

## DENSITY-DEPENDENT LESLIE MATRIX MODELING FOR LOGISTIC POPULATIONS WITH STEADY-STATE DISTRIBUTION CONTROL

The Leslie matrix model allows for the discrete modeling of population age-groups whose total population grows exponentially. Many attempts have been made to adapt this model to a logistic model with a carrying capacity, with mixed results. This presentation describes a new model for logistic populations that tracks age-group populations with repeated multiplication of a density-dependent matrix constructed from an original Leslie matrix, the chosen carrying capacity of the model, and a chosen steady-state age-group distribution. The total populations from the model converge to a discrete logistic model with the same initial population and carrying capacity, and growth rate equal to the dominant eigenvalue of the Leslie matrix minus 1.

Keywords: Leslie matrices, discrete population models, exponential population model, logistic population model