

Population Ecology

biotic/abiotic factors → response: acclimate, regulate, conform, migrate, torpor, etc.

fundamental niche=range of factors/resources a species could use

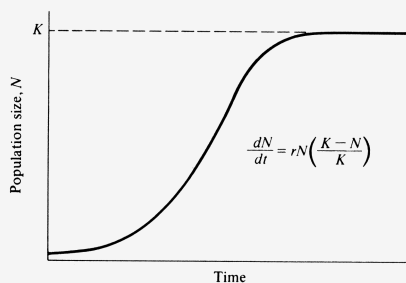
realized niche=actual use of potential environment

uniform dispersion=evenly spaced

random dispersion=unpredictable spacing

clumped dispersion=aggregate in patches

Logistic Growth



K-selection=sensitive to population density
 r-selection=maximizes r (reproductive rate)
 density independent= pop. density does not affect birth/death rate
 density dependent= ↑ pop. density → ↓ birth rate/ ↑ death rate

Species Richness and Diversity

species richness # of different species in a community

species diversity # & size of each population in a community

relative abundance proportion of different species in a community

dominant species most abundant species w/ highest biomass

keystone species has pivotal ecological role/niche

Interspecific Interactions

Competitive Exclusion Principle

2 species can't survive in the same ecological niche; fundamental≠realized

Interspecific Interactions (cont)

Predation

+/-; adaptations: cryptic/aposematic coloration, Batesian/Müllerian mimicry

Symbiosis

-parasitism: +/-, endo & ecto
 -mutualism: +/+, obligate vs facultative
 -commensalism: +/- interaction

Community Disturbance

primary succession colonization by pioneer organisms (bacteria/algae/lichens/moss) in a virtually lifeless area to form soil

secondary succession colonization of an area where the existing community was cleared but soil is intact

Learning

habituation loss of responsiveness to stimuli w/no new info

imprinting formation of permanent long-lasting response to an individual during sensitive period

spatial landmarks, cognitive maps

associative classical/operant conditioning

cognitive awareness, reasoning, judgment → problem solving

Social Behavior

cooperation behavior done as a group

agonistic aggressive behavior

dominance hierarchies dictate social position of an animal in a culture

territoriality behavior to defend an area from others

altruism ↓ individual's reproductive fitness, ↑ fitness of colony

Chemical Cycles

Water evaporation, condensation, precipitation, runoff/transpiration

Carbon photosynthesis & respiration, burning fossil fuels

Nitrogen fixation: free nitrogen → NH_4^+
 nitrification: NH_4^+ → nitrites/nitrates
 denitrification: nitrates → N_2
 decomposition: organic matter → ammonia

Animal Behavior

Proximate Cause how a behavior occurs/is modified

Ultimate Cause why behavior occurs in context of natural selection

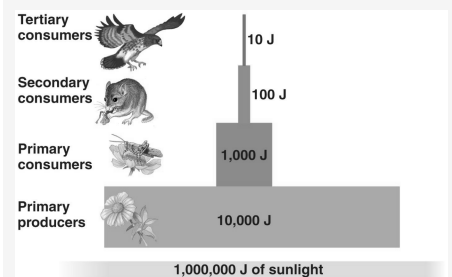
Fixed Action Pattern highly stereotypic behavior that is unchangeable and carried to completion

Sign Stimulus external cue that triggers FAP
 released within a species=r-releaser

Communication visual (waggle dance), chemical (pheromones), tactile, & auditory (birdsong)

Kinesis & Taxis change in activity in response to stimulus; oriented movement toward/away from stimulus

Ecosystem Energy Flow



bottom-up model: influence from low → high
 top-down (trophic cascade) model: influence from high → low
 biological magnification: ↑ trophic level = ↑ accumulated toxin concentration