

species: A population or group of populations of a particular type of organism whose members share certain characteristics and can breed freely with one another and produce fertile offspring.

population: A group of organisms of the same species that live in the same area.

evolution: Genetically based change in populations of organisms across generations. Changes in genes may lead to changes in the appearance, physiology, and/or behavior of organisms across generations, often by the process of natural selection.

natural selection: The process by which traits that enhance survival and reproduction are passed on more frequently to future generations of organisms than traits that do not, thereby altering the genetic makeup of populations through time.

adaptation: (1) The process by which traits that lead to increased reproductive success in a given environment evolve in a population through natural selection. (2) A trait that confers greater likelihood than an individual will reproduce.

Charles Darwin: English naturalist who proposed the concept of natural selection as a mechanism for evolution and as a way to explain the great variety of living things.

Alfred Russel Wallace: English naturalist who proposed the concept of natural selection as a mechanism for evolution and as a way to explain the great variety of living things.

mutation: An accidental change in DNA that may range in magnitude from the deletion, substitution, or addition of a single nucleotide to a change affecting entire sets of chromosomes. They provide the raw material for evolutionary change.

convergent evolution: The evolutionary process by which very unrelated species acquire similar traits as they adapt to similar selective pressures from similar environments.

artificial selection: Natural selection conducted under human direction.

biodiversity: (biological diversity): The variety of life across all levels of biological organization, including the diversity of species, genes, populations, and communities.

speciation: The process by which new species are generated.

phylogenetic tree: A treelike diagram that represents the history of divergence of species or other taxonomic groups of organisms.

fossil: The remains, impression, or trace of an animal or plant of past geological ages that has been preserved in rock or sediments.

fossil record: The cumulative body of fossils worldwide, which paleontologists study to infer the history of past life on Earth.

extinction: The disappearance of an entire species from Earth.

endemic: Native or restricted to a particular geographic region. It occurs in one area and nowhere else on Earth.

background extinction rate: The average rate of extinction that occurred before the appearance of humans.

mass extinction events: The extinction of a large proportion of the world's species in a very short time period due to some extreme and rapid change or catastrophic event. Earth has seen five mass extinction events in the past half-billion years.

ecology: The science that deals with the distribution and abundance of organisms, the interactions among them, and the interactions between organisms and their nonliving environments.

biosphere: The sum total of all the planet's living organisms and the nonliving portions of the environment in which they interact.

ecologist: a scientist who studies ecology.

population ecology: The scientific study of the quantitative dynamics of population change and the factors that affect the distribution abundance of members of a population.

community: In ecology, an assemblage of populations of interacting organisms that live in the same area at the same time.

community ecology: The scientific study of patterns of species diversity and interactions among species, ranging from one-to-one interactions to complex interrelationships involving entire communities.

ecosystems: In ecology, as assemblage of all organisms and nonliving entities that occur and interact in a particular area at the same time.

ecosystem ecology: The scientific study of how the living and nonliving components of ecosystems interact.

landscape ecology: The study of how landscape structure affects the abundance, distribution, and interactions of organisms.

habitat: The specific environment in which an organism lives, including both biotic and abiotic elements.

habitat use: The process by which organisms use habitats from among the range of options they encounter.

habitat selection: The process by which organisms select habitats from among the range of options they encounter.

niche: The functional role of a species in a community.

specialist: A species that can survive only in a narrow range of habitats or that depends on very specific resources.

generalist: A species that can survive across a wide array of habitats or that can use a wide array of resources.

population size: The number of individual organisms present at a given time in a population.

population density: The number of individuals within a population per unit area.

population distribution: The spatial distribution of organisms in an area. Three common patterns are random, uniform, and clumped.

sex ratio: The proportion of males to females in a population.

age structure: The relative number of individuals of different ages within a population.

demographers: A social scientist who studies the population size; density; distribution; age structure; sex ratio; and rates of birth, death, immigration and emigration of human populations.

rate of natural increase: The rate of change in a population's size resulting from birth and death rates alone, excluding migration.

population growth rate: The rate of change in a population's size per unit time (generally expressed in a percent per year), taking into accounts births, death, immigration, and emigration.

exponential growth: The increase of a population (or of anything) by a fixed percentage each year. Results in a J-shaped curve on a graph.

limiting factor: A physical, chemical, or biological characteristic of the environment that restrains population growth.

carrying capacity: The maximum population size of a given organism that a given environment can sustain.

logistic growth: The pattern of population growth that results as a population at first grows exponentially and then is slowed and finally brought to a standstill at carrying capacity by limiting factors. Results in an S-shaped curve on the graph.

density-dependent: The condition of a limiting factor whose effects of a population increase or decrease depending on the population density.

density-independent: The condition of a limiting factor whose effect of a population are constant regardless of population density.

life history theory: scientific study that seeks to explain how natural selection influences patterns in reproduction, survival, and life span, and how organisms allocate investment among reproduction, survival, and parental care.

ecotourism: Visitation of natural areas for tourism and recreation. Most often involves tourism by more-affluent people, which may generate economic benefits for less-affluent communities near natural areas and thereby provide economic incentives for conservation of natural areas.