CRAIG ESTIMATOR

free program for population size estimation from mark-recapture data

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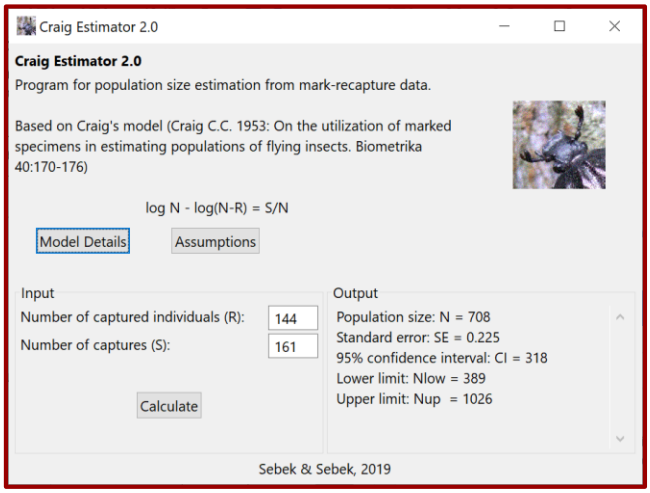
WHAT IS CRAIG ESTIMATOR ?

Craig Estimator is a freely available utility for population size estimation using mark-recapture data. It is based on the Craig's model (see Craig C.C. 1953: On the utilization of marked specimens in estimating populations of flying insects. Biometrika 40: 170-176).

CRAIG'S MODEL IN MORE DETAIL

Capture-recapture expriments (also mark-recapture or capture-release-recapture experiments) are experiments where an observer catches animals, marks them, and immediately releases them. Then he catches animals from the same population again, records marked individuals, and marks unmarked indiviuals. In his paper, C. C. Craig (1953) has formulated six methods for estimating population size of insects from capture-recapture data. Craig Estimator uses the first of the methods, *Method 1*.



The model

According to the Craig's model, population size n can be estimated from:

$$\log n - \log (n - r) = s / n$$

where r is the number of captured individuals, and s is the overall number of captures (how many times these individuals were captured altogether).
Craig Estimator uses the bisection method to solve the equation. Standard deviation of the estimate, 95% confidence interval, and lower and upper confidence limits are then calculated.

Assumptions

Craig's model has assumptions about the design of mark-recapture experiments. These are:
- individuals are marked and released back to the population,
- catchability is same for all individuals (marked and unmarked),
- the study population is stable during the sampling period,
- the model is designed for closed populations (individuals may not immigrate to or emigrate from the study population). However it can also be used for open populations if the sampling period is short and thus effects of immigration and emigration of are negligible.

HOW TO GET CRAIG ESTIMATOR ?

Currently, **Craig Estimator 2.0** is available for download at: www.oldtree.cz/craig2
You must have Java Runtime Environment installed on your computer to run the program.
For more information write an e-mail to: pav.sebek[at]gmail.com