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FUTURE IN PERIL

ENDANGERED ANIMALS IN THE UNITED STATES

STUDENT MAGAZINE

FUTURE IN PERIL

ENDANGERED ANIMALS IN THE UNITED STATES

You know the story of dinosaurs...

For millions of years, these fascinating, prehistoric reptiles roamed our planet. Then, about 65 million years ago, they disappeared. Many scientists now believe that an asteroid the size of a mountain slammed into the earth, along the coast of what is now Mexico.

The immediate impact and longer term environmental effects of that natural disaster quickly wiped out about 80 per cent of life on Earth, including almost every **species** of dinosaur.

Fast forward to the modern era, about 1800. Earth, including the continent of North America, is again teeming with life. Among the incredible diversity of plants and animals are the dinosaurs' modern cousins: birds.

One type of bird, the passenger pigeon, was by far the most common in the skies across the United States. Numbering in the billions, scientists say these sleek birds may have been the most abundant bird species that ever existed. Huge colonies of passenger pigeons roosted in the forests of eastern North America.

Once the most common bird species in the United States, the last wild passenger pigeon was killed by a hunter in 1900.

However, as colonization of the United States intensified and forests were cleared for homes and farmland, passenger pigeons lost huge swaths of the habitat they depended on for food, for shelter and **roosting**, for nesting, laying eggs, hatching and rearing young.

The impacts of deforestation on these birds was made worse by hunting on a massive scale. Passenger pigeons were killed by farmers to protect their crops and by hunters for food. In just a few decades, the passenger pigeon population declined from billions to zero. The last of the wild species was killed by a hunter in 1900.

Like their distant dinosaur ancestors, passenger pigeons ceased to exist: they became extinct.

How does extinction happen?

Extinction is part of the natural process of life on Earth, which is inhabited by an incredible natural diversity of species and **ecosystems.**

This huge variety of living things is called **biodiversity**, which is short for biological diversity.

Scientists have identified about 1.5 million different animal species. That includes 950,000 species of insects, 19,000 species of fish, 9,000 species of birds, and 4,000 species of mammals. This is only a small portion of the total number of species on Earth. There are millions more species yet to be discovered and named.

At the same time, millions of species have gone extinct over the course of our planet's

history, perhaps more than two thirds of the animals and plants that once lived on Earth.

The natural process of extinction occurs in a variety of ways, both gradually and in sudden, dramatic events. Sometimes, a single natural event, like a volcano erupting, can kill an entire species. Other times, extinction happens more slowly as natural processes gradually change environments and living conditions.

Some species adapt to these changes, while others cannot. For example, after the Ice Ages, when the glaciers melted and the earth became warmer, many species died because they could not adjust to living in a warmer climate.

While natural changes to Earth's ecosystems and habitats have always made it hard for species to survive, scientists say that nowadays it is human activities that are the biggest threat to our biodiversity.

Research suggests that humans have altered the Earth's ecosystems more in the past 50 years than any other period in our history on Earth. As a result, biologists believe that current levels of extinctions are 100 to 1,000 times the natural rate. In fact, while the mass extinction of dinosaurs was caused by a natural event, the rapid extinction of passenger pigeons was almost entirely caused by us – humans.

Although there are some exciting wildlife conservation success stories (see p. 10-11), scientists estimate 100 species will become extinct every day this century. Globally, more than 26,000 species are threatened with extinction, according to the International Union for the Conservation of Nature (IUCN). In the United States, there are over 1,300 species at risk of extinction, according to the US government.

The HAWAIIAN MONK SEAL (above), SNAKE RIVER SOCKEYE SALMON (middle), and RED WOLF (bottom left) are three of the rarest animals in the United States, among more than 700 native animal species that are officially in danger of extinction nationwide.

Why does extinction matter?

Not only is every species important for its own sake, all species are interconnected. Forests provide homes for animals. Animals eat plants. The plants need healthy soil to grow. Fungi help decompose organisms to fertilize the soil. Bees and other insects carry pollen from one plant to another, which enables the plants to reproduce. With less biodiversity, these connections weaken and sometimes break, harming all the species in the ecosystem.

All of our planet's diverse species rely on healthy, functioning **ecosystems** to survive. From a rotting log to the rainforest, a forest stream to the ocean floor, a farm field to a school yard, ecosystems provide essential **habitat** for animals of all kinds.

HUMAN IMPACT

The main reason that many wildlife species are endangered today is because people have destroyed or altered the natural habitats upon which they depend. We clear land to plant crops or build houses and factories.

We cut down forests for lumber and firewood. This means that fields, forests, and wetlands where wild plants and animals live are disappearing. We pollute fields, forests, wetlands and oceans with trash and chemicals.

We deplete populations of fish and wildlife through **overfishing** and **overhunting**, which means catching fish and killing animals in such great quantities and faster rates that the population cannot reproduce enough to replace them.

Biodiversity can also be harmed when people introduce species from one part of the world to another. These **non-native species** often have no natural predators. They thrive in their new habitat, often endangering or destroying **native species** in the process.

Global climate change—which is linked to human activity—is also a factor. Warmer ocean temperatures damage fragile ecosystems such as coral reefs. A single coral reef can shelter 3,000 species of fish and other sea creatures such as clams and sea stars.

HABITAT LOSS & DEGRADATION

Habitat destruction, encroachment and fragmentation caused by human activities is the greatest modern threat to animals. Housing developments, agriculture, highways, ranching, mining operations and logging are just a few examples. Amphibians are especially at risk. Globally, more than one third of the nearly 6,000 known amphibian species are threatened with extinction. **MISSISSIPPI GOPHER FROGS**, which live primarily underground in forests, breeding in small seasonal ponds, are one critically-endangered example: Only about 100 individuals are thought to survive in three small ponds in Mississippi.

NON-NATIVE SPECIES

The introduction of **non-native** species, sometimes inadvertently via shipping or trade, has greatly impacted native wildlife around the world. Sometimes called invasive species, the introduced species compete with native species for resources and may also prey on native species directly. Almost half of all species at risk in the United States are endangered because of introduced species alone or because of their impact combined with other threats.. In Florida, snakes such as pythons and **GREEN ANACONDAS** were brought into the region as exotic pets and then were released or escaped into the wild. This has decimated some native wildlife species, including bobcats and opossums.

POLLUTION

From plastic and pesticides to sewage and smog, pollution imperils myriad species and habitats. Noise pollution from shipping and commerce, such as oil and gas exploration, makes the ocean so noisy that whales have difficulty feeding, breeding, navigating, and communicating. On land, toxic chemicals and pesticides endanger entire food webs. Predators such as hawks, owls and coyotes can be harmed if they eat animals that have consumed the poisons. **BROWN PELICANS** nearly disappeared from the United States due to the pesticide DDT, which led to thinner egg shells. As a result, pelican eggs were crushed when mothers birds placed their web feet over them to keep them warm.

THE MAIN REASON THAT MANY WILDLIFE SPECIES ARE ENDANGERED TODAY IS BECAUSE PEOPLE HAVE DESTROYED OR ALTERED THE HABITATS UPON WHICH THEY DEPEND.

MONARCH BUTTERFLY

Monarch butterflies are renowned for their annual mass migration, flying north up to 3,000 miles from their wintering grounds in central Mexico and southern California, into the U.S. and Canada. Once abundant, monarch populations have decreased by 80% in the past two decades. This decline is inextricably linked to a decline in milkweed plants, which monarch caterpillars need to survive. The US government is currently considering an Endangered Species listing to protect monarchs and restore their critical habitat.

ILLEGAL HUNTING & TRADE

Many species have been endangered because of **over-fishing** and hunting. The gray whale, alligator, and certain sharks are just a few examples of U.S. species whose populations severely declined after being caught and killed at an alarming rate. Millions of animals are also removed from the wild each year for the exotic pet trade, which threatens many birds, amphibians and reptiles, such as the diminutive **BOG TURTLE**, one of the smallest turtles in the world. They can fetch hundreds of dollars each in the illegal pet trade, which exacerbates the threats they face from habitat loss, pollution and invasive species.

CLIMATE CHANGE

Climate change caused by human activities could drive more than a million animals and plant species to extinction worldwide by 2050 and half of all species could go extinct in some areas by the end of this century, according to recent research. Melting sea ice, warming ocean and river waters, and changes in precipitation have widespread impact on habitat, life cycles and migration patterns. **POLAR BEARS**, the world's largest carnivores, are only found in the Arctic. They need sea ice to hunt, travel, mate and raise their young. They are the first U.S. species officially designated as threatened with extinction due to climate change.

INDIANA BAT

Indiana bats were listed under the U.S. **Endangered Species Act** following massive die-offs caused by human disturbance of the caves in which they hibernated. Over several decades, the ESA helped to preserve these small brown bats and their critical habitat. One of the reasons bats are so important is that they eat LOTS of bugs, reducing pest, such as mosquitoes, and the need for polluting pesticides. However, in spite of the ESA protection, a disease known as White-Nose Syndrome now threatens all cave-dwelling, hibernating brown bats in the United States and Canada.

WHY SAVE ENDANGERED SPECIES?

Here's **FIVE** important reasons we should all care about protecting species from extinction - and preventing them from becoming endangered in the first place.

01 WE ARE ALL CONNECTED

All species are linked in our interconnected web of life on earth. Every living species, including people, depend on other species for survival. While scientists can't predict how the extinction of one organism will affect the other members of its ecosystem, they do know that the removal of a single species can set off a chain reaction affecting many others. A healthy environment for wildlife contributes to a healthy environment for people, today and tomorrow. Human health, pollination, pest control, water quality, food availability and other critical factors also depend on healthy ecosystems and biodiversity.

02 INTRINSIC VALUE

Intrinsic value means that all species have worth, for their own sake, independent of their usefulness to humans. If humans did not exist, individual animals, populations and the ecosystems in which they live would still be important in and of themselves. From this perspective, the loss of plant and animal species is simply wrong, especially since an extinct species can never be replaced.

03 FOOD & HEALTH

Protecting endangered species and biodiversity saves species that may become important sources of medicines or foods. About 25 percent of the medicines used today are taken from or modeled on chemicals found in plants, animals, or other living things.

04 NATURE'S 911

Endangered species are an early warning system for pollution and environmental degradation that may someday affect human health. Endangered species are linked to environmental quality (for example, endangered mussels are indicators of poor water quality).

05 QUALITY OF LIFE

A study on wildlife tourism found that encountering wildlife can provoke an emotional response of awe, wonder and privilege, as well as a "deep sense of well-being that transcends the initial encounter leading to spiritual fulfillment and psychological health benefits." Conserving endangered species and wildlife can also generate income for local communities through responsible ecotourism and wildlife-watching businesses. Studies by the International Fund for Animal Welfare (IFAW) have found that whale watching is not only awe-spiring but also one of the fastest growing tourism products in the world. In one year alone, more than 13 million whale watchers worldwide pump $2 billion into the global economy.

FLORIDA PANTHER

The Florida panther is a subspecies of puma that is native to the southeastern U.S. By the late 1960's, only 20 animals survived in a single population in southwest Florida. A 1973 Endangered listing under the ESA protected the animals from hunting and allowed them to hang on. In the mid-1990's, the U.S. government preserved critical habitat and introduced pumas to bolster the population. Today, there are as many as 160 panthers in Florida. As the top predator in its habitat, the panther is important to the healthy functioning of the south Florida ecosystem, which includes armadillos, deer, and feral hogs.

HOW DO WE PROTECT ENDANGERED SPECIES?

By the time people realized what was happening to the passenger pigeon, it was too late to save the species. However their demise prompted Congress to pass the nation's first wildlife protection law in 1900 and other regulations soon followed. Eventually, as populations of numerous wildlife species continued to decline in the United States and worldwide, Congress passed the comprehensive Endangered Species Act (ESA) of 1973.

The ESA is a federal law that requires the U.S. government to identify, protect, and restore healthy populations of endangered wildlife, including birds, insects, fish, reptiles, mammals, crustaceans, flowers, grasses and trees. It currently protects more than 1400 animal and 900 plant species in the United States and worldwide.

The ESA is designed to protect not only large, charismatic wildlife such as grizzly bears and bald eagles, but also more obscure - yet equally important - species critical to the web of life. The ESA also protects the **critical habitat** that is needed to prevent the extinction of endangered plants and wildlife.

Once ranging from parts of South America to the southwestern United States, **JAGUARS** disappeared from the U.S. due to hunting and habitat loss. Jaguars were not listed under the ESA until 1997, when male jaguars were spotted roaming into Arizona and New Mexico. The ESA added protection for their critical habitat in 2014, increasing the chances of jaguars once again finding a permanent home in the U.S.

 # OF U.S. ANIMAL SPECIES LISTED AS THREATENED OR ENDANGERED UNDER THE ESA

Summary of Listed Species from USFWS
https://ecos.fws.gov/ecp0/reports/box-score-report
as of Mon, 22 Oct 2018 12:43:59 GMT

THE U.S. ENDANGERED SPECIES ACT RECOGNIZES THAT ALL ANIMALS AND PLANTS HAVE VALUE AND DESERVE PROTECTION.

Ninety-nine percent of the species listed under the Act since it was first enacted still survive, a remarkable record. A strong foundation in science has been at the heart of this success. Under the Act, a species receives federal protection if scientific evidence indicates its continued existence is at risk.

For a species to gain protection under the ESA, it must be listed as either "threatened" or "endangered":

- **Endangered** species are those plants and animals that have become so rare they are in danger of becoming extinct.
- **Threatened** species are plants and animals that are likely to become endangered within the foreseeable future throughout all or a significant portion of their **range**.

Once a species has been officially assessed and classified as threatened or endangered, the law prohibits the U.S. government from authorizing, funding, or carrying out any action that would jeopardize it or degrade its critical habitat. The ultimate goal of the ESA is to help species **recover** so they no longer need protection.

PROTECTING SPECIES WORLDWIDE

The ESA is regarded as one of the world's strongest environmental laws. The Act requires the U.S. government to list species as endangered or threatened regardless of which country the species lives in. It currently protects about 580 foreign species. The listing of foreign species aims to ensure that U.S. citizens and residents do not contribute to the further decline of those species. An ESA listing can also help increase awareness about endangered species around the world and provide some financial assistance from the U.S. for conservation efforts in foreign countries.

The U.S. government also uses the ESA to implement the 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Under this treaty, 183 nations have agreed to work together to ensure that legal international trade in wild animals and plants does not threaten their survival. CITES restricts or prohibits trade in more than 35,000 species of animals and plants, whether they are traded as live specimens, fur coats or dried herbs.

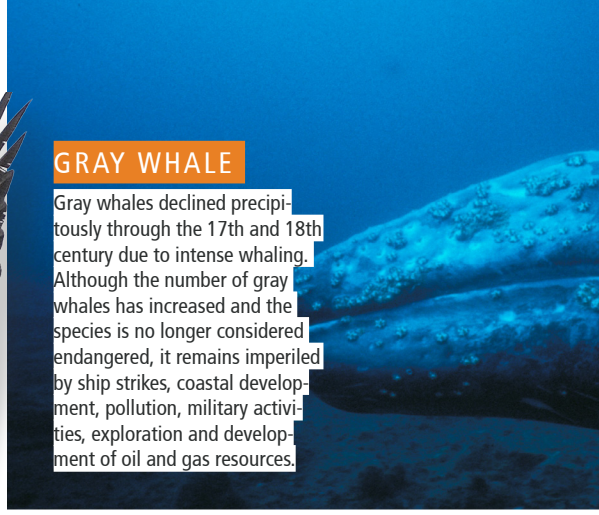
BACK FROM THE BRINK

ESA SUCCESS STORIES

All of the plants and animals on the U.S. endangered species list got there because they were in serious trouble. The good news is: species can, and do, recover. The Endangered Species Act has been one of the most effective tools used to protect America's perilously declining wildlife. Scientists estimate that without the ESA, at least 227 threatened species—including the iconic bald eagle, Florida manatee, and California condor—would be extinct. In fact, the ESA has successfully prevented extinction for 99 percent of the species that are listed as endangered or threatened.

BALD EAGLE

Bald eagle populations were decimated by shooting and habitat destruction, and the species was nearly extirpated in the U.S. until protected by federal law (the Bald and Golden Eagle Protection Act) in the 1940s. Populations then stabilized, but the widespread use of DDT, a pesticide that is especially harmful to birds of prey, caused bald eagle populations to plummet again. By 1973, there were only about 400 nesting pairs in the lower 48 states. Thanks to the ESA and related conservation efforts, critical nesting habitat was protected, reintroduction efforts were conducted and DDT was banned. Today, there are about 10,000 breeding pairs of bald eagles in the continental U.S. In 2007, bald eagles were removed from the ESA but they remain protected under other laws.

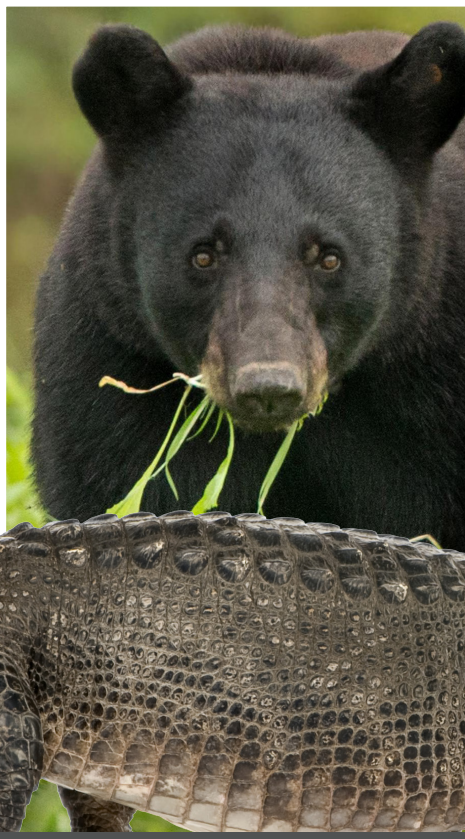


GRAY WHALE

Gray whales declined precipitously through the 17th and 18th century due to intense whaling. Although the number of gray whales has increased and the species is no longer considered endangered, it remains imperiled by ship strikes, coastal development, pollution, military activities, exploration and development of oil and gas resources.

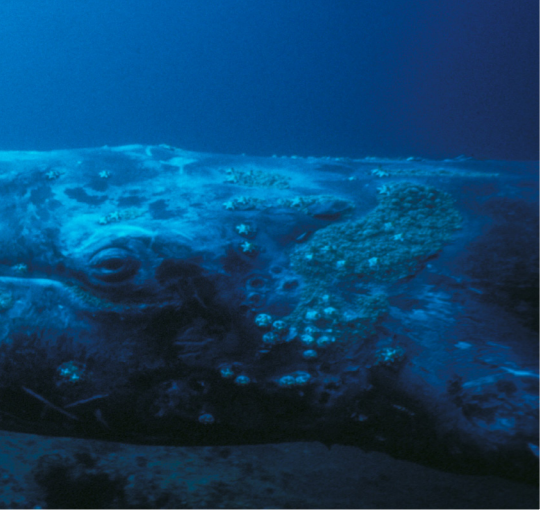
CALIFORNIA CONDOR

One of the largest flying birds in the worlds, these **raptors** were nearly driven extinct by DDT, lead poisoning and hunting. Although protected under the ESA since it was first passed, the condor population declined to 9 birds by 1985. A successful **captive breeding** and release program was implemented and by 2016 there were more than 400 condors, including about 125 in the wild.



AMERICAN ALLIGATOR

Prized for their hides and nearly wiped out by hunting, American alligators were one of the first species listed under the ESA in 1973. Suspended hunting of these alligators led to the species' rapid recovery. Delisted in 1987, the species is now widespread across the Southeast.



SOUTHERN SEA OTTER

Southern sea otters were nearly hunted to extinction by the fur industry and were placed on the endangered species list in 1977. The population increased from 1,789 in 1976 to 2,735 in 2005.

BLACK-FOOTED FERRET

As many as 5.6 million once inhabited the Great Plains, but their population was decimated as numbers of their primary prey, prairie dogs, also precipitously declined due to habitat loss, poisoning and disease. The ferret was thought to be extinct in 1980, but one small colony was discovered on a ranch in Wyoming. Through captive breeding and reintroduction, their total population is now about 400.

DELMARVA FOX SQUIRREL

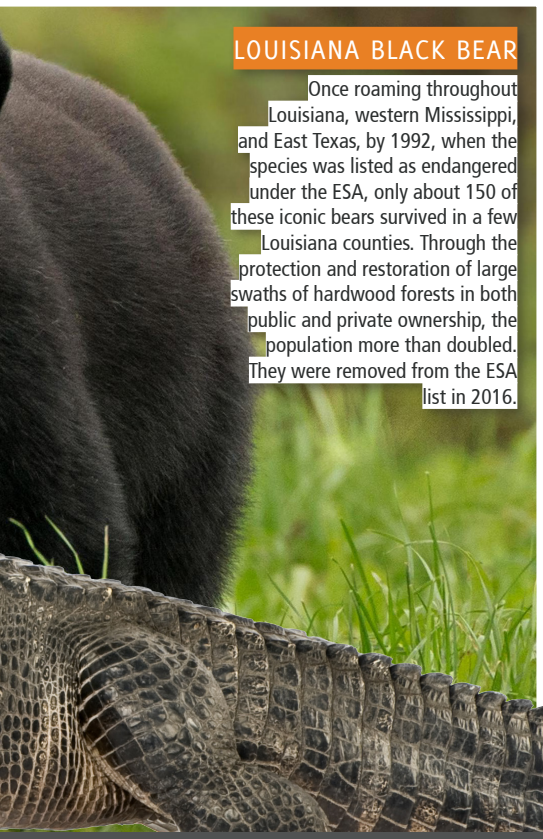
Habitat loss and hunting reduced this large, silver-gray tree squirrel to just 10 percent of its historic range by the time the ESA was adopted. With habitat protection and other efforts, their population grew to more than 20,000 and they were removed from ESA listing in 2015.

GRAY WOLF

Listed as Endangered, except for populations in several Western and Midwest states, gray wolves once roamed across much of North America. They were hunted to near extinction in the lower 48 states by the early 1930s. Listed under the ESA in 1974, gray wolf packs were reintroduced in parts of the American west, in the 1990s and have made a remarkable recovery.

WHOOPING CRANE

Our nation's tallest bird was nearly lost forever to widespread habitat loss and hunting. In 1941 there were only 16 birds left. Listed on the ESA since it was first enacted, key migratory sites have been conserved and hunting restricted. Several captive-bred populations were also successfully introduced. With combined captive and wild populations exceeding 500 birds, the whooping crane is considered one of the ESA's greatest success stories.



LOUISIANA BLACK BEAR

Once roaming throughout Louisiana, western Mississippi, and East Texas, by 1992, when the species was listed as endangered under the ESA, only about 150 of these iconic bears survived in a few Louisiana counties. Through the protection and restoration of large swaths of hardwood forests in both public and private ownership, the population more than doubled. They were removed from the ESA list in 2016.

WEST INDIAN MANATEE

Once abundant throughout the warm, coastal waters of the Atlantic and Caribbean, these marine mammals were devastated by hunting and habitat loss throughout the 19th and early 20th centuries. The species has made a remarkable recovery ESA protection and other conservation measures. In the last 25 years, Florida's manatee population grew from fewer than 1,300 to 6,300, prompting the U.S. Fish and Wildlife Service change their status from Endangered to Threatened. Manatees, while currently rebounding, are still threatened by pollution, habitat loss, and boat strikes.

How does the ESA work?

The U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) administer the ESA. The USFWS has primary responsibility for terrestrial (land-based) and freshwater organisms, while the responsibilities of NMFS are mainly marine wildlife such, as whales and ocean fish. Under the ESA, these government agencies must ensure that any action they authorize or fund (such as building, drilling, or logging projects) doesn't pose risks to listed endangered species or their habitats. They work closely with state governments and tribal authorities to develop and help finance conservation programs that protect listed species. Because a lot of the habitat critical to the survival of listed species is located on private land, the government must also find ways to protect landowner rights, while encouraging activities that benefit endangered and threatened wildlife.

Challenges

While the Endangered Species Act has contributed substantially to species and habitat conservation and there have been a number of endangered species recovery success stories, there are politicians, businesspeople and others who disagree with the way the law is implemented. They believe that a conflict exists between human interests and wildlife protection. For instance, some people suggest that butterflies, fish or other species shouldn't be protected if that will negatively impact the development of a commercial building, or that plants, wolves or birds on public lands should not be protected if that interferes with ranchers driving cattle on those lands.

However, other policy-makers, scientists and conservationists stress that the Endangered Species Act serves a vital role in species conservation and that it must be implemented without the undue influence of individuals with special business or other interests.

They emphasize the importance of scientific data to inform the critical decisions of listing species under the ESA. They also argue there does not have to be a conflict between human and wildlife interests. By protecting wildlife and wild lands, we provide the greatest benefit to the greatest number of humans—clean air, clean water, medicines, eco-tourism dollars and more.

SAVING NORTHERN SPOTTED OWLS

The process of listing species under the Endangered Species Act can become controversial. The debates often focus on the need to protect threatened plants and animals versus how such protections could inhibit land use or economic development.

One well-known example is the listing of northern spotted owls as a threatened species in 1990. The critical habitat of these owls lies primarily in old-growth forests in the Pacific Northwest. By the 1990s, the state of Washington alone had lost over 90 percent of its old growth forest due to logging, which caused a 40-90 percent decline of the northern spotted owl population.

The decision to list this bird as an endangered species caused a bitter rift between environmentalists and loggers, who argued that the decision was costing thousands of jobs. However, from the environmentalists' perspective, the benefits of preserving the northern spotted owl and its habitat far outweigh any of the costs. Saving the spotted owls means protecting an entire ecosystem on which plants, other animals, and humans depend. The owls' ancient forest home plays a critical role in preventing soil erosion, floods, and landslides, providing clean water for agriculture and cities, enhancing the productivity of salmon fisheries, enriching the soil with vital nutrients, and helping to combat climate change by absorbing carbon dioxide.

The ESA & Marine Mammal Protection

The ESA was passed alongside other landmark environmental laws passed in the United States during the 1970s, including regulations focused on clean air and water, preventing overfishing and protecting marine mammals.

While some marine mammals are protected under the ESA, **all** marine mammals are protected by U.S. law under the 1972 Marine Mammal Protection Act (MMPA). Marine mammals are mammals that rely on the ocean, or bodies of freshwater, to survive. They include whales, dolphins, porpoises, seals, sea lions, walruses, polar bears, sea otters, manatees, and dugongs. Some are fully aquatic, such as whales and dolphins. Others, such as seals and sea lions, spend most of their time in water, but return to land or ice for activities such as resting or giving birth.

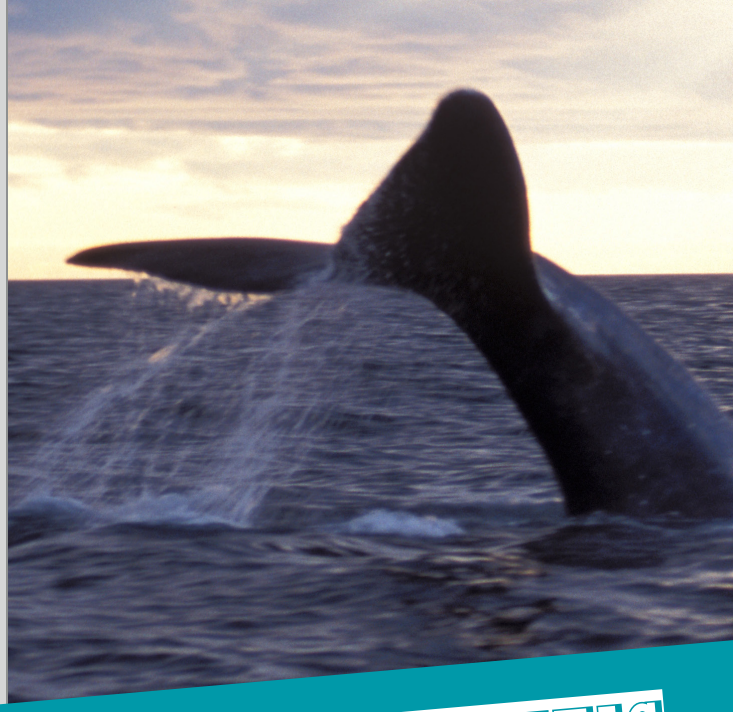
Congress passed the MMPA in response to increasing concerns among scientists and the public that human activities were causing significant declines in the populations of many marine mammal species. Seals were being hunted for their fur, thousands of dolphins were killed each year as **by-catch** in the tuna fishery and whales were still being commercially hunted.

The goal of the MMPA is for marine mammals to be able to feed, migrate and reproduce without interference from humans. The law prohibits, with some exceptions, harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing or collecting any marine mammals in U.S. waters or by U.S. citizens in international waters. It also prohibits the importation of marine mammals and marine mammal products into the U.S. without a special permit.

Like the ESA, the MMPA is jointly administered by USFWS and NOAA Fisheries.

MMPA success stories include recovery of many of the great whale species, such as blue whales and humpbacks, as well as harbor seals and gray seals in New England; California sea lions, northern elephant seals and harbor seals on the Pacific Coast; and bottlenose dolphins and manatees in Florida.

Yet some species, such as North Atlantic and Pacific Right Whales, remain critically-endangered in spite of both ESA and MMPA protections. And human-caused threats, such as climate change, are of growing concern.



NORTH ATLANTIC RIGHT WHALE

Right whales are the most critically-endangered whale species and among the rarest of all marine mammals. They once were plentiful in the Atlantic Ocean, but were over-hunted in by commercial whaling in the 19th century. Although protected by both the ESA and MMPA, right whale populations have yet to recover. Human activities threaten whales in multiple ways, including ship collisions, entanglement in fishing gear, habitat degradation, climate change and ocean noise pollution. As of 2018, only about 450 North Atlantic right whales survive.

Because of ongoing and potential loss of their sea ice habitat resulting from climate change, polar bears were listed as a threatened species in the U.S. under the Endangered Species Act in 2008.

BETTER SAFE THAN SORRY

Prevention and precaution are the best ways to protect wildlife and our shared environment

The Endangered Species Act has been described as an "emergency room" approach to wildlife conservation that gives federal protection to species only after their populations may already be too "sick" to survive - often just a few hundred individual animals. When species have declined this far, recovery is very difficult.

It is much easier to protect wildlife species before they need to be listed as endangered or threatened. A **precautionary approach** to wildlife conservation recognizes that delaying action until there is compelling evidence of harm to a species or habitat will often mean that it is then too costly or impossible to avert the threat. Instead, this approach calls for action to reduce threats even if the scientific evidence is uncertain or there is a lack of data.

With this precautionary goal of protecting wildlife populations and habitat while they are still healthy and intact, thousands of wilderness areas have been set up throughout the United States and around the globe, to conserve plants, animals, and ecosystems. Marine protected areas (MPAs) have been established to preserve sea life.

As of 2018, 59 national parks throughout the United States encompass more than 84 million acres under the jurisdiction of the National Park Service. Established by an act of Congress, national parks protect habitat and biodiversity within the park by restricting activities such as mining and drilling. Millions more acres of habitat are protect by conservation areas and parks managed at the state level.

A precautionary approach to protecting endangered wildlife requires efforts that focus not just on preserving single species in small islands of habitat but also on securing large landscapes and entire ecosystems. This is especially important given climate change, which is already forcing species to migrate into new geographical terrain and regions.

It is much easier to protect species before they need to be listed as endangered or threatened than to try to recover them when they are in danger of extinction.

WHAT YOU CAN DO

When humans move into natural areas to farm, log, and mine and to build places to live, work and play, animals lose their homes. The best thing is to avoid destroying habitat in the first place but you can also take steps to reduce your impact.

- **WILDLIFE-FRIENDLY YARDWORK**
  Minimize the use of herbicides/pesticides on crops and home gardens. A garden planted with native species will provide food, water and cover to attract a wide variety of animals. Flowers with lots of nectar attract bees; plants with berries attract birds; climbing plants are ideal for bird nests and insects; even a dead log can be a home!

- **PLANT A POLLINATOR GARDEN**
  Monarch butterflies and pollinators are in trouble. A simple, native flower garden will attract beautiful butterflies to your yard and help pollinators stay healthy. You can plant a pollinator garden anywhere - your yard, school, church, business or even in a pot for your front steps. In addition to nectar from flowers, monarch butterflies need milkweed to survive.

- **DON'T KEEP WILDLIFE AS PETS**
  Unlike house cats and dogs, who are domesticated animals, wild animals aren't suited to life as pets. Although cute as babies, wild animals quickly become too difficult for most people to care for, putting both the animal and owner at risk. If you encounter orphaned or injured wildlife, contact a licensed wildlife professional who is trained to deal with the special needs of wildlife, including rehabilitating and returning them to their natural habitat or, if necessary, a wildlife sanctuary.

- **BE AWARE AND TAKE CARE**
  Animals and their homes are everywhere! Whether playing in your yard, riding your bike to a friend's house, travelling with your family, or on a nature walk, you will come in contact with animals, large and small, and the homes they depend upon for survival. It might be an insect marching across a walkway, a small reptile or mammal foraging for food in the grass.

- **REFUSE, REDUCE, REUSE, RECYCLE**
  Refuse what you don't need. Reduce the number of things you throw away (pack a litter-free school lunch). Reuse items (switch to reusable shopping bags). Recycle (bottles, paper, plastic, tin), etc.

- **SAVE ENERGY**
  At home, school and work, switch off lights and electrical items. Walk, cycle and use public transport where possible and choose to travel less by plane. Buy foods grown locally and goods produced in your region. Vacation closer to home. It all adds up to help combat climate change, pollution and depletion of natural resources.

- **KEEP IT CLEAN**
  Dispose of your own rubbish and hazardous waste properly. Compost table scraps. Pick up trash when you come across it. Organise a local clean-up with a group of friends or your class at school. Or volunteer to help clean up a beach, park or other public space with an organization in your area.

- **SPEAK OUT**
  Find out how you can help conserve a species native to your area. Educate your family, friends and community about endangered wildlife species with posters, presentations, social media, newspaper articles, art, etc. We are all in this together!

Words to Know

BIODIVERSITY The variety of life and its processes, including the number and variety of living organisms, the genetic differences among them, and the variety of communities and ecosystems in which they occur.

CAPTIVE BREEDING The process of controlled breeding of animals by humans outside of their natural environment in restricted conditions, such as in farms, zoos or other closed facilities.

CRITICAL HABITAT Specific geographic areas that contain features essential to the conservation of an endangered or threatened species and that may require special management and protection, according to the Endangered Species Act. Critical habitat may also include areas that are not currently occupied by the species but will be needed for its recovery.

ECOLOGICAL HEALTH The interdependent health of people, animals and ecosystems.

ECOSYSTEM The dynamic and complex interactions of plant and animal communities and their associated nonliving (such as physical and chemical) environment.

ENDANGERED SPECIES According to the U.S. Endangered Species Act, an endangered species is an animal or plant in danger of extinction within the foreseeable future throughout all or a significant portion of its range.

ENDANGERED SPECIES ACT (ESA) National legislation enacted by the United States government in 1973 to provide a framework to conserve and protect endangered and threatened species and their habitats.

ENDEMIC SPECIES A species native and confined to a certain region; generally used for species with comparatively restricted distribution.

EXTINCT SPECIES A species that no longer exists.

EXTIRPATED Locally extinct, but still exists elsewhere.

FERAL Domestic animals living in a wild state.

HABITAT The natural environment in which an organism or population normally lives, comprised of the physical (abiotic) factors, such as soil, moisture, and temperature range, as well as biotic factors, such as the availability of food and the presence of predators that make it possible for survival and reproduction.

INTRINSIC VALUE is defined as the inherent worth of something, independent of its worth (or usefulness) to anyone or anything else. An individual animal has intrinsic value because it is [genetically] unique and cannot be exchanged for another individual. A species has intrinsic value for the same reason; it cannot be exchanged for another species.

NATIVE SPECIES A species that normally lives and thrives in a particular ecosystem.

NON-NATIVE SPECIES A species living outside its native distributional range, but which has arrived there by human activity, either deliberate or accidental. Sometimes referred to as: alien species, exotic species, non-indigenous species, or introduced species.

POLLUTION The release of a potentially harmful chemical, physical, or biological agent to the environment as a result of human activity. Examples include plastics, pesticides, sewage, noise, light, and smog.

PRECAUTIONARY APPROACH A principle of science that prescribes caution or conservative action in the face of scientific uncertainty or lack of data in order to reduce or alleviate threats of harm to the wellbeing of humans, animals or the environment pending further scientific investigation.

RANGE The geographic area a species is known to or believed to occupy.

RAPTOR A bird of prey; a large, strong bird that feeds on smaller animals.

RECOVERY The process that stops the decline of an endangered or threatened species by removing or reducing threats.

ROOSTING When birds or bats settle or congregate for rest or sleep.

THREATENED SPECIES According to the Endangered Species Act, a threatened species is a species likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

UNSUSTAINABLE Not able to be maintained at the current rate or level.