

Constructing a Food Web - Great Lakes

Instructions - Read and annotate the following information about the Great Lakes basin. Create a complete food web containing **ALL** organisms and their interactions described within the reading. Hint: **There are 16 organisms (circle every NEW organism you come across) and 44 arrows (underline these feeding relationships whenever you come across them) in this food web.** A video of me reading the text below and modeling a few of the annotations can be found here: bit.ly/GreatLakesFoodWeb

The Great Lakes ecosystem contains various types of habitats: forests, marshes, wetlands, and dune communities. These communities allow for more than 3,500 species of plants and animals to inhabit the basin. The many varieties of organisms make the Great Lakes basin a unique and complicated ecosystem.

The entire Great Lakes region is supported by the photosynthetic organisms at the base of this ecosystem. Organisms like phytoplankton, blue-green algae, duckweed, and cattails can all be found in the Great Lakes basin. As a larger plant, the cattails need to reproduce by creating many seeds. Smaller photosynthetic organisms tend to reproduce using techniques such as budding and fission. As autotrophs, these organisms use sunlight energy and convert it into chemical energy. All of the plants except for the cattails (and their seeds) are consumed by zooplankton and water fleas.

The Great Lakes are also home to a number of fish species, some of which are native and others of which have been introduced. Many small fish species such as the Yellow Perch, Alewife and Rainbow Smelt feed on zooplankton and water fleas. Larger species of fish that inhabit this region include Smallmouth Bass, Rainbow Trout and Walleye. These larger fish species thrive on consuming the smaller fish species. However, the Rainbow Trout will consume water fleas in early stages of life. The invasive Sea Lamprey came to inhabit many parts of the great lakes by swimming through man-made locks and shipping canals constructed during the 1800's. Sea Lampreys are able to feed on all species of fish (large and small) in the great lakes and have no natural predators. They feed blood and body fluids of fish without killing them. They do this by using their sucker-like mouths and sharp teeth to attach to the body of host fish. Each lamprey can consume about 40lbs of fish blood and body fluids in its 18 month life span. This is why it is so important that organizations like the DNR (Department of Natural Resources) continue to reduce the populations of these fish by actively fishing for them and removing them from the Great Lakes.

Along the coastal regions of the Great Lakes, many native bird species can be found. These birds include the great blue heron, the bald eagle, and wood ducks. Wood ducks feed in the shallow areas of the lakes mostly on duckweed and cattail seeds. The blue heron is an opportunistic feeder and will usually eat whatever food is abundant in an area. Mostly, they will prefer a steady diet of all large and small fish, but occasionally they will consume ducklings. Since the banning of a bioaccumulating insecticide called DDT (a chemical used in farming to kill plant-eating insects) the bald eagle has become a more common sight in this region. Bald eagle populations suffered drastically as this insecticide got into the waterways and began to biomagnify throughout the food chain. The build up of this toxin occurred in many large fish species as well. Fish like the Smallmouth Bass, Rainbow Trout and Walleye all contained high levels of DDT when they were consumed by bald eagles. This caused the bald eagles to lay eggs with thin shells that often cracked during incubation. Many generations of bald eagle breeding pairs were impacted and this greatly reduced population numbers.

Food Web- Individual Assignment

1. Write out 1 complete food chain from your food web. Use arrows. Then, identify the producer and, at least, two levels of consumers.
2. Identify the following ecosystem interactions in your food web.
 - A. Predator-prey (*this should feature two organisms in a feeding relationship*) -
 - B. Herbivory (*this should feature two organisms in a feeding relationship*) -
 - C. Top Level Consumer -

Name _____ Date _____ Hour _____

D. Parasitism (*this should feature two organisms in a feeding relationship*) -

3. Predict what specific event would happen in your food web if all the producers became extinct.

4. Predict what specific event would happen in your food web if the DNR stops reducing lamprey populations.

5. Aside from bald eagle populations decreasing, predict what specific event would happen in your food web if DDT was never banned from use.

Food Web Diagram (rough draft)

[illegible]