

## Population Ecology

An understanding of how populations of wildlife/species are affected by features of the physical environment and other organisms

## Population Size

- \*The number of individuals in a population at a given time
- \*Sudden and dramatic decreases in population size can indicate an unhealthy population headed toward extinction.
- \*Ecologists often use sampling techniques to estimate population size.

## Population Density- how crowded a population is

High population density:	Low population density:
-Larger organisms generally have lower population densities.	More space, resources;
-Finding mates is easier; tends to be more competition; more infectious disease; more vulnerability to predators	finding mates can be difficult

## Limiting Factors

Environmental characteristics slow population growth and determine carrying capacity.

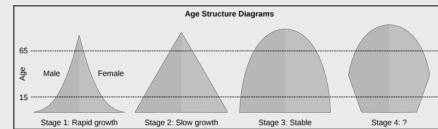
Density-dependent: Influence changes with population density. ex. parasitism and diseases.
Density-independent: Influence does not change with population density ex: unusual weather, natural disasters, certain human factors (clear cutting, damming up a river)

## Population Distribution:

Random	Clumped	Uniform
Organisms arranged in no particular pattern	Organisms evenly spaced	Organisms evenly spaced

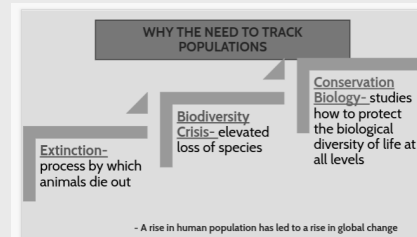
How organisms are arranged within an area

## Age Structure Diagram



- Relative number of organisms of each age group within population
- Can be used to predict future population growth of a population

## Tracking Populations



## Biotic Potential

An organism's maximum ability to produce offspring in ideal conditions

- Factors influence biotic potential:
- Gestation time
  - Generation time

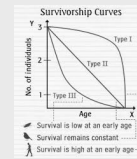
## Sex Ratio

- Proportion of males to females
- Age structure diagrams give information about sex ratios.

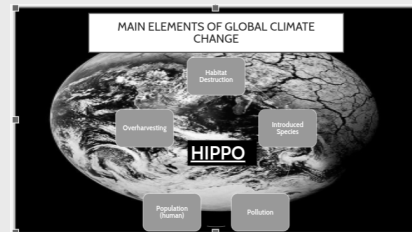
### Methods to Tracking Populations

Complete Counts	Sample Counts	Indirect Methods	Mark and Recapture
<p>Good: - counts EVERY single species in the area - ideal for larger animals - small spaces - ex. Deer drives</p>	<p>Estimate the numbers of animals in the total area by sampling a smaller unit of the total area: Ex. Nets, Quadrats, strip census</p>	<p>Counting organism indirectly (Not actually, physically seeing the organism) Look for SIGNS....</p>	<p>catch a live individual, tag it, release it, then count the number of individuals marked during new captures.</p>
<p>Bad: Not widely used Expensive Tedious (all animals must be accounted for)</p>	<p>Cons: visibility of animals can be hard, habitat could be difficult, animal behavior</p>	<p>ex.scats, trail cams, tracks</p>	<p>animals can learn to avoid traps animals can become trap happy Marks may injure animals Marking assumes no immigration or emigration (which we know happens) Make them unattractive to mates</p>

### Survivorship Curve



### HIPPO



1. Habitat Destruction
2. Introduced Species
3. Pollution
4. Population
5. Overfishing



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Page 2 of 2.

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