

# Glossary on Ecology & Biodiversity

## A

### **Access and benefit-sharing:**

One of the three objectives of the Convention on Biological Diversity, as set out in its Article 1, is the “fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and technologies, and by appropriate funding”. The CBD also has several articles (especially Article 15) regarding international aspects of access to genetic resources.

**Abundance :** The number of organisms in a given population.

**Adaptive Behavior :** In behavioral ecology, any behavior which contributes to an individual's reproductive success and is thus subject to the forces of natural selection.

**Adventitious :** Pertaining to a plant part that develops outside the usual order of time, position, or tissue. An adventitious bud arises from any part of a stem, leaf, or root but lacks vascular connection with the pith; an adventitious root arises from parts of the plant other than a preexisting root, eg., from a stem or leaf.

**Aerobic :** Living or occurring only in the presence of oxygen

**Aesthetic :** Sensitivity to or appreciation of beauty through recognition of its unique and varied components or through its orderly appearance.

**Afforestation :** The establishment of a forest or stand in an area where the preceding vegetation or land use was not forest.

**Age class :** it is a group of animals in a population with approximately the same age (I.e., fawn, yearling, adult)





**Age structure** : It is the number of individuals of each age within the population.

**Agroforestry** : A land use system that involve deliberate retention, introduction or mixture of trees or other woody perennials in crop and animal production systems to take advantage of economic or ecological interactions among the components.

**Algal Bloom** : Explosion of a phytoplankton population, sometimes because of incoming pollutants that artificially enrich the waters with nutrients.

**Algae** : Primarily marine organisms, single-celled or multicellular, that use chlorophyll to feed, like plants, but lack the roots, leaves, flowers, etc. of true plants.



**Allee Effect**: A concept in population ecology that describes the positive relationship between the size of a given population and its growth.

**Alien species** : A species occurring in an area outside of its historically known natural range as a result of intentional or accidental dispersal by human activities (also known as an exotic or introduced species).

**Alluvium** : Sediment or soil that is deposited by a river or running water

**Alpha Diversity** : Diversity within a particular area or ecosystem, and is usually expressed by the number of species (i.e., species richness) in that ecosystem.

**Amphibians** : Cold-blooded, smooth-skinned vertebrates of the class Amphibia, such as a frog or salamander, that characteristically hatch as aquatic larva with gills. The larva then transforms into an adult having air-breathing lungs.



**Anaerobic** : An organism, like bacteria, that lives without the presence of oxygen

**Angiosperms** : Flowering plants that place their seeds in fruits. The monocots have an embryo with a single cotyledon (seed leaf), three-part flowers, parallel leaf veins, and adventitious root growth. Dicots have two cotyledons, four- or five-part flowers, and net leaf vein patterns. Monocots include grasses, orchids, palms, and cattails, and dicots include oaks, sycamores, and maples.

**Animal Behaviour** : Animal behavior includes all the ways animals interact with other organisms and the physical environment. Behavior can also be defined as a change in the activity of an organism in response to a stimulus, an external or internal cue or combo of cues.

**Animal Communication** : Transfer of information from one or a group of animals (sender or senders) to one or more other animals (receiver or receivers) that affects the current or future behavior of the receivers.

**Animal Migration** : It is the long- distance movement of individual animals, usually on a seasonal basis. It is the most common form of migration in ecology. It is found in all major animal groups, including birds, mammals, fish, reptiles, amphibians, insects, and crustaceans.

**Animals** : The animal kingdom branches into the deuterostomes (mouth and anus develop separately) and the protostomes. Animals are multicellular and possess mitochondria, a complex nervous system, and cells protected by a membrane and filled with complex organelles.

**Annuals** : Pioneer plants which grow, flourish, and die in one season, seeds often germinate during the following wet season.

**Anther** : The pollen-producing tip of a flower's stamen.





**Antheridium** : The organ that produces antherozoids--male gametes (sperm cells)--in algae, bryophytes (mosses, liverworts), and pteridophytes (club mosses, ferns, horsetails)

**Anthophyte** : A flowering plant or its closest relatives. Applied Ecology : A branch of ecology which uses ecological principles and insights to solve environment-related problems. It includes agroecology and conservation biology.

**Aquatic Plant** : A vascular plant adapted to living in salt water or fresh water aquatic environments.

**Arthropods** : Jointed, backbone-less animals--namely, arachnids, insects, and crustaceans--often protected by a shell or exoskeleton.



**Asexual reproduction** : The process of reproduction without fertilization. New individuals may develop from vegetative parts such as tubers, bulbs or rooted stems or from sexual parts such as unfertilized eggs or other cells in the ovule.

**Atmosphere** : Earth's atmosphere is composed of gases and water which are retained by Earth's gravity and help to retain heat and reflect UV radiation from the Sun.

**Autecology** : A major sub-field of ecology which studies the dynamics of populations and the ways in which they interact with the environment. Also called population ecology.

**Autopoïesis** : It refers to a system capable of reproducing and maintaining itself.

**Autotroph** : It is an organism that can produce its own food using light,



carbon dioxide, or other chemicals.

**Aquaculture ponds:** Aquaculture is defined as "The breeding and rearing of fresh-water or marine fish in captivity. Fish farming or ranching". The water bodies used for the above are called aquaculture ponds (Encyclopaedic Directory of Environment, 1988). Aquaculture ponds are geometrical in shape usually square or rectangular. Tone is blue.

## **B**

**Backwater:** A creek, arm of the sea or series of connected lagoons, usually parallel to the coast, separated from the sea by a narrow strip of land but communicating with it through barred outlets(Margarate et al, 1974).

**Bacteria :** Single-celled prokaryotic organisms, many microscopic.

**Bacteriophage :** A virus that infects and eventually kills its bacterial host.

**Basal area :** The cross sectional area of a single stem, including the bark, measured at breast height.

**Basiphile :** A plant that favors basic soils (those low in acid).

**Behavioral Ecology :** A branch of ecology which studies the ecological and evolutionary basis of animal behavior, mainly at the level of individual animals.

**Benthic :** Organisms living on the sea floor.

**Benthos :** Benthos is the community of organisms that live on, in, or near the seabed, river, lake, or stream bottom, also known as the benthic zone.





**Bergmann's Rule :** Warm-blooded animals in cold climates tend to be larger than animals of the same species living in warm climates.

**Beta Diversity :** The extent of change in community composition, or degree of community differentiation, in relation to a complex-gradient of environment, or a pattern of environments.

**Biodegradable :** Reducible by bacteria as opposed to something that remains in the environment (plastic, certain industrial wastes).

**Biodiversity:** The variety and abundance of life forms, processes, functions and structures of plants, animals and other living organisms including the relative complexity of species, communities, gene pools and ecosystems at a spatial scales that range from local through regional to global



**Biogeochemical Cycle:** A pathway through which a chemical element or molecule moves through the atmosphere, hydrosphere, lithosphere, and biosphere.

**Biogeochemistry :** The science that studies the effects of biota on global chemistry and on the cycles of matter and energy that transport Earth's chemical components in time and space.

**Biogeographic realm:** A biogeographic realm or ecozone is the broadest biogeographic division of Earth's land surface, based on distributional patterns of terrestrial organisms. They are subdivided into ecoregions, which are classified based on their biomes or habitat types.

**Biogeography :** The study of the geographic distribution of species on Earth.

**Bio-invader :** A non-native species.



**Biological control:** The artificial application of a natural control agent to regulate a pest species.

**Biological Dispersal :** The movement of organisms from their birth site to their breeding site or from one breeding site to another.

**Biological Magnification/ Bio magnification:** The increase in concentration of a chemical substance in the tissues of organisms comprising successively higher levels in a food chain.

**Biological Oxygen Demand (BOD) :** The amount of oxygen required to dissolve and decompose organic matter.

**Biomass :** The sum of all living organisms in a given area

**Biomass pyramid :** A graph that illustrates the productivity within a trophic level. Also called an ecological pyramid.

**Biome :** A large geographic area with somewhat uniform climatic conditions; a complex of communities characterized by a distinctive type of vegetation and maintained under the climatic conditions of the region.

**Biotechnology :** Any technology that is applied to living organisms to make them more valuable to people.

**Bioregion :** A naturally bounded, ecologically distinct geography.

**Biosphere :** The part of the earth's crust (water and atmosphere) where living organisms can exist.

**Biota :** The total collection of organisms belonging to a particular geographic region or extant during a particular time period.





**Biotic :** The living components of an ecosystem (fauna and flora); a reference to the living components of the biosphere or of an ecosystem as distinguished from the non-living components.

**Bird :** According to one source, a vertebrate whose body is covered with feathers.

**Blight:** A disease or disease symptom characterized by rapid discoloration, wilt and death of all parts of a plant.

**Bog :** A permanently wet area that gets water only from precipitation. Bogs usually lack drainage and are characterized by a high content of organic matter, extreme acidity and low fertility.



**Boreal Forest :** Forest areas of the northern temperate zone, mostly consisting of conifers. Also called taiga in Siberia.

**Breeding:** The science of changing the genetic constitution of a population of plants or animals through sexual reproduction.

**Brood :** The offspring of a bird or mammal.

## C

**Calcareous soil:** A soil containing lime or other carbonates. It is indicated by effervescence (the release of fine bubbles of CO<sub>2</sub>) when an acid such as dilute HCl is applied to the soil.

**Callus:** A growth of large, undifferentiated, nonlignified, homogeneous cells produced by the cambial zone on the margin of a wound.





**Cambium** : The cell-generating tissue between the bark and the stem. Usually absent in monocotyledonous (see Monocot) plants.

**Camouflage** : Colors, tones, patterns, shapes or behaviors that enable an organism to blend in with its surroundings. Some organisms, for example, have a skin or coat color that lets them hide from predators.

**Canker**: A disease of the bark and cambium that causes a usually welldefined sunken or swollen necrotic lesion.

**Canopy**: A tree's uppermost layer: branches and leaves.

**Carbon Cycle**: The biogeochemical cycle by which carbon is exchanged between Earth's biosphere, pedosphere, geosphere, hydrosphere, and atmosphere.



**Carbon Nitrogen Ratio**: The ratio of the weight of organic carbon to the weight of total nitrogen in the soil or inorganic material.

**Carrying Capacity**: The maximum number of individuals a given environment's resources can support, including the food and water available for that environment.

**Caterpillar**: A larva of butterflies, moths and sawflies.

**Cation**: An ion carrying a positive charge of electricity. Cation exchange capacity (CEC): A measure of the total amount of exchangeable cations that can be held by the soil.

**Charismatic Megafauna** : A large animal species with widespread popular appeal that environmental activists use to achieve conservation goals well beyond just those species.



**Chemical Ecology:** A branch of ecology which studies the use by organisms of naturally occurring chemical compounds for various purposes, e.g. in defense against predators.

**Chlorosis:** An abnormal yellowing of foliage. Chlorosis is often a symptom of some mineral deficiency, virus infection, root or stem girdling or extremely reduced light.

**Chromosome:** A microscopic, generally threadlike or rodlike body consisting of linear segments of deoxyribonucleic acid (DNA), carrying the genes and forming the primary constituent of the cell nucleus.

**Climate:** The long-term average weather patterns of a particular place.

**Climax:** The final stage of plant or animal succession; when environmental conditions have been stable long enough for an area to develop a semi-permanent biome.

**Climax Community:** A community of biological species that has reached a stable state, occurring when the different species are best adapted to average conditions in a given area.

**Clone:** The genetically uniform individuals (ramets) propagated vegetatively from a single individual.

**Coastal plain:** Large, nearly level areas of land near ocean shores.

**Collar:** The transition zone between stem and root, sometimes recognizable in seedlings by the presence of a slight swelling.

**Commensalism:** A relationship between two organisms of different species in which one organism benefits, while the other is generally neither helped nor





harmed.

**Community:** An assemblage of various organisms living in the same environment.

**Community Ecology:** A branch of ecology which studies the interactions between the species comprising an ecological community. Also called synecology.

**Competition:** Organisms from the same or from different species competing with each other for food, living space, reproductive success, or any other limited resource; the most adapted individuals come out on top and thus survive and reproduce.

**Competitive Exclusion Principle / Also Gause's Law:** A biological rule which states that two species cannot coexist in the same environment if they are competing for exactly the same resource, often memorably summarized as "complete competitors cannot coexist".

**Compost:** Organic residues or a mixture of organic residues and soil that have been piled and allowed to undergo biological decomposition.

**Coniferous :** Describes a type of forest characterized by mostly needle-leaved, cone-bearing trees or shrubs, such as pine, spruce, and fir.

**Coniferous Forest:** One of the primary terrestrial biomes, culminating in the taiga.

**Conservation Biology:** The study of Earth's biodiversity with the aim of protecting and conserving natural habitats and the plant and animal species living in them.

**Consumer:** An organism that obtains energy by feeding on other organisms and their remains.





**Contiguous:** Lands that share a common border

**Cooperation:** The process by which organisms work together for mutual benefit.

**Coppice:** The production of new stems from the stump or roots. 2. To cut the main stem at the base or to injure the roots to stimulate the production of new shoots for regeneration.

**Copses:** The plural for a dense grouping of small trees and shrubs, also known as a thicket or coppice.

**Coral Reef:** Coral reefs are large underwater structures composed of the skeletons of colonial marine invertebrates called coral. The coral species that build reefs are known as hermatypic, or "hard," corals because they extract calcium carbonate from seawater to create a hard, durable exoskeleton that protects their soft, sac-like bodies.



**Cost-benefit ratio:** The ratio obtained by dividing the anticipated costs of a project by its anticipated benefits to obtain a measure of expected cost per unit of benefit.

**Cotyledon:** An embryonic leaf which often stores food materials.

**Courtship:** A pre-mating behavior where the male tries to woo or court the female in order to mate.

**Courtship display:** Ritual social behavior between possible mates.

**Creek:** A notable physiographic feature of salt marshes, especially low marshes. These creeks develop as do rivers "with minor irregularities sooner or later causing the water to be deflected into definite channels" Creeks will be delineated, however, their area will not be estimated.



**Cryosphere** : The combined portions of Earth's surface where water is frozen in solid form as ice, including sea ice, lake ice, river ice, snow, glaciers, ice caps, ice sheets, and frozen ground such as permafrost. There is significant overlap with the hydrosphere.

## D

**Deciduous** : Describes a type of forest characterized by trees that seasonally shed their leaves.

**Deciduous Broadleaf Forest** : Any forest situated in a temperate zone whose trees shed their leaves during the cold season.

**Decomposer**: A plant, animal, or fungi which feeds on dead material and causes its mechanical or chemical breakdown.

**Decomposition**: The process by which tissues of dead organisms break down into simpler forms of organic matter, thereby clearing the limited available space in a biome.

**Deep Sea Community**: Any community of organisms linked by a shared habitat in the deep sea.

**Defoliator**: Any organism but more particularly insects that can cause leaves to drop.

**Deforestation** : Conversion of forested land to non-forest areas.

**Dense forest** : All lands with the forest cover having a canopy density of 40% and above.

**Desalination** : The removal, using any of several processes, of excess salt





and other minerals from water in order to obtain fresh water suitable for animal consumption or irrigation, and if almost all of the salt is removed, for human consumption, sometimes producing table salt as a by-product.

**Desertification:** This is land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors, including climatic variations and human activities. It involves crossing thresholds beyond which the underpinning ecosystem cannot restore itself, but requires ever-greater external resources for recovery.

**Disaster:** Major disturbances in the life of a community or population which occur sufficiently often to leave their record in the 'genetic memory' of the population.

**Denitrification :** The process by which nitrates or nitrites in the soil organic deposits are reduced to ammonia or free nitrogen by bacterial action. The process results in the escape of nitrogen into the air and is therefore wasteful.

**Dioecious :** A species having male and female flowers produced on separate plants.

**Dormancy:** A condition in the life of an organism or its parts when a tissue predisposed to proliferate does not do so and visible growth are temporarily suspended.

**Detritus :** Organic waste material produced by the decomposition of dead plants and animals.

**Diurnal :** Refers to a species that is active during the day, rather than at night

**Dominant species :** The plant or animal species which exerts major





controlling influence on the community. Removal of dominant species results in important changes in the community. Generally, dominants have the greatest total bio-mass represented by total number or weight.

**Domesticated:** Referring to animals which humans have tamed, kept in captivity, and bred for special purposes.

**Diurnal:** Active by daylight; the opposite of nocturnal.

**Denitrification:** The breakdown of nitrates (mostly in the soil), by anaerobic bacteria, into their constituent chemical

**Elements:** nitrogen and oxygen.

**Density Dependence :** The dependence of the growth rate of a population of a given species on its density.

**Desert :** A landscape that receives less than 10 inches of rain per year.

**Desert Ecology :** The sum of the interactions between both biotic and abiotic factors that occur in a desert biome, including interactions between plant, animal, and bacterial populations in a desert community.

**Desertification :** A process by which areas become desert-like wastelands with a lower and different biodiversity.

**Detrital Food Web :** A food web depicting the energy flow from photoautotrophs through detritivores and decomposers.

**Detritivore :** Heterotrophs which consume decomposing bits of organic matter, such as plant litter.

**Disturbance :** It is a temporary change in environmental conditions that





causes a pronounced change in an ecosystem. Disturbances often act quickly and with great effect, to alter the physical structure or arrangement of biotic and abiotic elements.

**Dominance Hierarchy** : The organization of individual organisms into groups with a social structure.

**Dominance Species** : A species characterizes and dominates an ecological as measured by its primary productivity or biomass.

**Duck Weed** : They are the smallest flowering plants.

## E

**Earth Science** : This is a branch of science dealing with the physical and chemical constitution of the Earth and its atmosphere

**Ecology** : The scientific study of interactions between living organisms and their environment.

**Ecology of Fear** : A framework describing the psychological impact that predator-induced stress experienced by animals has on populations and ecosystems.

**Ecological Economics** : It is an interdisciplinary field defined by a set of concrete problems or challenges related to governing economic activity in a way that promotes human well-being, sustainability, and justice.

**Ecological Extinction** : Ecological extinction is "the reduction of a species to such low abundance that, although it is still present in the community, it no longer interacts significantly with other species.







**Ecological Land Classification** : Ecological land classification is a cartographical delineation or of distinct ecological areas, identified by their geology, topography, soils, vegetation, climate conditions, living species, habitats, water resources, and sometimes also anthropic factors.

**Ecological Literacy** : The ability to understand the natural systems that make life on Earth possible.

**Ecological Niche** : Ecological niche is a term for the position of a species within an ecosystem, describing both the range of conditions necessary for persistence of the species, and its ecological role in the ecosystem.

**Ecological Selection** : ecological processes that operate on a species' inherited traits without to mating or secondary sexual characteristics.



**Ecological Productivity** : Refers to the primary fixation of solar energy by plants and the subsequent use of that fixed energy by plant-eating herbivores, animal-eating carnivores, and the detritivores that feed upon dead biomass

**Ecological Succession** : The change in the species structure of an ecological community over time.

**Ecological Threshold** : Ecological threshold is the point at which a relatively small change or disturbance in external conditions causes a rapid change in an ecosystem.

**Ecophagy** : The destruction of an ecosystem.

**Ecophysiology** : The study of the interaction of the physiological traits of an organism with its abiotic environment.



**Ecopoiesis** : The hypothetical shaping by human action of a sustainable ecosystem on a currently lifeless, sterile planet.

**Ecoregion** : A region defined by its geography and ecology.

**Ecosynthesis** : The use of introduced species to fill niches in a disrupted environment with the aim of increasing the speed of ecological restoration.

**Ecosystem** : The total of interacting organisms (biocoenosis) and non-living things (biotope) in a specific environment.

**Ecosystem approach:** The Ecosystem Approach is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. The Ecosystem Approach places human needs at the centre of biodiversity management. It aims to manage the ecosystem, based on the multiple functions that ecosystems perform and the multiple uses that are made of these functions. The ecosystem approach does not aim for short-term economic gains, but aims to optimize the use of an ecosystem without damaging it.



**Ecosystem diversity:**

The variety of ecosystems that occurs within a larger landscape, ranging from biome (the largest ecological unit) to microhabitat.

**Ecosystem Ecology** : A branch of ecology which studies how flows of energy and matter interact with biotic elements of ecosystems.

**Ecosystem Engineer** : Any organism that creates, significantly modifies, maintains or destroys a habitat. These organisms can have a large impact on the species richness and landscape- level heterogeneity of an area

**Ecosystem Functional Type** : It is a new ecological concept to characterize



**Ecosystem Functioning** : It is defined as groups of ecosystems or patches of the land surface that share similar dynamics of matter and energy exchanges between the biota and the physical environment.

**Ecosystem Modeling** : The use of mathematics, computer programs and models to understand and predict ecosystem behavior.

**Ecosystem Services** : Resources and processes provided in an ecosystem and which benefit organisms.

**Ecotone** : A transition area between two adjacent but different landscape patches.

**Ecotope** : They are the smallest ecologically distinct landscape features in a landscape mapping and classification system

**Ecotoxicology** : The study of the ecological role of toxic chemicals (often pollutants, but also naturally occurring compounds).

**Ecozone** : An area that has characteristics of natural origin such as climate, terrain, vegetation, etc. It is also the largest division of the Earth's surface filled with living organisms.

**El Niño** : A band of anomalously warm ocean water temperatures that occasionally develops off the coast of South America and can cause climatic changes across the Pacific Ocean.

**Emigration** : For an organism, leaving its native community for a new one.

**Endangered Species** : A species at imminent risk of becoming extinct.





**Energy Pyramid** : A graphical representation designed to show the biomass or biomass productivity at each trophic level in a given ecosystem.

**Environment** : The biotic and abiotic surroundings of an organism or population, and the chemical interactions between these factors that influence their survival, development, and evolution. An environment can vary in scale from microscopic to global.

**Environmental Degradation** : Environmental degradation is the deterioration of the environment through depletion of resources such as air, water and soil; the destruction of ecosystems; habitat destruction; the extinction of wildlife; and pollution. It is defined as any change or disturbance to the environment perceived to be deleterious or undesirable.



**Environmental Restoration** : Undoing the damage caused to an area by human activity or by natural disasters.

**Ephemerality** : The concept of things being transitory, existing only briefly.

**Estuary** : A body of coastal water, attached to both ocean and river, often coloured black as a result of silt and sediment being carried by the latter.

**Ethology** : The study of animal behavior.

**Eutrophication** : An increase in natural or chemical nutrients in an ecosystem. This increase of nutrients typically stimulates growth of some aggressive plant species and hampers that of others, thereby harming biodiversity. In aquatic ecosystems, it may result in hypoxia.



**Evaporation** : It is the process by which water changes from a liquid to a gas or vapour. The slow vaporization of water from either the soil or from surface water.

**Evolutionary Ecology/Ecoevolution:** The evolutionary changes occurring to an organism within its population or within the wider community.

**Evolution** : Any gradual change. Organic evolution is any genetic change in organisms from generation to generation.

**Exotic Species** : An introduced species not native or endemic to a habitat.

**Ex situ conservation** : A conservation method that entails the removal of germplasm resources (seed, pollen, sperm, individual organisms, from their original habitat or natural environment. Keeping components of biodiversity alive outside of their original habitat or natural environment.



**Extinction** : The termination of an organism or of a taxon, usually a species, which occurs when the last individual organism of the taxon dies. Compare functional extinction.

**Extinction Vortex** : It is the term used to describe the process that declining populations undergo when "a mutual reinforcement occurs among biotic and abiotic processes that drives population size downward to extinction.

**Extreme Environment** : An environment in which few living organisms can survive.

**Extremophile** : An organism which thrives in physically or geochemically extreme conditions.



## F

**Fall Overturn** : The mixing (or "turning over") of lake water occurring in autumn, facilitating its re- oxygenation.

**Fauna** : All of the animals found in a given area.

**Flora** : All of the plants found in a given area

**Fire Ecology** : A branch of ecology which studies the ecological role of naturally occurring wildfires.

**Flagship Species** : A species chosen to represent an environmental cause, such as an ecosystem in need of conservation.

**Food Chain** : A group of organisms interrelated by the fact that each member of the group feeds upon the one below it.


**Food density** : The amount of food available within a given ecotope.

**Food Web** : A set of interconnected food chains by which energy and nutrients circulate within an ecosystem.

**Forest Ecology** : A branch of ecology that studies the interrelated patterns, processes, flora, fauna, and ecosystems within forests.

**Foundation Species**: A species that is a dominant primary producer in its ecosystem, both in terms of abundance and influence on other organisms and the environment.

**Founder Effect**: The accumulation of random genetic changes in an isolated population.





**Freshwater Biology** : It include study of micro-organisms, algae, macrophytes, invertebrates, fish and other vertebrates, as well as those concerning whole systems and related physical and chemical aspects of the environment, provided that they have clear biological relevance.

**Functional Ecology** : A branch of ecology which studies the roles, or functions, that certain species (or groups of species) play in an ecosystem.

**Functional Extinction** : The effective extinction of a species or other taxon such that reports of its existence cease, the reduced population no longer plays a significant role in ecosystem function, or the population is no longer viable because it is unable to sustain healthy reproduction, even if the last individual organism of the species has not yet died.



**Functional Response** : The intake rate of a consumer as a function of food density.


**Fungus** : Along with bacteria, fungi are the major decomposers in most terrestrial (and some aquatic) ecosystems and therefore play a crucial role in the nutrient cycle.

## G

**Gene** : The functional unit of heredity; the part of the DNA molecule that encodes a single enzyme or structural protein unit.

**Gene bank** : A facility established for the ex situ conservation of individuals (seeds), tissues, or reproductive cells of plants or animals.

**Genetic Bottleneck** : An evolutionary event in which a significant percentage of a population or species is killed or otherwise prevented



from reproducing.

**Genetic diversity:** The variety of genes within a particular population, species, variety, or breed.

**Grassroots (organizations or movements) :** People or society at a local level, rather than at the center of major political activity

**Genetic Bottleneck :** An evolutionary event in which a significant percentage of a population or species is killed or otherwise prevented from reproducing.

**Geodiversity :** It encompasses all of our planet's geologic forms and processes, soils, sediments, rocks, minerals, and even fossils.

**Geographical Zone :** Any of the regions of the surface of the Earth loosely divided according to latitude or longitude zone and climatic zone.

**Global Ecology :** It is the study of the interactions among the Earth's ecosystems, land, atmosphere and oceans.

**Global Ecophagy :** The destruction of Earth's ecosystems.

**Global Warming :** The increase in the average temperature of Earth's near- surface atmosphere and oceans.

**Gloger's rule :** It is an ecogeographical rule that links animal colouration with climatic variation.

**Grassland :** An area where the vegetation is dominated by grasses.

**Greenhouse Effect :** The warming of the Earth's climate that







results from solar irradiance being trapped in the atmosphere. The phenomenon is caused by atmospheric gases which allow the sun's energy to reach the Earth's surface but subsequently absorb heat that is radiated back from the warmed surface.

**Ground Cover :** Any plant that grows over an area of ground, providing protection of the topsoil from erosion and drought.

**Guest :** The generic term used for parasitic, mutualistic, and commensalist symbionts.

## H

**Habitat :** A specific ecological area that is inhabited by specific plant and animal species.

**Habitat degradation :** The diminishment of habitat quality, which results in a reduced ability to support flora and fauna species. Human activities leading to habitat degradation include polluting activities and the introduction of invasive species. Adverse effects can become immediately noticeable, but can also have a cumulative nature. Biodiversity will eventually be lost if habitats become degraded to an extent that species can no longer survive.

**Habitat Fragmentation :** The discontinuation of a species' habitat as caused by environmental change.

**Habitat loss :** The outcome of a process of land use change in which a 'natural'; habitat-type is removed and replaced by another habitat-type, such as converting natural areas to production sites. In such process, flora





and fauna species that previously used the site are displaced or destroyed. Generally this results in a reduction of biodiversity.

**Halophyte** : A salt-loving plant.

**Halophile** : A salt-loving organism.

**Heath** : Low-growing woody vegetation found on free-draining acidic soils.

**Heterotroph** : It is an organism that cannot manufacture its own food by carbon fixation and therefore derives its intake of nutrition from other sources of organic carbon, mainly plant or animal matter.



**High Altitude lakes:** These lakes occur in the Himalayan region. Landscapes around high lakes are characterized by hilly topography. Otherwise they resemble lakes in the plain areas. For keeping uniformity in the delineation of these lakes contour line of 3000 m above msl will be taken as reference and all lakes above this contour line will be classified as high altitude lakes.

**Homeostasis** : The property of a system by which it regulates its internal environment and maintains a constant and stable condition; e.g endothermic animals maintaining a constant body temperature.

**Host** : An organism that harbors a parasitic, mutualistic, or commensal symbiont.

**Hotspot** : An area on earth with an unusual concentration of species, many of which are endemic to the area, and which is under serious threat by people.



**Human Ecology :** A branch of ecology that studies the relationships between humans and their natural, social, and built environments.

**Humus :** The organic component of soil, formed by the decomposition of leaves and other plant material by soil microorganisms.

**Hydrologic Cycle :** The cycle or process of evaporation and condensation of water and its distribution across the earth as driven by solar energy.

**Hydrophyte :** See aquatic plant.

**Hydrosphere :** The combined mass of water found on, under and above the surface of the Earth.

**Hydrothermal Vent :** An underwater steaming fissure that has a unique ecosystem.

**Hypoxia :** Reduced oxygen content of air or a body of water, detrimental to aerobic organisms.

## **I**

**Illegitimate Receiver :** An organism that intercepts a signal intended for another organism, to the fitness detriment of either the signaler or the legitimate receiver of the signal.

**Indicator Species :** Any living species that defines a trait or characteristic of its environment. The presence and/or abundance of organisms of these species can be used as an indication of the health of a given ecosystem.





**In situ conservation :** A conservation method that attempts to preserve the genetic integrity of gene resources by conserving them within the evolutionary dynamic ecosystems of the original habitat or natural environment.

**Instinctive Behavior :** The inherent inclination of an organism towards a particular complex behavior.

**Insular Biogeography:** The study of the distributions of biological communities on islands.

**Intermediate Disturbance Hypothesis:** A theory that tries to predict how species diversity will change with varying levels of disturbance.

**Interspecific Competition:** A form of competition that occurs between individuals of different species, e.g. when different species try to use the same resources in an environment. Contrast intraspecific competition.

**Intertidal Zone:** A coastal area periodically submerged underwater by the action of tides.

**Intraspecific Competition:** A form of competition that occurs between individuals of the same species, e.g. when members of the same species compete for territories or access to mates. Compare interspecific competition.

**Invasive Species:** A non-native species whose introduction to an area causes economic or environmental harm or harm to human health.

**Ion Exchange:** A reversible chemical reaction where ions with the same charge are switched. This principle is used in the purification of waste water.





## L

**Jungle:** A dense, wet, humid forest, often tropical, which supports a large variety of wild plant and animal species.

## K

**K-Selected Species:** A species that forms a group of strong competitors in a crowded environment and that has fewer but stronger offspring. Contrast r-selected species.

**Kelp:** They are large brown algae seaweeds that grows as big as a tree in the ocean

**Keystone Species:** A species that has a disproportionate effect on its environment relative to its abundance. Such species affect many other organisms in an ecosystem and help to determine the types and numbers of various other species in a community.

## L

**Land use :** Land use refers to how a specific piece of land is allocated: its purpose, need or use (e.g. agriculture, industry, residential or nature).

**Lagoons/Backwaters:** Such coastal bodies of water, partly separated from the sea by barrier beaches or bass of marine origin, are more properly termed lagoons. As a rule, lagoons are elongate and lie parallel to the shoreline. They are usually characteristic of, but not restricted to, shores of emergence. Lagoons are generally shallower and more saline than typical estuaries (Reid et al, 1976).





**Land use requirements:** The requirements are related to growth and yield of crops and trees, animal husbandry, land management and conservation.

**Lake:** An inland body of water localized in a basin and often fed by a river.

**Lake Ecosystem:** It includes biotic (living) plants, animals and micro-organisms, as well as abiotic. (nonliving) physical and chemical interactions.

**Lake Stratification:** It is the tendency of lakes to form separate and distinct thermal layers during warm weather.

**Landscape Ecology:** An interdisciplinary branch of ecology combining aspects of ecology, botany, biogeography, physical geography and environmental planning.

**Large Marine Ecosystems:** The 64 global extensive coastal sea areas, as indicated by the National Oceanic and Atmospheric Administration, where primary production and biomass are higher than in the open ocean.

**Lek Mating:** An animal mating system in which an aggregation of male animals gathers to engage in competitive displays to entice females during the breeding season.

**Lichen:** A composite organism that is the result of a symbiosis between algae or cyanobacteria and the hyphae of a fungus. The combined lichen has properties different from those of its component organisms.

**Life Form:** An entity or being that is living.





## M

**Macroecology:** A branch of ecology which examines ecological phenomena at the largest possible scale. Compare microecology.

**Mangroves:** The mangrove swamp is an association of halophytic trees, shrubs, and other plants growing in brackish to saline tidal waters of tropical and sub-tropical coastlines

**Mangrove Wetland:** Mangroves are shrubs or small trees that grow in coastal saline or brackish water in the tropics and provide a habitat to many marine organisms.

**Marine Ecosystem :** An aquatic ecosystem dominated and defined by the presence of saline water.


**Marine Snow:** Tiny particles, including dead organic matter from the upper layers of the ocean, sinking deep into the ocean.

**Mark And Recapture:** An observational methodology used to estimate variables of a population under study, including population density, survival rates, movement, and growth.

**Marsh :** A wetland dominated by herbaceous rather than woody plant species and often found at the edges of lakes and streams, where it forms a transition between the aquatic and terrestrial ecosystems.

**Mesopredator Release Hypothesis:** A hypothesis which states that as top predators dwindle in an ecosystem, an increase in the different populations of mesopredators occurs.

**Metabolic Theory of Ecology:** A theory that explains the relationship between an organism's body mass and metabolic rate.





**Microbial Ecology :** A branch of ecology that studies microorganisms.

**Micro-Climate :** A local set of atmospheric conditions that differ from those in surrounding areas.

**Microecology :** A branch of ecology which studies ecological phenomena at very small scales. Contrast macroecology.

**Migration:** The movement of organisms from one place to another.

**Mimicry:** An adaptive similarity of one species to another that protects one or both species from predators.

**Molecular Ecology:** A branch of ecology concerned with applying molecular population genetics, molecular phylogenetics, and genomics to traditional ecological questions. It is essentially the same as ecological genetics.

**Monsoon:** The predictable occurrence of dramatic seasonal changes in atmospheric circulation and precipitation patterns.

**Mutualism :** A form of symbiosis from which both individual organisms involved derive a fitness benefit.

## N

**Natural Resource :** Natural biotic and abiotic resources combined.

**Natural Selection:** It is a mechanism of evolution. Organisms that are more adapted to their environment are more likely to survive and pass on the genes that aided their success. This process causes species to change







and diverge over time.

**Negative Feedback Loop:** A circular chain of effects that opposes change

**Neutralism:** The belief that changes in evolution are caused by random mutation rather than by natural selection.

**Niche:** A position or function of an organism in a community of related organisms.

**Niche Construction:** The process by which an organism alters its own or another organism's ecological niche.

**Niche Differentiation:** It is a process which occurs through several different modes and on multiple temporal and spatial scales. In most cases, niche differentiation has created a relationship between two species where current competition is small or non-existent.



**Nitrification:** The oxidation of ammonia with oxygen into nitrite.

**Nitrogen Cycle:** The continuous cycle by which atmospheric nitrogen and compound nitrogen are continually exchanged through the soil into substances that can be taken up and used by green plants; what is left returns to the atmosphere as a result of denitrification.

**Nitrogen Fixation:** The conversion of nitrogen into nitrogen compounds (ex. nitrate, nitrite) that is carried out naturally by certain bacteria and algae.

**Numerical Response:** A change in predator density as a function of change in prey density.

**Nutrient:** Chemical elements and compounds that provide organisms



with the necessary nourishment.

**Nutrient Cycle:** The movement and exchange of organic and inorganic matter back into the production of living matter. Also called ecological recycling.

**Nutrient Cycle Efficiency:** See ecosystem ecology.

## O

**Ocean:** A vast body of salt water. Oceans cover almost 75% of the Earth's surface.

**Overexploitation :** Over -exploitation occurs when harvesting of specimens of flora and fauna species from the wild is out of balance with reproduction patterns and, as a consequence, species may become extinct.

**Ox-bow lakes/ Cut off meanders:** A meandering stream may erode the outside shores of its broad bends, and in time the loops may become cut-off, leaving basins. The resulting shallow crescent-shaped lakes are called oxbow lakes (Reid et al, 1976).

**Oxygenation:** The addition of oxygen to any system, including the human body.

## P

**Paleoecology:** A branch of ecology which uses data from fossils to reconstruct ecosystems of the past.





**Parasite:** An organism that depends for its survival on a symbiotic relationship with another organism its host which it does not usually kill directly but does negatively affect.

**Parasitoid:** An organism that is a parasite for most of its life and which usually kills its host.

**Permafrost:** The permanently frozen layer of terrain found beneath the arctic tundra.

**Pheromone:** A chemical excreted into the environment as a signal, which causes a natural behavioral response in members of the same population.

**Phosphorus Cycle :** The biogeochemical cycle that describes the movement of phosphorus through the environment.



**Phytophysiology:** The overall physical characteristics of a plant community.

**Phytoplankton:** They are the autotrophic (self-feeding) components of the plankton community and a key part of oceans, seas and freshwater basin ecosystems. In other words they are microscopic marine algae. Phytoplankton is the base of several aquatic food webs.

**Pioneer Species:** A species that is the first to inhabit a previously unoccupied environment or niche.

**Plankton:** It is a collective name for all such organisms—certain algae, bacteria, protozoans, crustaceans, mollusks, and coelenterates, as well as representatives from almost every other phylum of animals.

**Plant:** They are multicellular organisms in the kingdom Plantae that use photosynthesis to make their own food.



**Plant Community:** it is an aggregation of individuals with mutual relationships among themselves and to their environments.

**Plant Litter:** The layer of dead plant material on the ground, providing a habitat to plants, microorganisms and animals. It plays an important role in the nutrient cycle.

**Plant Nutrition:** Plants meet their nutritional needs for growth by absorbing soil nutrients, water, and carbon dioxide, in addition to the required sunlight.

**Polar Climate:** Characterized by a lack of warm summers

**Political Ecology:** A branch of ecology which studies how political and economic power affect ecosystems, and vice versa how environmental factors influence social activity.

**Pollination:** A type of fertilization in which pollen grains are transported through the air from one seed plant to the ovule-bearing organs of another seed plant. This transport is helped by either wind, water, or animal assistance.

**Population Density:** The number of individuals of a species living in a defined area.

**Population Ecology:** A branch of ecology which deals with the dynamics of populations within species, and the interactions of these populations with environmental factors. Also called autecology.

**Population Size:** The number of individuals of a species in a particular population.





**Positive Feedback Loop:** A process in which the effects of a small change in a system include an increase in the magnitude of the change; "A produces more of B, which in turn produces more of A". Contrast negative feedback loop.

**Prairie:** They are enormous stretches of flat grassland with moderate temperatures, moderate rainfall, and few trees

**Predation:** The preying of one animal on others.

**Predator:** An organism that lives by killing and consuming other living organisms.

**Prey:** An organism upon which a predator feeds.

**Primary Production:** The production of organic compounds out of carbon dioxide present in the Earth's atmosphere. All life on Earth directly or indirectly depends on it.

**Producer:** An organism that produces its own food from inorganic material present in the environment, through photosynthesis or, in the deepsea, through chemosynthesis. Also called a primary producer.

**Protocooperation:** A type of mutualism without necessity.

**Productivity in Ecosystem:** The rate of biomass production is called productivity or The rate of production of new biomass by an individual, population, or community; the fertility or capacity of a given habitat or area.





## Q

**Quadrat** : A rectangular plot of land extensively studied for its ecology. Often abbreviated as quad.

**Quarter Girth:** The girth of a tree or log divided by four. A measure commonly used in countries where volumes are reckoned by hoppus feet.

## R

**Rain Shadow:** An area with a consistently arid or semi-arid climate due to its position in the lee of a mountain range.

**Range:** The distribution of a species in the geographical area within which that species can be found.

**Resource:** A substance or object in the environment required by an organism for normal growth, maintenance, and reproduction.

**Resource Partitioning:** The coexistence of two or more competing species that use the same natural resource but in different ways.

**Restoration Ecology:** A branch of ecology which attempts to understand the ecological basis needed to restore impaired or damaged ecosystems.

**Riparian Forest:** It is the forested area of land adjacent to a body of water, stream, river, bay, or marsh. Riparian forests form the transition between the aquatic and the terrestrial environment.

**River Ecosystem:** They are flowing waters that drain the landscape, and include the biotic (living) interactions amongst plants, animals and micro-





organisms, as well as abiotic (nonliving) physical and chemical interactions of its many parts

**Riverine Wetlands:** Along the major rivers, especially in plains water accumulates leading to formation of marshes and swamp. Swamps are 'Wetland dominated by trees or shrubs'

**R-Selected Species:** A species selected for its superiority in variable or unpredictable environments. Contrast k-selected species.

**Runoff:** The flow of water over land from rain, melting snow, or other sources

## S

**Sand/Beach:** Beach is an unvegetated part of the shoreline formed of loose material, usually sand that extends from the upper berm (a ridge or ridges on the backshore of the beach, formed by the deposit of material by wave action, that marks the upper limit of ordinary high tides and wave wash to low water mark(Clark,1977). Beach comprising rocky material is called rocky beach.

**Salt pans:** Inland salt pans in India occur in Rajasthan (Sambhar lake). These are shallow rectangular man-made depressions in which saline water is accumulated for drying in the sun for making salt.

**Saprotrophic Nutrition:** A mode of nutrition in which organisms obtain nutrition from dead and decaying matters is called the Saprotrophic Nutrition.

**Savanna:** A tropical or subtropical grassland eco system with trees, but





without a closed canopy.

**Scramble Competition:** All individuals take the same resource share, and if this share is insufficient to support an individual, all of them die, and the population size after the competition falls to zero

**Secondary Succession:** A stage of ecological succession which occurs after the original community has been destroyed or disturbed, as with a forest fire.

**Sessile:** It is the biological property of an organism describing its lack of a means of self-locomotion.

**Sexual Selection:** Sexual selection is a mode of natural selection in which members of one biological sex choose mates of the other sex to mate with (intersexual selection), and compete with members of the same sex for access to members of the opposite sex (intrasexual selection).



**Sign Stimulus:** A fixed action pattern such as a mating dance.

**Signaler:** Communicates by signals

**Social Animal:** It refers to an animal which is highly interactive with other members of its species

**Social Behavior:** The behavior of an individual organism towards other members of the population of its species.

**Social Parasitism:** It is the coexistence of two or more ant species in one nest or colony. It involves a parasitic species which is dependent on one or several host species.





**Sociality:** It is the degree to which individuals in an animal population tend to associate in social groups and form cooperative societies.

**Soil:** The naturally occurring, unconsolidated or loose covering of Earth's surface; part of the pedosphere

**Soil Ecology:** A branch of ecology which studies the pedosphere.

**Source-Sink Dynamics:** A theoretical model used by ecologists to describe how variation in habitat quality may affect the population growth or decline of organisms.

**Speciation:** The evolutionary process by which new biological species emerge from a common ancestor.

**Species Diversity:** It is defined as the number of species and abundance of each species that live in a particular location.

**Species Evenness:** Refers to the variation in the number of individual organisms of each separate species in an ecosystem has or refers to how close in numbers each species in an environment is.

**Species Richness:** The number of species that live in a certain location is called species richness.

**Spring Overturn:** The mixing of lake water through the melting of ice cover, the warming of surface waters, convection currents and wind action occurring in spring.

**Sulfur Cycle:** Circulation of sulfur in various forms through nature

**Stream :** A flowing-water ecosystem that starts out as a freshwater spring





or as melting snow

**Survivorship Curve:** A graph showing the number or proportion of individuals surviving at each age for a given species.

**Symbiosis:** The living together in close association of two or more dissimilar organisms; includes parasitism, mutualism, and neutralism.

**Swamp:** A wetland dominated by trees. **Survival:** It is the number of animals that live through a time period (usually 1 year) and is expressed as a rate.

**Succulent:** Having thick fleshy leaves that conserve moisture.

**Synecology:** The ecological study of whole plant or animal communities.



## **T**

**Terrestrial ecology:** It is the study of land-based ecosystems, their populations and communities of plants, animals, and microbes, their interactions with the atmosphere and with streams and groundwater, and their role in the cycling of energy, water, and the major biogeochemical elements such as carbon and nitrogen

**Territory:** An area that one or more individual organisms defend against competition from other organisms.

**Thermal Ecology:** The study of the relationship between temperature and organisms.

**Threat Display:** A signal used by individual organisms of certain species



meaning that the user intends to attack.

**Theoretical Ecology:** The development of ecological theory, usually with mathematical, statistical and/or computer modeling tools.

**Threatened:** A designation given to species that are likely to become endangered in the foreseeable future if current trends continue. This is the intermediate category between endangered and species of special concern.

**Tree Line:** Any delineation between habitats in which trees are capable of growing and in which they are not capable of growing. Tree lines are found at the edges of habitats with suitable conditions for tree growth and development; beyond the tree line, trees cannot tolerate the harsher environmental conditions, usually because of very cold temperatures or a lack of sufficient moisture.



**Trophic Level:** The position of an organism within a food chain: what it eats, and what eats it.

**Tropical Rain Forest:** A biome characterized by regular, heavy rainfall, a humidity of at least 80 percent, and great biodiversity.

**Tundra:** A permanently frozen, treeless expanse between the ice cap and tree line of arctic regions

## U

**Undergrowth:** The lowest stratum of woody and other vegetation above the ground cover.

**Underwood:** Woody species growing under an overwood, i.e., the



understorey. Also used for the coppice in coppice with standards.

**Umbrella Species:** A species selected for making -related decisions because protecting it indirectly protects the many other species that make up the ecological community of its habitat. Compare flagship species.

**Upwelling:** Wind-driven motion of cooler nutrient-rich ocean water towards the ocean's surface, which stimulates the growth of phytoplankton.

**Urban Ecology:** A branch of ecology which studies ecosystems in urban areas.



## V

**Vector:** An animal that can carry and transmit a disease agent from one animal to another. For example, mammals are vectors, or carriers, of rabies.

**Vegetation:** Ground cover provided by plants.

**Vegetation Formation:** A concept used to classify vegetation communities.

**Vegetative Reproduction:** An asexual means of propagating new plants through root shoots, bulbs, leaf cutting, or underground stems.

**Vegetation Type:** They are characterized by full floristic and growth form (physiognomic) composition, which together express ecological and biogeographical relations.



**Virology:** It is the study of viruses and virus-like agents, including (but not limited to) their taxonomy, disease-producing properties, cultivation and genetics.

**Virus:** A microscopic obligate intracellular parasite which infects and replicates exclusively within the living cells of host organisms.

## W

**Warning Coloration:** A warning signal consisting of brightly colored or starkly contrasting patterns used by a prey species to advertise its unprofitability to potential predator species.



**Water Column:** It is a concept used in oceanography to describe the physical (temperature, salinity, light penetration) and chemical (pH, dissolved oxygen, nutrient salts) characteristics of seawater at different depths for a defined geographical point.

**Water Cycle/ Hydrologic Cycle:** The non-stop circulation of water on, above, and below Earth's surface. At different times during the cycle, water changes between its different states: liquid, vapor and ice.

**Water Pollution:** It is the contamination of water bodies, usually as a result of human activities. Water bodies include for example lakes, rivers, oceans, aquifers and groundwater

**Waterlogged:** Said of an area in which water stands near, at, or above the land surface, so that the roots of all plants except hydrophytes are drowned and the plants die (Margarate et al, 1974). Floods or unlined canal seepage and other irrigation network may cause waterlogging.



**Water Stagnation:** When water stops flowing.

**Water Vapor:** The gaseous state of water.

**Watershed:** The area of land from which rain and melted snow drains downhill into a body of water (i.e. a river, lake, reservoir, estuary, wetland, sea, or ocean).

**Web of Life:** The feeding relationships between different species in a given ecosystem. Also called a food chain, food network, or trophic social network.

**Weed:** A plant growing where it is not wanted, often at a high rate of dispersal.

**Wetland:** A type of ecosystem consisting of land permanently or seasonally saturated with water; the habitat of aquatic plants.

**Wildfire:** Is an unplanned fire that burns in a natural area such as a forest, grassland, or prairie.

**Wildlife:** Refers to undomesticated animal species, but has come to include all organisms that grow or live wild in an area without being introduced by humans.

**Wildlife Corridor:** A strip of land intended to facilitate the movement of wildlife species between disconnected areas of their habitat.

**Woodland:** A low-density forest.





## X

**Xeric:** Extremely dry, as of a landscape or habitat.

**Xerocole:** An animal adapted to life in a desert.

**Xerophyte:** A plant adapted to dry conditions.

**Xylem :** Woody tissue that transports water and nutrients upward from the roots.

**Xylophagous:** Feeding on wood, as of an organism.

## Y

**Yield:** The volume or number of stems that can be removed annually or periodically or the area over which fellings may pass annually or periodically, consistent with the attainment of the objects of management.

**Yellow Rain:** A powdery, poisonous, yellow substance reported dropping from the air in the eastern parts of China and Asia and found to be the excrement of wild honeybees contaminated by a fungal toxin.

## Z

**Zero Population Growth (ZPG) :** when birth rate (plus immigration) equals the death rate (plus emigration), resulting in an ecologically stable number of organisms.

**Zooplankton:** Tiny, free-floating organisms in aquatic systems. Unlike





phytoplankton, zooplankton cannot produce their own food, and so are consumers.

**Zygote** : The fertilized egg; the single- celled product resulting from the union of (1) the nucleus of the sperm cell from the male and (2) the nucleus of the ovum (egg cell) from the female. In birds, fertilization occurs in the infundibulum of the oviduct.