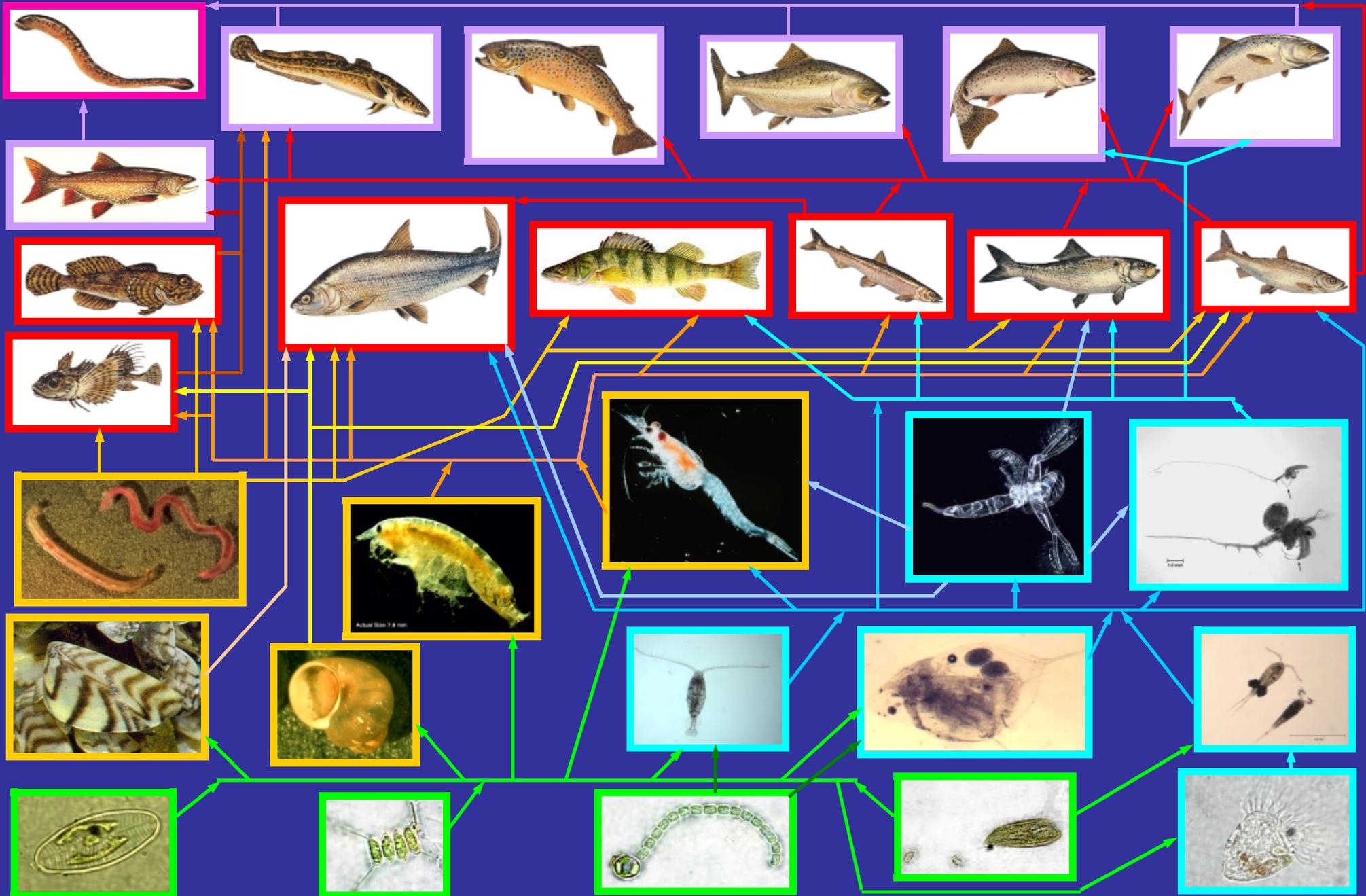




# Lake Michigan Food Web



## Sea Lamprey



Sea lamprey (*Petromyzon marinus*) - an aggressive, non-native parasite which fastens onto its prey and rasps out a hole with its rough tongue. Numbers in Lake Michigan are currently only about 10% of their peak numbers in the 1950s.

## Piscivores (Fish Eaters)



Chinook salmon (*Oncorhynchus tshawytscha*) - Pacific salmon species stocked as a trophy fish and to control alewife. Natural reproduction sustained by stocking.



Brown trout (*Salmo trutta*) - A European species introduced in the late 1880's which does well in slightly degraded habitats no longer suitable for brook and other native trout.



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 Michigan by the 1950's. Stocking & lamprey control are resulting in its resurgence.



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



Coho salmon (*Oncorhynchus kisutch*) - A Pacific species imported and stocked in Lake Michigan since 1966. They reproduce naturally in many streams on the eastern side of Lake Michigan, but their general population must be sustained with hatchery-reared fish.



Burbot (*Lota lota*) - Elongated, cylindrical, freshwater codfish, the commercial harvest during the early 1980s increased to a total of nearly 100,000 pounds annually.

## Forage Fish



Lake whitefish (*Coregonus clupeaformis*) - Native which schools in cold, deep waters and usually feeds along the bottom in the northern portions of the lake. Prized commercial species with annual take exceeding 2 million pounds.



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



Slimy sculpin (*Cottus cognatus*) - Native, nocturnal inhabitant of nearshore areas where it primarily eats invertebrates.



Yellow perch (*Perca flavescens*) - Native which schools near shore, usually at depths less than 30 feet. Yellow perch numbers appear to have decreased 80% since 1990.



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



Alewife (*Alosa pseudoharengus*) - Atlantic species which invaded in 1949 via the Welland canal, now the major prey of the Lake Michigan's trout and salmon.



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

116 species of fish, including 20 non-natives, make their homes in the waters of Lake Michigan. 11 species of native fish have been extirpated from Lake Michigan. This food web includes only the dominant species.

## MacroInvertebrates



Chironomids/Oligochaetes - Larval insects and worms living on the lake bottom.



Amphipods (*Diporeia*) - The most common species of amphipod found in fish diets in Lake Michigan which began declining in the early 1990's.



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 & quagga mussels (*Dreissena polymorpha* and *Dreissena bugensis*) - Invaded Lake Michigan in 1980's/90's, filter-feeders which remove huge quantities of plankton.

## Zooplankton (Microscopic animals found in the water column)



Invasive Fishhook & Spiny waterfleas (*Cercopagis pengoi* & *Bythotrephes cederstroemi*) - Raptorial predators found at high densities



Native raptorial waterflea (*Leptodora kindtii*) - Slow moving and patchy distribution of small swarms at relatively low numbers. Photo Credit: Wim van Egmond.



Cyclopoid copepods (*Cyclops bicuspidatus*) - The most common of the four predatory copepod species of Lake Michigan.



Native waterfleas (*Daphnia galeata*) - 7 genera of native filter-feeding waterfleas live in Lake Michigan.



Calanoid copepods (*Diaptomus spp.*) - 6 genera of native filter-feeding copepods live in Lake Michigan.



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

## Phytoplankton (Algae found in the water column)



Blue-green algae - Largely inedible and frequently toxic, these algae can form large blooms when phosphorus concentrations are high or water quality poor.



Green algae - Microscopic (single-celled) plants which form the main support of the summer food web.



Diatoms - Cold-loving microscopic (single celled) plants encased in silica shells which 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.