

# Distributional properties of the Lincoln-Petersen estimator under extreme lower recapture values

Russell Alpizar-Jara, Lígia Henriques-Rodrigues  
& Nilton Ávido<sup>1</sup>,

<sup>1</sup> Research Center in Mathematics and Applications, Institute for Advanced Studies and Research (IIFA), Department of Mathematics, School of Sciences and Technology (ECT), Doctoral Program in Mathematics (PDM), University of Évora

Capture-recapture studies have been widely used to monitor and quantify animal populations and species richness [2]. The most basic and conceptual framework for capture-recapture models is based on a simple rule of three to intuitively derived the well-known Lincoln-Petersen estimator. The theoretical properties of this estimator date back to the work of Chapman, Bailey and others in 1950s, following various distributional assumptions for the number of recaptures. A common problem with its performance is related to low number of recaptures, leading to small sample biases and very low precision. In this work, we study its distributional properties based on results about the minimum of some discrete random variables [1]. We will also highlight the importance of this estimator due to its wide range of applications and the use of mathematical statistics and extreme value theory to study the distributional properties.

## References

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- [2] WILLIAMS, B.K., NICHOLS, J.D., AND CONROY, M., *Analysis and Management of Animal Populations*, Academic Press (2002).