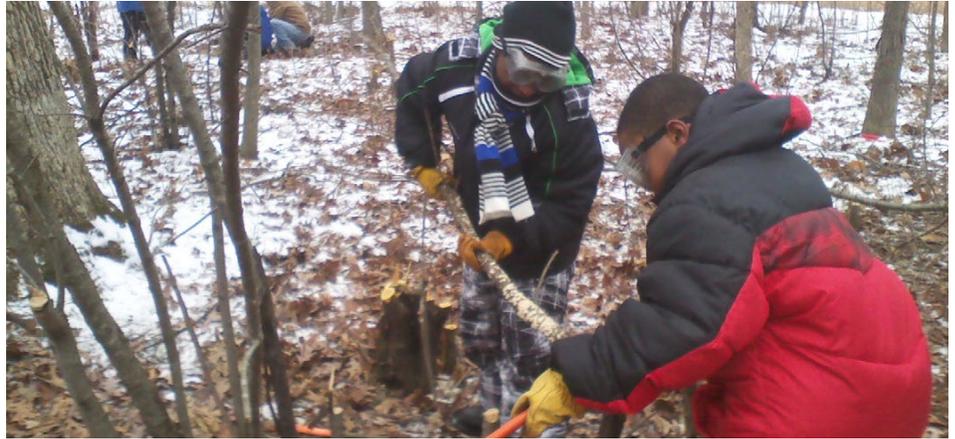


What's the Impact?



Next Generation Science Standards Disciplinary Core Idea LS2.A: Interdependent Relationships in Ecosystems

The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as “decomposers.” Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem.

Disciplinary Core Idea: ESS3.C Human Impacts on Earth Systems

Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect earth's resources and environments.

FIELD STUDY OVERVIEW

During this Field Study, students will play an **Outdoor Learning Game** to model how humans impact the biodiversity of a habitat through introducing invasive species and developing land and how these impacts affect the organisms that live there. They will also conduct an **Environmental Exploration** where they will observe the evidence of human impacts on the environment, such as the presence of introduced invasive species, roads, landscaping, or buildings. As a **Stewardship Activity**, students will remove invasive plant species and/or collect and plant seeds.

GUIDING QUESTIONS

- How have humans impacted the local environment over time?
- What affects do these impacts have on the organisms that depend on these environments?

OBJECTIVE

Students will be able to demonstrate their understanding of the affects that humans can have on the health of a habitat by acting out the impacts that different human actions have on the organisms that live there.

STEWARDSHIP ACTIVITY

Students will participate in a stewardship activity lead by staff at the Field Site. This may involve removing invasive plant species and/or collecting and planting seeds.

EXPLORATION GUIDELINES

While exploring, take note of evidence of human impacts on the environment, such as the presence of introduced invasive species, roads, landscaping, or buildings.

MATERIALS

Educators at the Field Site will provide the following materials:

- 4 to 6 cones to mark off large playing area
- 8 hula-hoops
- 25 yellow poker chips
- 25 blue poker chips

What's the Impact? Procedures

Procedures

1. Set up four cones to mark off a large rectangular playing field.
2. Inside the playing field, place the hula-hoops to represent migration stopover habitats that birds can use to rest and refuel during long migrations. Distribute the blue and green poker chips inside each hula-hoop to represent water and food present in these habitats.
3. Select one student to represent natural migration hazards that may hinder birds as they migrate (such as bad weather or disease). Instruct this student to stand in the middle of the playing field.
4. Tell all other students to line up on one side of the playing field. These students will represent migrating birds. Their goal is to collect one yellow chip (food) and one blue chip (water) and run to the other side of the playing field (the migration destination) without being tagged by the student representing natural hazards.
5. If a migrating bird is tagged by natural hazards, they did not survive the migration and must exit the playing field. If a migrating bird crosses the finish line to the migration destination without collecting one food and one water, they must go back to get the resources they need to survive the journey or they must exit the playing field because they were not able to survive the migration.
6. After each round, allow all students playing migratory birds to restart and line up on one side of the playing field. Select a different student to play the role of the natural hazards, if desired.
7. Play each of the following rounds. After each round take note of how many birds were able to survive. Discuss how the presence of introduced invasive plant species or other human impacts affect the migratory birds' ability to survive.

ROUND 1: Natural migration stopover habitats

Place 5 hula-hoops in the playing field. Inside each hula-hoop place 3 yellow chips and 3 blue poker chips. This scenario represents natural migration.

ROUND 2: Invasive species are introduced to the habitats

In each of the 5 hula-hoops, place just 1 yellow chip and 3 blue chips. This represents that the invasive species have out-competed the plant species that naturally occur in the habitats that the birds rely on for food.

ROUND 3: Restoration efforts restore and create new habitats

Place an additional 2 hula-hoops in the playing field for a total of 7. In each hula-hoop place 3 blue and 3 yellow poker chips. This represents the restoration of the original habitats through conservation efforts and the creation of new migration habitats.

ROUND 4: Land is drained in preparation for development

In each of the 7 hula-hoops, place 3 yellow chips, but remove all blue chips except for 5 total (distributed between the 7 hula-hoops). This represents the draining of water from the habitat to prepare for the development of a large shopping mall.

ROUND 5: Habitat destruction due to human development

Remove 5 hula-hoops, leaving just 2 in the playing field. In each hula-hoop, place 3 blue and 3 yellow poker chips. This represents the loss of natural habitat due to the development of the land for a shopping mall.