

Chapter 19

POPULATIONS



Population Properties

- Populations are groups of organisms
 - belong to the same species
 - live in a particular place at the same time



Population Properties

- Population's Size is the number of individuals
 - If small we count

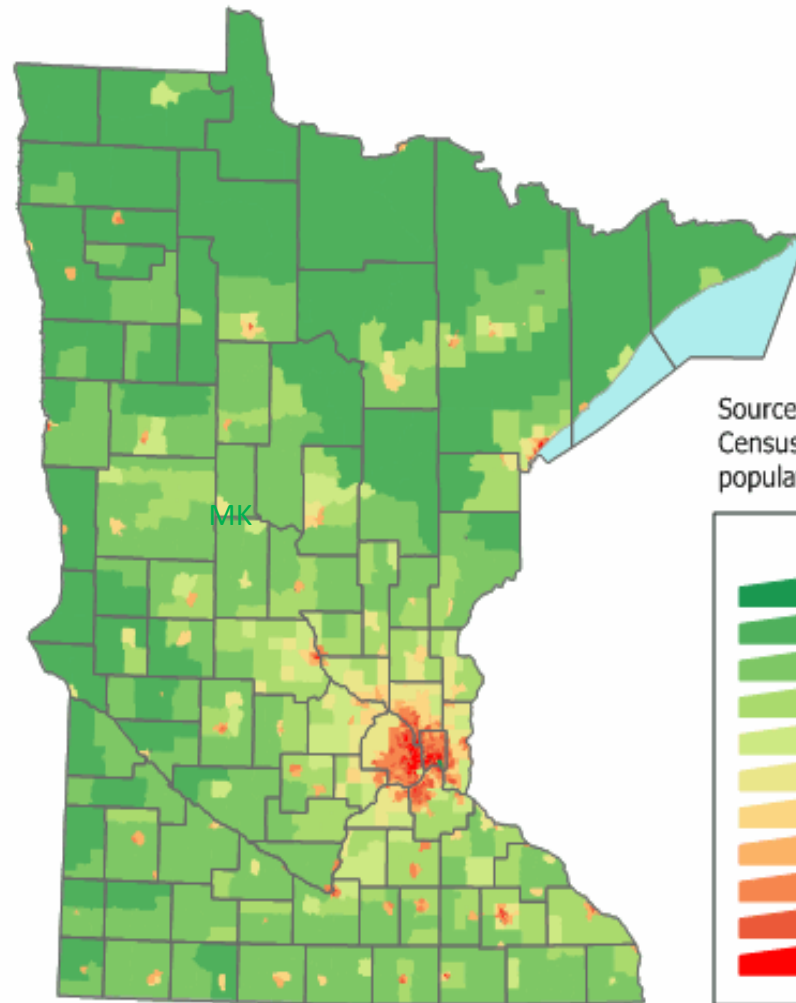


- If big we population sample it up (football field)

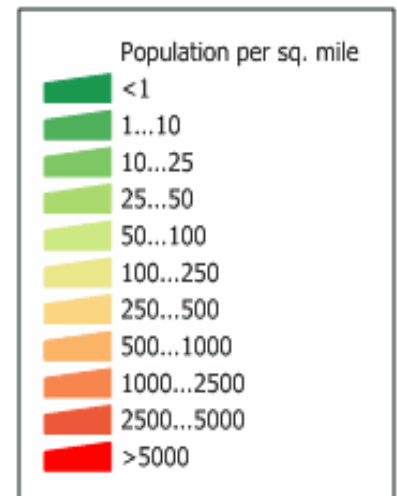


Population Properties

- Population Density is how crowded a population is
 - Number of individuals per unit of area or volume



Source: U. S. Census Bureau
Census 2000 Summary File 1
population by census tract.



Population Properties

- Dispersion is spatial distribution
 - Clumps= Clustered together
 - Uniform= Separated fairly consistent distance
 - Random= Independent locations
 - Gannets= Interaction with Birds



Clumped



Uniform



Random



Population Dynamics

- Birth rate



Population Dynamics

- Death Rate
- Mortality



Population Dynamics

- Life expectancy how long average organism would live



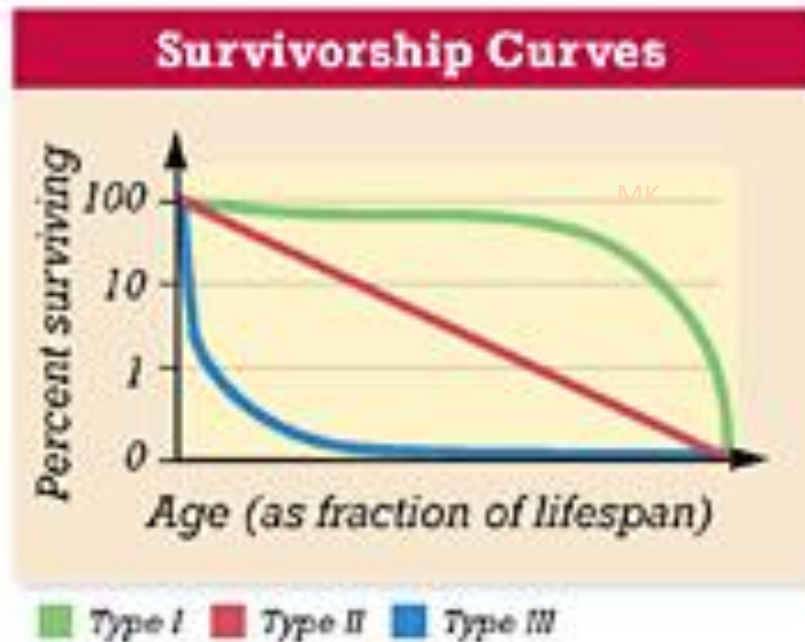
Population Dynamics

- Age Structure- different ages in a population



Population Dynamics

- Patterns of mortality-
- Survivorship curves-



Type1: people and elephant

Type2: birds

Type3: fish and insects



Measuring Populations

- Growth rate- population size changes over time
 - Birthrate-deathrate=growthrate
- Immigration- movement of individuals into population
- Emigration- movement of individuals out of a population

Measuring Population

- Exponential model-study of growth
- Limiting factor-space

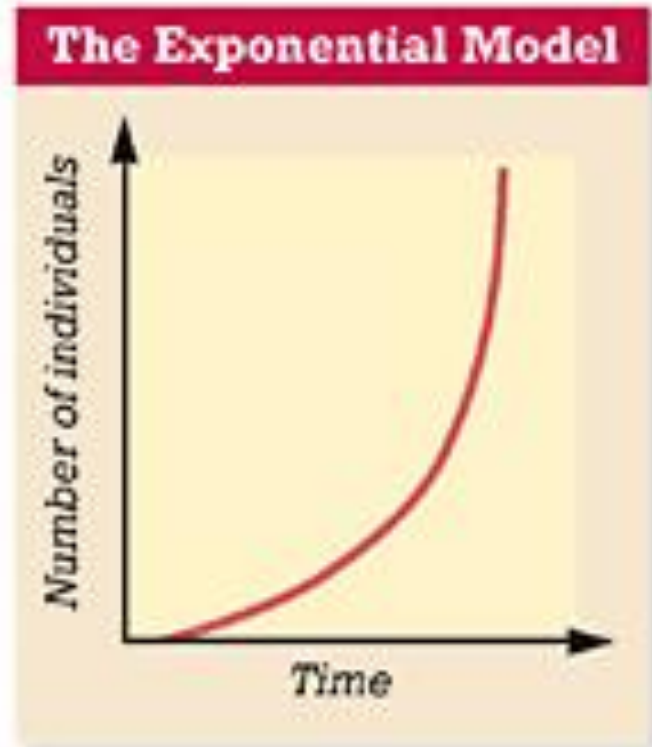


FIGURE 19-6

The graph of exponential population growth has a characteristic J shape. The exponential model indicates constantly increasing population growth.

Measuring Population

- Logistic model



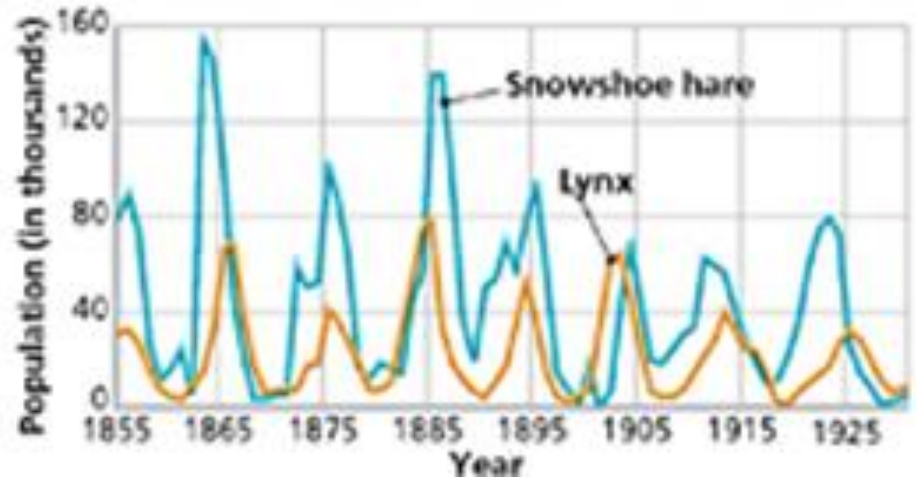
Population Regulation

- Density-independent factors
 - Weather, floods and fire
- Density-dependent factors
 - Shortages of food or nesting sites



Population Regulation

- Population Fluctuations
 - Lynx and the snowshoe hare



Population Regulations

- Perils of small populations
 - Inbreeding-mating with relatives



History of Human Population Growth

- Hunter-gather lifestyle - caveman/woman
 - LIFE WAS HARD – mortality
- Agricultural revolution - dramatic change
 - Food – domesticated animals and plants



History of Human Population Growth



- Population Explosion
 - 1347-52 Bubonic plague killed 25% of population in Europe
 - 1650 Rapid population growth have a better control on disease and hygiene
 - Population grew from 3 billion to 5 billion in 27 years

History of Human Population Growth

- Today 20 % live in developed countries – very low population Growth
- 80 % in developing countries – population Growing faster

Demographic Transition

- Wow, you have got to see page 392!