

Family Fun

If the Water is Clear

Enduring Understanding: Caring for and protecting freshwater habitats is important for plants, animals, and people.

Materials

- Writing materials
- Publishing materials (optional)

Setup:

1. Review some of the benefits of freshwater habitats in the “Instructor Background” section.
2. Prepare the necessary writing and optional publishing materials.

Program outline:

Why is it important to care for our freshwater habitats like rivers, lakes, and creeks?

- Many animals depend on clean freshwater during part or all of their life cycle.
- Most land animals need clean freshwater to drink.
- Other animals live in freshwater. It’s their home and they need it to stay clean.
- People need clean freshwater, too, and they like to visit lakes, rivers, and creeks.

Why are freshwater habitats in trouble?

- People leave litter or create other pollution, and that pollution ends up in rivers, creeks, and lakes. It sometimes makes it to the bay or ocean, too.
- People sometimes use more than their fair share of freshwater, which means there is less freshwater to fill rivers, lakes, creeks, and streams.

The good news is that we all have a voice. Why is it important to you to keep our freshwater habitats clean?

- Depending on your students’ experience with creative writing,



Program outline continued:

You may do one of the following:

- Have each student write a creative writing piece (poetry or prose) about why taking care of our freshwater habitats is important to the student, animals, and other people.
- Have each student write one sentence or a phrase about why caring for our freshwater habitats is important. Then, each group of four to six students can put their sentences and phrases together to make a group poem.

Get the Word Out

- Publish their work on a social media site, so that they can help others learn about protecting the watershed. Use the hashtag #Aquarium of the Bay.

What we can do

- Taking care of our freshwater habitats is everyone's responsibility.
- There are choices we can make every day that can help take care of these habitats.
 - Brainstorm ideas with your family.
- Have each family member pledge to do one thing to help protect freshwater habitats.



Background information:

Freshwater is essential to life as we know it. It is perhaps the most vital of all resources. It is essential to all different kinds of living things, from the smallest flowers to the tallest trees, from bacteria to salmon. Freshwater is essential to human bodies. It drives all kinds of human endeavors, from agriculture to industry to art. There is a finite amount of water on Earth—the amount of water on our planet has been the same throughout geologic time, and we can't create more of it—and less than 1/100 of 1 percent of that water is available for human use. Because of all these things, protecting our freshwater resources and habitats is one of the most important things that we can all do to care not only for the environment and other animals but also ourselves.

The Importance of Freshwater Habitats to Animals

All freshwater and terrestrial, or land-dwelling, organisms depend on freshwater to meet a variety of needs, including for drinking and habitats. Organisms of all varieties—from algae to fairy shrimp to rainbow trout to beavers—live in freshwater habitats throughout their life cycles, from which they get everything they need to survive. This unit focuses on just three of the many animals that live in freshwater habitats for a portion of their life cycle. Still other animals rely on freshwater habitats for food and drinking water. Even living things in the ocean rely on freshwater, because the water flowing from rivers and streams into the ocean carries important nutrients that provide the basis for coastal food webs.

The Importance of Freshwater Habitats to People

Freshwater habitats provide many ecosystem services for people. Perhaps the most obvious of these is that freshwater habitats provide the water to drink and to use in our homes, schools, and businesses. Freshwater is also integral to growing food, with more than 80 percent of freshwater use in California going to agriculture. Freshwater habitats also feed us by providing much-needed habitat for important fish like salmon, rainbow trout, and sturgeon. In addition to this, healthy freshwater habitats provide refuge for endangered and important animals, create opportunities for recreation, and can even help protect us against flooding.

Protecting Local Freshwater Habitats

A watershed is all of the land where the freshwater drains into the same ocean, bay, river, or lake. The San Francisco Bay has an extraordinary watershed that is home to the animals discussed in this unit, in addition to many more. Freshwater habitats in the San Francisco Bay's watershed face two major threats, one that impacts the quantity of freshwater flowing through our waterways, and another that impacts the quality of that water. These two primary issues are freshwater diversion and freshwater pollution.

Freshwater diversion occurs when people siphon off water from natural systems for human use. This diversion of water is often so large that freshwater ecosystems can't compensate for it. For example, so much water is diverted from the San Joaquin River—the second largest river in California and an important part of the San Francisco Bay's watershed—that it sometimes runs dry or even backward. All told, about half of the freshwater that historically flowed through the watershed is diverted before it reaches San Francisco Bay. This has had huge ecological impacts, including driving some animals to the brink or over the edge of extinction.

Fortunately, we can make many choices in order to keep the water flowing through our freshwater

background information continued:

habitats, including the following:

- Support legislation that requires enough water be left in natural freshwater habitats to keep ecosystems healthy.
- Save water at home, work, and school by
 - turning off the water while brushing your teeth, washing your hands, or shaving.
 - taking shorter showers.
 - washing only full loads of laundry.
 - watering the lawn or garden in the evening or morning instead of afternoon.
- Agriculture uses more than 80 percent of the freshwater used by people in California. Wise food choices include the following:
 - Eat more fruits and vegetables, which take less water to produce than grains, dairy, or meat.
 - Support farmers who use water-saving techniques by choosing dry-farmed or drip-irrigated fruits and vegetables.

Pollution also impacts freshwater ecosystems in a number of ways. Many kinds of pollution find their way into freshwater ecosystems, including litter, household chemicals, and agricultural chemicals (i.e., pesticides and fertilizers). Litter, particularly plastic, can harm animals living in freshwater habitats when they eat it or become entangled in it. Chemical pollution from homes, cities, and agriculture can cause deformations in animals or make them more vulnerable to disease or predation, particularly for amphibians like frogs. Freshwater pollution also often makes its way downstream to the San Francisco Bay and the ocean.

Some things we can do to keep pollution out of freshwater habitats include the following:

- Dispose of litter properly and clean up litter you find.
- Participate in creek and beach cleanup events, such as Coastal Cleanup Day.
- Choose more organic foods and products.
- Support local laws that ban plastic bags and other single-use plastics that often end up polluting our waterways.
- Reduce, reuse, recycle, and compost.
- Choose toiletries and household cleaning products that include natural ingredients and don't contain chemicals that can harm freshwater ecosystems (like the triclosan found in many hand sanitizers).

