

Big Idea 4

Biological systems interact, and these systems and their interactions possess complex properties.

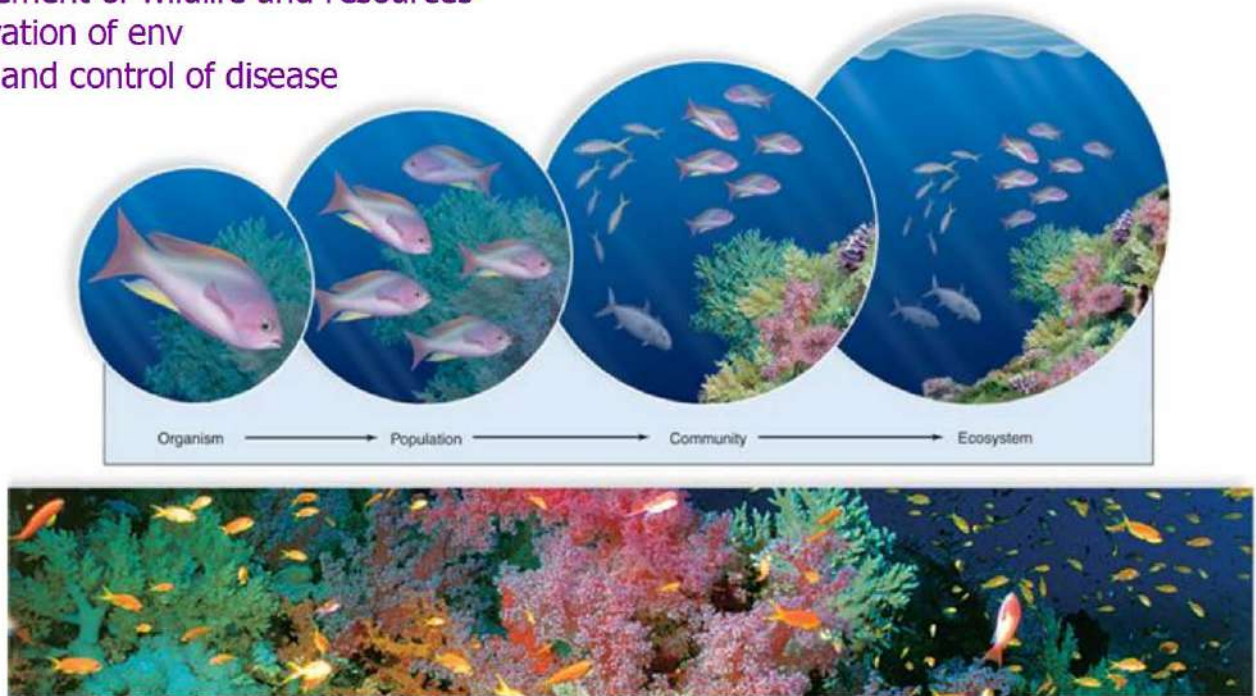
Chapter 44: Population Ecology



<http://www.popecol.org/wp-content/uploads/2012/12/meerkat-e1355606233498.jpg>

44-1 The Scope of Ecology

- intertwined with evolution
- describes and predicts distribution and abundance of orgs
- management of wildlife and resources
- preservation of env
- impact and control of disease

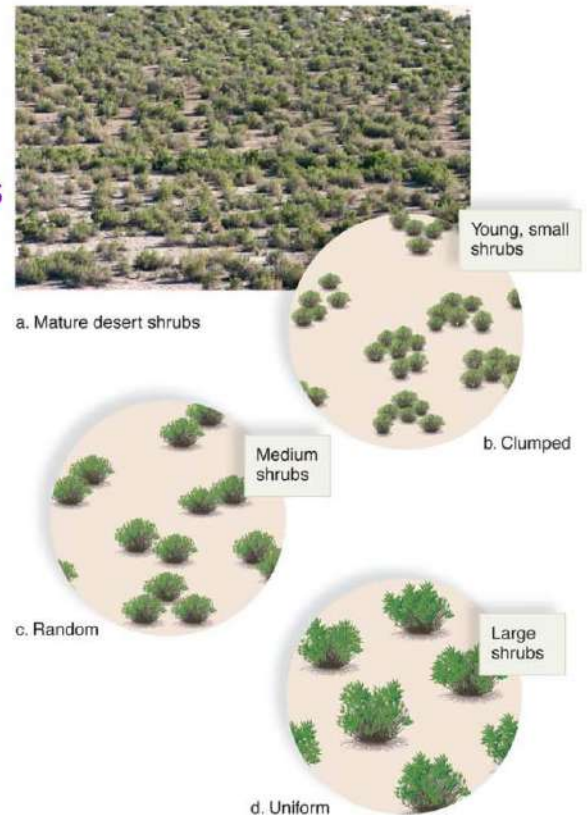


44-2 Demographics of Populations

- statistical study of a population

Density and Distribution

- population density is number of individuals in given area
- population distribution - pattern of dispersal of individuals in area of interest
- affected by availability of resources (limiting factors)
- distribution can be:
 1. clumped
 2. random
 3. uniform
- can vary within range and over time



Population Growth

- rate of natural increase (r) - growth rate
- depends on birth/death
- assumes immigration = emigration
- biotic potential is highest possible rate of natural increase for a population
- depends on:
 - offspring per reproductive event surviving to reproductive age
 - competition within population
 - age of and number of repro opportunities
 - presence of disease and predators

$$r = \frac{(\text{birth} - \text{death})}{1,000 \text{ individuals}}$$



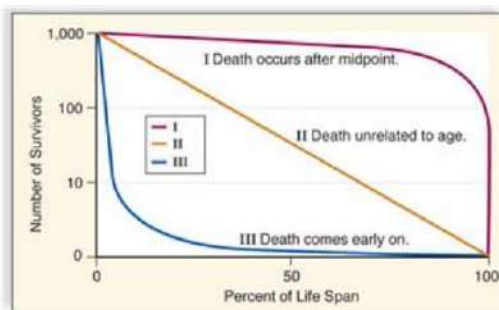
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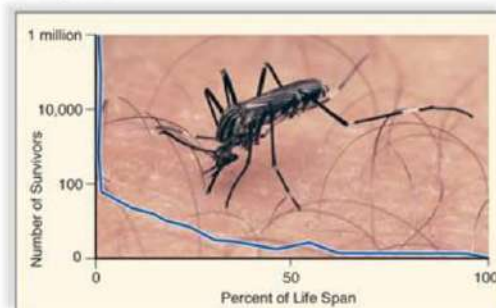
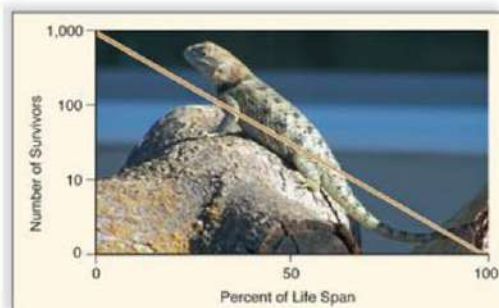
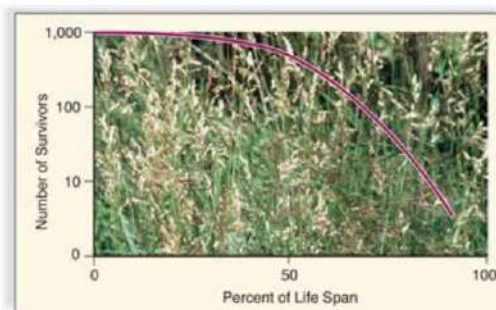
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Mortality Patterns

- cohort - all members of a population born at the same time
- survivorship is probability that newborns from a cohort survive to particular ages
- each species tends to have a particular survivorship curve
- idealized curves below

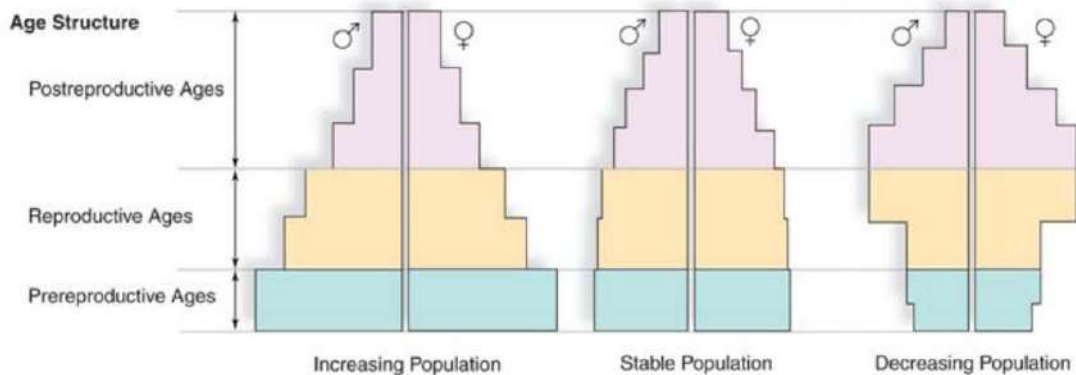


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Age Distribution

- three major age groups:
 - prereproductive
 - reproductive
 - postreproductive
- age structure diagrams show what percentage of population falls into each category



44-3 Population Growth Models

Semelparity

- one single reproductive event in lifetime
- ex: winter moths, annual plants
- resting stage of development that waits until appropriate season (seeds)
- adaptation to unstable env

Iteroparity

- many reproductive events in lifetime
- adaptation to stable env



a.



