



Article & Photo by Margie Manthey and published in the Westport Review Mirror, 2020



**Lake Ice and Fish Life** - Did you ever wonder what fish do all winter long? Do they continue swimming around under the ice, or is the phrase “go to sleep with the fishes” based on fact? A little of both, really!

Backing up a bit, let’s first learn about a process called “lake turnover” that occurs before the freeze-up. In the summer, most lakes are thermally stratified – that is, the warmer, low-density water sits above the colder, higher-density water. As summer gives way to fall, the upper layers cool and begin to break down the stratification within the water column. With the advance of colder weather, the lake surface eventually cools to 4 degrees Celsius (39.2 F), the temperature at which water is most dense. This results in the surface water settling to the bottom, which pushes the now warmer water at the bottom back up to the surface. This turnover process continues until the surface water cools below 4 degrees Celsius, whereby it becomes less dense and begins to freeze. The key thing to note is that water is at its most dense at 4 degrees Celsius; so regardless of whether the water is above or below this temperature, it becomes less dense. A good thing -- because if water was at its most dense as a solid (ice), the lakes would freeze from the bottom up, literally freezing solid! Our winters may be tough, but thankfully not long or cold enough to *completely* freeze most lakes and ponds. Furthermore, ice formation itself, especially when topped with snow pack, acts as an insulator for the water below.

Okay, back to the fish and their winter exploits. They have different adaptations and strategies that help them get through winter. This is important, as fish are cold blooded; so their body temperature is the same as their surrounding environment. When the water gets cold, fish do, too. They experience a reduction in their metabolism, which triggers a decrease in respiration, digestion and activity. Fish are often classified as cold water, cool water and warm water species. Warm water species, like largemouth and smallmouth bass, bluegills and sunfish, will seek out the warmest water possible. In winter, this is usually at the bottom of the lake, if you will recall the turnover process. To conserve energy, warm water species also avoid places with a strong current. They will lay low and enter a state of lethargy known as torpor. Cool water fish, such as northern pike, walleye, crappie and perch, remain somewhat more active; but they, too, experience a reduction in metabolic processes as water temperatures drop, and will seek the warmest places to hunker down. Both warm and cool water species generally lose weight over the winter. Cold water species include whitefish, burbot, and varieties of trout and salmon. These hardy fish stay robust all winter long, actively hunting prey throughout the water column and building fat stores. This can translate to late season success for ice anglers.

During the lake turnover process, oxygen is distributed throughout the entire water column, which is vital to fish. As winter wears on, ice and snow cover seal the water from oxygen in the atmosphere and also block out sunlight that aquatic plants need to produce oxygen. As a result, oxygen levels in the lake drop progressively through the season. Oxygen is especially limited at the lake bottom, where many fish species gather. When lakes stay frozen too long, dissolved oxygen levels can drop so low that it causes a considerable winter fish kill.

Article & Photo by Margie Manthey

*Margie is a self-proclaimed nature nerd with a passion for all things finned, furred and feathered...even the creepy-crawly-scaly kinds. She’s summured on Wolfe Lake since childhood and loves sharing what she learns about our wild things.*