

## Int 2 Biology - Unit 2 Environmental Biology & Genetics

### Revision Notes for Chapter 7 - Variety of Species in an Ecosystem

#### Species Biodiversity

A *species* is defined as a group of organisms that can interbreed to produce fertile offspring.

- a group of horses is a species - they can breed together and produce fertile offspring
- a group of donkeys likewise
- when a horse and donkey are mated together a mule is produced
  - mules are infertile
  - therefore horses and donkeys are not members of the same species
- A similar situation exists with lions and tigers.

Biodiversity is the variation within and between species; it covers the whole variety of life.

- Biodiversity is important because:
  - It is aesthetically pleasing to humans
  - There is the potential for new products, crops, medicines
  - It retains a wide genetic variety in a species to allow for changes in the environment and challenges by diseases.
  - Many wild plants and animals possess genes which potentially could be valuable in domesticated crops and cattle

The more biodiverse an ecosystem is the more stable it is when environmental change occurs such as changes in use or changes in climate.

#### Adaptations

An adaptation is any aspect of an organism's physiology (body structure) or behaviour which helps it to survive. Here are some examples of adaptations:



##### CACTUS

Physiological adaptations:

Long roots - to reach water underground

Surface roots - allow water to be absorbed quickly after it rains

Succulent tissues - store water

Leaves reduced to spines - decreased water loss



##### WOODLOUSE

Behavioural adaptations:

Remains in conditions which are dark and damp. This allows the woodlouse to hide from predators and prevents the drying

## Effects of Grazing

Grazing can increase or decrease the biodiversity of an ecosystem depending on the circumstances:

- Sheep grazing on grassland increase the biodiversity by keeping the size of large aggressive plants down so that the more delicate can survive
- Cattle overgrazing on marginal land reduces the biodiversity by tearing out the existing plants and causing erosion and desertification. The effects of human activity on habitat destruction and the biodiversity crisis.

## Effects of Human Activity

Humans can affect the biodiversity of an ecosystem in many ways. Some examples are:

- Pollution - usually reduces the biodiversity of an ecosystem
- Burning of fossil fuels - produces sulphur dioxide gas, which dissolves in cloud vapour to form acid rain
- Sewage - the release of sewage into a river results in an increased number of bacteria and decreased oxygen concentration in the river.
- Deforestation - humans are cutting down tropical rain forests to make profit, make space for expanding populations or to create grazing land for cattle

## Competition

Competition occurs:

- when two species are trying to occupy one niche:
- when resources needed by a single species are in short supply:

Plants compete mainly for:

- water
- light
- soil nutrients.

Animals compete for:

- food (e.g. predator prey interactions),
- water
- shelter.

**Interspecific competition** is competition between members of different species

**Intraspecific competition** is competition within the same species. This is more intense.

Some species reduce intraspecific competition by showing territoriality. Territoriality is a series of behaviours (such as singing or showing a colourful breast in birds, or scent marking in cats) which are used to defend a territory (piece of land). By doing this members of a species are spaced out according to the availability of resources.