

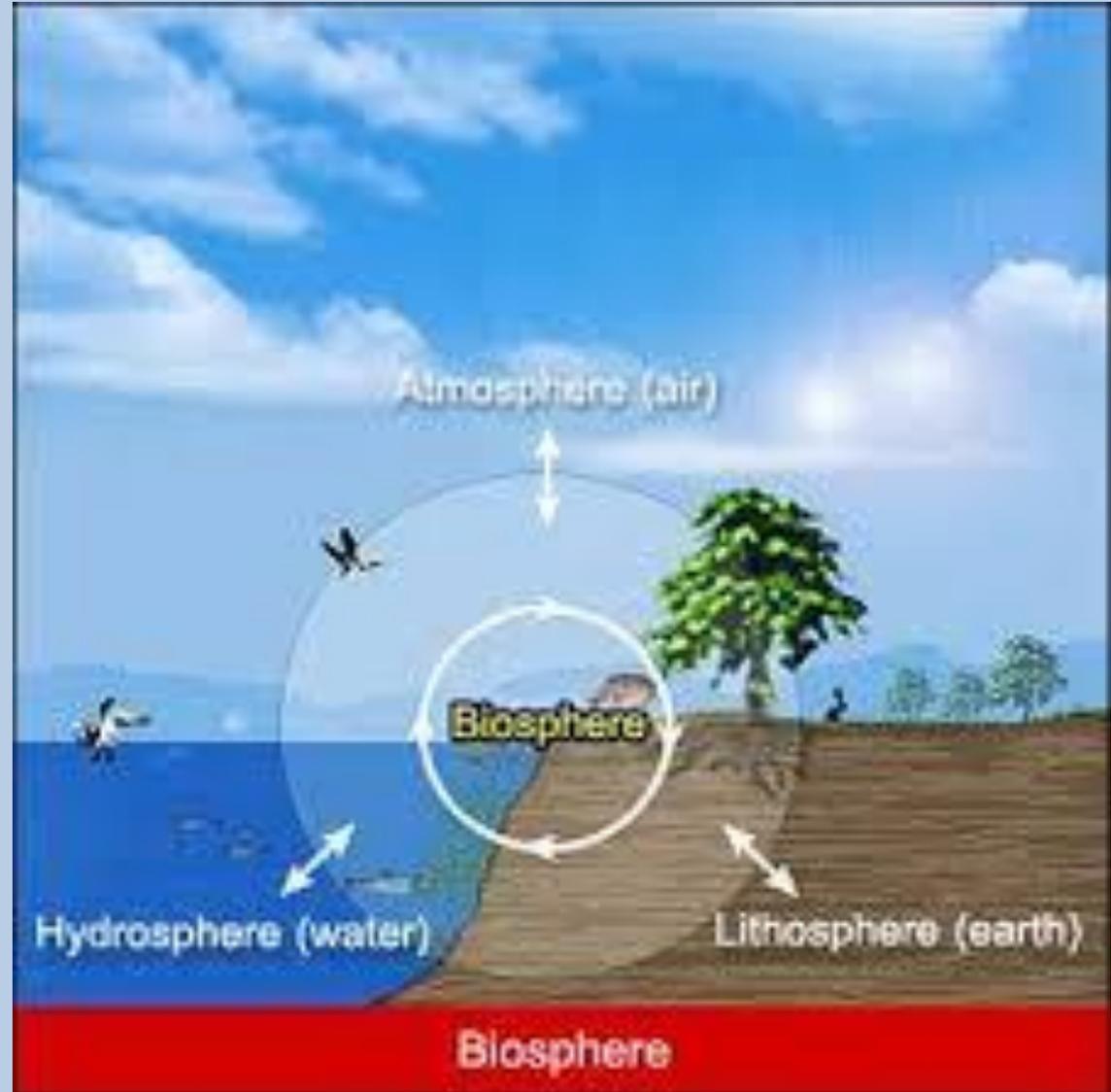
ECOSYSTEMS: Limits to Population Growth



BIOSPHERE

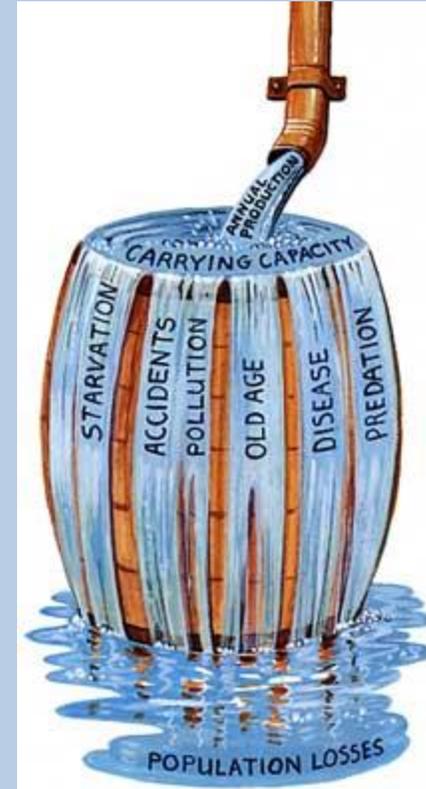
- The biosphere is made up of 3 parts
 - All the Water on the planet
 - All the Layers of air making our atmosphere
 - All the land

Holds all life on our planet



Populations in an Ecosystem

- An ecosystem can only support a certain number of organisms.
- When a population of organisms gets too big, certain things (certain **factors**) will cause the population to decrease.



Limiting Factors

- Factors that slow down or stop the growth of a population



Limiting Factors

- Density Dependent Factors
 - Factors that cause a population to decrease when there are TOO MANY organisms.

Limiting Factors

- Density Dependent Factors

- Examples:

- Predation (Predator-Prey)

- Parasites

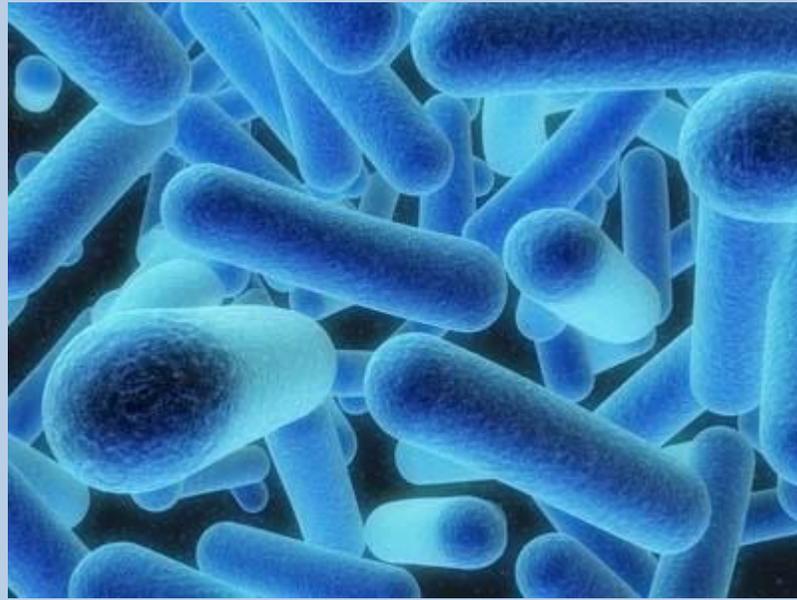
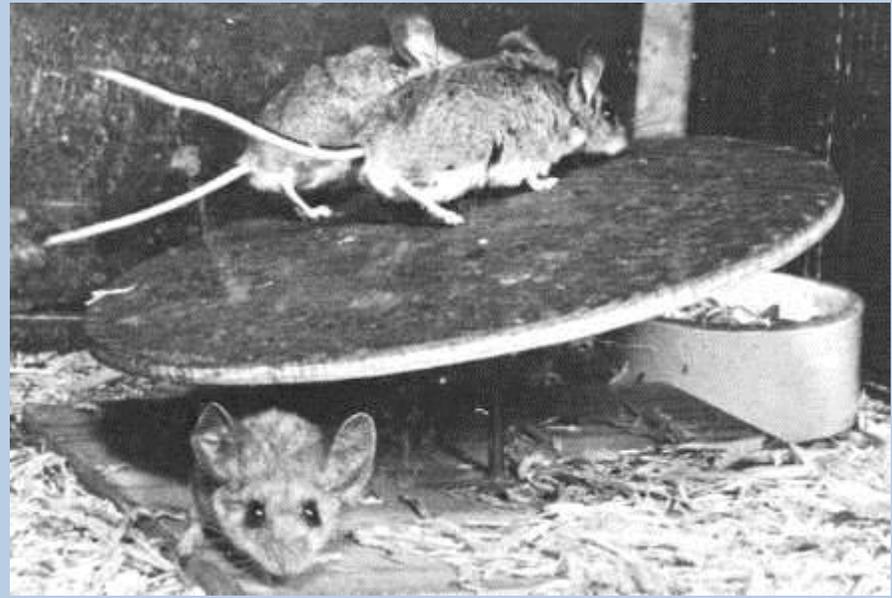
- Disease

- Competition for:

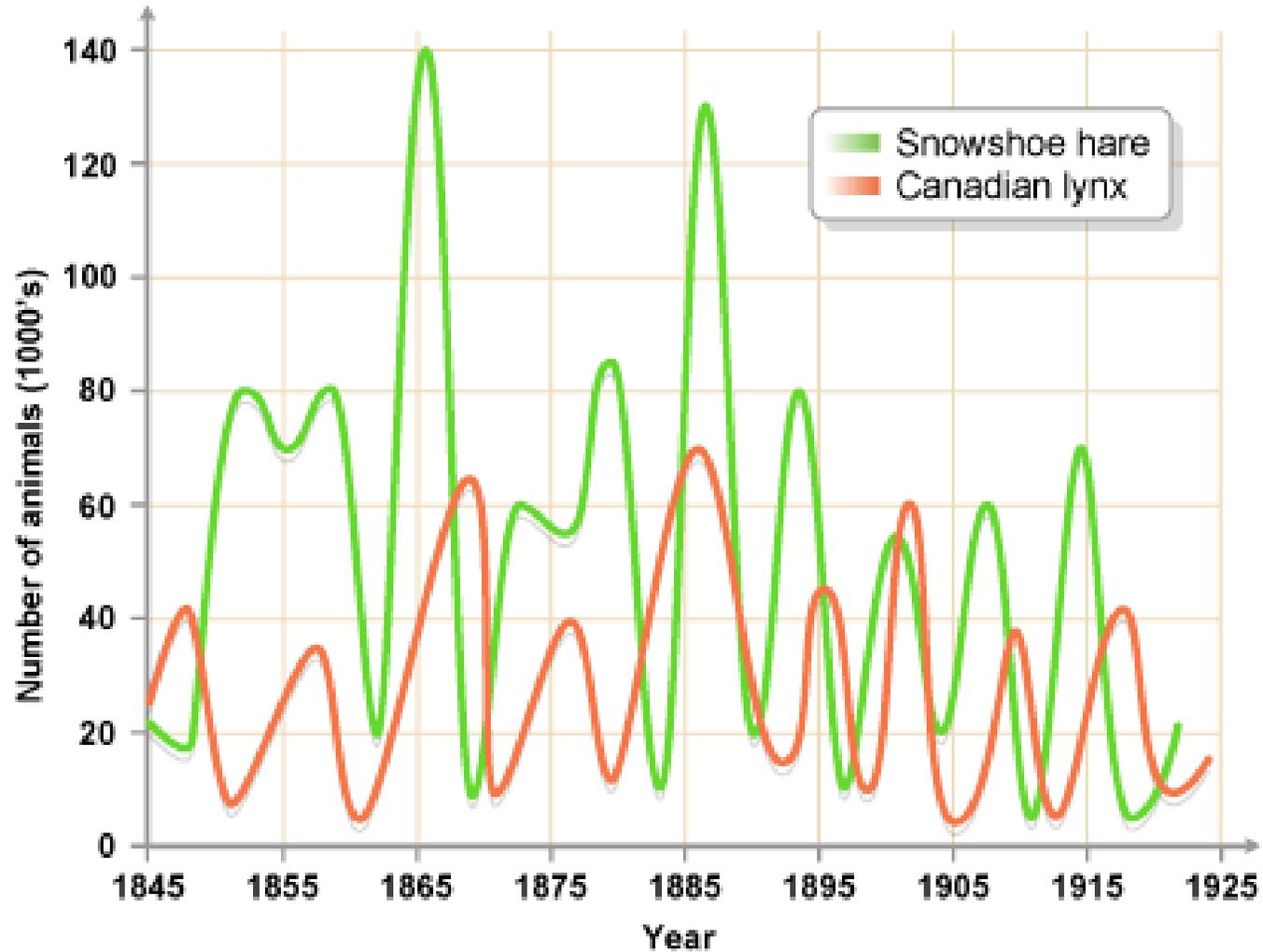
- Food

- Water

- Space



Living things in an ecosystem effect one another

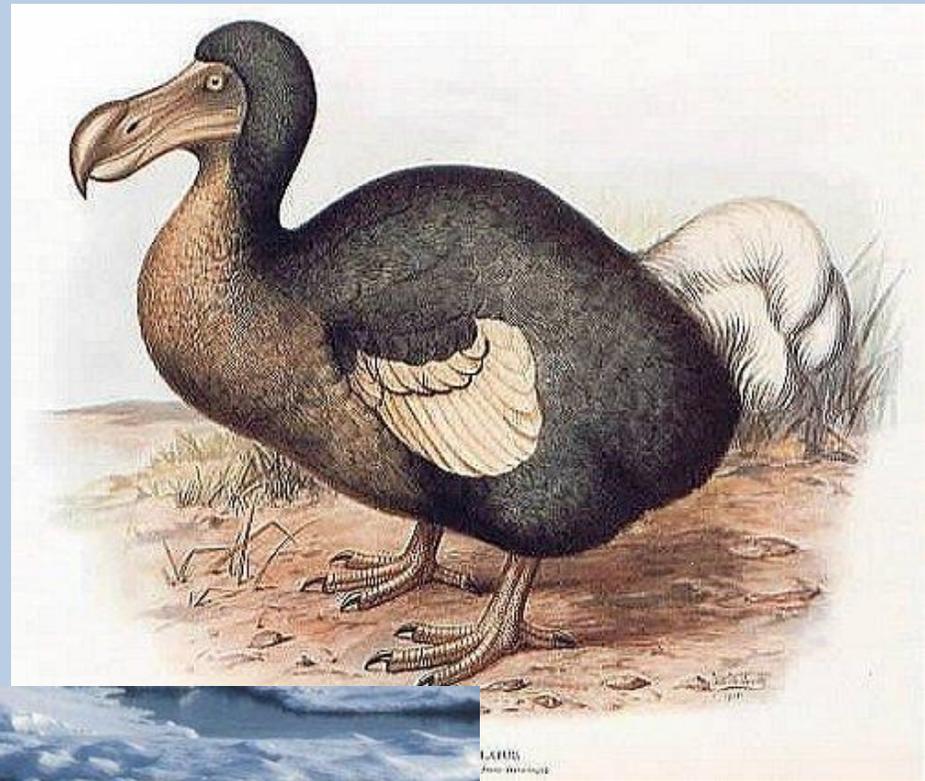


Limiting Factors

- Density Independent Factors
 - Factors that cause a population to decrease even when there are NOT too many organisms.

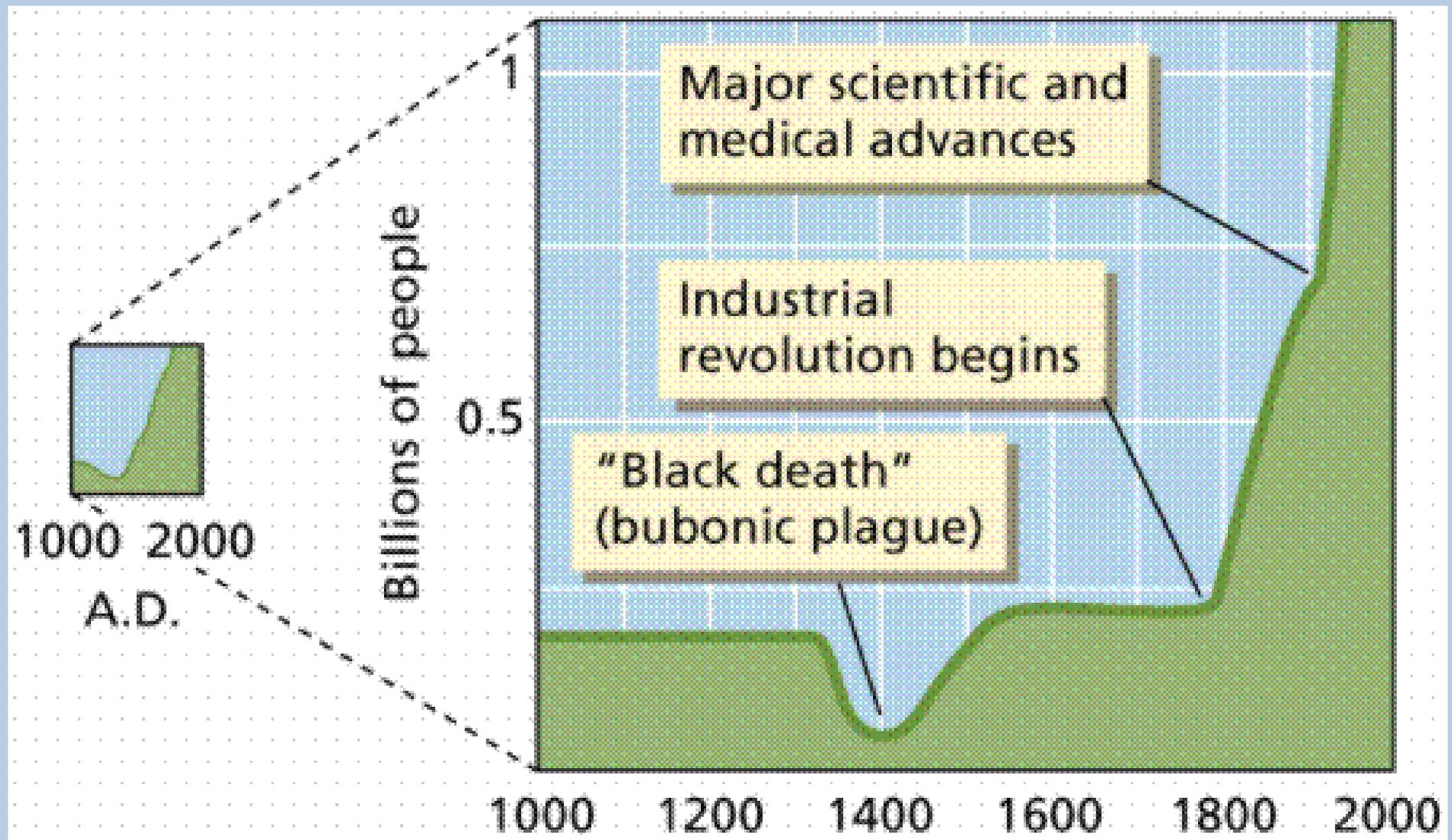
Limiting Factors

- Density Independent Factors
- Examples:
 - Humans
 - Natural disasters
 - Climate change

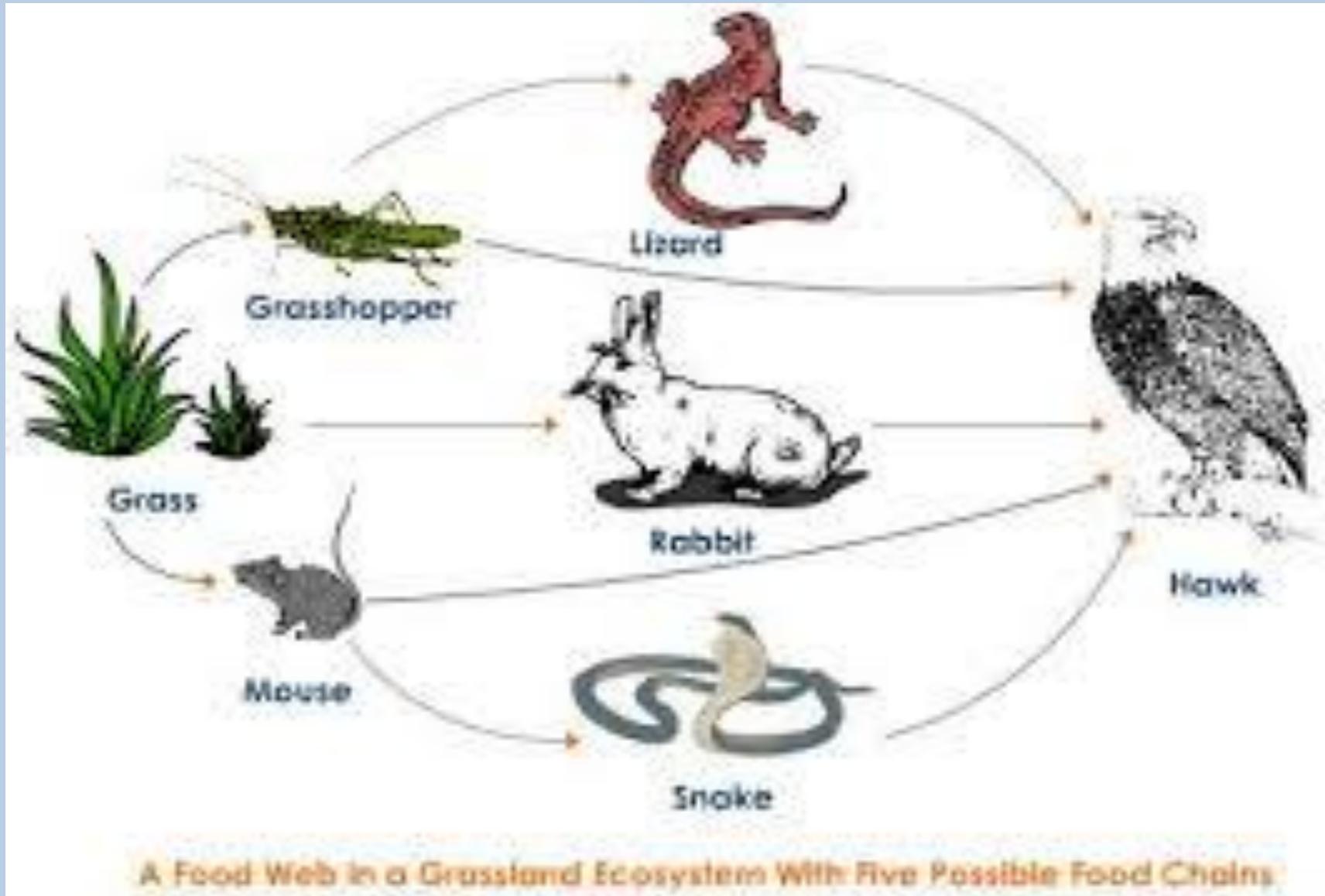


What Causes Populations to Grow?

- Reproduction
 - More babies = more organisms
- Changes in food chains
 - Ex: Predator numbers decrease so the prey numbers increase
- Migration
 - Usually only causes populations to grow temporarily



ECOSYSTEMS: RELATIONSHIPS



KEY VOCABULARY:

Relationships between living things

- Symbiosis
- Mutualism
- Commensalism
- Predation
- Parasitism

SYMBIOSIS

- A relationship between two living things
 - Could be positive or negative
 - Example: Tree and Termites (negative) or Bees and flowers (positive)



MUTUALISM

- Both Species benefit from one another
 - Example: Alligator and Plover Bird
 - The alligator gets its teeth cleaned by the bird
 - The bird gets free food and protection



COMMENSALISM

- When one living thing benefits while the other is not benefitted or harmed another.
- Example: Sharks and pilot fish

(The pilot fish get protection from the sharks and left over food not eaten by the shark, the shark is not benefitted nor harmed by the small fish.)



PREDATION

- Predator/ Prey
 - Example:
 - Cheetah and gazelle
 - Wolf and rabbit
 - Bear and fish



PARASITISM

- When one organism Benefits at the expense of another. One is hurting the other.
- Example: Ticks and Dogs



ECOSYSTEMS NOTES

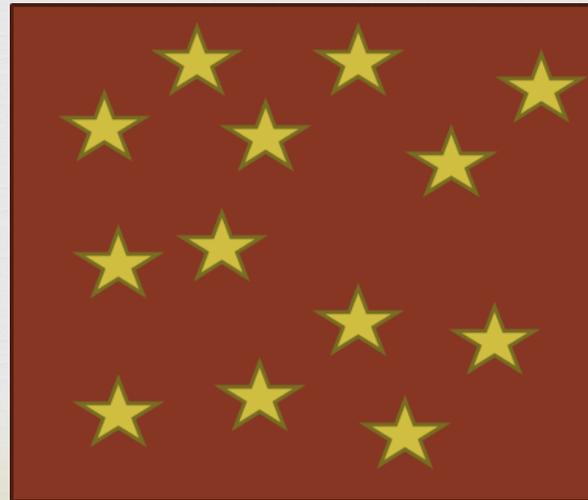


Part 2: Population

Population Density



- ☞ Density is how close or far apart things are in a given space.
- ☞ Two things affect the density of a population.
 - ☞ Space
 - ☞ How many living things are in trying to live in that particular area.



Population Density



❧ A population of bees in a beehive

❧ More dense and “clustered” because there are many living things in a small space.

❧ A family of 3 living in a two story, 5 bedroom, house

❧ Less dense because there is a lot of space for the amount of people living in that area (house).

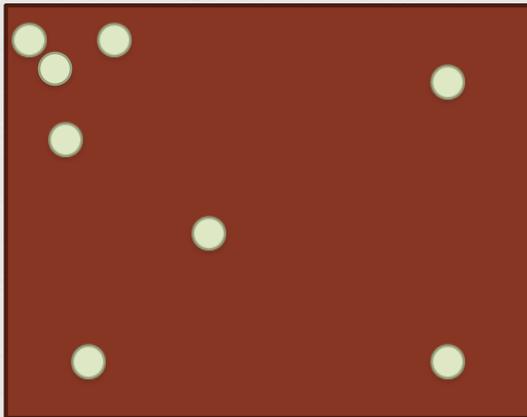
Population Spacing



Living things can organize themselves in different ways.
In other words they can spread out or clump together.

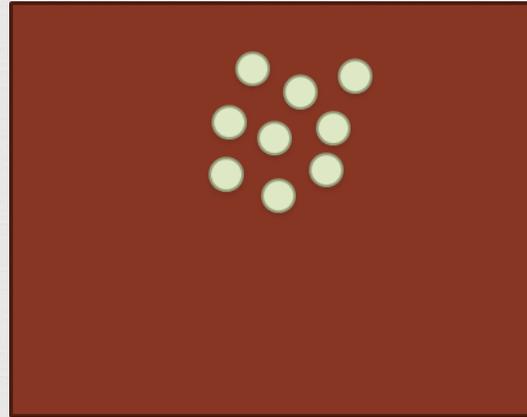
Random

(No pattern)



Clumping

(In a group or several groups)



Uniform

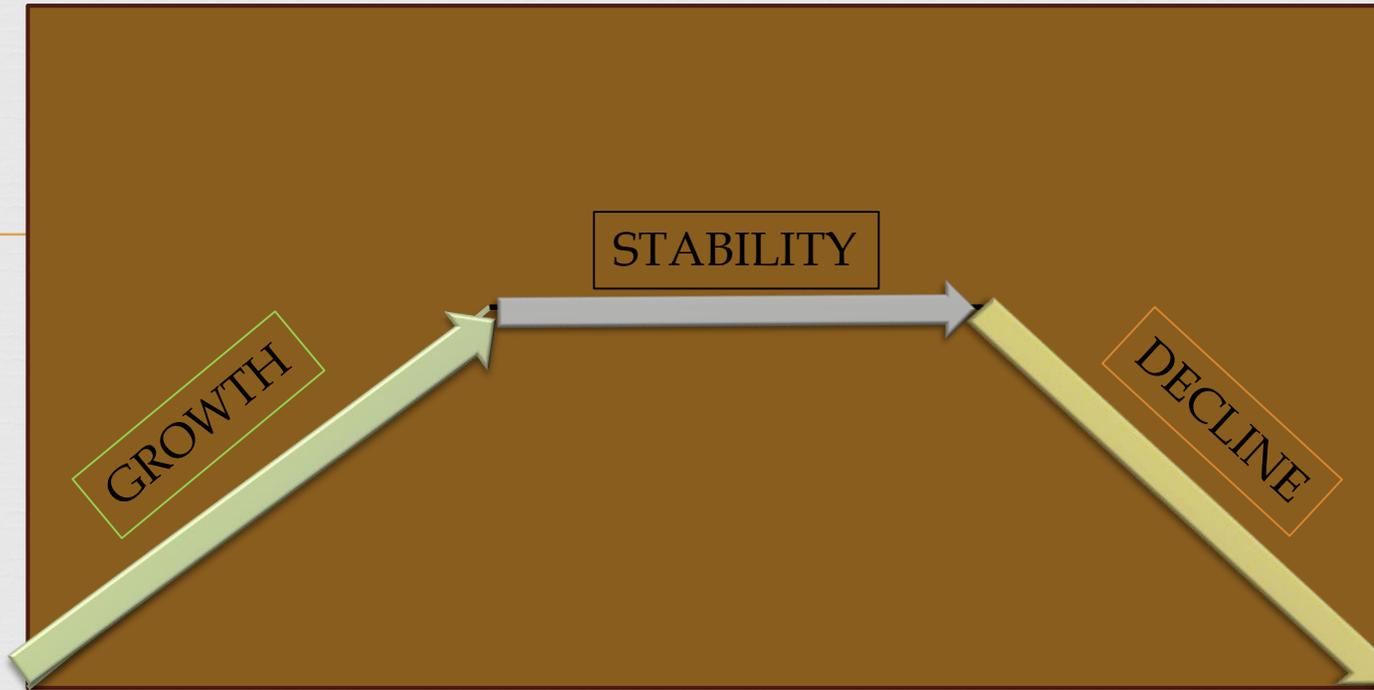
(all the same)



3 stages of population growth



- ❧ Growth- birth rate $>$ death rate. The population is growing.
- ❧ Stability/ Stabilize -number born \sim amount dying.
No growth, no decline.
- ❧ Decline - the birth rate $<$ death rate. The population is shrinking



This cycle repeats over and over as time goes on until a population becomes extinct in an area.

Immigration vs. Emigration



- ❧ Immigration – to move, or migrate, into a new area.
- ❧ Emigration- to leave an area to live in another due to resource availability or availability of space.

- ❧ EXAMPLE: She emigrated from one country (moving out), to immigrate into another country (moving in).