# YEAR 10 UNIT 1: Introduction to ecosystems and hot deserts

#### What is an ecosystem?

An ecosystem is a system in which organisms interact with each other and with their environment.

#### Ecorystem Components

**ABIOTIC** - These are **non-living**, such as air, water, heat and rock. **BIOTIC** - These are **living**, such as plants, insects, and animals.

- Plant life occurring in a particular region or time.
- Animal life of any particular region or time.

### **Nutrient Cycling**

Plants take in nutrients to build into new organic matter. Nutrients are taken up when animals eat plants and then returned to the soil when animals die and the body is broken down by decomposers.

LITTER On Control of the solution

**Litter** - This is the surface layer of vegetation, which over time breaks down to become humus.

Bioman - The total mass of living organisms per unit area.



Coniferous forest
Deciduous forest
Tropical rainforests
Tundra

Temperate grasslands Tropical grasslands

Hot deserts.



Simple **food chains** are useful in explaining the basic principles behind ecosystems. They show only one species at a particular trophic level.

**Food webs** however consists of a network of many food chains interconnected together.

## CASE STUDY: UK Ecorystem: Epping forest, Essex

This is a typical English lowland deciduous woodland. **70% of the area** is designated as a **Site of Special Scientific Interest (SSI)** for its biological interest, with **66 %** designated as a **Special Area of Conservation (SAC)**.

Component	v & Interrelation <i>s</i> hips 🛛 🐥	Management		
Spring	Flowering plants (producers) such as bluebells store nutrients to be eaten by consumers later.	<ul> <li>Epping has been</li> <li>managed for centuries.</li> <li>Currently now used</li> </ul>		
Summer	Broad tree leaves grow quickly to <b>maximise photosynthesis</b> .	for <b>recreation</b> and <b>conservation</b> . - Visitors <b>nick fruit</b> and		
Autumn	Trees shed leaves to <b>conserve energy</b> due to sunlight hours decreasing.	berries, helping to disperse seeds.		
Winter	Bacteria <b>decompose</b> the leaf litter, releasing the nutrients into the soil.	- Irees cut down to encourage <b>new growth</b> for timber.		

#### Biome*r*

A biome is a large geographical area of distinctive plant and animal groups, which are adapted to that particular environment. The climate and geography of a region determines what type of biome can exist in that region.

Biome's climate and plants						
Biome	location	Temperature	Rainfall	flora	Fauna	
Tropical rainfore <i>r</i> t	Centred along the Equator.	Hot all year (25-30°C)	Very high (over 200mm/year)	Tall trees forming a canopy; wide variety of species.	Greatest range of different animal species. Most live in canopy layer	
Tropical grazzlandz	Between latitudes 5°- 30° north & south of Equator.	Warm all year (20-30°C)	Wet + dry season (500-1500mm/year)	Grasslands with widely spaced trees.	Large hoofed herbivores and carnivores dominate.	
Hot dezert	Found along the tropics of Cancer and Capricorn.	Hot by day (over 30°C) Cold by night	Very low (below 300mm/year)	Lack of plants and few species; adapted to drought.	Many animals are small and nocturnal: except for the camel.	
Temperate fore <i>s</i> t	Between latitudes 40°- 60° north of Equator.	Warm summers + mild winters (5-20°C)	Variable rainfall (500- 1500m /year)	Mainly deciduous trees; a variety of species.	Animals adapt to colder and warmer climates. Some migrate.	
Tundra	Far Latitudes of 65° north and south of Equator	Cold winter + cool summers (below 10°C)	Low rainfall (below 500mm/ year)	Small plants grow close to the ground and only in summer.	Low number of species. Most animals found along coast.	
Coral Reef/	Found within 30° north – south of Equator in tropical waters.	Warm water all year round with temperatures of 18°C	Wet + dry seasons. Rainfall varies greatly due to location.	Small range of plant life which includes algae and sea grasses that shelters reef animals.	Dominated by polyps and a diverse range of fish species.	

#### Hot Dezert Characterizticz

**Dirtribution** - Most of the world's hot deserts are found in the subtropics between 20 degrees and 30 degrees north & south of the Equator. The Tropics of Cancer and Capricorn run through most of the worlds major deserts.

**Climate** - Very little rainfall with less than 250 mm per year. It might only rain once every two to three years. Temperate are hot in the day (45 °C) but are cold at night due to little cloud cover (5 °C). In winter, deserts can sometimes receive occasional frost and snow.

#### Adaptations to the desert

Cactus Large roots to absorb water soon after rainfall. Needles instead of leaves to reduce surface area and therefore transpiration.

Camels Hump for storing fat (NOT water). Wide feet for walking on sand.

Long eyelashes to protect from sand.

#### Thar Devert

The Thar Desert is located on the border between India and Pakistan in Southern Asia. With India soon becoming the most populated country in the world in the next five years. With this, more people will plan to live in the desert.

Opportunities and challenges in the Hot desert						
Opportunitie <i>r</i>	Challenge/					
<ul> <li>There are valuable minerals for industries and construction.</li> <li>Energy resources such as coal and oil can be found in the Thar desert.</li> <li>Great opportunities for renewable energy such as solar power at Bhaleri.</li> <li>Thar desert has attracted tourists, especially during festivals.</li> </ul>	<ul> <li>The extreme heat makes it difficult to work outside for very long.</li> <li>High evaporation rates from irrigation canals and farmland.</li> <li>Water supplies are limited, creating problems for the increasing number of people moving into area.</li> <li>Access through the desert is tricky as roads are difficult to build and maintain.</li> </ul>					
<b>Desertification</b> Desertification means the turning of semi-arid	Strategies to manage desertification • Water management i.e. growing crops that					

areas (or drylands) into deserts.

Causes – over cultivation, overgrazing, increasing demand for fuel wood, population growth and climate change.

- don't need much water
- Tree Planting acts as a wind break ٠
- Soil Management allows it to recover
- Technology i.e. magic stones

