Proposal Assignment: Analyzing Density Dependence and Survival Rates of Starling Offspring

EEB313

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**Hypothesis and Predictions**

We have chosen to complete a hypothesis-driven project. Our hypothesis states that in high-density brooding locations, competition will increase due to reduced resources per hatchling, therefore causing lower survival rates between eggs to hatchlings to fledglings. It can then be assumed, that since in high-density locations, a higher ratio of female offspring are produced, that then, a high female-to-male ratio is a response to competition and that overall brood survival will be higher in a high female sex ratio per location.

Our data source comes from the study titled Density Dependence of clutch size and offspring sex ratio in Starling Colonies. The purpose of this study was to explore the sex ratio of broods and clutch size in low and high-density breeding locations. Essentially it searches for the optimal sex ratio and clutch size per amount of breeding density. The study found that mothers produced higher female sex ratios and smaller clutch sizes in high-density locations. It seemed fitting that in high-density locations, due to reduced resources clutches may be smaller. However, we were interested in the idea of a higher female sex ratio in more competitive environments and decided to explore this further. The data set features data on the size of clutches, including the number of eggs, hatchlings and fledglings. This will show survival rates in the featured area.

**Sources and Data Collection**  Data was collected among 2 types of nests, High Density (HD) and Low Density (LD), with 24 in each group. HD is further split into 4 groups of 6, averaging ​​10 ± 5 m away from the closest neighbour. LD is scattered randomly, on average, 58 ± 13 m apart. Each nest was visited daily to examine the number of eggs and to sex the nestlings. In the dataset, we will be examining the year, treatment, eggs, hatchlings, fledglings, and the number of males and females in each clutch.

**Citation**

Rubalcaba, J.G. and Polo, V. (2022), Density dependence of clutch size and offspring sex ratio in starling colonies. J Avian Biol, 2022: e02993.<https://doi.org/10.1111/jav.02993>

Dataset: <https://zenodo.org/record/6525052>