Capture/Recapture

Directions: Set up your proportion and show all steps.

1. Suppose that naturalists catch, tag, and release 50 deer in a forest. After allowing time for the tagged deer to mix with the others, they catch a sample of 100 deer, 10 of which have tags. What is the estimate for the number of deer in the forest?

2. Suppose that wildlife workers capture 328 penguins on an island, mark them, and allow them to mix with the rest of the population. Later, they capture 200 penguins, 64 of which are marked. What is the estimate for the number of penguins on the island?

3. Suppose that the high school in a town has 500 students. A random survey of 200 people in the town finds 40 high school students. What is the estimate for the number of people in the town?

4. Visitors conducted a capture-recapture experiment to determine the number of taxicabs in Edinburgh, Scotland. On the first day, observers saw 48 taxicabs. The next day they observed 52 cabs, 10 of which they had seen the previous day. What is the estimate for the number of taxicabs in Edinburgh? What are some assumptions being made about the sample?

5. In a study of raccoons in a certain region of northern Florida, 48 animals were captured using cages baited with fish heads. The raccoons were marked and released. In the following week, 71 raccoons were captured, 31 of which had been marked. What is the estimate for the number of raccoons in this region?

6. Sometimes some "trap happy" animals are easier to capture and easier to recapture than others. Thus an animal captured the first time is also likely to be in the second sample. What do you think this behavior will do to the estimate of the population size?

7. In the capture-recapture method, we assume that the marks will not be removed, wear off, or become invisible in some way before the recapture. If some animals lose their marks during the study, how will this affect the estimate of the population size?

8. Suppose the time between the capture and the recapture is too long and some marked animals die. Suppose also that some new animals are born so that the population size remains constant. Will the deaths tend to make the estimate of the population size too large or too small? Explain. Complete on back please.