

# 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

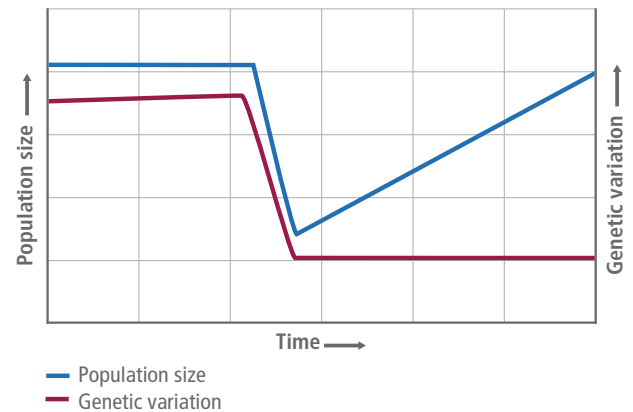
Write an explanation of the evolutionary mechanism that affected genetic diversity in cheetah populations. Can cheetah populations recover lost genetic diversity?

## 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](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