

# Changes in Biodiversity

by ReadWorks



Hundreds of years ago, before North America was split up according to states and countries, native populations lived in the many varied areas of the continent. There were jungles, forests, riverlands, dry prairies, wetlands, and many other types of geographies where people lived. There were no cities as we know them today: humans lived in tune with nature, relying on their surroundings to build shelters, hunt and gather food, and create forms of exchange (for example, shells found on beaches could be traded for animal skins).

Each Native American tribe was attuned to the specific land on which they lived, and had certain customs that utilized their land to the utmost. Native Americans living in what is now known as the Midwest relied on hunting large animals like bison for their meat and their skins. Their meat provided an important source of nourishment for many tribes, and their skins were a valuable material that was used in the production of clothes and teepees, a type of shelter. Other tribes who lived on the eastern coast of North America made extensive use of the forests there, trapping small animals and game (like deer) that lived among the trees, and farming hearty foods that could handle the changes in weather, like corn. Still other tribes, who lived in the deserts of what is now Arizona, built homes in the rocky cliffs and hills for protection.

The variety of plant and animal life in these specific environments is called biodiversity. The tribes who lived in what is now known as Seattle fished salmon, while the tribes who lived in what is now known as Maine caught crabs and lobsters. As you can see, even though each group relied on seafood, the type of fish they ate was dependent on the type of fish that was available to them. At the

time we are thinking about, if you lived in Seattle, there were no restaurants you could go to and order lobster!

Now think for a moment about what this means. Let's say one year, a pod of whales was unable to go to their usual feeding area in Alaska because a school of sharks was inhabiting those waters during the whales' feeding time. So, looking for other sources of food, the whales swam down towards Seattle and noticed a large population of salmon. They ate all the salmon and, full and content, swam away to their next destination. The next week, the human tribes living in Seattle go to where the salmon usually are in order to get the first big catch of the season, and they find that no salmon are there. Instead of catching salmon, a staple of their diet, the humans must find another food source: their habitat has changed, and now the humans, like the whales before them, must adapt to their new situation.

This brings us to the very important idea of the ecosystem. An ecosystem is a very complex and delicate arrangement of plants and animals that provide nourishment for each other in a variety of ways. If one part of the ecosystem changes or is disrupted, it can affect the entire workings of an environment.

Humans have made changes to their ecosystems to serve a specific need. And in certain cases, the goal is to disrupt the population of another species within the ecosystem. However, there can be unintended consequences. One example is the use of pesticides. When American farmers began using pesticides (chemical insect-repellants) to get rid of bugs that decimated entire harvests of crops, they had no idea what the consequences would be-or whether there would be any consequences. As scientists began to study how people used certain types of chemicals for certain types of crops, they learned that there are some pesticides that are not just harmful for insects-they are harmful for humans too, and were making many people sick after they had eaten the crops that had been sprayed with those pesticides. With this knowledge, scientists were able to develop other pesticides that were less harmful for humans but were still useful in getting rid of the bugs that liked to eat humans' important crops. As you can see, the changes that humans made in the ecosystem-the biodiversity that the humans cut down on by making sure the insects left the plants alone-needed to be studied carefully so that the changes made were sure to be beneficial.

# biodiversity

bi · o · di · ver

## Advanced Definition

noun

1. the diversity of life forms on earth or part of the earth, including diversity of species, genes, and ecosystems, esp. when regarded as providing the optimal conditions for evolution.

## Spanish cognate

*biodiversidad*: The Spanish word *biodiversidad* means biodiversity.

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## These are some examples of how the word or forms of the word are used:

1. Similarly, if you visit an aquarium, you can look through thick panes of glass to shark tanks, complete with large swimming turtles, rays and other fish that live peacefully among sharks. These are attempts to reproduce the conditions in which the animals we see on display evolved-in so doing, they highlight **biodiversity**.
2. The world's population has doubled in the last 50 years, and all of these people drink water and eat food grown from crops every day. Humanity's increasing water consumption represents a growing threat to **biodiversity**.
3. The Amazon rainforest in South America is an amazing place. Filled with beautiful tropical flowers, towering trees, colorful parrots, and poisonous fish, it has some of the greatest levels of **biodiversity** of any region in the world.
4. This particular study highlights the importance of bees to the continuation of, not just our food supply, but also all **biodiversity**, as the effects of this study do not end with the larkspur plant alone, but point to a much larger issue.
5. Food chains can get much longer and more complicated, though, resembling webs more than linear chains. The word commonly used to describe the relative number of different species in an ecosystem is "**biodiversity**," and the more biodiversity within the ecosystem, the more complex the food web.
6. Where are the most biologically diverse places on the planet? If I asked you this question, you might guess the Amazon rainforest in Brazil or the jungles of India. But, in fact, one of the richest sources of **biodiversity** is actually underwater. Off the northeastern coast of Australia live thousands of species of fish, birds and reptiles.

# ecosystem

ec · o · sys · tem

## Advanced Definition

### noun

1. a community of living things, together with their environment.

*A pond is an interesting ecosystem to study.*

## Spanish cognate

*ecosistema*: The Spanish word *ecosistema* means ecosystem.

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## These are some examples of how the word or forms of the word are used:

1. Biodiversity is a general term that describes diversity among plant and animal species in a given environment or **ecosystem**.
2. The Everglades, a famous region in Southern Florida, are a wetland **ecosystem** home to tropical and marshland plant and animal species.
3. An **ecosystem** is a group of living organisms going through their life cycles in a particular environment alongside nonliving things. Ecosystems exist because of the interactions between these living and nonliving things.
4. Historically, cities were built next to bodies of water for a host of reasons. A river or stream could be a food-rich **ecosystem** for nearby populations and could also provide fresh water for drinking and provide power for mills.
5. Even though there clearly are numerous advantages to the activation of The Hoover Dam and the work done at the site, there are a few environmental impacts that are harsh. Local **ecosystems** have declined as a result of water being used up by the Dam and its emptying into the Lake Mead reservoir.
6. Charles Darwin, the famous biologist who first proposed the scientific theory of evolution, described the coral reef as an oasis in the desert of the ocean. Though tropical waters typically provide very little nutrients, the coral reefs that exist in tropical waters are among the richest and most diverse **ecosystems** on earth.
7. The loss of ocean life will cause more than just a shortage of seafood. Overfishing can damage the entire ocean **ecosystem**. An ecosystem is a community of organisms functioning as a unit with its environment. The disappearance of one species can throw the entire system out of balance and cause disaster up and down the food chain.
8. Since it contains so many trees, which absorb carbon dioxide the way we breathe oxygen, the rainforest acts like the lungs of our planet. And since carbon is a "greenhouse gas" that heats up our atmosphere, the Amazon helps to keep our planet cool by storing carbon in its plants. So, even though the Amazon is far away from many places in the world, it still plays an important role in our world **ecosystem**.
9. There's a lot to consider when talking about the health of an **ecosystem** and to better understand how scientists measure that, it's helpful to know what some of the buzzwords are. For starters, an ecosystem is defined as a community, characterized by the types of things (plants and animals) that live there; the type of environment around them; and the ways in which they all interact. There are ocean ecosystems, mountain ecosystems, rainforest ecosystems, desert ecosystems and even city ecosystems.

Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. What does biodiversity refer to?

- A. chemical replants that are used to get rid of bugs
- B. the scientific study of an ecosystem
- C. the variety of plant and animal life in an environment
- D. the large population of salmon that live near Seattle

2. What does the author explain in the passage?

- A. the author explains the terms "biodiversity" and "ecosystem," giving examples of each
- B. the author explains the terms "tribe" and "Native American" without giving any examples
- C. the author explains the terms "pod," "school," and "wetlands," giving two examples of each
- D. the author explains the terms "nourishment" and "chemical" without giving any examples

3. Changing one part of an ecosystem can affect other parts of the environment where the change is made.

What evidence from the passage supports this statement?

- A. Native Americans who lived in what is now known as the Midwest hunted large animals like bison.
- B. Tribes who lived in the deserts of what is now Arizona built homes in the rocky cliffs and hills.
- C. When American farmers began using pesticide to harm bugs, they harmed humans as well.
- D. Tribes on the West Coast of North America fished salmon, while tribes on the East Coast caught crabs and lobsters.

4. Based on the information in the passage, what can the reader conclude about biodiversity?

- A. There was very little biodiversity in North America before it was split up into states and countries.
- B. There was a lot of biodiversity in North America before it was split up into states and countries.
- C. Biodiversity cannot be affected by human activity.
- D. Biodiversity cannot be affected by changes to the ecosystem.

5. What is this passage mainly about?

- A. different Native American tribes and the ways in which they obtained food
- B. natural environments and the way changes can affect those environments
- C. pesticides used by farmers and the harmful effects of those pesticides on humans
- D. a pod of whales that cannot go to its usual feeding area in Alaska because of sharks

6. Read the following sentences: "An ecosystem is a very complex and delicate arrangement of plants and animals that provide nourishment for each other in a variety of ways. If one part of the ecosystem changes or is disrupted, it can affect the entire workings of an **environment**."

What does the word **environment** mean?

- A. a species of plant or animal
- B. a group of Native Americans living in the same place
- C. the damage that humans can do to their surroundings
- D. an area where things live

7. Choose the answer that best completes the sentence below.

Native Americans living in what is now known as the Midwest hunted large animals; \_\_\_\_\_, Native Americans living on the eastern coast caught small animals.

- A. on the other hand
- B. as a result
- C. as an illustration
- D. most importantly

8. What happened when American farmers started using pesticides to get rid of bugs?

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9. According to the passage, how could a pod of whales being unable to go to their usual feeding area affect humans? Be sure to describe the full chain of events in your answer.

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**10.** Suppose that people living by a lake decided to put a chemical in the water to get rid of a certain type of fish in the lake. Would that action be likely to affect other living things in that environment? Use evidence from the passage to explain why or why not.

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8. What happened when American farmers started using pesticides to get rid of bugs?

Many people got sick from eating crops sprayed with those pesticides.

9. According to the passage, how could a pod of whales being unable to go to their usual feeding area affect humans? Be sure to describe the full chain of events in your answer.

Students should describe the sequence of events described in the paragraph beginning "Now think for a moment..." A pod of whales being unable to go to their usual feeding area results in them going to a new feeding area. They eat all the salmon in that area. The humans living in that area, who usually eat the salmon, must then find a new food source.

**10.** Suppose that people living by a lake decided to put a chemical in the water to get rid of a certain type of fish in the lake. Would that action be likely to affect other living things in that environment? Use evidence from the passage to explain why or why not.

Based on information in the passage, students should respond that the chemical would be likely to affect other living things in that environment. They may cite the example of the chemicals farmers used to get rid of insects that ended up making humans sick. They may point out that the interconnectedness of an ecosystem means that a change to one part of it affects other parts, citing the example of the whale pod that changes its feeding area. They may make other arguments as well, provided that they support their claims with evidence from the passage.