

Grasshopper Mark-Recapture

Name:

Date:

Knowing the size or density (size / unit area) of a population is the first stage in many ecological questions. The most direct way to determine population size is to count all the individuals, but for most populations, a complete count is not possible. Fortunately, several methods are available that estimate population size after sampling a portion of the total population. In this lab we will use the capture-recapture method to estimate population size in two habitats.

The capture-recapture method rests on several assumptions:

1. All individuals in the population have an equal chance of being captured.
2. There is no change in the ratio of marked to unmarked animals between capture times. This means that there have been no significant additions of unmarked individuals to the population and that decreases in the population have affected marked and unmarked individuals proportionally.
3. Marked individuals distribute themselves in the population homogeneously after being released.
4. Capturing and marking an organism does not affect its chances of being recaptured.
5. Marks are not lost or overlooked.

Data Table:

	# marked 1 st capture (M)	# of marked 2 nd capture (R)	# of unmarked 2 nd capture	Total # 2 nd capture (n)
Your Group:				
Class Data:				

Calculations:

$$N = \frac{n M}{R}$$

M = The number of marked grasshoppers in the 1st capture period

R = The number of marked grasshoppers trapped in the 2nd capture period

n = The total number of grasshoppers trapped in the 2nd capture period

N = The population estimate

Population Estimate (N): _____

Analysis Questions:

1) What factors in the environment do you think had an impact on grasshopper population density? Predators? Plant diversity? Abundance of a particular plant?

2) Address each of the assumptions involved in using this method to calculate population size (stated above) and note whether or not you think it was met, and why. For one of the assumptions, explain how the estimate would change if it was not met (i.e. over- or underestimated?).