Species Interactions

The particular characteristics of ecosystems and their communities arise as a result of the physical environment, the species that live there, and the complex interactions occurring between those species. Species interactions may involve only occasional or indirect contact (**predation** or **competition**) or they may involve close association or **symbiosis**. Symbiosis is a term that encompasses a variety of interactions involving close species contact. There are three types of symbiosis: **parasitism** (a form of exploitation), **mutualism**, and **commensalism**.

Species Interactions on the African Savannah

Competition is an interaction between organisms over a resource in which both organisms suffer negative effects. In zebras, competition may occur between male rivals during the mating season. There may be competition between herds of other zebras and other grazing species for space available for grazing.

Out on the Savannah

Interactions between zebras and other species		
Interaction	Zebra	Species B
Competition	–	Male rival
		–

Ectoparasites, such as ticks (left) mites, and fleas, live attached to the skin or hair of the host, where they suck body fluids, cause irritation, and may act as vectors for disease-causing microorganisms. Parasitism is an exploitative relationship in which the host is harmed but usually not killed.

Predation is a relationship in which one species kills and eats another. On the savannah the zebra's main predators are lions and hyenas. Herbivory is similar type of exploitation, except that the plant is usually not killed by the herbivore and may even benefit from regular cropping.

Species Interactions in Redwood Forests

Before obtaining their towering height, redwoods must compete for resources with other trees of both the same and different species. Light a is crucial resource for plants and competition for it is vigorous. Overtopped plants may eventually die from a lack of light.

The Redwood Forest

Interactions between redwoods and other species		
Interaction	Redwood	Species B

Commensal relationships are common between trees and the animals that live on them. Birds building nests benefit from the cover the tree branches and leaves give them. The marbled murrelet is a seabird known to nest on the old growth branches of redwoods.

Bears may strip bark from trees and eat the sugar laden sapwood beneath. Young trees may be severely damaged. Redwoods tend to be naturally resistant to invasion by many pathogens and boring insects.

Redwoods rely on **mutual** associations with fungi called mycorrhizae. These help the trees to absorb water and nutrients from the soil. In return the fungi are provided with sugars from the tree. The mycorrhizae in redwoods are known as endomycorrhizae because they exist within the cells of the redwood's root cortex.

1. Complete the tables of relationships on the proceeding page for each of the examples given, filling in the type of relationship the effect (+, –, 0) and the species involved. The first one has been done for you.

2. Summarize your knowledge of species interactions by completing the following, entering a (+), (–), or (0) for species B, and writing a brief description of each term. Codes: (+): species benefits, (–): species is harmed, (0): species is unaffected.

Interaction	Species		Description of relationship
	A	B	
(a) Mutualism	+		
(b) Commensalism	+		
(c) Parasitism	–		
(d) Predation	–		
(e) Competition	–		

3. Distinguish a **predator** from a **parasite**: _____

_____

4. Explain why **competition** for a resource has negative effects on all parties: _____

_____

_____

5. Explain how competition for light affects the population density of redwoods: _____

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_____

6. Explain why the redwood's dependence on mycorrhizae might limit the range expansion of redwoods:

_____

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7. Explain how the marbled murrelet is affected by the density of the redwoods: _____

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8. Explain how redwood density may affect the feeding preference of bears: _____

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_____

9. Oxpeckers are African birds that feed on parasites that live on the large grazing mammals of the African savannah. This is of benefit to the large grazers. However, they are now known to actively keep wounds open caused by ectoparasites and feed off the blood. How would you classify the interactions between oxpeckers and their hosts? Explain your answer:

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