

Big Picture

One of the effects of an exponentially increasing human population growth is the loss of other species. Biodiversity, or the variety of species and life, has been decreasing due to human actions. According to scientists, we are the cause of the sixth mass extinction. Other reasons that contribute to the loss of biodiversity are habitat loss and degradation, invasive species, pollution, climate change, and overexploitation. The biodiversity crisis is something worth countering because of the economic benefits and the environmental services biodiversity provides.

Key Term

Biodiversity: Refers to the variety of life and its processes. This includes the variety of living organisms, their genetic differences, and the communities and ecosystems in which they occur.

Sixth Mass Extinction: The extinction that is occurring now to species across the planet.

Habitat Loss: Destruction or disruption of Earth's natural habitats, most often due to human actions such as agriculture, forestry, mining, and urbanization.

Exotic Species: Species introduced by humans into new habitats carry disease, prey on local species, and disrupt food webs. They also act as competitors.

Importance of Biodiversity

Economic benefits

- Wild plants and animals have a wide pool of genetic variation, in comparison to domestic species.
- Many of our manufactured products rely on organisms. Timber, fibers, adhesives, dyes, and rubbers are just a few that we would not have otherwise.
- Species' activities warn us of toxins in the environment.
- Nearly half of prescription drugs are from wild species.
- Living things inspire designs for engineering and technology.

Ecosystem services

- Plants and algae remove carbon dioxide and add oxygen into the atmosphere.
- Plants improve soil quality and prevent erosion.
- Microorganisms purify water in rivers and lakes and recycle nutrients.
- Bacteria can either fix nitrogen and make it available to plants or recycle the nitrogen from organic wastes and remains of dead organisms.
- Insects and birds pollinate flowering plants.
- Natural predators control pests.
- Increases the stability of an ecosystem
- Increases the chance that at least some will survive in the face of large environmental changes

Causes of Extinction

Previously on Earth there have been five mass extinctions, according to the fossil record. Unlike those, the **sixth mass extinction** is largely due to human actions.

- **Habitat loss** is the biggest cause of extinction today. Agriculture, forestry, mining, and urbanization have disturbed or destroyed more than half of Earth's land area.
- Over-harvesting of fish, trees, and other organisms threatens the survival of the species that depend on them and of the species themselves.
- **Exotic species** introduced by humans to new habitats prey on native species, carry disease, and disrupt food webs.
 - Examples: rabbits brought to Australia for recreational hunting have spread uncontrollably and become a serious pest.
- The burning of fossil fuels is the main contributor to global climate change. Rising temperatures threaten many species.
- Pollution adds heat, chemicals, and noise to the environment beyond its carrying capacity.
- Human overpopulation is crowding out other species and making the above causes of extinction worse.

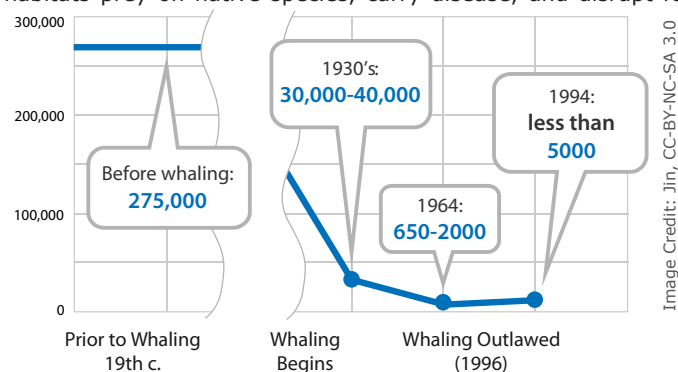


Figure: A look at the effects of whaling on blue whale (*Balaenoptera musculus*) population over time.



A helpful way of remembering the causes of extinction: acronym "HIPPCO," which stands for: **H**abitat loss and degradation, **I**nvasive species, **P**opulation growth, **P**ollution, **C**limate change, **O**verexploitation (overfishing for aquatic biomes)