

Concepts on Population

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Habitat

- natural environment where the organism lives
- physical environment that surrounds a population of species



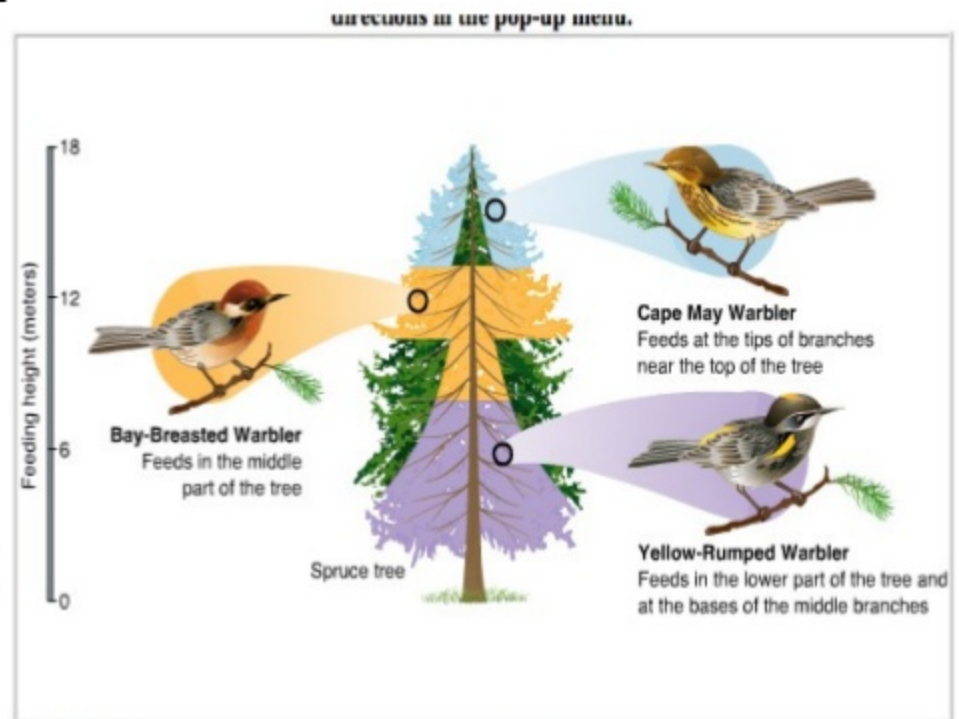
Geographic Range

- distribution of a species where the species can be found



Ecological Niche

- the role and position a species has in its environment
- it is how it meets its needs for food and shelter, how it survives, and how it reproduces.



Warbler Niches Each of these warbler species has a different niche in its spruce tree habitat. By feeding in different areas of the tree, the birds avoid competing with one another for food. **Inferring** What would happen if two of the warbler species attempted to occupy the same niche?

Demography

- the scientific study of biological population
- a general science that can be applied to any kind of dynamic population that is one that changes over time or space.
- encompasses the study of the size, structure, and distribution of populations and spatial and or temporal changes in them in response to birth, death, migration and ageing.



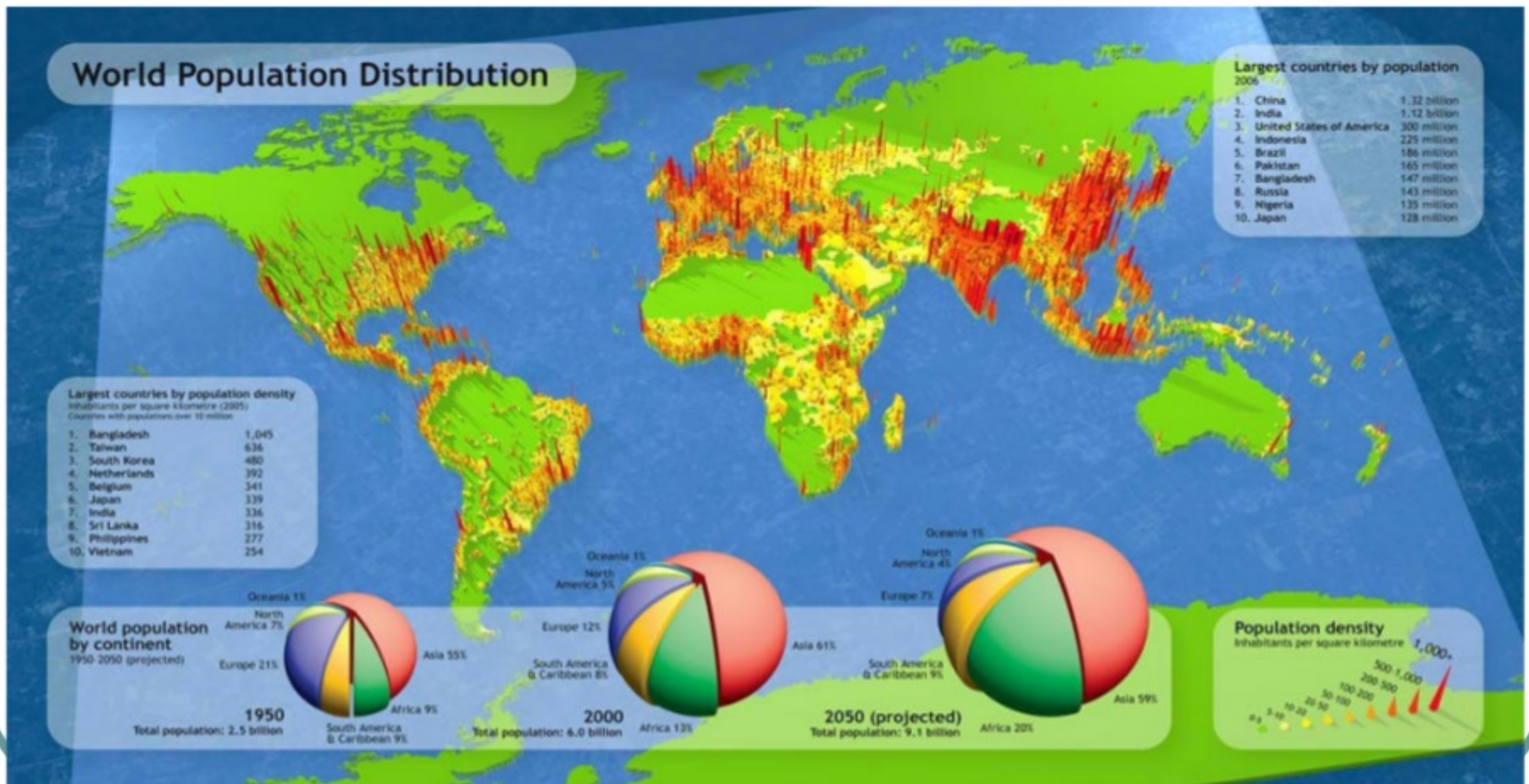
Population

- sum of all the organisms of the same group or species, which live in a particular geographical area, and have the capability of reproduction.



Population distribution

- the spread of people across the world



Patterns of Population Distribution

CLUMPED



Organisms are clustered together in groups. This may reflect a patchy distribution of resources in the environment. This is the most common pattern of population dispersion.

RANDOM



Organisms have an unpredictable distribution. This is typical of species in which individuals do not interact strongly.

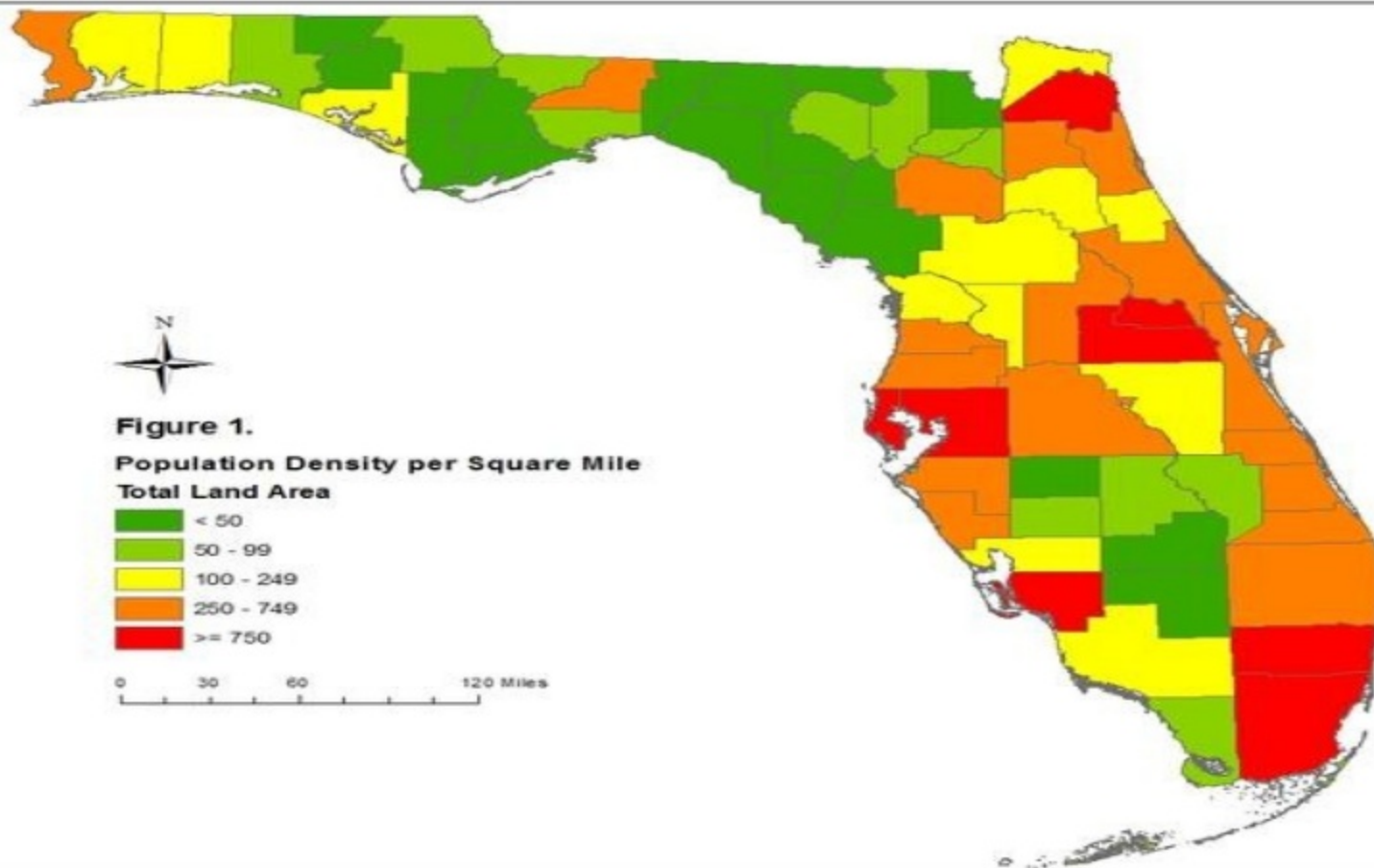
UNIFORM



Organisms are evenly spaced over the area they occupy. This is typical of species in which individuals compete for a scarce environmental resource, such as water in a desert.

Population density

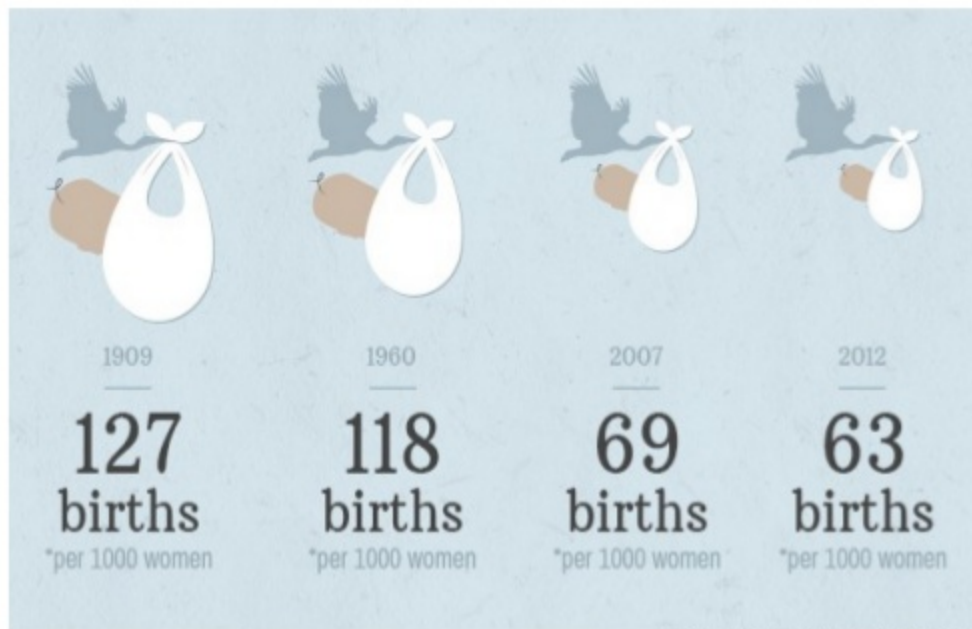
- a measurement of **population** per unit area or unit volume



Natality or Birth Rate

- the greatest factor that influences population increase.
- the inherent ability of population to increase. Maximum natality - the absolute or theoretical maximum production of new individual under ideal condition.

Ecological natality - the population increase under actual or environmental conditions.



Mortality or Death Rate

- usually expressed as the probability of dying.

Minimum Mortality is the loss of the individual ideal condition. Ecological Mortality is the loss of individual under given environment.



Immigration

- the movement of people into a destination country to which they are not native or do not possess its citizenship in order to settle or reside there, as permanent residents or naturalized citizens, or to take-up employment as a migrant worker or temporarily as a foreign worker.



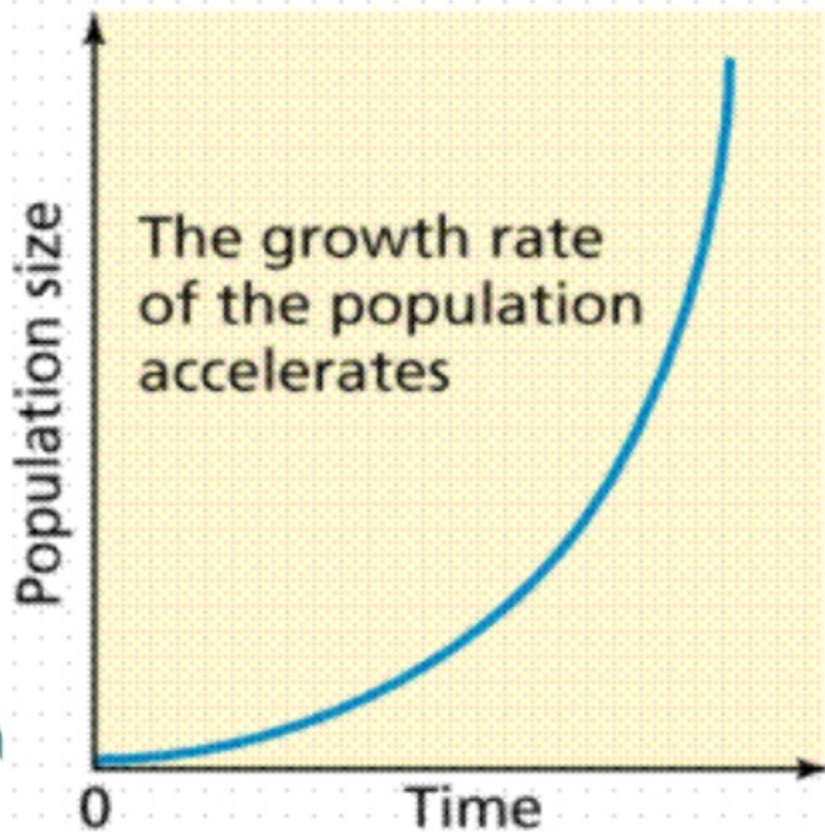
Emigration

- act of leaving one's resident country with the intent to settle elsewhere

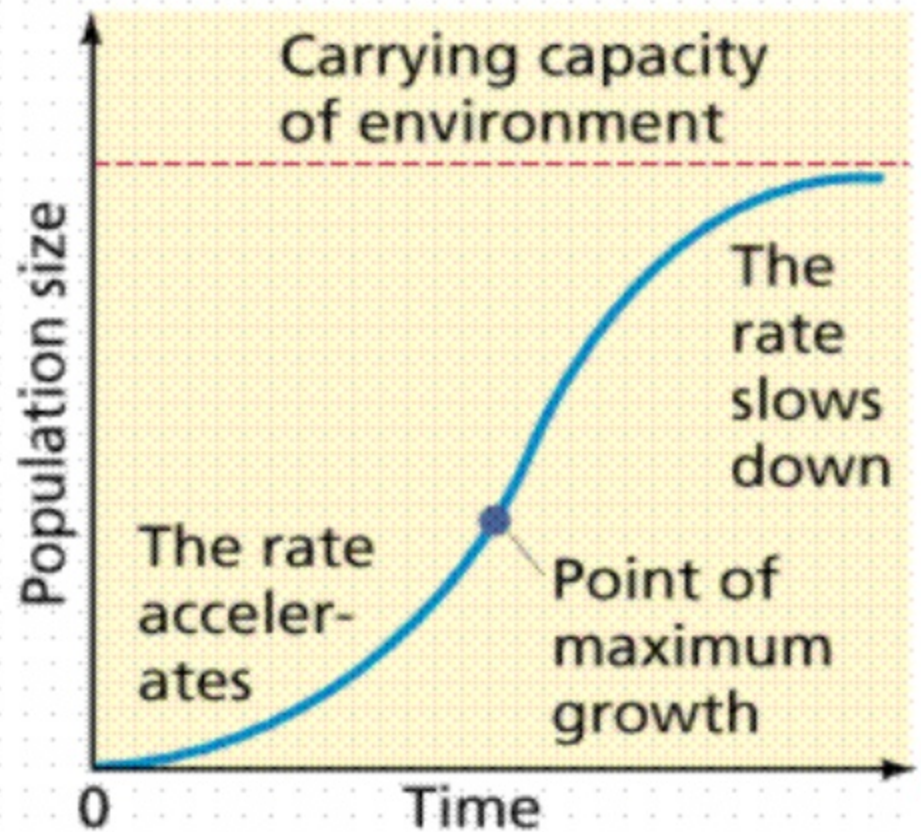


Growth Forms

(a) Exponential (un-restricted) growth



(b) Logistic (restricted) growth



Logistic Growth

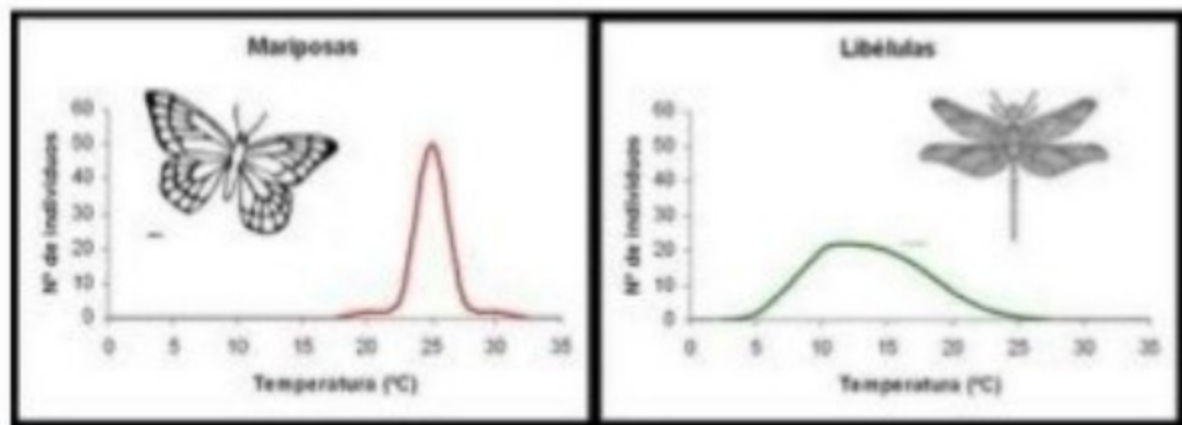
- As a population increases in size, the same resources must be shared by a greater and greater number of individuals. The decreasing supply of resources may lower the birth rate, increase the death rate or both, thus population growth declines with increasing density, eventually reaching a level at which population growth ceases. The level is called carrying capacity and is expressed as K of the environment. A sustainable supply of resources including nutrients, energy and living spaces defines the carrying capacity for a particular environment.
- Its rate of increase is low at first then accelerates and slows again, then levels off as the carrying capacity of the environment is reached. A plot of this growth pattern gives as a sigmoid or S-shaped curve.

Exponential Growth

- Population exhibit characteristic patterns of increase known as population growth forms.
- Exponential growth is a pattern of growth wherein the variables affect population size and can be measured either for the entire population or per individual.

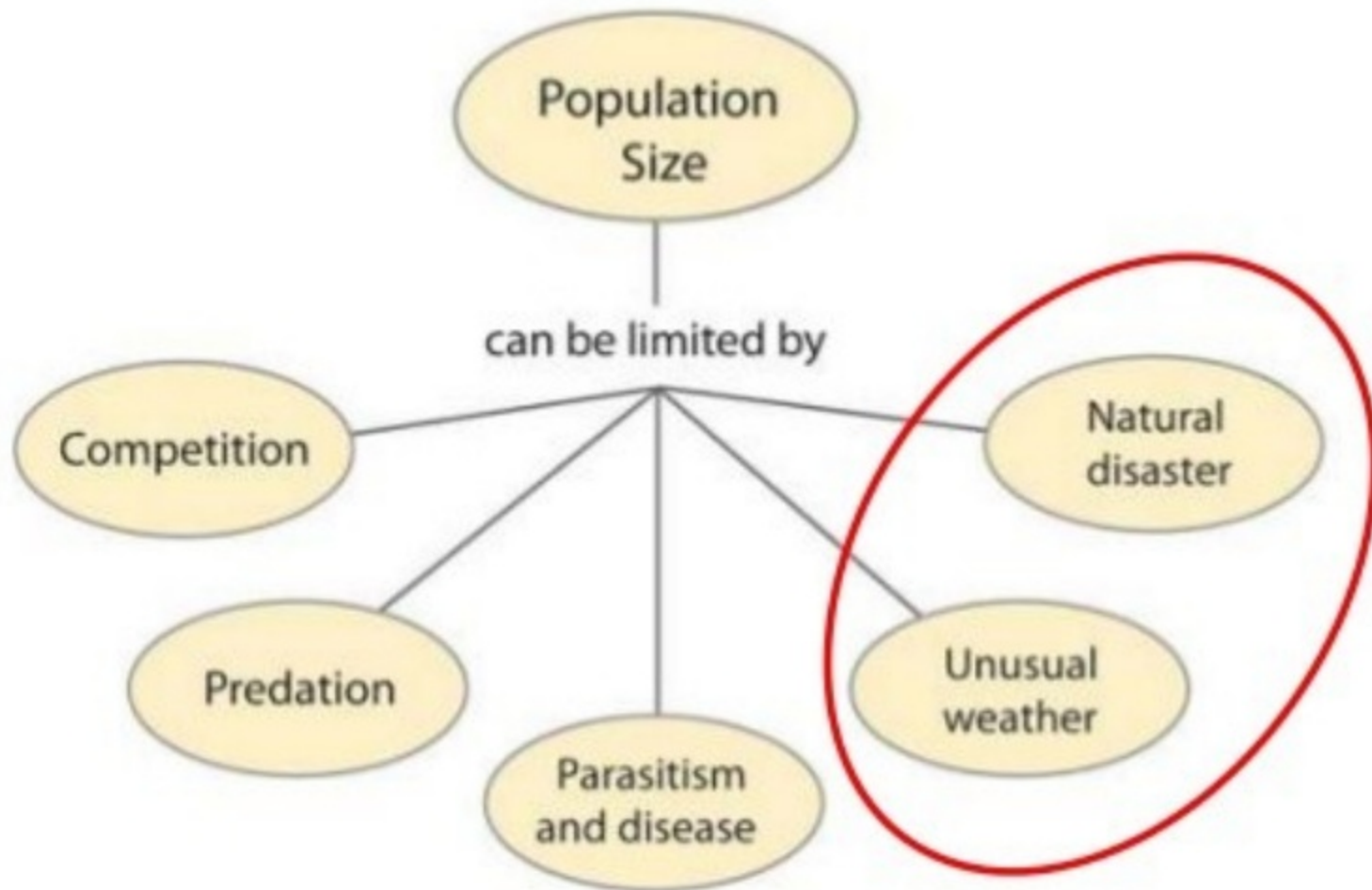
Limiting factors

- Factors that at specific levels, affect the survival and reproduction of a population. The limiting factor may be biotic or abiotic. These are considered **limiting factors**.
- The species will have a specific **range of tolerance** to changes in these factors, with an **ideal** or **optimal value** for growth and reproduction.
- Certain species will have greater **tolerance** to changes in a determined factor than others.
- **Example:** temperature, daylight hours, other species, O₂ levels, minerals.

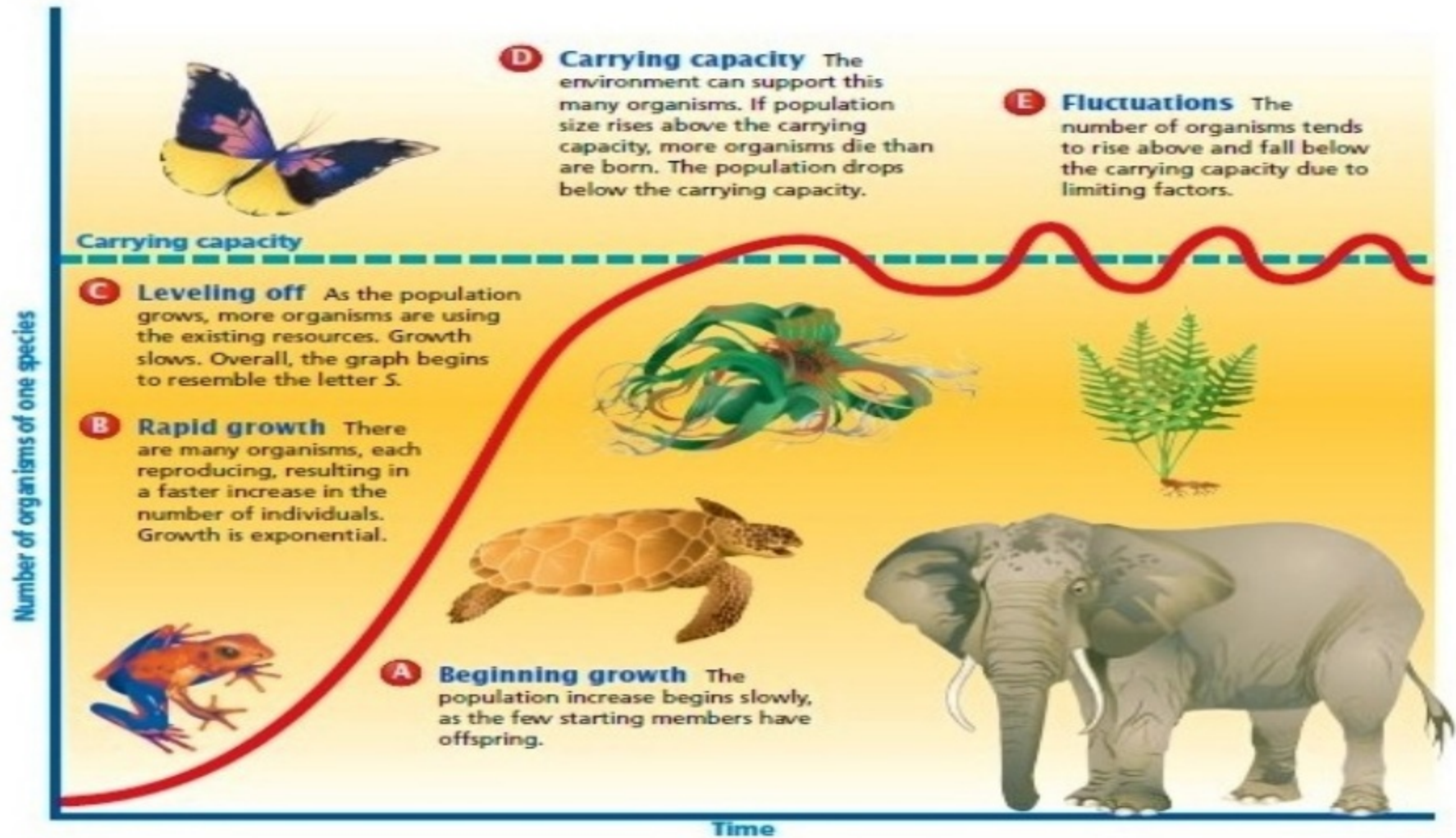


Density-Independent Factors

Density-independent limiting factors affect all populations regardless of population size and density.



Limiting Factors in Population



Impact of Population Growth

