

4.1.b) Extinction of species

Introduction

When a species' population has been reduced to the point where it is likely to become extinct shortly, it is deemed endangered. A threatened species is one whose population has plummeted to the point where any further decline would result in its designation as an endangered species. When a species is no longer found in the wild or captivity, it is considered extinct. Understanding the extinction process is a crucial first step in understanding why species become threatened or endangered. Extinction is a natural event or process that has occurred since the earliest forms of life developed, according to biologists.

Extinction of species

The term "extinction" has two distinct meanings. Extinction can refer to the extinction of a species across its whole range (global extinction) or the extinction of a species within a portion of its geographic range (regional extinction). When a species goes extinct, it not only diminishes the richness of its community but also has the potential to harm other species.

If we look at a list of threatened or endangered species, we'll see that many of them have similar traits. Large size, specific nutrition, specialized habitat requirements, small population number, limited geographic distribution, and economic or commercial significance are only a few of these characteristics. A closer look at each of these qualities will help us understand why animals with multiple of these features are frequently candidates for not only vulnerable or endangered status but also extinction.

Causes of species extinction

➤ Habitat Disturbance

In most ecosystems, biological, physical, and chemical factors are all linked. As a result, changes in one of these elements can cause changes in the others. As a result, habitat exploitation can have a big impact on a lot of different parts of a system. It is the most common cause of current extinctions. More species have perished as a result of deforestation than we can count. Our woodlands are home to entire ecosystems. If we do not stop deforestation, it is estimated that all of our rainforests will be gone in the next 100 years.

➤ Overexploitation

In comparison to terrestrial organisms, intensive exploitation of marine organisms has just been occurring in the last few hundred years. Initially, marine animals did not appear to be harmed by the extinction wave that afflicted land species. However, since humans have been able to sail across the water, marine creatures have been under severe threat. Human exploitation of marine resources has been a major cause of extinction in this short time, both through direct killing of target species and numerous collateral impacts on non-target species.

➤ Over Hunting

Elephant ivory, tiger fur and organs, tuna's delicacy, and shark fins curative benefit are just a few instances of why mankind has overhunted these animals to the brink of extinction.

➤ Pollution

When we introduce unnatural chemicals into our air, soil, and seas, they disrupt animal metabolism and make them unable

to cope. Carbon monoxide, sulphur dioxide, and nitrogen oxides are examples of air pollutants. Heavy metals including mercury, cadmium, and lead, as well as pesticide and herbicide chemicals, pollute the water and soil.

We drain freshwater from rivers and lakes for irrigation, drinking water, and industrial uses, in addition to polluting them. There is less water in rivers and lakes to dilute harmful substances.

All of these causes act in concert, resulting in the fastest rate of extinction ever recorded. Large-bodied animals and rare species are more vulnerable to the effects of human activity on the environment. Extinction can disrupt natural processes such as pollination and seed distribution, as well as lead the food chain to collapse, resulting in future extinctions.

Consequences of species extinctions

Species extinction on a local or regional scale results in a decrease in species richness and biodiversity in general. There is compelling evidence that a region's species diversity improves ecological production and stability. The extinction of any species might have a negative impact on the ecosystem. This is especially true of species at higher trophic levels, which are at the highest risk of (local) extinction as a result of human hunting, habitat loss, or toxic bioaccumulation.

The extinction of some species, such as large carnivores and pollinators, may have more severe ecological implications than the extinction of others. Ironically, as certain large predatory animals become fewer in tropical populations, bird vulnerability to predation is often enhanced.

Large-sized species with a confined distribution that exhibit habitat specialization are more vulnerable to a human agency than other species within their taxon (e.g., Javan rhinoceros), especially to processes like fast habitat loss. Rare species may be more vulnerable to extinction than common species due to their high habitat specialization and/or low population densities. The extent of a species' range is also a big factor in how likely it is to go extinct. Even if local abundance is high, animals with small ranges may be more vulnerable to stochastic perturbations.

There are many consequences of extinction. Some of these consequences include:

- Loss of food (edible plants), medications, aesthetic environment and economic assets (money, trade, income, jobs)
- Other species may become more vulnerable
- Decrease in biome diversity and biodiversity
- Decline in effective population sizes (e.g. fish)
- Impacts on food webs (collapsing food chains)
- Reduction of ecosystem efficiency and community productivity

4.1. c) Impact of developmental projects - dams, roads, rails, SEZs

Introduction

Plants, animals, and people have been harmed since the 1960s as a result of uncontrolled high population growth, waste-related pollution of air, water, and soil, as well as changes in ecosystems. The natural equilibrium has been disrupted by