What is Ecosystem Structure?

Worksheet

Ecosystem structure refers to the biotic (living) and abiotic (non-living) components of an environment and how they are organized into levels: organism, population, community, ecosystem, biome, and biosphere.

Questions

1. Which is an example of an abiotic component of an ecosystem?

A) Sunlight
B) Bacteria
C) Deer
D) Oak tree

2. What is the correct order of ecological organization, smallest to largest?

A) Community Population Organism Ecosystem
B) Organism Population Community Ecosystem
C) Ecosystem Community Population Organism
D) Population Ecosystem Organism Community

3. A niche refers to...

A) The physical place an organism lives
B) The functional role an organism plays in its environment
C) The total number of species in an area
D) The climate of a region

4. All the populations of different species living and interacting in an area form a...

A) Biome
B) Ecosystem
C) Community
D) Biosphere

5. A pond ecosystem has 3 producer species, 5 primary consumer species, and 2 secondary consumer species. Calculate the total species richness.

6. A forest plot of 1 hectare contains 250 trees of the same species. Calculate the population density.

7. A community has three species with population sizes A=40, B=30, C=30 (total N=100). Calculate Simpson's Diversity Index (D = 1 (n/N)).

8. Define: What is an ecosystem?

9. Define: Biotic vs abiotic components?

10. Define: Difference between population and community?

Answer Key

1. A) Sunlight - Sunlight is a non-living (abiotic) factor; the others are living organisms.

2. B) Organism Population Community Ecosystem - Organization builds up: organism population community ecosystem biome biosphere.

3. B) The functional role an organism plays in its environment - A niche is an organism's functional role - resource use, interactions, and behavior.

4. C) Community - A community is defined as all interacting populations of different species in an area.

5. Species richness = number of different species present Richness = 3 + 5 + 2 = 10 species

6. Population density = number of individuals area Density = 250 1 = 250 trees per hectare

7. Proportions: A=0.40, B=0.30, C=0.30 (n/N) = 0.40 + 0.30 + 0.30 = 0.16 + 0.09 + 0.09 = 0.34 D = 1 0.34 = 0.66

8. A community of organisms interacting with each other and with their physical (abiotic) environment.

9. Biotic = living things (plants, animals, microbes); abiotic = non-living factors (water, soil, temperature, light).

10. A population is all individuals of one species in an area; a community is all populations of different species living together.