

Emily Curry

A. Personal Statement

“If a picture is worth a thousand words, then an experience is worth one thousand pictures.” I remember hearing this at an outdoor education conference last year. By participating in the Isle Royale course I have had my “experience.” My experience has rejuvenated and deepened my appreciation for the outdoors. I am inspired to use the outdoors as a tool to teach students. Hopefully students will have their own experiences, even if we can’t make it to Isle Royale. Hopefully their experiences and virtual trips to Isle Royale will inspire them to one day seek out the cool waters of Lake Superior, and vast, tranquil wilderness known as Isle Royale.

B. Three Lesson Unit

1. Introduction to Isle Royale
 - a. Internet Scavenger Hunt
 - b. Power Point Intro
 - c. Writing reflection
2. Moose and Wolf of Isle Royale
 - a. Collecting Moose Data Activity
 - b. Wolf and Moose Power Point
 - c. Graphing Data
3. Biodiversity of Isle Royale through Observation and Tracking
 - a. Power Point
 - b. Track Key
 - c. Tracking scenario maps

Works Cited

- Cheek, Wendy. *January Thaw*. Leopold Education Project: Lessons in Land Ethic.wcheek@drenthe.net.
- Isle Royale National Park. July 25, 2006. National Parks Service. August 15, 2006. [<http://www.nps.gov/isro/>].
- Peterson, Rolf O. and Candy Peterson. Bangsund Cabin. *Introduction Lecture to the Moose and Wolf Research on Isle Royale*. 24 June 2006
- Peterson, Rolf O. and John A. Vucetich. *Ecological Studies of Wolves on Isle Royale*. 2005-2006.
- Rajdle, Brian. Isle Royale Institute Instructor. Ecology of Isle Royale Course. Michigan Technological University, Houghton, MI. June 2006
- Shelton, Napier. *Superior Wilderness: Isle Royale National Park*. Houghton, MI: Isle Royale National History Association, 1997.
- The Wolves and Moose of Isle Royale. 2006. School of Forest Resources and Environmental Science Michigan Technological University. 15 Aug, 2006. <http://www.isleroyalewolf.org>.

US National Parks Net. 2002. Uhler, John William. Isle Royale National Park. August 15, 2006.

[<http://www.isle.royale.national-park.com/info.htm>].

Western Association of Fish and Wildlife Agencies and the Western Regional Environmental Education Council, Inc. *Project Wild*. Project Wild National Office: 5430 Grosvenor Lane, Bethesda, MD 20814. 1992.

Lesson 1

Introduction to Isle Royale National Park

Grade Level – 9th -12th

Allocated Time- 50 minutes

Materials List- Copies of Scavenger hunt, Internet access, if internet access is not available resources material such as books and pamphlets about Isle Royale and the Lake Superior region, LCD projector

Standard B2: Interdependence of living Systems and the Environment

B2.3c Examine the effects of human activities such as reducing the amount of forest cover, increasing the chemicals released into the atmosphere, and intensive farming have changed the Earth's land, oceans, and atmosphere and also its capacity to support life forms.

B2.R2 Predict the impact of human population growth on the environment and the survival of other organism in given situations

Objective- The Student will-

- Gain introductory knowledge of economic history of Isle Royale
- Infer how the economic history of the island has affected the island as a whole ecosystem, and the status of that ecosystem
- Gain introductory knowledge of the geological, and biological history of Isle Royale

Instructional Procedure-

1. Isle Royale is a national park we have here in Michigan. Here are some questions to begin the lesson/ conversation with the class
 - a. What does a “National Park” mean?
 - b. Have they ever been to a National Park?
 - c. Have they ever been to Isle Royale or heard of it?
 - d. Does anyone know the definition of an Isle from social studies class maybe? Different from the word “aisle”
2. Introduce the internet scavenger hunt. They will have 15-20 minutes to answer as many questions as they can, using whatever internet sources they can find. You can always give them more time if they need it.
3. Use the Introduction power point to introduce Isle Royale and its History. You can find all answers to the scavenger hunt in the power point.

Assessment-

On the reverse side of your paper write a short essay. You may choose to write from one of the following point of views: lumberman, fisherman, miner, or property owner on Isle Royale. What was your experience like? What hardships did you face while living on the island?

Name _____

Date _____ Hour _____

Isle Royale Internet Scavenger Hunt

Find the answers to as many questions as possible.

1. Where is Isle Royale Located? _____

2. How large is Isle Royale? _____

3. Why is Isle Royale important to scientists? _____

4. Has there ever been economic development on Isle Royale, if so when and what kind? _____

5. When did Isle Royale become a National Park? _____

6. What types of flora and fauna occupy the island now? _____

7. Does anyone currently live on Isle Royale? _____

8. What type of rock forms the bedrock for Isle Royale? _____

9. How do visitors reach Isle Royale? _____

10. How was Isle Royale formed geologically? _____

11. Which valuable mineral was once mined on Isle Royale? _____



Lesson 2

The Moose and Wolves of Isle Royale

Grade Level – 9th -12th

Allocated Time- 90 minutes

Materials List- Copies of graph sheet, colored pencils, rulers, large enough space for students to move around freely

Standard B2: Interdependence of living Systems and the Environment

B2.4A Graph changes in population growth given a data table.

B2.4B explain influences that affect population growth including those characteristics of the organism and environmental influences.

B2.4C Predict the consequences of an invading organism on the survival of other organisms.

Objective- The Student will-

- Conclude hardships and variables that face moose populations on Isle Royale
- Characterize what conditions are needed for moose populations to flourish
- Identify factors that will contribute to the carrying capacity of island ecosystem

Instructional Procedure-

4. Tell you students that they are going to collect some data, about a moose population. They have all just become moose.
5. There are three basic needs that all animals need to survive. What are they? Food, Water, and Shelter, I like to say 4 basic needs because within shelter you need adequate space.
6. Take the students outside or in an area with adequate space for moving around. Number your students off 1-4. All of the number 1's will become moose. All of the 3-4's will become the basic needs for moose.
7. You will line the student's up on two lines with their backs facing each other, all the moose on one end and the others on the opposite line.
8. The basic need student's get to choose which need they would like to be. However they cannot change once the round has begun. They will have to wait until the next round to change. Student' have a tendency to want to change when they see their friend on the other line doing something else.
 - a. Water- hand over mouth
 - b. Food- Hand over stomach
 - c. Shelter- hands over head, or in front of their bodies in a teepee structure
9. Each moose must also decide what they are going to seek: food, water, shelter by doing the same symbols.
10. On your count the moose and basic needs turn and face each other. The moose are looking for someone who is matching the need they are currently looking for.
11. If the moose sees someone, they must run down to the opposite line and retrieve this person. This is survival of the fittest. If they are the first to reach that person they have successful lived and reproduced for another year. If a moose cannot find their "basic need" they will die, and join the other line.
12. As the instructor you should count the moose population each year, and record it for use later. Do about 15 rounds.

13. Show the Moose and Wolf or Isle Royale Power Point. Ask student's to pay special attention to the factors that influence the populations of moose and wolves on the island. Are they density dependent factors, or density independent factors?
14. Post the data collected outside on the board or on an overhead.
15. Have the students complete graphing activity, by creating a line graph.

Assessment

Have students complete on their own. After adequate time has been given read through the sheet together and check for correct information.

Extension-

The moose activity above was adapted from A Project Wild activity. I would highly recommend project wild to anyone interested in outdoor education. They have trainings during various times throughout the year.

Western Association of Fish and Wildlife Agencies and the Western Regional Environmental Education Council, Inc. *Project Wild*. Project Wild National Office: 5430 Grosvenor Lane, Bethesda, MD 20814. 1992.

Discovery Science Film- *Wolf Battlefields*: Although it is not on the IR wolves it has quality information about wolves

- Enter a mountain battlefield where war is waged through cooperation, communication, and terror. Join the Lone Pine pack, one of North America's largest and most successful packs of timber wolves.

"*Gray wolves, gray matter*" is a free-online Online curriculum that features a section on Isle Royale wolves and moose. More information on pack dynamics and anatomy of the wolf.

Wolves & Moose on Isle Royale: Tri-fold brochure. I received this brochure while visiting the Bangsund cabin on Isle Royale this summer. It is an excellent resource on the lives of both moose and wolves. I would imagine it could be obtained from MTU somewhere.

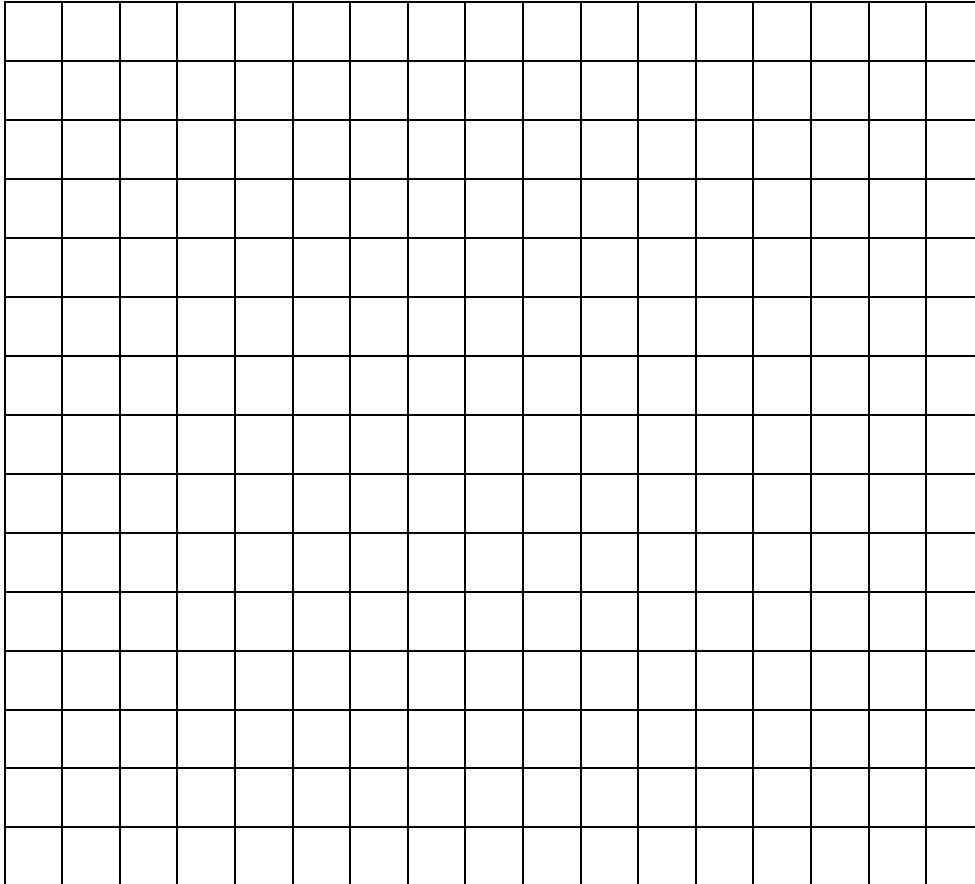
Name: _____

Date: _____ Hour: _____

Moose Population Dynamics

Adapted from a *Project Wild Activity: Oh Deer*

1. Create a graph from the data collected outside. Include all proper labels.



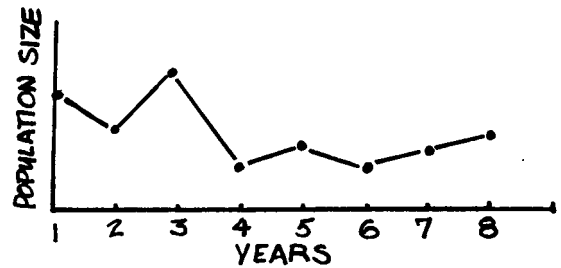
2. Name the four essential components of habitat.

3. Define limiting factors.

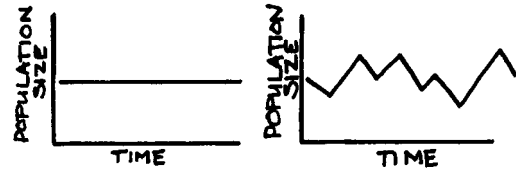
Factors Affecting Moose Population	Factors Affecting Wolf Population

4. Examine the graph. What factors may have caused the following population changes?

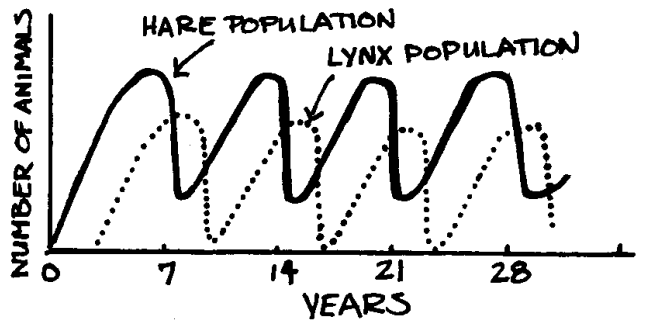
- a) between years 1 and 2
- b) between years 3 and 4
- c) between years 5 and 6
- d) between years 7 and 8



5. Which of the following graphs represents the more typically balanced population?



Predator-Prey Interactions



6. Which animal is the predator? Which is the prey?

7. Are predators controlling the prey, or are they controlling the predators?



Lesson 3

The Biodiversity of Isle Royale through Observation and Tracking

Grade Level – 9th -12th

Allocated Time- 60-90 minutes

Materials List- 4 laminated paper or back side of a poster and dry erase markers OR just large sheets of paper and any markers: play dough, small pieces of natural materials: sticks, different textured plants, rocks, dried weeds, grasses, 1 copy of scenarios, copy of track key for each student

Standard B2: Interdependence of living Systems and the Environment

B2.4C Predict the consequences of an invading organism on the survival of other organisms.

B2.R3 Locally or in a larger geographical area identify and describe an ecosystem including: examples of interdependence, diversity succession.

B2:1A Identify where energy is stored in an ecosystem.

Objective- The Student will-

- Identify where energy is stored and how energy is passed down.
- Compare and Contrast the biodiversity of the mainland vs. islands.
- Predict what type of animals will be found on IR

Instructional Procedure-

1. Introduce students the biodiversity of IR with the power point. It also has some introductions to observation and tracking.
 - a. You might want to ask if anyone has ever tried to track an animal before. Some student's may have hunted before. Also ask if they have ever seen animal tracks or footprints before and where. Get them thinking about the animals you have around you area, and the tracks they are familiar with. (wild and domesticated)
2. After the introduction is done hand out the guide for the track scenarios.
3. Go over the tracks and display each on the board. You can talk about the movement of each animal.
4. Give each group one scenario, have the above materials available so they can get what they need.
5. Give them 25-30 minutes to complete their map/scenario.
6. Have the other groups go around and try to interpret the other groups scenarios, using only their track key.

Assessment

Have each group write down their final interpretation of each scenario. Then see how well they did by having each group present what was actually going on.

Extension

This idea was adapted from a Leopold Education Project (LEP) Activity called January Thaw. Aldo Leopold was a naturalist with a strong belief in developing a land ethic. All of the LEP lessons revolve around his book *The Sand County Almanac*. LEP trainings are held throughout the state of MI, by Wendy Cheek the State of MI LEP Coordinator, many times they are sponsored by The Pheasants Forever organization and the training is completely free. I would highly recommend LEP training to anyone interested in Outdoor Education. Contact Wendy Cheek at wcheek@drenthe.net if you would like to find out more about LEP trainings or get on her email list.

IR Scenarios

Scenario 1

- A moose calve and his mother are browsing in a young balsam fir forest.
- The East pack wolf pack is out patrolling their borders.
- A squirrel scurries from tree to tree in search of cones, and their seeds.
- The East Pack picks up the scent of the new calve and his mother.
- When the wolf pack find them, the mother stands her ground and defends her calf.
- The East pack finally retreats.
- A mouse is surprised by a fox in the forest.

Scenario 2

- A beaver is busily working on their dam.
- A young bull moose is enjoying aquatic plants, near the ponds edge.
- A fox has chased a hare into a downed tree.
- After trying to wait out the hare the fox wonders down to the pond for a drink.
- The hare makes his escape, and ventures into a clearing.
- The hare tracks end with wing impressions. Why?
- The moose decides to go for a swim to cool off

Scenario 3

- Moose tracks lead into a brushy area where an old moose has denned down.
- The Chippewa Harbor pack is coming to check in on the old moose. They find his trail.
- The moose is startled and heads for the forest.
- There he turns to stand his ground against the wolf pack, but runs again, and the wolves attack.
- Two days later a red fox finds the carcass of the old bull moose and grabs a quick bite.
- Mice scamper about the forest floor, in search of seeds.
- A squirrel moves up and over downed trees

Scenario 4

- A Red fox approaches a bush and circles it. Why?
- A set of hare prints leads away from the bush in the opposite direction.
- The red fox takes off, and encounters a set of wolf tracks. The red fox turns and goes the other direction.
- Moose tracks enter a balsam fir forest and wander through it. Why?
- Down by the lake an otter happily eats a fish on the rocky shoreline.
- On the opposite shoreline from the otter a wolf stops by for a drink.

Name _____

Date _____ Hour _____

Biodiversity of Isle Royale Tracking Key

Animal	Track	Example	Movement
Snow Shoe Hare	Sideway T shows direction -] -] -]		
Mouse	::-::-:-::-:- shows tail dragging		
Moose	heart shaped with pointed end pointed toward direction of movement		
River Otter	: : :		
Beaver	tail obstructs tracks, like marking with a pencil by laying it flat and dragging across a paper		
Fox single like of small solid dots		
Wolf	o o o o o o o o o single line of larger open /hollow dots		
Squirrel	:: :: :: :: :: spacing between for speed		