

CSI: Changing Species Investigation

Tuskless Elephants

This file contains real data about elephant populations. Is there evidence of natural selection? You're on the case!

Species Profile

African elephants are sometimes **poached**, or illegally hunted, for their ivory **tusks**. The ivory is carved into ornaments and jewelry. Adult elephants have the biggest tusks, so elephants are often killed around the age they would have calves (babies). Some elephants never grow tusks at all, so they are not killed for ivory.

Poaching is happening less in some places, but in others it's still a big problem for elephant populations.



Is the tuskless trait helpful, harmful, or neutral?

Circle the most likely answer for each environment.

1. In the time before poaching, the tuskless trait was (**helpful** / harmful / neutral) to an elephant.
2. In the present with poaching, the tuskless trait is (**helpful** / harmful / neutral) to an elephant.

Prediction

Write a sentence about how **poaching** may affect the **tuskless trait** in elephant populations:

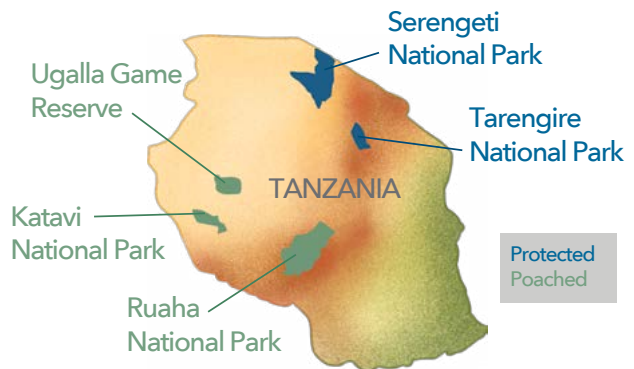
Have elephant populations changed over time?

To find out, you would ideally compare tusklessness in today's herds to tusklessness in historic herds. But while we know tusklessness used to be rare, we don't have exact numbers.

There are some modern herds in protected parks that experience low poaching. They can represent historic herds in your study.

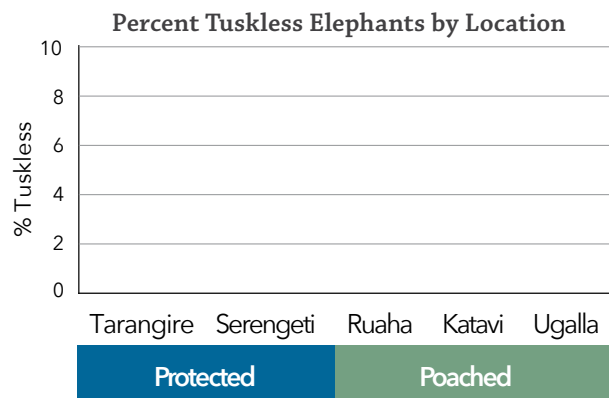
Time to do some field work! You travel to different parks in Tanzania and count elephants with and without tusks.

Let's analyze your data!



Complete the table (*calculate the percent of tuskless elephants*). **Then make a bar graph of your findings.**

Elephant Population	Total Elephants	Tuskless Elephants	Percent (%) Tuskless
Tarangire	443	4	
Serengeti	364	5	
Ruaha	329	23	
Katavi	413	26	
Ugalla	153	15	



Summarize the evidence. Complete the summaries by circling the correct words:

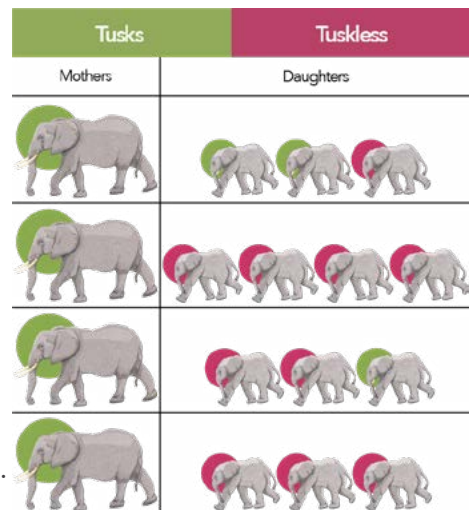
- In poached populations, the percent of tuskless elephants is (**lower / higher**) than in protected populations.
- The evidence suggests that the tuskless trait has become: (**more common / less common / stayed the same**).
- Does the evidence suggest tusklessness in elephant populations is influenced by poaching? (**yes / no**)

Is the tuskless trait inherited?

While you investigated parks in Tanzania, other researchers observed elephants in South Africa's Addo National Park. The herd is protected now, but was once heavily poached. Nearly all the females are tuskless. The image below shows the **only** mothers that **do** have tusks and their daughters.

Count the daughters and fill in the top row of the table.

Mothers	Total Number of Daughters	Number of Tuskless Daughters	Number of Tusked Daughters
Tusked			
Tuskless	161	160	1



Summarize the evidence:

Calculate from the top row of the table...

6. Tusked mothers have **tuskless** daughters _____ % of the time.

7. Tusked mothers have **tusked** daughters _____ % of the time.

Calculate from the bottom row of the table...

8. Tuskless mothers have **tuskless** daughters _____ % of the time.

9. Tuskless mothers have **tusked** daughters _____ % of the time.

10. The evidence suggests the tuskless trait is (**heritable** / **acquired**).

Is it natural selection?

Write 2-3 sentences to explain your thinking: