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How Many Monarchs This Winter? Estimating the Size of the Monarch Population in Mexico



Photo © Dr. Lincoln P. Brower

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Millions of Monarchs in Mexico

Monarchs migrate to Mexico from across eastern North America. They cluster by the millions in just 12 mountain sanctuaries. The butterflies gather in one small region of Mexico. This gives scientists a chance to estimate the size of the *entire migratory population*. How do you suppose scientists count so many butterflies?



1

Scientists Measure the *Area Covered With Monarchs*

It's impossible to count individual butterflies, so scientists measure the area of forest covered with monarchs. This picture shows a monarch colony from the air. The trees look orange because they are covered with butterflies! How large an area does this colony cover? Count the trees and estimate.



Photo © Dr. Lincoln P. Brower

2

How Scientists Measure a Colony

Scientists walk through the forest and decide which trees have *enough butterflies* to be considered part of the colony. They mark the edge of the colony with flagging tape.



3

Measuring the Colony's Border

Next the scientists walk around the border of the colony and measure the distance between all of the marked trees. They must visit and measure all 12 of the monarch wintering sites. Their goal is to calculate the **total area** of forest covered with butterflies.



4

A Winter Round-Up

The scientists always measure the colonies in December or January. This is the coldest time of year, when the monarchs form their tightest clusters.

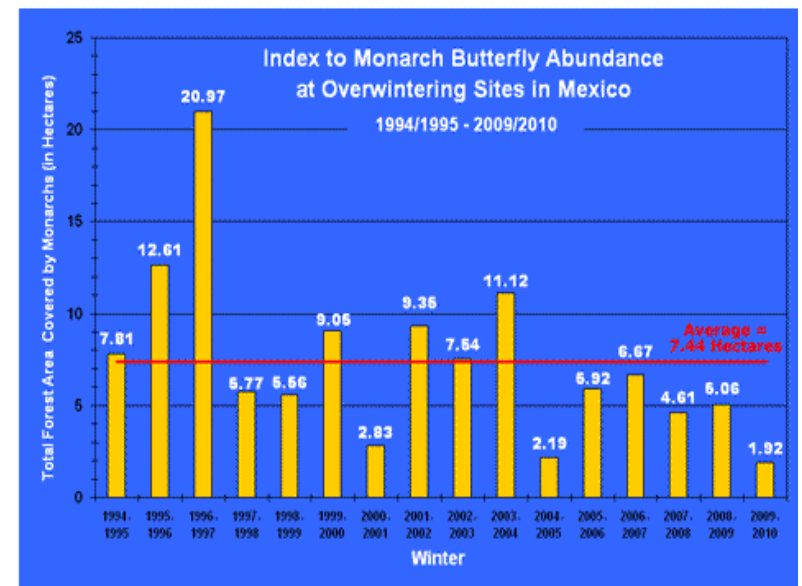


5

Take a Look at the Data from Mexico

This bar graph shows the data scientists have collected since 1994. It shows the estimated size of the monarch population in Mexico every year. The area covered in monarchs is measured in "hectares." One hectare is 2.47 acres, about the size of two and a half football fields.

- Can you find this year's data?
- How does it compare to other years?
- Why do you think it's important to collect and study population data every year?



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