Population Ecology Lab Exercise Using Mice and Fox in a Meadow Ecosystem

Materials:

One habitat container

100 red beads - these are 'control' and represent times that the mice will escape/gets away; "strikes".

100 yellow beads - these represent the prey species; mice

Data sheet

Graph paper

Colored pencils

Fox - students will be the predators in this lab exercise

Procedure:

- 1. Place 100 control (red beads) in the habitat
- 2. Add 10 mice (vellow or white beads) to the habitat

Generation 1 - Your designated 'fox' will draw 15 beads from the habitat, without looking.

If the fox gets 5 yellow/white/mouse beads, it survives and reproduces. You would start generation 2 with 2 fox- the survivor and its offspring.

If a fox gets 10 mice it survives and has 2 babies (fox total is now 3).

If the fox captures less than 5 mice it dies (and doesn't reproduce either).

<u>Count</u> the number of mice left in the habitat container — each of these survivors *reproduces*. For example, if your fox captures 3 of the ten mice (this fox starves) but the 7 mice left in the container reproduce. You would then start generation 2 with 14 mice.

<u>Always</u> start each generation with a minimum of 10 mice and 1 fox; even if all of your organisms die, assume that new ones will discover your meadow and immigrate.

Never have more than 200 mice or 20 fox. (We have set an arbitrary carrying capacity for this meadow.)

Generation 2 - Place beads in your habitat that represent the next generation of mice and fox; consider that some have reproduced and some have starved.

If you have more than one fox, then each fox captures its 15 beads individually. The first fox takes 15 beads, counts the mice and PUTS THE RED BACK. Then the 2nd fox takes 15 beads, counts the mice and RETURNS THE RED. Eventually the more fox you have the more that will start starving, and the "early fox gets the mouse". Total the mice caught by all your fox, subtract from 100 and double the survivors. This is your prey number for the next generation.

"Its getting harder and harder to find food with all this competition !"

Continue for 20 generations.

Population Ecology Lab Exercises

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