

GENERAL BIOLOGY Lecture 35 - Population Ecology

- I. Ecology - study of all organisms in relation to other species and to the environment**
 - A. Levels of organization in ecological interactions**
 - 1. **Population (Collared Lizards) - a group of individuals of same species in same area (habitat), and actually or potentially interbreeding**
 - 2. **Community (Animals including lizards, as well as plants, bacteria, and worms) - two or more populations of different species living and interacting in the same area (all interacting populations within an ecosystem)**
 - a) **Producers - plants**
 - b) **Consumers - lizards**
 - c) **Decomposers - bacteria and fungi**
 - d) **Detritivores - worms (feed on partially digested stuff)**
 - 3. **Ecosystem - all the organisms and their non-living environment within a defined area**
 - 4. **Biome - a general type of ecosystem occupying an extensive geographical area (tropical rain forest, desert, grassland, etc.)**
 - 5. **Biosphere - that part of the Earth inhabited by living organisms; includes the living and non-living components**
- II. Population dynamics**
 - A. Variables affecting population size**
 - 1. **Natality - births**
 - 2. **Mortality - deaths**
 - 3. **Immigration - individuals joining the population**
 - 4. **Emigration - individuals leaving the population**
 - B. Population growth rate = (births + immigrations) - (deaths + emigrations) [per individual]**
 - C. # indiv. added to pop. = population growth rate * number of original individuals**
 - 1. **This is an exponential growth rate (2, 4, 8, 16, etc.)**
- III. Environmental resistance - limits to growth**
 - A. Density-dependent factors - supply of food**
 - 1. **Exploitation competition - rate of eating food differs (Neil Smith eats faster)**
 - 2. **Interference competition - make Neil Smith sick by talking about the vacuum cleaner (thus others eat more efficiently)**
 - 3. **Predation, parasitism, competition**
 - B. Density-independent factors - temperature**
- IV. Human growth**
 - A. Currently varies from 0 to 4%**
 - B. Present world population is expected to double before it levels off**
 - C. Rapid human growth the past few years has been made possible through technology**