Determining Factors that Improve the Efficiency of Capture-Recapture

Sees, Alexa (School: Avon High School)

The purpose of this experiment is to discover how the percent of animals marked and the sample size affects the accuracy of the capture-recapture method. To simulate if the percent of marked animals affects the accuracy and precision of a population estimate, a random non-repeating number generator was used to generate sets of 10 numbers, with numbers ranging from 1-100. The 100 numbers represent the population, while the 10 numbers represent the animals recaptured. Numbers 1-5 (5%) were used to represent the marked animals that had been recaptured. Finally, a proportion was used to calculate the estimated population. This process was repeated using different percentages of animals marked. To simulate if the sample size affects the accuracy and precision of the population estimate, again sets of numbers 1-100 were generated. However, this time the amount of numbers in each set were varied to represent different sample sizes. Again, a proportion was used to calculate the estimated population. To see if there is a correlation between the accuracy of the population estimate and each factor, a scatter plot was constructed. To determine the effect on precision, the mean estimated population along with the 95% confidence intervals were calculated. The results show that as the percent of marked animals and sample size increased, so did the accuracy and precision of the estimate of the population. However, as the sample size approached 20%, the accuracy and precision of the estimated population leveled off. This suggests that when using the capture-recapture method to estimate the population of a species, it is more important to increase the number of animals marked as compared to collecting a larger sample size.

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