

Populations

- a. group of individuals of same species living in same area (size, density, distribution/dispersion)
- b. habitat (type of area organism lives) vs. niche (role in ecosystem)
- c. competition for resources
- d. age structure (rapid growth vs. declining vs. stable populations)

e. population growth

- (1) density dependent limiting factors (competition for resources, parasites & diseases, waste products, stress, predation)
 - (2) density independent limiting factors (climate = temperature & rainfall, natural disaster)
 - (3) exponential growth (J-shaped, unlimited) vs. logistic growth curve (S-shaped, limited)
 - (4) carrying capacity = maximum population supported by habitat
 - (5) populations can cycle
- f. Population ability to respond to changes in the environment is affected by genetic diversity. Species and populations with little genetic diversity are at risk for extinction.

Communities

- a. measured and described in terms of species composition and species diversity
- b. symbiosis = species interaction
 - (1) mutualism +/+ (acacia tree & ants; lichens, N-fixing bacteria & legume plants)
 - (2) commensalism +/- (egrets & cals)
 - (3) parasitism +/- (tapeworm, cowbird)
 - (4) predation +/- (carnivores & herbivores)
 - (5) compeon

Ecosystems

a. Free Energy

- (1) Reproduction and rearing of offspring require free energy beyond that used for maintenance and growth. Different organisms use various reproductive strategies in response to energy availability.
- (2) There is a relationship between metabolic rate per unit body mass and the size of multicellular organisms — generally, the smaller the organism, the higher the metabolic rate.
- (3) Excess acquired free energy versus required free energy expenditure results in energy storage or growth.
- (4) Insufficient acquired free energy versus required free energy expenditure results in loss of mass and, ultimately, the death of an organism.

Ecology Review Cards

- a. Energy flow/production = energy flows through; 90% lost at each level & 10% transferred to next level
- (1) trophic levels = primary producers, primary consumers, secondary consumers, tertiary consumers, detritivores & decomposer
 - (2) ecological pyramids (pyramids of energy, biomass, numbers)
 - (3) food chains & food webs
 - (4) Biotic and Abiotic factors can both cause disruption and collapse of ecosystems