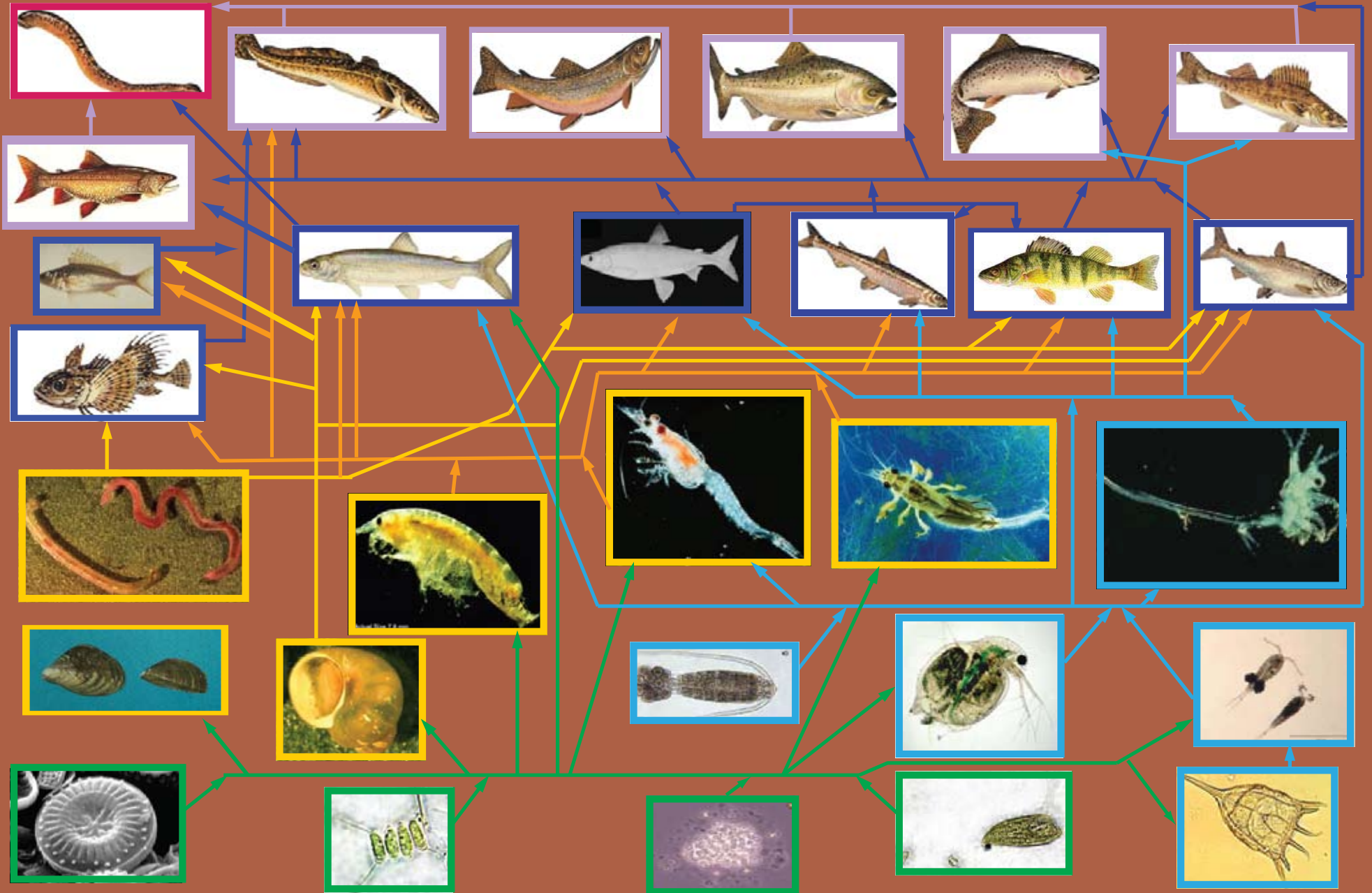




Lake Superior Food Web



Food Web based on model constructed for "Impact of Exotic Invertebrate Invaders on Food Web Structure and Function in the Great Lakes: a Network Analysis Approach" by Mason, Krause and Ulanowicz — 2002, Modifications for Lake Superior — 2008.

Sea Lamprey



Sea lamprey (*Petromyzon marinus*) - An aggressive, non-native parasite that fastens onto its prey and rasps out a hole with its rough tongue.

Piscivores (Fish Eaters)



Chinook salmon (*Oncorhynchus tshawytscha*) - Pacific salmon species stocked as a trophy fish and to control alewife. Natural reproduction may currently account for 85% of the stock.



Steelhead trout (*Oncorhynchus mykiss*) - A lake strain of rainbow trout, rarely found deeper than 35 feet along the coast. Natural reproduction supplemented by stocking.



Lake trout (*Salvelinus namaycush*) - Once the most valuable commercial fish in the Upper Great Lakes, overfishing and sea lamprey predation nearly eliminated this fish from Lake Huron by the 1950's. Stocking and lamprey control are resulting in its resurgence.



Brook trout (*Salvelinus fontinalis*) - Preferred habitat includes headwater spring ponds and small spring-fed streams that have cool, clear waters with sand and gravel bottoms and moderate amounts of vegetation.

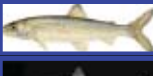


Walleye (*Stizostedion vitreum*) - Native coolwater species found in nearshore areas.



Burbot (*Lota lota*) - Elongated, cylindrical, freshwater codfish.

Forage Fish



Lake herring (*Coregonus artedii*) - Once abundant in all lakes. Population was reduced greatly by pollution and over-fishing. Now thrive in western Lake Superior.



Kiyi (*Coregonus kiyi*) - Lives in clear, cold-water environments at depths between 35 and 200 meters. Population declined due to overfishing and predation.



Rainbow smelt (*Osmerus mordax*) - Carnivorous fish that usually schools in the dark, cool off shore depths. Introduced as food for stocked inland salmon in the 1900s and escaped to Lake Michigan.



Bloater (*Coregonus hoyi*) - Native deepwater chub feeding on zooplankton and other organisms near the lake bottom. Harvested commercially for smoked fish.



Yellow perch (*Perca flavescens*) - Native that schools near shore, usually at depths less than 30 feet.



Deepwater sculpin (*Myoxocephalus quadricornis thompsonii*) - a native glacial relic that lives at the bottom of cold, deep water feeding largely on aquatic invertebrates.



Ruffe (*Gymnocephalus cernuus*) - From Eurasia; introduced to western Lake Superior in ballast water of shipping tankers.

82 species of fish, including at least 8 non-natives, make their homes in the waters of Lake Superior. This food web includes only the dominant species.

MacroInvertebrates



Chironomids/Oligochaetes - Larval insects and worms living on the lake bottom. Species present are a good indicator of water quality.



Amphipods (*Diporeia*) - The most common species of amphipod found in fish diets.



Mayfly nymphs (*Hexagenia spp*) - A burrowing insect larvae found in warm, shallow water bays and basins, usually in soft sediments. The presence of this sensitive organism indicates good water quality conditions.



Opossum shrimp (*Mysis relicta*) - Omnivore feeding on algae and small cladocerans. Migrates into the water column at night.



Mollusks - A mixture of native and non-native species of snails and clams are eaten by lake whitefish and other bottom feeding fish.



Zebra and quagga mussels (*Dreissena polymorpha* and *Dreissena bugensis*) - Zebra mussels invaded Lake Superior in 1990, quagga mussels in 2005. Filter-feeders that remove huge quantities of plankton.

Zooplankton (Microscopic animals found in the water column)



Invasive Spiny waterfleas (*Bythotrephes longimanus*) - Raptorial predator found at high densities.



Cyclopoid copepods (*Cyclops bicuspidatus*) - One of 7 carnivorous cyclopoid copepod species in Lake Superior.



Native waterfleas (*Daphnia galeata*) - More than 40 species of native filter-feeding waterfleas live in Lake Superior. Photo Credit : Dr. James F. Haney, 1999



Calanoid copepods (*Diaptomus spp.*) - Ten species of native calanoid copepods live in Lake Superior. Calanoid copepods are omnivores but prefer active prey.



Rotifers - Omnivorous microscopic animals that package the smallest particles, including small phytoplankton and wastes into a form that can be eaten by larger zooplankton.

Phytoplankton (Algae found in the water column)



Blue-green algae - Largely inedible and frequently toxic, these algae often form large blooms that contribute to shoreline slime accumulations.



Green algae - Microscopic (single-celled) plants that form the main support of the summer food web. Also includes large nuisance species such as *Cladophora*.



Diatoms - Cold-loving microscopic (single celled) plants encased in silica shells that support the first wave of production in the spring.



Flagellates - Motile, single-celled plants or animals frequently found in high numbers. Most eat bacteria and so may help funnel bacterial products back into the food chain.