

**APPLICATION OF INDIRECT ADJUSTED RATES TO UNDERSTAND
THE TIME AND HABITAT PREFERENCES OF
ELEPHANTS IN SRI LANKA**

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Elephants in Sri Lanka have been used since ancient times for various activities such as farming, transportation, entertainment, *etc.* At present, life styles of humans and elephants encounter numerous intersections in day to day life which causes human elephant conflict. The major reasons for human elephant conflict are the habitat loss and fragmentation through conversion to settlements, and permanent cultivation in home gardens. One of the solutions for this problem is to understand the habitat preferences and frequenting time periods within a day of elephants in various habitats. In this study, an attempt was made to find those preferences using adjusted rates as practice in literature.

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 for three days from 11th to 13th August in 2011, in order to assess the structure and composition of the elephant population in Sri Lanka. The data was collected by placing trained observers in selected observation points and recording the number of elephants with the time when an observer detects an elephant or group of elephants. The observed counts were recorded under 11 different categories of elephants (adult male, adult female, *etc*) according to the observer's subjective knowledge. The data collected from that survey was used for this study by combining the observed categories to create five main categories, adult elephants (A), Calves and female elephants (CF), Female elephants (F), Male elephants (M) and Tuskers (T) by considering their relative importance to the study.

In this research, adjusted rates were obtained using an iterative procedure based on observed counts to understand the habitat and time preferences of the above five main categories of elephants separately in four major habitats (Grassland, Scrub forest, Tall forest, Water bodies), and in eight time slots per day. According to the chi square test ($p < 0.05$) it was found that the two categorical variables, habitat preferences and time slots, are independent from each other. For adult elephants (A), the estimated maximum adjusted rate is 0.61 is in scrub forest, and for calves and female elephants (CF) it is 0.33 both in scrub forest and water bodies. For male (M) and female elephants (F) the minimum adjusted rate is in tall forests, and an equal preference can be seen in other habitats. When considering the time slots the estimated adjusted rates for male (M) and female (F) elephants are very similar. However, the calves and female elephants (CF) show different adjusted rates among time slots.

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