

Important notes on extinction

Species have become extinct throughout history. Biological evolution, driven by natural climate change, catastrophic geologic events, and competition from better-adapted species, has involved extinction of billions of species since the beginning of life on Earth about three billion years ago. In fact, only 2-4% of the species that have existed on Earth exist today.

A typical species becomes extinct within 10 million years of its first appearance, although some species, called living fossils, survive virtually unchanged for hundreds of millions of years.

Most extinctions occur naturally, without human intervention: it is estimated that 99.9% of all species that have ever existed are now extinct.

Now, however, species threatened by human actions are becoming extinct at a much quicker rate. Some scientists estimate that up to half of presently existing species may become extinct by 2100



Scientists estimate that current extinction rates are 1,000 to 10,000 times higher than the average natural extinction rate.

An important aspect of extinction at the present time are human attempts to preserve critically endangered species, which is reflected by the creation of the conservation status "Extinct in the Wild" (EW). Species listed under this status by the International Union for Conservation of Nature (IUCN) are not known to have any living specimens in the wild, and are maintained only in zoos or other artificial environments. Some of these species are functionally extinct, as they are no longer part of their natural habitat and it is unlikely the species will ever be restored to the wild.

The extinction of one species' wild population can have knock-on effects, causing further extinctions. These are also called "chains of extinction"

Human Caused Extinction:

Currently, environmental groups and some governments are concerned with the extinction of species caused by humanity, and are attempting to combat further extinctions through a variety of conservation programs. Humans can cause extinction of a species through overharvesting, pollution, habitat destruction, introduction of new predators and food competitors, overhunting, and other influences. Explosive, unsustainable human population growth is an essential cause of the extinction crisis.

Modern extinctions:

The possibility of extinction was not widely accepted before the 1800s.

The devoted naturalist Carl Linnaeus, could "hardly entertain" the idea that humans could cause the extinction of a species. When parts of the world had not been thoroughly examined and charted, scientists could not rule out that animals found only in the fossil record were not simply "hiding" in unexplored regions of the Earth. Georges Cuvier is credited with establishing extinction as a fact in a 1796 lecture to the French Institute

According to a 1998 survey of 400 biologists conducted by New York's American Museum of Natural History, nearly 70 percent believed that they were currently in the early stages of a human-caused extinction, known as the Holocene extinction.

In that survey, the same proportion of respondents agreed with the prediction that up to 20 percent of all living populations could become extinct within 30 years (by 2028).

Biologist E. O. Wilson estimated in 2002 that if current rates of human destruction of the biosphere continue, one-half of all species of life on earth will be extinct in 100 years.

Causes

Unsustainable hunting:

Overhunting and overfishing: have threatened animal species since aboriginal

Europeans, Australians, and Americans developed effective hunting technology thousands of years ago.

The dodo, passenger pigeon, great auk, and Steller's sea cow were hunted to extinction.

Unsustainable hunting and fishing continue to endanger numerous animals worldwide.

In the United States, many of the animals considered national symbols—bald eagle, grizzly bear, timber wolf, American bison, bighorn sheep, Gulf of Mexico sea turtles—have been threatened by overhunting.

The eskimo curlew is a large sandpiper that was abundant in North America in the nineteenth century. The birds were relentlessly hunted by market gunners during their migration from the prairies and coasts of Canada and the United States to their wintering grounds on the pampas and coasts of South America. The eskimo curlew became very rare by the end of the nineteenth century. The last observation of a curlew nest was in 1866, and the last "collection" of birds was in 1922.

The Guadalupe fur seal was abundant along the coast of western Mexico in the nineteenth century, numbering as many as 200,000 individuals. This marine mammal was hunted for its valuable fur and almost became extinct in the 1920s. Fortunately, a colony of 14 seals, including pups, was discovered off Baja California on Guadalupe Island in 1950. Guadalupe Island was declared a pinnaped sanctuary in 1975; the species now numbers more than 1,000 animals, and has begun to spread throughout its former range.

The Juan Fernandez fur seal of Chile had a similar history. More than three million individuals were killed for their pelts between 1797 and 1804, when the species was declared extinct. The Juan Fernandez seal was rediscovered in 1965; and its population presently numbers several thousand individuals.

Commercial whaling: Done for meat and oil since the eighteenth century has

threatened most of the world's baleen whale species, and several toothed whales, with extinction. Faced with severe depletion of whale stock, 14 whaling nations formed the International Whaling Commission (IWC) in 1946. In spite of these measures, only a few whale species have recovered to their pre-whaling populations, and a number of species remain on the brink of extinction.

The California gray whale is a rare success story. This species was twice hunted near extinction, but it has recovered its pre-whaling population of about 21,000 individuals. The gray whale was removed from the endangered species list in 1993.

Large predators and trophies: Many large predators are killed because they compete with human hunters for wild game like deer and elk, because they prey on domestic animals like sheep, or sometimes because they threaten humans. Consequently, almost all large predators whose former range has been developed by humans have become **extirpated** or endangered.

The list of endangered large predators in the United States includes most of the species that formerly occupied the top of the food chain, and that regulated populations of smaller animals and fishes: grizzly bear, black bear, gray wolf, red wolf, San Joaquin kit fox, jaguar, lynx, cougar, mountain lion, Florida panther, bald eagle, northern falcon, American alligator, and American crocodile.

A number of generally harmless species are, sadly, endangered because of their threatening appearance or reputation, including several types of bats, condors, non-poisonous snakes, amphibians, and lizards. Internationally, many endangered species face extinction because of their very scarcity. Though CITES agreements attempt to halt trade of rare animals and animal products, trophy hunters, collectors of rare pets, and traders of luxury animal products continue to threaten numerous species. International demand for products like elephant tusk ivory, rhino horn, aquarium fish, bear and cat skins, pet tropical birds, reptile leather, and tortoise shells have taken a toll on many of the earth's most extraordinary animals.

Endangerment caused by introduced species:

In many places, vulnerable native species have been annihilated by non-native species imported by humans. Predators like domestic cats and dogs, herbivores like cattle and sheep, omnivores like pigs and diseases have killed, starved, and generally out competed native species after being introduced by humans.

Species living on islands are especially vulnerable to introduced predators. In one case, the accidental introduction of the predatory brown tree snake to the Pacific island of Guam in the late 1940s caused a severe decline of native birds. Prior to the introduction of the snake there were 11 native species of birds on Guam, most of which were abundant. By the mid-1980s seven of the native species were extinct or extirpated on Guam, and four more were critically endangered. The Guam rail, a flightless bird, is now extinct in the wild, although it survives in captivity and will hopefully be captive-bred and released to a nearby, snake-free island.

Endangerment caused by habitat destruction:

Many species have become extinct or endangered as their natural habitat has been converted for human land-use purposes.

The American ivory-billed woodpecker, for example, once lived in mature, bottomland hardwood forests and cypress swamps throughout the southeastern United States. These habitats were heavily logged and/or converted to agricultural land by the early 1900s.

The black-footed ferret was first discovered in the North American prairie in 1851. This small predator became endangered when the majority of its grassland habitat was converted to agricultural use. Farming in the American and Canadian plains also dramatically reduced the population of prairie dogs, the black-footed ferret's preferred food.

The northern spotted owl lives in the old-growth conifer forests of North America's

Pacific Northwest. These small owls require large areas of uncut forest to breed, and became endangered when their habitat was greatly reduced and fragmented by heavy logging. The Environmental Species Act prescribes, and legally requires, preservation of large areas of extremely valuable timber land to protect the northern spotted owl. Upon receiving its status as an endangered species, the otherwise unremarkable owl became a symbol of the conflict between environmental preservation and commercial enterprise. For environmentalists, endangered classification of northern spotted owl brought the possibility of protecting the forests from all exploitation; for timber industry workers, the decision represented the government's choice to preserve a small bird instead of their livelihood. Small stores on the back roads of the Pacific Northwest expressed their resentment for the ESA by advertising such specialties as "spotted owl barbeque" and activities as "spotted owl hunts."

Tropical deforestation presents represents the single greatest threat to endangered species today.

Destruction of coastal and shallow marine habitats associated with global warming may present an even larger challenges in the future.

While there was little net change in the total forest cover of North America between the 1960s and the 1980s, the global area of forested land decreased by 17% during that period. In the mid-1980s, tropical rainforests were being cleared at a rate of 15–20 million acres per year.

The causes of tropical deforestation include conversion to subsistence and market agriculture, logging, and harvesting of fuel-wood.

Actions to Protect Endangered Species:

In the US the Endangered Species Act of 1973 protects threatened and endangered species.

A solution is to adopt new, more sustainable, methods of profitable resource use.

Many countries have their own similar version and, like the United States, are members of the World Conservation Union, and participants of the Convention on International Trade In Endangered Species of Wild Fauna and Flora

Many international agreements deal with the conservation and protection of endangered species. Many countries, like the United States, have also undertaken their own actions to catalog and protect endangered species and other elements of biodiversity.

Another important aspect of protection is collaboration organizations like the World Wildlife Fund, the Nature Conservancy and the Ocean Conservancy.

Modern environmental protection strategies attempt to present alternatives that permit sustainable human productivity.

HUMAN CAUSED/ON PURPOSE!

While many human-caused extinctions have been accidental, humans have also engaged in the deliberate destruction of some species, such as dangerous viruses, and the total destruction of other problematic species has been suggested. Other species were deliberately driven to extinction, or nearly so, due to poaching or because they were "undesirable", or to push for other human agendas.

One tragic example was the near extinction of the American bison, which was nearly wiped out by mass hunts sanctioned by the United States government, in order to force the removal of Native Americans, many of whom relied on the bison for food

KEY TERMS

.....

Endangerment

–Refers to a situation in which a species is vulnerable to extinction or extirpation.

Endemic

–Refers to species with a relatively local distribution, sometimes occurring as small populations confined to a single place, such as a particular oceanic island. Endemic species are more vulnerable to extinction than are more widespread species.

Extinction

–The condition in which all members of a group of organisms have ceased to exist.

Extirpation

–The condition in which a species is eliminated from a specific geographic area of its habitat.



Read more:

<http://science.jrank.org/pages/2467/Endangered-Species.html#ixzz1HuUfje50>

Wikipedia:

A typical species becomes extinct within 10 million years of its first appearance, although some species, called living fossils, survive virtually unchanged for hundreds of millions of years. Most extinctions occur naturally, without human intervention: it is estimated that 99.9% of all species that have ever existed are now extinct.

Some scientists estimate that up to half of presently existing species may become extinct by 2100

An important aspect of extinction at the present time are human attempts to preserve critically endangered species, which is reflected by the creation of the conservation status "Extinct in the Wild" (EW). Species listed under this status by the International Union for Conservation of Nature (IUCN) are not known to have any living specimens in the wild, and are maintained only in zoos or other artificial environments. Some of these species are functionally extinct, as they are no longer part of their natural habitat and it is unlikely the species will ever be restored to the wild.

The extinction of one species' wild population can have knock-on effects, causing further extinctions. These are also called "chains of extinction"

Currently, environmental groups and some governments are concerned with the extinction of species caused by humanity, and are attempting to combat further extinctions through a variety of conservation programs. Humans can cause extinction of a species through overharvesting, pollution, habitat destruction, introduction of new predators and food competitors, overhunting, and other influences. Explosive, unsustainable human population growth is an essential cause of the extinction crisis.

Gene pollution:

populations can face such extinctions when new populations are imported or selectively bred by people, or when habitat modification brings previously isolated species into contact. Extinction is likeliest for rare species coming into contact with more abundant ones

Interbreeding can swamp the rarer gene pool and create hybrids, depleting the purebred gene pool (for example, the endangered Wild water buffalo is most threatened with extinction by genetic pollution from the abundant domestic water buffalo).

Habitat Degradation:

Habitat degradation is currently the main cause of species extinctions. The main cause of habitat degradation worldwide is agriculture, with urban sprawl, logging, mining and some fishing practices close behind. The degradation of a species' habitat may alter the fitness landscape to such an extent that the species is no longer able to survive and becomes extinct.

Habitat degradation through toxicity can kill off a species very rapidly, by killing all living members through contamination or sterilizing them. It can also occur over longer periods at lower toxicity levels by affecting life span, reproductive capacity, or competitiveness.

Habitat degradation can also take the form of a physical destruction of niche habitats. Deforestation is where this is seen the most. For example, a fern that depends on dense shade for protection from direct sunlight can no longer survive without forest to shelter it.

Predation, competition, and disease:

Before the evolution of hominids, life forms competed with each other and drove one another extinct. Recently in geologic time, Humans have been transporting animals and plants from one part of the world to another for thousands of years, sometimes deliberately (e.g., livestock released by sailors onto islands as a source of food) and sometimes accidentally (e.g., rats escaping from boats). In most cases, such introductions are unsuccessful, but when they do become established as an invasive alien species, the consequences can be catastrophic.

Invasive alien species can affect native species directly by eating them, competing with them, and introducing pathogens or parasites that sicken or kill them or, indirectly, by destroying or degrading their habitat.

Human populations may themselves act as invasive predators. According to the "overkill hypothesis", the swift extinction of the megafauna in areas such as New Zealand, Australia, Madagascar and Hawaii resulted from the sudden introduction of human beings to environments full of animals that had never seen them before, and were therefore completely unadapted to their predation techniques

Global warming:

A 2003 review across 14 biodiversity research centers predicted that, because of climate change, 15–37% of land species would be "committed to extinction" by 2050

The ecologically rich areas that would potentially suffer the heaviest losses include the Cape Floristic Region, and the Caribbean Basin. These areas might see a doubling of present carbon dioxide levels and rising temperatures that could eliminate 56,000 plant and 3,700 animal species.

Why preserve?

Biologist Bruce Walsh of the University of Arizona states three reasons for scientific interest in the preservation of species;

genetic resources, ecosystem stability, and ethics

and today the scientific community "stresses the importance" of maintaining biodiversity.

How people are helping now:

Nature preserves are created by governments as a means to provide continuing habitats to species crowded by human expansion

Alternative Methods:

Voluntary Human Extinction Movement

The primary motivation of VHEMT as a movement is the belief that the biosphere of the planet Earth would be better off without humans. In VHEMT's view, the human race is akin to an "exotic invader", whose population is out of control and threatens other species with extinction, and only removal of the human race can restore the natural ecological order. VHEMT's primary goals are to influence people to choose to

not reproduce and to advocate ready access for all human beings to methods of birth control

Cloning

Ongoing technological advances have encouraged the hypothesis that by using DNA from the remains of an extinct species, through the process of cloning, the species may be "brought back to life". Though bioethical and philosophical objections have been raised, the cloning of extinct creatures seems a viable outcome of the continuing advancements in our science and technology

