

OBJECTIVES

Your discussions should include:

- Define the following terms: threatened, endangered, extinct, extirpated, SSP, conservation;
- List causes for reduction of animal populations;
- List the four items necessary to the survival of living things (components of habitat);
- Name at least five animals at Potter Park Zoo that are endangered species.
- Explore ways in which zoos and aquariums are cooperating locally, nationally, and internationally to protect vanishing species from extinction;
- Identify things individuals can do to help the environment and endangered species.

KEY TERMS

Endangered, extinct, threatened, extirpated, habitat, conservation, habitat loss, human encroachment, poaching, SSP, scientific captive breeding, reintroduction, specialist, generalist.

GETTING STARTED

As you prepare for your tour, please keep in mind the following:

- Do not just talk about causes for the reduction of animal populations but also talk about positive actions that are being taken by zoos and others to help the situation. It is important that children not be overwhelmed with the weight of this topic and that they understand that adults are working to improve the situation.

- Ask students to define threatened, endangered and extinct; introduce the term extirpated.
- Have them name some endangered species. See if they can name some of the causes of animals becoming endangered (habitat loss, human encroachment, poaching). Have your students define habitat and its four main components. What happens to them if they cannot find food, water, shelter, and space?
- At some later point in your tour discuss: Why is it important to save species? How do zoos help endangered animals? (education, research, conservation)

Following is a detailed chart of the exhibit animals along with some suggestions which point out a few of the many ways in which you can use the animals to highlight and illustrate the concepts and terms listed above. Remember, these are only suggestions. Remember to keep your discussion to the appropriate grade level of your audience. Be sure to consult the animal data sheets for more additional information.

For upper elementary, include a discussion of how generalists usually tolerate changes better than animals that are specialists.

Middle/high school: With all the information available in the charts below, you can just go into more depth and details with the information provided.

POTENTIAL FOCUS CONCEPTS	PPZ SPECIES	SSP* at PPZ	STATUS OF SPECIES; CAUSES FOR THE REDUCTION OF POPULATIONS	WAYS THAT INSTITUTIONS ARE COOPERATING TO PROTECT VANISHING SPECIES
Breeding research, education	Bongo	x	Endangered; overhunting, habitat loss, habitat destruction; superstitions once protected this animal from hunting.	U.S. zoos have bred animals for reintroduction. PPZ: Successful at natural breeding; unsuccessful attempt at artificial insemination.
Increased knowledge from zoo veterinary work; AAZK Bowling for Rhinos fundraiser	Black rhino	x	Endangered, CITES I; poaching for horn to make dagger handles in Middle East and for use in traditional Asian medicine	San Diego Zoo researchers are looking at how to better manage black rhino populations and increase survivorship and breeding at new translocation sites in the wild. PPZ: Medical knowledge gained through treatment of previous/current rhinos; Bowling for Rhinos fundraiser supports wild conservation efforts.
Zoos working to establish protected areas	Pallas cat	x	Near threatened, CITES II; protected in most areas; eats agricultural pests so is seen as beneficial, poisoning of pest rodents and pikas may affect the cat.	The Wildlife Conservation Society, which operates the Bronx Zoo, is working with governments and scientists in central Asia to establish international peace park to protect animals in the region.

* SSP species are all examples of the Last Ark, that is, reproduction efforts as a hedge against extinction in the wild, even if PPZ is not breeding the species.

TOUR: LAST ARK

POTENTIAL FOCUS CONCEPTS	PPZ SPECIES	SSP* at PPZ	STATUS OF SPECIES; CAUSES FOR THE REDUCTION OF POPULATIONS	WAYS THAT INSTITUTIONS ARE COOPERATING TO PROTECT VANISHING SPECIES
Projects between U.S. and native country	Cotton-top tamarin	x	Endangered, CITES I; habitat destruction, exotic pet trade.	Project between Disney's Animal Kingdom and a Colombian zoo that combines field research, education initiatives, and community programs.
Legislation and enforcement; owning a bird	Parrot/macaw		Most species endangered, all protected in some way, CITES I or II; deforestation, illegal pet trade	Legislation halting the import of endangered birds in the United States has been implemented. Problems with the enforcement of export restrictions in South American countries. Do homework before buying!
Veterinary involvement in field research	Eastern Massasauga rattlesnake		Species of special concern in Michigan and a candidate for federal species list; more common in Michigan than in other parts of its range but in isolated populations; wetland habitat loss, human persecution.	PPZ: Dr. Tara is participating in a research study to learn more about Massasauga rattlesnakes in Michigan. She puts transmitter chips into snakes found in the wild, and they are then returned to where they were found. These chips allow researchers to learn more about the snakes' population, movement, deaths, etc.
Research and education	Spiny Asian turtle		Endangered, CITES II; Asian food market, pet trade, habitat destruction; difficult to breed in captivity.	Zoo Atlanta and Knoxville Zoo have been among very few successful at breeding, information on biology and ecology from these efforts could help conservation in wild. PPZ: Redesigned exhibit to encourage breeding
Amphibian crisis	Puerto Rican crested toad	x	Endangered; human encroachment, predation and competition from introduced animals; amphibians in great trouble worldwide with a fungus a large threat.	Zoos: Breeding and reintroduction PPZ: As of 2016, has sent over 18,000 tadpoles
Breeding research	Red panda	x	Endangered, CITES I; fragmentation and loss of habitat, exotic fur trade.	Zoos breeding; National Zoo an early leader in the SSP program with Knoxville Zoo a current center for red panda reproduction. PPZ: Two cubs born in 2016.
SSP, importance of known lineages	African lion	x	Vulnerable, CITES II; habitat destruction and human conflicts.	African lions are part of an SSP program even though they are not yet endangered. Most captive lions of unknown genetic origin and thus are not included in SSP. PPZ: Currently holding (successful breeding by other zoos, so there is no current need)
How SSP works, increased knowledge of species	Amur tiger	x	Endangered, CITES I; habitat destruction, human encroachment, poaching (traditional Chinese medicine).	PPZ: Birth of three cubs in 2005 and 2011; aspects of SSP matching; movement of animals; loss of cubs; illness/hand-raising. Target training of our tigers allowed their participation in several important research projects.
Conservation organizations, fundraising, partnerships, education of locals	Snow leopard	x	Endangered, CITES I; fur trade, human encroachment (natural prey decreasing due to competition from domestic livestock, human/animal conflicts).	PPZ: Birth in 2007. Pioneering training protocols with our female enables veterinarians to perform ultrasounds, blood work and other medical tests without anesthesia that provide valuable info shared with other institutions; has provided valuable information on her pregnancies and saved her life. Snow Leopard Trust: Includes zoos as fundraising partners for its work building partnerships; uses science and research to sustain a community-based conservation program.

* SSP species are all examples of the Last Ark, that is, reproduction efforts as a hedge against extinction in the wild, even if PPZ is not breeding the species.

TOUR: LAST ARK

POTENTIAL FOCUS CONCEPTS	PPZ SPECIES	SSP* at PPZ	STATUS OF SPECIES; CAUSES FOR THE REDUCTION OF POPULATIONS	WAYS THAT INSTITUTIONS ARE COOPERATING TO PROTECT VANISHING SPECIES
Increased knowledge in the wild	Mandrill	x	Endangered, CITES I; habitat destruction and poaching.	The Wildlife Conservation Society, which operates the Bronx Zoo, is radio-collaring mandrills to gather data that can be used to help ensure protection in areas that they frequent. PPZ: Births in 2007 and 2010; offspring are at other zoos paired with females.
Reserve animals involved in SSP	Red-ruffed lemur	x	Endangered, CITES I; habitat destruction, hunting, pet trade.	Protected area established in Madagascar. Individuals housed at a reserve in Madagascar participate in SSP to increase captive population's genetic diversity and to increase knowledge about species.
University research, partnerships	Ring-tailed lemur	x	Endangered, CITES I; habitat destruction, space on an island is a very limited resource.	Duke Univ. Lemur Center partners with a local zoo in Madagascar to teach locals about reforestation, agricultural techniques, and ecotourism. It is also involved in research, captive breeding, and reintroductions of various lemur species.
Reintroduction, zoo, ecotourism	Golden lion tamarin	x	Endangered, CITES I; habitat destruction, exotic pet trade.	In the 1980s, led by the National Zoo, zoos began breeding and reintroducing tamarins in protected areas in Brazil. Public education in reintroduced areas has been important. PPZ: Holding a pair of siblings
SSP	Spider monkey		Endangered, CITES II; habitat destruction, poaching.	PPZ: Animals are of unknown genetics, so they are not part of the SSP program.
Extirpation comeback, legal protection	Gray wolf		CITES II; human encroachment and overhunting.	Public education and protection of wolves (Endangered Species Act), they returned to Michigan via Wisconsin and Minnesota. By 2015, there were over 600 individuals in the Upper Peninsula (not including Isle Royale). Some wolves have been reintroduced into remote areas of the western U.S., although legal battles remain regarding their population status, hunting and reintroduction.
Extirpation comeback, legal protection, banning of pollutant	Bald eagle		Became endangered (or threatened in six states) in the lower 48 states due to DDT (pesticide which caused thinning of eggshells and deformities in embryos. They are no longer endangered or threatened in most of the U.S.	The use of DDT was banned from use in the U.S. in 1972. Since the banning, eagle populations have recovered significantly. In 1995 they were down-listed in the lower 48 states. In 2007 they were delisted from threatened status in the lower 48 states. There is a wild pair that has successfully nested along the Grand River near the zoo.
Extirpation comeback, improvement in water quality and trapping management	River otter		Status in U.S. varies regionally from endangered to threatened to common, CITES II; habitat destruction, pollution, and human encroachment and recreational activities; extirpated throughout much of its range due to overhunting and habitat destruction in the 1800s; Michigan populations large enough to sustain harvests.	Field biologists from a number of zoos are working with others to monitor populations and potential threats. PPZ: Male born in 2013; currently paired with a female for breeding.

* SSP species are all examples of the Last Ark, that is, reproduction efforts as a hedge against extinction in the wild, even if PPZ is not breeding the species.