Focus on Aitkin Area

Fisheries

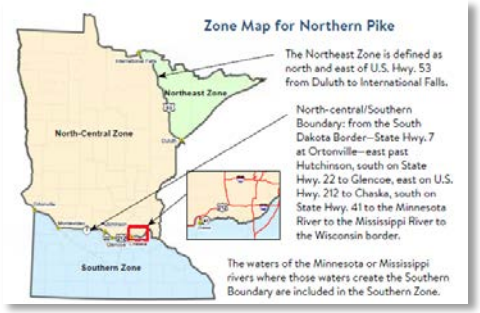
DEPARTMENT OF NATURAL RESOURCES

A NEWSLETTER OF THE MINNESOTA DNR AITKIN AREA FISHERIES OFFICE

JANUARY, 2019

Reminder… New Pike Regulations!

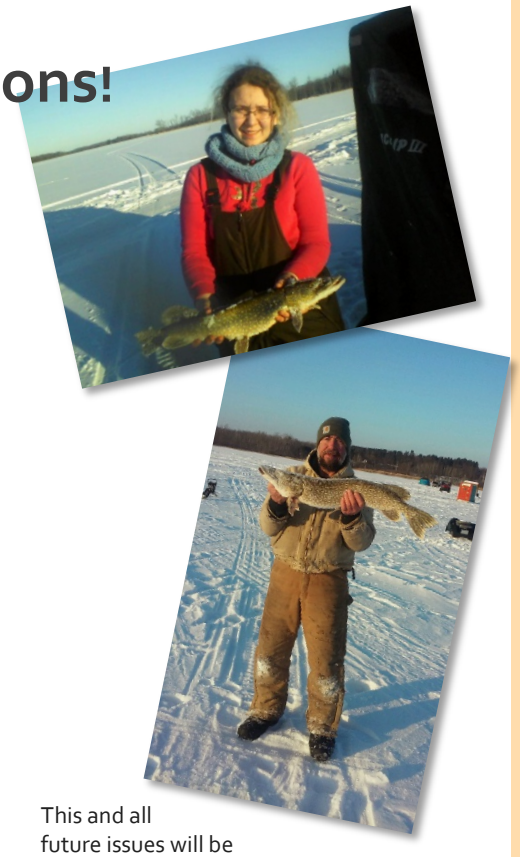
This is a reminder for all of you pike anglers and spearers. The statewide regulations have been in effect almost a year now; changed to the new "Zone" regulations for pike. See regulations synopsis or DNR website for any special regulations that still



exist, as they take precedence over the zone regulations. As you can see by the map, our area is entirely within the North-Central Zone, where the regulation *is* as follows:

Angling: The limit is 10, with no more than 2 over 26", and all from 22-26" must be immediately released.

Dark-house spearing: The limit is 10, with only 1 between 22-26" or only 2 over 26".



This and all future issues will be posted on the Aitkin Fisheries website at: DNR FISHERIES LINK. I look forward to your feedback and suggested topics for future issues. You can contact our office by email at aitkin.fisheries@state.mn.us.

TINY TIDBITS

There are hundreds of species of Mayflies. While many do emerge in their namesake month, others emerge in nearly every month of the year.

Did you know? … Mayflies live most of their life underwater. Only after one to three years of aquatic living do they emerge into their adult form. Then they only live long enough to mate, deposit fertilized eggs, and then die. Often all that occurs within just a few hours.

Larval Mayflies are an important year-round diet item for many fish, whereas the adults are only available for a very short period of time. This larval Mayfly makes its living by grazing while crawling on rocks and logs.

"GRUMPY" TECH TIPS

By Kris Nissen

Hi, my name is Kris Nissen, I have been a Fisheries Technician at Aitkin for eleven years. While most of our field work is during the open water seasons, we occasionally need to work on the ice. Between work and my own personal ice fishing with a portable flip over style fish house I like to stay mobile. I also like staying warm. Doing so in sub-zero temperatures can be a trick, but I have found that propane "buddy" or "sunflower" style heaters work really well to keep you comfortable. However, I do get really grumpy after a long walk or snowmobile ride to my fishing spot and find that my "buddy" heater doesn't want to work!

Popular portable "buddy" style propane heater used for ice fishing.

One of the most important tips to keeping your "buddy" style heater working is to keep the ignitor area and ceramic plates dry. If your heater falls off your sled into the snow, or if spray from your snowmobile accumulates on your heater you might be rather cold until you can get it dried out.

You can also give your heater a little tune up with some simple cleaning and maintenance. I learned how to do this from a You Tube video from the manufacturer of my "buddy" style heater.

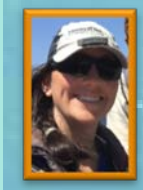
Pilot flame should be blue and sharp, indicating the pilot thermal couple is clean and operating properly. Click on the image to link to a You Tube video on maintenance.

1. Clean the grates and intake vents by vacuuming or by blowing with a compressed air computer duster.

2. Inspect the pilot flame. It should be blue and sharp. If the pilot flame is yellow, you should clean the pilot tube. Carefully remove the metal grate in front of the heater to gain access to the pilot tube. Take a cotton swab and remove some cotton from the end so it will fit in the pilot tube. Dip the altered cotton swab in isopropyl alcohol, then thoroughly clean the pilot tube with the cotton swab. Using the extension on a compressed air computer duster, blow out the pilot tube.

3. Reinstall the grate and give it a try.

I sure hope some of these tips help to keep your heater working and you fishing in comfort.



Limnology Basics: Dissolved oxygen

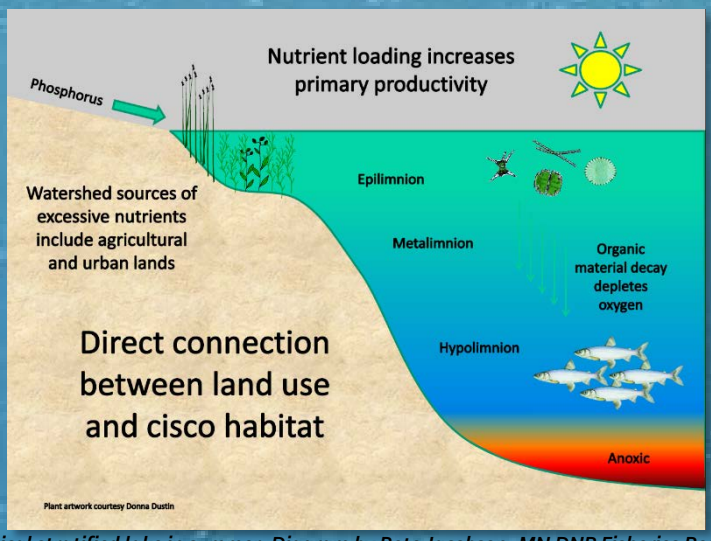
By Alisha Hallam

Dissolved oxygen is essential to most forms of aquatic life including fish, invertebrates, bacteria and plants. These organisms use oxygen similar to the way organisms on land use it. Fish obtain oxygen for respiration as water passes over their gills, while plant life and phytoplankton require dissolved oxygen for respiration when there is no light for photosynthesis. The amount of dissolved oxygen needed varies from creature to creature, and the dynamics of oxygen distribution in our lakes helps us to understand the distribution, behavior, and growth of aquatic organisms.

Dissolved oxygen enters water through the air or from plants as a byproduct of photosynthesis. Through the air, oxygen can diffuse across the water's surface, or be mixed in quickly by aeration such as with wind and wave action (especially during fall and spring turn over), rapids, waterfalls, ground water discharge or other forms of running water. Photosynthesis mostly takes place underwater wherever light wavelengths are able to reach. During the process of photosynthesis carbon dioxide is absorbed and oxygen is released while at night plants utilize oxygen and release carbon dioxide. Therefore, oxygen levels will peak during the day and decline at night.

The solubility of dissolved oxygen into our lakes is most affected by temperature and pressure. As water temperatures increase the solubility of water decreases. As pressure (atmospheric and hydrostatic) increases so will the dissolved oxygen. For example, a colder, deeper lake will be capable of holding higher concentrations of dissolved oxygen than a lake that is warmer and shallow. With both temperature and dissolved oxygen playing a role, water densities are variable and will cause some lakes to stratify.

Lakes typically stratify into three layers commonly known as the epilimnion, metalimnion, and the hypolimnion. The epilimnion is the least dense and uppermost layer that remains warmest during



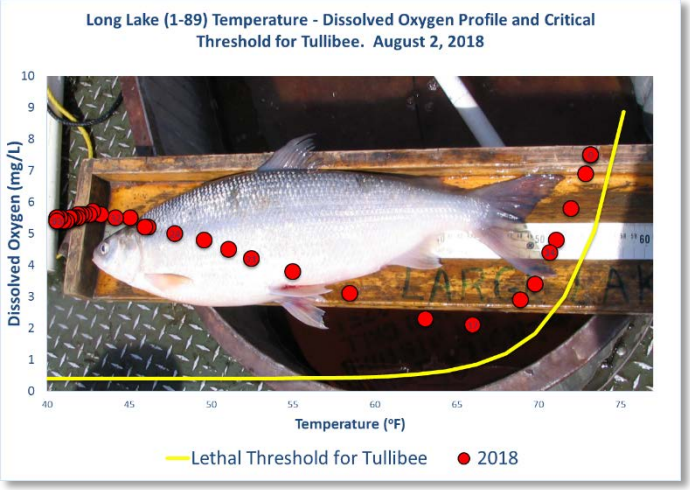
Cross section of typical stratified lake in summer. Diagram by Pete Jacobson, MN DNR Fisheries Research Supervisor.

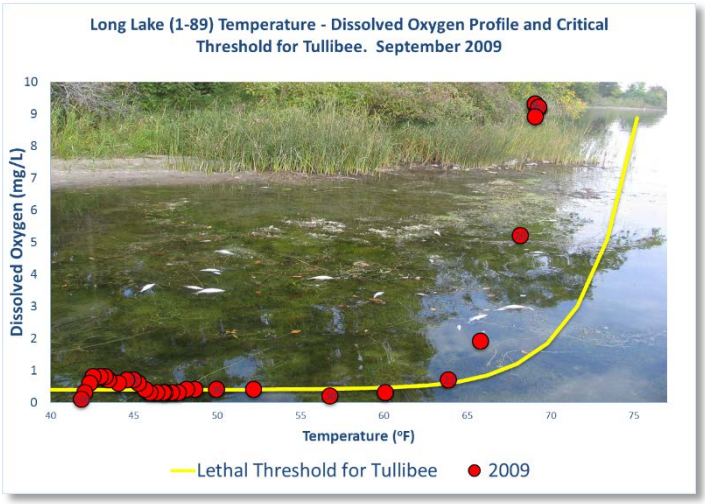
Limnology Basics: Dissolved Oxygen Continued

openwater months. The metalimnion (often referred to as the thermocline) is the middle layer, which is a transitional layer where temperature declines at the greatest rate. This is the cold water that you might feel when swimming and you dive to a slightly deeper depth or even when you just lower your legs. Below this level is the hypolimnion. This is the coldest and densest water in the lake and where the water sometimes becomes anoxic, meaning there is little to no dissolved oxygen.

Freshwater fish vary in their requirements for dissolved oxygen. Northern Pike, Yellow Perch, Bullheads and Fathead Minnows are very tolerant of low oxygen levels, especially when the water is cold (i.e.winter). Whereas Species like Bluegill, Largemouth Bass and Walleye require higher oxygen levels, even in winter. This is why these species are more susceptible to "winterkill". Coldwater fish such as Trout, Burbot, Lake Whitefish, and Tullibee are most affected by low dissolved oxygen levels in warmer temperatures. In some years, summer temperatures either exceed the thermal tolerance for these species, or oxygen levels in their preferred temperature range is too low. This can result in what is commonly called a "summerkill".

In Aitkin County, we have a number of lakes where we annually collect temperature-dissolved oxygen profiles (TDOs) as a means of monitoring Tullibee habitat. We do this because Tullibee are an important prey species for Northern Pike, Walleye and Muskellunge.



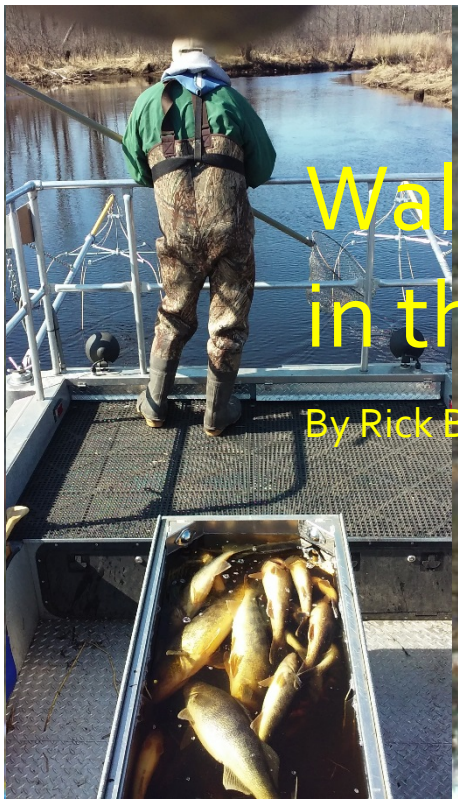


***Above:** Temperature and dissolved oxygen compared with lethal threshold for Tullibee at Long Lake in August of 2018. This is an example of good oxy-thermal habitat for Tullibee. Note that depth measurement is inset in the red mark for various depths. **Below:** Same figure for Long Lake in September 2009, showing very poor habitat for Tullibee, and which resulted in a summerkill.*

These TDOs are an important tool in the long term monitoring of changes taking place in lakes over time. Two of these changes that can affect water temperature and dissolved oxygen are climate change and changes in the watershed. Increases in average temperatures result in warmer water getting pushed deeper in the water column (in other words – pushing the thermocline deeper and deeper). At the same time, changes in land uses can result in increased nutrients running into the lakes ultimately resulting in greater aerobic activities in the deepest waters resulting in more anoxic water in the hypolimnion. The results of this combination is less habitat for cold water species like tullibee.

Part of our work in DNR fisheries includes collecting TDO information on area lakes. While we do so on every lake we test net each year, we also collect these data on a subset of lakes that have Tullibee. Aitkin County lakes are on the southern edge of the range for Tullibee and some of these lakes have rather limited suitable habitat. To evaluate this habitat we compare the data from the TDOs with the Tullibee lethal threshold values that were developed by one of the DNR researchers. Temperatures and dissolved oxygen levels that fall to the left and above the lethal threshold are considered the oxy-thermal habitat where Tullibee will likely survive; whereas, habitat that falls below or to the right of the curve will likely have higher Tullibee mortality (see pics).

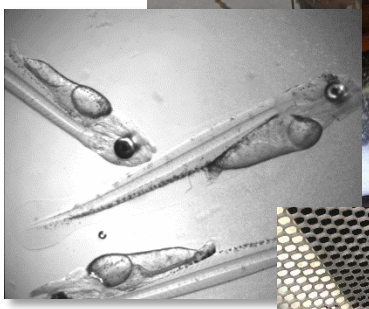
I hope this helps you understand the importance of dissolved oxygen in our waters.



Walleye Natural Reproduction in the Aitkin Area

By Rick Bruesewitz

Walleye are an important species in Minnesota (*State Fish after all!*), including in the Aitkin Fisheries Management Area. Walleye that anglers catch in the Aitkin area, like most areas of the state, are made up of fish both stocked and of fish from natural reproduction. The key criteria for Walleye reproduction are: appropriate ***habitat*** (physical, thermal, and chemical), adequate ***spawning stock*** (eggs), and good ***survival of fry and juveniles*** (requiring adequate food for the young Walleye and good alternate food sources for larger Walleye and other potential predators like Northern Pike or even Bluegills). Not meeting any one of those criteria, will result in poor natural reproduction.



Of all the Walleye lakes in the area, only Big Sandy is still managed exclusively with natural reproduction. It still has excellent habitat and low densities of predators such that juvenile survival and abundance is very good.

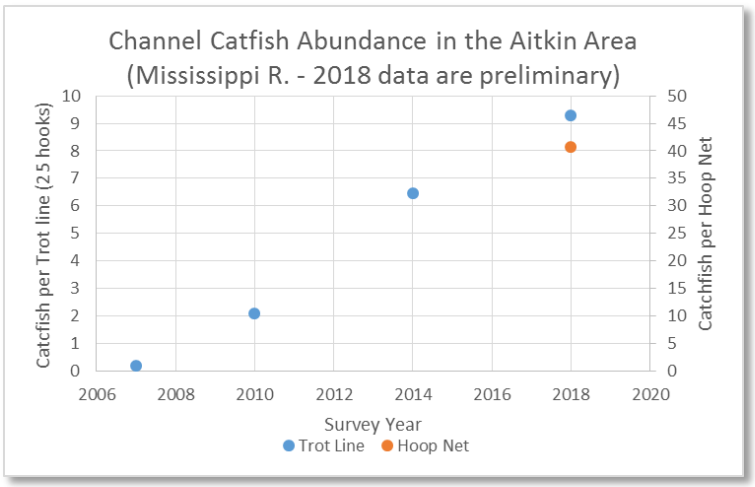
Other lakes that historically have had significant natural reproduction include Lakes Minnewawa, Horseshoe, the Ripple River chain (especially Ripple and Hanging Kettle), Hill, Dam, Clear, Gun, and Round (west of Palisade). Of these lakes, Lake Minnewawa and Horseshoe were the last to go to some type of stocking regime. They had been managed with natural reproduction since 1982. While many of these lakes are still excellent walleye lakes, some have changed and no longer have acceptable levels of Walleye. Losing natural reproduction generally means a tough go, and population levels will generally be lower, even if we do stock. This is one reason why we emphasize good riparian management– because once we lose the habitat, getting it back is nearly impossible.

Mississippi River Catfish – 2018 Survey

By Greg Berg

Here's the scoop on Aitkin County catfish. They've been here for a while now and it appears they're really liking it!

Channel Catfish (*Ictalurus punctatus*) have been present in fishable numbers downstream of the Brainerd Dam for decades. There is a strong feeling that this population originated from early stockings on the Crow Wing River. The dam in Brainerd is a barrier for fish passage so early on this was the farthest point upstream on the Mississippi River that catfish were supported. Beginning in the late 1990s, catfish started showing up on the end of angler's lines in areas above the dam. The first reports of anglers catching catfish in Aitkin County began to surface in Aitkin County in that same time period and through the early 2000's. It is unknown how they came to be in the river above the dam, but speculation is that they were introduced by anglers. In 2007, the Brainerd fisheries crew observed three catfish in Rice Lake Reservoir – just upstream of the dam. In that same year the first of four surveys targeting Mississippi River Channel Catfish was completed in Aitkin County. A stream survey conducted in 2007 confirmed there existence with 4 catfish that were sampled by MNDNR fisheries personnel. A follow up survey in 2010 captured 22 catfish with a similar amount of effort. A couple of different size classes were present in that second survey indicating that natural reproduction was probably occurring in the river. In 2014, a comparable survey was conducted yielding 58 catfish with a variety of sizes confirming that the population was indeed expanding. These first three surveys were confined to a rather small stretch of river within about 5 miles on either side of Aitkin. In 2018, however, a large scale effort encompassing the entire length of river in the county was completed (as well as in Crow Wing and Itasca Counties from dam to dam). In Aitkin County, there is approximately 100 river miles, so you can imagine it was a bit of a daunting task.



Trot lines have been the primary gear used to evaluate the fishery in Aitkin County and are widely used to sample catfish in other waters as well. In case you are not familiar with trotlines they are essentially what some would call "set lines". The lines themselves are 150 ft long and each of them has 25 dropper lines with a hook on each one. The lines are baited with a piece of cut redhorse sucker and are set in the river overnight and checked the following day. One end of the line is staked to the shore and the other end is fastened to an anchor which is out in the river channel. The lines are set approximately perpendicular to shore. Trot lines are actually a legal way to fish in some states, however they are illegal in Minnesota and may only be used by government agencies for research purposes.

Another sampling gear, called hoop nets, were also used in 2018, and are another common way to

sample catfish in the United States. The nets have a large open "hoop" on one end for the fish to swim into then there are several tapered funnel like hoops leading back to a pot which they can't escape from until the net is lifted. There is an anchor on either end of the net. When the net is set it is oriented with the pot upstream. In some surveys bait is placed inside the net before it is set, however for this survey nets were set un-baited.

In this survey a whopping total of 1405 Channel Catfish were sampled!! Keep in mind this was a much larger survey than what had been done in the past. Trot lines sampled 464 catfish while hoop nets accounted for 941. There were 50 trotlines set throughout the survey for a catch rate of 9.3/line and the catch rate for hoop nets was 49.5/net. In general trotline catches seemed to fish more consistently while hoop net catches were more boom or bust. Combining both gear types channel catfish ranged in length from 8.2 to 30.3 inches and averaging 17 inches. Trotlines tend to select for larger fish while hoop nets are not as picky about the size of fish they catch.

"So how's the catfish fishing?" you might ask.

Well……. it's pretty good and relatively easy too. It doesn't require a lot of fancy or expensive gear and can be quite relaxing.

Traditionally people fish from shore or a boat that is anchored in the river and let their baits sit right on the bottom. Common baits used are night crawlers, cut bait, frogs, stink bait and a multitude of others too. Catfish can get big and are good fighters so you'll want some reasonably strong terminal tackle and rod/reel combos. In general you will see an increase in feeding activity during the lowlight periods but they are active during daytime as well. It's a good idea to move around until you find some active fish, for instance, fish in a spot for a half hour to 1 hour and then move on if nothing is biting. Catfish angling has gained some popularity in the county but there is not a lot of fishing pressure directed toward them at this point in time meaning there will be plenty of fishing spots available.

The rapid increase in abundance of the catfish population is typical of many populations when reaching new environments. It's hard to predict what will happen with the population but I would guess that at some point the population growth will level out and will reach some equilibrium at a lower level of abundance than what we are seeing now. Channel Catfish have also been confirmed in Big Sandy Lake, which they likely accessed during a high water event in 2012, when river and lake levels were near equal and flow was low enough such that they could get through the lift gates of the Libby Dam. To date we have not sampled catfish in Cedar Lake which has a direct connection to the Mississippi River through Cedar Brook. Fisheries personnel will continue to monitor trends in the channel catfish population at regular intervals into the future. At this point in time, channel catfish inhabit the entire length of river between Brainerd and Grand Rapids in good fishable numbers.