Bye, Bye, Birdie

Student Activity

Method:

Students determine which factors should be considered in deciding the fate of endangered species. They then conduct research to find out about an endangered species and prepare a short presentation, justifying the preservation of the species.

Introduction:

Humankind is now precipitating the extinction of large numbers of animals, birds, insects and plants. Estimates are that without human influence, one species in a million would go extinct each year. Because of human activities, over 1,000 species out of a million go extinct each year. We stand a good chance of losing 20 percent of all species by the year 2020.[1]

Scientists believe that many of the species being lost carry untold potential benefits for the health and economic stability of the planet. With limited funding available for conservation, many believe that humanity should make some tough choices and decide which species can and should be saved.

In the following activity, students will develop a method for making these tough choices on wildlife preservation and compare the relative "value" of different species.

Procedure:

1. Before beginning the activity, be sure that your class is familiar with the concept of **biodiversity**, the measure of variety of living things and their ecosystems. Emphasize that biological diversity provides us with products (including pharmaceuticals, foods, materials for building and clothing, etc), as well as crucial **ecosystem services**, such as clean water, breathable air, natural climate control, and providing stability to the environment. While humans are drawn to plants and animals that appeal to our hearts or our sense of beauty, often the ones that are valuable to us are the species that are most unique, regardless of their size or appearance.

Then, working individually or in pairs, have students determine which factors should be considered before a decision is made to save a species or let it become extinct. They should list each reason they think is important and write a one-paragraph defense of each.

2. Students will now apply the criteria they developed. Working individually, students should "adopt" one of the endangered species listed in the attached document (make sure that each student "adopts" a different species). Give them time to research information about their species. The Web site of the U.S. Fish and Wildlife Service (www.fws.gov) contains extensive information about the ecology of most of these species.

The students should prepare a short presentation that describes the species, states its importance, and gives reasons why it should be preserved. Students should also discuss threats to the species' survival. These might include habitat destruction, poaching or overhunting, disease, lack of adaptability to changes in climate or other ecological systems, increase in numbers of predators or competitors, etc. If they have difficulty finding information on lesser-known species, students may wish to bolster their research by looking into similar species.

3. Divide the class into groups of 6-8 students. Students in each group will present their findings on their "adopted" species to the group. As the presentations are made, students should rate each species using the criteria developed in the first step of the activity. After the presentations, ask students if they would change the criteria they developed earlier after they researched their species and rated the others. Have students explain the changes they would make.

Concept:

The rate of wildlife endangerment is increasing. Difficult decisions are required to determine how to prioritize our efforts to save endangered species.

Objectives:

Students will be able to:

- Develop criteria that ecologists, wildlife managers, and public officials might use to make decisions about protecting endangered species.
- Conduct research on an endangered species through the Internet and other sources.
- Present their findings to the class, showing how their species measures up against the chosen decision criteria.

Subjects:

Biology, environmental science, language arts, civics

Skills:

Critical thinking, cooperation, research, writing, evaluation, public speaking

Materials:

Copies of Selected List of Endangered Species

Key Terms: Biodiversity, ecosystem services, indicator species, keystone species, umbrella species

4. As the final part of the activity, students must decide which species they will "save" and why. Analysis should focus on the relative possibility of success, examine the value of the species, and include less concrete factors such as the preservation or loss of beauty. In addition to the students' individual ratings, each group should try to reach consensus on which species should be "saved."

Follow-up Activities:

There are many endangered species of plants and animals throughout the United States. Students can contact the U.S. Fish and Wildlife Service (www.fws.org) or your state fish and game agency to obtain a list of threatened or endangered species in your area. Contacting a nearby nature center or natural history museum might also provide helpful information. Once students know which species are endangered in your area, they can research whether or not any efforts are being taken to protect the endangered animals or plants. Preservation projects could be initiated through your school, scouts, 4-H, nature clubs, or hunting and fishing clubs.

Using a map, have students identify areas where endangered species live. Looking for places with several species, they should then try to figure out why some of these species are endangered and what could be done to preserve the remaining animals.

Assessment Idea:

The student should be evaluated by the quality of his or her research and presentation and the coherence of his or her arguments in favor of or against preservation of endangered species.

SELECTED LIST OF ENDANGERED SPECIES

Species	Where found	Teacher's notes
Alabama cave shrimp	U.S.A.	Indicator[2] for water quality
American burying beetle	U.S.A.	Decomposer: helps remove decaying animals
Asian elephant	Southeast Asia	Important for domesticated use
Attwater's prairie chicken	Texas	Indicator for healthy coastal prairie, potential game animal
Black rhinoceros	Africa	Threatened by poachers, important for tourism industry
California condor	U.S.A.	Carrion eater: helps remove decaying animals
Cheetah	Africa	World's fastest land animal
Chinchilla	Bolivia	Valuable fur species
Chinook salmon	U.S.A.	Important food species for humans
Cracking pearly mussel	U.S.A.	Indicator species for clean water
Everglade kite	U.S.A.	Umbrella[3] species: eats snails, snails need healthy everglades
Giant panda	China	Umbrella species: undisturbed bamboo forest
Grizzly bear	U.S.A., Canada	Umbrella species: Needs wilderness
Humpback whale	Oceania	Important for tourism industry
Indiana bat	U.S.A.	Eats mosquitos and other insects
Karner blue butterfly	U.S.A.	Umbrella species: endangered savanna/barrens ecosystem
Kirtland's warbler	U.S.A., Canada	Umbrella species: scrub pine habitat, valuable for tourism
Mexican long-nosed bat	U.S.A.	Keystone[4] species: important pollinator for cactus species
Mountain gorilla	Africa	One of Homo sapiens closest relatives
Mountain sweet pitcher plant	U.S.A.	Indicator species for healthy wetlands, valuable for collectors
Nene goose	Hawaii	State bird of Hawaii
Piping plover	U.S.A., Canada	Requires undisturbed beaches for nesting
Przwalski's horse	China	Domesticated horses are descendants of this species
Red wolf	U.S.A.	Important predator
Scrub mint	U.S.A.	Potentially valuable for medicinal use
Snow leopard	Asia	Threatened by poachers
Utah prairie dog	U.S.A.	Keystone species: their towns offer habitat for other species
Vernal pool tadpole shrimp	U.S.A.	A living fossil: it has been around over 70 million years
West Indian manatee	U.S.A.	Helps keep seabeds from becoming overgrown
Whooping crane	U.S.A., Canada	Largest North American bird, important for tourism
Wood bison	Canada	Numerous historical uses for food, clothing, etc.

Endnotes

1. Wilson, E. O. (1992). *The Diversity of Life*. Cambridge, MA: Harvard.
2. An **indicator species** is one that shows the effects of habitat alteration before others. Miners used to bring canaries into coal mines because they acted as an indicator species. If the canary died, the miners knew the air was bad and that they should vacate the mine.
3. By protecting an **umbrella species**, ecologists are able to protect many other species that share the ecosystem. This is usually because the umbrella species requires a large area of undisturbed habitat, which is also good for the other species that share the habitat.
4. A **keystone species** is one whose presence is necessary for other species to survive and thrive. Often, the keystone species provides some ecological service that no other species can provide, such as pollinating a certain type of plant.