Modelação Ecológica

Componente Teórica - Prática

Ficha de trabalho

11

A common simple model for the growth of a population is the logistic model. This is represented by

$$N(t) = \frac{KN(0)}{N(0) + (K - N(0))e^{-rt}}$$

where N(t) represents abundance at time t, `N0` is known as the initial population size, `K` the carrying capacity and `r` the growth rate.

1. Explore this model, by coding a function in R that represents it, and then try different values for the parameters. Note that N0 should be less than K.

2. The data data4FT11.txt contains the times and population sizes which are assumed to have been generated from a population that could be modeled using the above model. Plot the data and comment on it.

3. Using function `nls`, estimate the values of the parameters of a logistic model based on the data. Plot the data, the true model and the estimated model in a single plot

4. Try to fit a LM, a GLM, and a GAM to the data, and compare the predictions.