What's in the Water?

By Jim Hedrick

A microscopic female zooplankton with egg sacs attached.

Photo below: *a species of microscopic zooplankton with long horns on its head and tail to defend against predators.*

Photos by Jim Hedrick

Have you ever been fishing or just walked up to a lake or pond and seen beautiful clear water that looks so clean you could drink it? Our first natural instinct is to say "Wow! That is clean good quality water". Not so fast, don't let clear, clean looking water lead you astray. Could this clear water indicate good quality water? Absolutely, especially in northern cold water lakes, but it may not always be true in West Virginia. Crystal clear water can indicate that little or nothing is growing in the water column. For example, if a lake or pond is receiving acidic water, the water may be clear because the acid in the water prevents plant and animals from growing.

What most people don't realize is the water column of a healthy lake or pond should be full of life, microscopic life. This microscopic life that lives suspended in the water column of lakes and ponds creates the very beginning of the food chain.

Microscopic plants that grow in water are known as phytoplankton, which means drifting plant. These small plants need sunlight like other plants, and absorb nitrogen and phosphorus from the water; the same basic elements that make our gardens grow. Phytoplankton are found in many shapes and forms with a large number of species occurring simultaneously in a single body of water.

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Crystal clear water is not necessarily indicative of a healthy aquatic ecosystem.

Photo above: *The green water color of Rollins Lake in Jackson County indicates a healthy plankton population.*

Photo by Art Shomo

These phytoplankton are consumed by microscopic animals known as zooplankton, which means drifting animal. Zooplankton are the second link in the food chain of most lake and ponds. Similar to phytoplankton, the zooplankton community is very diverse with a large number of species not easily distinguished from one another. Most zooplankton in West Virginia range in size from completely microscopic (1/1000 of a millimeter) up to a couple millimeters (about 1/8 inch).

The combination of phytoplankton and zooplankton in the water column gives lakes a deep dark green, almost cloudy color. If you've ever been swimming in a lake or pond and accidentally swallowed a mouthful of water, you've eaten a couple of thousand phytoplankton and zooplankton. Yep, you just ate a couple thousand phytoplankton and zooplankton. But don't worry. They won't hurt you. The larger danger is the potential for eating bacteria that could be harmful.

Zooplankton are an important and often sole food source for freshly hatched fish. The coincidence of zooplankton population with the hatching of many species of fish is very important. If zooplankton densities are inadequate at the time of fish egg hatching, survival of these young fish could be very low.

Phytoplankton and zooplankton are excellent biological indicators, and changes in plankton species often indicate changes in water quality. Biologist can evaluate phytoplankton and zooplankton densities by analyzing water samples and/or pulling a very fine mesh net through the water to collect these small plant and animals. Zooplankton often sink deep into the lake during the day to avoid predators and swim toward the surface at night to feed on phytoplankton. Therefore, biologists submerge a specialized net to the bottom of the lake and pull it up through the water column to capture the zooplankton from all depths of the lake.

So what does all of this mean for anglers? If microscopic phytoplankton and zooplankton levels are low in any given year from any number of environmental conditions, your fishing success could be affected several years down the road. If fish eggs hatch during a time period when plankton abundance is low, most of the young fish will be eaten by larger fish. It's all about survival. Small fish must have lots of food available and grow quickly to reduce their chances of becoming prey of a larger fish. It is hard to believe that these microscopic organisms directly and significantly affect our fish populations on an annual basis.

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