

# Spotlight on... Endangered Species!



**Grades 2 & up**

**Special exhibits, artifacts and  
presentations select days in November 2009!**

**Nov. 5 & 6**

**Nov. 12 & 13**

**Nov. 19 & 20**



**SPOTLIGHT ON ENDANGERED SPECIES**  
**Getting the Most From Your Visit**

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SPOTLIGHT ON ENDANGERED SPECIES  
Getting the Most From Your Visit

## Endangered Species Days (10:00-1:00) November 5-6, 12-13, 19-20

Our **Spotlight on Endangered Species** is the perfect way to help your students understand the impact human actions can have on the survival of plants and animals!

Although students are familiar with actions that conserve our land-based plants and animals, they are less aware of personal conservation actions that can help to save marine life. During this special event, featuring a series of staffed learning stations throughout the Aquarium, your students will come nose-to-nose with living creatures while learning about the threats – and small, day-to-day remedies – that can help to conserve species and even ecosystems.

Featured animals include sharks, seals, otters, and a variety of fishes and invertebrates, in addition to the amphibians at our new permanent frogs exhibit. The embodiments of some of the terrestrial conservation success stories—a live wolf and/or various birds of prey—will make special appearances on select days during this special event.

In addition to our educator-led presentations, self-directed activities have been developed to support *state science standards* for Connecticut and New York. Through the Aquarium's living exhibits and Endangered Species Learning Stations, students can observe the structures and behaviors of animals that help them survive in different environments. The Learning Stations will help them understand the importance of interdependencies in ecosystems and show them how changes in the environment cause some organisms to survive and others to die or move to other locations. Emphasis will be on how human actions can affect the survival of animals. (Make sure to supplement your visit with your own school curricula involving these science standards.)

We've created Critter Cards, as a tool students can use to guide them through the Endangered Species Learning Stations described on page 3. Be sure to have your students bring *pencils and clipboards*, so they can record their observations and complete the questions posed at learning stations and in the Critter Card.

Complete your visit, by seeing the ***Tropical Rainforest*** (10 AM, 11AM, 12 NOON) at the IMAX Theater!

**NOTE: Be sure to print out & bring copies of the Trail Map & Critter Cards for your students!**

## SPOTLIGHT ON ENDANGERED SPECIES Getting the Most From Your Visit

# On the Day of Your Visit

### Did You Know...

Endangered species are those at immediate risk of going extinct. The primary factors leading to species becoming endangered include habitat loss, pollution, introduction of other species and overexploitation. Facing extinction are: one-third of amphibians, nearly half of all freshwater turtles, one in eight birds, and one in four mammals, as well as more than 8,000 plant and algae species.

### Meet & Greet

Upon your arrival at the Aquarium, you will be escorted into Oyster Hall. There, an Aquarium educator will meet with your class and give you:

- An overview of our Endangered Species Program
- Tips on how to get the most out of your visit
- Suggestions on how to efficiently navigate through the exhibits to visit all the Learning Stations

### Conservation Symbols

Throughout The Aquarium you will see these symbols posted by various exhibits. They are there to alert you to the conservation status of an animal in the exhibit.



**Extinct:** Species no longer living or existing. For every species that is alive today, perhaps 1,000 more have lived previously and become extinct. Most of these extinctions occurred before humans evolved, and we know the species only through fossils. Extinctions are a natural part of evolutionary processes, but through most of the history of life on Earth, biological diversity has been increasing. Periodically, however, major changes in the conditions on Earth have caused the collapse of living systems, and large percentages of species have become extinct. These species will never return.

**Endangered:** Endangered species are those at immediate risk of going extinct. The primary factors leading to species becoming endangered include habitat loss, pollution, introduction of other species and overexploitation.

**Threatened:** Any species likely to become an endangered species within the foreseeable future.

**Special Concern:** Any species for which a welfare concern, or risk of becoming endangered, has been documented; species that have a naturally restricted range or habitat and are found to be at too low a population level to be self-sustaining.

**Recovering:** The process by which the decline of an endangered species is arrested or reversed and threats removed or reduced, so that the species' survival in the wild can be ensured for the foreseeable future.

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# Learning Stations

Below are brief descriptions of the Learning Stations and related websites. On the Trail Map, starred stations will have a presentation by an educator. Numbered stations are self-directed activities spotlighting environmental factors that impact species survival..

### WE'RE ALL CONNECTED - EDUCATOR-LED PRESENTATIONS

**At these stations, educators will lead discussions about the relationships between species and their ecosystems. The importance of predators and prey in ecosystems will be explored with students.**

#### HS - Harbor Seals and Other Marine Mammals

The population of harbor seals in Long Island Sound is healthy, but many other marine mammals around the world aren't as fortunate. For example, the West Indian manatee is now in severe danger of extinction. In 1989, the estimated manatee population in Florida was 1,200. The following year over 140 manatees died. Human causes were responsible for 75% of these deaths, and the single biggest cause of deaths was attributed to being hit by boats. Manatee reserves have been set up, but death rates are still high. Manatees give birth only every three years or so. Find out what measures must be taken to prevent manatees from becoming extinct.

#### BB - Back From The Brink

We've arranged to have some special guests! Here you'll have a chance to get "up close and personal" with live ambassador animals of recovering species. You'll find out first hand what it takes to save an endangered species.

#### O - Otters

Our river otters are not an endangered species, but their marine "cousins" are in trouble. Sea otters are an example of a species that needs to have its ecosystem protected in order for it to survive. Is it too late already, or is there still time to save them and their kelp forest ecosystem?

#### S - Sharks

Sharks have been in the earth for hundreds of millions of years. But they are now disappearing from oceans throughout the world. Is it too late to save them? Should we care? At this station, your students will have a chance to separate shark facts from fiction and to learn about another marine predator that is now on the road to recovery.

## SELF-DIRECTED INTERACTIVE LEARNING STATIONS

### 1. Welcome / Information Station

Learn about the various conservation status symbols you will encounter throughout your visit. You'll have a chance to see mounted specimens of some special endangered species. This is where your students can turn in their completed **Critter Card**. As they visit each station, they can check for information about their specific critter, record observations and answer questions about what they see. It's also an opportunity for students to qualify for our website honor roll: "Kids Who Care".

#### Kids Who Care

- This is where your students find out how a single individual can make a difference. We'll show them what other students throughout the world have done. Then we'll ask them if they care enough to take action. There are many ways to effect change and we'll help your students select actions they can take to prevent currently endangered species from joining the passenger pigeons! Students who take a Kids Who Care Pledge will receive a sticker acknowledging their

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pledge. Students who complete a Critter Card, or Student Survey card, are eligible for our “Kids Who Care “ online honor roll where we will post their name along with their school.

#### 2. Reef Fish (Invasive Species)

Invasive species impact nearly half of the species currently listed as Threatened or Endangered under the U.S. Federal Endangered Species Act. Essentially, invasive species reduce biodiversity by outcompeting native species for resources and thereby eliminating them from the genetic pool, which reduces the larger diversity of species. Find out how you unintentionally may be aiding the spread of some of these destructive species.

#### 3. Shortnose Sturgeon (Pollution)

The pollution of rivers and streams with chemical contaminants has become one of the most critical environmental problems of the century. Many human activities can pollute rivers. Industry, housing, agriculture, horticulture, transport and discharges from the many disused mines can all affect water quality. Pollution has been a contributing factor in the loss of 29 percent of our freshwater animal species over the last 35 years. In addition to pollution, shortnose sturgeon populations in North America have declined due to overfishing, loss of habitat and limited access to spawning areas.

#### 4. Timber Rattlesnake (Loss of Habitat)

Indiscriminate killing, illegal collection and loss of habitat due to human development have resulted in the severe decline of timber rattlesnake populations. This species has been eliminated from many part of its historic range. Disturbance by humans and lack of suitable den sites appear to be the major limiting factors for rattlesnakes in Connecticut. The timber rattlesnake was probably very wide spread in colonial times as evidenced by the many land features named “rattlesnake”. Once documented in over 20 towns in CT, it is now limited to isolated populations in just 10 towns.

#### 5. Jellies (Out of Balance)

From Spain to New York, to Australia, Japan and Hawaii, jellyfish are becoming more numerous and more widespread, and they are showing up in places where they have rarely been seen before, scientists say. The faceless marauders clog fishing nets and sting swimming children, forcing beaches to close. But while jellyfish invasions are a nuisance to tourists and a hardship to fishermen, for scientists they are a source of more profound alarm, a signal of the declining health of the world’s oceans. “These jellyfish near shore are a message the sea is sending us saying, ‘Look how badly you are treating me,’ ” said Dr. Josep-Maria Gili, a leading jellyfish expert, who has studied them at the Institute of Marine Sciences of the Spanish National Research Council in Barcelona for more than 20 years. The explosion of jellyfish populations, scientists say, reflects a combination of severe overfishing of natural predators, like tuna, sharks and swordfish; rising sea temperatures caused in part by global warming; and pollution that has depleted oxygen levels in coastal shallows.

#### 6. Sea Turtles (Bycatch)

Bycatch refers to unwanted and untargeted fish, sponges and other marine life unintentionally caught in fishing gear and discarded overboard. These animals come up dead or dying and unlikely to survive. Sea turtles are frequently caught in shrimp nets and unintentionally drowned. Find out how the development of the Turtle Excluder Device has helped turtles survive these deathtraps.  
<http://www.cccturtle.org/>

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# Preparing Students to Participate

### Discussion Topics

1. Why are there laws to protect endangered animals and marine mammals?  
(See: The Endangered Species Act and Marine Mammal Protection Act)

2. In addition to the animals normally on view at the Aquarium, there will be Learning Stations with live endangered animals. Discuss reasons for captive wildlife: education, research, propagation for release in the wild, entertainment, rehabilitation. Are any of the reasons better than others (student opinion and discussion)? Why are the animals they will see in captivity? Why are the people with the animal qualified to have it? How will the animals react to you? Discuss the behavior students are expected to display while at The Maritime Aquarium and the reasons why (such as animal's comfort, student safety, courtesy to presenter, etc).

3. Are there “good” animals and “bad” animals?

Read stories about animals with image problems such as sharks, snakes, bats and wolves.

### Research

Review profiles of selected endangered species to find out basic natural history of an animal and learn how it lives in the wild (see “Links”)

- Eating habits (how, what, when, frequency, quantity)
- Home range or territory size
- Type of habitat needed
- Is the animal social or solitary (group sizes, how groups are formed)
- Communication
- Daily activity patterns, annual activity patterns
- Time of year born, how many to a litter, age to maturity
- Length of life
- Size, weight
- Evolution/Taxonomy
- Adaptations for their lifestyle and environment
- Geographic range of species
- Status of species in the wild: if declining, stable or increasing, why?
- Relationship to other species/ecological contributions to environment
- What stories are told about the animal? How is it portrayed in books, movies, advertising, etc.?
- Does it appear in logos or as a mascot and what's implied by the use of the animal as a symbol?
- Do other cultures view the animal differently than we do?
- What cultural values are underscored by our portrayal of the animal?

### Discuss Learning Stations

- Review our **Glossary** of terms and concepts related to endangered species.
- Review the **Learning Station** descriptions and visit related websites for background information.
- Have students make a list of questions to ask presenters at specific Learning Stations.

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## Follow-up Activities

### Spread the Word

It all starts with awareness. The Maritime Aquarium's Spotlight on Endangered Species is one of its many educational programs designed to increase awareness about the conservation status of our plants and animals. Tell your students it's their turn to spread the word! By studying hard at school, staying informed and involved and sharing what they have learned with family and friends, they can become one of the "Kids Making a Difference". The following website shows how Canadian kids have made a difference.

<http://www.wwf.ca/satellite/wwfkids/Projects2006.htm>

### Classroom Activities

Visit the websites listed with the descriptions of the Learning Stations to access a wealth of standards-based classroom activities related to the focus of the learning station.

**Illustrate the history of the decline of a species through a collage or computer design.** Make a pictorial timeline showing the factors that affected the species' population (for example, commercial hunting, the ivory trade, and habitat loss for elephants), either by hand or with your computer.

<http://worldwildlife.org/gorillas/subspecies/mountainTimeline.cfm>

**Monitor and support a recovery plan for a threatened or endangered species in the U.S.** Review the list of Connecticut's endangered species. Contact the United States Fish and Wildlife Service and ask them what is being done to help recovery of one of these species. Ask the agency for a copy of the applicable recovery plan, and find out whether it is being implemented. If not, find out why not.

<http://northeast.fws.gov/Endangered>

### Sea Turtles, A Journey for Survival

This site provides a file you can download with activities for a complete classroom sea turtle learning unit.

[www.seaturtle.org/documents/Educators\\_Guide.pdf](http://www.seaturtle.org/documents/Educators_Guide.pdf)

### Investigate illegal trade in wildlife and wildlife parts

Find out how international laws regulating wildlife trade are enforced and if the enforcement is successful. Think of things to do that would help to decrease illegal wildlife trade. Develop a list of things you, government agencies or private organizations can do to reduce illegal wildlife trade. Then convey your suggestions to the appropriate agency or group.

<http://www.traffic.org>

### U.S. Fish and Wildlife Videos

Order online at the USFWS website or send away for a USFWS video to view in your class. Then discuss why such videos have been made.

<http://www.fws.gov/video/>

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## Links

There is an enormous amount of information on the Internet. These are just a few of the many quality sites you may want to explore. Most of them include additional links to other relevant sites.

### General Conservation

<http://www.iucn.org>

The World Conservation Union IUCN RED LIST (The Inter. Union for the Conservation of Nature & Natural Resources)

<http://endangered.fws.gov/>

US Fish and Wildlife Service, Endangered Species Program

<http://dep.state.ct.us/burnatr/wildlife/learn/esfact.htm>

Fact sheets about many of Connecticut's Threatened and Endangered Wildlife species

<http://dep.state.ct.us/burnatr/wildlife/learn/kids.htm>

Activities, pictures and fun facts for kids

<http://northeast.fws.gov/Endangered>

List of CT endangered and threatened species

<http://www.kidsplanet.org/factsheets/map.html>

Defenders of Wildlife kids' site with excellent overview of the Endangered Species Act in easy-to-understand language

<http://www.worldwildlife.org/endangered/index.cfm>

World Wildlife Fund

<http://www.traffic.org>

TRAFFIC's mission is to ensure that trade in wild plants and animals is not a threat to the conservation of nature

<http://www.endangereearth.com>

Bagheera provides more information about the endangered species issue, or a way to take action

<http://www.enature.com/main/home.asp>

This encyclopedic National Wildlife Federation nature site includes online field guides to America's plants and animals

<http://www.nationalgeographic.com/education/>

Find out how scientists get the evidence to help solve crimes against endangered animals

<http://www.mnh.si.edu>

The Smithsonian's National Museum of Natural History

### Oceans

<http://www.montereybayaquarium.org/cr/seafoodwatch.asp>

Monterey Bay Aquarium Seafood Watch Program

[http://overfishing.org/pages/guide\\_to\\_good\\_fish.php](http://overfishing.org/pages/guide_to_good_fish.php)

Guides available throughout the world

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<http://www.msc.org>  
Marine Stewardship Council

<http://www.pewoceanscience.org/>  
Pew Institute for Ocean Science

<http://www.seaworld.org/infobooks/Endangered/home.html>  
Site from Sea World with info on endangered animals, laws, organizations, books for kids, and more

[http://www.fishandkids.org/show\\_play.php?css=large&id=62](http://www.fishandkids.org/show_play.php?css=large&id=62)  
Fish and Kids

### Selected Species

**Bald Eagle**  
<http://www.windoverwings.com/>  
Eagle Conservation

<http://eagleconservationalliance.org/>  
Eagle Conservation

**Frogs**  
<http://web.conservation.org/xp/amphibians/index2.xml>  
Conservation International

<http://www.globalamphibians.org/>  
Global Amphibian Assessment

<http://froggy.lbl.gov/virtual/game/>  
Virtual Frog Builder Game

<http://www.amphibianark.org>  
Special events for amphibians

<http://www.nwf.org/frogwatchUSA>  
Amphibian monitoring programs

**Polar Bears**  
<http://www.polarbearsinternational.org/>  
Polar Bears International

**Sharks**  
<http://www.flmnh.ufl.edu/fish/organizations/ssg/ssg.htm>  
The IUCN/SSC Shark Specialist Group

<http://www.sharkwater.com/>  
Documentary about shark populations

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<http://www.nmfs.noaa.gov/sfa/hms/sharks.html>  
NOAA Fisheries Shark Web Site

<http://www.oceannenvironment.org/main2.htm>  
Ocean conservation

[http://www.uae.gov.ae/uaeagricent/FISHERIES/Sharkfin1\\_en.stm](http://www.uae.gov.ae/uaeagricent/FISHERIES/Sharkfin1_en.stm)  
Report on shark finning

<http://www.kidzone.ws/sharks/activities/index.html>  
Shark activities for kids

### Turtles

<http://www.cccturtle.org/>  
Caribbean Conservation Corporation and Sea Turtle Survivor League

<http://www.cccturtle.org/sea-turtle-information.php?page=FlashSeaTurtleQuiz2>  
Online Sea Turtle Quiz

<http://www.turtleprotection.org/>  
Turtle Conservation Organization

<http://teacher.scholastic.com/activities/explorer/oceanlife/main.asp?template=mission>  
Turtle Activities

<http://www.nationalgeographic.com/ngkids/9911/turtle/index.html>  
Turtle Activities

### Wolves

<http://www.wolf.org/wolves/support/support.asp>  
International Wolf Center

<http://www.nywolf.org/typo3/index.php>  
Wolf Conservation Center

### Special Interest

[www.marinemammal.org/2007/gregr.php](http://www.marinemammal.org/2007/gregr.php)  
New classification system for marine mammals based on classifying marine ecosystems

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# Glossary

**Anthropogenic**– Relating to or resulting from the actions humans have on the natural world.

**Apex Predator** - A predator becomes an "apex predator" when the other species living alongside it cease to consider that animal as prey, or only attempt to attack it in the most dire of situations. (Ex. Hyenas will prey on lion cubs, but NOT adult lions)

**Bycatch** – Unwanted and untargeted fish, sponges and other marine life unintentionally caught in fishing gear and discarded overboard. These animals are dead or dying and unlikely to survive.

**Endangered** - Any species in imminent danger of *extirpation* or extinction. Endangered species are those at immediate risk of going extinct. The primary factors leading to species becoming endangered include habitat loss, pollution, introduction of other species, and overexploitation. Facing extinction are: one-third of amphibians, nearly half of all freshwater turtles, one in eight birds, and one in four mammals, as well as more than 8,000 plant and algae species.

**Environment** - The surroundings of an organism or a species and the ecosystem in which it lives.

**Extinct** - Species no longer living or existing.

For every species that is alive today, perhaps 1,000 more have lived previously and become extinct. Most of these extinctions occurred before humans evolved, and we know the species only through fossils. Extinctions are a natural process. Periodically, however, major changes in the conditions on Earth have caused the collapse of living systems and large percentages of species have become extinct. These species will never return.

The current extinction crisis is unique, in that the loss of biodiversity is occurring very rapidly. Some scientists believe the current crisis began when humans and their domestic animals first began to colonize the various parts of the globe. Others believe it began around 1600, when human population growth exploded, and the level of per capita resource consumption began to rise dramatically in some parts of the world. Of the species that are best known, the so-called "higher animals," more than one percent has become extinct in the last 400 years and the overwhelming majority of these extinctions are *anthropogenic*. Many more species are in danger of becoming extinct if we do not act quickly to conserve them.

**Extirpated** - Species is not extinct, but no longer occurring in a wild state within a given area, or no longer exhibiting patterns of use traditional for that species in a given area (e.g. historical breeders no longer breeding here).

**Habitat** - A particular environment such as a pond or an alpine meadow where an animal, plant or microorganism finds the essentials it needs for survival.

**Indicator Species** - A species that is particularly sensitive to environmental conditions and therefore can give early warning signals about ecosystem health. Because they are so sensitive, a decline in indicator species' health can signal air and water pollution, soil contamination, and climate change or habitat fragmentation. Indicator species are often threatened or endemic (native) species. (Ex. Most amphibian species)

**Keystone Species** - A species that has a major influence on the structure of an ecosystem. Its presence impacts many other members of the ecosystem, and if its population dwindles or

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disappears, there can be far-reaching consequences for the ecosystem. (Ex. African elephants)

**Overfishing or Overexploitation** - When fishing activities reduce fish stocks below a self-sustaining level. This can occur in any body of water, from a pond to the oceans. Catching too much fish for the system to support leads to an overall degradation to the system and is a non-sustainable use of the oceans. Sometimes referred to as overexploitation.

**Range** - The region throughout which a plant or animal species naturally occurs.

**Recovering** - The process by which the decline of an endangered species is arrested or reversed and threats removed or reduced so that the species' survival in the wild can be ensured.

**Special Concern** - Any native species for which a welfare concern or risk of endangerment has been documented; species that have a naturally restricted range or habitat and are found to be at a low population level, to be in such high demand by man that its unregulated taking would be detrimental to the conservation of its population.

**Species** - The basic unit of classification for living organisms. A species consists of a population or series of similar populations capable of interbreeding. (Ex. Different types of dogs may interbreed with other types of dogs – a poodle with a beagle)

**Threatened** - Any native species likely to become an endangered species within the foreseeable future.

**Umbrella Species** - Umbrella species are typically large and require a lot of habitat. By protecting this larger area, other species are protected as well. Umbrella species generally have the following characteristics: their biology is well known, they are easily observed or sampled, they have large home ranges, they are migratory, and have a long lifespan. (Ex. Grizzly bears)

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## About Our Partners

We wish to acknowledge participation of the following organizations in Endangered Species Days.

### **The Bruce Museum**

One Museum Drive  
Greenwich, CT 06830  
<http://www.brucemuseum.org>

The Bruce Museum promotes the understanding and appreciation of Art and Science to enrich the lives of all people.

### **Wind Over Wings, Inc.**

22 Old Road  
Clinton, CT 06413  
<http://www.windoverwings.org>

This Wildlife Rehabilitation and Education Center specializes in the rehabilitation of eagles and great blue heron. Their goal in education is to provide a personal connection with wildlife that will lead to good stewardship of the environment. Their goal in rehabilitation is to release wildlife back to their natural environment when viable.

### **Wolf Conservation Center**

South Salem, NY  
<http://www.nywolf.org>

The Wolf Conservation Center (WCC) promotes wolf conservation by teaching about wolves, their relationship to the environment, and the human role in protecting their future. It is the preeminent facility in the eastern United States for the captive breeding and pre-release of endangered wolf species and provides the natural habitat for a few captive wolves where observation of natural behavior is possible.