# An Analysis of Capture- Recapture Methods using Maximum Likelihood

Nathan Torno

28 July 2009

Abstract: Capture-Recapture estimations are a foundation for population studies in ecology. However due to advanced statistics and modern computing technology, modern capture-recapture estimations are far more complex then the once simple estimation done by hand. As a result, a variety of so called ``black boxes'' have become popular for ecologists who can input data and receive an estimation with little to no understanding of the mathematics involved in that answer. In an attempt to unveil the various devices of capture-recapture analysis, several models are examined and replicated in an independent statistical software unrelated to the ecology field. This exploration uncovers the mathematical basis behind each model to confirm results and evaluate the efficacy of the conclusions.