
ECOLOGY - Introduction and terms

The term "Ecology" in English is derived from the word "Okologie" proposed by the German animal scientist Ernst Haeckle in 1869 to mean the animal's relationship with the organic and inorganic components of the environment. The term "ecology" was coined by combining two Greek words, oikos (house or dwelling place), and Logos (the study of) to denote the relationship between organisms and their environment. **E.P.Odum**, the famous ecologist defined ecology in 1971 as (the study of structure and function of nature), in simple terms ecology is the branch of biology that deals with the scientific study of the interactions among organisms and their environment . The oldest mention of this word in the Oxford Dictionary of English language in 1891. Ecology as a distinct field of Biology dates back to 1900.

Definition of Ecology: is the study of the relationships among organisms and, the relationship between them and their surroundings (These surroundings are called the environment of the organism.) .

What is the relationship of ecology with other sciences?

As with other sciences, it is difficult to separate environmental science from other sciences. It is closely linked to all branches of biology such as physiology, zoology, botany, biochemistry, genetics and evolution, behavioral science, molecular biology, biotechnology. The computer is used to analyze the results and give the best ways to display and clarify them as well as it is related to the science of chemistry, physics, geology and engineering ,statics and has a great relationship with the science of pharmacy, medicine and agriculture in various branches.

Branches of Ecology: Ecology can be divided into several branches depending on:

I - Depending on individual species or many species

- 1- Autecology: it is the study of individual organism or individual species or a population in relation to their environment.

Example: study of Zebra population in relation to its environment (may be factors like rainfall, hunting, lion population etc. in grassland ecosystem).

- 2- Synecology: it is the study of group organisms or many species or communities in relation to their environment.

Example: study of entire grassland ecosystem (including all the species or communities).

II- Depending on kind of environment or habitat

- 1- Terrestrial ecology: is a branch of ecology that deals with the study of land organisms and how they interact with each other and adapt to their environment.
- 2- Aquatic Ecology : deals with the study of the ecosystems found in bodies of water, and can be divided depending on salinity to

- a- Fresh water ecology : salinity is not more than 0.5 parts per thousand
- b- Estuarine ecology: salinity is no more than 19 parts per thousand.
- c- Marine ecology: its high salinity estimated at 35 parts per thousand.

Aquatic ecology focuses on the interactions among living organisms in a particular aquatic habitat which can directly affect various factors in the ecosystem . Such factors include competition for food and predation, temperature, nutrient concentration, and oxygen demand.

III- Depending on its components of organisms

- 1- Animal ecology
- 2- Plant ecology
- 3- Microbes ecology

IV – Depending on taxonomic group

- 1- Insect ecology
- 2- Invertebrates ecology
- 3- Vertebrates ecology
- 4- Reptiles ecology and others

V- Depending on its correlation with other sciences

- 1- Physiological ecology
- 2- Ecological pollution
- 3- Paleoecology
- 4- Ecological technology
- 5- Wildlife Management
- 6- Forestry ecology and others

Ecology is further divided into several specialized branches that focus on a wide variety of topics such as : (Population Ecology , Biodiversity , Global ecology , Human ecology , community ecology, Ecosystem Ecology , Behavioural Ecology ... and others) .

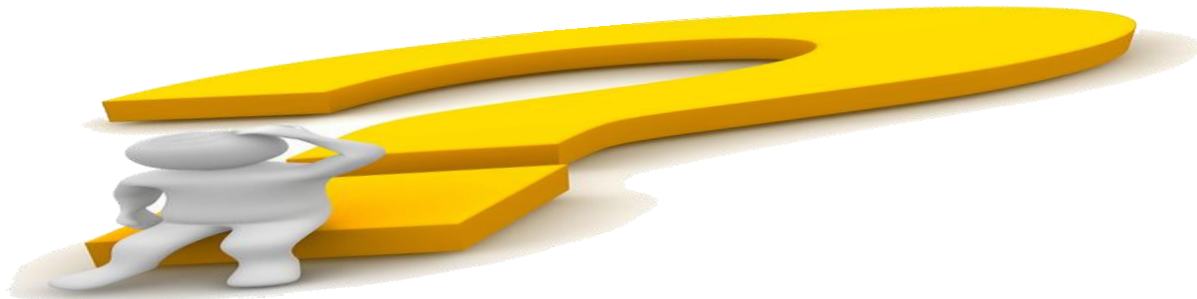
Population Ecology : deals with the study of population structures and dynamics, rather than looking at the individual behavioral patterns of living organisms , population ecology studies the various factors that affect population size, density, dispersion modes, and growth rate and mortality rate.

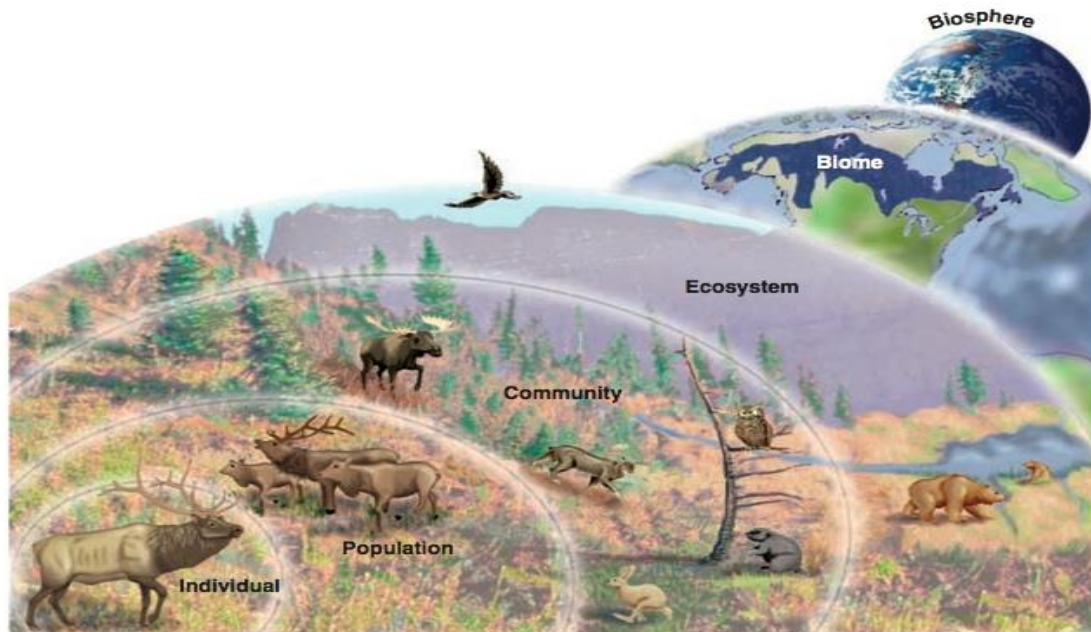
What Are the 6 Levels of Organization in Ecology?

1. At the lowest level of ecological organization, you find individual species of living organisms. (species : individuals that can breed with one another)
2. The second level is population: (population :all the individuals of the same species in an area).
3. The third level is community: (community: all the different species in an area) .
4. At the next level of ecological organization lies the ecosystem (ecosystem: all populations in one area interacting with each other and their non-living environment) or((the community plus the physical factors in an area (temperature + soil + rainfall)).
5. The fifth level of an ecological organization is that of a biome (biome: group of ecosystem with the same climate and similar communities . (desert biome, rainforest biome, Savannah biome, etc.)
6. The last level is the biosphere (biosphere: portion of planet where life exists)

Find the answer

Q / What is the difference between the two terms Ecology and Environment?





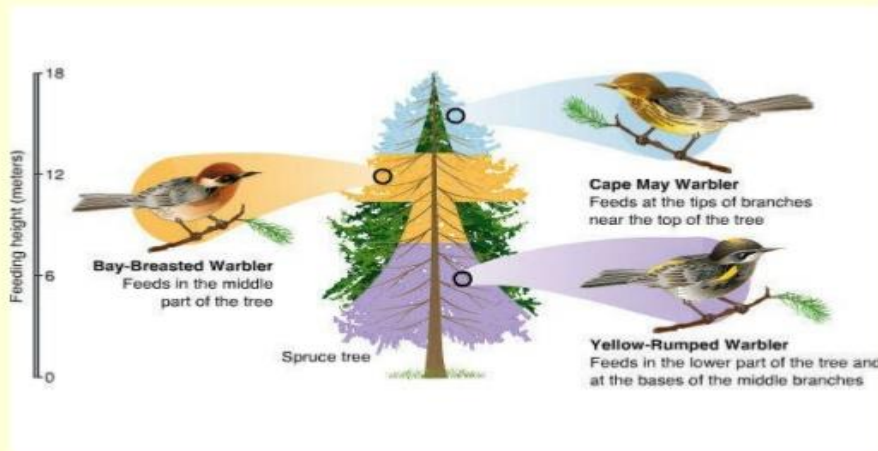
Levels of Organization The study of ecology ranges from the study of an individual organism to populations, communities, ecosystems, biomes—and finally, to the entire biosphere. The information that ecologists gain at each level contributes to our understanding of natural systems.

Habitat **الموطن** : the place or environment where a plant or animal naturally or normally lives and grows. It is characterized by both physical and biological features. A species' habitat is those places where it can find food, protection and mates for reproduction. A habitat is not necessarily a geographical area, it can be the interior of a stem, a rock, and for a parasitic organism it is the body of its host, part of the host's body such as the digestive tract, or a single cell within the host's body.

Ecological niche **النخ البيئي (الموضع البيئي)** : a niche is the role or job of a species in a habitat. The word niche comes from the French word *nicher*, which means “to nest.” An ecological niche describes how a species interacts with, and lives in, its habitat. Ecological niches have specific characteristics, such as availability of nutrients, temperature, terrain, sunlight and predators, According to the competitive exclusion principle, two species cannot occupy the same ecological niche in a habitat if they are competing for the same resources .

Niche

- Each species occupies a niche in the community. A niche is the role the species plays, and includes the type of food it eats, where it lives, where it reproduces, and its relationships with other species.



Ecological equivalents (المكافئات البيئية) : a different species

that occupies a similar ecological niche in a similar ecosystem in a different part of the world.

For example, Australian kangaroos can be considered as environmentally equivalent to the US bull because they feed on similar grass areas.