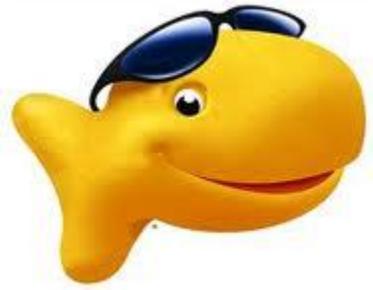


Lab: Mark & Recapture

(MAKEUP VERSION)

Background Information: How do biologists determine the population of a species in a particular area? There are a variety of ways that it can be done, however the most common method involves tagging. In this method, biologists first capture and tag a sample of the animals. Then, after some time has passed for the animals to “redistribute” themselves, the scientists take repeated random samples and calculate the percentage of each sample that is tagged. We would expect that these example percentages should vary around the true population percentage. Using this assumption, one can calculate the approximate population size given that they know the original number tagged and the mean percent tagged from the samples.



Prelab Questions:

1. What concerns should biologists have about a species and their habitat before they use the mark & recapture method to approximate the size of a population?
2. Which of the following examples do you think reflects the largest population? Which reflects the smallest? Explain your answer.
 - a. Large first sample, large second sample, large recapture
 - b. Large first sample, large second sample, small recapture
 - c. Small first sample, large second sample, large recapture
 - d. Small first sample, small second sample, large recapture
3. Imagine that you are studying birds that are flying south for the winter. How might their migration affect the results of a mark-recapture study? Can you accurately estimate the migrating bird population using the mark-recapture method? Explain your answer.
4. Name three marine species that migrate large distances.

What We Did in Class:

Students used the Mark & Recapture technique to estimate the size of a population of cheddar goldfish. They “marked” the fish by replacing the captured fish with pretzel goldfish. Subsequent captured populations yielded a ratio of cheddar to pretzel goldfish that estimated the total size of the population. You will use the sample data set below to answer questions.

Results:

Sample #	# of Tagged Fish in Sample	Total Sample Size	Percent Tagged in Sample
1	11	47	
2	10	48	
3	12	50	
4	17	50	
5	11	69	
6	11	38	
7	3	35	
8	12	31	
9	9	49	
10	3	63	
11	6	26	
12	6	33	
13	9	25	
14	8	48	
15	12	28	
16	5	26	
17	6	33	
18	10	48	
19	7	25	
20	15	62	
Average Percentage Tagged =			

Calculate the Percent Tagged for each sample, then calculate the Average Percent Tagged.

Number of fish originally tagged: **38**

$$\text{Population size} = \frac{\text{number originally tagged}}{\text{mean percent tagged from the 20 samples}}$$

5. Using the formula above, calculate the predicted size of your population:

Postlab Questions:

6. Why was this experiment performed twenty times?

7. Why is this method necessary in real life (why can't we just count all the fish)?

Watch the video <https://youtu.be/Hi460--lUhM> and answer the following questions

8. What food items were used as fish in the video?

9. How did the estimated population size compare to the actual population size in the video?

10. What did you learn in this makeup lab?