

Genetic Diversity in Cheetahs

Today, there are fewer than 20,000 African cheetahs (*Acinonyx jubatus*). Before the last ice age, cheetah species could be found in North America, Europe, Asia, and Africa. Around 10,000 to 12,000 years ago, a mass extinction event occurred that caused the extinction of almost 75 percent of the world's large mammals. A single cheetah species survived this extinction event, with a range limited to parts of eastern, central, and southern Africa. What effect did this mass extinction event have on cheetah diversity?

1. DEFINE THE PROBLEM

With your team, write a statement outlining the problem you've been asked to solve. Record any questions you have on the problem and the information you need to solve it.

2. ANALYZE DATA

With your team, analyze the graph of genetic variation and population size shown in Figure 5. What effect does a sudden decrease in population size have on genetic variation? Does genetic variation within a species recover as the species' population recovers?

3. CONDUCT RESEARCH

On your own, use library and Internet resources to research how the mass extinction event affected genetic variation in cheetahs. How does a change in genetic variation affect modern-day cheetah populations?

4. CONSTRUCT AN EXPLANATION

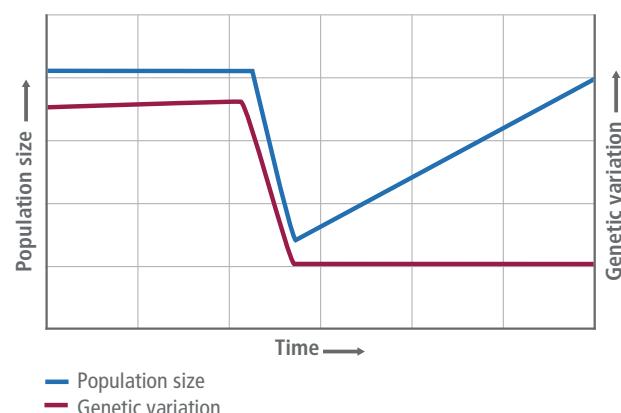
Write an explanation of the evolutionary mechanism that affected genetic diversity in cheetah populations. Can cheetah populations recover lost genetic diversity?

5. COMMUNICATE

Write a report detailing your analysis and your predictions for what will happen to genetic variation in cheetah populations in the future.

Changes in Population Size and Genetic Variation

FIGURE 5: Genetic variation and population size



Source: "Low genetic variation." Understanding Evolution. University of California Museum of Paleontology. 8 December 2016 <http://evolution.berkeley.edu/evolibrary/article/conservation_04>.



CHECK YOUR WORK

A complete report should include the following information:

- a clearly defined problem with supporting questions that are answered in the final presentation
- an analysis of the mass extinction event that affected genetic variation in cheetahs and how that event continues to impact modern-day cheetah populations
- an explanation of the evolutionary mechanism that led to a change in genetic variation in cheetahs
- predictions about future changes in genetic variation in cheetah populations