

# How Water Loss Affects Biodiversity

## By ReadWorks



In order for humans to live, they need access to fresh water. While nearly 70% of the earth's surface is water, most of it is salt water, which humans cannot drink. Only a small percentage, about 3%, is fresh water. Of this, about 69% is currently frozen as ice caps and glaciers, while another 30% is held underground in the soil or in rock. This means that only one percent of the world's fresh water—or .03% of the world's total water—is surface water that humans can access to drink. The small amount of potable (suitable for drinking) water makes its conservation incredibly important, so that water shortages already occurring in some regions do not spread any further. If they do, this may lead to conflicts over the right to use this water.

There are many ways in which humans can affect access to fresh water. For example, humans can pollute bodies of water, thereby making them undrinkable. In some cases, they may make physical changes to the land by building over wetlands or damming up rivers. While wealthy countries can afford to make the investments necessary to make sure their residents have access to fresh water, poorer countries often cannot. This means that poorer countries are at greater risk of devastating droughts, which can lead both to dehydration and starvation, as the country is unable to water its crops.

Droughts can also have a negative impact on the *biodiversity* of a region. Biodiversity refers to an abundance of different types of plant and animal species within a particular region. The prefix “bio” means living, while “diversity” refers to different types of things. Around the world, more than 125,000 animal species live entirely in freshwater habitats, including 15,000 species of fish, 4,300 species of amphibians, and 5,000 species of mollusks, such as clams and oysters. Millions of other species, including humans, depend on fresh water to drink. When an area loses a large percentage of its fresh water, many animals die off. In some cases, species go entirely extinct. This leads to a decrease in the region’s biodiversity.

While droughts are natural and, in many places, a frequent occurrence, there are many things that humans do to increase the severity of these droughts. For one thing, humans use much more fresh water to drink and grow crops than they did in the past. 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.

In Africa, where droughts are common, they have been more prolonged than in the past. This is due in part to climate change, as well as a greater demand for water as the continent’s population has increased. During a drought in Kenya that lasted from 2007 to 2009, over 60 elephants died—some of dehydration, others of starvation due to lack of vegetation to eat, and others of diseases that became fatal due to the elephants’ weakened states. Some other endangered animals, such as the white rhinoceros, died too, which brought them closer to extinction.

When the biodiversity of a region declines, the human population suffers as well, in different ways. When a region experiences a significant drought, many animals may die from lack of water and food. If the region is one like Kenya, which depends on its wildlife to draw tourists, the effects of the drought can be devastating. If tourism declines due to high wildlife casualties, then the locals who depend on income from tourism will lose their livelihood. People may then turn to farming to earn money, but crops require water to grow. This can place further strain on the water supply and worsen the original problem of the drought. Sometimes, an imbalance in the system, such as a lack of water, can enter into a feedback loop where the situation only gets

worse and worse.

Losses in biodiversity can also lead to problems with the availability of food. As we've discussed, a lack of water can prevent farmers from growing crops, which can lead to starvation. However, when a region loses its biodiversity, it disrupts the food chain in many ways. For example, if a species goes extinct, all the species used to feeding on it must find another source of food. Say a particular species of freshwater frog dies because its habitat has been depleted in a drought. This means the population of birds that feeds on this frog may decline as well, as it lacks sufficient food. Conversely, the insects that the frogs fed on may increase in number, as the frogs are no longer around to keep their population in check.

One of the main advantages of biodiversity is that there are certain natural processes that plants and animals perform that humans simply cannot. The billions of bees in the world play a critical role in pollinating the world's flowers. If they did not do this, the food supply would dwindle and the human population would suffer greatly.

Biodiversity can play an important function in the cleaning of water. When water passes through lakes, wetlands, and streams, it often encounters different species of fungi, algae, and bacteria. Many of these microbes actually filter microscopic particles out of the water, making it safe for humans to drink. Even some larger species do similar work. For example, the caddisfly constructs nets underwater that filter out different kinds of particles, which it then eats. Wetlands rich with these filtering organisms act as natural water filtration systems. When the biodiversity of a region declines, many of the organisms critical to this filtering process can disappear. So, pressures on the freshwater supply can cause biodiversity to decrease, which can cut the drinkable water supply even further.

While humans do have some water filtration plants, these plants are expensive and take a lot of energy to maintain. For centuries the water that flowed into New York City was naturally filtered by a northern watershed. As the water flowed south, it was purified. However, as the watershed was polluted and diverted, the water flowing to New York City was no longer filtered. The city faced a choice of spending \$6 billion to \$8 billion to build a water filtration plant, or just \$1 billion to restore the natural watershed. The city wisely chose the latter option.

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

1. What is biodiversity?

- A a lack of different types of plant and animal species within a particular region
- B an abundance of different types of plant and animal species within a particular region
- C the different types of plants and animals that live in freshwater habitats
- D a method of conserving the planet's small amount of potable water

2. The cause of humanity's increased water consumption is an increased population. What is the effect?

- A less potable water, a growing threat to biodiversity
- B more potable water, a growing threat to biodiversity
- C less potable water, a decreased threat to biodiversity
- D more potable water, a decreased threat to biodiversity

3. Poorer countries are at greater risk during droughts than richer countries. What evidence from the passage supports this conclusion?

- A With no water for crops, droughts can lead to starvation and dehydration.
- B Droughts in Africa have been more prolonged than in the past due to climate change.
- C During droughts, many animals die, and sometimes whole species go extinct.
- D Poor countries often cannot afford investments that ensure access to fresh water.

4. Read the following sentences: "When the biodiversity of a region declines, many of the organisms critical to this filtering process can disappear. So, pressures on the freshwater supply can cause biodiversity to decrease, which can cut the drinkable water supply even further."

Based on this information, what can be concluded?

- A Water supply and biodiversity are unrelated.
- B Biodiversity affects the fresh water supply, but not vice versa.
- C Water supply and biodiversity are interconnected.
- D The fresh water supply affects biodiversity, but not vice versa.

5. What is this passage mostly about?

- A the effects of water loss on biodiversity
- B the drought in Kenya from 2007 to 2009
- C the distribution of the world’s fresh water
- D the effects of population growth on the water supply

6. Read the following sentences: “Say a particular species of freshwater frog dies because its habitat has been depleted in a drought. This means the population of birds that feeds on this frog may decline as well, as it lacks sufficient food. **Conversely**, the insects that the frogs fed on may increase in number, as the frogs are no longer around to keep their population in check.”

What does the word “**conversely**” mean?

- A in the same vein
- B for this reason
- C as an example
- D on the other hand

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

Humans can affect access to fresh water in many ways, \_\_\_\_\_ polluting bodies of water and building dams.

- A finally
- B such as
- C initially
- D although

8. What makes the conservation of fresh drinking water so important?

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9. Describe a problem caused by losses in biodiversity.

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10. How might humans help prevent losses in biodiversity? Use information from the passage to support your answer

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## Teacher Guide &amp; Answers

Passage Reading Level: Lexile 1180

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8. What makes the conservation of fresh drinking water so important?

**Suggested answer:** The conservation of fresh drinking water is important because there is so little of it (only 0.03% of the world's total water).

9. Describe a problem caused by losses in biodiversity.

**Suggested answer:** Answers may vary and should be supported by the passage. Examples:

- Without organisms that are critical to water filtration, the drinkable water supply is decreased. In turn, the increased pressure on the fresh water supply can lead to further losses in biodiversity.
- Losses in biodiversity can lead to problems with the availability of food. If one population is wiped out or drastically reduced, the populations that feed on it will have to find another source of food, or the second population will die as well.
- Losses in biodiversity can also hurt the human population. If a community relies on wildlife for tourism, that means that they rely on their area's biodiversity for income. If tourism declines due to high wildlife casualties (a loss in biodiversity), then the locals who depend on income from tourism will lose their livelihood.

10. How might humans help prevent losses in biodiversity? Use information from the passage to support your answer

**Suggested answer:** Answers may vary and should be supported by the passage. For example, students may explain that humans can help prevent losses in biodiversity by minimizing water loss. Humans can prevent water loss by conserving the limited supply of fresh water, in order to prevent water shortages from spreading. Humans can prevent water loss by minimizing water pollution, therefore minimizing the water made undrinkable. Richer countries could give financial aid to poorer countries to build infrastructure that would help minimize the effects of droughts and ensure that citizens have access to fresh water.