

# Tagging Lab

In order to fully understand the dynamics of an ecosystem, it is necessary to have a good idea of the size of each population in the ecosystem. Because it may be difficult or impossible to count each individual, tagging is a useful method for determining the size of an animal population.

The first step of this process is to capture, tag, and release a measured number of individuals in a population. After the tagged individuals are released back into the population, samples of the population are randomly recaptured, the number of tagged and non-tagged individuals is determined, and released. The recapturing step is repeated several times and the average percentage of tagged individuals is calculated. The determination of the size of the population is accomplished by using the average percentage of individuals tagged in the recapturing steps. The population size is estimated by inferring that the total number of individuals tagged represents the same percentage of the total population as the tagged individuals represented in the average recaptured sample.

The following equation will get you started on your calculations:

$$\frac{T}{N} \times 100 = \% \text{ tagged} \quad \text{or:} \quad \frac{T}{N} = \frac{\%}{100} \quad \text{or:}$$

$$T = N \frac{\%}{100} \quad \text{or:} \quad N = \frac{100}{\%} \times T$$

where:      N = population size  
                  % = average percentage of tagged individuals  
                  T = number of individuals tagged

## Materials

- A population of small objects
- 1 container
- 1 marker

## Procedure

1. Obtain a population of small objects, a container, and a marker.
2. Count all of the individuals in the population. Remove all tagged individuals as you count and dispose of them.
3. Use the marker to tag 10% of the total # of individuals, then return them to the population.
4. Mix the small objects up well, then without looking into the tray grab a sample of the population.
5. Count and record the number of tagged individuals and the total number of individuals in the sample.
6. Return the sample to the population.
7. Repeat steps 4 & 5 a total of ten times.

## Data Analysis

- Calculate the percentage of tagged individuals in each sample.
- Calculate the average percentage of tagged individuals.
- Calculate the percent error for your estimate:

$$\% \text{ error} = \frac{|actual\# - estimated\#|}{actual\#} \times 100$$

- Write a one or two paragraph Discussion. Comment on the accuracy of the results. Identify and discuss the inherent challenges associated with the capture and release method of estimating population size. Identify and discuss the sources of error in the lab.