



A DETERMINATION OF THE FEMALE AFRICAN ELEPHANT GROWTH RATE AT AMBOSELI NATIONAL PARK, USING THE LESLIE PROJECTION MATRIX

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Abstract

In this paper, we determine the growth rate to specifically understand the development pattern of the Female African Elephant. We have carried out both short term and long term projections using the Leslie Projection Matrix. We use the Amboseli African Elephant base populations of the actual data from the Amboseli Trust for Elephants, ATE, as at the end of 2017. The elephant growth pattern is analyzed using the eigensystem with its dominant eigenvalue λ_1 , being equivalent to the growth rate. This rate is confirmed by calculating from the projected asymptotic stable age distribution data shown in Figure 1(b) which yields a similar result as that of the dominant eigenvalue λ_1 . A determination of the female growth rate is determined from the female vital rates reflected in the first row F_i and the sub-diagonal elements P_i of the projection matrix M . Whereas the female elephant plays a vital role in the growth rate and population development of the male elephant, the male elephant, on the other hand, does very little to the development and growth structure of the female elephant since one male in an ecosystem is enough irrespective of the number of females. Matlab software is used in carrying out the Analysis.

Keywords and phrases: Leslie projection matrix, female African Elephant, Amboseli national park, Mortality rates, fertility rates, fecundity and survival probabilities.

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