



CENTER LINE

A Publication of Waukesha County's Retzer Nature Center

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LONG GONE FISHING

Hard to believe it's been over sixty years since I have gone fishing. Nevertheless, pleasant childhood memories magically floated down-stream, when discovering a Wisconsin Fishing Report tucked in the centerfold of my Wisconsin Natural Resources publication. Childhood memories were in the decade of the Great Depression. I was never aware. Time was a simple time, and I should add it was a simply wonderful time. With hook, line and sinker, a companion cane pole, an assortment of corks, maybe a new red and white bobber, and this fisherman was ready for some action!

I remember this decade as a span of summer vacations spent on lakes, up North, at cabins in the woods, with freedom to revel in nature's surprises. In these settings, I learned to set my cane pole in order, attach the hook, line and sinker, and screw on wiggly baits of minnow or night-crawlers to the hook. Remembering these old times always gives me pleasure. With that cursory dip into the 2012 Wisconsin Fishing Report, the red and white bobber disappeared into waters of now famous Wisconsin fishing spots. Silver Lake, Wolf River, the Rainbow Flowage, and Eagle River's Chain of Lakes, were mentioned. Deep in the woods, the lakes of Tomahawk and Clearwater were also brought to mind. In childhood, I had fished in all of these places, and even pulled out a few big fish that measured "keepers"!

Up to date statistics show there are at least 2000 species of fish found in North American waters. Nine-tenths of these species are in a class considered bony fishes. That is, their bodies contain a skeleton made mostly or entirely of bone. As fishermen's luck would have it, Wisconsin's bony fish can all be found in the thousands and thousands of lakes and rivers that fishing aficionados frequent year-round. A few facts about the bony catch: Bony fish are cold blooded and they breathe by means of gills. On each side of a bony fish a gill cover protects each gill. They also have an internal Organ, that helps the fish stay buoyant, which is called a swim bladder. An interesting habit of the bony fish, they generally spawn rather than mate. After the females shed the eggs from their bodies, the males then will fertilize them.

Equally important in identifying Wisconsin's fish fry is in the position, size, and structure of their fins. Fins of a bony fish are usually made of thin membranes supported by rods. Rods are either hard, pointed spines, or flexible, softer rays. This adornment is especially important in the identification of a catch. Dorsal fins of larger Wisconsin favorites—Largemouth Bass, Smallmouth Bass, Walleye, Northern Pike, and Musky, all are species dressed in designer duds. Placement, fit, and sculpture of the dorsal fin give the bony fish his strutting style. Arrangement of the pectoral fin, the pelvic fin, and the anal fin, also add to this style, while the tail fin will put a flutter in the angler's line. Silhouettes of the Largemouth Bass and the Smallmouth Bass are almost identical in size, placement, and number of fins. Walleye, however, carry the same number of fins, but size of the dorsals are much larger, and their shape sculpted more openly. Pelvic fin and anal fin placement is farther apart, and the tail fin is thinner with a more pointed "V". Northern Pike and Muskellunge, noticeably larger than bass or Walleye, have their dorsal and anal fins in front of their tail fins. Pectoral and pelvic fins are spaced further apart. The shape of these classic Wisconsin fish finds them almost twins when in profile. Pike and Musky also have duck-like heads and long pointed jaws, with many sharp pointed teeth. Both have the stare of a feisty game fish. Aid in identifying the catch can also be found, noticing color shades and, markings. Is the fish dark green or black? It is spotted or barred, maybe have a lateral line, or a stripe down the side? How about the underbelly, pink or white? This color key will vary with the seasons and the water temperature. Sex, age, even the mood of the fish is involved in this variation. Sounds like a warm-blooded trait. It has been noted that a fish out of water fades rapidly! One last aid before you weigh in the keeper. Does this fish have scales?

If memory serves me correctly, the decade of summer vacations spent in Northern Wisconsin woods, living in small log cabins embraced by Mother Nature, will forever resonate incredible memories. On a scale of 1 -10, an 11 will always break the scale. Surrounded by nature, of all things, one learned to swim, work the oars of the cabins rowboat, and practice a technique called baiting your hook. All this activity would culminate in an art form called fishing. All aforementioned fish were caught in Wisconsin's now frequented fishing spots. Fish were landed using a sturdy cane pole and a simple hook, line and sinker. Bait consisted of worms or minnows. Worms were grabbed off the grass the evening before. Minnows were scooped from waters near the pier before rowing out in the early morning hours.

Reminiscence of childhood experiences on Wisconsin waters remains a constant. Being surrounded in the nature of things is a privilege. However, being able to remember these early decades in my life is the miracle. Although summer vacations were always exciting, they were short periods in the yearly span of time, so Wisconsin waters closer to home, which was then Milwaukee, became the element for many weekend picnics, which always included fishing. Small lakes like Waubesa, Wind and Geneva come to mind. Delavan, Nemadji, also Beulah are remembered. In these little lakes our family fished for smaller fish. Pan fish they were called, and that's were they ended. Panfish included Crappie, Yellow Perch, Bluegill and Pumpkinseed. Pumpkinseed and Bluegill have sharp spines at the front of the dorsal and anal fins. Their bodies are slab-sided, heads are blunt, and gill covers have bright earflaps. The Bluegill and the Pumpkinseed are pudgy, brightly colored fish. We called them sunfish and they are almost too beautiful to eat. Bluegills are not fussy about their diets, and they have the habit of sucking in their prey, rather than striking at it. One can always use the red and white bobber.

Yellow Perch have slender bodies, with many sharp spines at the front of the dorsal and anal fins. Dorsal and anal fins have only one or two weak spines in the makeup. Scales are rough. Perch prefer cooler waters, so they will be found in the deeper parts of the lake. A valued thought: Perch move about in schools just like the kids fishing. They also move in numbers, so if you caught one, chances are you could catch another.

As of this day, crappie fishing remains popular in springtime, when the male fish will strike at anything that plunked near their nests. Summer and fall finds the crappie searching for deeper holes, or hiding in more sheltered brush. Sunken logs or submerged weedy growths would be excellent spots to toss the red and white bobbers. Crappie, nevertheless, is a fish for all seasons. Crappie will be out and about even in the coldest of Wisconsin's winters, so ice fishing can be the sport for fishermen who aren't afraid of freezing their chips. Chances are they will go home carrying a fine fish fry at one end of the stringer. Profiles of the Bluegill, the Pumpkinseed, and the Crappie, are somewhat similar, but there are slight variations in the shadows cast in the mottling of their fins. However, if I may repeat myself, the four fish mentioned are still called pan fish, and that is where they all will end.

I remember my dad always saying, if you gonna eatum, you gotta cleanum. These conversations always took place after the fun part of catching um. Dad always handled the chore of cleaning the pan fish at the end of our stringer. I watched thinking "that looks like it would be fun!" When old enough to handle the fish scraper and the small jack knife in dad's fishing box, cleaning fish became a chore we shared. Removing scales; off with the heads gutting, and finally rinsing. Then all were ready for mom's frying pan. The fun scale ratio, however, lessened in proportion to the weight at the end of our stringer!

The one fish different from the others, in more ways than one, was the Freshwater Catfish. My limit, if there was one at the time, was always caught in Wisconsin's Eagle River area. This was a spooky-looking fish with whiskers around its mouth. Their whiskers are called barbels. Their dorsal and pectoral fins have sharp, hard spines at their fronts and the catfish will use this armor to defend the territory. Another peculiarity is the lack of scales. Their skin is smooth as silk and dark as night. The dynamic species of catfish we called Bullheads. Many bullheads were pulled up from muddy lake bottoms as they probed with their whiskery barbels to locate food. Cleaning the bullheads always remained a problem for me. One had to make a cut around the head and peel the skin down from the body with pliers. It was double duty work for a young kid. Nonetheless, the bullhead fry was a tasty treat at the end of a wonderful day.

Wrapping up LONG GONE FISHING brought nostalgic memories back from a long gone past. A decade of growing up, while the Great Depression wore itself out, revised so many comfortable moments in the lap of nature. However, it's been over sixty years since I've gone fishing. Add a few extra years to the mix since spending time in a northwoods cabin. Quality time, in a natural setting is now found ambling along the Brandybrook, or Vista sitting near the Nature Center. There are times, however, before heading home, that I will stop by the Nature Center Aquarium and give those Wisconsin fish a high five!

See you on the trail,

Shirley Blanchard

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NEWS FROM THE FRIENDS OF RETZER

The new sky watch platform and fire pit donated by the Friends was put to good use at the Wild Winter Night event on Feb. 2. Many toasted marshmallows and s'mores were enjoyed at the fire pit but due to cloudy skies the sky watching did not take place as scheduled.



During your next visit to Retzer check the pictures on the TV in the display area of the Learning Center. The Friends new trail camera has captured some interesting shots. We will continue to update it as we get new pictures.

We are in the planning stages of a May trip to the Aldo Leopold Center for our members. The tentative date is May 14th.

We have a very special guest planned for the Friends annual meeting and chili dinner on April 29th.

A second trip to Costa Rica, sponsored by the Friends, will take place in March. Because the first trip was so successful the second trip filled quickly. We trust that there will be as many good pictures and stories as our members got from the first trip.

If you would like to become a member of the Friends of Retzer Nature Center or find out more information about us you can check our web site at www.FriendsofRetzer.org.

*Jerry Strom
President— Friends of Retzer*

THE LAST PRAIRIE



Subzero

“Get inside before you freeze to death!” We have all heard, and perhaps even shouted, that famously overdramatic phrase—or some variant thereof. I suppose it is possible to actually freeze to death, but highly unlikely on the corner of 3rd and Madison Avenue. Oh well, mom was probably right, and at least you went to get your coat. Now, imagine there is no inside, and you already have all the ‘coat’ that you are going to get. Did we mention that it’s winter? This far north, winter is a very real hurdle for those creatures who either choose to stay, or are unable to leave. So, what’s a body to do? Adapt or die, that’s what! At first, this seems as theatrical as the above situation, but it really isn’t. Either Wisconsin’s wildlife (and by this term, I mean all flora and fauna that are on their own in the great outdoors) species find a way to deal with the cold, or they do not make it. The art of ‘dealing with the cold’ includes some amazing physical and physiological techniques. Some strategies are obvious (fur, feathers) and we may touch on these, but we will attempt a deeper delving into the less than obvious mechanisms.

Peacefully Pass On: You probably already have the idea that we are not going to deal much with migrating fauna. You know, those fair-weather residents that cannot hack it here during snow season. I admit, it is one good strategy if you have the means and don’t mind the mileage. But we are focusing on those that remain. Shockingly, one of the main strategies to deal with winter is to cease living. This does not mean that one succumbs to the cold, just that the plan is to complete a life cycle before the frosts. Many plants and invertebrates simply procreate, enjoy the sun while they can, and then die, counting on the next generation to handle things the following year. Hopefully these species are happy enough with their brief lives. Say what you will, dying has worked well enough since the beginning of life as we know it.

Tough it Out: Let’s say expiring is not your grand design this year, and taking a long nap isn’t your cup of tea. If that is so, eat a lot of calories and take measures against the cold. Grow yourself a good fur coat or fluff up those feathers, and take shelter from the elements. Guard hairs and contour feathers protect undercoats and down, with structure and weatherproofing. This gluttony and insulation goes a long way in keeping winter wildlife warm and alive, but it is not the whole story. There are a couple of physiological magic tricks worth mentioning.

The first adaptation for those who stay active is torpor; safely slowing metabolism and actually dropping body temperature to reduce caloric loss for a relatively short period of time. Animals employ this strategy to deal with many problems (heat, cold, thirst, hunger). In winter, some birds such as Chickadees (*Poecile atricapillus*) enter torpor on a nightly basis (Chaplin 1976). The second technique we investigate is countercurrent circulation. Do you ever wonder why wolf paws don’t freeze? They are warm-blooded after all, but those paws tread over some awfully cold surfaces. In short, arteries in the legs are in the middle, running blood down to the paws as close to the center as possible. Veins in the leg corralling blood back to the body core are tight to the arteries; close enough that heat transfers from artery to vein. This cools the blood traveling to the extremities (paws), and warms the heart-bound blood traveling back to the pump. The result keeps the paws warm enough to avoid frostbite while minimizing heat loss (Ninomiya 2011).

How canines and others (some birds are known to have this vascular structure as well as Beavers' tails) who walk on ice deal with the discomfort of the cold is less known. They may not have as many pain receptors, and staying outside as the weather turns may toughen-up those pads. Heaven knows my couch-loving pooch is a cold-weather wuss.

Siesta: When the weather gets really bad out, sometimes the best strategy is to stay inside and do nothing, or maybe take a good, long nap. Sometimes this is called estivation or aestivation—a state of inactivity and reduced metabolic rate in fauna, which is relatively longer in duration than torpor. Also, a body in estivation utilizes stored energy where torpor tends to use recently consumed calories. Some declare that estivation is specific to hot or arid situations, where animals shut down due to lack of water or extreme heat. This is the most accepted view in the profession. So, we may claim our own napping creatures are in winter rest (or *Winterruhe* if you prefer German). Some also call this false hibernation, or even torpor; the latter in direct conflict with the definition above. As you can see, it gets a little confusing, but just keep in mind the general concept and you'll be alright.

Many northern humans are very fond of this strategy. So are Squirrels, Bears, Skunks, Raccoons, Badgers, and Opossums to name a few. The common denominator with winter rest is warm-bloodedness. They build up some fat reserves (not as much as true hibernators) in the summer and fall and get to sleep when Jack Frost visits. On outright inhospitable days in winter, these animals slumber with very reduced heart rates and a somewhat reduced metabolism (Stokes 1976). That is the big difference with aestivation and hibernation; metabolic rates only slow a little compared with hibernation, where you have to 'jump-start' your entire body come spring. With their bodies on 'stand-by', it is much easier to wake up for the nice, warm days that come along every so often and enjoy the good weather.

The Deep Sleep: These individuals are definitely down for the count. Don't bother trying to rouse them if you don't want to be disappointed (and anyway, it's just rude). Ground Squirrels, Woodchucks (including Punxsutawney Phil), Bats, and some mice hibernate. The House Mouse (*Mus musculus*), White-footed Mouse (*Peromyscus leucopus*), Western Harvest Mouse (*Reithrodontomys megalotis*) and Deer Mouse (*Peromyscus maniculatus*) do not hibernate, but Woodland Jumping Mice (*Napaeozapus insignis*) and Meadow Jumping Mice (*Zapus hudsonius*) do for weeks at a time; they wake to urinate and eat from food stores, then go back to sleep. Most in this comatose group reduce their heart beats and metabolism to a fraction of their normal rates (as low as 3%), until temperatures warm again (Jackson 1961). Their own bodies drop very close to the ambient temperature of their hibernaculum—a protective shelter or residence during their dormancy, it can also refer to a bud casing on a plant. Their sleepy winter home stays slightly above freezing if chosen well, as long as it has enough insulation from the elements. The occupant(s) also still give off a small amount of heat. If the temperature drops too low for too long, it is possible for the sleeper to never wake again.

Mammals that hibernate start packing on the pounds in fall, raising their body weight an additional one-third by bedtime on average. Like Jumping Mice, hibernators need to rouse every few weeks to work their muscles and defecate. Raising one's body temperature by one thousand percent just to evacuate one's bowels seems costly, even for such a noble function. Brown adipose tissue (BAT) makes this possible. Let's back up a little, packing on the pounds means fat, but what kind of fat? Northern mammals have both white and brown fatty tissue.

The white fat can provide some calories and sustenance, but it is the BAT that packs a punch. It has more mitochondria and energy than the woefully inadequate white blubber. It has much more energy per unit weight, and BAT is the only thing responsible for thermogenesis without shivering (Cannon 2004). So, if you plan on waking up in the spring, check your BAT tank before you drift off to sleep.

Finally, hibernation is not an exclusive adaptation to cold environments. The Fat-tailed Dwarf Lemur (*Cheirogaleus medius*) is endemic to Madagascar, where it is out 'cold' for seven months of the year (Dausmann et al. 2005). There is also at least one bird known to truly hibernate. The "Sleeping One" as the Hopi name it, or Poor Will (*Phalaenoptilus nuttallii*) displays utter and complete lethargy for most of the winter weeks (Jaeger 1949).

Deep Ambience: On the ectothermic side, amphibians and reptiles use a slightly different mechanism. Brumation is similar to hibernation except the animal does not sleep as such. It's body shuts down and stops moving, wasting, and eating. The physiology is also different, although it is not really clear just how different. What is clear is that these herptiles (amphibians and reptiles) select a protected area with sufficient moisture, like a sedge root mass, hole in the ground, or buried in mud. If the mud is below the winter water, have no fear, dormancy in mud or water is no problem for amphibians, who can absorb oxygen through their skin. In the summer, a frog must use its lungs to take in enough oxygen, but not in the cold of winter (Oliver 1955). Mostly, these shelters remain slightly above freezing, and mostly, they need to stay that warm (Harding 1997). Most snakes experience high mortality beginning at four degrees Fahrenheit below freezing. They must get close to or below the frost line, which usually runs about 24-30 inches deep (Oliver 1955).

So what if your chosen place of rest falls well below freezing? Then, poikilotherms (another name for cold-blooded creatures) are in real trouble, but there are a few that can withstand cold extremes. Some herptiles use the 'avoid freezing' strategy, and some use the 'tolerate freezing' method. By 'avoid freezing', we mean that a body produces high levels of natural cryoprotectants (antifreeze), usually in the form of proteins, glucose, or glycerol. Many of these creatures will die if ice crystals form at their supercooling threshold. 'Freezing tolerant' individuals allow and even encourage ice to form in their bodies. They also produce large amounts of antifreeze, but also employ ice nucleating agents (particles that encourage ice crystals to develop) in the form of proteins or bacteria. This 'freezing tolerant' group distributes glucose in such a way to freeze their body fluids, but not their organs or cells (Edwards et al. 2004).

Both groups begin by lowering the amount of water in their bodies. When temperatures and/or photoperiod trigger dormancy, water percentages drop 25-50%, especially within vital organs (Oliver 1955). During this physiological dehydration, the animal's body produces glucose at up to one hundred times the normal concentration. Then, a given critter is ready to freeze almost two thirds of itself (Storey 2011). For example, here are some of our very own Waukesha County frogs that can literally freeze nearly solid, which by itself is no great feat (anyone can freeze nearly solid), but they can (and often do) survive! This is incredulity incarnate! Spring Peepers (*Pseudacris crucifer*), Chorus Frogs (*Pseudacris triseriata*), Eastern Gray Tree Frogs (*Hyla versicolor*), Cope's Gray Tree Frogs (*Hyla chrysoscelis*), and the famous frozen Wood Frogs (*Rana sylvatica*) all seem to think freezing oneself is a good idea (Layne and Lee 1995).

There are two interesting anomalies to the above information on cold-blooded vertebrates. First, the ever-present Common Garter Snake (*Thamnophis sirtalis*) can survive the freezing of a third of its body for two days without injury. The insane thing is that herpetologists could detect no cryoprotectants at all; one tough snake (Costanzo et al. 1988). Second, in stark contrast to most of the above, the Mudpuppy (*Necturus maculosus*) will remain active under the ice on our lakes. I know this because it will occasionally feed in the winter while one is ice-fishing—quite a surprise.

Invertebrate Interrupted: Like herptiles, insects and arachnids have no on-board heaters; they cannot use thermogenesis. Around November and December, most enter inactivity in a state called diapause—the specific type of dormancy used by arthropods and some fish. It differs in the chemical and physiological processes happening when they enter and exit their long rest; especially the exit part, although we are most definitely not going to discuss it here. There are also some unique stimuli that kick the whole thing off when compared to the previous methods. Photoperiod and temperature can make them sleepy, but arthropods can also enter the very same

diapause at a given life cycle stage. As usual, bodies begin storing away energy when conditions are right (or wrong, depending on perspective). This crowd stocks up on the usual fats, proteins, sugars and other carbohydrates. They may also add lipids to their exoskeleton for extra pliability and protection. Some, especially at predetermined life-cycle changes, even build their own shelter, as with a pupae casing or the more flamboyant cocoon.

Any overwintering larvae, pupae, or adult is again either freeze-resistant or freeze-tolerant when encountering temperatures lower than their internal melting point. I understand that's a little weird, since when you speak of 'melting point', you are usually talking about something that is normally solid, but freezing points vary here without the nucleating agents—it's all very scientific.

As you have now guessed, yes, some insects actually 'allow' ice crystals to form in their bodies, joining the insane group of organisms that wish to emulate ice cubes; they must have compared notes with the Wisconsin Frog Association. Someone should tell all these critters that freezing is dangerous. Remember that lettuce you forgot outside in January? Those flaccid, soggy leaves are the result of ruptured cell walls, courtesy of your friendly neighborhood ice crystal. Water expands when it freezes, and that could mean broken bugcicles.

But the Arthropod Association has its own group of antifreezes. One is quite literally antifreeze; ethylene glycol is probably in your vehicle radiator. They also use sugars and alcohols, making them the most adaptable of the anti-freezers (Kostal 2006). Tough little buggers!

A final thought on dormant invertebrates and you: resist the urge to bring a cocoon inside during the winter. A colleague taught me by example, that if you display a Cecropia (*Hyalophora cecropia*) cocoon in your office during the month of February, you will soon have an adult Cecropia Moth on your desk. He (the moth turned out to be male) was probably wondering something like "This is definitely not the tree I pupated upon" and "Where the heck are the female Cecropia Moths?!" This is bad for the moth (see above), and bad for you (Giant Silkworm moths secrete a fluid to dissolve an exit in their cocoons—Covell 1984).

The Others: A quick 'look' at some other wildlife. Many plants die back in the fall, but trees and shrubs must have their branches and buds survive the cold.

They mostly utilize the same sugars, proteins, and fats to help protect themselves, but they also have tough-as-nails cell walls surrounding the cell plasma membranes. Garden Slugs (*Deroceras reticulatum*), use antifreeze sugars as they overwinter in the topsoil, and can survive down to -5°C , but they also more effectively overwinter as eggs. Earthworms can survive down to -20°C . Clams and mussels just hunker down in the lake or river bottoms as usual, but can survive a little freezing, even down to -20°C . Overall, it is the arthropods that are toughest (down to about -80°C), with trees/shrubs of course able to survive even lower temperatures (Costanzo 2012).

In Conclusion: So there you have it. The main strategies for in situ winter survival are migration (pansies), death (martyrs), toughness (rough riders), semi-active (couch potatoes), dormancy (sleepyheads), and freezing (popsicles). Decide what approach will best help you endure the cold and settle down. We'll see you in the spring, when the weather outside is not so frightful.

Mike

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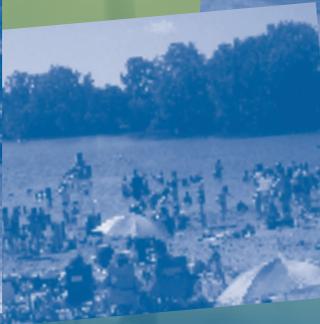
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Waukesha County
Park System

Get Outside Get Active - 13 reasons for 2013

- 1.) Watch spring come alive
- 2.) Hear the first robin of the year
- 3.) Your dog wants out
- 4.) Go camping and star gaze from your tent
- 5.) It's been years since you ice skated - no excuses, we have indoor ice rinks!
- 6.) Enjoy a game of golf at Moor Downs, Naga-Waukee or Wanaki Golf Courses.
- 7.) Hit the beach (ours open June 1st)
- 8.) Get back on your bike and enjoy the Bugline, New Berlin and Lake Country Trails
- 9.) Enjoy Retzer Nature Center...the trails, the programs, the special events
- 10.) Take the family on a picnic, then take a hike!
- 11.) To let your inner child out to play
- 12.) Get active
- 13.) Get healthy



www.waukeshacountyparks.com