Endangered species are plant and animal species that are in danger of extinction, the dying off of all individuals of a species. Over 34,000 plant species and 5,200 animal species around the globe are threatened with extinction, and many thousands more become extinct each year before biologists can identify them.

A steady rate of extinction is a normal process in the course of evolution, and is called the background rate of extinction. Species have slowly evolved and disappeared throughout geologic time because of climatic changes and the inability to adapt to survive competition and predation. Since the 1600s, however, the rate of extinction has accelerated rapidly because of human population growth and resource consumption. Today, most of the world’s habitats are changing faster than most species can adapt to such changes through evolution, or natural selection. The current global extinction rate is estimated at about 20,000 species per year, exponentially greater than the background extinction rate. Many biologists believe that we are in the middle of the greatest mass extinction episode since the disappearance of the dinosaurs 65 million years ago.

Species become extinct or endangered for a number of reasons, but the primary cause is the destruction of habitat by human activities. As species evolve, most adapt to a specific habitat or environment that best meets their survival needs. Without this habitat the species may not survive. Pollution, drainage of wetlands, conversion of shrub lands to grazing lands, cutting and clearing of forests, urbanization, coral-reef destruction, and road and dam construction have destroyed or seriously damaged and fragmented available habitats. Habitat fragmentation, the isolation and division of habitats into smaller areas, has caused plant and animal species in the remaining islands of habitat to lose contact with other populations of their own kind. This reduces their genetic diversity and makes them less adaptable to environmental or climatic change. These small populations are highly vulnerable to extinction. For some species, the fragmented habitats become too small to support a sustainable population.

Since the 1600s, worldwide commercial exploitation of animals for food and other products has caused many species to become extinct or endangered. The whaling industry, in which whales are slaughtered for oil and meat, for example, has led many whale species to the brink of extinction. The African black rhinoceros, killed for its horn, which is prized as a medicine and aphrodisiac, is also critically endangered. The great auk and the passenger pigeon became extinct in the 19th and early 20th centuries because of overhunting, and the Carolina parakeet perished as a species because of a combination of overhunting and habitat destruction. Virtually entire families of plants such as cactus, orchids, and cycads are considered threatened or endangered because of overcollection for commercial purposes.

Nonnative species introduced to a new ecosystem have caused serious native species declines. The nonnative, or exotic, species may be introduced either accidentally or intentionally, and either out-compete the native species or prey on them. Native plants and animals may have no defenses against these invaders, which can exterminate or greatly reduce the populations of many native species. The damaging effects are generally irreversible, and there is often no way to keep the damage from spreading. The accidental introduction of a blight, for example, virtually eliminated the American chestnut tree from North American hardwood forests. The zebra mussel, first discovered in North America in Lake Saint Clair, Ontario, Canada, in 1988, is rapidly spreading to most of the major freshwater ecosystems of the
eastern United States, altering aquatic ecosystems and displacing native mollusks at an alarming rate. In 1959 British colonists introduced the Nile perch into Lake Victoria in eastern Africa as a sport fish. This large predator drastically reduced native fish populations and caused the extinction of as many as 200 endemic species of cichlid fish. Because the cichlids are important algae-feeding fish, the lake has since become choked with decomposing aquatic vegetation, depleting the oxygen in the water and leading to further species declines.

**Pollution** is another important cause of extinction. Toxic chemicals—especially chlorinated hydrocarbons, such as dichlorodiphenyltrichloroethane (DDT) and polychlorinated biphenyls (PCBs)—have become concentrated in food webs, the interconnected food chains that circulate energy through an ecosystem. These toxic chemicals strongly affect species near the top of the food chain. Both DDT and PCBs interfere with the calcium metabolism of birds, causing soft-shelled eggs and malformed young. PCBs also impair reproduction in some carnivorous animals. Water pollution and increased water temperatures have wiped out endemic species of fish in many habitats. Oil spills destroy birds, fish, and mammals, and may contaminate the ocean floor for many years after the event. Acid rain, the toxic result of extreme air pollution, has been known to kill organisms in freshwater lakes and destroy large tracts of forested land.

*(Microsoft Encarta Reference Library 2005)*