



Smithsonian

Saving a Species



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The background of the page features a close-up of a panda's head on the left side, looking towards the right. On the right side, there is a faint, stylized diagram of interlocking gears and circles. The main content is presented in a white box with a blue border.

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Animals at Risk

Over 1,500 animals live at Smithsonian's National Zoo and Conservation Biology Institute in Washington, DC. Each one has its own story. But the five zoo animals in this book fight the same challenge: **extinction**. Why is that? Farmers and villagers take over their land. Humans destroy fragile environments when they clear forests and overfish. **Poachers** sell animals for food and fur to make a living. It seems that people are their worst enemies.

But people can also be heroes. They can save animals. **Conservationists** protect plants, water, and animals. They learn about the problem and take part in the solution. Researchers travel into the wild to study animals where they live. **Zoologists** work behind the scenes at zoos. They gather information about animal health and behavior. These are the people with a passion for saving **species**!

Now, let's meet Tusa, Chowder, Bei Bei, Niko, and Lek. They have all lived at the Asia Trail exhibit at Smithsonian's National Zoo. Learn about where they are from, what they eat, and why they are in danger. Then, see what people are doing to save them. Let the adventure begin!

An animal keeper feeds a red panda a grape.

A hippo swims
in an aquarium.



ARTS

Beauty and Function

People who plan exhibits are known as habitat designers. They re-create natural environments for animals in a zoo. Exhibits also need to look nice to attract visitors. Imagine a cool and misty waterfall. Can you picture lush, green plants? And how do you feel when you see an aquarium with soothing blue lights? The ideal zoo exhibit appeals to animals and people.

Tusa the Red Panda

First thing's first: red pandas are not the same as giant pandas. They aren't even bears. If you ever met Tusa at the National Zoo, you would say he looked more like a raccoon. The word *ponya* is used in the country Nepal to describe an animal that eats bamboo. People believe *panda* comes from this word. Amazingly, red panda fossils from five million years ago have been found in North America. At some point, these animals disappeared from that continent and today are found only in Asia. They live in China, India, Myanmar, Tibet, and Nepal.

A Disappearing Act

Red pandas thrive in habitats with large forests near water. They climb high into trees to relax and get warm in the sun. They can hide from predators there. Red pandas eat mostly bamboo, so they need land with plenty of these plants.

This species is **endangered** because its habitat is disappearing. Humans clear the forests where they live to make room for farming. They chop down trees for firewood or to sell as lumber. People also kill red pandas to eat them and sell their fur. With all of these challenges, there may be fewer than 2,500 adult red pandas left in the wild.



Map Key



area where red pandas live and travel



Species may be endangered if there are not a lot of those animals left in the wild or if their habitats are threatened. Another reason is if they live only in a few places.

Tusa



This red panda cub was born at Smithsonian's Conservation Biology Institute in 2017.



A zoologist feeds a red panda a biscuit for leaf-eaters.

Bamboo Buffet

Tusa and his **mate**, Asa, lived together in Smithsonian's National Zoo. Zoologists worked hard to make sure Tusa and Asa stayed healthy and ate well. Animal keepers fed them grapes and apples, plus special biscuits for leaf-eating animals. In the wild, red pandas eat 1 to 2 kilograms (2.2 to 4.4 pounds) of bamboo leaves each day. At the Zoo, they snacked on bamboo all the time. Bamboo doesn't provide red pandas with much energy though, so they slept about half the day.

People Taking Action

Many laws try to protect red pandas. But people still **hunt them**. And they still cut down bamboo forests. A clever way to defend red pandas is the Forest Guardians program. The Red Panda Network **organizes** this program and collects donations. They raise money for each person who becomes a Forest Guardian. These guardians get to know **people** in their communities. They earn their respect. They even become friends. When they talk to people about how to save red pandas from extinction, it changes their behavior. This can be more powerful than any law.

SCIENCE

Let's Just Chill

When weather gets cold, red pandas use less energy. They become **dormant**, which means their body functions slow and they use fewer **calories**. This lowers the amount of heat that escapes from their bodies. They also roll into balls, which helps hold in the heat. Every few hours, they use just enough energy to look for food.



STEAM CHALLENGE

Define the Problem

Smithsonian's National Zoo is always trying to find ways to inspire animals' natural behaviors. One way they do that is by hiding their food in interesting ways. Zoo staff have asked you to design a new puzzle feeder to encourage natural feeding behaviors. They would like a stationary puzzle feeder that can be installed in several animal exhibits.



Constraints: Your design must fit on and fill a poster board that is 60 centimeters $\times$ 71 centimeters (22 inches $\times$ 28 inches).



Criteria: Your puzzle feeder must have three different challenges for animals to get food. To make sure it is challenging, it should be difficult or impossible for a person to grab small items in the puzzle feeder, such as counters, using just their thumbs and pointer fingers.





Research and Brainstorm

What are some ways that humans are taking action to protect endangered species? How are zoos part of the effort? How do zoos help inspire animals' natural behaviors? What are some ways they hide food for animals?



Design and Build

Sketch your puzzle feeder. Make sure it includes three different puzzles or challenges. What purpose will each part serve? What materials will work best? Build the model.



Test and Improve

Add small items to your puzzle feeder, such as counters or bird feed. Present your design to your friends. Have a team member demonstrate the difficulty of the challenges by trying to grab small items with their thumb and pointer finger. Did it work? How can you improve it? Modify your design and try again.



Reflect and Share

Would you need to modify your design for larger animals to use the puzzle feeder? What other materials could you use? How do you think habitat designers decide what to include in a zoo exhibit?

