



How Veterinarians and American Zoos Help Endangered Species

A teacher resource
developed by the
American Veterinary Medical
Association
www.avma.org



Why have a teacher guide?

The goal of AVMA-sponsored 4th-6th grade learning activities is to heighten awareness of the vital role that veterinary medicine plays in the lives of humans, animals, society, and the environment. This initiative has five objectives:

- To teach children that there is an inseparable relationship between animals and humans
- To teach children that veterinary science makes vital contributions to our world
- To teach children that veterinary science significantly impacts their lives every day
- To interest young students in a career involving biology, mathematics, and applied science
- To promote a greater understanding of the scope of veterinary medicine

What is an endangered species?

Endangered species are animals or plants at immediate risk of extinction because of habitat loss, pollution, introduction of other species, or over-exploitation. Animals currently facing extinction include one-third of all the earth's amphibians, nearly half of all freshwater turtles, one in eight species of birds, and one in four mammals. There are also more than 8,000 plant and algae species on the verge of extinction.

What is the *Endangered Species Act*?

The *Endangered Species Act* (ESA) of 1973 currently protects more than 1,200 U.S. plant and animal species found on Federal lists as endangered or threatened with the possibility of becoming endangered. These lists are the List of Endangered and Threatened Wildlife and the List of Endangered and Threatened Plants. An "endangered" species is one that is at risk of extinction throughout all or a significant portion of its range. A "threatened" species is one that is likely to become endangered in the foreseeable future. The National Wildlife Service also maintains a list of U.S. plants and animals that could eventually be added to the federal list.

What laws protect endangered species?

There are international and U.S. laws in effect that offer protection to endangered species. Depending upon the country creating the law, it may be a crime to capture or kill listed species, fail to act to recover them, or harm their habitat or range. More information about laws in the United States is available at www.fws.gov/endangered/wildlife.html.

What is the IUCN and what does it do for endangered species?

The International Union for the Conservation of Nature and Natural Resources (IUCN) is the world's largest and most important conservation network. Use of the name "World Conservation Union" began in 1990, but the full name and the acronym still appear together as many people continue to know the Union as IUCN.

The IUCN-World Conservation Union maintains a record called the *Red List* of the world's species threatened with extinction. The *Red List* now includes 16,306 species—more than 7,800 animals and more than 8,400 plants—that are critically endangered, threatened, or vulnerable.

What is the role of zoos in protecting endangered species?

The *Endangered Species Act* of 1973 brought public attention to the rate of loss of the world's animals and birds. In response, the American Association of Zoos, Parks, and Aquariums started the *Species Survival Plan* to improve genetic variety and ensure the survival of endangered species. By the year 2000, 200 survival plans were up and running. Zoos began creating more natural enclosures to house larger groups of animals and improve reproduction rates. Zoo veterinarians play a vital role in monitoring the health of captive animals, in disease research, and in the breeding of endangered species. Zoo veterinarians use artificial insemination, embryo transfer, in vitro fertilization, and simpler techniques, like hatching eggs of endangered birds in the lab to promote reproduction. As a result, today's zoos offer many beautiful, natural habitat exhibits and veterinarians continue their efforts to protect and promote populations of endangered species.

What else is being done to protect endangered species?

Recovery programs are now in place in many zoos to determine the actions needed to save a species from extinction. In the United States and many other countries, these programs help preserve species through

- habitat restoration
- captive breeding efforts
- assisted reproduction efforts
- field research into behavior and reproduction

Saving endangered species in captivity and in the wild involves help from experts in many fields. Wildlife biologists, ecologists, veterinarians, geneticists, behavioral biologists, reproductive biologists, environmental educators, captive breeding specialists, geographic information specialists, environmental policy makers, reserve managers, and legislators all work together to develop recovery plans.

One example of zoo veterinarians assisting wild and endangered species:

The Paul Harter Veterinary Medical Center (HVMC) is a state-of-the-art animal hospital located at the Wild Animal Park (San Diego). It has treatment rooms, a central surgery room, intensive care wards, and a special area where X-rays are taken on small and large animals. There are also individual rooms for animals waiting for treatment or recovering from surgery—complete with windows or skylights and even outdoor sunbathing areas!

Some of the zoo animals are too big for treatment in the HVMC. Adult elephants, giraffes, and rhinos are treated in their own field exhibits. In fact, San Diego Zoo veterinarians prefer to make "house calls" whenever possible, and that's how most of the park's animal residents are treated. The veterinarians' trucks are equipped just like a mobile hospital, with most of the supplies needed to help care for sick or injured animals. Like humans, animals are more comfortable in their own familiar surroundings, but they can be brought to the HVMC if they cannot be treated safely "at home."

What other areas are under study at American zoos?

- Habitat conservation:
 - Protect, study, and manage the natural areas that support plant and animal communities
 - Develop new conservation programs that utilize flagship species to protect associated habitats
- Restoration biology:
 - Revitalize functional ecosystems by restoring species to the wild
 - Develop and optimize release programs, including evaluation of sites, candidates, and strategies
- Wildlife health:
 - Enhance the health and well-being of captive and wild populations through research
 - Identify and characterize new pathogens and develop appropriate prevention and control methods and strategies

Enrichment Ideas for this curriculum:



The timeline on your poster has examples of discoveries that help veterinarians treat animals and physicians treat humans. Consider extending this lesson using this timeline.

1851— A French veterinarian, Dr. Tabourin, improved the hypodermic syringe to make it a more effective tool for veterinary surgeons and physicians. This medical invention made it possible to give injections to animals and people to treat or prevent disease.

1954—Tranquillizers were developed for use on animals and humans. When a person or animal is hurt, tranquilizers calm them down so doctors can treat their injuries.

Timeline activity: Ask students to create a similar timeline by researching facts about endangered species. Answer questions such as:

- When did people begin worrying about the decline in animal populations?
- What laws are in place and when were they enacted?
- What organizations (zoos, the AVMA, the IUCN, etc.) care about declining animal populations?
- What dates can they add relating to these organizations (i.e., when were they founded and what major reports have they created or conferences have they held)?

The screenshot shows the Saint Louis Zoo website page for Polar Bears. The page includes a navigation menu with links like Home, Your Visit, Animals, WildCare Institute, Education, Events, Membership, and Support the Zoo. The main content area is titled 'Polar Bear' and contains several sections: a table with facts (Range, Habitat, Conservation Status, Scientific Name), a paragraph about their natural habitat, another paragraph about their adaptation to cold, a paragraph about their social behavior, and a section titled 'The Crisis of Melting Sea Ice'. A red circle highlights a section titled 'The Zoo is Helping Polar Bears' which mentions the zoo's participation in the Species Survival Plan (SSP) for polar bears.

www.stlzoo.org/animals/about_theanimals/mammals/carnivores/polarbear.htm

Veterinarians at the St. Louis Zoo are helping to save endangered species. Ask students to research and report on what is being done there for polar bears.

Research different zoos for examples of their work with endangered animals.

Glossary:

Amphibian — an animal capable of living both on land and in water

Captive breeding — process of breeding rare or endangered species in human controlled environments with restricted settings, such as wildlife preserves and zoos

Climate change — variations in weather in a region over long periods of time using parameters such as temperature and rainfall to measure shifts in the environment

Clinical pathologist — a medical doctor or veterinarian responsible for the diagnosis of diseases based on the analysis of body fluids like blood or urine

Conservation — the protection, preservation, management, or restoration of wildlife and of natural resources such as forests, soil, and water

Ecology — the science of the relationships between organisms and their environments

Flagship — the most important or leading member of a group

Genetics — branch of biology that deals with heredity, especially the mechanisms of hereditary transmission and the variation of inherited characteristics among similar or related organisms

Habitat — area or environment where an organism or ecological community normally lives

Pathogen — an agent that causes disease, especially a living micro-organism such as a bacterium or fungus

Physiology — the study of the functions of living organisms and their parts

Reintroduction — the deliberate release of animals from captivity into the wild, usually involving species that are endangered or extinct in the wild

Vulnerable — at risk of physical or emotional injury

Additional Resources:

www.wildlifedisease.org Wildlife Disease Association
www.aazv.org American Association of Zoo Veterinarians
www.aza.org/ConScience/ConScienceSAGFact/ Association of Zoos and Aquariums
www.cres.sandiegozoo.org/ Conservation and Research for Endangered Species
www.dsc.discovery.com/convergence/planet-earth/planet-earth.html Planet Earth Videos
www.sandiegozoo.org/zoo/ex_polar_bear_plunge.html Polar Bears
www.stlzoo.org/animals/abouttheanimals/mammals/carnivores/polarbear.htm Polar Bears
www.sandiegozoo.org/zoo/index.html San Diego Zoo
www.nationalzoo.si.edu/default.cfm Smithsonian National Zoo
www.fws.gov/endangered/wildlife.html U. S. Fish and Wildlife
www.nwrawildlife.org/home.asp National Wildlife Rehabilitators Association
www.stlzoo.org/animals/veterinaryhospital/ Veterinary Hospital St. Louis Zoo
www.sandiegozoo.org/wap/ex_harter_vet_hospital.html Paul Harter Veterinary Medical Center
www.fws.gov/endangered/kids/html/000.htm - U.S. Fish & Wildlife Service site
www.kidsplanet.org/factsheets/map.html Fact Sheets on Endangered Species
www.endangeredspecie.com/ Endangered species activities and information
www.amnh.org/nationalcenter/Endangered/ Exhibition of endangered animals
www2.lhrc.org/pocantico/5thgrade99/animals.htm 5th grade stories about endangered animals
www.multcolib.org/homework/animhc.html Library of animal information
www.ecovetinternational.com Veterinarians in ecosystem health and wildlife conservation

Student Activities:

4th Grade Activity Sheet: *Endangered Animals Right Here*: The students will determine how many endangered species currently exist in each state and graph their findings.

5th Grade Activity Sheet: *Interesting Facts About Polar Bears*: The students will work cooperatively in small groups to learn five facts about polar bears from library and/or Internet research and share the facts with the class.

6th Grade Activity Sheet: *Zoos Helping Endangered Species*: The students will research what veterinarians in zoos are doing to prevent extinction of endangered animals using the impact of climate change on polar bears as one example.

Vocabulary Cross Word Puzzle Activity Sheet: The student will demonstrate knowledge of the vocabulary words by correctly solving a crossword puzzle using the definitions of each word as clues.