Forestry in the Classroom Series

Endangered Species

An Educational Series for Grades 4, 5 and 6

What Does Endangered Mean?

According to the federal Endangered Species Act of 1973, an endangered species is "any species which is in danger of extinction throughout all or a significant portion of its range."

Endangered species are like fire alarms. They can tell us about problems in our home we call Earth. If we listen to their alarm calls, they could help us improve our lives and the health of our planet. An endangered species is one that is in immediate danger of becoming extinct and needs protection to survive.

Gray wolves are an endangered species in most of the lower 48 states. They once roamed widely across North America. As predators, they keep their prey in balance with nature by ensuring the prey species does not become over populated. Before people understood how important predators are to keep a healthy balance in nature, many wolves were killed.

A **threatened species** is one that is likely to become endangered if it is not protected. The African elephant, the largest land animal on Earth, is a threatened species. Having been hunted to near-extinction by ivory poachers, elephants are slowly recovering in a few regions of Africa. However, as their habitat shrinks and they come into greater conflict with people, they are becoming more and more vulnerable. Habitat loss and illegal poaching remain the biggest threats to elephant survival. Even though an international ban on elephant hunting was instituted in 1989, these magnificent mammals continue to be targeted for their ivory tusks.

The Endangered Species Act of 1973

Animals and plants have come and gone since life on earth began. However, habitat destruction and other causes of species' decline have accelerated the extinction rate. What used to take millions of years is now compressed into decades.

In the past, solutions seemed easy. When an animal or plant needed protection, laws were passed to prohibit killing or destroying it, or a refuge was established for it, or provi-sions were made to feed it through the win-ter months. In such manner the American buffalo, elk, antelope, and trumpeter swan were brought back from very low numbers to at least viable populations.

Now, far more complex factors threaten plant and animal life. In parts of the West, eagles are electrocuted when they perch on power transmission poles. In Florida, hatching sea turtles are lured into the cities because they mistake the reflected city lights for the starlit sky over the ocean. Salmon migrating upstream die from nitro-gen saturation caused by the compression of bubbles under power dam spillways.

Congress passed the Endangered Species Act in 1973 to help save species facing the risk of extinction. The U.S. Fish and Wildlife Service and the National Marine Fisheries Service became the designated federal agencies with responsibility for administering the law.

Destruction and degradation of habitat are currently the leading causes of extinction for both plants and animals. Clear-cutting forests near rivers can cause excessive *erosion*, and the increased silt in the waterways can suffocate fish. This caused the Michigan grayling, a trout-like sport fish, to become extinct in the 1920s.

What Causes Species to Become Endangered?

Habitat Destruction, Degradation, and Fragmentation. Once abundant throughout the Southeast, the red-cockaded woodpecker rapidly declined as its pine forest habitat was altered for a variety of uses, primarily timber harvest and agriculture. It nests and roosts exclusively in cavities of older, living pine trees.

Environmental Pollution. Endangered species often serve as indicators of environmental problems that may also affect people. A good example is freshwater mussels. Several mussels are endangered in large part due to pollution of the waterways where they live. Contamination commonly results from agricultural pesticide runoff, municipal sewage disposal, and industrial waste discharge.

Introduction of Exotic (Non-Native) Species. Introduced species can, if uncontrolled, increase and become a threat to other species of wildlife. Foxes released by Russian and American fur traders in the Aleutian Islands of Alaska nearly destroyed the Aleutian Canada goose.
Rats introduced by sailing ships to the Hawaiian Islands played havoc with nesting birds. Mongooses (African weasels) were imported to control the rats; but they, themselves, turned on nesting birds and were a serious factor in bringing near extinction to the nene goose.
In addition, diseases and parasites, introduced by international trade, have caused such disasters in America as Dutch elm disease and chestnut blight which have driven two native trees nearly to extinction.

Commercial Exploitation. Many early laws passed to protect animals and plants were poorly written and/or inadequately enforced. This made it relatively easy for rare, native plants such as some cactus, carnivorous orchid, and others to pass into commercial trade. The demand for exotic pets, such as parrots and other wild birds, has caused many of these species to become endangered. Also, some animal parts, such as those of bear species, rhinoceros, and tiger, are considered by some Asian cultures to have medicinal powers. The illegal wildlife trade is a very lucrative business, and the demand for these animal parts is a growing threat to their very survival. Elephants and many species of sea turtle are also endangered due in large part to the demand for ivory and turtle shell for jewelry and other wildlife products.

Natural Factors. Species that do survive exhibit a common trait, adaptability. The animal or plant that is able to change its requirements to fit changes in its environment holds the vital key to survival. Conversely, animals and plants that rigidly resist change, or specialize rather than adapt, are more vulnerable to extinction. The Everglade kite, for instance, feeds only on the apple snail; and the black-footed ferret of the Great Plains feeds almost entirely on the prairie dog. These species are precariously dependent on extremely narrow resources or habitats. They are comparable to people who have only one skill in a job market that is constantly changing.

The Human Factor. Some plants and animals will become extinct for reasons not yet fully understood by science. Some may die out regardless of what we can do for them. Extinction remains a fact of life on this earth. But a disregard for the many manmade factors contributing to destruction of our natural world could soon cause us to find our own survival in question. The fact is we do not know all of the functions of each species in our ecosystems and their effects on and potential benefits to man. That is why the Endangered Species Act is designed to protect all species in danger of extinction, not only those that we know a lot about and understand-otherwise we might discover their value only after it is too late. Inevitably, attempts to judge which species are worth protecting and which are not would be lacking, as we may never know enough information about the intricate web of life. Once a species is extinct there is no way to correct past actions to bring it back, but endangered means there's still time.

Endangered Species in Kentucky!

VIRGINIA BIG-EARED BAT

The Virginia big-eared bat is threatened by destruction and disturbance of its maternity and hibernation caves, and possibly by pollution. At the time of listing in 1979, the population was estimated at 3,500 bats. By 2000, it had grown to 18,442. Most of its essential caves have been protected by private and government agencies.

Kentucky supports one major hibernaculum (Stillhouse Cave) which is surveyed every odd year. The statewide population increased from 3,850 in 1992 to 5,105 in 2000.

SHORT'S GOLDENROD

Solidago shortii, commonly known as Short's goldenrod, is a species of goldenrod that is considered one of the rarest plants in the world. The only known populations of Short's goldenrod occur around the Blue Licks Battlefield State Park area of Kentucky and Harrison-Crawford State Forest in Indiana. It was listed on the Federal Register of Endangered Species on September 5, 1985, and was given a global rank of G1 (critically endangered) on February 29, 2000. Land was donated to the Kentucky State Nature Preserves Commission to create Blue Licks State Nature Preserve, an area dedicated to preserving Short's goldenrod. Today, the preserve hosts the Short's Goldenrod Festival; all proceeds from the festival fund efforts to preserve the plant.

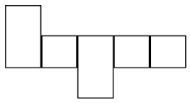
RED-COCKADED WOODPECKER

One of the few bird species endemic to the United States, the Red-cockaded Woodpecker is a bird of mature southern pine forests. Its preference for longleaf pine and the destruction of that habitat have resulted in the woodpecker becoming an endangered species. Historically, this woodpecker's range extended in the southeastern United States from Florida to New Jersey and Maryland, as far west as eastern Texas and Oklahoma, and inland to Missouri, Kentucky, and Tennessee. Due to the high importance of nesting habitat on the woodpecker's reproduction, much management has been dedicated to create ideal and more numerous nesting sites. Nesting clusters have been spared from forestry activity to preserve old-growth, large diameter trees.

RUNNING BUFFALO CLOVER

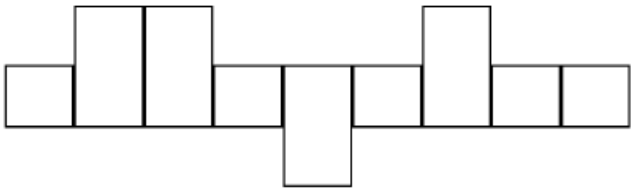
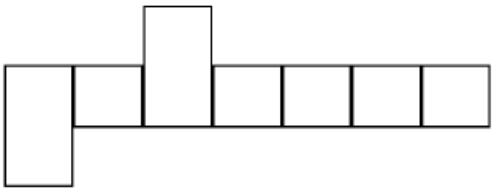
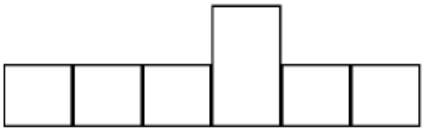
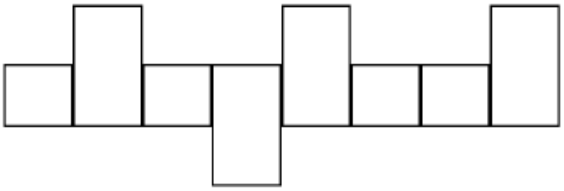
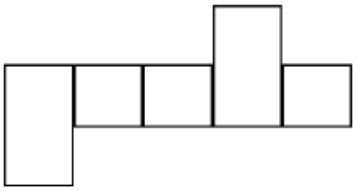
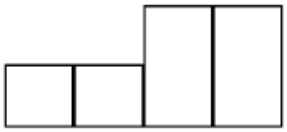
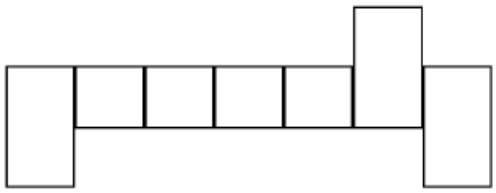
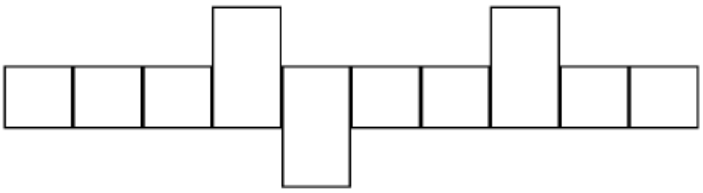
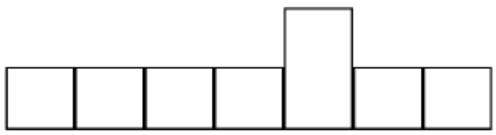
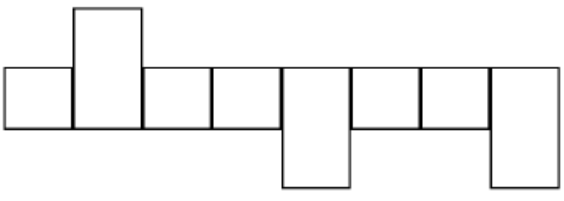
Running buffalo clover is found in Indiana, Kentucky, Missouri, Ohio, and West Virginia. Running buffalo clover may have depended on bison to periodically disturb areas and create habitat, as well as to disperse its seeds. As bison were eliminated, vital habitat and a means of seed dispersal were lost. Clearing land for agriculture and development has led to elimination of populations, loss of habitat, and fragmentation of the clover populations that remain. Small, isolated populations of running buffalo clover are prone to extinction from disease, and inbreeding. Invasive non-native species, such as white clover, garlic mustard, and Japanese honeysuckle outcompete running buffalo clover for moisture, nutrients, space, and sunlight.

Word Shape Puzzle

Write each of the following words in the box that matches the letter shapes of that word.
For example, **tiger** would look like 

Word List

American **alligator**	brown **pelican**	California **condor**
elephant	giant **panda**	gray **wolf**
grizzly bear	**manatee**	red-cockaded **woodpecker**
whooping crane		

Success Stories

AMERICAN ALLIGATOR

Scientific research has worked well in many cases, and some endangered species have come back. The American Alligator is an example of a success story. The unregulated killing for the exotic leather trade threatened this reptile with extinction. In 1987, it was taken off the endangered species list, due to the efforts of many agencies working together to save it from over exploitation.

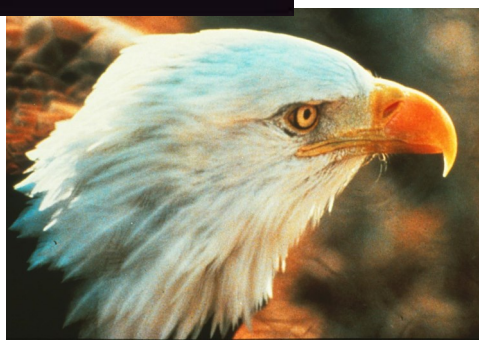
KIRTLAND'S WARBLER

Kirtland's warbler (Dendroica kirtlandii) was described in 1851 and the first nest was discovered in 1903 in Michigan. Until 1996 all known nests were within 60 miles of this site. Kirtland's warblers nests in grasses and shrubs below living tree branches in jack pine forests that are five to ten years old. This early stage habitat was historically maintained by fire. By 1951, however, the warbler had been reduced to 432 pairs due to fire suppression and nest predation by brown-headed cowbirds.

Over 150,000 acres of jack pine forest is designated for Kirtland's warbler management on state and national forests. These forests are managed by logging, burning, seeding, and replanting on a rotational basis to consistently provide approximately 38,000 acres of productive nesting habitat. The total population remained at about 200 pairs through 1989, began to increase in 1990, and grew steadily to a preliminary count of 1,701 territorial males 2007.

GRAY BAT

The gray bat (Myotis grisescens) is primarily found in Alabama, northern Arkansas, Kentucky, Missouri, and Tennessee. About 95% of hibernating bats are found in just eight caves: two in Tennessee, three in Missouri, and one each in Kentucky, Alabama and Arkansas. Because gray bats are found in just eight caves, disturbance and vandalism of maternity and hibernacula caves is the main threat to the species. After listing in 1976, the number of gray bats continued to decline to a low of 1.5 million in 1992, but numbers then began to increase and reached 2.5 million in 2003 when the U.S. Fish and Wildlife Service announced an intent to down list the species.

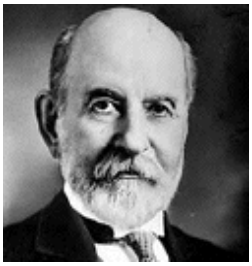


BALD EAGLES

Bald eagles are another great success story, and a good example of how we need to keep our environment clean and free of dangerous pesticides. With efforts to protect eagle habitat, ban DDT and reintroduce eagles into former habitat, the number of nesting pairs in the lower 48 states has increased from 450 in the 1960's to over 4000 now. In Kentucky, it's estimated that there are about 50 pairs that live in the state year-round. That compares to just one known nesting pair in Kentucky about 20 years ago.

Some people worth knowing about…

William Hornaday: 1854—1937



In 1886, William Hornaday traveled to Montana to collect American Bison specimens for the National Museum. It was widely believed that the bison would soon be extinct. After seeing the devastation to the once large herds, Hornaday dedicated his life to conserving this species. He is also credited with saving the Alaskan fur seal from extinction. He influenced the passage of laws and treaties that saved egrets, ducks and other migratory birds from extinction.

Rachel Carson: 1907—1964

Carson began her career as a biologist in the U.S. Bureau of Fisheries, and became a full-time nature writer in the 1950s. In the late 1950s, Carson turned her attention to conservation and the environmental problems caused by synthetic pesticides. The result was *Silent Spring* (1962), which brought environmental concerns to an unprecedented portion of the American public. *Silent Spring* spurred a reversal in national pesticide policy—leading to a nationwide ban on DDT and other pesticides—and the grassroots environmental movement the book inspired led to the creation of the Environmental Protection Agency. This helped prevent the extinction of bald eagles, peregrine falcons, and other birds.

R.D. Lawrence: 1921—2003

R.D. Lawrence, concerned himself with the environment and with the study of wildlife and plants. His contribution to our understanding of nature through his long-term field studies and award-winning publications was significant and continues to receive international acclaim. But perhaps RD Lawrence's greatest legacy is to articulate nature's example in story form so that we humans might transform ourselves. He helped establish Haliburton Forest and Wildlife Reserve Wolf Centre. One of his greatest goals was to dispel myths regarding wolves. He is the author of many books on animals, especially wolves.

Jane Goodall: 1935—present

In July 1960, at the age of 26, Jane Goodall traveled from England to what is today Tanzania and bravely entered the little-known world of wild chimpanzees. She was equipped with nothing more than a notebook and a pair of binoculars. She managed to open a window into their lives. The public was fascinated and remains so to this day. Today Jane's work revolves around inspiring action on behalf of endangered species, particularly the chimpanzee. She founded the Jane Goodall Institute in 1977. The Institute is a global nonprofit that empowers people to make a difference for all living things.

Endangered species is an international topic. We all live on the same planet. Try to find these words that relate to the topic of endangered species. Look up any words you don't know in a dictionary to find their

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ES **ACT** • **Biologist** • **Captive** • **Degradation** • **Disease** • **Diversity** • **Ecosystem** • **Endangered** • **Exploitation** • **Exotic** species • **Extinct** • **Habitat** • **Humans** • Illegal **killing** • **List** • **Migration** • **Old-growth** forest • **Pesticides** • **Pollution** • **Predator** • **Prey** • **Refuge** • **Reintroduction** • **Species** • **Threatened** • U.S. Fish & **Wildlife** • **Wetlands** •

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