

Population Growth & Limiting Factors

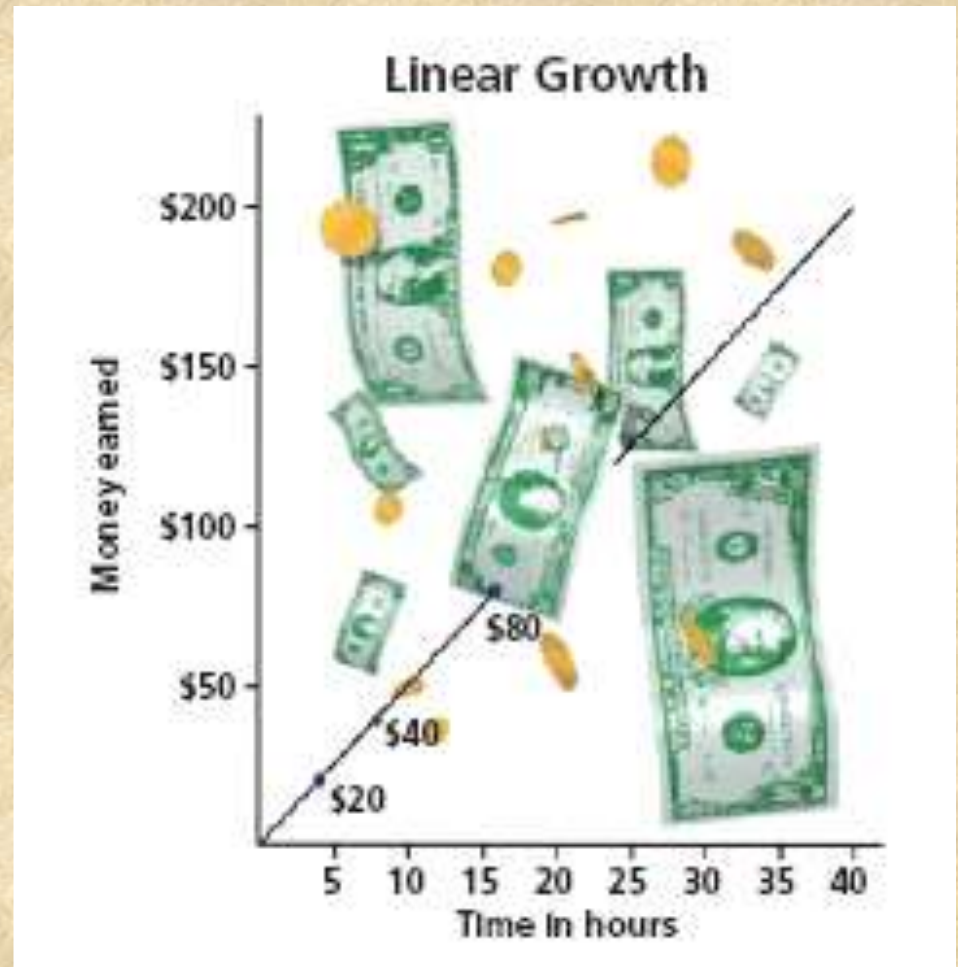
Dr.S.R.Sivakumar
Assistant Professor
Department of Botany
Bharathidasan University
TRICHY-24

Ecology

Population Growth & Limiting Factors

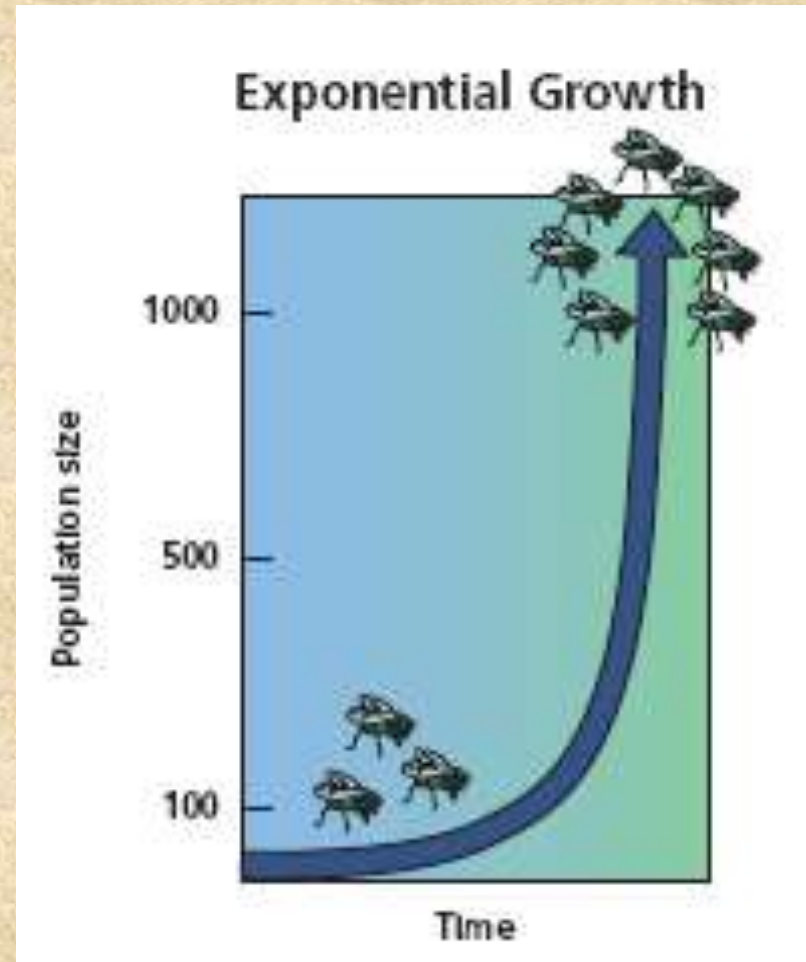
Population Growth

- What is Population Growth?
 - An increase in the size of a population over time
- Some things exhibit Linear Growth
 - As time goes by, growth occurs at a steady rate
 - when graphed, it is a straight line



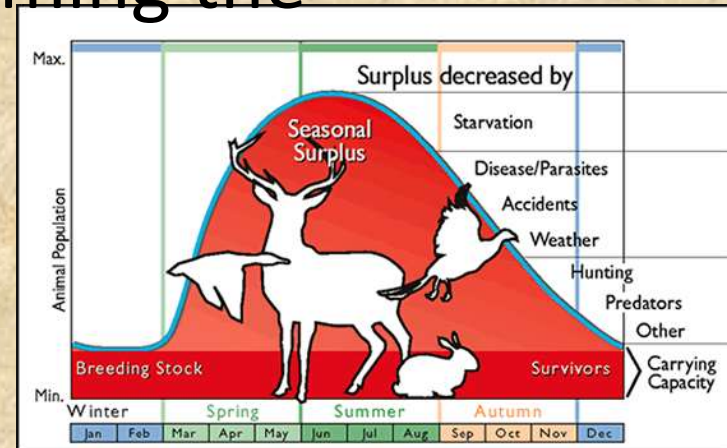
How do Populations Grow?

- **Exponential Growth**
 - Populations show a J-shaped curve
 - Initial increases are slow, but as the population gets larger, it grows faster
 - Why?
 - There are more organisms available to reproduce



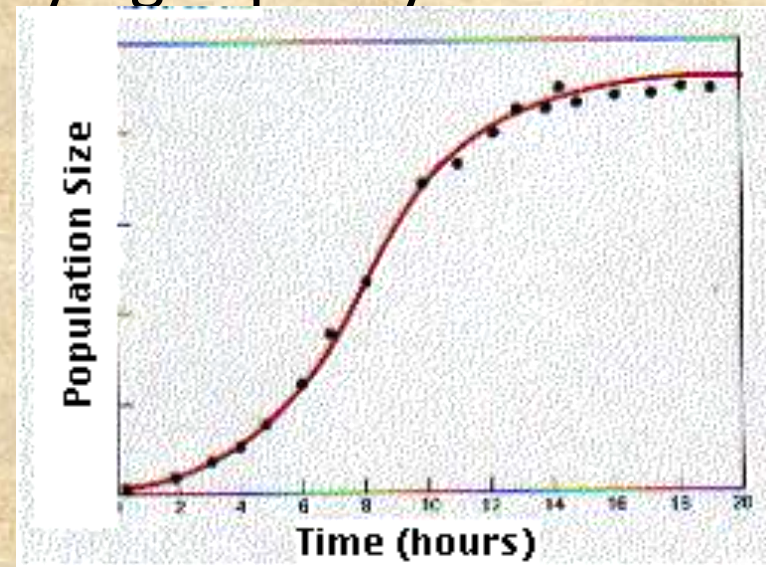
Can it go on Forever?

- Eventually, population growth will be affected by *limiting factors*
 - Any factor that slows population growth
 - Such as: availability of food and space
- **Carrying Capacity:** Maximum number of organisms an environment can support over a long period of time without harming the environment



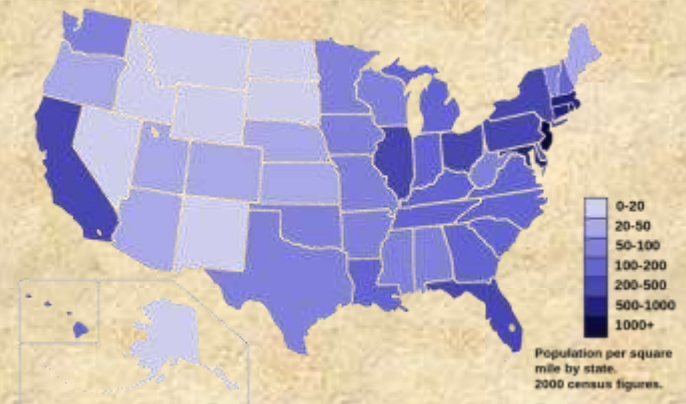
Logistic Growth Model

- Includes the influence of limiting factors on population growth
- A graph of this model shows 3 phases
 - 1- rapid, nearly exponential growth
 - 2- growth rate slows until carrying capacity is reached
 - 3- population is stable



Describing Populations

- Populations can be described based on their size, density, or distribution.
 - Population density is calculated by dividing the number of individuals in a population by the unit area.
 - The size of a population is affected by the number of births, deaths, and individuals that enter or leave the population.



Environmental Limitations

1. **Density-Dependent Limiting Factors** have an increased effect as population increases (more organisms, more risk)

- Disease
- Competition
- Parasites
- Predation



Environmental Limitations

2. Density-Independent Limiting Factors affect all populations regardless of their density (more organisms, same risk)

- Temperature
- Storms
- Natural Disasters
 - (floods, hurricanes, etc)
- Drought
- Habitat Destruction
- Pollution
- Most are abiotic factors

