Mark-Recapture Laboratory

by G Lyon

This is a laboratory that simulates a population census technique commonly used by wildlife biologists in the field. The first step is to trap a random sample of animals of the desired species. These animals are then car-tagged or marked in some other manner and released. The next step is to trap once again. Some of the animals captured may have been marked from the first sample. Using a simple ratio, the biologist can come up with a quick population estimate.

\[
\frac{N}{M} = \frac{n}{m}
\]

\(N=\)Population estimate
\(M=\)Number of animals captured and marked in first sample
\(n=\)Number of animals captured in second sample
\(m=\)Number of "n" that were already marked

1. Put 4-6 large handfuls of pinto beans into a shoe box. Do not count them. Then make an estimate as to how many beans are in the box. Write your estimate here ___________.

2. Now we shall use the mark-recapture technique to get an estimate of the population.

3. Pick out a handful of beans and count them. This is your first trapping sample, M.
\(M=\) __________

4. To mark these beans merely replace them with colored beans (white or red). These marked individuals must be released back into the population (shoe box).

5. Shake the box and, without looking, grab another handful of beans. This is your second trapping sample, n.
\(n=\) __________

6. How many of the beans in your second trapping sample were already marked (colored beans)?
\(m=\) __________

7. Now use the equation above to calculate your population estimate, N.
\(N=\) __________

8. Count the actual number of beans in your box. Write the number here _________.

9. Was your estimate using the ratio closer than your initial guess?

10. How could you increase the accuracy of your estimate?

11. What species of animal would this technique work well for? What species of animal would this technique not work for? Why?

12. Can you think of a better way to estimate the number of beans in the box?

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