

## Rationale

To understand the topics of and relationships between population and range of condors, students will participate in a range fluctuation activity.

## Objectives

1. Students understand the affects of range reduction on a population
2. Students begin to identify reason for habitat loss

## Aligned Standards

NGSS: Asking Questions, Defining Problems and Analyzing Data and Using Mathematics; Causation and Scale and Stability, Change  
LS 4.D: Nest sites vary in distance to human populations and affect the relationships between condors and humans.

## Time

One-day lesson  
Teaching time: one hour (approximately)

## Vocabulary

habitat  
range  
forage  
endangered  
extinct  
survey

## Materials

Rope

## Tech Integration

Maps illustrating historic range and current range

## PROCEDURE – DAY 1

### EXPLORE (30 minutes)

Divide students in two groups: condors and range holders. The range holders, along with the teacher, stand in a large circle with a rope. The condors fly around the “territory” created by the rope. The teacher then cuts the rope or tells the range holders to take giant steps towards the middle (to illustrate a decrease in range). Discuss the affect on the condor population as the range shrinks. Ask condors to leave the range for unknown reasons. Condors that have left the inner rope area may become rope holders. This process should continue until one condor is left (AC-9 was the final condor in the wild when conservationists began trapping the condors in the early 1980s). The process is reversed as the “Conservation Program” begins. Increase the range and little by little allow condors into the territory.

### JOURNAL (20 minutes)

Debrief activity verbally or through journaling about causes for habitat loss and the importance of habitat for animals.

## Before you begin

Obtain a long rope, about 30' in length.

## What to do

A significant concern in the sustainability of condor conservation is the fluctuation in the condor's ability to travel across its natural range.

### Explore

This activity should be conducted outdoors in a large, open space. Students will need to listen carefully to your instructions during the activity.

Describe the activity before beginning: this exercise is intended to give students an idea of how the condor's "range" or space for travel has changed over time. Ask the students why range might be important. Guide responses to considering the physical size of the condor, where they nest, then how they hunt and what they hunt. One group of students will be designated "condors" and another will be "range holders." Encourage students to observe the behavior of "condors" as the range fluctuates. (Instruct the "condors" to behave realistically, soaring and looking for food.) They will be asked to share their observations in class.

Divide the class into the two groups and have the "range holders" stand in a large circle with the rope fully extended. Explain in a loud voice that this is how the condors lived over 100 years ago, before recent major changes in their environment. Have the "condors" run through the space provided inside the rope. It should be clear that they have a sense of freedom and plenty of space for one another.

Ask the condors to gather in the middle of the circle while you fold the rope in half. Have the range holders now create the circle, at half its area, and ask the condors to attempt to soar through the space. There should be a noticeable difference in their behavior due to the lack of space. Slowly remove half of the condors from the center of the circle and ask them to have a seat. Fold the rope in half again, and have the range holders re-create the circle (now  $\frac{1}{4}$  of the original area). This should show a drastic change in the condors' ability to fly freely. Remove all but one of the condors and ask him or her to sit out with the others. The last lonely condor should continue flying.

Once the students are able to observe these changes, have the range holders drop the rope, and ask the entire class to gather in the center for a brief discussion.

Ask what they observed when the area shrunk to half of its original size, then what they observed when it was small. Inform them that this was what happened right before the Conservation Program began in the early 1980s. This was when conservationists decided to trap the few remaining condors for a program hoping to breed condors in captivity. What do they think caused the range to shrink so drastically? (Possible responses: People moved into their habitat, condors couldn't find food, there were no safe places to nest, etc.) What options do you think conservationists came up with? What would've happened if the conservationists did not intervene? (The population might have continued to decrease until they were extinct.)

If there is time, demonstrate the restoration of the condor's habitat by reversing the activity: going from the small area, slowly to the larger area, and then to the largest area with the rope fully extended. Note that the present range is not the same as the historic range.

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### OPTIONAL EXTENSION:

Have the students return to the classroom and journal about the activity and what it represented.

Have them add their opinions about habitat loss, how it makes them feel to know animals have less space to survive, and possibly an argument about why we should make habitat conservation a priority.