ASSESSMENT OF HABITAT SUITABILITY AND ENVIORNMENTAL FACTORS AFFECTING THE DISTRIBUTION OF ELEPHANTS IN SRI LANKA

R.D.C.S. Rajapaksha[1], D.M.H.K. Dissanayake[1], P. Wijekoon[1]*, C. Santiapillai[2] and S. Wijeyamohan[2]

[1]*Department of Statistics and Computer Science, Faculty of Science, University of Peradeniya, Sri Lanka*
[2]*Postgraduate Institute of Science, Peradeniya, Sri Lanka*
*pushpaw@pdn.ac.lk

Since Asian Elephant has now been categorized as an "endangered" species by the International Union for Conservation of Nature (IUCN) Red List, the identification of suitable places for their habitats is very important to protect them. The major threat to elephants in Sri Lanka is habitat loss and fragmentation through conversion to settlements and permanent cultivation. A National elephant survey was conducted by the Department of Wildlife Conservation in Southern, Eastern, North Western, Central, and Mahaweli wildlife regions, and in a part of Northern wildlife region from 11th to 13th August in 2011, in order to assess the structure and composition of the elephant population in Sri Lanka.

The objective of this pilot study was to analyse the habitat suitability factors (forest type, proximity to water bodies and proximity to main roads), and environmental factors (forest cover, agriculture and elevation) affecting the distribution of elephants. For wildlife regions, habitat suitability maps were created by using weighted sum overlay procedure, and elephant density surfaces were created by using kernel density procedure. A Poisson model was fitted to identify the relationship between elephant counts with habitat suitability factors. According to the comparison of habitat suitability maps with elephant density surfaces, there exists a positive relationship with habitat suitable areas with elephant dense areas. Also by considering the elephant density in each divisional secretariat, a density surface was obtained by using the Kriging method to interpolate the elephant distribution to the whole island. Furthermore a multinomial model was fitted, and the forest cover is identified as the most significant environment factor.