

Population Dynamics Activity; SB5 d & SB4 ab



Introduction: In 1970 the deer population of an island forest reserve about 518 square kilometers in size was about 2000 animals. Although the island had excellent vegetation for feeding, the food supply obviously had limits. Thus the forest management personnel feared that overgrazing might lead to mass starvation. Since the area was too remote for hunters, the wildlife service decided to bring in natural predators to control the deer population. It was hoped that natural predation would keep the deer population from becoming too large and also increase the deer quality (or health), as predators often eliminate the weaker members of the herd. In 1971, ten wolves were flown into the island. The purpose of this lab is to show how interactions among populations can result in variation in survival and reproduction.

The results of this program are shown in the following table. The population change is the number of deer born minus the number of deer that died during that year. Copy the table below on your paper and fill out the third and last column for each year (the first has been calculated for you).

Year	Wolf Population	Deer Population	Deer Offspring	Predation	Starvation	Deer Population Change
1971	10	2,000	800	400	100	+300
1972	12		920	480	240	
1973	16		1,000	640	500	
1974	22		944	880	180	
1975	28		996	1,120	26	
1976	24		836	960	2	
1977	21		788	840	0	
1978	18		766	720	0	
1979	19		780	760	0	
1980	19		790	760	0	

1. After reading the introduction and completing the population calculations, explain how this scenario relates to the three Georgia Performance Standards (SB4a, SB4b, SB5d).

2. Use a sheet of graph paper to graph the deer and wolf populations. Use one color to show deer populations and another color to show wolf populations. Give the graph a title and label the x and y axis. Place "Year" on the X-axis. **This will be a double line graph.**

3. Describe what happened to the deer and wolf populations between 1971 and 1980.

4. What do you think would have happened to the deer on the island had wolves NOT been introduced? Please justify your response.

5. Most Environmental Science textbooks describe that predators and prey exist in a balance. This "balance of nature" hypothesis has been criticized by some scientists because it suggests a relationship between predators and prey that is good and necessary. Opponents of this hypothesis propose the following three questions: Why is death by predators more natural or "right" than death by starvation? How does one determine when an ecosystem is in "balance"? Do predators really kill only the old and sick prey?

After reading the above scenario, thoroughly describe your opinion of the balance of nature hypothesis? Would the deer on the island be better off, worse off, or about the same without the wolves? **Defend your position.**