Isle Royale, Not Battle Royale

Oregon State University

Levels: Grades 5-8

Lesson Time: 60 Minutes

Next Generation Science Standards:

Performance Expectations

5-LS2-1, 5-ESS3, MS-LS2-2, MS-LS2-5

Contact:

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Description

In this lesson, students interpret historical data from the Island Royale study, watch recent news clips, and engage in a debate whether or not to introduce wolves to the island using the information they learned during the activity. The goal of the activity is for students to see the relationship between predators and prey, and the effects of isolation on a population's ability to survive over time.

Outcomes

- Students will learn about the longest running population ecology study on Isle Royale.
- Students will use historical data and video clips to make sense of predator-prey relationships on the Island Royale.
- Students will learn that as predator population increases their prey population decreases, which also effects the broader ecosystem (e.g. plants that their prey feed on).
- Students will engage in reading graphs and argument from evidence (e.g. historical data and videos) to suggest how many wolves should be reintroduced to the island.

Guiding Questions

How changes in a predator (wolf) population change their prey's population (moose) over time?

How can predators keep an ecosystem in balance?

Background Information

Isle Royale

Isle Royale is the largest island in Lake Superior. The island is approximately 45 miles in length and 9 miles wide. It is located about 12 miles south of the Canadian border, 20 miles southeast of Minnesota, and 53 miles north of Michigan. The only way to access the island is by seaplane or boat. Moose arrived at Isle Royale around 1900. Wolves first arrived at the island on an ice bridge from Canada in 1940. The Isle Royale moose and wolves

have been studied since 1958. It is the longest continuous study of any predator-prey population. The ecosystem of the island is unique because it only contains one top predator, the wolf.

Isle Royale Facts

Isle Royale National Park is 571,790 acres

The number of people visiting in 2017 was 28,196

Isle Royale was made a national park on March 3, 1931

The lowest is 601 feet at Lake Superior

The highest is 1,394 feet on Mount Desor

Entrance fee is $7 per person per day

In the Eastern time zone

Materials

- Isle Royale student worksheet (provided)
- Internet access
- Links to Videos/Website
- Student PowerPoint (provided)

Isle Royale National Park Random Facts

Isle Royale National Park is the only national park in the United States that completely closes in the offseason. The park is typically closed November through mid-April.

The most common large mammals are moose and gray wolves. The interaction of these two species in the park has been extensively studied. On rare occasions Lake Superior completely freezes over in winter, allowing animals from the mainland to access the island.

Getting Students Started

Activity Set Up

Have enough student's worksheets for each student. Setup the PowerPoint and have the videos ready to go. Once materials are ready, the activity is ready to start.

Activity Introduction

Ask Students how they think predators effect prey populations, using an example they are familiar with (e.g. wolves to deer or moose, owls and mice, etc.). Ask them how scientists study these predator-prey relationships and tell them they will learn about the longest running population ecology study on Isle Royale.

Go over the Prezi of the food web of Island Royale

https://prezi.com/xuf1hc4fvvbu/food-web-for-the-isle-royale/

Activity

1. Watch the first video until 2:36, and then have students read the test on part 1 and work through their worksheet.
2. Use the online graph, or the graphing images in the PowerPoint to guide student thinking to see how when predatory population goes up prey population goes down and vice-versa.
3. At the end of part 1, watch the second half of the first video.
4. After part 1, complete part 2 and watch the last video.

Wrap-up

1. Have students consider what the scientists did at Isle Royale and discuss how they feel about it.
2. Ask students if Oregon has a similar or different relationship with wolves?
3. Ask students what "really" caused the decline in the wolf population? (isolation/inbreeding)
4. Ask students if they would like to explore wolves in Oregon (see resources)
5. Students may want to see where the project is at now, and encourage them to look that up.

Extension/Scaffolding

At the simplest level this is an activity that can be used to teach reading and interpreting a graph with three variables on it. However, it can be scaffolded into a much more complex activity using the AP HS curriculum to compute carrying capacity.

This activity is also very useful following an active simulation of a predator prey population dynamics, like Owls Mice and Seeds and Deer Me (see below). If you do one of these activities prior to this activity, students will expect the wolf population to rebound from the start and they may not want to know why that was. Adding in an active simulation prior to doing this activity will also help students to see the patterns between predators and prey population dynamics.

Resources

Isle Royale Wolf Study (more graphs, charts, and background information)

http://www.isleroyalewolf.org/http%3A//www.cpc.ncep.noaa.gov/products/precip/CWlink/pna/nao.shtml

AP HS Curriculum using Isle Royale

https://www.hhmi.org/biointeractive/wolves-isle-royale

Radio Collar Data of Wolves in Oregon
https://www.dfw.state.or.us/Wolves/notification.asp

Deer Me (population game to simulate predator-prey relations)
https://www.wolfquest.org/pdfs/Deer%20Me%20Lesson.pdf

Owls, Mice, and Seeds (population tag game with running around)
https://wiki.islandwood.org/index.php?title=Owls,_Mice_and_Seeds

Food web of Isle Royale (Prezi from PowerPoint)
https://prezi.com/xuf1hc4fvvbu/food-web-for-the-isle-royale/

Video Links

Part 1 Video (watch 0-2:26 before Part 1, the rest after part 1)
https://www.youtube.com/watch?v=_BNZM2Y7Nsc

Part 2 Video (watch after Part 2)
https://www.youtube.com/watch?v=teoxnHkcULA