The Journey Home:

Reintroducing Endangered Species

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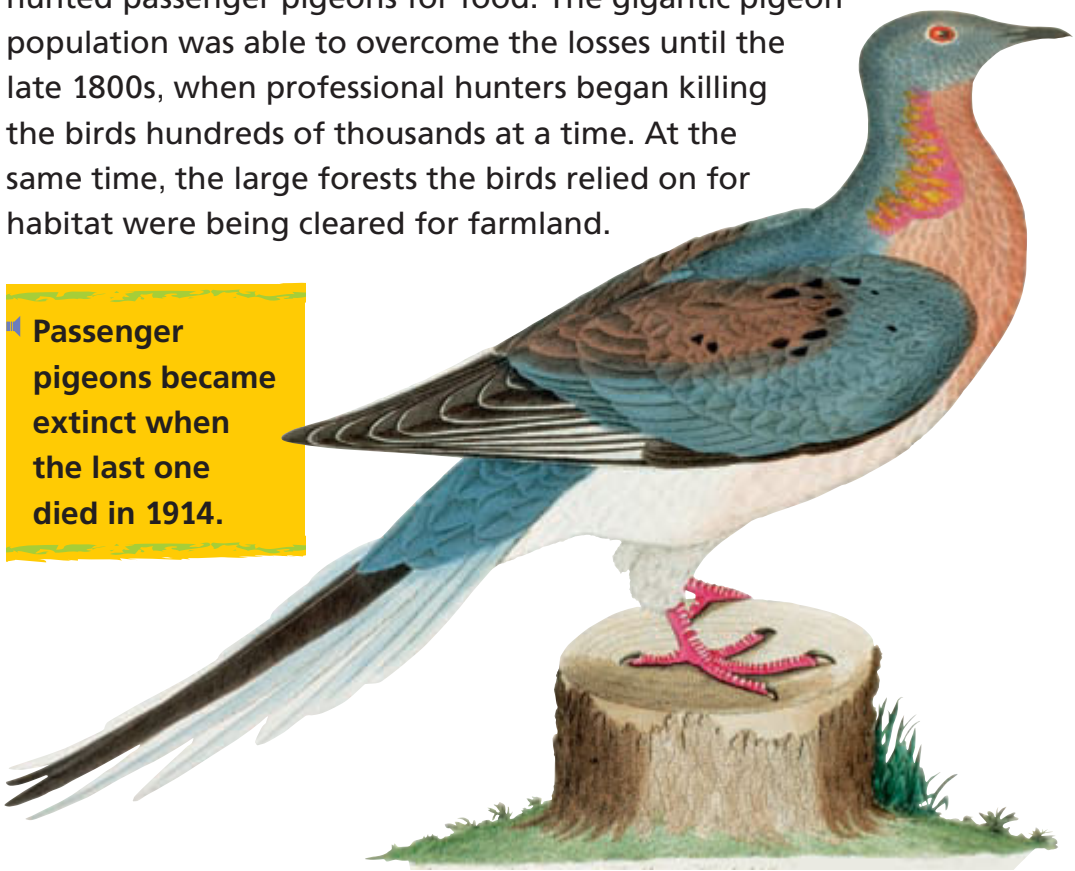
Extinction

On September 1, 1914, the last passenger pigeon in the world died at the Cincinnati Zoo at one o'clock in the afternoon. The bird was a female named Martha, after Martha Washington. When she died, passenger pigeons became extinct. A species becomes extinct when the last living member of the species dies. When a species is extinct, it is gone forever from Earth.

Scientists believe that there were 3 to 5 billion passenger pigeons in America when Christopher Columbus arrived in 1492. The birds lived and traveled in huge flocks. American colonists wrote that it took hours for a flock of migrating passenger pigeons to pass overhead. By the late 1800s, these gigantic flocks of passenger pigeons were gone. By the early 1900s, the only passenger pigeons left were in zoos.

Two things killed off the passenger pigeon: overhunting and destruction of habitat, both caused by humans. People had always hunted passenger pigeons for food. The gigantic pigeon population was able to overcome the losses until the late 1800s, when professional hunters began killing the birds hundreds of thousands at a time. At the same time, the large forests the birds relied on for habitat were being cleared for farmland.

Passenger pigeons became extinct when the last one died in 1914.



It is normal in nature for new species to develop and old species to die out. As Earth changes, living things need different adaptations in order to survive. Today, however, humans are causing species to die out at a rate 1000 to 10,000 times faster than would happen normally.

There are many reasons for human-caused extinctions, but overhunting and habitat destruction are the biggest reasons by far. Passenger pigeons were hunted as food until their population was too low to recover. Wolves were hunted because they were seen as dangerous to people and to livestock. People destroy habitat when they cut down forests and change ecosystems so that they have food and shelter. Sometimes, though, people cause extinction by accident. Scientists brought rosy predator snails to Hawai‘i because they thought these snails would eat another invader, the giant African snail. Instead, the new snails eliminated many of the native snails of Hawai‘i.

By 2004, 746 species of plants and 518 species of animals have been officially recognized as threatened or endangered in the United States. Laws protect these endangered species and their habitats. But for some endangered animals, this is not enough. In these species, too few individuals exist in the wild to successfully reproduce. For some of these species, the only individuals left are in zoos.

Scientists are finding new ways to help these species. In some cases, scientists are taking wild animals from places where they can still be found and reintroducing them into places where they no longer exist. In other cases, scientists are learning how to breed the endangered animals in captivity and then reintroduce the young animals into the wild.

Reintroducing Endangered Species

Before scientists can reintroduce an animal species to a place it once lived, they must know a great deal about the animal's needs and its role in the ecosystem. Several attempts to reintroduce animals have failed because scientists did not know enough about what the animals needed. Scientists learned from these failures, and now several animals have been successfully reintroduced into the wild. Two of these animals are the gray wolf and the California condor. Their stories are very different.

Gray Wolves

The biggest obstacle to reintroducing wolves is people. People and wolves have had a long, unfriendly history. Wolves have often been the "bad guys" in children's stories such as "Little Red Riding Hood" and "The Three Little Pigs." In most of the United States, all of the wolves have been destroyed to protect livestock.

Wolves are predators, or animals that hunt other animals for food. They generally hunt ungulates, hoofed mammals that eat plants. Wolves prefer wild ungulates, such as deer, elk, and moose. But if they cannot find enough of these, they will go after farmers' and ranchers' ungulates—sheep and cattle.

People were afraid that reintroducing wolves would endanger domestic livestock. So a system was set up to pay farmers and ranchers who could prove that a wolf had killed one of their animals. People were also afraid that reintroduced wolves would kill too many wild ungulates. Some scientists agreed that the number of ungulates in an ecosystem was determined by the number of predators in the system. Other scientists thought that the number of ungulates was determined by the amount of food the ecosystem could provide for the ungulates. The scientists had to find a way to determine which hypothesis was correct.

This posed a problem. Most ecosystems include many different predators and prey, and many different things that affect the animals in the ecosystem are happening at the same time. Under these conditions, it is very difficult to determine what causes what. To find the answer to their question, scientists needed a simple ecosystem where they could study the interaction of one predator—wolves—and one prey—moose.

Isle Royale

Isle Royale, an island in Lake Superior, was the place they needed. Before 1900, neither moose nor wolves lived on the island, but both lived in nearby Canada. Then moose arrived, probably by swimming across the lake. For many years, they lived on the island with no natural predators. By the 1930s, there were 2000 to 3000 moose on Isle Royale. But there were not enough of the right kinds of plants on the island to feed that many moose. Eventually the food ran out and the moose population dwindled, and in 1935 only about 500 moose were left on the island.

Wolves control the moose population on Isle Royale.

As the plants grew back, the number of moose increased. Then in 1948, the winter was so cold that an ice bridge formed on the lake between Isle Royale and Canada. Wolves came across the bridge and now live on the island. Since that happened, the ecosystem included the necessary predator—wolves—and one large prey.

For more than 40 years, scientists studied the wolves and the moose on Isle Royale. They noted that abiotic factors, such as snow, had a great influence on both wolves and moose. In very snowy years, wolves had an easier time catching moose. When this happened, the population of wolves increased. In drier years, moose could escape from the wolves. When this happened, the number of moose increased.

The most important thing scientists found was that wolves generally ate animals that were weak or sick. This left more food for the healthy, reproducing portion of the moose population. It also kept the number of moose from getting so high that they starved. Scientists found that the moose population was more stable when wolves were part of the ecosystem than when they were not. The wolves were controlling the moose population without destroying it.

The studies at Isle Royale helped change the way people thought about predators. The studies showed that predators help regulate an ecosystem by keeping the number of ungulates

Scientists have worked hard to learn the best ways to reintroduce gray wolves to Yellowstone National Park.

from becoming so great that they eat all of the food and starve. This conclusion helped convince people that reintroducing wolves could benefit an ecosystem rather than destroy it.

Returning Wolves to Yellowstone

Gray wolves once lived in all areas of the United States except the southeast, which was home to the red wolf. When scientists and government officials decided to reintroduce gray wolves into the wild, they had to find places that would be suitable for them. To be suitable, a place had to have a natural population of wild ungulates on which the wolves could feed. It also had to be as far as possible from human populations and domestic livestock. Officials divided the United States into four regions and chose one place in each of the regions to reintroduce wolves.

The place they chose in the western region was Yellowstone National Park, the nation's first and largest national park. Yellowstone had plenty of elk, deer, bison, and other large ungulates for the wolves to eat. Also, few people live inside the park boundaries. Scientists realized, however, that wild wolves would not stay inside the boundaries of the national park. The wolves would become part of the entire Greater Yellowstone ecosystem. This ecosystem covers two national parks, several national forests, and nearby protected areas in Wyoming, Montana, and Idaho.

In 1995, scientists returned the first wolves to Yellowstone. Because wolves live in packs, scientists knew that they had to introduce the wolves in groups rather than one or two at a time. They captured 14 wild wolves in a similar ecosystem in Canada and moved them to the park. Scientists divided the group into three packs. They took each new pack to the area where it would be released and put the wolves in holding pens for 8 to 10 weeks. This gave the animals a chance to get used to their new pack and the new place they were in. It also kept them from running off too far when they were eventually released.

The next year, the scientists moved 17 more wolves from Canada to Yellowstone. Ten more followed in 1997 from a different area. Since then, these wolves have formed new packs in Yellowstone. Several packs have had wolf pups. Today there are more than 300 wolves in Yellowstone.

Not everyone agrees that the wolves should be returned to Yellowstone. Some people fear that the wolves will hurt people, because there are so many people who visit the area. Nearby ranchers still worry about losing their livestock to the wolves. They already lose many animals to coyotes and do not welcome another predator. People with many different concerns and opinions are still trying to balance the needs of the wolves with the needs of people.

The Last of the Condors

With a wingspan of 3 meters (9 ft), California condors are the largest birds in North America. Condors are a type of vulture that serve the ecosystem as scavengers. Scavengers are animals that feed on the remains of dead animals. These high-flying birds travel as much as 241 kilometers (150 mi) a day looking for dead deer, elk, livestock, and marine mammals.

California condors are the largest birds in North America.

Like other vultures, condors have special adaptations that allow them to eat dead animals. They have a strong immune system that keeps them healthy, even though their food often contains bacteria. Their bald heads keep rotting meat from sticking to them.

Condors normally mate for life and start reproducing at age 7 or 8. They have one chick every other year, so the number of condors does not grow quickly.

Returning California condors to the wild has been different in almost every way from the reintroduction of wolves to Yellowstone. First, most people did not feel threatened by condors, so there was never any public opposition to reintroducing the birds. Second, the only California condors in the world are the ones endangered in California. In 1985, this population fell to 9 birds. There was no wild population to draw from. So to make sure that condors would not become extinct, scientists captured all of the wild birds and bred them in captivity.

California condors were probably never very common. There may have been several hundred along the west coast of North America around 1800. As early as the 1890s, scientists worried that the number of condors was dropping. In 1939, there were only 60 to 100, mostly near the mountains between Los Angeles and San Francisco. By 1979, the population had dropped to between 25 and 35 birds in the wild.

There are several reasons for the drop in the number of condors. Birds died from flying into power lines and from eating poison left out for coyotes. Sometimes they ate deer and other animals left in the wild by hunters, and lead in the bullets poisoned them. Like some other birds, condors suffered from the widespread use of the chemical DDT, which caused condors to produce eggs with eggshells too thin to protect the developing chicks. People have also played a more direct role, destroying condor habitat along the Pacific Coast and illegally collecting condors and eggs.

Starting in the 1980s, scientists used radio transmitters to keep track of the birds. The radio transmitters enabled scientists to learn more about how condors live and reproduce. In 1981, these scientists made a key discovery. Even though condors lay only one egg every other year, they will lay a second one if they lose the first one early in the season. This information gave scientists hope that they could breed condors successfully.

Once scientists had captured all of the remaining wild condors, they brought them into the breeding program. A special breeding facility called a "condor-minium" was built at the San Diego Zoo's Wild Animal Park. Each "apartment" at the condor-minium is large enough to allow the birds to fly a bit. The apartment also has roosting and nesting areas.

The female condor lays her egg sometime between January and March. Scientists collect the egg and incubate it in a large incubator. Because they have lost their first egg, the condor pair produces a second egg. The condors incubate the second egg and rear the chick. But scientists incubate the first egg and rear the chicks that hatch from them. This way, each breeding pair produces two young condors every other year instead of one.

Scientists built the "condor-minium" so that they could breed endangered condors in captivity and return them to the wild.

Condor chicks are fed using puppets that look like adult condors so that the birds will not become too used to humans.

Scientists have to take special precautions when they are rearing the artificially incubated chicks. They have to keep out of sight so that the young condor chicks do not imprint on them. Imprinting is the formation of a strong attachment between a young animal and its caretaker. Imprinting is very important in the wild. But if condor chicks imprint on humans, they will try to follow humans instead of seeking out condors.

To protect them from imprinting on humans, the artificially incubated condor chicks are fed using hand puppets that look like adult condors. When the chicks get to be about twelve days old, they are able to play tug-of-war with the puppets. This is how they learn to be aggressive as they eat. When they are 28 days old, the chicks are let outside into the condor-minium.

The breeding program has been very successful. By 1993, there were 71 birds in captivity. Returning the birds to the wild has not been as easy. The problems that caused the drop in condor numbers have not been completely solved. Some condors have flown into power lines. Now scientists teach young condors to stay away from power lines before they release them. Other birds have died of poisoning from lead bullets. Bullets without lead have been made. Several groups teach hunters about these bullets and other ways to keep condors safe.

By 2004, there were 246 California condors, including 110 in the wild. These condors have started to lay eggs again in the wild and scientists are hopeful that the program will succeed.

The Role of Zoos

Wolves in Canada could be brought to Yellowstone for reintroduction. Many endangered animals, like the California condor, have not been that lucky. The only hope for these endangered species to have a wild future lies with captive breeding programs. Zoos around the world are working together to help breed many endangered species.

The first condor egg that hatched at a zoo was taken from the wild and hatched at the San Diego Zoo in 1983. Other zoos in California and Oregon have helped with the condors. Condors are one of more than 160 species with species survival plans run by zoos in North America.

Zoos have played an important role in the reintroduction of California condors into the wild.

Think and Write

1. What are the main reasons that animals are becoming extinct today?
2. What types of abiotic factors in their ecosystems do you think might affect California condors?
3. How do humans fit into the condor's ecosystem?
4. **Persuasive Writing** Suppose that you are a sheep rancher in Idaho. Write a short argument against reintroducing wolves. Now suppose that you are a biologist. Write another short argument in favor of returning wolves to the wild.

Hands-On Activity

Condor Diagram Make a diagram showing the steps involved in reintroducing California condors into the wild.

School-Home Connection

Zoo Animals Visit a zoo or read a book about zoos with a family member. Discuss your thoughts about keeping wild animals in captivity.

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