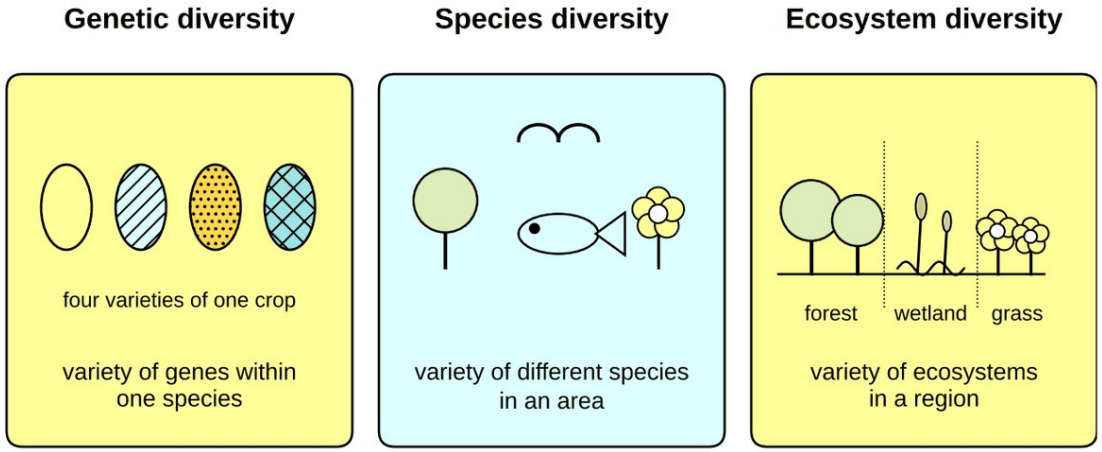
Essential Question

Why do people depend on diverse ecosystems?

Biodiversity and Ecosystem Services

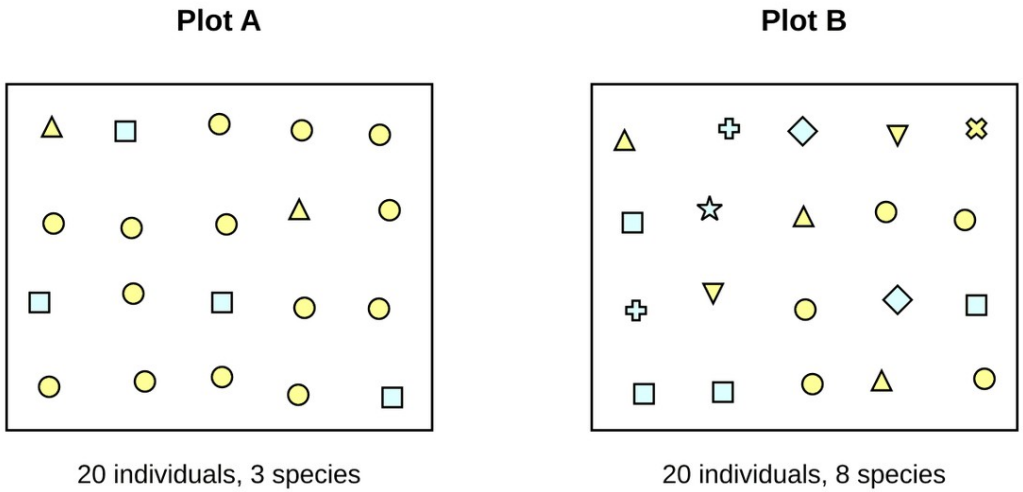
What Is Biodiversity?

- Biodiversity: the variety of life
- Genetic: variety of genes in a species
- Species: variety of species in an area
- Ecosystem: variety of ecosystems in a region



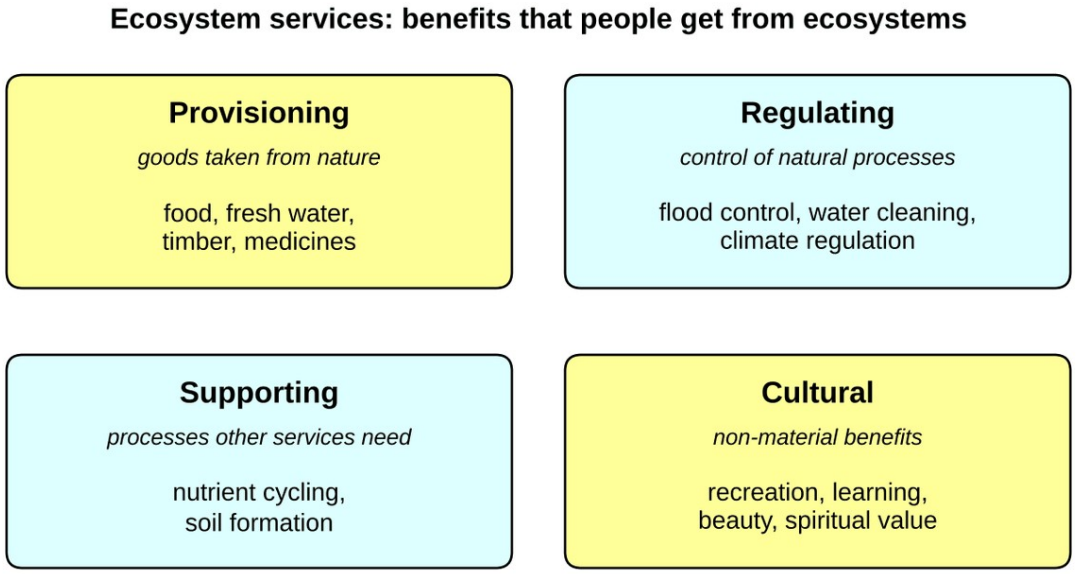
Measuring Species Richness

- Species richness: number of different species
- Count species, not individuals
- Compare areas of the same size



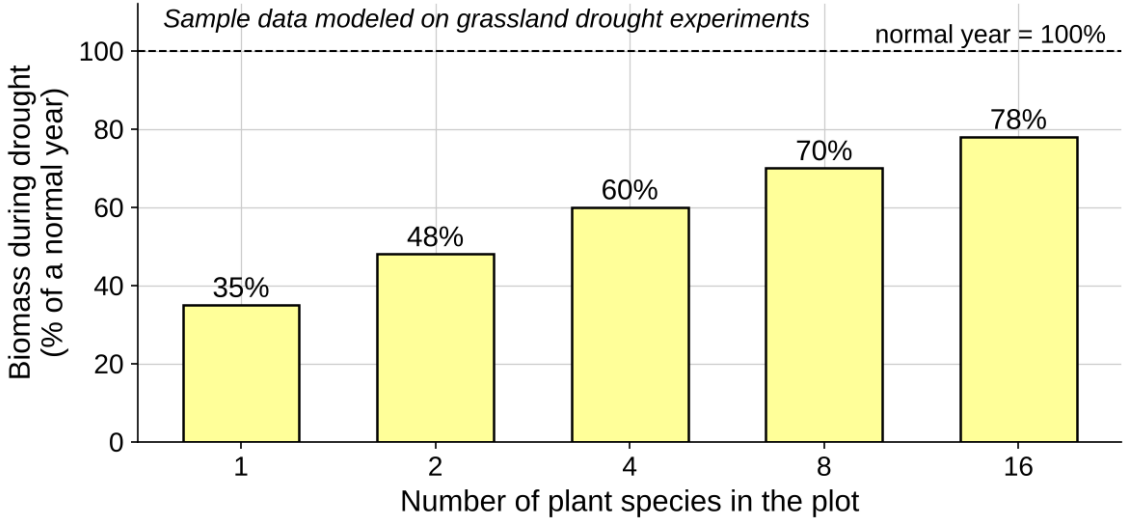
Ecosystem Services

- Benefits that people get from ecosystems
- Provisioning: food, water, timber
- Regulating: floods, water quality, climate
- Supporting: nutrient cycling, soil
- Cultural: recreation, learning, beauty



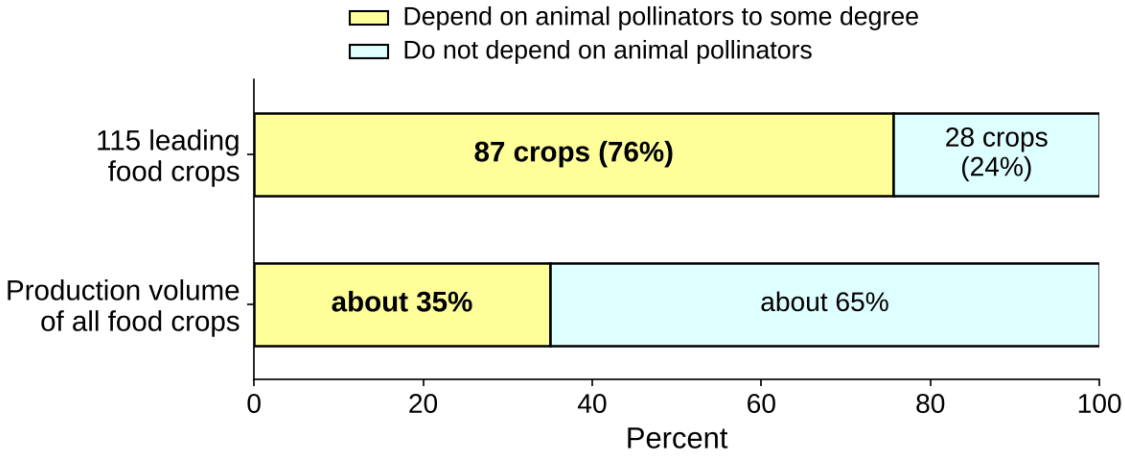
Diversity and Stability

- A drought tests a community
- Plots with more species lost less biomass
- Species tolerate different conditions
- Diverse communities tend to recover better



Services Have Real Value

- Many crops depend on animal pollinators
- Forests help filter water for cities
- Protecting nature can cost less than replacing it



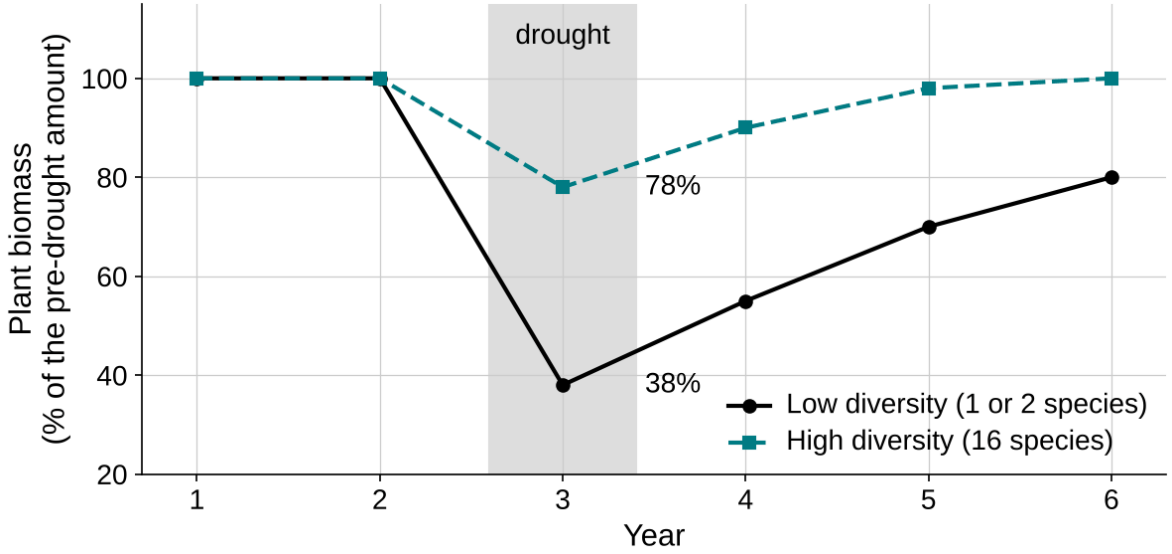
Example: Lawn or Meadow?

A student surveys two 10 m × 10 m plots. Find the species richness of each plot and the number of individuals. Which plot has more species? Which has more individuals?

Lawn species	Count	Meadow species	Count
Kentucky bluegrass	170	Little bluestem	38
White clover	22	Purple coneflower	26
Dandelion	8	Black-eyed Susan	20
		Yarrow	16
		Goldenrod	12
		Aster	8

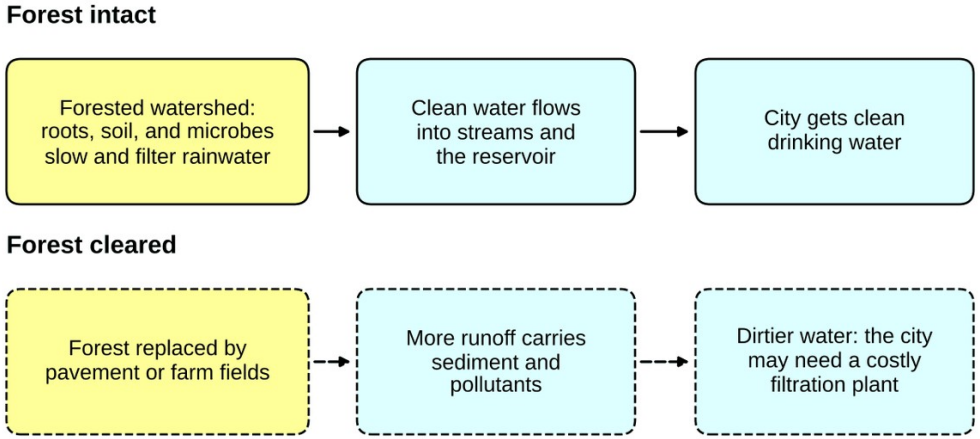
Example: Drought and Recovery

Two grassland plots, one with 1 or 2 species and one with 16 species, were measured before, during, and after a drought in year 3. Which plot lost more biomass? Which recovered more? Write a claim, evidence, and reasoning.



Example: A City's Water Supply

The model compares a city's water supply when its forested watershed is intact and when the forest is cleared. Use the model to predict what happens to the water reaching the city if the forest is cleared. What might the city have to do?



Biodiversity and Ecosystem Services

Big Ideas

- Biodiversity includes genetic, species, and ecosystem diversity
- Species richness is the number of different species
- Diverse communities tend to resist and recover from disturbance
- Ecosystem services: provisioning, regulating, supporting, cultural
- Protecting ecosystems can cost less than replacing their services