Population Ecology Definitions

microclimate	climate patterns on a very fine scale (ex. under a log)
abiotic factors	*nonliving* properties of the environment
biotic factors	*living* factors in an environment
population ecology	study of populations in relation to their environment
population	group of the same species that live in the same area
community	all the populations of organisms in an area
cohort	group of the same age bracket
territoriality	animals defend a bounded physical space

3 Life History Characteristics

1. when they reproduce (age of maturity)	2. how often they reproduce	3. how many offspring are produced

k-selection	selection of life history traits that are *sensitive to population density*
	↳ density-dependent selection (high density)

Population Ecology Definitions (cont)

r-selection	selection for life history traits that *maximize reproductive success*
	↳ density-independent selection (low density)
density dependent	characteristic that varies with population density/ % affected is high (biotic)
density independent	characteristic that is NOT affected by population density (abiotic)

3 Dispersal Patterns

1. clumped	2. uniform	3. random

Survivorship Curve

survivorship curve	members of a cohort that are still alive at each age

	Death Rate Of Young	Death Rate of Old	# of Offspring	Example
Type 1	low	high	few	people
Type 2	constant	constant	several	rodents
Type 3	high	low	many	fish

Sponsored by **ApolloPad.com**
Everyone has a novel in them. Finish Yours!
https://apollopad.com

Equations

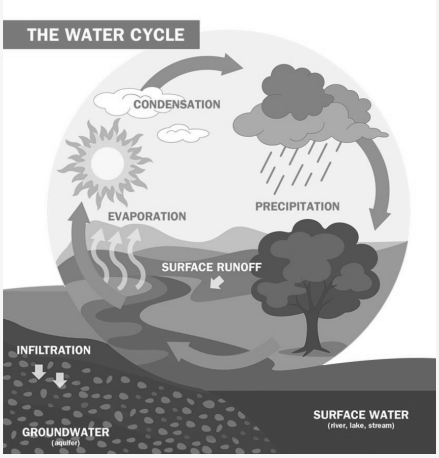
EXPONENTIAL GROWTH	
equation:	$dN/dt = r_{max}N$
symbols:	dN~ change in population size
	dt~ change in time
	r_{max}~ rate of increase (max)
	N~ population size
shape:	J
LOGISTIC GROWTH	
equation:	$dN/dt = r_{max}N\ [(K-N)/K]$
symbols:	K~ carrying capacity
shape:	S

Ecosystem Terms

primary producers	(autotrophs) support all other levels/photosynthetic
primary consumers	(herbivore) eats plants & other autotrophs
secondary consumers	a carnivore that eats herbivores
tertiary consumers	a carnivore that eats other carnivores
detritivores (decomposers)	consumer that gets its nutrients from nonliving organic material
primary productivity	amount of light energy converted to chemcial energy
gross primary productivity (GPP)	total primary production/ chemical energy
net primary productivity (NPP)	GPP- R_A (autotrophic respiration)
secondary productivity	energy converted to a consumers biomass (GSP & NSP)
production efficiency	% of energy stored (used for growth in consumers)
trophic efficiency	% of production transferred between each trophic level (10%)
net ecosystem production (NEP)	GPP - R_T (total respiration)
limiting nutrient	element that must be present for production to increase in an area
- factors that affect primary production:	temp./moisture/light/nutrients/etc.

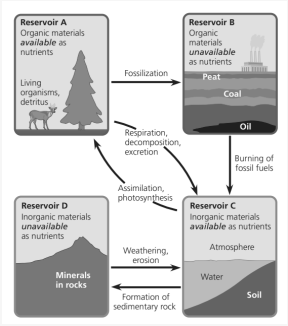
Sponsored by **ApolloPad.com**
Everyone has a novel in them. Finish Yours!
https://apollopad.com

Water Cycle

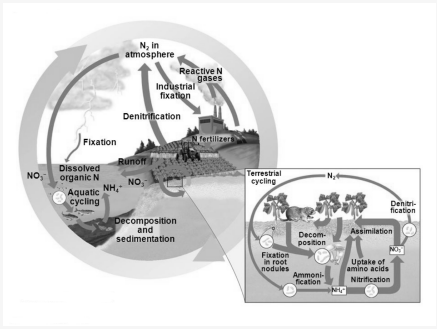


evaporation: liquid to gas
condensation: gas to a liquid
sublimation: solid to a gas

Carbon & Oxygen Cycle



Nitrogen Cycle



nitrogen fixation: N2 to NH3
ammonification: break down organic molecules into NH4+
nitrification: NH4+ to NO2- to NO3-
denitrification: changes fixed N forms back into N2

Interspecific Interactions

inters-pecific interactions	relationship between individuals of 2+ species in a community

1. COMPETITION

inters-pecific competition	competition for resources between individuals of 2+ species
comptetive exclusion	species compete for a resource but one will be more efficient & have a reproductive advantage that leads to the elimination of the other
niche	species use of biotic & abiotic resources in its enviro-nment
resource partitioning	division of environmental resources by species such that the niche of each species differs

2. PREDATION

cryptic coloration	camouflage that makes species difficult to spot against its background
aposematic coloration	bright warning coloration of animals with physical or chemical defenses
Batesian mimicry	harmless species looks like a species that is poisonous or harmful
Mullerian mimicry	reciprocal mimicry by 2 species that are unpleasant to eat

3. HERBIVORY

↳ organism eats parts of a plant or algae

- plants protect themselves by...	chemical toxins & spines/thorns

4. SYMBIOSIS

Sponsored by **ApolloPad.com**
Everyone has a novel in them. Finish Yours!
https://apollopad.com

Interspecific Interactions (cont)

parasitism	one organism benefits at the expense of the other
mutualism	both participants benefit
commen-salism	one organism benefits while the other is neither hurt nor helped

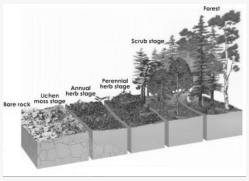
5. FACILITATION

↳ 1 species has a positive effect on the survival and reproduction of another species without intimate association

Diversity

invasive species	species that takes hold outside of its native range
keystone species	species that isn't abundant yet exerts a strong control on the community
species diversity	variety of different kinds of organism that make up the community
↳ two components~	species richness & relative abundance
↳ 2 benefits of high species diversity~	increased productivity & stability
- latitude & diversity~	equator = high diversity / poles = low diversity
- geographic area & diversity~	large area = high diversity / small area = low diversity

Ecological Succession



primary succession: occurs in areas where no organisms are present and no soil has formed
secondary succession: occurs where an existing community has been cleared but leaves soil intact
pioneer species: species that are the first to colonize (ex. lichen)

Plant Adaptations

phototropism	gorwth of a plant towards (positive) or away (negative) from light
coevolution	joint evolution of 2 interacting species, each in response to selection imposed by the other
Pollination	
wind~	pollen grains
insects~	fragrant & bright colors
bats~	open at night
birds~	bent floral tube
Germination	
desert~	after substantial rainfall (soil wet)
fire areas~	after intense heat (vegetation cleared)
harsh winter~	after extended exposure to the cold (long growth season)
small seeds~	after light (poke through the soil)
digested~	after passed through digestive tract (travel distances)
Dispersal	
water~	buoyant
wind~	winged seeds
animals~	edible fruits & burs

Advantages of Reproduction

Asexual	*Sexual*
1. no pollinator	1. dispersal of offspring
2. pass all genetics (suitable enviro-nment)	2. variation (unstable environment)
3. stronger offspring	3. growth suspended

Sponsored by **ApolloPad.com**
Everyone has a novel in them. Finish Yours!
https://apollopad.com