

Analysis of survivability, trends, and status of sea turtle species found in Sri Lanka

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Five of the seven living sea turtle species are reported in Sri Lanka. The main objective of this study is to investigate the impact of decreasing the number of sea turtle inhabitants in Sri Lanka due to the rapid growth of civilization and anthropogenic activities. The deterioration of the sea turtle population has been examined using the total number of eggs, number of dead eggs, number of living hatchlings, and number of dead hatchlings. In this study, the stability of the system of ordinary differential equations which were initially formulated in previous literature is evaluated, and proven that the population of sea turtles in Sri Lanka may decrease when both prey and predator coexist. The distribution analysis of the total number of eggs proves that the prime nesting season in Sri Lanka is from January to June and November to December. Based on the statistical analysis it proves that a significant difference exists ($P < 0.05$) and nesting in each destination has decreased throughout the years. The Lefkovitch matrix proves that the reduction of the number of green sea turtles, hawksbill, and olive ridley sea turtles will happen in Sri Lanka within 12, 15, and 24 years respectively. By examining the matrix model's sensitivity analysis, the present study proposes to head start conservation by protecting the juvenile sea turtle population to prevent the reduction of sea turtle inhabitants in Sri Lanka. Therefore, conducting awareness programs, and declaration of protected areas strictly following and implementing existing laws are recommended for their conservation.

Keywords: Extinction, Lefkovitch, Predator-prey, Sea turtles, Sensitivity analysis

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