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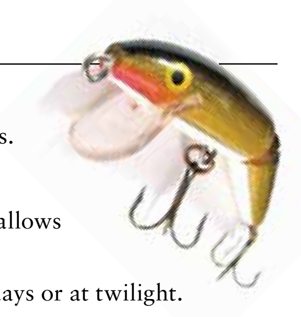
Selecting Lure Colors for Successful Fishing

How Fish See Color

Every spring, the tackle counters of local sport shops are filled with attractive displays of the latest lures in myriad colors, designed to capture the attention of eager anglers, to say nothing of eager fish. Most tackle boxes are bulging with lures of every hue, and each fishing trip becomes a study of what color bait will entice the fish that day. However, certain principles of vision and the behavior of light as it penetrates water can make lure selection more scientific.

Most fish see colors. As with people, the retina of a fish's eye contains two types of cells: cones and rods. Cones are used for day vision and are the cells that discern color. Rods are used for night vision and cannot distinguish colors, although they can discern light intensity. In most freshwater fish, the eyes possess both rods and cones, although night feeders like walleye or fish that live at greater depths have more rods.

QUICK READ



1. To improve angling success, consider how fish see and eat.
2. Lure colors that are visible to fish change with increasing water depths.
3. Bright colors look drab to a fish if presented in deep water.
4. In clear water, longer color wavelengths (like red) are visible in the shallows and shorter wavelengths (like blue) are visible in the depths.
5. On clear days, light penetrates deeper into the water than on cloudy days or at twilight.
6. Cloudy or turbid water will reduce the depth that light can reach.

KRISTEN ROST

Research suggests day feeders like bass, trout and salmon are more sensitive to color than night feeders like walleye. Studies have shown that rainbow trout and Pacific salmon have color vision similar to that of humans. They can distinguish complementary colors and up to 24 spectral hues. Other studies have shown that brown trout are capable of sharply focusing on near and far objects at the same time and can clearly see different colors at different distances.

What Happens to Light in Water

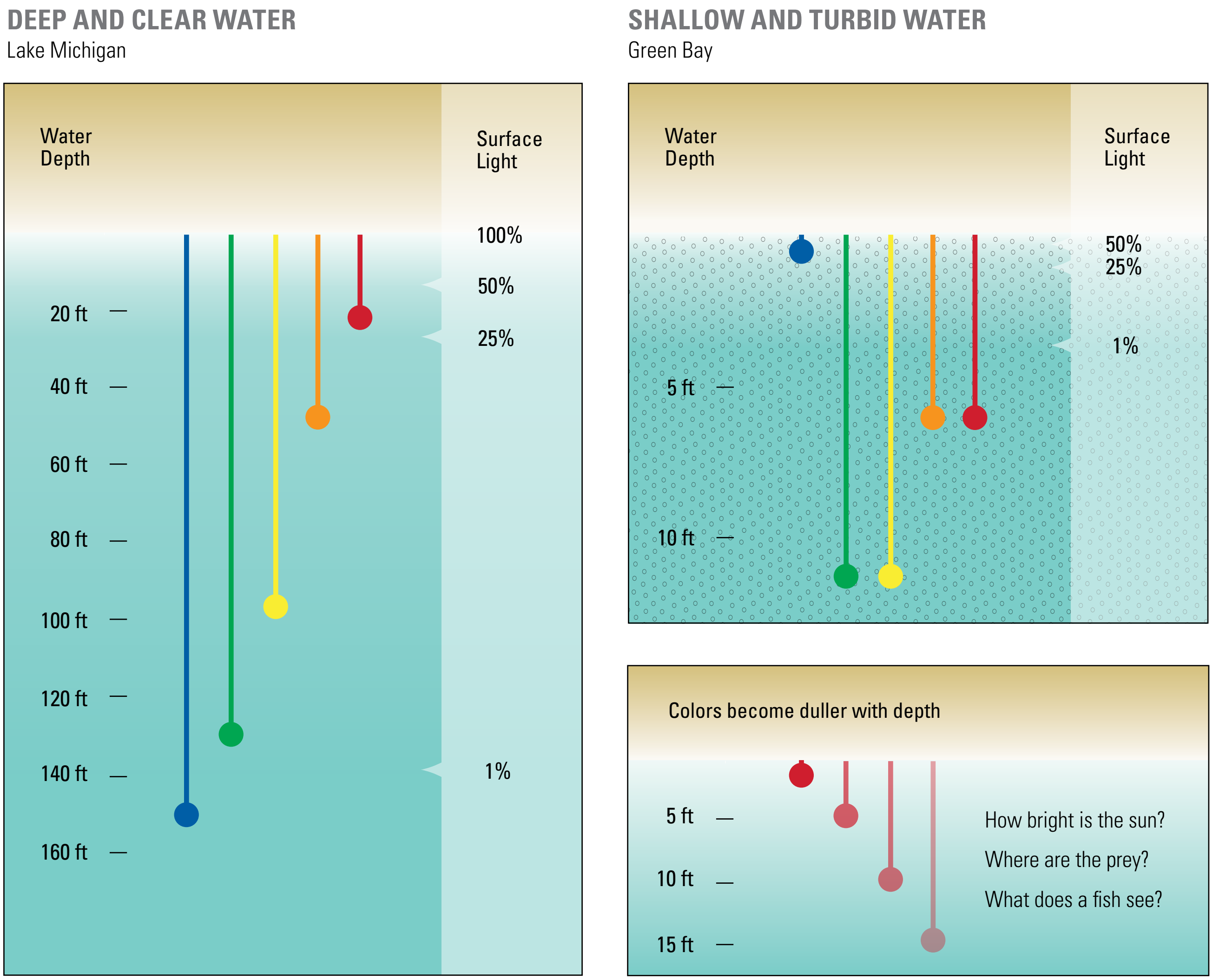
Light behaves differently in water than in air. The various colors of light have different wavelengths–from reds, with the longest wavelength, through oranges, yellows, greens, blues and indigos, and finally to violets, with the shortest wavelength. When light travels through clear water, some of its energy is absorbed, with the longest wavelengths absorbed first. So the warmer colors (red, orange, yellow) fade out and gradually appear darker or black as the lure runs deeper. Red light is almost completely absorbed within the first 20 to 25 feet. Orange penetrates 35 to 45 feet, and yellow 65 to 75 feet, while green and blue remain visible for as deep as the light penetrates. The proliferation of zebra mussels and quagga mussels, which can filter plankton out of the water, has resulted in increased water clarity in lakes; clearer water allows light to penetrate to greater depths. (See illustrations on page 3.)

The total intensity of light also decreases with depth. At 50 feet, a yellow lure will still appear yellow, but will not appear as bright as it did at 20 feet.

While red may be the first color to disappear in the clear water of Lake Michigan, in turbid water, like river mouths, this relationship is reversed. Blues disappear first, with greens and reds reaching to greater depths. At depths where it is nearly dark, a white lure would show up better than a blue or green lure against a blue-green background of water. Commercial products designed to reflect any light that strikes them also make lures more visible.

On a cloudy day, colors of light will not penetrate as deeply as they will on a sunny day. At dusk, as light intensity fades, red is the first color to go, followed by orange, yellow, green and blue. As total light intensity decreases, the rod cells in the fish's eye become more active and the fish is no longer able to distinguish colors. After dark, anglers can choose a shiny lure to catch any available light or a lure that glows in the dark. In the dark, fish may be attracted to a lure by smell and vibration, and only use vision at close range.

At dawn, as light intensity increases, the cone cells become effective again and fish can see colors. Blues, greens, yellows, oranges and finally reds appear. At early dawn, a red J-plug near the surface shows up as a dark shape against the brightening sky. As the sky gets lighter, red no longer contrasts as well, and anglers should experiment with other colors. Light also affects the movement of forage fish. They may move up and down in the water column in response to increasing and decreasing light, which in turn,



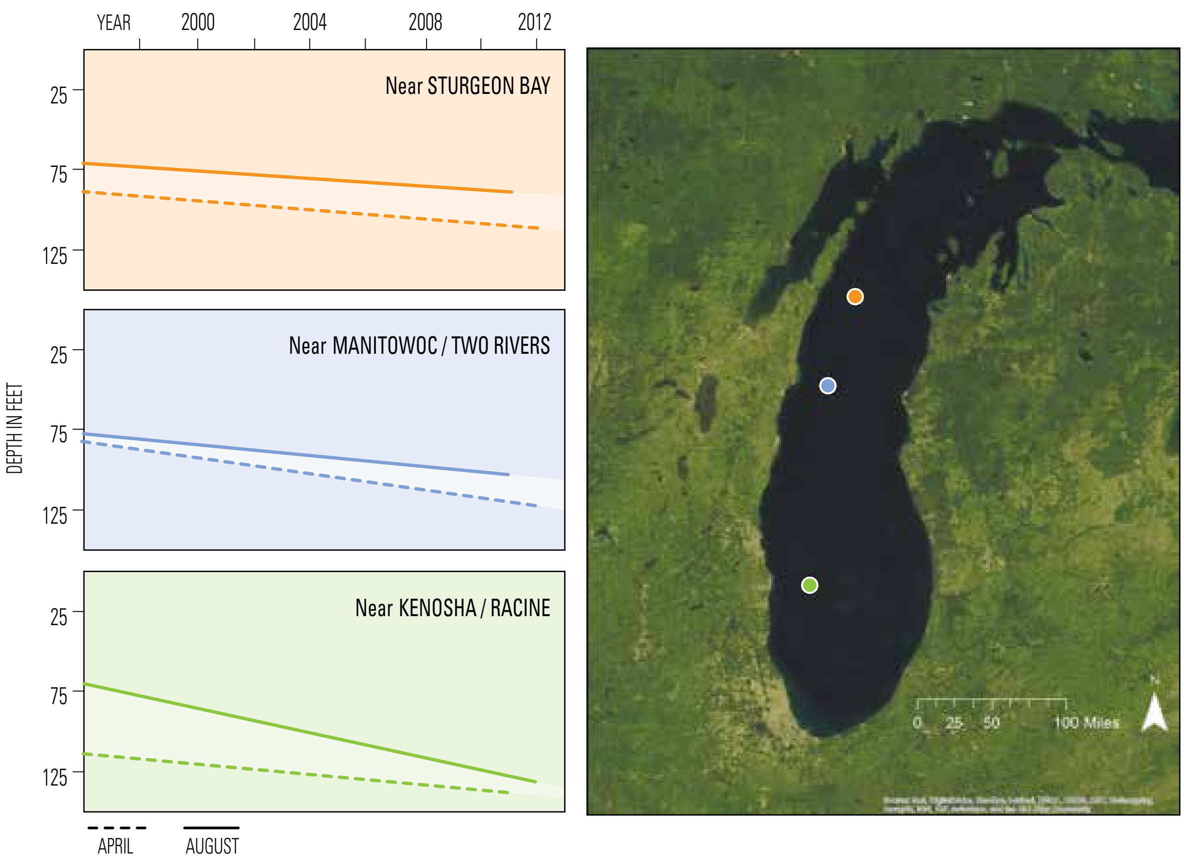
The figures demonstrate the maximum depth (represented by color-coded lures) at which different colors are no longer visible due to the absorption and scattering of different wavelengths of light. Turbid systems, like Green Bay, favor greens and yellows over blues, and dull the intensity of colors (on the left). Lake Michigan is clear and its effects on color are presented on the right. The top line on eac h graph shows the percentage of light at different depths, with all the light (100 percent) to little light (1 percent) at greater depths. As the total light diminishes with depth, the numbers and intensity of colors are also reduced.

affects the distribution of sport fish. For example, alewife will migrate up from the bottom at night in response to the location of their planktonic prey. Salmon will follow the alewife to the surface.

How Fish React to Color

Studies on salmon have shown that their feeding behavior depends on whether they are seeing with cones or rods. During the day, salmon use cone cells to give them information on the hues and shades of moving prey. When prey are located, they are stalked and eaten head first. From dusk to dark, rod-based vision takes over. Schools of prey fish break up and salmon assume a position below their prey to see them in contrast against the water surface. They watch them move for a few moments, and then snap up the prey one by one.

Ultimately, the appeal of the lure to the fish is most important. Fish must strike the lure, either to eat it or attack it. While many fish locate the general area of the bait by smell or sound, most of the fish in the Great Lakes make their final attack by sight. Fish scents and noisemakers can draw fish to the area of the lure, but before they can strike, fish must also be able to see it.



Water clarity change in Lake Michigan. The lines show the change in depth to which 1 percent of the surface light penetrated in April and August at three locations in Lake Michigan over a period of 18 years. Data collected by the EPA's Great Lakes National Program Office.

Water Clarity on Lake Michigan

The depth where 1 percent of surface light reaches, also called the euphotic depth, is the depth below which photosynthesis can no longer occur. At the euphotic depth, there is little light in the water column, and few colors are visible to fish. One carefully studied water body is Lake Michigan. The U.S. Environmental Protection agency has measured the amount of light at different depths at three locations in the Wisconsin waters of Lake Michigan since 1996, which means the role of invasive Dressenid mussels in filtering and clarifying the lake has been recorded for more than 15 years.

The graph above shows the change in the depth that 1 percent of surface light can reach in April and August. There is a trend of light reaching greater depths at all three sites–the water is getting clearer over time.

There are differences in the euphotic depth between seasons, with similar depths for the three stations in the spring. Early in the season while algae growth is starting, the waters are clear. In the summer there are differences between the stations, with more light absorbed in the water column and not reaching as deeply. Light reaches the greatest depths (~140 feet) in the southern part of Wisconsin waters and is reduced to the north near Sturgeon Bay (~80 feet).

– *Titus Seilheimer and Phil Moy*

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