POPULATION DISTRIBUTION & SURVIVORSHIP

1. ABUNDANCE

absolute abundance
- total no. organisms in population

complete census
- direct count of all organisms

sampling - census small area
- multiply by total area

mark – release – recapture
- mark small sample, recapture marked

2. DENSITY

density - concentration of organisms

crude density - number per unit of area
- includes unusable habitats

ecological density
- number per unit of suitable habitat

if low density?
- more food & space
- fewer opportunities for reproduction

if high density?
- less food & space
- more repro, also disease & predation

3. DISTRIBUTION

spatial distribution
- also spacing, dispersion, arrangement

random - no pattern (wind-distributed)

uniform - equal distanced (uniform habitat)

clumped - clustered, most common
- select most suitable habitats
- also behavioral (sociality, repro)

other factors
- dispersal patterns
  (emigrate, immigrate, migrate)
- temporal patterns (circadian,
  tidal, lunar, seasonal, annual)

4. AGE STRUCTURE

functional age classes
- divide lifespan into 3 phases
  1. pre-reproductive
  2. reproductive
  3. post-reproductive
- short pre-repro leads to pop incr

age distribution
- stable pop (birth rate = death rate)
- incr pop (reduce death esp. young)
- decr pop (reduce birth rate)

5. AGE PYRAMIDS

age pyramid
- chart of age structure in population
- youngest age at base, oldest at apex
- males on left, females on right

stable pop - relatively narrow base

increasing pop - very broad base

decreasing pop - very narrow base

6. SEX RATIOS

sex ratios - proportion males to females
- expected to be 50:50

if fewer males - genetic diseases
- attract predators, fight other males

if fewer females - nesting, preg/eggs

7. VITAL RATES

crude birth rate (b)
- no. births per time period

crude death rate (d)
- no. deaths per time period

mortality rate (q = d / N)
- prob. of dying during time period
- no. deaths divided by pop size

8. SURVIVORSHIP

survival rate (l)
- prob. of surviving during time period
- opposite of mortality rate (q)

survivorship curves
- proportion surviving during lifespan
- y-axis - survival rate in log scale
- x-axis - proportion of age classes

concave (type III)
- die young or survive thru adulthood

linear (type II)
- constant mortality & survival

convex (type I)
- survive youth then die of old age

invertebrates & plants - type III

vertebrates - between types II + I