

Course Code:MCC102A
Course Title:Environmental Studies

Lecture No: 11
Title: Threats to biodiversity
Course Leader : Ms. Priyanka N



Lecture-11

Intended Learning Outcomes

At the end of this Lecture, students will be able to

- Identify Habitat loss
- Explain about threats to Biodiversity and extinction rates
- Discuss Pollution and Eutrophication



Threats to Biodiversity

- **Main idea:** Some human activities destroy biodiversity in ecosystems, and current evidence suggests that reduced biodiversity might have serious long-term effects on the biosphere.
- **Objectives:**
 - Describe the biodiversity crisis.
 - Explain the factors that threaten biodiversity.
 - Describe how the decline of a single species can affect an entire ecosystem.
- **Review Vocabulary:**
 - Food web: a model representing the many interconnected food chains and pathways in which energy and matter flow through a group of organisms



Extinction Rates

- The accelerated loss of species began several centuries ago.
- Many of the species' extinction in the past have occurred on islands.
- Islands are particularly vulnerable to extinction due to several factors.
 - Many species evolved without the presence of natural predators.
 - Introduction of nonnative species with diseases.
 - Islands have relatively small populations sizes



Factors that Threaten Biodiversity

- The current high rate of extinction is due to the activities of a single species—*Homo sapiens*.
- Humans are changing conditions on Earth faster than new traits can evolve to cope with the new conditions.
- Evolving species might not have the natural resources they need.
- Natural resources are all materials and organisms found in the biosphere, including minerals, fossil fuels, nuclear fuels, plants, animals, soil, clean water, clean air, and solar energy.



Overexploitation

- Overexploitation, or excessive use, of species that have economic value is a factor increasing the current rate of extinction.
- Historically, overexploitation was the primary cause of species extinction.
 - Bison
 - Passenger Pigeons
 - Ocelot
 - Rhinoceros



Habitat Loss

- If a habitat is destroyed or disrupted, the native species might have to relocate or they will die.
- Destruction of habitat - such as the clearing of tropical rainforests, has a direct impact on global biodiversity.
- Disruption of habitat - the declining population of one species can affect an entire ecosystem.



Fragmentation of Habitat

The separation of an ecosystem into small pieces of land is called habitat fragmentation.

- The smaller the parcel of land, the fewer species it can support.
- Fragmentation reduces the opportunities for individuals in one area to reproduce with individuals from another area. (Genetic diversity decreases over time)
- Carving the large ecosystem into small parcels increases the number of edges—creating edge effects.

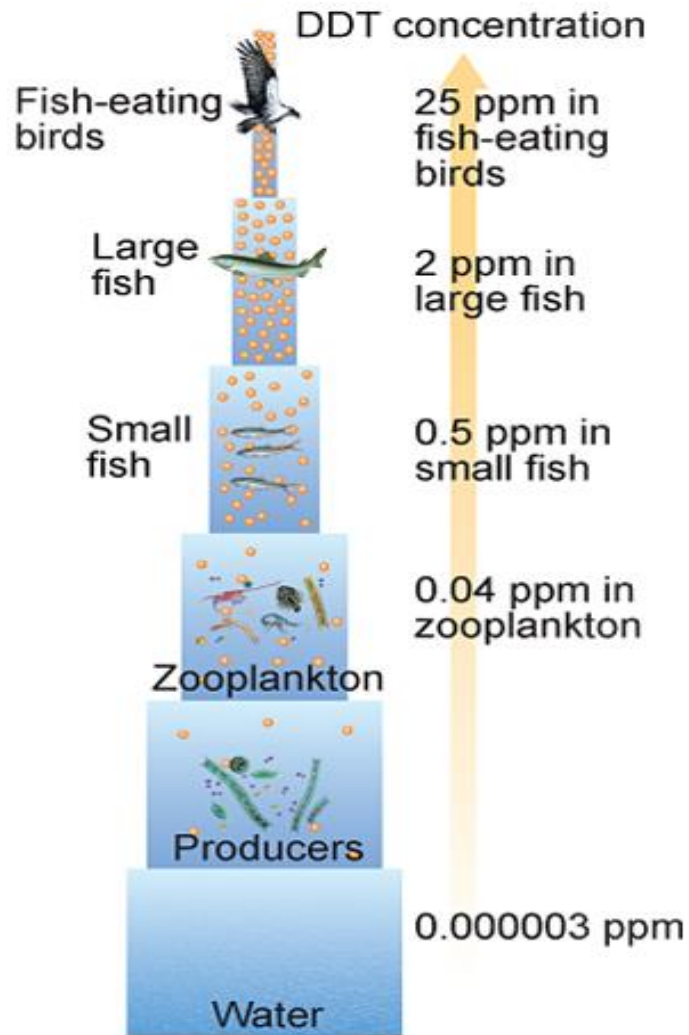


Edge Effects

- Edge effects are different environmental conditions (abiotic factors) that occur along the boundaries of an ecosystem.
- Edge effects often make species more vulnerable to predators and parasites.
- Edge effects do not always create a disadvantage for all species.
- Some species find these conditions favorable and they thrive.



Pollution - Biological Magnification



- Pollution and atmospheric changes threaten biodiversity and global stability.
- Biological magnification is the increasing concentration of toxic substances in organisms as trophic levels increase in a food chain or food web.
- Pesticides - DDT

Pollution - Eutrophication

- Eutrophication occurs when fertilizers, animal wastes, sewage, or other substances rich in nitrogen and phosphorus flow into waterways, causing extensive algae growth.
- The algae use up the oxygen supply during their rapid growth and after their deaths during the decaying process.
- Other organisms in the water suffocate.
- Eutrophication is a natural process, but human activities have accelerated the rate at which it occurs.



Summary

- Some human activities destroy biodiversity in ecosystems and current evidence suggests that reduced biodiversity might have serious long-term effects on the biosphere
- Islands are particularly vulnerable to extinction due to several factors
- The current high rate of extinction is due to the activities of a single species—*Homo sapiens*



Summary contd...

- Overexploitation, or excessive use, of species that have economic value is a factor increasing the current rate of extinction
- If a habitat is destroyed or disrupted, the native species might have to relocate or they will die
- The separation of an ecosystem into small pieces of land is called habitat fragmentation
- Edge effects are different environmental conditions (abiotic factors) that occur along the boundaries of an ecosystem



Summary contd...

- Pollution and atmospheric changes threaten biodiversity and global stability
- Eutrophication occurs when fertilizers, animal wastes, sewage, or other substances rich in nitrogen and phosphorus flow into waterways, causing extensive algae growth.

