

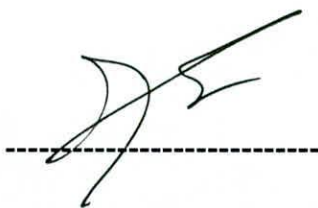
**Habitat Use by Large Mammalian Herbivores
in Udawalawe, Wasgomuwa and Bundala
National Parks in Sri Lanka**

By

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**Thesis submitted to the University of Sri Jayewardenepura for the
award of the Degree of Doctor of Philosophy in Food Science and
Technology on 2008**


The work described in this thesis was carried out by me under the supervision of Prof. Arthur Bamunuarachchi and Dr. U. K. G. K. Padmalal and a report on this has not been submitted in whole or in part to any university or any other institution for another Degree.

A handwritten signature in black ink, consisting of several fluid, overlapping strokes, positioned above a horizontal dashed line.

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We certify that the above statement made by the candidate is true and that this thesis is suitable for submission to the University for the purpose of evaluation.

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U. K. Lakshman Peiris

ABSTRACT

Understanding of habitat quality and habitat relations of herbivores within protected areas are vital to draw up long term conservation strategies and to establish management plans for protected areas. Therefore this study was undertaken to identify Habitat use by Large Mammalian Herbivores in Udawalawe, Wasgomuwa and Bundala National Parks with the objectives of studying the distribution of herbivores in different habitats, their habitat relations and the quality of the habitat they live in different environmental conditions during the period from October 1999 to September 2004.

The forestland, scrublands and the grasslands were the main habitat types that were recognized in these protected areas using habitat maps and confirming them with the ground surveys. The environmental conditions were categorized using meteorological data available at the Department of Meteorology. Three distinct environmental conditions i.e wet, dry and extreme dry were recognized.

The distribution of herbivores in different habitats during different environmental conditions was assessed by using King Census technique. The habitat utilization patterns were assessed by using dung and pellets counts method. The fodder plants and food preferences were identified by direct observation and the feeding signs left by the herbivores, respectively. The parts of the different fodder plants were analyzed to determine the amount of nitrogen, fiber and the availability of water as food quality under the different environmental conditions. The samples were collected

during every environmental condition in all three protected areas under the study. The fecal samples were analyzed to determine the food habits of herbivores.

The highest and the lowest populations of elephant at Udawalawe National Park (UNP) were 361 ± 81 and 104 ± 48 during wet and extreme dry conditions respectively. In Wasgomuwa National park (WNP) the values were 201 ± 71 and 30 ± 28 and in Bundala National park (BNP) the values were 63 ± 11 and 3 ± 2 respectively. The highest population of spotted deer in UNP, WNP and BNP were 563 ± 161 , 363 ± 169 and 126 ± 23 respectively and the lowest populations recorded were 311 ± 95 , 298 ± 176 and 41 ± 28 . The highest population of buffaloes in UNP, WNP and BNP were 7450 ± 1890 , 516 ± 171 & 1630 ± 615 and the lowest populations were 5306 ± 2006 , 301 ± 90 and 760 ± 306 respectively. The habitat use of herbivores indicated that the elephant prefers scrublands and grasslands and the spotted deer prefers the grassland, the sambar prefers the scrublands while the buffalo prefers grassland. The amounts of different plant parts present in the fecal matter of herbivores confirmed the distribution pattern of herbivores.

The distribution and habitat use by herbivores were strongly co-related with the environmental changes and the availability of food plants. The availability of food in different habitats directly depends on the environmental conditions. It was also observed that the presence of water in the soil was crucial in maintaining a quality habitat. The spotted deer and the sambar prefer mosaic type of habitats. Therefore establishing mosaic type habitats can be recommended. The existing grasslands should be maintained as such by removing of unpalatable perennials with continuous monitoring. Domestic buffaloes have been identified as competitors with their counterparts in the wild for foraging. It is recommended to remove or control the buffalo population through implementing a suitable strategy. Further studies on other habitat components are vital to establish appropriate management interventions for long term conservation of healthy animal populations in the wild.