

Black Canyon of the Gunnison

National Park Service
U.S. Department of the Interior

Black Canyon of the Gunnison
National Park



Population of Great Blue Heron in Curecanti: Teacher Guide

Grade/Level: 9th - 12th grade

Time Allotment: 1-2, 60-minute class periods

NGSS Standard Addressed:

HS-LS2-1 Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.

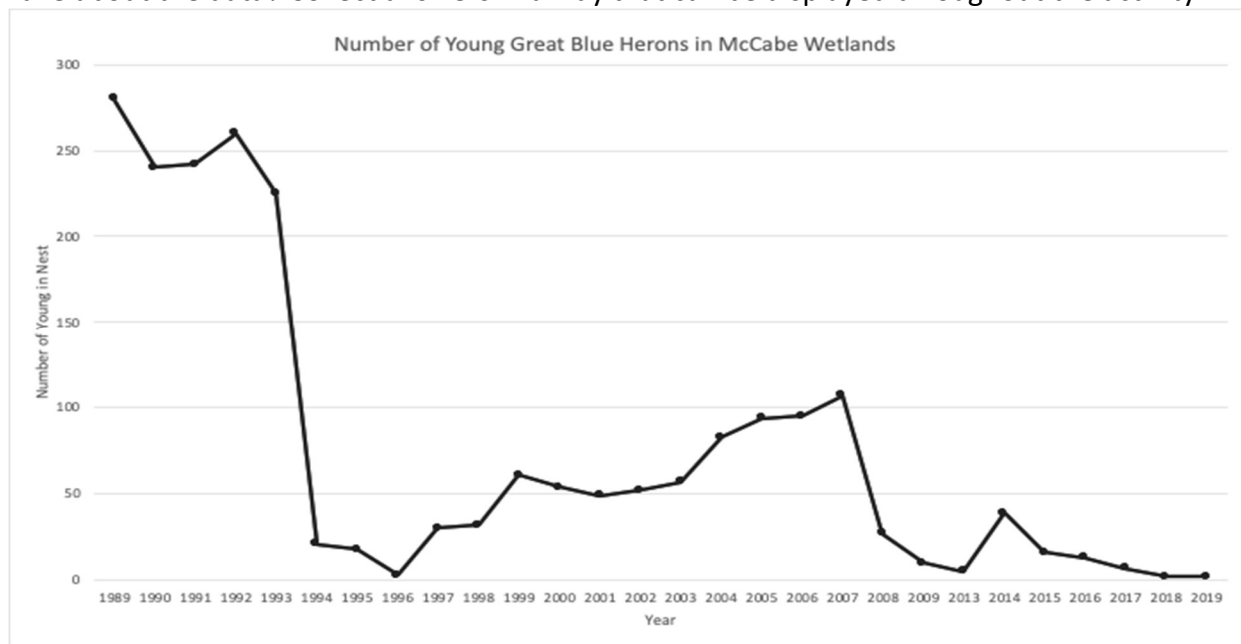
HS-LS2-2 Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.

Objective: Students will analyze data on the great blue heron population to determine limiting factors and carrying capacity of the nesting sites.

Materials: Computers, phenomenon sheets, worksheets

Background Information: Data for this lesson was collected at the McCabe wetlands in the Curecanti National Recreation Area from 1989-2019. The early data was collected by a citizen scientist who shared his data with the National Park Service (NPS). The later data was collected by NPS staff. During the time of data collection, 3 main nest sites were observed, with some of the birds nesting in a 4th site after one site was abandoned. Natural predators in the area include red-tailed hawks, golden and bald eagles, and great horned owls. Also noted was an increase in human activity near the nesting sites, as the land was further developed for agriculture. At this time, it is still unknown what caused the nesting sites to become unproductive in the mid-1990s. To complete this lesson, students should be familiar with the terms limiting factor, carrying capacity, density dependent factor, and density independent factor.

Phenomenon: Have students look at the graph. What do they notice about the data? What questions do they have about the data? Collect answers in a way that can be displayed throughout the activity.



Activity: Have them conduct the research and data analysis questions.

When they have read the journal entry by Ron Meyer, ask if this answered any of their questions from the initial data or brought up new questions. Have the students fill out the table on limiting factors and answer the next set of questions.

When they get to the extension questions, discuss how real science often gives messy data without clear answers. This may be different from the textbook data they are used to seeing.

For the citizen science questions, you may have students go to the link below and find a citizen science project in a national park, national monument, historic site, recreation area, or byway near them.

<https://www.nps.gov/subjects/citizenscience/index.htm>

Extensions: Design a citizen science project for your students in your community. Contact your local agency (national park, national forest, state park, and parks and wildlife) to see if there are projects you can help with or to ask what type of data the agency would like to have. Many great public land projects, like the study at McCabe wetlands, started with concerned citizens conducting citizen science!

Resources: For additional information on great blue herons, nesting habits, habitats, and how the National Park Service helps these birds, see the following webpages.

Audubon Society

<https://www.audubon.org/field-guide/bird/great-blue-heron>

Gulf Islands National Seashore

<https://www.nps.gov/guis/learn/nature/blueheron.htm>

Big Thicket National Preserve

<https://home.nps.gov/bith/learn/nature/great-blue-heron.htm>

Cuyahoga Valley National Park

<https://home.nps.gov/articles/000/great-blue-herons-in-cuyahoga-valley.htm>

We would love to hear from you!

Let us know how this activity went for you and your students! Contact us at: cure_education@nps.gov