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 Facotors

Environmental characteristics slow population growth and determine carrying capacity.

Density-dependent:
Influence changes with population density.
ex. parasitism and diseases.

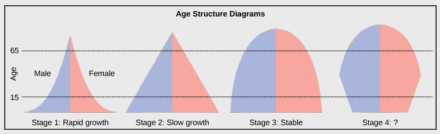
Density-independent:
Influence does not change with population density
ex: unusual weather, natural disasters, certain human factors (clear cutting, damming up a river)

Population Distribution:

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

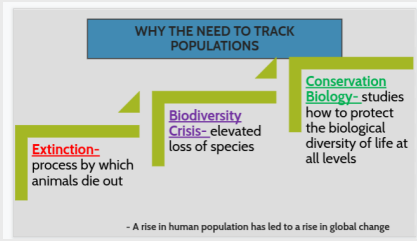
How organisms are arranged within an area

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

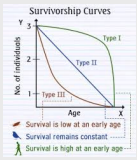
Sex Ratio

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

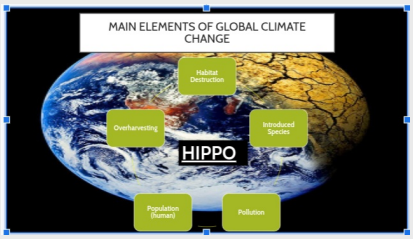
Methods to Tracking Populations

Complete Counts	Sample Counts	Indirect Methods	Mark and Recapture
Good: - counts EVERY single species in the area - ideal for larger animals - small spaces - ex. Deer drives	Estimate the numbers of animals in the total area by sampling a smaller unit of the total area: Ex. Nets, Quadrats, strip census	Counting organism indirectly (Not actually, physically seeing the organism) Look for SIGNS….	catch a live individual, tag it, release it, then count the number of individuals marked during new captures.
Bad: Not widely used Expensive Tedious (all animals must be accounted for)	Cons: visibility of animals can be hard, habitat could be difficult, animal behavior	ex.scat, trail cams, tracks	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

Survivorship Curve



HIPPO



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