

WILDLIFE POPULATIONS

ESTIMATING WILDLIFE POPULATIONS IN AMERICAN NATIONAL PARKS

Name: _____ Date: _____

Example Problem with Detailed Solution

Problem: If Yellowstone National Park (Wyoming, Montana, Idaho) covers 3,468 square miles and there are an estimated 30 grizzly bears per 100 square miles, how many grizzly bears are estimated to be in the entire park?

Solution:

Given ratio: $\frac{30 \text{ bears}}{100 \text{ square miles}}$

Set up a proportion: $\frac{30 \text{ bears}}{100 \text{ square miles}} = \frac{x \text{ bears}}{3,468 \text{ square miles}}$

Cross-multiply: $30 \times 3,468 = 100 \times x$

Simplify: $104,040 = 100x$

Solve for x : $x = \frac{104,040}{100} = 1,040.4$

Since we cannot have a fraction of a bear, we round up:

Estimated number of grizzly bears: 1,041

Problems

1. Wrangell-St.Elias National Park (Alaska) spans 13,005 square miles and has an estimated 50 moose per 1,000 square miles. Estimate the number of moose in the park.
2. Death Valley National Park (California, Nevada) covers 5,269 square miles and has an estimated 5 desert tortoises per 100 square miles. Estimate the number of desert tortoises in the park.
3. Glacier Bay National Park (Alaska) spans 5,039 square miles and has an estimated 40 bald eagles per 500 square miles. Estimate the number of bald eagles in the park.
4. Everglades National Park (Florida) covers 2,357 square miles and has an estimated 15 panthers per 200 square miles. Estimate the number of panthers in the park.
5. Grand Canyon National Park (Arizona) spans 1,902 square miles and has an estimated 30 mountain lions per 100 square miles. Estimate the number of mountain lions in the park.
6. Olympic National Park (Washington) covers 1,442 square miles and has an estimated 20 black bears per 100 square miles. Estimate the number of black bears in the park.

The numbers used in these problems are for educational purposes only and do not reflect current animal populations in the respective national parks.

Detailed Solutions

Problem 1: Wrangell-St. Elias National Park (Alaska) spans 13,005 square miles and has an estimated 50 moose per 1,000 square miles. Estimate the number of moose in the park.

$$\begin{aligned}\text{Given ratio: } & \frac{50 \text{ moose}}{1,000 \text{ square miles}} \\ \text{Set up a proportion: } & \frac{50 \text{ moose}}{1,000 \text{ square miles}} = \frac{x \text{ moose}}{13,005 \text{ square miles}} \\ \text{Cross-multiply: } & 50 \times 13,005 = 1,000 \times x \\ \text{Simplify: } & 650,250 = 1,000x \\ \text{Solve for } x : x = & \frac{650,250}{1,000} = 650.25 \\ \text{Estimated number of moose: } & 650\end{aligned}$$

Problem 2: Death Valley National Park (California, Nevada) covers 5,269 square miles and has an estimated 5 desert tortoises per 100 square miles. Estimate the number of desert tortoises in the park.

$$\begin{aligned}\text{Given ratio: } & \frac{5 \text{ desert tortoises}}{100 \text{ square miles}} \\ \text{Set up a proportion: } & \frac{5 \text{ desert tortoises}}{100 \text{ square miles}} = \frac{x \text{ desert tortoises}}{5,269 \text{ square miles}} \\ \text{Cross-multiply: } & 5 \times 5,269 = 100 \times x \\ \text{Simplify: } & 26,345 = 100x \\ \text{Solve for } x : x = & \frac{26,345}{100} = 263.45 \\ \text{Estimated number of desert tortoises: } & 264\end{aligned}$$

Problem 3: Glacier Bay National Park (Alaska) spans 5,039 square miles and has an estimated 40 bald eagles per 500 square miles. Estimate the number of bald eagles in the park.

$$\begin{aligned}\text{Given ratio: } & \frac{40 \text{ bald eagles}}{500 \text{ square miles}} \\ \text{Set up a proportion: } & \frac{40 \text{ bald eagles}}{500 \text{ square miles}} = \frac{x \text{ bald eagles}}{5,039 \text{ square miles}} \\ \text{Cross-multiply: } & 40 \times 5,039 = 500 \times x \\ \text{Simplify: } & 201,560 = 500x \\ \text{Solve for } x : x = & \frac{201,560}{500} = 403.12 \\ \text{Estimated number of bald eagles: } & 404\end{aligned}$$

Problem 4: Everglades National Park (Florida) covers 2,357 square miles and has an estimated 15 panthers per 200 square miles. Estimate the number of panthers in the park.

$$\begin{aligned}\text{Given ratio: } & \frac{15 \text{ panthers}}{200 \text{ square miles}} \\ \text{Set up a proportion: } & \frac{15 \text{ panthers}}{200 \text{ square miles}} = \frac{x \text{ panthers}}{2,357 \text{ square miles}} \\ \text{Cross-multiply: } & 15 \times 2,357 = 200 \times x \\ \text{Simplify: } & 35,355 = 200x \\ \text{Solve for } x : x = & \frac{35,355}{200} = 176.775 \\ \text{Estimated number of panthers: } & 177\end{aligned}$$

Problem 5: Grand Canyon National Park (Arizona) spans 1,902 square miles and has an estimated 30 mountain lions per 100 square miles. Estimate the number of mountain lions in the park.

Given ratio: $\frac{30 \text{ mountain lions}}{100 \text{ square miles}}$

Set up a proportion: $\frac{30 \text{ mountain lions}}{100 \text{ square miles}} = \frac{x \text{ mountain lions}}{1,902 \text{ square miles}}$

Cross-multiply: $30 \times 1,902 = 100 \times x$

Simplify: $57,060 = 100x$

Solve for x : $x = \frac{57,060}{100} = 570.6$

Estimated number of mountain lions: 571

Problem 6: Olympic National Park (Washington) covers 1,442 square miles and has an estimated 20 black bears per 100 square miles. Estimate the number of black bears in the park.

Given ratio: $\frac{20 \text{ black bears}}{100 \text{ square miles}}$

Set up a proportion: $\frac{20 \text{ black bears}}{100 \text{ square miles}} = \frac{x \text{ black bears}}{1,442 \text{ square miles}}$

Cross-multiply: $20 \times 1,442 = 100 \times x$

Simplify: $28,840 = 100x$

Solve for x : $x = \frac{28,840}{100} = 288.4$

Estimated number of black bears: 289