

Weather and Whooping Cranes

Pre-Lab Discussion

The whooping crane is a tall, white bird with red markings on its forehead and face. It is native to certain North American wetlands. In the 1900s, the population of this magnificent bird had decreased almost to the point of disappearing. In 1941, only 14 cranes were living. Although more than ten times as many cranes are now living in the wild, they are still at risk. About half of the cranes live in the wild. Most breed in Wood Buffalo National Park in Canada and winter in Aransas National Wildlife Refuge in Texas.

Scientists, working to save the whooping cranes, investigated what abiotic factors affect the birds. In this investigation, you will analyze the data from one such study.

1. What do whooping cranes need to obtain from their habitat?

2. What abiotic factors might limit the population of whooping cranes?

Problem

How does precipitation affect the population of whooping cranes?

Materials (per group)

ruler

calculator

pencil

Procedure

1. Using Figure 1 and the data in Data Table 1, plot a graph showing how the crane population changed from year 1 to year 16 of the study. The crane population in any given year is the total number of migrating adults and hatched eggs. Answer Questions 1–2 in Observations.
2. Study the data in Data Table 1. Answer Questions 3–6 in Observations.
3. Using a calculator, determine the hatching success rate for each year.

$$\text{Hatching success rate} = \frac{\text{Number of eggs hatched}}{\text{Number of eggs laid}} \times 100\%$$

Write these values in the corresponding boxes in Data Table 2. Answer Question 7 in Observations.

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Weather and Whooping Cranes (continued)

Data Table 1

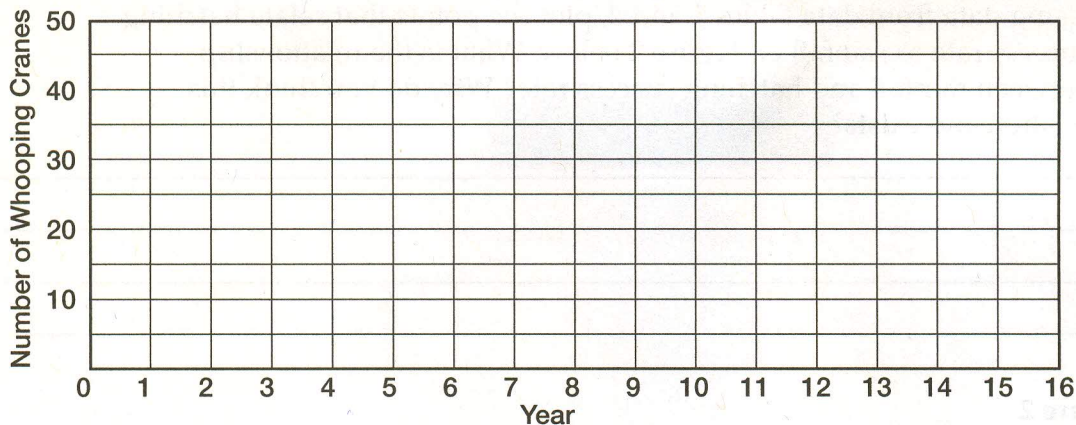
One Study Relating Weather and Reproductive Rate of Whooping Cranes

Year	Migrating Adults	Number of Nests	Eggs Laid	Hatched Eggs	Rainfall (cm)	Snowfall (cm)
1	21	6	6	4	8.9	3.6
2	20	3	2	0	15.0	0.5
3	20	4	4	3	11.7	2.0
4	22	5	5	4	6.1	2.8
5	23	4	6	2	6.4	14.2
6	23	8	8	4	8.1	4.6
7	30	6	6	5	7.4	0.0
8	32	0	0	0	19.3	7.6
9	28	4	6	2	15.0	1.3
10	26	10	10	7	8.1	2.0
11	32	10	10	6	7.4	2.5
12	36	2	2	0	13.7	7.4
13	30	4	4	3	8.9	1.0
14	32	3	4	3	7.1	1.8
15	33	3	3	1	14.7	6.1
16	32	5	5	4	5.3	1.5

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Observations

Figure 1



Populations and Communities

1. When was the crane population at its highest level? When was it at its lowest level?

2. During which year did the population increase the most?

3. In which year did the most adult cranes die?

4. Which four years were the poorest breeding years for the cranes? In which year were the most eggs laid and hatched successfully?

5. During which five summers was rainfall greatest?

6. Was snowfall ever high the same year that rainfall was high? If so, in which year or years?

7. In which year was total precipitation (rainfall plus snowfall) lowest? What was the hatching success rate that year?

Data Table 2

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hatching Success Rate (%)																

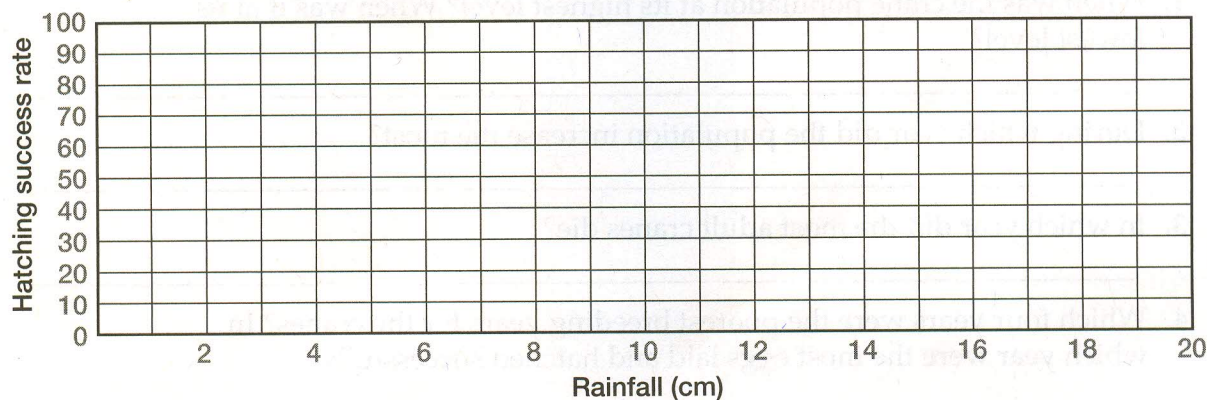
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Weather and Whooping Cranes (continued)

Analyze and Conclude

1. Using data from data tables 1 and 2, plot the points that relate hatching success rate to rainfall on Figure 2 below. What is the relationship between rainfall and hatching success rate? Why do you think this relationship exists?

Figure 2



2. Suppose you want to find out how rainfall affects the whooping-crane population. Why would you need to find daily or weekly amounts of rainfall rather than seasonal amounts?

3. Suppose that years 10 and 11 had high levels of precipitation. How would this have affected the population? Give a reason for your answer.
