



Introduction to Ecology

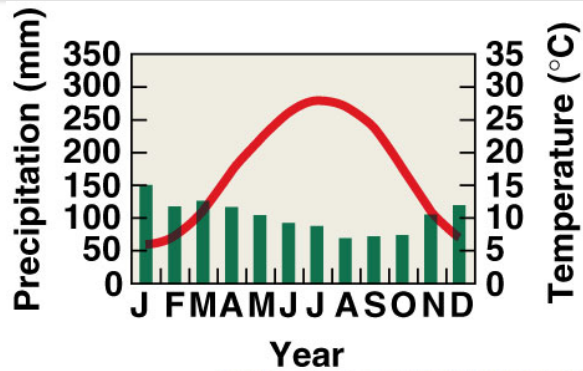
BY 101

Ecology is...

- ...the study of the interactions between organisms & their environment
- What are some of the most components of an organism's environment?







(c)



(d)



(e)



(b)



(f)



Individual

What characteristics allow the *Echinacea* to survive, grow, and reproduce in the environment of the prairie grasslands of central North America?



Population

Is the population of this species increasing, decreasing, or remaining relatively constant from year to year?



Community

How does this species interact with other species of plants and animals in the prairie community?



Ecosystem

How do yearly variations in rainfall influence the productivity of plants in this prairie grassland ecosystem?



Landscape

How do variations in topography and soils across the landscape influence patterns of species composition and diversity in the different prairie communities?



Biome

What features of geology and regional climate determine the transition from forest to prairie grassland ecosystems in North America?

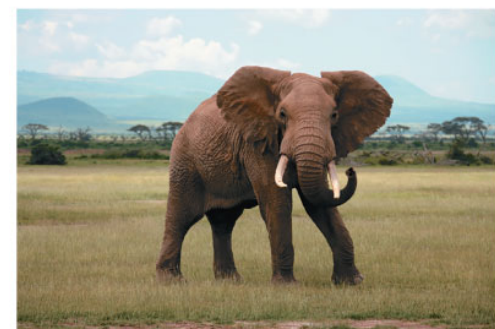
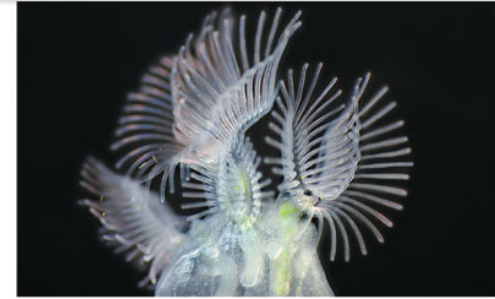


Biosphere

What is the role of the grassland biome in the global carbon cycle?

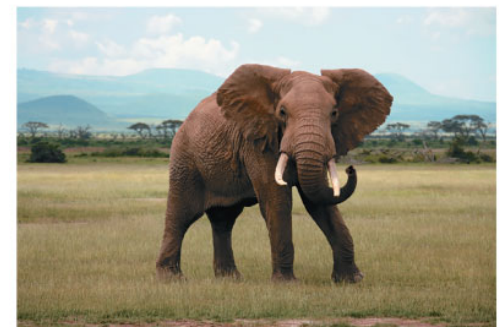
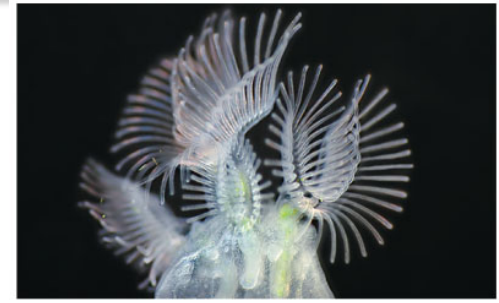
What is a species?

- Definition has changed over time
- *Biological species concept* (1937): “Species are systems of populations: the gene exchange between these systems is limited or prevented by a reproductive isolating mechanism or perhaps by a combination of several such mechanisms”



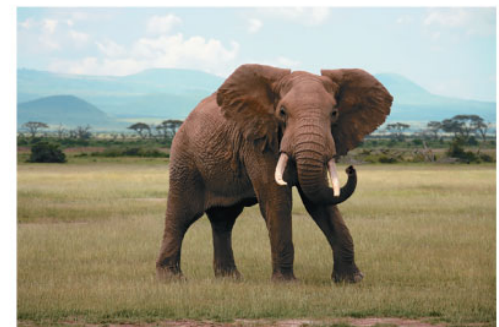
Barriers to reproduction

- Prezygotic:
 - Ecological or habitat isolation
 - Temporal isolation
 - Ethological isolation
 - Mechanical isolation
 - Gametic mortality/incompatibility



Barriers to reproduction

- Postzygotic:
 - Hybrid (F_1) inviability
 - Hybrid (F_1) sterility
 - Hybrid breakdown

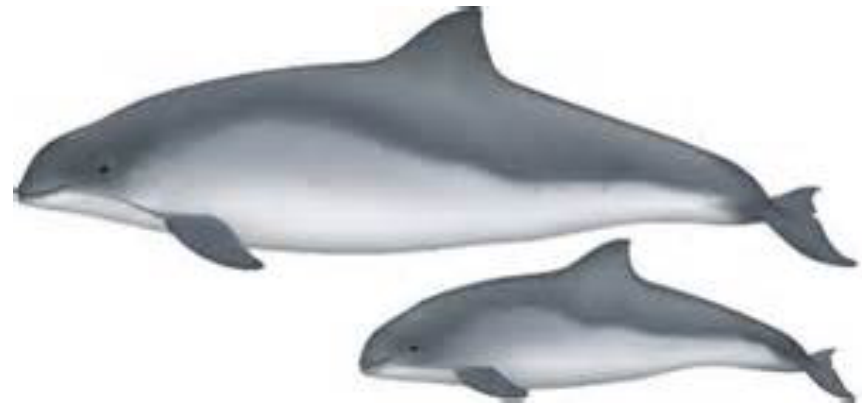


Porpoises

Dall's porpoise



Harbor porpoise



Killer whales (orcas)

Resident (fish eaters)



Transient (mammal eaters)



720

MARINE MAMMAL SCIENCE, VOL. 24, NO. 3, 2008

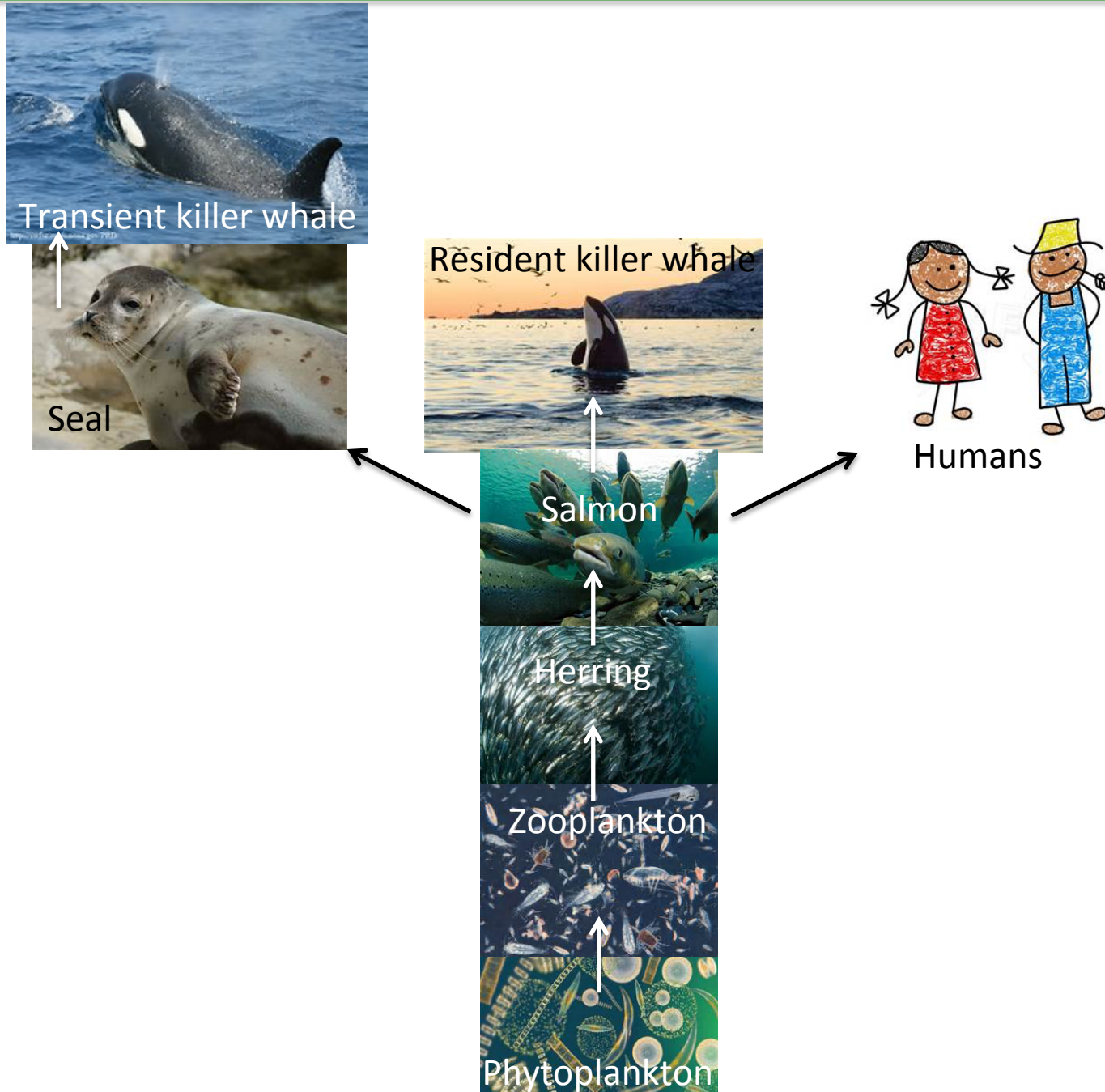
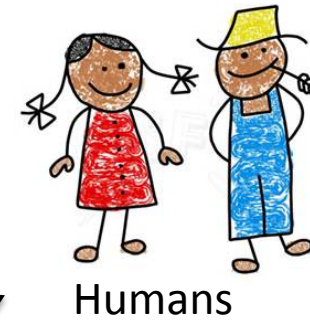
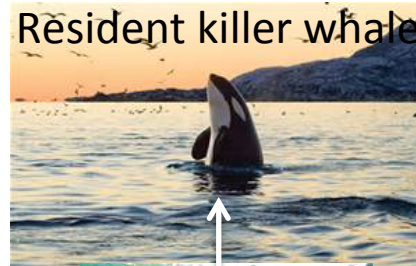


OFFSHORE WHALE

RESIDENT WHALE

TRANSIENT WHALE

Figure 1. Photographs depicting morphological differences in killer whale ecotypes.





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Biosphere

Ecology disciplines

- Molecular ecology
- Sensory ecology
- Cognitive ecology
- Social ecology
- Behavioural ecology
- Population ecology
- Chemical ecology
- Community ecology
- Ecosystem ecology
- Landscape ecology
- Conservation ecology
- Climate ecology
- Agroecology
- Applied ecology
- Ecomechanics
- Ecotoxicology
- Evolutionary ecology
- Paleoecology