



Lesson Plan: Protecting Endangered Species

OVERVIEW:

This lesson plan is designed to be used in conjunction with the film *The Chances of the World Changing*, which chronicles the personal sacrifices and challenges faced by a New York writer who dedicates his time and resources to rescuing endangered turtles. This lesson will explore the interdependence of organisms in an ecosystem, identify what some private citizens are doing to protect endangered turtles, and discuss whether or not humans have an obligation to help endangered species.

Note: This film contains a couple of brief images of turtles being butchered in Asian food markets. Please preview before classroom use.

P.O.V. documentaries can be taped off-the-air and used for educational purposes for up to one year from the initial broadcast. In addition, P.O.V. offers a lending library of DVD's and VHS tapes that you can borrow anytime during the school year — FOR FREE!

OBJECTIVES:

By the end of this lesson, students will:

- Demonstrate how organisms in an ecosystem are interdependent and that numerous species are affected when an organism becomes extinct.
- Use viewing skills and note taking strategies to understand and interpret a video clip.
- Discuss and justify whether or not humans have a responsibility to protect endangered species.

GRADE LEVELS: 7-10

SUBJECT: Science

MATERIALS NEEDED:

- A large ball of yarn
- Nametag stickers
- Computers with Internet access.
- Handout: Viewing Guide (PDF file)
- Method (varies by school) of showing the class a video clip from the P.O.V. Web site of *The Chances of the World Changing*, or have a copy of the film and a VHS/DVD player and monitor.

ESTIMATED TIME NEEDED: Two 50-minute class periods

SUGGESTED CLIPS:

Clip 1: Meet Richard and His Collection (length: 5:28)

The clip begins at 3:57, just after the shot of NYC streets, then shows turtles in Richard's apartment and the intro narration begins. The clip ends at 9:25 with "...and defy their disappearance."

Clip 2: Uncertain Future for the Turtles (length: 2:13)

The clip begins at 1:08:00, just after the shot of pine trees and shots of home in South Carolina. The clip ends at 1:10:13 with "...we can try to save them."

BACKGROUND:

Turtles are native to every continent except Antarctica. Although the number of different species is relatively small (301), there is a great deal of variation within the species. Turtles have adapted to live in almost every climate and region of the world, from deserts to forests, freshwater creeks to oceans, and nearly every kind of habitat in between.

The adaptability of turtles has not insulated them from the threat of extinction. Twenty-eight percent of known species face significant threats, due to two primary causes: harvesting in the wild and the destruction of natural habitats. As many as half of all species are at some degree of risk. The International Union for the Conservation of Nature (IUCN), which tracks species facing extinction threats, lists 19 turtle species as critically endangered. Among those facing less severe threats, 33 are classified as endangered and 32 as vulnerable.

Harvesting for use by humans (as food, for medicinal purposes, or for sale as pets) is the greatest threat to turtle species in Asia, while the destruction of habitat is of greater concern in most other regions of the world.

The Turtle Conservation Fund, a partnership between IUCN and Conservation International's Center for Applied Diversity Science, has focused on assurance colonies as part of its overall strategy for protecting threatened turtle species. Assurance colonies preserve species in captivity while conservation efforts continue in the wild. Conservationists are also boosting biological research efforts to track species and coordinating further international efforts to enforce and augment the current protection regulations.

ACTIVITY:

1. Create a model of an ecosystem by having the class stand in a large circle around the classroom. Use a nametag sticker to label one person in the circle as "the sun" and give that student a ball of yarn. Use stickers to identify others in the circle as:

- "primary producers" (plants that photosynthesize like grass and algae)
- "primary consumers" (plant eaters like rabbits, snails, worms, insects, some turtles)
- "secondary consumers" (animals that eat primary consumers, such as frogs, fish, snakes, rats, some turtles)
- "tertiary consumers" (animals that eat secondary consumers, such as foxes, skunks, raccoons, snakes, fish, birds)
- "quaternary consumers" (animals that would eat tertiary consumers like hawks, wolves)
- "top predators" (animals with few or no natural enemies, such as alligators, bobcats, wolves, bears)

Note: In reviewing these trophic levels, point out that some organisms' positions in the food chain can vary as their diet differs. For example, a bear that eats berries would be a

primary consumer, but it would be a tertiary consumer if it ate salmon since salmon eat primary consumers, who in turn eat primary producers.

2. Explain that the class will now illustrate a food web. The student who represents the sun will now pass the ball of yarn, or its energy, to a primary producer, who then passes the ball of yarn to a primary consumer and so on up through the food chain. Students should continue to hold on to the yarn after they pass the ball on to the next person. When the ball of yarn gets to a top predator, cut the yarn so that one food chain is represented. Then, hand the ball of yarn back to “the sun” and begin a new food chain. Continue this process until each student is holding at least one piece of yarn and a food web composed of a number of food chains has formed.

3. Next, tell students that pollution has made it impossible for certain primary producers to grow. Ask two primary producers to drop their pieces of yarn and have those holding on to the yarn that was connected to those primary producers (except the sun) raise their hands. Point out the interdependence of organisms and who was affected by the loss of those primary producers.

4. Have the producers pick their yarn back up and then present another scenario. Tell the class that man has hunted down a primary consumer to such a degree that it is now extinct. Have a primary consumer drop his or her piece of yarn and have those connected to the primary consumer (except for the primary producer) raise his or her hand.

5. Ask the class to describe why all members of an ecosystem are important, and the impact on an ecosystem when one or more organisms become extinct. Then, have students return to their seats.

6. Explain that many species of turtles are threatened with extinction. The International Union for the Conservation of Nature (IUCN), which tracks species facing extinction threats, lists 19 turtle species as critically endangered. Among those facing less severe threats, 33 are classified as endangered and 32 as vulnerable. Tell students that the biggest threats to these turtles are rampant harvesting for use by humans (as food, for medicinal purposes, or for sale as pets) and destruction of habitat. Because some turtle species were disappearing so quickly, some private citizens began acquiring and housing endangered turtles in what they call “assurance colonies,” with the hope of repopulating the wild once the current threats to their existence have been eliminated.

7. Introduce the class to one such conservationist named Richard Ogust by showing the video clip, “Meet Richard and His Collection” (length: 5:28). Use the provided handout to focus student viewing.

8. After the clip, explain that Richard dedicated five years of his life and spent over half a million dollars working to preserve these turtles. Ask students if, funds permitting, they would be willing to make a similar commitment to helping endangered species. Why or why not?

9. Tell students that, eventually, the care and expense of Richard’s assurance colony became overwhelming and he was forced to find homes for his 1,200+ turtles with other private collectors. One person who took on some of Richard’s turtles is a man named

Cris who lives in South Carolina. Show the clip, “Uncertain Future for the Turtles” (length: 2:13).

10. Discuss student responses to the handout question for Clip 2. Do humans have an obligation to protect endangered species? Why or why not? How might today’s decisions affect the needs of future generations and the overall health of the world?

ASSESSMENT SUGGESTIONS:

Students can be assessed on:

- Participation in the food web activity.
- Completion of the Viewing Guide.
- Contributions to class discussion.

EXTENSIONS & ADAPTATIONS:

- Richard and the other turtle conservationists featured in *The Chances of the World Changing* were reacting to the rapid and widespread decline of freshwater turtle and tortoise species in Southeast Asia, a phenomenon collectively known as the “Asian Turtle Crisis.” Learn more about this situation from P.O.V.’s exclusive online interview with George Amato, Director of Conservation Genetics at the Museum of Natural History in New York City (www.pbs.org/pov/pov2007/chancesoftheworld/special.html). Then, have students conduct research to find out how many turtles from the United States are being harvested and sent to Asian food markets to satisfy demand. Which states have already taken action to protect turtles from over harvesting?
- After observing Richard’s love and respect for turtles in the film, have students read examples of “nature writing” and then try authoring pieces of their own. Naturewriting.com provides a great definition of nature writing, recommended reading materials, and ideas for getting started. In addition, the 900-page “Norton Book of Nature Writing” offers a collection of work from writers such as Henry David Thoreau, John Muir, Annie Dillard, and Barry Lopez.
- Use *Chances of the World Changing* as a case study for discussing how people, the environment, and the economy are inextricably linked at all levels from local to global.
- Have students consider why private collectors like Richard took on the responsibility of preserving endangered turtles. Should government be playing a bigger role in species conservation? Why or why not? Review legislation, such as the Endangered Species Act of 1973 (www.fws.gov/endangered/esa.html) and discuss whether or not appropriate laws are in place to address current needs.
- Explore the work of other conservationists, such as marine biologist Carl Safina, who provided a field journal of his work with sea turtles for P.O.V.’s *Borders: Environment* (www.pbs.org/pov/borders/2004/talk/cs.html).
- Discover what types of turtles or tortoises live in your region and find out if any are threatened or endangered by doing a search on the IUCN Red List of Threatened Species site (www.iucnredlist.org). Join or start community-wide initiatives to protect local turtle populations, or check out the U.S. Humane

Society's recommendations for Twelve Things to Do for Turtles and Tortoises (www.hsus.org/wildlife/a_closer_look_at_wildlife/turtles_and_tortoises/thirteen_things_to_do_for_turtles.html).

- Make connections between turtle conservation activities and local Earth Day events, or celebrate World Turtle Day on May 23rd. (See the U.S. Humane Society's Web site for details (www.hsus.org/wildlife/a_closer_look_at_wildlife/turtles_and_tortoises/celebrate_world_turtle_day.html)).
- Try an alternative activity with students to get them thinking about threatened and endangered species. The NOAA Fisheries Web site offers, The Game of Life lesson plan (www.nmfs.noaa.gov/pr/pdfs/education/kids_gameoflife.pdf) that outlines an activity using a ball that shows students how easily remaining animals in a species can perish when most of the population is gone.

RESOURCES:

Nature: The Reptiles: Turtles and Tortoises

www.pbs.org/wnet/nature/reptiles/turtles_tales.html

The Web site for the PBS series *Nature's* episode on "The Reptiles: Turtles and Tortoises" is a good resource for general information on turtles.

TRAFFIC

www.traffic.org

The Web site of the Wildlife Trade Monitoring Network is the central site for information on global trade and trafficking in wild plants and animals.

Turtle Survival Alliance

www.turtlesurvival.org

The Turtle Survival Alliance is a membership organization for people involved in sustainable captive management of freshwater turtles and tortoises. One of their conferences is featured in the film. The Web site reports on members' ongoing projects.

The World Conservation Union

www.iucn.org

The World Conservation Union's Web site features information on a wide variety of turtle conservation issues and initiatives. They also host a companion Web site, www.iucnredlist.org that is the most up-to-date list of the world's threatened species.

World Wildlife Fund

www.wwf.org

The Web site for the World Wildlife Fund includes species fact sheets as well as reports on the status of endangered species and programs currently in place to help those species.

STANDARDS:

These standards are drawn from "Content Knowledge," a compilation of content standards and benchmarks for K-12 curriculum by McRel (Mid-continent Research for Education and Learning) at www.mcrel.org/standards-benchmarks/.

Science

Standard 6: Understands relationships among organisms and their physical environment.

Level III, Benchmark 4: Knows how energy is transferred through food webs in an ecosystem (e.g., energy enters ecosystems as sunlight, and green plants transfer this energy into chemical energy through photosynthesis; this chemical energy is passed from organism to organism; animals get energy from oxidizing their food, releasing some of this energy as heat.)

Level IV, Benchmark 5: Knows ways in which humans can alter the equilibrium of ecosystems, causing potentially irreversible effects.

Standard 7: Understands biological evolution and the diversity of life.

Level III, Benchmark 3: Understands the concept of extinction and its importance in biological evolution (e.g., when the environment changes, the adaptive characteristics of some species are insufficient to allow their survival; extinction is common; most of the species that have lived on the Earth no longer exist).

Level IV, Benchmark 3: Knows how variation of organisms within a species increases the chance of survival of the species, and how the great diversity of species on Earth increases the chance of survival of life in the event of major global changes.

Language Arts

Standard 10: Uses viewing skills and strategies to understand and interpret visual media.

ABOUT THE AUTHOR:

Cari Ladd, M.Ed., is an educational writer with a background in broadcast journalism, secondary education, and media development. Previously, she served as PBS Interactive's Director of Education, overseeing the development of curricular resources tied to PBS programs, the PBS TeacherSource Web site (now PBS Teachers), and online teacher professional development services. She has also taught in Maryland and Northern Virginia.

Background Sources:

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http://www.conservation.org/xp/news/press_releases/2003/turtle_kit/turtlebrochure.pdf

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