

Lab Exercise 14.4.1: Investigating Predator—Prey Cycling

INQUIRY SKILLS

- Questioning
- Hypothesizing
- Predicting
- Planning
- Conducting
- Recording
- Analyzing
- Evaluating
- Communicating

The large white-tailed deer population in a forest reserve in Ontario has caused concern about overgrazing that might lead to the extinction of plant and animal species found there. To manage this excessive deer population, forest personnel decided to introduce its natural predator, the wolf. In the year 1990, 2000 deer lived within the reserve, and 10 wolves were flown into this reserve. Population densities of white-tailed deer and wolves were monitored for a 10-year period.

Question

What effect does the introduction of a natural predator, the wolf, into a habitat have on the white-tailed deer population?

Hypothesis

- (a) Develop a hypothesis about the effect on the white-tailed deer population as a result of the introduction of wolves into their habitat.

Procedure

1. Plot the changes in the white-tailed deer and wolf population using the data in **Table 1**, including both sets of data on one graph and using an appropriate labelling method.

Table 1 Changes in White-Tailed Deer and Wolf Populations

Year	White-tailed deer	Wolves
1990	2000	10
1991	2300	12
1992	2500	16
1993	2360	22
1994	2244	28
1995	2094	24
1996	1968	21
1997	1916	18
1998	1952	19
1999	1972	19

(continued)

Analysis

- (b) Is wolf predation a limiting factor in this forest reserve? Explain your reasoning.
- (c) What other factors might limit the deer population?
- (d) Explain how the number of wolves in the reserve is influenced by the size of the deer population.

Synthesis

- (e) The Atlantic cod population was an extremely abundant stock of primary economic importance to fishing communities throughout the Atlantic provinces. The Department of Fisheries and Oceans has stated that the collapse in Atlantic cod stocks can be attributed to overfishing. Others claim that the use of equipment that disturbs fish spawning sites on the ocean floor is primarily responsible, and still others argue that the harp seal, a predator of Atlantic cod, is responsible for this mass reduction in the cod population. One suggestion to help cod stocks recover is for large numbers of harp seals to be killed. Suggest some ways that marine biologists might study changes to the Atlantic cod population to determine whether the reduction of the harp seal population would be an effective solution.