

Populations Continued...

GROWTH, FACTORS AFFECTING POPULATION, HUMAN POPULATION GROWTH

Remember that...
How high and how fast a population increases depends upon...

- Age at which reproduction begins
- Number of offspring per reproduction
- How often reproduction occurs
- Reproductive timespan
- Chances of survival until age of reproduction
- Immigration and emigration

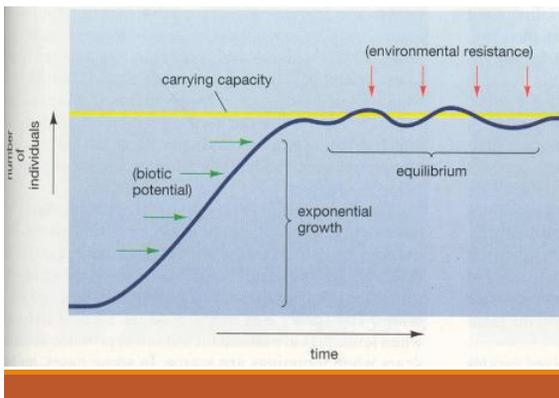
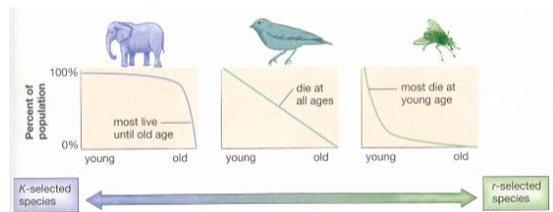


r and k strategists

- r-strategists: Give birth to many offspring which mostly die early in life
- k-strategists: Give birth to a few offspring, care for them, many reach adulthood/sexual maturity



<https://www.youtube.com/watch?v=FzRH3ITQPrk>



Density independent vs. Density dependent limiting factors...

Density independent factors

- Nothing to do with concentration of organisms
- Organisms have no control over them
- Will affect organisms in an under OR over populated area



Inclement weather



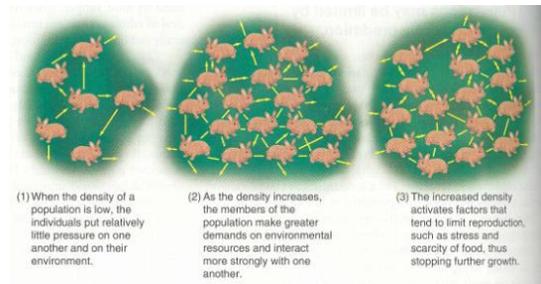
Natural disasters



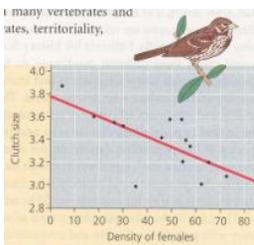
Man-made disasters

Density dependent factors

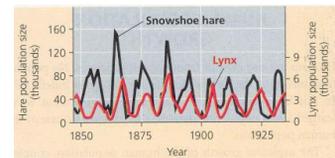
- Affect population differently depending on the abundance of a population
- Regulatory

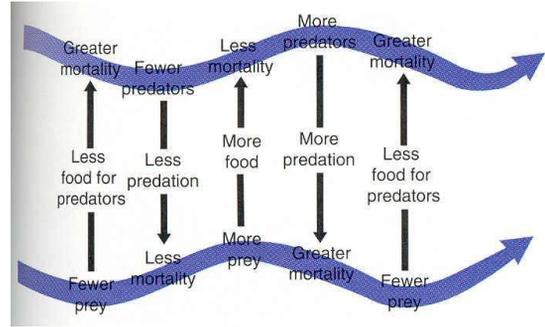
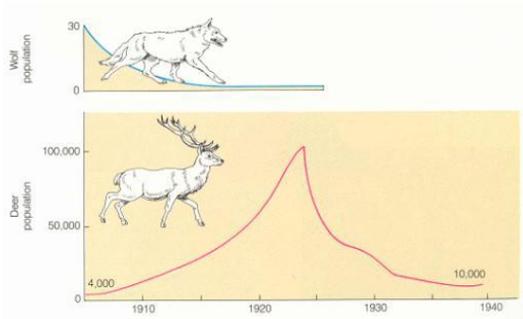


1. Space, food, water



2. Predators

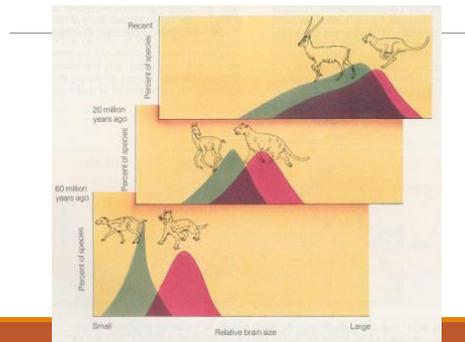




Size of prey makes big difference in how it is handled...



Coevolution of prey and predators



Predator Strategies

Speed

<https://www.youtube.com/watch?v=icFMTB0Pi0g>



Agility and Locating Skills



Venom and "weapons"



Trapping/ Attracting

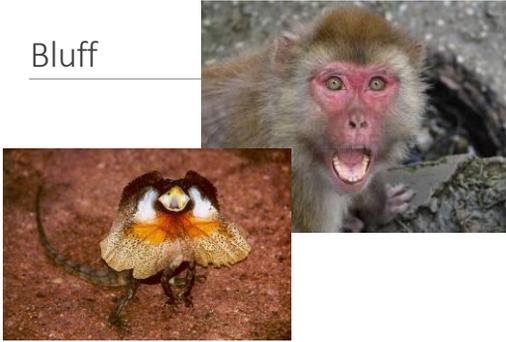


Prey Countermeasures

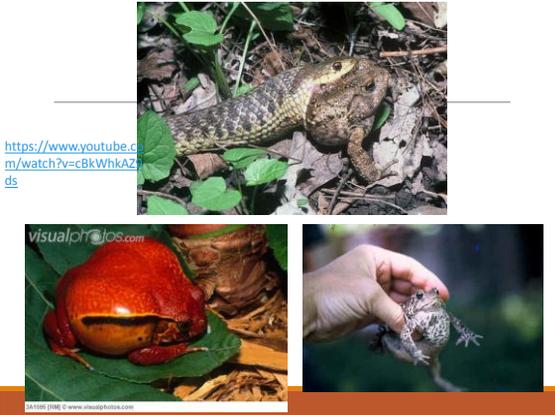
"Constant vigilance"



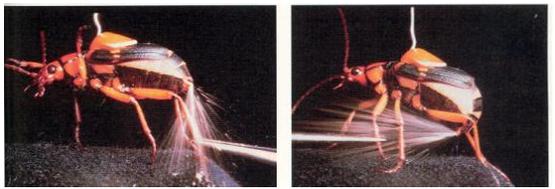
Bluff



Physical defenses



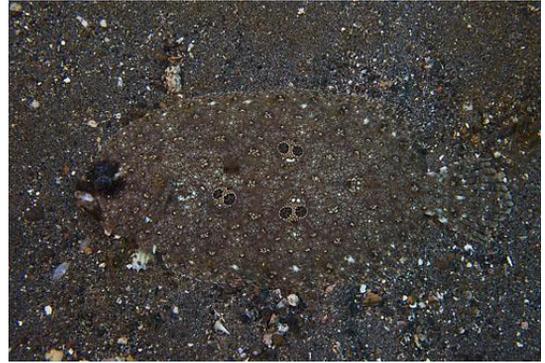
Chemical deterrents



Speed and Agility



Camouflage or cryptic coloration





Mimic octopus...

Mimic octopus...

<https://www.youtube.com/watch?v=t-LTWFnGmeg>

Aposematic (warning) coloration



Startle coloration



Batesian mimicry: one species is poisonous and the other is harmless.





(a) Hawkmoth larva



(b) Snake



Mullerian mimicry: both species are dangerous and enforce each others' threat to predators



3. Disease

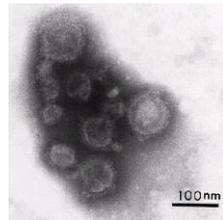


Table 9.1
Estimates of some major infectious and parasitic diseases

Disease	New Cases Each Year	Yearly Deaths
Respiratory diseases*	1 billion	7 million
Diarrhea	1 billion	3 million
Malaria	500 million	2 million
Measles	200 million	1.2 million
AIDS	2 million	1 million
Tetanus	1 million	600,000
Polio	2 million	200,000
Worms and flukes	1 billion	200,000

4. Competition

- Intraspecific competition: competition among the same species
- THE most severe



scramble



contest

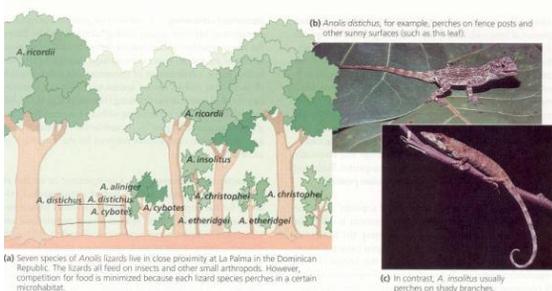
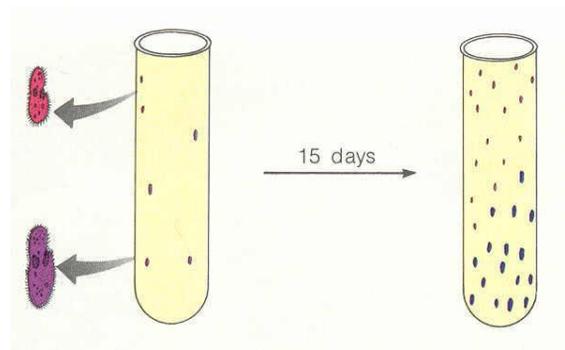
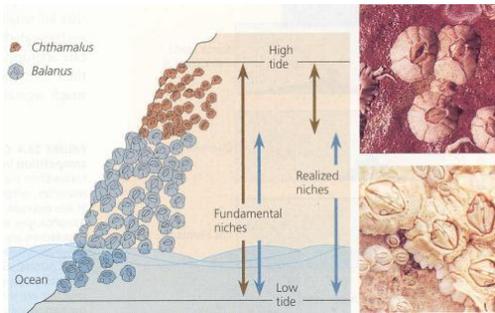
Interspecific competition: competition between species

Principle of competitive exclusion = Gause's law
 "no two species can fill the same niche"

Gause's Law

- If in direct competition with one another, populations must either...
 - win outright
 - adapt by resource partitioning or character displacement
 - migrate away
 - die out

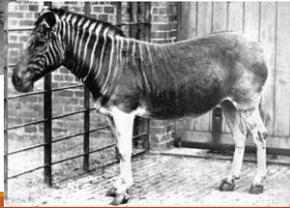
resource partitioning



Migration



“Die out” = extinction



How competition leads to evolution...

<http://www.youtube.com/watch?v=CCYVPUChnlo>

5. Invasive Species

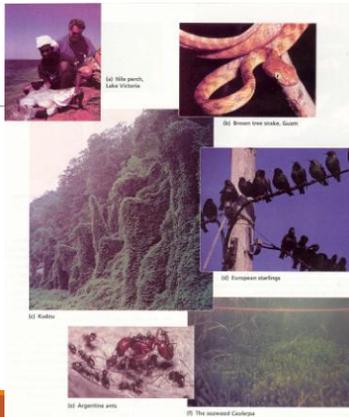
- Any species that is not native to a given area is considered “invasive” to that area
- Compete with native animals because they fill the same or very similar niches
- May not have natural predators in the environment they are invading



THIS PICTURE IS GROSS.



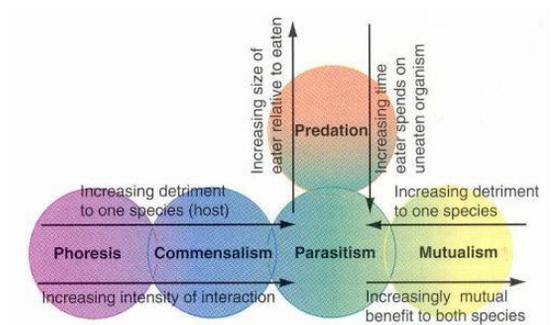
Influx of alien species adds to competition



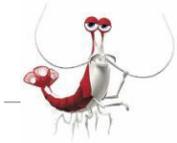
Organismal Interactions

Table 39-1 Interactions among Organisms

Type of Interaction	Effect on Organism A	Effect on Organism B
Competition between A and B	Harms	Harms
Predation by A on B	Benefits	Harms
Symbiosis		
Parasitism by A on B	Benefits	Harms
Commensalism of A with B	Benefits	No Effect
Mutualism between A and B	Benefits	Benefits



Mutualism: both organisms benefit



Commensalism: one benefits
other is neither harmed nor
helped





Parasitism: one organism benefits, the other is harmed

