

# Why do we care about nutrients in the water?

Primary producers survive by using nitrogen and phosphorus during life processes, including performing photosynthesis with energy from the Sun.

In a marine food web, phytoplankton are an example of a primary producer.

Phytoplankton are then eaten by herbivores, who in turn are eaten by a variety of consumers until the energy reaches the top predator.

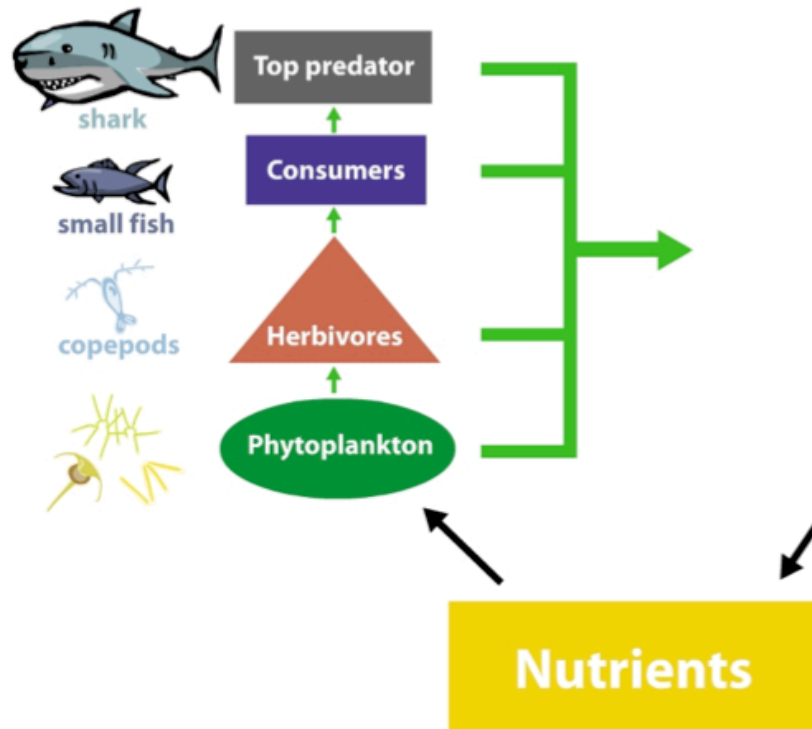
Another name for this is the **GRAZING FOOD WEB**.

The grazing food web begins and ends with nutrients.

These nutrients move up the food chain as one organism eats another.

However when an organism dies, its energy and chemical elements will be lost to the food chain unless there is some way to reintroduce them.

## GRAZING FOOD WEB

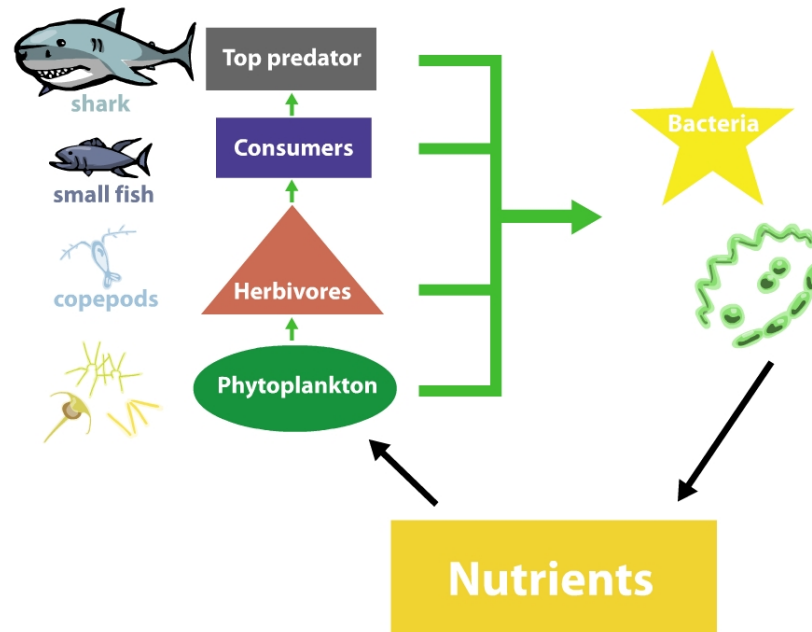


How do you think the nutrients are recycled in the food chain?

The answer is bacteria.

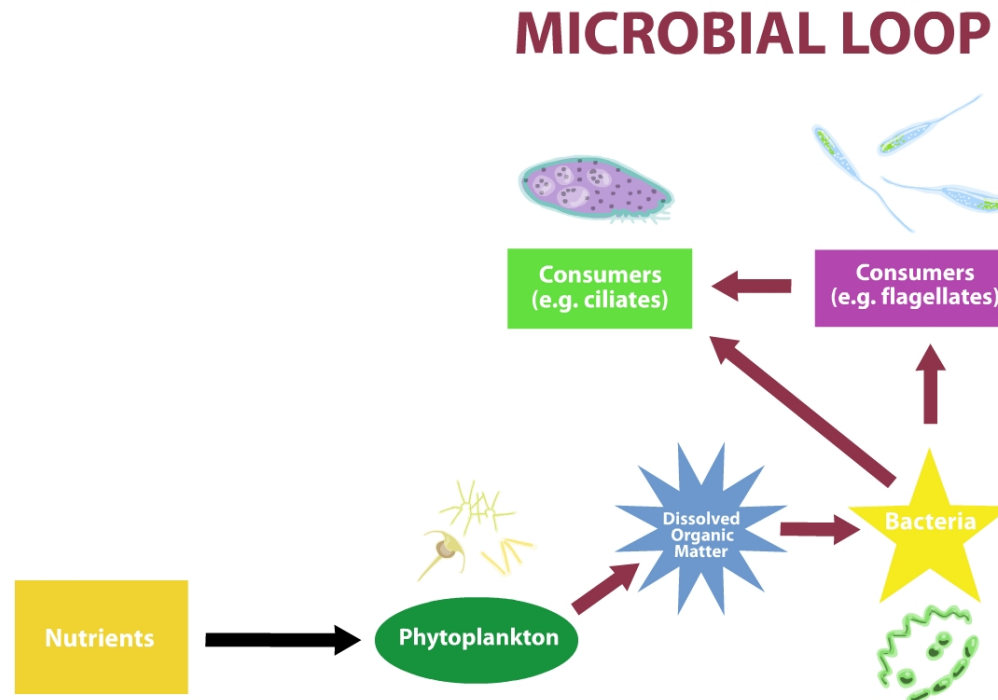
Bacteria act as decomposers. They break down dead organisms and release nutrients back into the environment, acting as recyclers.

## GRAZING FOOD WEB



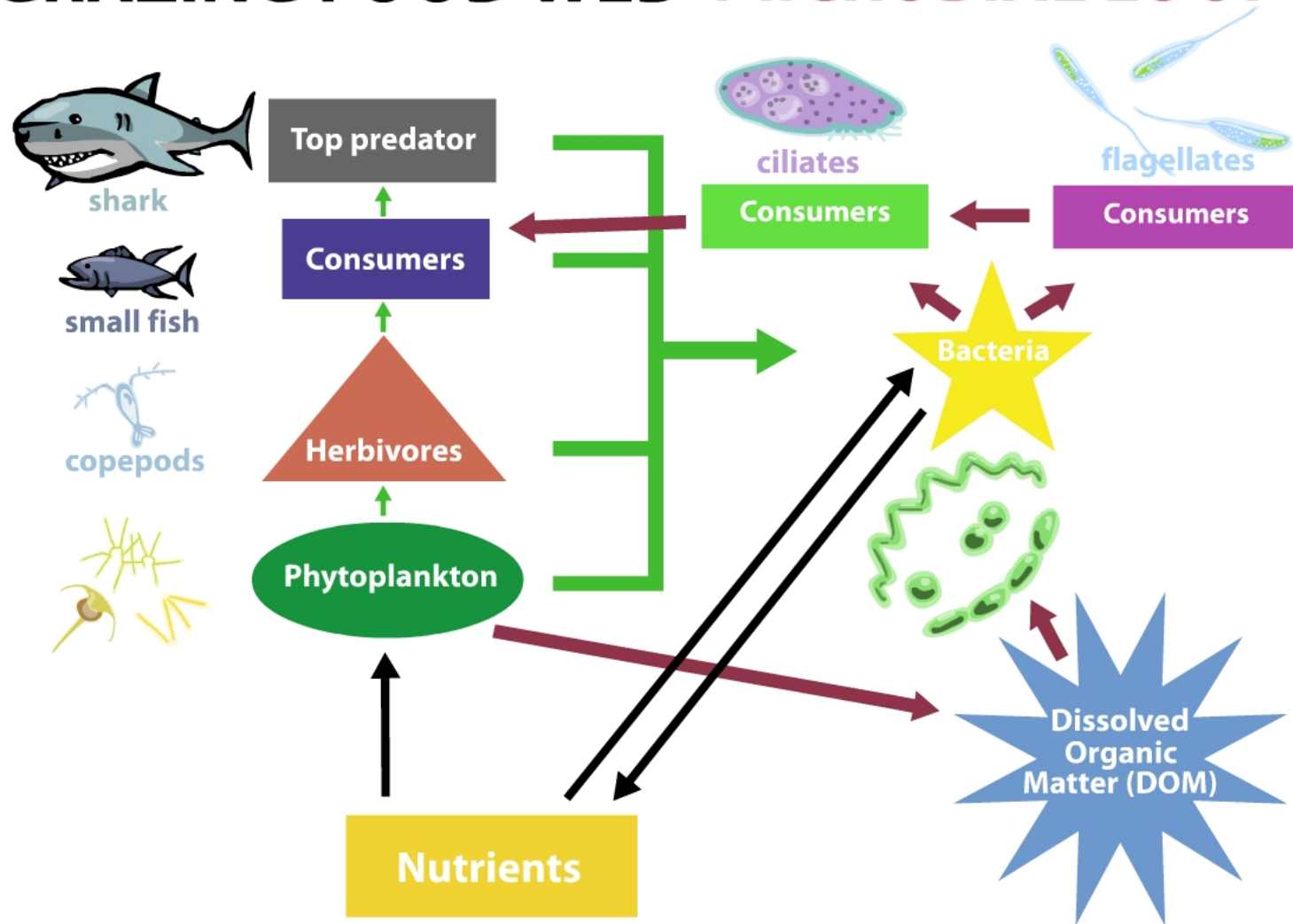
It is also important to realize that bacteria will use some of the nutrients themselves ~ to help them grow.

Not only a recycler, bacteria also act as a food source. Bacteria consume dissolved organic matter released by phytoplankton. Then the bacteria are consumed by small organisms including protists.



In turn, these organisms are eaten by other consumers until the energy reaches the top predator. This food web is called the microbial loop. Here nutrients support the phytoplankton and thus all of the organisms above it.

# GRAZING FOOD WEB MICROBIAL LOOP



As you can see from the complex food webs, both the grazing and microbial loop, many organisms can be directly or indirectly affected by nutrients.