SNOMNH

Wild and Rare

Teacher Guide

Grade Levels: 4 — 5

Program overview

The instructor will lead a discussion about extinction and the causes of extinction. The students will then work in groups at different stations. Each station features specimens and information cards about a different animal. Using the given information, students must decide if each animals is endangered or not. The class will then discuss their findings and the causes for each animal's fate.

P.A.S.S.

GRADE 4

Science Process – 1.2, 2.1, 3.1, 4.3, 5.1, 5.3, 5.4
Life Science – 3.1, 3.2

GRADE 5

Science Process – 1.2, 2.1, 3.1, 4.3, 5.1, 5.3, 5.4
Life Science – 2.1, 2.2

Objectives/Student Learning Outcomes

After participating in this program, students will be able to:

- Understand the causes of animal and plant endangerment and extinction.
- Explain the difference between threatened, endangered, and extinct plants and animals.

Background

What is an **endangered** species? It depends on which person you ask. A biologist, or scientist who studies animals, might tell you that an endangered species in a plant, animal, or fungus that is in danger of becoming extinct in most of its natural habitat. If tigers still live in zoos, but not in the wild, are they extinct as a species? Not technically, but if there are no wild populations of tigers, then they are extinct in the wild. Current research shows that we may only see tigers in zoos 50 years from now unless humans decide to save them and their habitat.

Endangered Species may mean something else to a government leader. In the United States, Endangered is a legal term. The U.S. Fish and Wildlife Service maintains the list of **endangered**, **threatened**, or candidate for listing species. Once listed, an endangered species has legal protection.

If you ask a land owner in the United States, Endangered Species may mean something else. Once an endangered or threatened species is located in an area, there are laws that protect the plant or animal and guide what a land owner may do with the land. The rules for land use are intended to protect the animal in its natural habitat. Those rules may also prevent the land owner from using the land if the planned use may harm the endangered plant or animal. If a paper company owns land with forest growing on it,

and an endangered bird lives and depends on that forest, the Endangered Species Act protects the forest from being cut down by the paper company to make paper. So the endangered bird still has a home, as do all the other plants and animals who depend on that forest. But what about the people who had jobs as loggers? They are paid to cut down the trees. And the people who own the paper company will not be able to make money off the land they purchased. The company may have to lay off employees, or it may go out of business. Most of the time, protecting an endangered species is not as controversial. Protecting a **habitat** can be as simple as making a slight change in the way the land is used.

People are involved with saving endangered species, from the biologist who studies the bird, to the government department who legally protects it to the land owner who shares the bird's habitat. People must work together to find the best solution to save animals, plants, and habitats, not just for the species being protected, but for everyone who enjoys that natural habitat.

A plant or animals can become endangered for many reasons. Plants or animals that need specific things, or **specialists**, are more likely to be endangered. Giant Pandas in China depend on bamboo forests, both as **habitat** and food. The bamboo is being cut down for disposable chopsticks and other bamboo products, and to make way for farms, houses, and towns. Pandas are very picky about where they live, and they don't like to live near people. Because they need bamboo to

Vocabulary

Biodiversity – the variety and variability of living things; the diversity of life on earth.

Community- any relationship in nature that involves plants and animals living together and interacting with one another in a particular environment. The biotic component of an ecosystem.

Competition – situation in which two or more organisms compete for a limited resource, such as food or shelter. • active demand by two or more organisms or kinds of organisms for some environmental resource in short supply.

Ecosystem- all of the biotic (living) and abiotic (non-living) things interacting in a particular area.

Endangered – an species that is threatened with extinction.

Environment - all the living and non-living factors that actually affect an individual organism at any point in its life cycle.

Exploitation - to make use of meanly or unjustly for one's own advantage.

Extinct – a species that has no living members, a species that is gone from the earth forever.

Habitat - the physical place where an animal lives; it provides all of the resources needed for life.

survive, pandas are a specialist species.

Plants or animals that live in small places, such as islands or other limited habitats, are more likely to become endangered. The state bird of Hawaii is a goose, the Nene (nay-nay). It is not found anywhere else in the world. The goose was hunted by humans, and the eggs and young are still attacked by animals introduced to the islands by humans, dogs, cats, and mongoose.

Home range – the area over which an animal travels regularly to find food, water, and shelter.

Niche – role or job of an organism in the environment; its activities and relationships in the community.

Population – a group of organisms of the same species living and interacting together in a specific area.

Predation – the capturing of prey as a means of maintaining life.

Species - a group into which all living things are divided based on shared characteristics and the ability to reproduce their own kind.

Threatened – a species that is decreasing in numbers due a variety of causes, and may become endangered if action is not taken.

Black footed ferrets live in wide open grasslands and prey upon prairie dogs, a cute, barking rodent that also thrives in grasslands. Humans like to graze cattle in grasslands. Many ranchers think the prairie dogs, the native animal, eat too much grass and don't leave enough for the cattle, the introduced species. Many states and local governments declared prairie dogs a pest species (even though it is the native species) and allow ranchers to kill them. This is bad news for black-footed ferrets, who need to eat prairie dogs. Natural predator and prey relationship are a delicate balance. If the predator eats too many prey animals, there will not be enough food to feed all the predators. So natural predators generally eat just enough prey animals to survive. The ferret has an additional problem- a disease called canine distemper that is carried by dogs, both cattle dogs and wild coyotes. Most ferrets with distemper die. Black-footed ferrets are endangered because of human introduced diseases, but also because of habitat loss and specializing on prairie dogs.

There are many reasons a plant or animal many need the protection provided by the Endangered Species List. For some species it is a single reason. However, for most species, dwindling populations are caused by a number of forces, mostly human ones. The goal of the Endangered Species List is to help scientists, government leaders, land owners, and people who use the habitat to all work together to save plants, animals, and the natural habitats we all share.

At the Museum

The Hall of Natural Wonders features many plants and animals in their natural habitats.

Discussion questions:

- Ask students to look for animals or plants they think may be more vulnerable to extinction. Why is that plant or animal more likely to become extinct? Does it live in a limited and specific habitat? Does it depend on a specific food source?
- Are there any plants or animals that may become extinct due to human exploitation, or humans using a species for hunting, food, medicine, or clothing?

Writing prompts:

- When a habitat is destroyed, some animals die, but others survive and move into surrounding habitat, if any exists. Choose one of the four different habitats in this gallery. Imagine you are an animal in this exhibit. What would you do if humans destroyed your habitat? Where would you go? How would you find food?

The Hall of Ancient Life explores life in Oklahoma from the Paleozoic through the end of the last Ice Age. All of the animals in this gallery are extinct. Scientists use the fossil record (the history of life as preserved in fossils in the earth) to understand past ecosystems and extinctions as they have occurred through that earth's history. This gallery will give you a nice overview of Oklahoma's past and natural extinctions.

Discussion questions:

- Ask students to look at the different kinds of habitats represented in the different exhibit areas. The large murals on the walls and behind some of the exhibits may be helpful to your students. What kinds of habitats were in Oklahoma in the past? How have the landscape and the kinds of plants and animals in these habitats changed through time?
- Choose one animal from this gallery. Study the information about that animal in the exhibit label. Why do you think this animal became extinct?

Supplementary/Enrichment Activities

Science

1. **Oklahoma's Endangered Species**. Oklahoma has 13 endangered species, 8 threatened species, and many species of special concern. The list of Oklahoma's Endangered and Threatened Species is available at the Oklahoma Department of Wildlife Conservation's website at: http://www.wildlifedepartment.com/endanger2.htm.
    - Assign or let students choose one species from the list and learn more about it.
    - Answer the following questions: What is my animal's name? What kind of animal is it? Where in Oklahoma does it live? What is its preferred habitat? What does it eat? How often does it reproduce (have babies)? How many young does it have? It this animal used by humans in any way? Why is this animal endangered? What changes are being made or can be made to help this animal survive?

2. **What can you do?** Children sometimes feel overwhelmed and saddened while they are learning about endangered species. This exercise is a way to help them learn that they can make a difference, that they have power, even as kids.
   - As a class, select an endangered species, from Oklahoma, or from the U.S. Fish and Wildlife Endangered Species List, available at the U.S. Fish and Wildlife Service website at: http://www.fws.gov/endangered/wildlife.html.
   - Answer the same questions from the above activity to determine the needs of the endangered species and the reasons for it to be listed.
   - Discussion questions: Why is this animal endangered? What can humans do to help this animal? What can our class do to help this animal? What do we want to do to help this animal?
   - As a class, make a chart with the suggestions, then have students discuss or vote on which solution they'd like to try. There are lots of simple things kids can do, from deciding not to use disposable chop sticks, to asking their parents to buy only sustainable harvested lumber, to a letter writing campaign to governmental leaders. Maybe the students even want to put together a presentation for the rest of their school about their animal and how they have decided to help save it. Small changes can make a difference.

Art

1. **Wanted Poster**. Wanted Alive and In Its Natural Habitat!
   - Select a species from the Endangered Species List (see above activities to obtain lists).
   - Design a wanted poster for that animal. But there's a catch – you actually *want* this animal in its natural habitat.
   - Information to include on you poster: a drawing of your animal, a description of your animal (what is looks like), the natural habitat of your animal, where it is found (region, state, or country), what your animal eats, and interesting facts about your animal.
   - Include a "Not Wanted" section on your poster listing the threats to your animal.
   - Place your posters in a hall way or other public area at your school or in your town.

Math

1. **Graph the Species**. Obtain a list of Endangered Species (see above activities to obtain lists). Have your students graph these data to better understand the levels of protection offered by both lists, and the kinds of animals that are listed.
   - *Graph One: levels of protection*. Count the numbers of species that are Endangered, Threatened, and of Special Concern. Make a bar graph with the levels of protection on the x axis and the numbers of individuals or species in each of the three categories on the y axis. Discussion: Why are there different numbers of animals in each category? Do you think there should just be one category?
   - *Graph Two: kinds of animals*. Count the number of animals and plants on the list, such as mammals, birds, reptiles, amphibians, birds, and invertebrates. Make a bar graph with the kinds of animals on the x axis and the numbers in each category on the y axis. Discussion: Which kind of animal has the largest number of endangered species? Why do you think this is? What kinds of habitats do those animals need?

Additional Resources

Oklahoma Department of Wildlife Conservation, Oklahoma's Endangered and Threatened Species and Species of Special Concern
http://www.wildlifedepartment.com/endanger.htm

U.S. Fish and Wildlife Service, Species Information Threatened and Endangered Animals and Plants Database
http://www.fws.gov/endangered/wildlife.html

World Wildlife Fund
http://www.worldwildlife.org/endangered/