Predation Simulation

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Defined Terms:

1. **Population:** A group of organisms of the same species inhabiting a specific geographical locality.
2. **Community:** An assemblage of species that are associated in a common area and interact with one another in a self-sustaining and self-regulating relationship.
3. **Predation:** An interaction between species in an ecological community in which members of one species (prey) serve as food for another species (predator).
4. **Secondary Succession:** The ecological succession that occurs on a preexisting soil after the primary succession has been disrupted or destroyed due to a disturbance that reduced the population of the initial inhabitants.
5. **Immigration:** The movement of organisms *into* a specific area.
6. **Carrying Capacity:** The maximum number of individuals that can persist under specified environmental conditions.

Questions:

1. The population to first show an increase in population size was mice.
2. The factor that determined the size of the rodent population tended to be how many coyotes that were in the area.
3. The factor that seemed to determine the size of the coyote population were the number of mice in the area, how many mice the coyotes could catch and also how many other coyotes were in the area (amount of competition).
4. Predator-Prey examples
5. Forest habitat: Coyote preying on rodents.
6. Lake habitat: Trout preying on minnows.
7. Stream/River habitat: Otters preying on crayfish.
8. Yard habitat: Birds preying on worms.
9. Campus habitat: Stray cats preying on mice.
10. Three conditions that can possibly limit the size of a certain population include weather conditions, the amount of competition within the area, and the amount of producers available in an area. Weather conditions limit the size of populations within areas because not every animal is adapted to live in cold climates, or warm climates, thus only allowing those adapted to survive within the area. The amount of competition limits the population size because if competition were too high for a certain species to obtain food then none of them would be able to survive, or some will survive and a lot will starve. High amounts of competition will also drive out less efficient individuals and keep the population at a stable amount. The amount of producers is crucial for a community to have, and also another factor in establishing a carrying capacity. Producers are the foundation to any food web/chain. Producers are the ones that collect all of the energy from the sun and establish how many primary level consumers can exist, and primary consumers establish how many secondary consumers can exist etc. The amount of producers lays a foundation for the rest of the food chain, thus limiting the population.
11. Two possible reasons that change in a community occurs are natural disasters and foreign invaders. Natural disasters (hurricanes, earthquakes, tsunamis) are a huge factor in change in a community, because they can cause mass damage, thus destroying shelter and killing off organisms. Natural disasters have great ability to kill off large quantities of organisms at once and also destroy the living conditions within a habitat. Foreign invaders can also cause great change, for when something is not naturally a part of an ecosystem it has the ability to move in and establish itself at the top of the food chain. With no natural predators, if this foreign invader continues to reproduce and not acquire a predator than it shall prey upon all the other organisms within the community and drastically drop the number of other organisms.
12. Out of the three graphs we created we believe that graph #2 “mice and coyote survivors vs. generation” helped us the most in understanding the population dynamics. The reason we picked this graph over the other two is because this graph shows that the two populations (mice and coyote) were the most related when change occurred. This graph was very accurate and similar in showing increases and decreases within both populations, leading us to conclude that it was the simplest to follow when analyzing the population dynamics of both populations within this simulation.