
Course Learning Outcomes for Unit V

7. Evaluate relationships between living organisms and nonliving factors in ecosystems.
 - 7.1 Analyze the effects of human habits on ecosystems and organisms.
 - 7.2 Describe the characteristics of the different biomes.
 - 7.3 Identify relationships between living organisms.

Reading Assignment

Chapter 14: Is the Human Population Too Large? Population Ecology

Chapter 15: Conserving Biodiversity: Community and Ecosystem Ecology

Chapter 16: Where Do You Live? Climate and Biomes

Unit Lesson

This is a very important unit. Many humans believe that we are the “rulers of the world” and that we can take and use what we need. In Chapter 2, we learned that there are certain requirements for life. Refer back to page 32 in your course textbook if you need to refresh your memory about what living organisms need to survive. In order to meet these requirements, humans rely on other organisms. We know we have to have the obvious: oxygen, food, and water. We cannot synthesize the things that we need on our own, and we cannot make them for our use. We are not in this world alone, and we could not survive on our own; therefore, we must be willing to help take care of the world around us. In this unit, we will gain an understanding of the effects of a growing population of humans on a global, national, and local scale. We will also learn about conservation and about various types of environments and how they all interact. Are humans destroying the planet? Are we forcing other organisms into extinction? Is there anything that we can do or is it simply too late?

Our textbook states that our global population is nearing seven billion people. It is projected that our population will rise to 12 billion by the year 2050. Can we support that many people? It would seem that more people would be able to work more jobs, grow more food, and so on. Is more, better? Do we have enough land to grow more food? Do we have enough jobs for the people that are already here? It would seem that the world would be large enough to support our population; however, we need to examine what a population is. A population consists of a group of an individual species. When we are examining population size, we also have to consider the population size of all other living organisms on Earth. It is not just us—other organisms need space and resources as well. Are there limits to all populations? In nature, population sizes are limited depending on the competition for resources. There are only a certain amount of resources, and those that are fittest obtain the resources and survive.

Why does this competition not limit human population on a larger scale? Do only the fittest survive in a population of humans? Do we leave our less fit and less healthy to fend for themselves or leave them to die? In areas that do not have enough resources, do we leave those populations of people to struggle and die out?

In order for humans to survive, we already know that we rely on other organisms. We need food, we need shelter, we need water, and we need oxygen. Since we rely so heavily on other organisms, we have to learn how to conserve our resources. If we do not, we could become like other species. Would we stop caring for our less fit and less healthy? Would we become less human if our will to live and competition for resources became a fight for existence?

Extinction is a natural process; however, it is believed that humans are the greatest threat to biodiversity. Yes, natural disasters, such as hurricanes, floods, volcanoes, etc., sometimes force organisms to go extinct;

however, habitat destruction is one of the major current forces driving extinction. Why are we destroying habitats? With a growing population, we need more space. When we clear cut a forest or dam a river, we destroy the habitats of numerous organisms. When an organism's habitat changes or is destroyed quickly, they may not have time to adapt, forcing extinction.

We also destroy habits by introducing invasive species into an area. How many times have you traveled somewhere and saw a plant that you thought was beautiful? This does happen a lot. People travel and bring back plants from other areas. They plant the plants in their yard, seeds are dispersed to other areas by birds, wind, water, and insects, and soon the plant is growing in the wild. Big deal, right? Well, it can be if the new plant outcompetes native plants. Take the example provided in the textbook: kudzu. You have probably seen this growing on the side of interstates and in areas that are not inhabited by humans. This vine is not native to the United States. It was brought over to help control erosion and it is out of control. It outcompetes other native plants, and we cannot figure out how to get rid of it.

Competition is natural; however, when new species are introduced to an area by humans, this is not natural. Ecosystems contain predators, consumers, decomposers, and producers. One provides a food source for the other—this is the web of life. Organisms within an environment have a special ecological niche. They have a certain role or job to perform. Think about it like a manufacturing warehouse with an assembly line. The first person has a very small job of placing one tiny screw in each product that passes. That does not seem very important; however, if that person does not insert the screw, the next person cannot do his job, and the next cannot do his job. It is a vicious cycle. The same thing happens in nature. What if a very small organism that seems unimportant goes extinct? Other organisms may not be able to “do their job” or may not have a food source. The extinction of one organism could result in the extinction of numerous others. This is known as an extinction vortex.

Some organisms have so few numbers that genetic diversity among those living is very small. Can we save all organisms that are nearing extinction? What does it mean if an organism is “of concern” or “endangered”? You will actually conduct an exploration activity in which you will learn about the organisms that are in danger in your state or local area. You will learn about their importance, their habitat, how many currently exist, and what (if anything) is being done to protect their numbers.

In this unit, you will also learn that humans and other organisms live in a variety of biomes. The temperature in an area and the amount of precipitation is a limiting factor for life. Even still, some organisms live in very cold climates, very hot climates, wet climates, and dry climates. You will be able to determine the type of biome in which you live or have lived. In areas such as the tundra, many animals migrate or hibernate during the extreme cold seasons. In areas such as tropical rain forests, temperatures are moderate and precipitation is high, resulting in the greatest diversity of species on Earth.

We hear a lot about saving the rain forests these days. What if you do not live near a rain forest? Does it matter to you if we save them or not? Does only what happens in your local environment matter? If we take all of the different biomes, we end up with a biosphere. If we break that word down, *bio* means life, and *sphere* means circle. So, it really is one big circle of life.

Suggested Reading

Please see the chapter presentation links in Blackboard to download and view Chapter 14, 15, and 16 presentations. This will summarize and reinforce the information from these chapters in your textbook.

Learning Activities (Nongraded)

Biomes

Estimated time to complete: This activity will take approximately 10–15 minutes.

Introduction: The textbook authors talk about a wide variety of biomes, describing typical vegetation and climate patterns. The Missouri Botanical Garden maintains a website devoted to biomes.

Material: You will need a computer with Internet access

Procedures:

1. Go to: <http://mbgnet.mobot.org>
2. After reading about each biome in Chapter 16, click on the icon for that biome on the website.
3. For each biome, the website provides pictures and a list of topics on the left that can be explored. Try clicking on the different animals and plants to see how organisms have adapted to each biome.

Nongraded Learning Activities are provided to aid students in their course of study. You do not have to submit them. If you have questions, contact your instructor for further guidance and information.