

Chapter 6 Reading Guide Species Interactions and Community Ecology

Many of the terms in this chapter were taught in 9th grade biology. Make sure you review them and know them.

Phytoplankton	Community	Ecological restoration
Zooplankton	Trophic levels	Restoration ecology
Competition	Producers	Biome
Fundamental niche	Primary consumers	Climatographs
Realized niche	Secondary consumers	Temperate deciduous forest
Resource partitioning	Tertiary consumers	Temperate grassland
Predation	Detritovores	Temperate rainforest
Parasitism	Food web	Tropical rainforest
Cryptic coloration	Food chain	Tropical dry forest
Warning coloration	Keystone species	Savanna
Mimicry	Trophic cascade	Desert
Herbivores	Succession	Tundra
Mutualism	Primary succession	Boreal forest
Symbiosis	Secondary succession	Chaparral
Amensalism	Pioneer species	
Commensalism	Climax community	
Facilitation	Invasive species	

Black and White, and Spread All Over: Zebra Mussels Invade the Great Lakes –

One day you decided that you were tired of the amount of work and energy required to take care of your aquarium and you decided you would toss it out, fish, plants, and all into the Chatahoochee River. No one would care and no one would know that YOU did it, so what's the harm, right? Well, if you float the Chat these days you will see clumps of an aquatic plant called Anacharis (*Elodea canadensis*) that has become quite a nuisance on the river. You can look in the classroom aquariums and check out what this plant ("weed") looks like. Biology teachers like to keep it close by to use in labs. <http://en.wikipedia.org/wiki/Elodea>

1. What does the Clean Water Act of 1970 attempt to do?
2. How did the zebra mussel happen to end up in our Great Lakes?
3. What is the problem with their presence?
4. Where are the mussels found currently?
5. How do these mussels impact ecological systems?
6. What are phytoplankton?
7. What are zooplankton?

Species Interactions

Check out Table 6.1. The effects of Species Interactions on their Participants. KNOW IT!

Read "Inferring Zebra Mussels' Impacts on Fish Communities".

Competition can occur when resources are limited –

1. Is competition in nature an all out obvious thing? Explain.

2. What are the resources for which organisms compete?
3. What is the difference between interspecific competition and intraspecific competition?
4. Which of those is really a population-level phenomenon?
5. Which can have a greater effect on the composition of communities? Why?
6. What is competitive exclusion?
7. Species coexistence?
8. How does a fundamental niche differ from a realized niche?
9. How do species change to accommodate these types of competition?
10. What is character displacement? Examples?
11. What happens to the competition when this takes place?

Several types of interactions are exploitive –

Predators kill and consume prey –

1. How do predator/prey interactions affect community composition?
2. In terms of population size? Check out Figure 6.5 and compare the cycles of the hare and the lynx.
3. How does predation affect evolutionary success of a population?
4. So what have many prey evolved over time to help their cause?

Parasites exploit living hosts –

1. How is parasitism different in terms of the organism preyed upon's demise?
2. What is a pathogen?

3. Name some parasitic organisms.
4. What are parasitoids?
5. What is coevolution?

Herbivores exploit plants –

1. How do plants defend themselves against herbivores? Give examples.

Mutualists help one another –

2. How is it believed many mutualistic relationships occurred?
3. Give an example of a plant mutualism.
4. A coral?
5. Human?
6. How is pollination mutualistic?

Some interactions have no effect on some participants –

1. How do amensalism and commensalism differ from one another?
2. Give an example of each.
3. What is facilitation?

Ecological Communities

Energy passes among trophic levels -

Make sure you understand how all this works!!!

1. What is the importance of producers?

2. Consumers?
3. Detritivores?
4. Decomposers?
5. Draw the flow chart in Figure 6.10. **You do not need to draw the organisms, just make the flow chart.**

Energy, biomass, and numbers decrease at higher trophic levels –

1. Think back to the earlier study on energy. What happens to the energy as it travels up the different trophic levels?
2. What is the general rule of thumb about energy from one level to the next?
3. How does where you eat on the levels determine your ecological impact?
4. Who has a greater impact- a vegetarian or a carnivore? Why?

Food webs show feeding relationship and energy flow –

Familiarize yourself with Figure 6.12 and make sure you can make the connections to the different organisms. You will see this on the test!

Some organisms play bigger roles in communities than others –

1. What is a keystone species?
2. Give several examples of some keystone species and their effect on the ecosystem.
3. Give an example of an ecosystem engineer. Why is it called that?

Read “*Otters, Urchins, Kelp, and a Whale of a Chain Reaction*” on pages 156 – 157. This shows a great example of the relationship between sea kelp, sea urchins, otters, and whales. When there is an imbalance in the food chain due to man’s impact it has an affect on the dynamics of keystone species.

Communities respond to disturbance in different ways -

When Mount St. Helen’s erupted in Washington state back in the 80’s, ecologists believed it would take years for the ecosystem to revive itself. Much to their surprise it did not! Both plants and animals began to appear and reestablish themselves. <http://whyfiles.org/031volcano/6.html>

So what is the order to this reestablishment? Many plants require disasters such as fires in order to reseed and germinate. Can you imagine! We will talk about the importance of fires later in the year.

1. What is succession?
2. What would you expect to see in primary succession?
3. Secondary succession?
4. Who are the pioneer species?
5. What is a climax community?

Make sure you check out Figure 6.15 to get a great visual of what the succession looks like. This concept will be revisited when we discuss the impact agriculture and grazing has on ecosystems.

How cohesive are communities?

1. What are Clements's thoughts on community cohesiveness?
2. What are Gleason's thoughts on community cohesiveness?

Invasive species pose new threats to community stability –

1. How have most exotic species invaded new areas?
2. What happened in each of the following examples?
3. Chestnut blight –
4. Dutch elm disease –
5. Zebra and quagga mussels –

Check out figure 6.16 to see how zebra mussels have impacted the Great Lakes.

6. What is the National Invasive Species Act of 1996?

Can you think of some others? Fire ants? Kudzu?

Go to Chapter 11, pages 306 – 307 to see a table listing invasive species.

7. What happened with Cane Toads in Australia?

We can try to restore and altered community to its former condition –

8. How do ecologists worked to restore the ecology of the Florida Everglades?
9. Why is the Everglades of significant importance to Floridians?
10. Go across the globe to Iraq. What happened to the Tigris and Euphrates rivers area?
11. What are some of the problems encountered with restoration projects?

Earth's Biomes

Biomes are groupings of communities that cover large geographic areas –

What are climatographs?

What determines a biome?

Aquatic systems also show biome-like patterns –

What factors shapes aquatic biomes?

We can divide the world into roughly ten terrestrial biomes –

Temperate grassland –

Occur where –

Also known as –

Rainfall –

Animal life –

Plant life –

Temperate rainforest –

Occur where –

Also known as –

Rainfall –

Animal life –

Plant life –

Tropical rainforest –

Occur where –

Also known as –

Rainfall –

Animal life –

Plant life –

Tropical Dry Forest –

Occur where –

Also known as –

Rainfall –

Animal life –

Plant life –

Savanna –

Occur where –

Also known as –

Rainfall –

Animal life –

Plant life –

Desert –

Occur where –

Also known as –

Rainfall –

Animal life –

Plant life –

Tundra –

Occur where –

Also known as –

Rainfall –

Animal life –

Plant life –

Boreal forest -

Occur where –

Also known as –

Rainfall –

Animal life –

Plant life –

Chaparral –

Occur where –

Also known as –

Rainfall –

Animal life –

Plant life –

Altitude creates patterns analogous to latitude –

1. How does altitude affect vegetative communities?