



Tracking Lion Recovery in Gorongosa National Park

hhmi | BioInteractive

Scientists at Work
Student Worksheet

OVERVIEW

This worksheet complements the short video "[Tracking Lion Recovery in Gorongosa National Park](#)" from the *Scientists at Work* series.

PROCEDURE

1. Prior to watching the film, read the questions below.
2. Watch the film.
3. If working with a partner or in a small group, discuss and answer the questions below. If working alone, think about and answer the questions below.

QUESTIONS

1. Technology has changed the way scientists conduct their research. Provide two pieces of evidence from the film to support this claim: "Technology is crucial for lion research in Gorongosa National Park."
2. Two of the researchers in the film, Celina and Domingas, are from Mozambique, the country where Gorongosa National Park is located. For global restoration and conservation initiatives, list two reasons why it is important for the park to employ local people.
3. The lion researchers in the film have studied 20% of the park and identified 41 lions. (Show your work/justify your answer for each section.)
 - a. The entire Gorongosa Park is 4,000 km². Approximately how large (in km²) is the portion of the park that has been studied?
 - b. What is the density of lions (in lions/km²) in the portion of the park that has been studied?
 - c. Assuming that the density of lions is the same throughout the entire park, about how many lions are there total in Gorongosa National Park?
 - d. The 20% of the park that has been studied has roads, so it is accessible by vehicle. Based on this information, do you think it is more likely that your estimate from part (c) is too high or too low? Explain your answer.

4. **Figure 1** is an example of a food web that includes lions. Use the food web and any information from the film to answer the following questions:

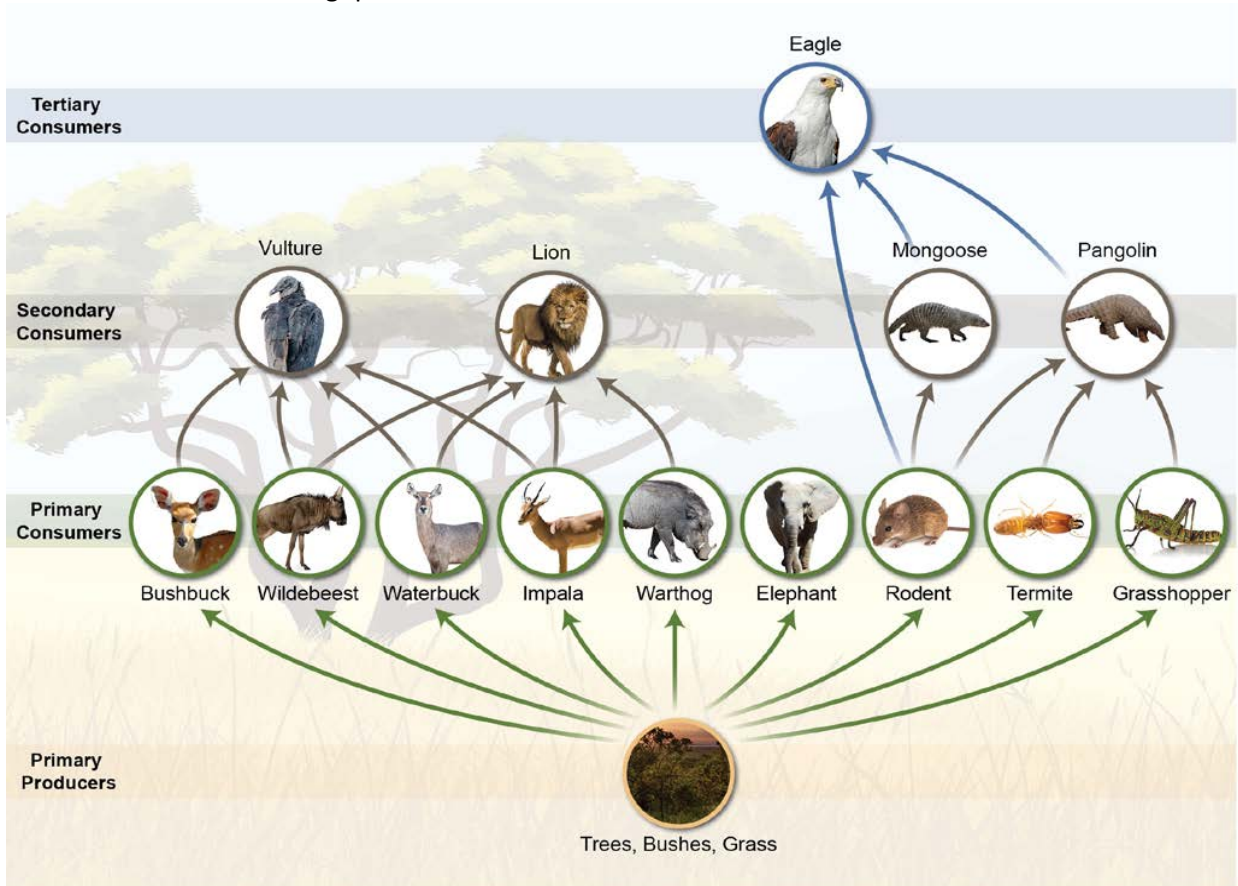


Figure 1. A food web in Gorongosa National Park.

- On average, 10% of the energy from one trophic level is available to the next level. Approximately what percentage of energy is available to the lions (secondary consumers) in the ecosystem represented in Figure 1 (assuming the primary producer level represents 100% of the energy)? Show your work to justify your answer.
- Use scientific reasoning and the food web to explain why, in general, it makes sense that the lion population is taking longer to recover than the herbivore populations.

5. Researchers use two rows, the **reference row** and the **identification spots**:
The **reference row** is the **top complete row of whisker spots**
The **identification spots** form an **incomplete row above the reference row**. There may be **up to 5 spots**.

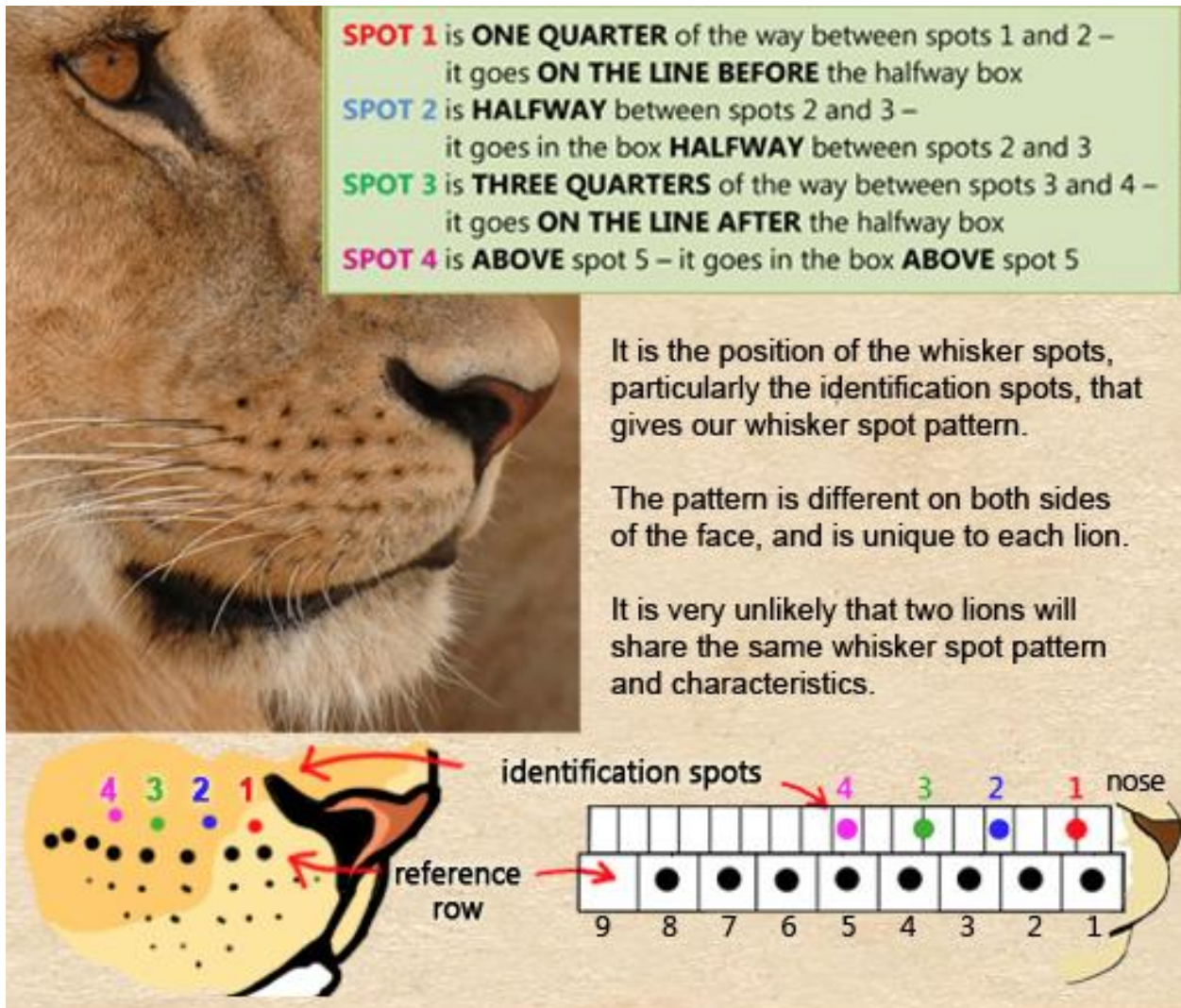


Figure 2. How researchers use whisker spot patterns to identify lions. (Image courtesy of the Mara Predator Project <http://livingwithlions.org/mara/how-to/identify-lions/>)

Use this information to draw the reference row and identification spots for the lion below, which was in the video. In the space to the right, write a description of the identification spots in relation to the reference row.

A hand-drawn diagram of a lion's head profile in black ink. The diagram is positioned to the left of a grid. The grid consists of two rows of rectangular boxes. The top row has 15 boxes, and the bottom row has 10 boxes. The boxes are intended for marking identification spots on the lion's face.

6. Researchers have discovered that the pride territory defended by a male lion can extend 330 km². Explain how the scientists used GPS collars, satellites, and computers to determine the size and geographic distribution (shape) of a lion pride's territory.

7. If you joined the research team shown in the film, what new scientific question would you like to try to answer?