



**AN INVESTIGATION OF THE EFFECT OF PERTURBATIONS
OF VITAL RATES ON THE GENERAL GROWTH RATE
OF THE AFRICAN ELEPHANT AT AMBOSELI
NATIONAL PARK, KENYA**

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Abstract

In this paper, we perturb the system by causing a disturbance to the vital rates across the different age classes. The intention is to investigate the effect of these perturbations on the different matrix elements representing different age classes with a view to determining which age class is most affected when all classes are subjected to a similar or equal level of disturbance. This will in turn inform the category of the animal population that will affect the general growth rate the most if perturbed, hence affecting the general growth rate of the African Elephant populations. 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. Since this analysis exhibit similar characteristics upon investigation for different gender, we have used the Female African Elephant dynamics in our investigation. We have for purposes of comparison determined growth rates for different matrix elements. The eigensystem is used in the analysis. 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, survival probabilities and perturbation.

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