Estimating population Size

Objective: You will be expected to estimate the size of a sample population using the mark-recapture technique. Be able to apply the technique to new population problems and compare the mark and recapture technique to other methods of population estimating.

1. If you were in charge of a team given the responsibility to determine the number of sunfish in Horseshoe Lake, discuss with your partner how would you accomplish this task and describe in detail below.

Technique 1: Sampling

A technique called sampling is sometimes used to estimate population size. In this procedure, the organisms in a few small areas are counted and projected to the entire area. For instance, if a biologist counts 10 squirrels living in a 200 square foot area, she could predict that there are 100 squirrels living in a 2000 square foot area.

2. A biologist collected 1 gallon of pond water and counted 50 paramecium. Based on the sampling technique, how many paramecium could be found in the pond if the pond were 1,000 gallons?

3. What are some problems with this technique? What could affect its accuracy?

Technique 2 - Mark and Recapture

In this procedure, biologists use traps to capture the animals alive and mark them in some way. The animals are returned unharmed to their environment. Over a long time period, the animals from the population are continued to be trapped and data is taken on how many are captured with tags. A mathematical formula is then used to estimate population size.

VIRTUAL MARK AND CAPTURE ACTIVITY

Go to the virtual lab website http://www.biologycorner.com/flash/mark_recap.swf

Choose Trap & Mark

_____ rabbits are marked and released

CHOOSE Retrap

CHOOSE Check Traps

CHECK TRAPS by clicking on the boxes marked TRAPS

	# CAPTURED	# of marked rabbits
TRAP 1		
TRAP 2		
TRAP 3		
TRAP 4		
TRAP 5		
TRAP 6		
TRAP 7		
TRAP 8		
TRAP 9		
TRAP 10		
TOTAL		

$$\text{Population Estimate} = \frac{(\text{Total number captured}) \times (\text{Number marked})}{(\text{Total Number Captured with Mark})}$$

ESTIMATE THE SIZE OF THE RABBIT POPULATION = _____ rabbits

CLICK on: Actual size button to see if you were right!

Actual size of population = _____