

Upper Midwest: Where's Walleye?

Building Climate Resilience for Fish and Communities through Land and Water Conservation Projects

A Fishing Tradition

Clear, cool lakes and rivers are part of the fabric of life in the upper Midwest. Generations of anglers flock to their shores to fish, targeting both Walleye and Large-mouth Bass from Michigan to Wisconsin. Homes, resorts, cabins and farms dot the shorelines. Recreational fishing in Wisconsin is valued at over \$2 billion annually. Midwest fish can be the lifeblood of many towns that rely on vacationers and homeowners having the ability to catch a Walleye or other fish in their backyard.

Nothing beats the excitement of heading "Up North" to fish in the clear, pristine, cold lakes that are found near Bemidji, Minnesota, or the Boundary Water Canoe Area Wilderness on the Minnesota-Canada border where the beautiful (and tasty!) Walleye are found. The fishing season opener each spring triggers lines of trucks with boat trailers driving north of the Twin Cities to cabins or resorts in pursuit of Walleye. Some towns throughout the upper Midwest have large statues of Walleye and Baudette, Minnesota even trademarked the slogan "the Walleye Capital of the World!"

It Never Rains but Pours

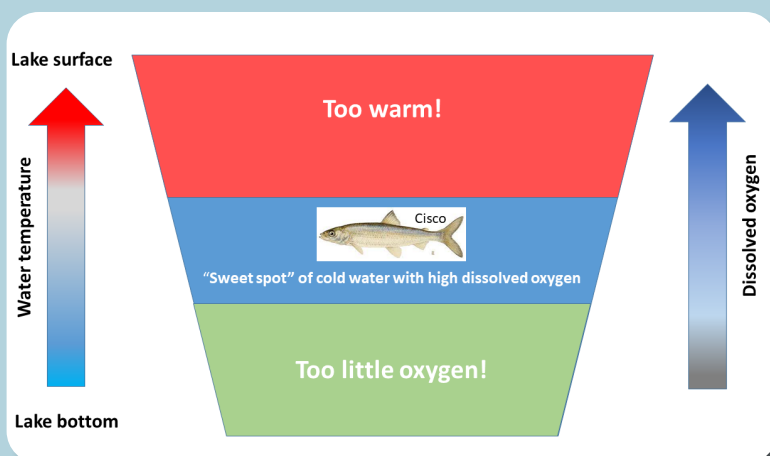
Anglers want to be able to fish frequently and catch big fish, but climbing temperatures, stronger spring storms, and heavier rainfall threaten the cultural heritage and economically valuable fishery. In a recent study of Wisconsin lakes, the number of lakes dominat-



When algae blooms die in a lake, they sink to the lake bottom and remove oxygen, creating hypoxic "dead zones" where fish can't survive. In many of these lakes, there is a sweet spot where the water is deep enough to stay cold but not so deep that oxygen is too low for fish to survive. Coolwater fish may need to go deeper to stay in the colder water, but if excess nutrients are using up the oxygen, there may not be enough oxygen in the deep water that is also a suitable temperature. Creating a buffer to absorb nutrients in watersheds, and protecting and restoring wetlands, will help ensure quality fish and fishing, but also healthy lakes and rivers that may be less prone to flooding now and into the future.

ed by Walleye could be reduced from 184 currently to about 17 in about 50 years!

Walleye are a coolwater fish—they are most likely to reproduce in cooler lakes and their growth is linked to water clarity. Lakes in Wisconsin have become warmer over the past 30 years and are expected to get even warmer in the future. Heavy rainfall events are predicted to double by the end of the century, leading to higher runoff and increased risk of flooding.



The reason for the decline in Walleye is complex but linked to (1) reduced Walleye reproduction and (2) loss of the Cisco, an important food source for Walleye in many lakes in the Upper Midwest. Cisco, a coldwater fish, is a canary in the coal mine for Midwest lakes and an indicator of good water quality. Coldwater fish may need to go deeper to stay in the colder water, but if excess nutrients are using up oxygen, there may not be enough oxygen in the deep water that also has a suitable temperature. When algae blooms die in a lake, they sink to the lake bottom and remove oxygen creating hypoxic "dead zones" and the Cisco can't survive.

With warmer temperatures, particularly during the spring, increasing runoff will flush more nutrients into lakes and rivers after heavy rains as lakeshores get developed with houses with green lawns, and farmers spread fertilizer on their fields. As these nutrients enter the lakes and rivers, they may create algae blooms and “pea soup” water clarity, impacting property owners, fish, and places for recreation like fishing and swimming, as well as drinking water that Midwesterners rely upon.



By the Numbers—Midwest Angling

- Recreational fishing in Wisconsin is valued at over **\$2 billion** annually.
- Fishing license sales in Minnesota rose **11%** in 2020, reaching their highest level in the past 20 years, and youth license sales were up **45%**.

Nutrient Runoff Fact: *Historic weather records also show climate change is leading to stronger spring storms that spur nutrient runoff from farms and lawns, which, in turn, fuel algae blooms in lakes. When those blooms die in a lake, they sink to the lake bottom and remove oxygen. The water layers prevent a replenishing of the depleted oxygen, creating hypoxic “dead zones.”*

LAND AND WATER CONSERVATION SOLUTIONS



Identify and protect the lakes believed to be resilient to climate change from other stressors such as habitat loss, invasive species, or overfishing to maximize the potential for continued Walleye production.



Preserving wetlands provides a range of benefits to fish, wildlife, and our communities. Wetlands act like nature’s kidneys and filter polluted runoff that would otherwise make its way to vulnerable fish and wildlife habitat and into drinking water. They also serve as buffers for dangerous flood waters and other extreme storm events and store carbon.



Decreasing nutrients into lakes and rivers by creating a buffer of vegetation along river and lake-shores can help create cleaner water that is better for fish and the communities that depends on lakes and rivers. Agricultural removal of trees and other vegetation along shorelines accelerates soil loss and increases runoff on the surface. Much like estuaries and wetlands in coastal areas, these buffers reduce pollution by filtering nutrients through vegetation, thereby reducing harmful algal blooms that use up oxygen fish need to thrive. Fencing to keep livestock out of the water and practicing no-till farming also can help create or maintain water quality.