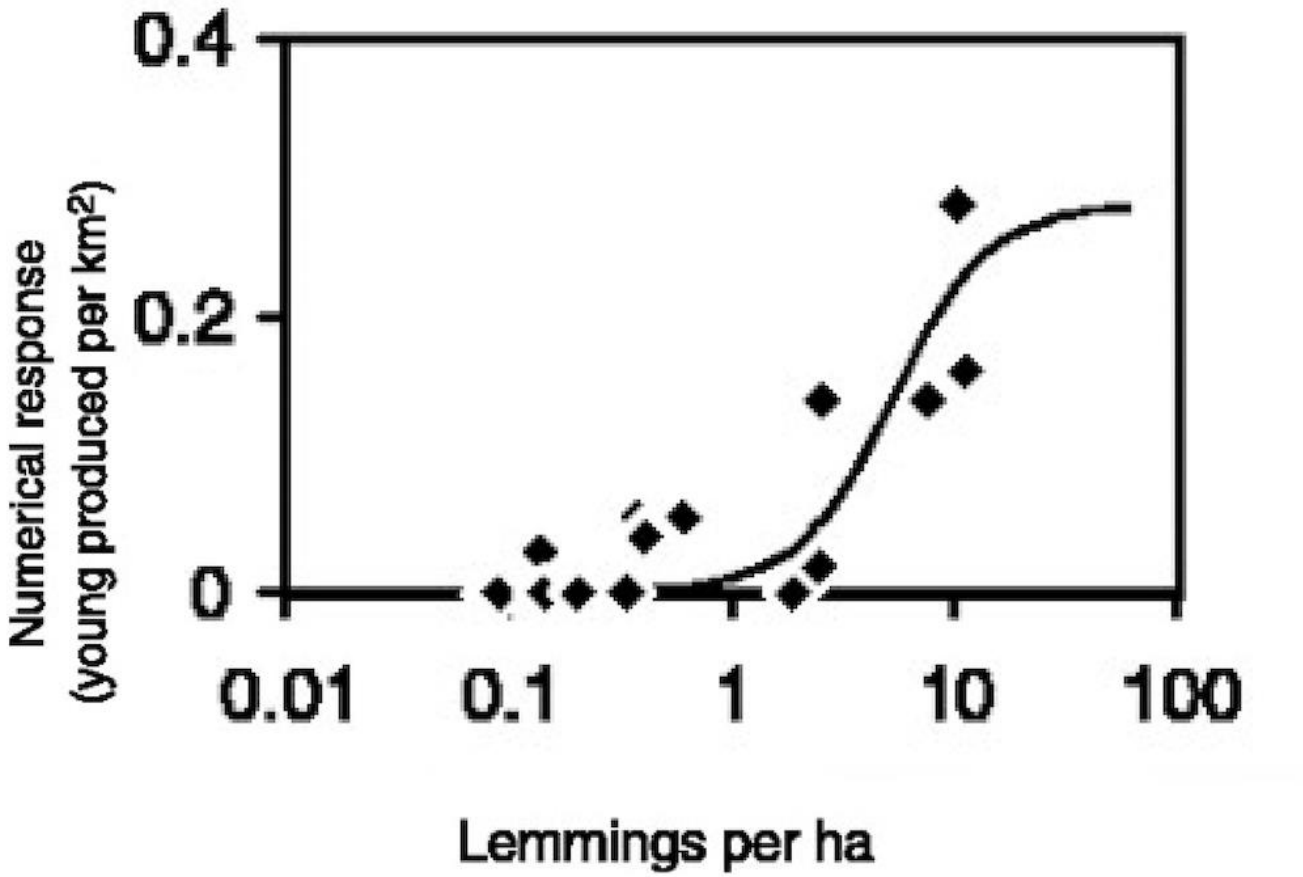


***Caption: The population density of collared lemmings (*Dicrostonyx groenlandicus*) is measured against the density of offspring produced by one of its predators, the Arctic fox (*Vulpes lagopus*). The data were collected in the High Arctic tundra in Greenland after annual snowmelt.***

## BACKGROUND INFORMATION

Population sizes of predators and their prey often rise and fall together, following predictable, cyclical patterns over time. These fluctuations are the direct result of the close cause-and-effect relationship between predator and prey population sizes. In other cases, population fluctuations can be caused by other factors, such as the food and habitat available. In a study investigating predator-prey population dynamics at a 75-km$^2$ field site in northeast Greenland between 1988 and 2002, scientists examined whether changes in population densities of Arctic fox are related to changes in population densities of its main prey, the lemming. The figure above compares the data collected on lemming and Arctic fox population sizes, showing the predator's response to changes in lemming density. The researchers counted the number of lemming winter nests at snowmelt each year and used this number to estimate the lemming population density. Predator response was determined by counting the number of "weaned young produced" in the Arctic fox population.