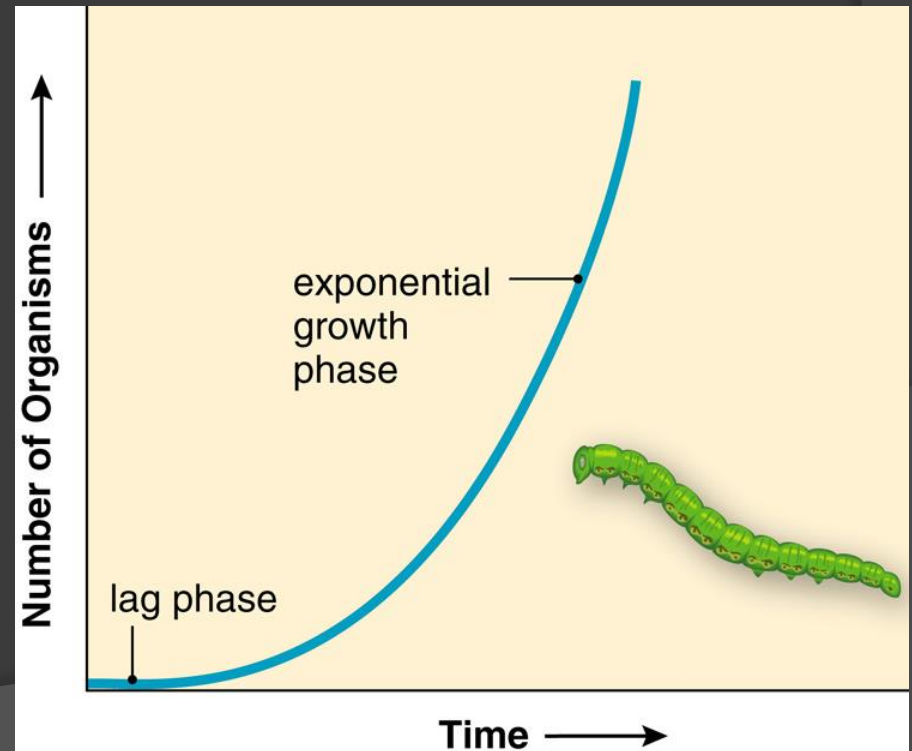
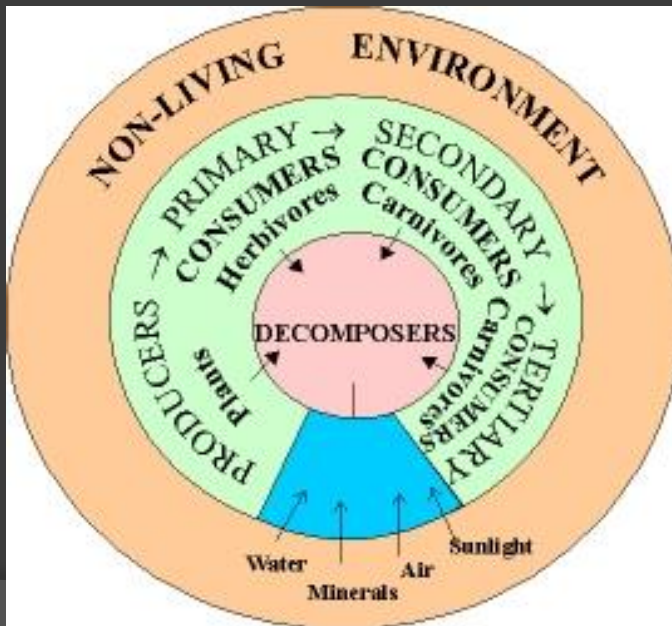


POPULATION GROWTH

Unit 8

Population Size

- **Increases** due to **biotic**, **abiotic**, **agriculture**, **sanitation**, & **medical advances**



Growth Rate

- Population **grows**: # **births** > # **deaths**
 - However, this requires **resources**

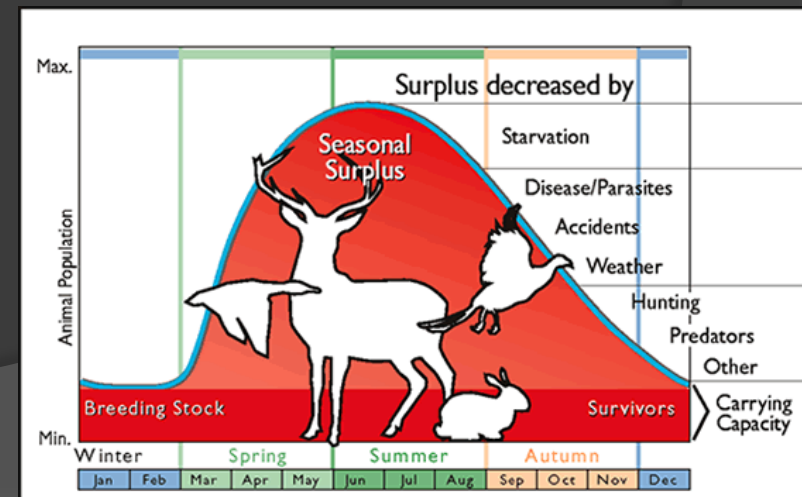
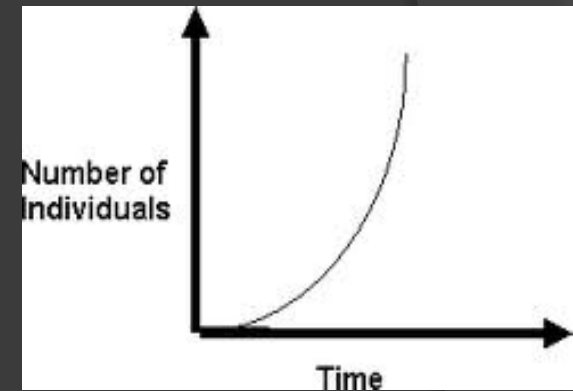


Biotic Potential

◎ DEF: **Max** capacity of a population to **REPRODUCE**

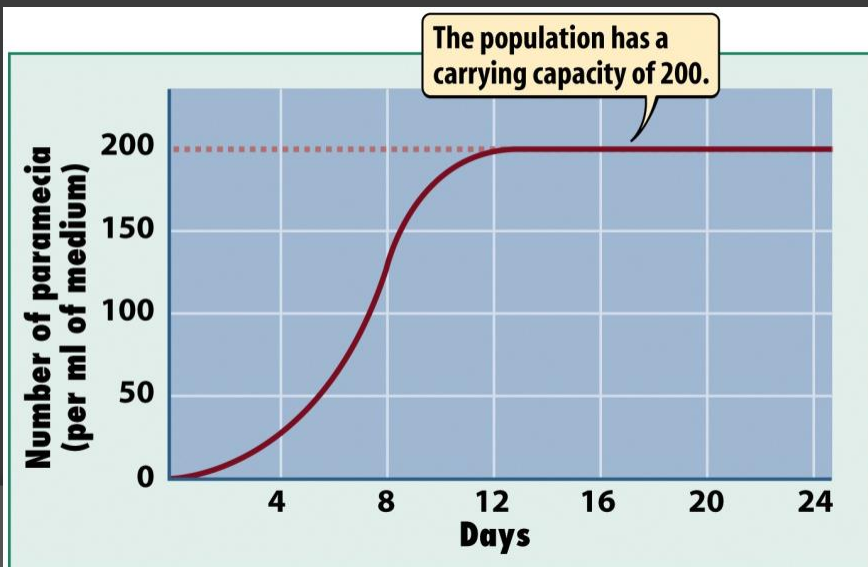
◎ Limiting Factors:

- **Disease**
- **Predation**
- **Food Resources**



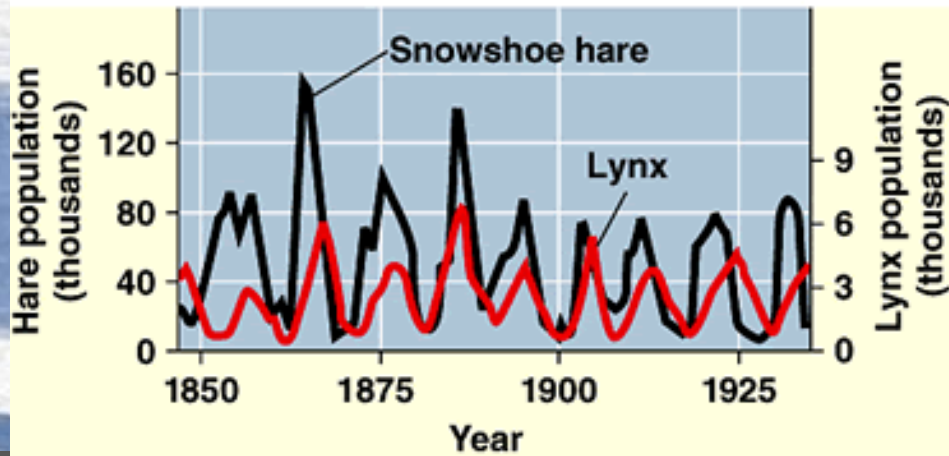
Carrying Capacity

- DEF: **Max** population **size** of any species that **environment** can **SUSTAIN** (support)
- Signified by **plateau** (leveled) on population graph
- When carrying capacity is reached, there is an **INCREASE** need for **food**, **shelter**, and **mates**



Limiting Factors

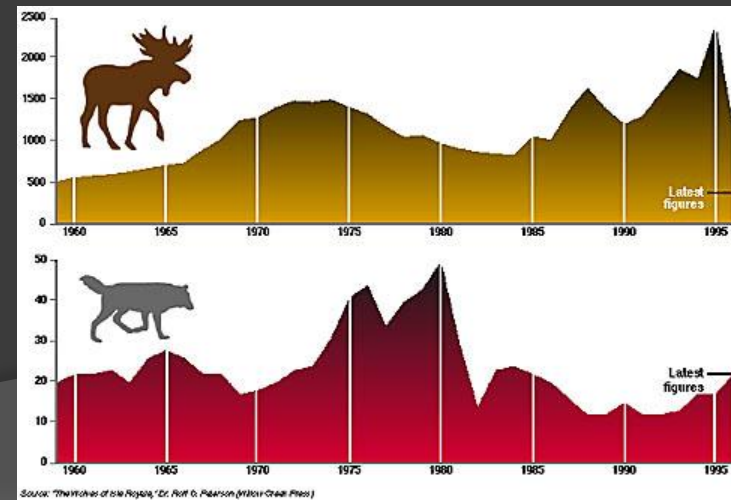
- Environmental factors (*biotic & abiotic*) that determine *growth* and *carrying capacity* of species within ecosystem
 - food, nutrients, space, water, sunlight



Density-DEPENDENT

Factors

- Factors **limiting** size of population whose effect is **DEPENDENT** on **# of individuals** in population
 - Ex) **Disease** – Greater effect in limiting **large populations** (overcrowding facilitates spread)
 - Ex) **Competition / Predators / Food / Bacteria**



Density-*INDEPENDENT*

Factors

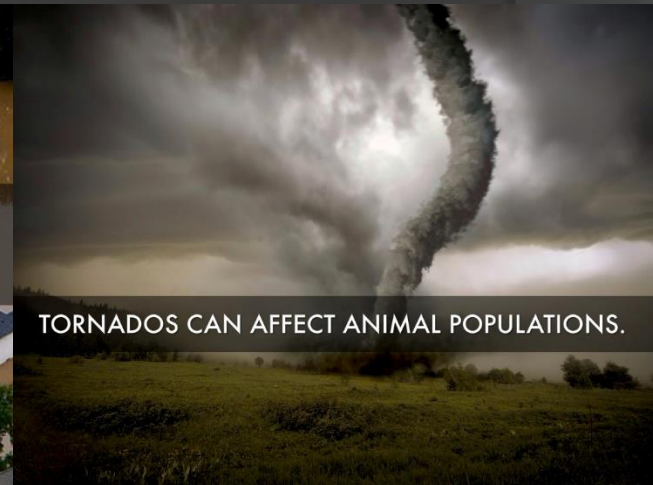
- Factors **limiting** size of population whose effect is **NOT DEPENDENT** on **# of individuals** in population
 - Ex) **Earthquake** – Kills all members of population regardless of population size
 - Ex) **Volcanoes / Temperature / Floods / Drought**



HEAT AND FIRE CAN HURT MANY ANIMALS.



FLOODS



TORNADOS CAN AFFECT ANIMAL POPULATIONS.

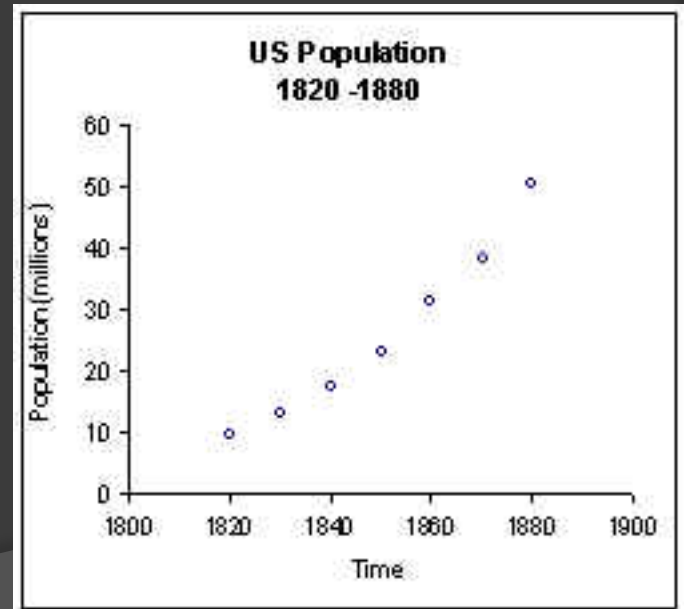
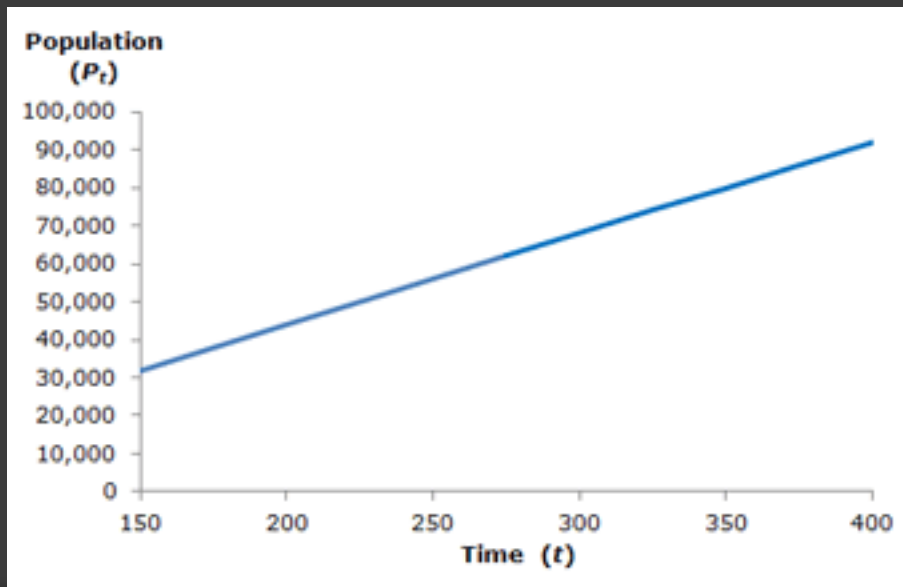
Population Growth

● **Three (3)** population growth curves — How a population can **grow**:

- Linear
- Exponential
- S-Curve (Logistic)

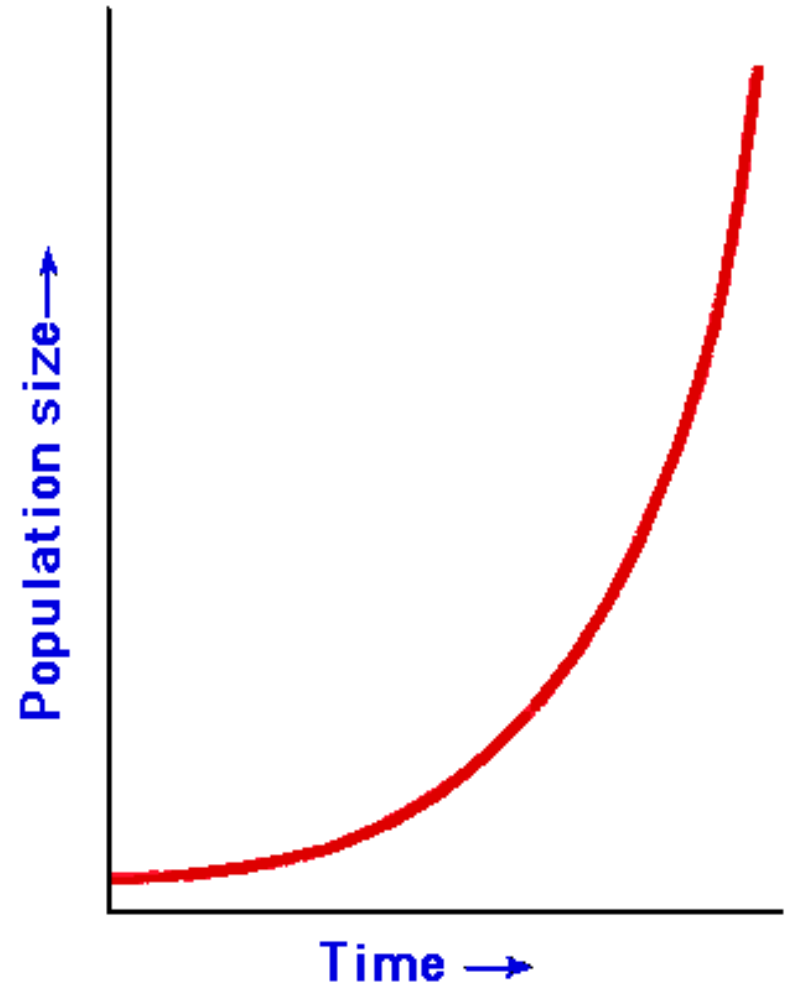
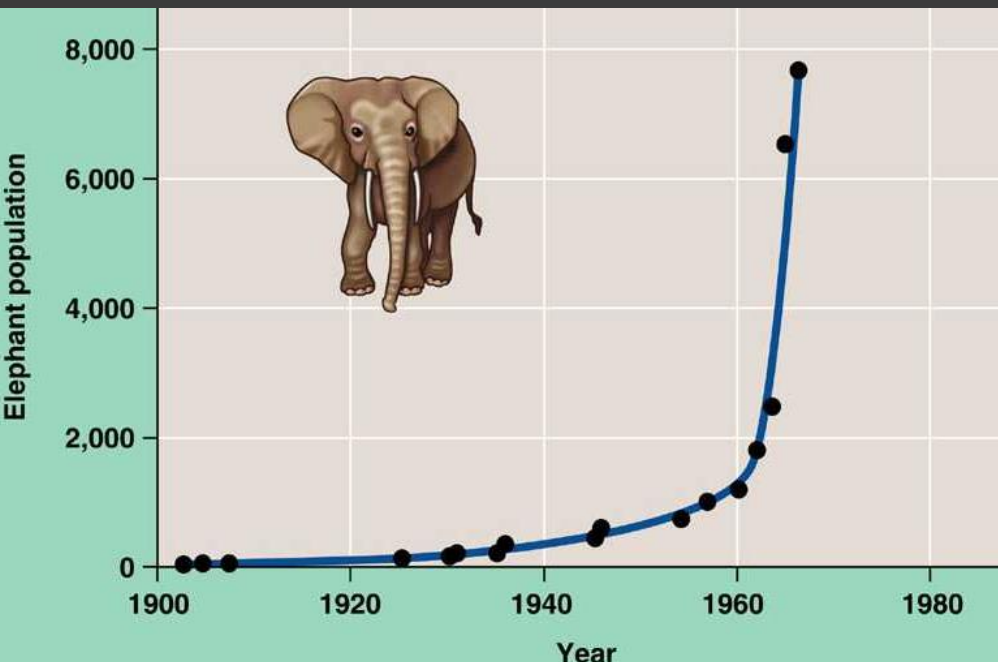
Linear Growth

- Population *increases* by *same* amount at *regular* intervals



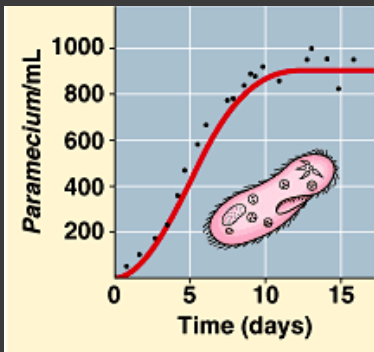
Exponential Growth

- # of individuals increase **rapidly** in **short time** intervals

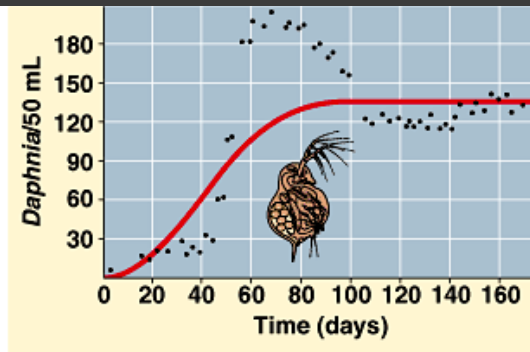


S-Curve (Logistic)

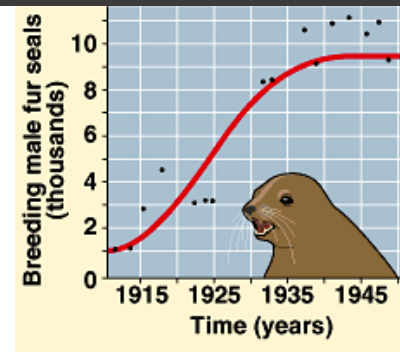
- **NO** population can grow forever
 - Eventually reaches **carrying capacity**



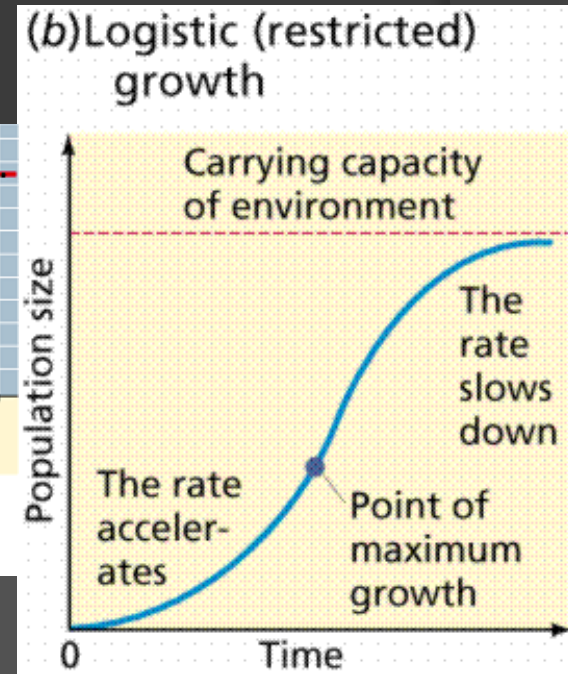
(a) A *Paramecium* population in laboratory culture



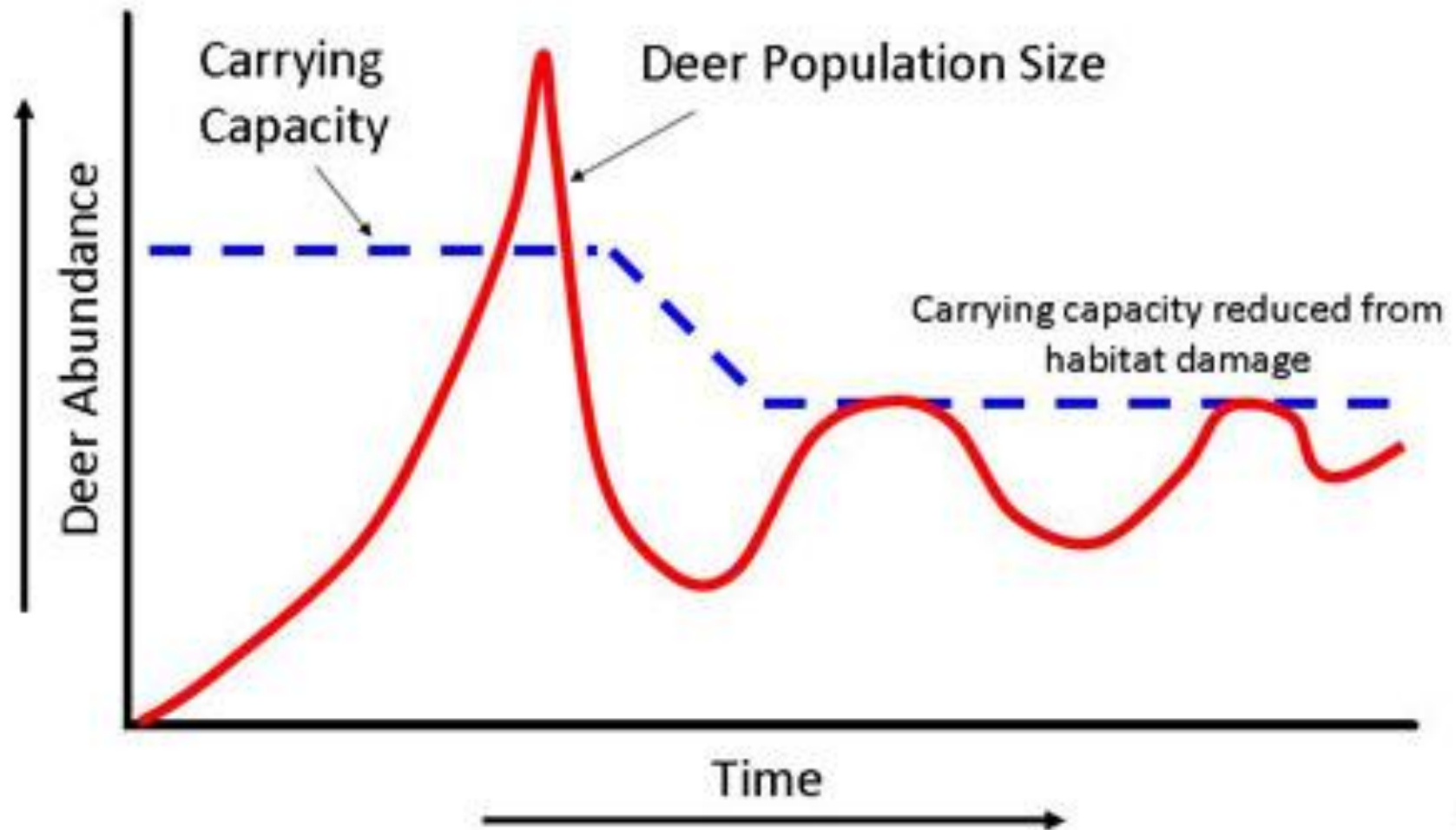
(b) A *Daphnia* population in laboratory culture



(c) A fur seal (*Callorhinus ursinus*) population on St. Paul Island, Alaska



Unrestricted deer population growth may diminish the habitat's carrying capacity



Lizard Population

