threatened or endangered, highlighting an urgent need to conserve these areas. Habitat loss through hunting, timber felling, extraction of firewood/cooler, livestock grazing, and fire is the greatest threats to Sri Lanka’s biodiversity. Estimates of forest loss in the Western Ghats/Sri Lanka has been so rapid that out of the original extent of 182,500 km² of primary vegetation only 12,450 km² (6.8%) remains.

Over 50% of Earth’s species are found within tropical latitudes where coinciding poverty and population pressures put substantial demands on natural ecosystems. The burdens of conserving the remaining wildlife must, therefore, identify surrogate species and their habitats that have the greatest protection for sympatric threatened species. These species are often called flagship species since they act as an icon for a particular ecosystem after they have suffered from heavy exploitation or habitat destruction. Conservation institutions selectively anoint this designation for certain species in order to attract public support and, as a result, typically feature animals that are both large and visually ‘charismatic’ to appeal to western cultures. Unfortunately, this approach precludes other similarly endangered species for conservation efforts based on such superficial traits.

Scientists now agree that the primary consideration of assigning ambassador species needs to feature those animals whose habitats support a wide variety of species and not just the most well-known. This concept was first put forward by J.R. Smith that coined the term, Cinderella species, which considers the often overlooked species with potential flagship appeal. By focusing conservation efforts on the ecosystems that each of these potential Cinderella species inhabit, it becomes possible to protect a greater number of rare and endemic wildlife that may benefit from protecting shared ecosystems.

**Methodology**

For the purposes of this study, only terrestrial mammals with overlapping ranges in Sri Lanka’s wet zone region were analyzed. To begin, a preliminary consensus of all terrestrial mammals inhabiting Sri Lanka was identified and subject to a process that deciphered animals of increased need for conservation. These steps are enumerated in the flow chart to the left. With the exception of the Red slender Loris, all other species were then identified to their subspecies counterparts whose extant (resident) ranges occur within the designated wet zone area.

Spatial information for extant ranges for each species was obtained from the most recent versions downloaded from their IUCN red list page. A habitat suitability analysis was then conducted on prime areas of habitat within the same area. Prime areas of habitat were mapped according to species-specific requirements listed on the table below. Dense canopy cover was a requirement for both the Red slender Loris and Golden palm civet due to the risks of entanglement and poisoning by nearby villagers that subsume their major threats. Once all habitat suitability factors were created and intersected, areas of prime habitat were joined to their previous extant ranges and categorized as either prime (10) or non-prime (1) for further analysis.

In order to find regions of Sri Lanka forest with the most protective potential for all prime and non-prime habitats, the habitat shapefile for each species was converted to raster. Prime areas overlapping non-prime areas were summed using raster calculator revealing three distinct areas of habitat overlap: the greatest prime range overlap, intermediate range overlap, and all extant range overlap.

An overlay analysis of all extant ranges revealed that the majority of the RSL habitat was consistently covered by the ranges of the other three species. The red areas on the Biodiversity Hotspot map represent forests with the greatest need for conservation efforts. These red habitats subsume prime habitats for all species with the exception of the RSL. Nevertheless, adequate protection of these areas may be beneficial to reintroduction programs for the primate species that are the most susceptible to habitat degradation. The analysis failed to produce any area with four prime habitats overlap which should be a top concern for future environmental protection policies.

Due to the lack of coverage in the biodiversity hotspot map along with its encompassing habitat overlap for the remaining species, the Red slender Loris should be designated as Sri Lanka’s newest Cinderella species. Adequate protection of the primate’s extant range along with conservation of its prime habitats is likely to have maximum benefit to the remaining three endemic species.

**Sources**

[Draft Title: Finding Cinderella: Selecting a Conservation Surrogate Species for Sri Lanka’s Endangered Wildlife]

**Table 1**

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**Discussion**

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**Habitat Suitability Analysis**

- **Purple-faced Langur (PFL)**
- **Golden Palm Civet (GPC)**
- **Toque Macaque (TM)**

**References**