

Name \_\_\_\_\_

Course/Section \_\_\_\_\_

Date \_\_\_\_\_

Professor/TA \_\_\_\_\_



**Activity 52.1 What methods can you use to determine population density and distribution?**

1. To measure the population density of the chipmunks in a particular park, you sample several plots and capture 50 chipmunks. You mark each of their backs with a small dot of red paint and then release them. The next day, you capture another 50 chipmunks. Among the 50, you find 10 that are marked.

a. Use the mark-recapture formula

$$\frac{\text{Number of recaptures in second catch}}{\text{Total number in second catch}} = \frac{\text{Number marked in first catch}}{\text{Total population } N}$$

to estimate how many chipmunks the population contains.

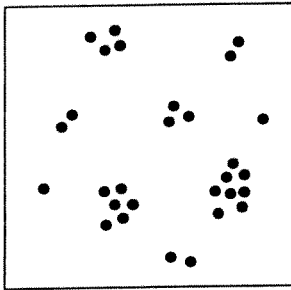
b. What effect would each of these discoveries have on your estimate?

i. You later discover that you sampled the one area of the park that was most favored by the chipmunks.

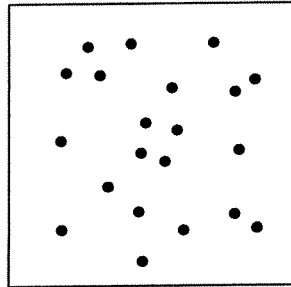
ii. You later discover that the chipmunks were licking the marks off of each others' backs.

- c. How could you modify your sampling program to ensure that you make more accurate estimates of population size?

2. Look at these two proposals for the distribution of a tree species.



Proposed distribution 1



Proposed distribution 2

- a. What type of distribution does each proposal represent?

Distribution 1:

Distribution 2:

- b. Given these possible distributions, what factors do you need to consider in setting up a sampling plan for the area? In other words, how will you know if you have chosen a plot size that gives you a good representation of both the size of the population and the actual distribution of organisms within the sampling area?