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Volume XX, No 2 • September/October 2011

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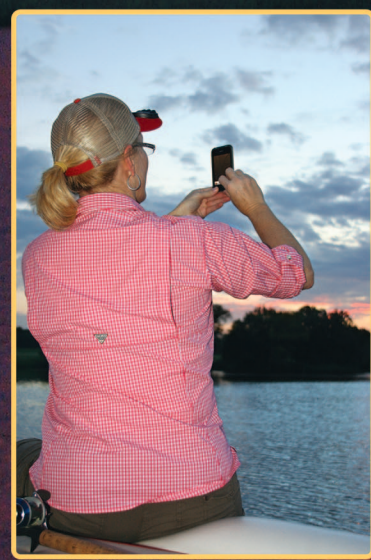
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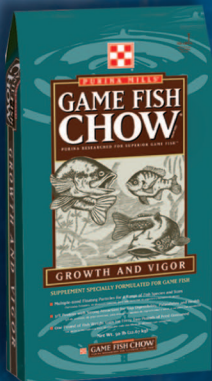


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Mike Otto cut his teeth working with heavy equipment as a teenager and has been at it ever since, for more than 35 years. Not only does he build fantastic fishing lakes, he also travels the nation as a pond building consultant. Reach him at mikeotto@ottosdirtservice.com or on his cell phone at 940.736.5333



Dan VanSchaik is a wildlife consultant working the private sector. He helps people design and implement wildlife plans and works with people desiring counseling about wildlife exemptions for property taxes. He is a 'hands-on' wildlife biologist and lives his passion to teach people how to be better managers of their wildlife resources. Reach him at danvtx@verizon.net



Dr. David Willis is head of the Wildlife & Fisheries Sciences department at South Dakota State University. He served as professor of fisheries and takes every opportunity to bring students outdoors to living ponds to gain practical experience. He and his students manage a number of private ponds in South Dakota. Dr. Willis also spends a good amount of time helping pondmeisters who dare venture into the Pond Boss discussion forums. Reach him at www.pondboss.com.



Mark Cornwell is a professor in the fisheries department at State University of New York in Cobleskill, New York. From foothills of the Catskills, Cornwell teaches fisheries with plenty of field trips for hands on experience. Cornwell works with a handful of private landowners and public waters, providing data collection services and analysis. He also assists with aquaculture projects with the college.



Eric West lives in Jackson, Mississippi. He's a natural resources attorney and ardent pondmeister. On www.pondboss.com, he's known as the "librarian." His uncanny ability to quickly find an answer is an asset to the website. He's also a strong researcher of scientific papers. Eric manages several lakes and ponds on his property near Star, Mississippi.



"**Bird Man Mel Toellner**" is the owner of Gold Crest Distributing (The largest "Wild Bird" distributor in North America), and Songbird Essentials (The fastest growing line of "Wild Bird Products" in North America). Birding is a passion, not just a business, with Mel. He has given hundreds of talks across the United States and Canada, and has been part of a TV Show "Animal Makeover TV" on "RFD TV" for the past three years. You can check him out at www.birdmanmel.com.

Editor
Bob Lusk

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Field Advisory Staff

Dr. Jeff Slipke, Greg Grimes, Dr. Dave Willis, Malcolm Johnson, Mike Otto, Mac McCune, Dan VanSchaik, Mike Mitchell, Mark Cornwell, Bill Cody, Dr. Bruce Condello, Cecil Baird, Gary Valentine

Business Administrator
Tonya Yanez

Layout/Design
Jim Stroud

Contributing Writers

Bill Cody, Richard Peterson, Dave Sefton, Bob McFarland, Cecil Baird, Brad Wiegmann, Dr. Michael Champ

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POND BOSS, Inc. reserves the right to refuse service to anyone regardless of race, creed, color, or favorite late-summer ice cream flavor. This issue we start the celebration with Labor Day favorites and end it with Halloween tricks and treats. Raise a toast to your big bass and tasty bluegills. Hear, here!

POND BOSS welcomes reader input. Please. We're on bended knee. Send electronic images, photos, short stories and new ideas for pond management and your most favorite bottle of wine (seriously, I'm still waiting for that good red wine) to: Editor: Pond Boss, P.O. Box 12, Sadler, Texas, 76264. We are always looking for fun stories and sharp smoky cheddar cheese to go with the wine. Or, e-mail the editor at pondboss@texoma.net.

Subscriptions: Home delivery is \$35 for six issues per year in the U.S., \$43 in Canada, \$77.00 in all other countries, free to the first pondmeister from Mexico with a United States mailing address and a bullet hole in his/her truck. Send photo of bullet hole.

Cover Photo: This photo begged to be taken. A late summer storm winding down at just the right time over Grand Lake at Eagles Nest Ranch, east of Athens, Texas.

Inset photo: Marj Witherspoon was taken with the sunset. She stopped fishing and savored the moment, while getting in a few shots of her own, with her iPhone.



From the Editor's Desk



A Priority That Really Matters...

by Bob Lusk



Here I sit, August 4, nestled in a cozy little cabin in Ruidoso, New Mexico. For three years, I've felt the need to escape, alone, and recharge for a few days. What better time, than when my home state of Texas, along with most all the south and too much of the Midwest sizzles in record heat? At home, the mercury looks like the speedometer of a NASCAR racer, during practice. 100-105...110 and then even 115. Those are big numbers for our part of the planet. Toss in the fact the lows in the morning barely scratch below 90 and we have serious issues, both socially and along the pond bank.

I started in the fisheries business in 1980... the last huge heat wave our region suffered. But, this one feels different. Never mind I was 25 years old and considerably less heavy. It seems this one is sucking our ponds drier faster than that monster spell 32 years ago.

There was a radio commercial the other day, hawking flea and tick powder for fish.

I must say, if the heat wave persists and no moisture falls, we'll see some interesting pond issues late summer, into fall.

In the meantime, in this cabin, I smell the freshness of a new rain through these giant pine trees. The high today barely made it into the 70's. My mind is peacefully at rest and still thoughtfully in motion.

I'm thinking of every one of you, our Pond Boss faithful. Wondering what you are doing to survive the Sizzle, or the Floods of 2011 or the political escapades we hear so often in the news. The stock market took a dive today, gold is soaring.

It's life. It's what we do. Every day, we live, we work, we think.

I admire all of you for fighting the good fight and I'll promise to keep fighting with you.

Last week, I spent almost four days with Drs. Dave Willis and Brian Graeb, from South Dakota State University. Dave is head of the Wildlife and Fisheries Sciences Department. Brian is a fisheries professor. They made the trek to LL,2 and we kept a stringent pace, looking at projects, touring hatcheries and facilities...and brainstorming, lots of brainstorming. We talked about environmental things. We talked fish production. We talked about genetics. Shoot, we even got to go catch a few nice striped bass in Lake Texoma...and promptly ate them for supper.

But, most of all, we talked about youth, students, those kids that are coming up the pipe. We talked about how all this practical stuff we were doing can apply in the classroom there at SDSU. A few times, I thought Brian was a kid, again. He went off our zip line, plunged into the bath-tub hot water of our swimming pond as Dave and I enjoyed a cold beverage...floating there ourselves. Brian can't wait to get in the classroom and teach. It's what he does.

I must tell you, these guys, all of us...all of you, sense the urgency to keep getting kids off the video games, out from in front of that electronic babysitter and out into the wild... even where the wild is managed. They need to learn to climb trees, tie knots, cook over a campfire, catch a fish...just be outdoors.

You feel it. We all do.

Inside this issue of your favorite magazine, be sure to read the plea to offer up any kind of support you can...good words, a place to fish, a check...to the I Support Outdoor Education movement. My good friend Alan Warren is spearheading a drive similar to the "Got Milk?" campaign from years ago to increase our awareness and to help get curricula into schools to teach outdoor education.

Sure, we have all the regular stuff, too. Birdman Mel reaches for the gold...goldfinches, that is. Walter Bassano preaches to the choir from his harvest pulpit. After a plea from one of our readers, I wrote a piece about managing a pond naturally. The fish professor sucks his two cents of blood with a story about leeches. Yummy. Brad Wiegmann made his way into this issue teaching you how to fish plastic frogs. Otto spends his time on compaction. Don't miss that. Eric West reviews the science between social interaction between channel catfish, largemouth bass and bluegills. Interesting science, that stuff. Dan V talks about the significance of feeding your wildlife, especially in times of stress...like floods and droughts. Speaking of those natural events, there's a story that explains what happens to your pond and its inhabitants during floods and droughts. And, be sure to set aside some time for Ask the Boss. I don't know what happened this time, but we got a flood of questions from all over the nation, with a heavy influence from Illinois. You'll get a chuckle or two, plus lots of practical tips you can use. So, welcome aboard this issue. Rear back, get a cold glass of tea, turn down the volume on the boob tube and let's share some good times!

Oh, and one last thing. In keeping with our 20th year anniversary celebration, we have a little gift for you. The very first Pond Boss centerfold.

Fish on!

Bob Lusk



Know Your Pond Life

There's More Than Meets the Eye...

by Bob Lusk



Pond life...two little four letter words that have an astounding meaning. As a professional consulting fisheries biologist, traveling the nation helping people with ponds and then writing about it, I'm constantly amazed at what's found beneath and beyond the watery boundaries of any given pond or lake.

Travel the nation and visit with people who ply their trade working with water. In Florida, aquatic plants dominate the mindset. In the Midwest, farmers have ponds to collect water draining from farm fields. In ranch country, landowners need water for livestock. In South Dakota, prairie potholes dominate much of the landscape of the eastern part of the state, into Minnesota. Waterfowlers cherish that water. Some areas have flood control lakes to slow the flow into the city. Urban zones have retention ponds.

But, everywhere, those ponds come to life. Where water gathers, an ecosystem develops. Not many people truly understand the

consequences of what happens. Our ponds and lakes, upward of 6.5 million of them in the United States, are not only their own, confined entities that are home to teeming populations of fish, plants and insects. They are staging areas for a much larger piece of nature's puzzle. Migratory waterfowl depend on our ponds. So does a variety of songbirds which make their way along migratory paths.

Where water gathers, an ecosystem develops.

Mammals depend on steady water sources to do what they do on the land which surrounds your pond. They drink, they eat, they populate. Without water, they don't.

Look at your pond as an entity, of course. But, also look at it as a vital segment of a much larger picture. With your pond, much, much wildlife is

supported. Step back from the pond and look at the water. See its pristine look? Now, raise your eyes a notch. Look at what grows around the edge. Nowhere else can that stuff grow. Cattails are nesting areas for red-winged blackbirds. Other birds gather their nesting material from plants that grow along the edge of water. Plus, that edge vegetation is habitat for a variety of amphibians and reptiles, too. Beneficial insects thrive in edge vegetation.

Now, raise your eyes a few more vertical feet. What do you see? See the next level? Typically, that's what we call the "riparian" area. Hardwood trees with some softwoods, too. Woody plants that need a little more water than the stuff further upland. Here, you'll see willows, cottonwoods, cedars which often yield to oaks, elms and others, depending where you live.

Next, raise your eyes another level, just a few more vertical feet. What's there? That's the upland area...grasses, forests, cultivated land, range and rangeland. That's the zone which



Left: Look vertically, in stages. See water, then marginal plants, then riparian areas, then upland. Right: Take a look at all the different habitat...all of it generated by water in your pond.

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All kinds of wildlife benefits from your pond. Credit Jim Stroud.

feeds much of the runoff from rainfall to nurture your pond and refill it.

Lastly, and certainly not least, look beyond the horizon, up, up. Blue sky. But, if your pond environment is anything like most of ours, you'll see a kingfisher, maybe an osprey.

You'll get your share of great blue herons and even some of those birds we don't care to have...cormorants and pelicans. Sure, they're beautiful, but they need to make their way onward to the coast or the bigger public lakes where they can make an honest living.

Now, early morning, cup of coffee next to you, sitting next to your pond, close your eyes and listen. What do you hear? Birds? Any of them sound familiar? Wind whistling through the reeds? Rustling noises of a squirrel hoarding a few acorns?

Without water, all of this is totally different.

And, the smells. The freshness of a new rain, the musty smell as your pond relieves itself of extra gasses, the scents of the different plants which call your pond their home.

My point?

Many of these vital signs of life, of healthy environments, would be absent if you were having coffee in a pasture. This is pond stuff... an area that not only supports itself, but supports a vast ecosystem which transcends its own shores.

You, as the steward, provide the stimuli and give the impetus to such a dynamic chain of events. Keep your learning curve steep, broaden your senses of what goes on under the water and understand that knowing your pond life benefits a chain of ecosystems much larger than your original target.

Oh, and sip the coffee as you smell the roses and see the sights your pond provides.



Feature

Harvest—A Must For Healthy Ponds

by Walter Bassano

Bass fishing rose to national prominence advocating the principle of “catch and release”. The well-intended philosophy was passed down through generations of anglers. But promoters of that noble movement left out one important caveat—“unless you’re fishing small ponds”.

Weekend after weekend, early fishermen visited their favorite lake. They caught numerous fish and proudly released them. No one thought much about those bass remaining the same size...weekend after weekend. They were having too much fun. Folks assumed the fish eventually would grow on their own.

After all, wasn’t it someone’s dad who professed, “Throw the little ones back, so they can grow”?

**After all, wasn’t it
someone’s dad who
professed, “Throw the
little ones back, so they
can grow”?**

Those were the days before pond owners learned new-fangled terms like food chain management. They thought Nature would provide unlimited minnows, crawfish, frogs, sunfish and other forage. Not true. We also must HARVEST predator species to achieve a balanced fishery whether it’s largemouth bass we seek or the most colorful of trout.

Pond management and fisheries consultants emphasize that ponds are confined impoundments. They are stocked and inhabited by highly efficient predators. If the predator population is allowed to outnumber and overpower the food chain, there can be only one unfortunate outcome.

Fish growth levels off, or worse, declines.

As fishermen do, they swap stories at the coffee shop or their favorite digs. One told of seeing bass jumping out of the water chasing dragonflies. His buddies chuckled, dismissed the tale, and awarded him Best Story of the Week.

A couple of weeks later, that fisherman visited the same pond. His earlier observation was not a fluke. Small bass still were chasing dragonflies. He hadn’t seen that around other ponds. Why here? He related the experience to other friends and one jokingly replied, “Maybe that’s all they had to eat.” Little did the gentleman know, he described a common condition. Too many bass. Too little food. The food chain couldn’t produce enough forage to feed the masses.

I’ll be first to volunteer for handing-out circulars encouraging thoughtful catch and

release of large-enough bass. I’ll also be first to grab a “bullhorn” and relate the importance of harvest. Close friends say I sound like a preacher when joining a conversation on the subject. I’m expecting one of them to give me a pulpit for a birthday present. I know I’m proverbially preaching to the choir on some management topics. For those of you who recently joined our congregation, many of our elder board will tell you “harvest” is the gospel according to pond managers.

Habitat is the first commandment of successful pond management. After food chain and genetics, I echo wide belief that harvest is the fourth commandment.

Ask a rancher why he runs 50 head of cattle in one pasture and 150 in another. He’ll tell you each animal must eat a scientifically calculated amount of food to gain weight. If



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the cow doesn't reach weight gain goals, the rancher doesn't make a profit. If he overstocks the pasture, there will be a food shortage. Cattle resort to eating leaves from trees instead of nutritional grasses.

The rancher also sells his calf crop each year to maintain a healthy herd number the pasture can support. Like cattle, fish are in a confined space. Small ponds provide a limited amount of food. We must harvest annual recruitment, like the rancher, so the bass feed trough is always full of plump bluegill.

Remember your kid's slumber parties? You couldn't keep enough food on the kitchen table. Young bass are the same. Think of them as teenagers at the party. They have insatiable appetites. They're in a fast-growth phase.

A marauding school of eight to 12-inch bass can eat a giant hole in a size-class of bluegill. Eight to 12-inch bass eat 1/4 to 3 inch sunfish. Before you realize it, that segment of the forage population is practically extinct for that moment. The bass haven't grown much, but the few surviving bluegill have. Soon, adult bluegill are too large for overcrowded bass to eat. It's a dismal picture for the bass, but occurs fairly often.

The good news is that, most of the time, there are enough adult bluegill to continue the



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This stringer of fish was purposely removed from a bass-crowded, 25 acre lake.



Do like this enterprising fishing club does. Bring a group, harvest fish and end with a fish fry.



This pond was overcrowded with sunfish. The owner bought a large seine and uses it faithfully to harvest bluegill to stock into his fishing lakes.

game...the game of reproducing again and again.

One of my favorite facts about bass states they must consume approximately eight to 10-pounds of forage to gain "just one pound". Imagine, it takes about 80 pounds of live forage fish eaten to grow and weigh eight pounds. If your primary sportfish fulfills only 50 percent of that requirement in one or two seasons, it will not reach full growth potential. Have you caught a bass and noticed the head was larger than its body? It should appear just the opposite. Food chain adjustments may get the forage train back on track, but under-developed fish cannot make up for the lost growing season(s) as an end gain.

Harvest policies should be determined by goals of your management strategy. Consult a professional biologist. If your goal is trophy bass, harvest fish 16-inches and under, after the

fishery is at least three, preferably into four, years old. Annual harvest should average 20-25 pounds per surface acre, spread out over an entire growing season. If your goal is a "quantity fishery", higher catch rates per hour, harvest 15 to 20-pounds of bass 14-inches and under, per surface acre.

Since crappie are predators, they should be high on the harvest list. Same for green sunfish, channel catfish, and other species with larger mouths which compete with bass for baitfish.

For other predator fish, such as smallmouth bass and trout species, harvest based on your goals and how well the fish reproduce in your waters. Smallies don't typically recruit in the same fashion as largemouth bass, so understand what they do in your waters. Same goes for different species of cold water fish. Some spawn, some won't. Some can, some can't. Those factors will influence your harvest

program.

It's not necessary to harvest your quota by May in any given year. But, sooner is better. With less competition, remaining fish will achieve better growth rates in short growing seasons. Plus, it's better to go into the spring and summer with fewer predators to give your food chain time to replenish over the growing season. Pond owners MUST harvest bass and other predator recruitment. If you take shortcuts or fail to enforce harvest policies, expect disappointing results in your management program over the long haul.

If you're not a big fish eater, find those anglers who can no longer travel to their old fishing hole. Surprise them with a bag of fresh fillets. Install a live box at the pond. Call the landowner or a neighbor and tell them to get the frying pan out and start peeling potatoes, supper's in the box.

If your 10 to 14-inch bass are healthy, contact an area consultant. Some of his customers may need to restock a missing age class or refresh genetics in an older lake. Sell the valuable bass surplus, if possible. Use those funds to buy another feeder and bolster your bluegill base. Hold a fishing tournament with buddies. Enjoy the harvest at a shoreline fish fry. If you have a large quota and too little fishing time, call the consultant. He can expedite harvest with an electrofishing boat. It will cost you a few dollars, but what's your fishery worth?

Does your lake manager recommend harvesting a percentage of adult bluegill? Transfer some to supplement forage in adjacent ponds. Stock 100 to 150 per acre in ponds with mature bass, where needed. Does your lake need more bluegill? Convert a one-quarter acre or smaller pond to a bluegill hatchery. Make sure it does not contain any fish, especially stray bass. Stock it with 25-50 adults in the spring. You'll have thousands of fingerlings by fall. Seine or trap them, move to your primary sport fishing lake, and send bass into a fall feeding frenzy. At the risk of sounding like a broken record, remember above-mentioned food requirements a bass must meet to develop normally.

Regularly sample size-classes of bluegill in your fishery. It's important to see a range of all lengths. Abundant bluegill in all sizes ensures feeding opportunities for bass of all sizes. If you suspect the bluegill base is out of balance, stock tilapia or threadfin shad for a couple of seasons, if regulations in your state allow. Bass will utilize those delicacies. By relieving feeding pressure on bluegill, they can rebuild populations.

Monitor harvest success by consistently sampling relative weights of bass. If your 16-inch bass weighs only two-pounds in the spring, sound the harvest alarm. If 16-inchers tip scales at two-pounds, four-ounces in the fall, congratulations, you've met standards of the American Fisheries Society.

Harvesting requires commitment. If you fish until dark, the last thing you want to do is clean fish when you have a two-hour drive home. I've been there. But some of my most memorable fishing experiences resulted from fulfilling harvest policies.

I got hooked on pond management before Webster's Dictionary recognized the term. I was a new member of a North Texas fishing club with a 50-acre lake. When arriving for my first tournament, the member managing our lake advised we must harvest all bass under 14-inches. He was serious! My initiation later that evening was helping clean more than 100 fish. His "serious enforcement" of harvest and forage policies created some of the best fishing

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I derive great pleasure from implementing management programs that improve quality of life for furry and scaly critters. While pursuing that passion, I've developed a keen awareness of monitoring a pond or pasture's ability to feed its inhabitants. If you have the opportunity to observe lake surveys, you'll soon join the cause. It's disappointing to see the potential of a beautiful pond go untapped.

Everyone's heard of Monday Morning Quarterbacks. I've been an armchair fish and wildlife biologist for many years. Some might

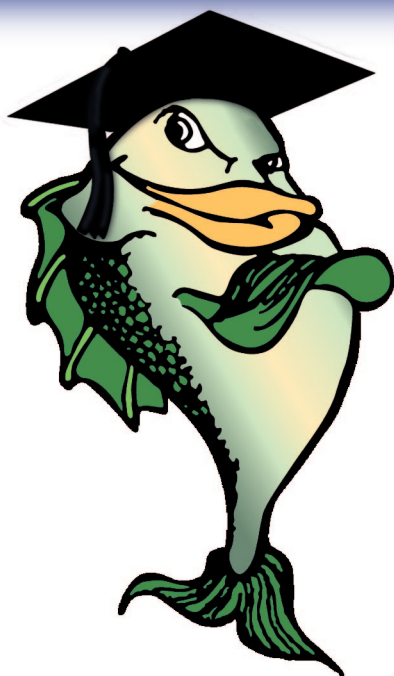
call me a "groupie" since I hang on every word from Bob Lusk, Dr. Dave Willis, Dan VanSchaik, and other Pond Boss contributors. I'm not sure how I missed being a biologist. I must have been one in a previous life. Surely, I'll be one in the next.

Next time friends say their fishing trip netted only small ones, share the gospel about harvest. It will improve their pond productivity and angling.

It should at least earn you an invitation to a fish fry.



Ask the Boss



Q: We recently added a homebuilt aerator to our pond using the idea that was published in the March-Apr 2003 issue. We have about an acre pond with an average depth of 12-14 feet. We had been having an average of about 6 to 10 fish die overnight after having some pretty warm weather...mid to high 90's followed by several thunderstorms that delivered some much needed rain. The first pump that we purchased didn't really work at the 12-14' depth, so we purchased a Hakko 80L pump which supplies air to 4 - 12" airstones. The temperature above the airstones was absolutely amazing after we got it submerged in the center of the pond, but in retrospect I am thinking that we created a pretty major turnover. Every morning since, when I go out to feed the fish, they are at the surface of the water struggling for air. We have a fair amount of coontail vegetation that has been progressively covered up by filamentous algae that doesn't look like it is doing very well (mostly yellowish brown instead of green). I had been pulling some of it out daily to try to reduce some of the vegetative growth in the pond, but stopped when the fish started turning up dead. My husband and I are newbies to owning a pond, and for the first year and half used copper sulfate to control the algae. This spring I added about 15 bags of barley straw which is probably very ripe also...The pond is stocked with bluegill, wide mouth bass and catfish. We had two huge catfish that died about a week ago and today, this huge grass carp turned up...didn't realize we had anything

else this big in the pond. Any insight you could give us would be greatly appreciated.

*Susy Eck
Mt Vernon, Ohio*

PB: The fish are being killed with kindness. Turn off your aerator. Here's what happens. When spring yields to summer and your pond's water begins to warm, the heat wants to escape. Heat can only be pushed down into the water column as far as the sun can penetrate and the wind can circulate. Typically, the warmth only goes down about halfway. So, your pond acts like a layer cake...it has a warm layer of water sitting on top of a colder layer of water. The top layer is lively, healthy and full of energy and is where all the healthy biology takes place. Plants grow and photosynthesize, creating oxygen during sunlight hours. Fish thrive, the water contacts the atmosphere, adding oxygen and releasing excess gasses, both good and bad ones. The dividing line where the two layers meet is called the thermocline. Beneath the thermocline, the water pouts...it doesn't connect with the atmosphere. Much of the organic matter produced from the living things above, along with leaf clutter and such, ends up in this lower zone. As that stuff tries to decompose, most of the oxygen is consumed and that water becomes anoxic (without oxygen), plus it accumulates gasses such as hydrogen sulfide. When the aeration system was turned on, it mixed that lower layer of water immediately into the upper layer, causing toxic issues. That's what killed your fish. Let the pond settle for a few days...say a week. Then, turn on the aeration system for 30 minutes on Day 1, then 45 minutes the second day...then 1.5 hours the next, then 3 hours the next...gently increase the time until there are no smells emanating from the pond.

Q: I am writing you this, asking you if you will please send me a sample issue. Thank you for your time. God bless.

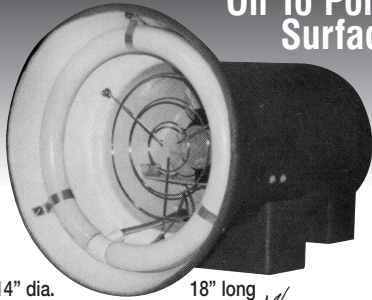
*David Carthel
Navasota, Texas*

PB: When this short, hand-written letter arrived at the office from our mailbox in Sadler, our subscription director was puzzled. I popped into the office, she handed it to me, and I smiled and asked her to send the man a copy. She said, "This is the fourth time he's done this." My smile shifted sideways a little bit. I said, "Fourth...you mean he's done this for the last

four issues?" She said, "Yep". Then, I looked at the address on the letter. There was a seven digit number beside his name, just above the address. Our inquirer is an inmate. Well, by golly, I looked at her, told her to sign him up! How many times in the masthead do you see me write, "Free to any inmate"? So, true to our word, David, you are now an official subscriber of Pond Boss magazine. Save your stamps and envelopes. You're in!

Q: Hi Folks, Our 8 year old daughter, Carly, caught her first ever topwater largemouth that reached an amazing 17 inches! She caught it in June in our little 2-acre gem! Blows me away because in October of 2009, Nate Herman came and electrofished the lake and we rolled only 8 bass. It seems we had an O2 deprivation kill in the winter of 2008. We restocked with 100 5-8 inch largemouth bass and 100 channel cats we purchased in October of 2009 from our local county fish sale. This summer, we have caught a multitude of 15-17 inch bass and one whopper at 19 in. Just in one summer(from the kill) the lake was teeming with lots of small bluegills and I guess that is just what the doctor ordered for the newly stocked fish as in less than two years, they have doubled in size. We do not feed and do not aerate, use chemicals or anything- just natural! I was very skeptical last summer but Nate just kept reassuring me to be patient and that "good things will come". Sure enough they did! Now, maybe that the balance has been restored, we will start growing some monster gills! I have been a subscriber of your fine magazine for a couple of years and have learned a wealth of information for which I am highly grateful. But there is something that has been going through my mind now for many issues. It seems as though the focus on growing quality fish in a private small lake is ever increasingly on "supplemental feeding." I am starting to have an inferiority complex when I view the photos of fish in your magazine that are grown with supplemental feeding. It is kind of like watching a deer or turkey hunting show on TV and realizing that the same opportunity is not available to those of us who own a smaller 20-30 acre property! I am a purist at heart and my hope and belief is that quality fish can be grown without feeding. I remember as a child, when my father and grandfather would take me to small farm ponds, that never had one single ounce of "management" and we would catch monster bluegills, bass and catfish. Another

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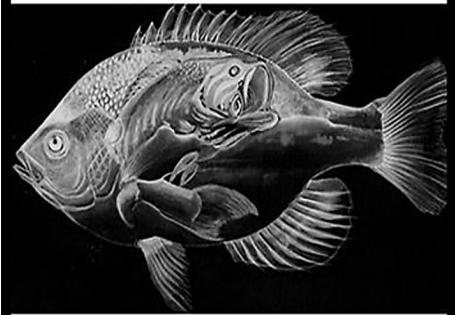
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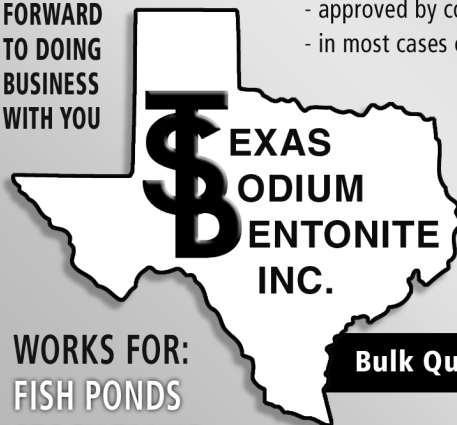
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consideration in regards to supplemental feeding, aeration, weed control and other "management techniques" is that it is not a reality for many folks like me who are still meeting the financial demands of a raising family and simply do not have the discretionary income to spend on my lake or property. It has been all I can do to even afford the property itself! I would love to see an article about the philosophy of going "back to basics" lake management where techniques and practices that do not require a considerable capital investment could be presented. There are probably many other lake owners that might

benefit from the same type of information or just to know that there are others like themselves who are interested for whatever reason in a more "purist or traditional" type of lake management. Thanks so much for your magazine and your willingness to respond to your readers! And, thanks to Nate for turning me onto Pond Boss and for the wealth I have gained from you!

David Van Acker
Milan, Illinois

PB: Great comments and much appreciated. When I write the masthead, at the bottom, I ask

for input from our readers. I sincerely mean it. I do want your thoughts. Because of your note, I've written an article titled, "Managing a Pond Naturally." You'll see it in this issue of the magazine.

Thanks for taking the time to write such a well thought out, kind and eloquent message.

Q: I am attaching water test results. I don't know if you remember me, but we spoke at the meeting you had in Natchitoches, Louisiana. You suggested I get the water in my pond tested to see if we could have Redfish in our pond. One of the results attached is for the pond and one is for the well. Thank you so much for all of your help.

Daniel Settle
Natchitoches, Louisiana

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Water Test Results

Settle, Daniel

Element	Results	Interpretation	Very Low
Alkalinity	1,141.92	Very High	< 25.00
Calcium, ppm	22.48	Low	< 5.00
Chloride, ppm	1,682.68	Very High	< 5.00
Conductivity, $\mu\text{mho/cm}$	6,630.00	Very High	< 100.00
Hardness (Ca, Mg)	100.74		
Iron, ppm	0.21	Medium	< 0.01
Magnesium, ppm	10.84	Medium	< 1.00
Manganese, ppm	0.04	Medium	< 0.01
Nitrate, ppm	20.46	High	< 2.00
pH	8.44	Medium	< 4.50
Potassium, ppm	14.11	High	< 0.50
Salts, ppm	4,243.20	Very High	< 64.00
SAR	70.09	Very High	< 5.00
Sodium, ppm	1,617.52	Very High	< 50.00
Sulfur, ppm	0.65	Very Low	< 1.67

PB: Your water is almost brackish, the salt is quite high. So, I'd say "Yes" you can raise redfish. The next caveat will be temperatures. Redfish don't like cold weather, so your biggest risk will be temperature. I'd give it a go and see what happens.

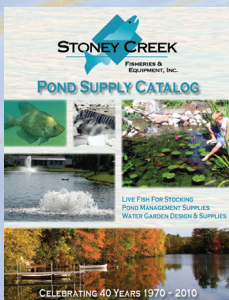
Q: Which AquaMax food is best for raising tilapia? Which is best for raising bluegill? Both of these applications are nursery ponds. If we are feeding non-nursery ponds trying to feed bluegill would you recommend a different model?

Steve Alexander
Private Waters Fishing
Richardson, Texas

PB: We passed this question along to our good friend Bob Wucher, of Purina Mills. Here's his reply: Start Tilapia on AquaMax 300 or 400 depending size. Move them to AquaMax 2000 once they are 4-5 inches and bigger. The

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2000 contains more carbs for Tilapia which they convert better than higher fish meal products. Bluegill follow the same pattern except we keep them on AquaMax 500 or 600 whichever throws better in the feeder. These guys do convert fish meal, the key ingredient in both 500 and 600; at a 1.5:1 ratio and can grow to over 2 pounds in less than 3 years. Bluegill live about 6 years, give or take, and we are starting to get 3+ pound coppers in just the last few years.

Q: I just received the new Pond Boss issue. What to say? Congratulations for the 20 YEARS of Pond Boss!! Great magazine!!!! All the Best,
*Armando Piccinini
Italy*

PB: Thanks, Armando! For those of you who don't know Armando, he's a fisheries biologist and professor of fisheries in Italy. He spoke at the Pond Boss conference in Missouri in April and has just about talked the Queen and me into visiting his country next summer for a true Pond Boss World Tour. Anyone want to go? Seriously...drop me a note.

Q: I have a two acre pond with a depth of 22 feet. It's very clean and I manage it on a daily basis! I stocked only hybrid bluegills along with bass and channel catfish. All of my hybrid bluegills now run a full pound or better. I see spawn beds every year but never see or catch small hybrids, which is fine! Do they still spawn or make beds even though they are hybrids and produce nothing? Do my bass consume all the fry? My bass are nice and they spawn and produce fry. The catfish don't. Just wondering. Thank you,

*Rodger Chaplain
Macomb, Illinois*

PB: Hybrid sunfish are mostly males, thus the nest building practice. The few females don't produce many viable eggs and typically don't reproduce with male hybrids. So, reproduction is minimal. That's why you don't see any baby sunfish. Our advice to people who want largemouth bass is to stock bluegill sunfish, not the hybrids for that very reason. Bluegill spawn multiple times yearly and are the backbone of the foodchain for largemouth bass. What few fry produced by your hybrids probably disappear faster than Cap'n Crunch at a daycare center. Channel catfish typically don't spawn in ponds because they are cavity nesters. If there's no place to hide, they don't spawn. Even when they do, it's at the end of the spawning season and their little yellow fry are quickly eaten by sunfish and small bass.

Such are the ways of the underwater world.

Q: We recently purchased a ranch 9 miles south of Hondo, TX and want to convert at least one of the existing tanks into a "mega-tank" for great fishing.

*Glenn Winship
San Antonio, Texas*

PB: I have several pieces of advice. Start with your soils. You'll need clay. Areas around Hondo have some clay, while nearby; others have soils which are way too rocky. Second, you'll need a large enough watershed to support the pond when it rains. We have a great book, exactly what you need to work your way through the different decisions to building a fine fishing pond. It's called "Perfect Pond, Want One?" and is loaded with information and a step by step process to help you wade through the methodology of building a pond.

Q: Where would I find information on exterminating gophers which are burrowing liberally in our dam?

*Ralph McNeil
La Mesa, California*

PB: Our best advice is to contact a trapper. Start with your local county extension agent. Also, there should be a city animal control agent who can refer you to trappers in the area. Plus, I bet there are some pest control companies in the San Diego County area, too.

Q: Do you folks actually go out to peoples land and fix ponds?

*Mel Crews
Dallas, Texas*

PB: Actually we do. We have a nice resource guide in the magazine and on the website that lists people we know and trust that are capable of doing much of what you want to do. Look them up and get in touch. Good folks, all of them.

Q: I have three acre pond, five years old. It has a 30 inch corrugated black plastic pipe in the dam. The contractor did not install an anti-seep collar. We have some seepage at times. Could I install one after the fact?

*Cliff Hamel
Jacksonville, Illinois*

PB: You can install an anti-seep collar after the fact by carefully digging a ditch into the dam and excavating around the pipe. There are anti-seep collars that bolt into place. Another way to do it is to dig your ditch in to a concrete-

form and pour a steel-reinforced concrete collar around it. If you haven't done it before, I'd seek help from someone who has done it.

Q: You guys should start a Facebook page. Easy and simple. Could add many subscribers.
*Joseph Gadberry
Columbia, South Carolina.*

PB: We did, more than a year ago. Actually, we'd like to have more people "like" us on Facebook. So, if you do Facebook, next time you're on, click that magic button and see our regular updates.

Q: Just found you. Need direction, we have a 550 acre farm in central North Carolina-has two small ponds (approximately 1 acre or less each). We love to fish for bluegills and catfish. We restocked 15 years ago. Fish are few and small. Need advice. Tight budget. Please advise.
*Lee King
Greensboro, North Carolina*

PB: Look at the resource guide in the back of this issue of the magazine, or on the Pond Boss website resource guide. Look for Foster Lake Management Company and another for Quality Lakes. Give them a call. I think they can help.

Q: I live in Wixom, Michigan and need help with weed control in my pond. Any fish you can recommend to eat the weeds?

*Mark Allen
Wixom, Michigan*

PB: Grass carp eat certain species of aquatic plants. Some states regulate the use of grass carp. So, you'll need to identify the plant species and check in with the state of Michigan to see if the fish are regulated.

Q: Is there any limit to the diameter of pipe used to create a siphon?

*Allen Bickhardt
Columbia, New Jersey*

PB: I've seen siphon pipes 12 inches in diameter. I think the limit is based on how quickly you want to move the water and how much money someone is willing to spend on the pipe. If you have access to a civil engineer who knows about the dynamics of water flow, lean on them to help figure out pipe size.

Q: What is the "best forage" for: (1) reproduction? (2) digestibility/growth (3) cost/weight gain (4) other... golden shiners vs. threadfin shad vs. trout? Our base forage is bluegill. By the way, thank you for your

response on trying to train bass to feed. We are working on renovating a 5.5 acre pond with famous biologist, Greg Grimes. It has great potential for an article. It will be the "Third Time is Charmed" for us, as we have learned big lesson on two previous lakes on the property.

*Brit Oehmig
Lookout Mountain, Georgia*

PB: The best forage for reproduction in Georgia is definitely bluegill sunfish. So, you are right on with that choice. Threadfin shad are also a good choice, but die when water temperatures drop below 42 degrees. Start with

bluegill. They are the backbone. But, if you intend to buy fish to use as immediate forage fish, remember this...it takes 10 pounds of baitfish for a bass to gain a pound. Yes, there is some difference in digestibility, but when you compare the costs, look at the conversion rates. 10 to 1 is a good rate to use in your calculations. If you can stock some forage fish and feed them, allow them to gain weight and reproduce before they are eaten, that's a cost efficient way to do things. And, yes, we'd love to talk about an article on what you are doing.

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for personal, family fishing - nothing elaborate and nothing open to the public. Since I live on the plains in Colorado where the winters are chilly and the summers are warm and it's always windy no matter what month of the year it is, I think my best bet is to stock the pond with trout. What is a good size and depth for a very small, private, trout fishing pond?

*Debbie Musich
Colorado Springs, Colorado*

PB: The size of the pond will depend on your water source, temperature, depth and that sort of thing. Allow me to refer you to an expert/friend of mine in Longmont, Mike Mitchell. I bet he can help. As we await his response, I'll offer this. You'll want moving water, if you can have it. Rocky habitat is good. Several feet of depth discourages wading birds and gives fish a safe haven. The size of the pond will ultimately be determined by the site you have selected. I would think a good size would be a tenth of an acre, give or take, larger if you have room.

Q: This is late, I've been busy, but wanted to tell you that I sent my brother-in-law and nephew to the Pond Boss IV conference, as they look after my pond in Iowa...and they told me that the conference was absolutely fantastic. They learned so much and had fun, too, and they said everyone was so nice and helpful. They talked about meeting a great guy who was an expert in excavation (Otto, I asked? YES, they said) and he was giving advice for a problem we have...which we still need to resolve. Apparently when the pond was dug it wasn't tamped down. At all. Now it's a nice, fish filled, spongy-mud pit that doesn't hold water well. We hope to continue getting some help and get that resolved soon... but anyway I wanted to express how pleased I was to know they enjoyed the conference so much. Wish I could attend one but logistics are too challenging. Thanks so much for all you do.

*Rhondi Ewing,
Thousand Oaks, California*

PB: Wish I could wave a magic wand and stop all those ponds out there in pond-land from leaking.

Q: I have kept trout alive throughout the summer in central Illinois. We have had the 4th hottest summer on record. You told me at the Pond Boss IV Conference and Expo if I was able to get trout to stay alive thru the summer, I would be a speaker at the next expo. Well, sir they are not only alive, but they are thriving. We feed them nearly every night and they come

up to the surface to eat. I also drop corn down to the ones who do not come up. Nate Herman said his trout in north central Illinois are down deep and surviving but certainly not coming to the surface to eat. I have an Aquaview camera with a DVR and I got a little bit of footage of them coming up, but it was too dark to get real clear video. Let me know if you are going to be in central Illinois and I will show you what I've got going.

*Terry Traster
Moweaqua, Illinois.*

PB: That sounds quite unique! This fall, let's talk. When those trout make past Thanksgiving, you'll have quite a story to tell...and that's about the time I should start working on Pond Boss V.

Q: After speaking with your office and renewing our Pond Boss subscription and ordering some "help" books, your office encouraged me to also write an email. Here's our problem: We dug our two acre pond about four years ago. We have aeration and a very nice mix of bluegill, bass and catfish. However, we continually fight algae and spend way too much on chemicals which work for a while and then, of course, it comes back. Our water is very clear so we also use AquaShade pond dye. The deep end of our pond is about 13 feet. We know the south side and east end are way too shallow at the edges. Cattails also grow out about 12' into the pond on the south side. We are thinking of having the south and east sides dug out so the slope is deeper to try to inhibit the algae growth. Should we be worried about breaking the "seal" of the pond (no leaks right now)? What depth should the sides of a pond be to discourage algae growth around the edges? Of course we won't mess with the area in front of the dam. Have you seen good results in other ponds from this kind of renovation? Anything else we should consider or be aware of if we decide to do this? We've had Nate Herman out to our property and when we get control of this algae problem, Nate's crew is going to come put in a dock for us. Really looking forward to using the pond for swimming along with the terrific fishing it has produced. Thanks for your time. Love your magazine.

*Paulette Trainor
West Chicago, Illinois*

PB: Wow! This issue belongs to Illinois! Must be something in the water there... ah, there is. Nate and Justin Herman! My first thought is that you should contact the contractor who built your pond. He'll know

better than most about your soils. If he lined the pond bottom with clay, you will be running a risk of breaking the seal. If your soils are good clay soils deep, you will be fine just deepening and doing what you want to do. Either way, I'd have my contractor out there to take a look-see. Regarding depth, a good rule of thumb is a 3 to 1 slope, leading to water at least three feet deep, deeper if you can, five or six feet. Cattails love shallow, silty water. Loose soils, topsoils, organic matter...that's what cattails prefer. I've seen them grow in some pretty deep water, but if you'll follow the advice above, you should have good success. One important tip, though. When the contractor moves the dirt, don't allow any of the cattail tubers to remain. Even if you have to pull them by hand, do it. Here's another tip...if you intend to do this dirt work, I'd suggest spraying the cattails now to kill them to the roots. That will pay off in the long run, too.

Q: Hi everybody, I have been a subscriber to Pond Boss for a long time. I love the magazine and it has been very helpful in developing my pond. In June of 2007 my 1/4 acre pond was completed and began filling with water. In June, 2008 I stocked 300 2-3 inch bluegill, 100 1-2 inch redears, 4 lbs of fathead minnows, 24 golden shiners and 2 grass carp. In June, 2009, I started feeding the bluegills. At this point the bluegills had spawned at least once and they may have spawned twice. On August 16, 2009 I stocked 25, six-inch largemouth bass; the bass were supposedly not feed-trained. The bass must have thought they died and gone to heaven because of the huge amount of bait fish they had to eat. Even though the bass were not feed-trained, they are the first fish to attack

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#208	13"	15 oz.	9\12\10
#209	13"	1 lb. 1 oz.	7\9\11
#210	13"	1 lb. 1oz.	6\11\11
#211	15"	1lb. 8 oz.	6\11\11
#212	15"	1 lb. 8oz.	6\12\11
#216	15"	1 lb. 6 oz.	7\9\11
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the pellets. I feed them by hand every night at 5:00, so I get a good chance to see who is feeding and how much. It has been almost two years since I stocked the bass and I have tagged them (only 14, I have not caught the others yet) and kept track of their length and weight (see chart at left). I know this is not much data, but I hope that it helps your project at least a little bit. Oh, by the way, I have also tagged some of the larger bluegills so there will be breaks in the number sequence. Here is the information for each fish as of the last time it was caught. The biggest bluegills that I have caught are 8 and 9 inches, and there are a good number of them. If there is other information that I have left out that you need please let me know.

*Joe Martina
Greenville, Kentucky*

PB: Great stuff! Much appreciated. For all you pondmeisters out there, we're building a database of fish lengths and weights to figure out the standards for feed-trained fish. If you have feed-trained largemouth bass and would like to participate in this important study, please drop us a line. Thanks to Joseph for sharing his pond world and for sending that information.



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Field Notes

Floods and Droughts

by Bob Lusk



Seems weather has a steady seat at the news desk this year. Floods have occurred all over the upper Midwest into the eastern part of the country and down the Mississippi River into the delta, purging into the Gulf of Mexico. Along the way, farmland, homes...and ponds, are inundated with excessive amounts of water. Severe drought throughout Texas and parts of the southwest. Scorching summer temperatures, much hotter than “normal” this summer in much of the nation.

What impact does drastic weather have on your pond?

Quite a bit, actually.

During floods, species of plants, insects, invertebrates and fish move around. When water connects, it creates a freeway for free movement. That doesn't necessarily mean you'll wind up with bighead carp if a tributary

of the mighty Mississippi backed up and spilled a little bit into the watershed of your farm pond. But, it might. Don't be surprised to hear tales of fish swapping homes during a flood.

What impact does drastic weather have on your pond?

It doesn't necessarily mean your fish will go away, either. But, they might...depending the severity and duration of the flood. If your pond connects for a day with moving water, you are more likely to receive fish than give many away. If you have a good home and plenty of food, your best fish aren't motivated to go anywhere. But, fish from neighboring

watersheds may just find their way to your place. Don't be surprised to see sunfish species or unwanted critters as gar and carp move in and call your pond “home”.

I got a call from a Texas county agent recently. The Lone Star State is in a devastating drought as I write. Several large west Texas reservoirs are dry...not low, but dry. O.C. Fisher reservoir, outside San Angelo, is bone dry. So is Baylor Reservoir near Childress. Lake Meredith, north of Amarillo in the Texas panhandle is 90% low. This is an historical drought.

The county agent has a cooperator who wishes to renovate a pond while at its low point. His question, “How much rotenone does it take to eradicate gar?” My answer? Where'd the gar come from?” With pause, he said, “I'm not sure”. As we wade through record heat and fast evaporating water, it's easy to decide to renovate a pond. But, in this case, if they do away with the gar without considering how they traveled into that pond in the first place, they aren't solving a problem...they are just one flood away from restocking with more of the same.

In this case, eradicate the fish, but give some thought and effort to preventing their re-entry.

But, a drought is the time to consider renovating, if it's something which needs to be done. It's also the time to bring in the heavy equipment and rearrange some dirt, too... if your favorite bulldozer guy has you high enough on the waiting list.

Here's something not too many people consider during a drought. As water evaporates, all that leaves is that precious wet stuff. It's sucked straight into the air and onward to its next destination. Everything dissolved in that water over time is left behind. Remember this...in most ponds, the top three or four feet is about half the volume of the entire pond. When your pond drops so much due to evaporation, the dissolved minerals, metals, nutrients



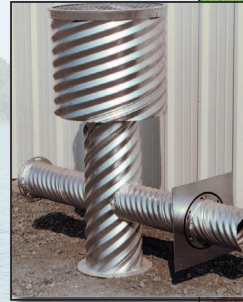
Droughts are often the best times to renovate. Here, Mike Otto is removing bottom soils from an older pond to deepen and widen it for the landowner.

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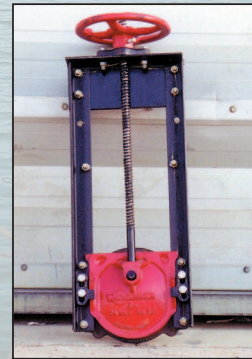
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and organic content increases measurably. For example, if your pond measured 100 ppm alkalinity and half the volume of water evaporates, your alkalinity can go to 200 ppm. Since it happens over the course of weeks, maybe months, the flora and fauna adjust gradually. The pH may have shifted one or two points, too. When those filling rains come, guess what happens? Everything is diluted... fast. So fast, in some cases, that fish and plants are shocked and stressed to their death.

Monitor your water quality and learn how to amend it, if needed.

This summer, in our neck of the woods, excessive heat has led to abnormal problems. Funny, it doesn't seem that the excessive heat actually caused this problem...what caused it was how quickly the temperature rose. We saw water temperatures jump from 68 to 85 in a period of days, not weeks as normally happens. Several species of rooted aquatic plants, especially southern naiad, grew explosively, consuming many ponds in the region.

Here's why. As a pond comes to life each spring, things happen in order. Cool water plants grow. Fish which spawn in cooler water, do so. Then, the water warms a little bit more and different plants awaken. The next line of fish do their thing and babies are evident



When your pond is connected to a creek or another pond in the watershed, life can migrate. Be aware.

everywhere. This continues as spring blooms into summer, when a diverse plant community is harbor to many species of insects and baby fish grow into juveniles on their way to an orderly spot in the food chain.

But, when the temperatures rise so fast, several steps of that process are skipped. Some plants dominate that wouldn't ordinarily do so. Some fish don't have their window of opportunity. Things get out of whack,



During droughts, fish are congregated and water chemistry changes. You can see the green color of this nutrient enriched water. That's a drought-related symptom.

biologically. Then, moving further into the drought, water volume declines as the quality and chemistry changes and the stage is set for a shift...when the next rains inevitably come.

On the up side, I've seen some of the fastest growing fish I've ever witnessed do so during a drought. As the water recedes, fish are confined to a smaller area. Nature motivates



When areas go dry during drought, it's a good time to deepen and revamp a pond bottom.

them to adjust their numbers for the size of water. Big fish feed on smaller fish. As the drought continues, forage fish numbers drop, big fish grow considerably larger and fish numbers decline.

Then, when the rains come...as they inevitably do... "new" areas of terrestrial plant growth and fresh habitat are inundated. The pond or lake spreads out, increases in size and things change, again.

I'll always remember and cherish Pinto Valle Lake, northwest of Laredo, Texas. I cut my teeth in the 1980's, helping manage that lake. When it was full, it spanned most of 50 acres. It was a neat lake, full of huisache, cacti and other plants that stick you. It was also full of bass. Literally thousands of them. With a harvest plan, the owners pulled more than 3,000 bass out of there over three years. They had bass ceviche, bass kabobs, fried bass, bass stew... bass enchiladas...any recipe you might think of. Yes, we stocked forage fish, bluegill and later, threadfin shad. But, the amazing thing about this lake was how we were able to use fluctuating water levels to assist bass growth.

Laredo, Texas, is in the desert. Pinto Valle Lake sits about three miles from the Rio Grande. It doesn't rain much there. But, when it rains, it can be a deluge...from a summer tropical storm or hurricane making landfall a hundred miles away. That lake notoriously went from 50 acres at one time to 35 to 30 to 20...over a span of two years. When excess bass were finally harvested to the point that their remaining cousins could actually grow, it was amazing to watch how fast they gained weight. When the lake was full, after the dynamics were shifted through harvest, the lake teemed with baitfish. Then, it would draw down, baitfish were flushed out of the brush and bass ate them like a Sumo wrestler at an all-you-can-eat buffet table.

The lake dropped for year, maybe two, and it was "advantage bass". Then, a tropical event would happen; fill the lake to capacity, and it would be "advantage baitfish". This cycle went on for years and the lake record changed dramatically from year to year.

Drawdowns can be the thrust to adjust the dynamics of a fishery.

Know this...when a flood happens or a long term drought comes along, your pond is affected. Part of your job is to assess how your precious body of water is affected. It might be a good thing...but there might be a few things to adjust. Change is inevitable...your job is to know what the change is, so you can be proactive, rather than reactive.





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Water is the Medium...

What's Dissolved in it Does the Work Water Quality, Part 1

by Bob Lusk

In Fisheries 101 we all hear about pH and oxygen and temperature and all that water chemistry stuff we “need” to know about.

After all, many of us who have ponds and lakes feel an inherent need to understand those basics of water quality, since water is the medium from which we derive so much pleasure and a sense of responsibility.

Water.

It's an amazing substance, one not so easily understood by even the most advanced pondmeisters.

There's an adage in the fisheries business. You're not a good fisheries biologist until you've lost fish in a variety of ways. At professional meetings, biologists have an almost macabre way of comparing their mistakes. Most of the time, those fish deaths can be mediated with

better management practices. Almost all of the time, water quality...or at the least, something dissolved or living...or missing...in the wet stuff...is a contributing factor.

Understanding water quality is important. Complicated, but important.

**It's an amazing substance,
one not so easily understood
by even the most advanced
pondmeisters.**

Over the next few issues of the magazine, we'll tackle the concept of water quality and do our best to make it simple, even though it's not.

Start with pH. If you delve very deeply into pond management, you'll soon see, or hear about, pH. Technically, pH is the measurement of free hydrogen ions in your water. If you take a beaker of distilled water, which has nothing dissolved into it, and pour an acid such as vinegar in it, the pH will drop. Low pH means acidic water. A pH of 7 means “neutral”...or there is a balance of acid and base in the water.

Listen to this...it will help you understand pH. In your mind, picture a ruler. Look at the 7 inch mark. When measuring pH, think of 7



Checking the pH regularly tells part of the water quality picture.

as ground zero. Then, each inch going down is a measure of acidity. Each inch going up is a measure of basicity. What's a base? Roloids and Tums are bases. They add "buffering capacity" to your water. That's why people with acidic pH are recommended to add lime. Lime is a base and buffers your water, just like Roloids.

Here's where it gets really interesting.

Each whole number of pH change is ten times the amount of the number next to it. That means a pH of 6 is ten times more acid than that neutral pH of 7. That means pH of 5 is ten times the pH of 6, but one hundred times the pH of 7. So, pH of 4 is 1,000 times more acidic than pH of 7. That helps us understand the significance of pH.

What should pH be in water? It's best when somewhere between 5 and 9, ideally from 6 to 8.

That's why biologists and pondmeisters care about pH.

What about some of that other stuff?

Oxygen, for example? People ask me fairly often if they should own an oxygen test kit or one of those fancy meters that check temperature and oxygen. Sure, it's a good idea...as long as you use it consistently. If you use an oxygen meter only when you think oxygen is low...and then you find out your oxygen IS low, what can you do about it?

Here's a primer about oxygen.



Regular water quality analysis helps you understand patterns as water changes.

Water, being the 'universal solvent', absorbs oxygen from wherever it can get it. There are two fundamental sources of oxygen in water. The main source is the atmosphere. Water is similar to a sponge. When it contacts the atmosphere, water releases excess gasses produced by biological affects under the water. But, it also absorbs gasses from the atmosphere

and oxygen is our most important one. At the same time, any plant life in the water produces oxygen, too. But, this process must have sunlight. Plants photosynthesize during daylight hours and produce oxygen from carbon dioxide, just as terrestrial plants do. At night, the reverse happens.

Here's where it gets a little tricky.

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As water temperature rises, its affinity for oxygen drops. In other words, warm water holds less oxygen than cold water. The physical properties of water affect the chemistry of water. Water is most dense at 39 degrees, F. Weigh a gallon of water at 39 and it's at its heaviest point. As the temperature rises or falls from that key temperature, it expands. Water can physically hold the most water at 39. As it expands, it holds less oxygen. Water at 80 degrees can't physically hold as much oxygen. That's why we don't see trout in 80 degree water. Their bodies need more oxygen than the water can physically hold.

Just because water has the affinity to hold so much oxygen doesn't mean it will. It still must have a source to replenish, as oxygen is consumed.

Ah...another factor. Oxygen is consumed in a number of ways. Fish take up oxygen. Plants do, in the absence of sunlight. Decaying organic matter uses oxygen. The biological term for "absence of oxygen" is "anoxic". During summer, water on the bottom of most lakes becomes anoxic. That's because there's a high demand from decaying stuff on the bottom and no way for that water to be able to replace oxygen. Bottom water is separated from the top water by a zone called the "thermocline". Bottom water is much cooler than the top water, so it's heavier and stays on the bottom until the temperature at the top cools to the level of that

water at the bottom, and the layers mix. That's what people are talking about when they say my lake "turned over". So, that bottom layer of water can't contact the atmosphere and is too deep for plants to grow, so it doesn't have an oxygen source. Oxygen disappears.

What about your fish? They definitely need oxygen. Their metabolism rate determines how much oxygen they need. Plus, bigger fish have a bigger oxygen demand than smaller ones. That's why you'll often see the biggest fish die when oxygen levels drop too low, but the smaller fish make it. Small fish need less oxygen to support their small sizes.

If water were to have as much oxygen as it could hold, we wouldn't see fish kills in our ponds. But, when too many plants or too much green microscopic algae, combined with a heavy load of fish, are trying to live in hot, summer temperatures, oxygen levels can plummet.

Most warm water fish need 3 parts per million dissolved oxygen or higher to avoid stress. Less than 3 ppm and larger fish become oxygen-starved. Different species have slightly different oxygen needs. But, look at 3 ppm as your lowest required levels.

So, there's a fundamental look at three important components of water quality. pH, temperature and oxygen. Temperature and oxygen work together, while pH is a measurement.

It gets a little ticklish once we understand how those three key ingredients work together for water to become what it is. What's so ticklish? Well, certain plants live under certain conditions. You'll not see bladderwort in water with high pH. It only grows in acidic water. Chara, on the other hand, cannot grow in low pH. It needs calcium to form its outer covering. Calcium is a base and is found in water pH mostly higher than 7. Bladderwort, a submersed, non-rooted plant, produces oxygen amounts that differ from Chara, a dense, rooted plant which grows in shallow water.

It's these sorts of things that bring water quality into sharper focus. Understanding water quality is an exercise in cognitive thinking, where we do our best to comprehend each different component and then try to figure out how these things work together to develop into what we have at hand.

Next issue, we'll tackle some of those water quality factors such as hardness and alkalinity and try to figure out how they impact what we do as pond managers.

Ah, water...and you thought you just buy a few bottles and drink them down...as you look at the gorgeous pond on your property and try to unlock some of its deep, wet secrets.



I Support Outdoor Education

As many in the Pond Boss family will remember from the conference at Big Cedar Lodge, Alan Warren provided a moving keynote address to the faithful in attendance. His message of connecting kids with Nature resonated with everyone in the room.

More than a lifelong sportsman and popular TV/Radio Host, Alan's passion is in getting kids connected with Nature through Outdoor Education classes in public and private schools. Recently, he's founded the National Partnership for Outdoor Education, Inc. a 501c3 nonprofit that is spearheading the I Support Outdoor Ed public service campaign nationwide. Their mission is to help make Outdoor Ed classes available for every child in every school in every state.

Similar to other successful public awareness campaigns like Don't Mess with Texas and "Got Milk?" the I Support Outdoor Ed campaign is raising the awareness of the disconnect between young people and nature and draws attention to the benefits to children that are exposed to outdoor education in their schools.

We at Pond Boss salute the I Support Outdoor Ed campaign and encourage our subscribers, advertisers and their families to get behind this movement to reach our Youth with this important initiative. Although our collective interest and passion is about ponds, we all recognize the importance of connecting our Youth with all of nature.

Those who are on Facebook can help spread the message in social media. Just log on to Facebook and "Like" the I Support Outdoor Ed Page.

We hope you'll share YOUR personal story of why you love nature and share your story with others. To learn more about the I Support Outdoor Ed campaign and to become involved in connecting our Youth with Nature, please visit www.ISupportOutdoorEd.com.

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On Northern Pond

Fliers!

by Dave Willis & Bob Lusk



Please raise and lock your tray tables and put your seat in the upright position. Make sure your seat belt is firmly fastened. We are about to take you on a trip to learn about fliers.

No, we are not talking about retired military pilots like our Pond Boss friend Peter Maffei. We are on topic, which is fish. A flier is a unique member of the sunfish (centrarchid) family.

Fliers have a distribution restricted to the southeastern part of the United States (Figure 1). They range from eastern Texas to the northern half of Florida and then up to Virginia. They tend to be an uncommon fish species throughout their range. Although they are not common, their populations are stable in the southern United States (Warren et al. 2000). They tend to be tolerant of low pH (acidic) water, and in fact, thrive there.

Fliers prefer lowland habitats with clear, heavily vegetated water without noticeable current.

The flier, *Centrarchus macropterus*, is a deep-bodied sunfish, almost round, and has a moderately large mouth, compared with some of its cousins like bluegill and redear sunfish. In fact, the mouth reaches back to about the middle of the eye for adult fliers. The spiny dorsal (back) fin and the soft dorsal fin are connected and don't have the notch between like we see on largemouth and smallmouth bass. Young fliers, smaller than two inches, have a distinctive orange spot on the trailing edge of the dorsal fin. Fliers typically have 7-8 anal spines and 11-12 dorsal spines. Compare that to the bluegill or redear sunfish, which only have 3 anal spines. The dark streak extending below the eye is characteristic of this fish as well. Adult fliers are sometimes confused with



Jim Gronaw shows us that fliers can indeed be part of the recreational catch! This one was caught in Richmond Mill Lake, North Carolina. A nice bonus while fishing for those big bluegills. Digital image used courtesy of T.J. Stallings (TTI-Blakemore Fishing Group; home of Road Runner lures).

black crappie because of the similar body shape and coloration.

But, put them side by side and it's easy to see the difference.

Maximum sizes likely vary somewhat by location. For example, the Texas Parks and Wildlife Department web site indicates a maximum size of 7 inches, while the Virginia Department of Game and Inland Fishes site indicates a maximum of 10 inches on their web page. The maximum reported length was 11.5 inches, and the world record weight was 1.23 pounds.

Fliers prefer lowland habitats with clear, heavily vegetated water without noticeable current. They are commonly found in coastal plain swamps and creeks, ponds and backwaters.

You've probably read about Richmond Mill Lake, home of the King Fisher Society, near Laurinburg, North Carolina. A healthy population of fliers lives in that lake.

This fish can feed on zooplankton, insects, and even small fishes. They have long, slender gill rakers, which often is a good indicator of ability to feed on zooplankton. When the fish ingests water to breathe, the water passes over the gill rakers, which capture zooplankton as water moves on through. Breathe and eat...at the same time.

The flier prepares a disc-shaped spawning nest and nest in colonies, preferably in gravel and rock habitat. In spring, as water temperature approaches 55-60° F, the female will deposit eggs, which are fertilized by the male who remains and guards the nest. The male will guard the fry for a while, too, after they swim up and leave the nest.



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We found an old reference from 1921 indicating that the fliers could be spawned in aquaria. So, they might just make a reasonable aquarium fish if you are interested. Please be aware that different states have different regulations on native fishes in aquaria, so check local information before proceeding.

What about your pond and fliers? Well, if

you live within the native range of fliers, they certainly could be fun as part of a diverse fish community. We suspect numbers will always be low, because they don't compete very well with other sunfishes.

Don't expect to be able to buy any from a hatchery. They aren't in great demand and have yet to become a favorite of aquaculturists. Where they are, they occur naturally and seem to thrive in the watershed where you find them.

So, there you have it. Fliers. You are now able to move about the country.

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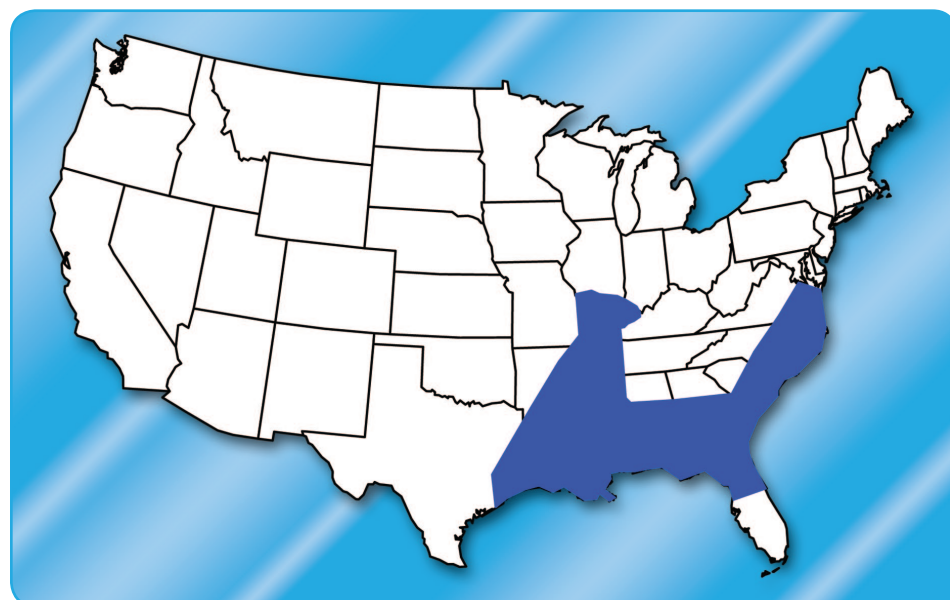


Figure 1. The blue shading indicates the distribution of the flier.



Feature

Frogs Catch Bass How to Use Frogs in Your Pond

by Brad Wiegmann

It's no real surprise that lures resembling frogs and toads catch fish in ponds. Small ponds and lakes provide frogs with shelter, food, a place to reproduce and raise their young. Although lures which resemble frogs will catch bass almost any time of the year, summer and fall is prime time to be fishing with amphibian shaped lures. As water temperature rises, bass begin prowling the shoreline, laydowns, docks, mats and vegetated areas in search of forage like frogs. On the other hand, frogs are always wary of predators any time they go in or near the water. There's a fine line between swimming across the pond or sitting on matted vegetation and being inhaled by a bass.

**Lures which imitate frogs
come in a number of styles,
sizes, and shapes.**

Lures which imitate frogs come in a number of styles, sizes, and shapes. They come in one of the following types: hollow bodied, soft body or hard body. Floating hollow-bodied frogs have a narrow shape closely imitating the real thing. Inside is embedded a weight molded into the body along with a specially designed double frog hook. Depending on the brand each bait will have some type of frog-imitating legs. They are made from various materials including living rubber, solid rubber, or silicone skirting. Hollow bodied frogs can be walked on the surface similar to walk-the-dog movement with a Zara Spook, hopped, or skipped across the surface. They are extremely effective for catching fish out

of thick mats, open water, or sparse grass. Unlike hollow body frogs, soft body frogs are solid pieces of plastic. These baits closely emulate a real frog with legs that look like they are swimming when reeled in. Most will have a belly slot to increase the hookup ratio. No hook is included with solid bodied frog, but numerous hook manufacturers offer frog hooks in an assortment of styles and sizes. Soft plastic bodied frogs are designed to be cast out and be reeled on the surface or waked just below. Unlike a hollow bodied frog, the solid

ones will sink when paused. A soft plastic bodied frog can be fished over thick grass mats, sparse patches of grass, stumps, logs, or any cover. Soft plastic bodied frogs are usually rigged texposed-meaning the hook is Texas rigged with the tip of the point tucked just under the surface of the lure. A texposed solid body frog is completely weedless and snag proof. One other type is the hard body frog constructed from plastic or wood. Hard bodied frogs have a solid body closely resembling a frog; in fact some of the new



These lotus pads and stumps are perfect zones to fish with a frog.

hard body frogs are so anatomically accurate it's hard to believe. While some of these hard body frogs are short and stubby others have a shape similar to a Zara Spook and can walk-the-dog effortlessly with continuous twitches of the rod tip. Hard bodied frogs can be fished in open water situations or around the edge of grass mats, laydowns, shoreline, submerged timber, and docks.

Most every fishing pond has productive areas for casting a frog-style lure near the shoreline or within casting distance. Selecting the right style and color of frog is important. Anglers should focus on grass mats, individual clumps of grass, submerged timber, laydowns, docks, and the shoreline. Select lure color based on two important things...native species of frogs and a color which contrasts with the water to be most easily seen by a bass.

Aquatic Vegetation

Most any type of rooted aquatic vegetation in a pond becomes an oasis for bass. It offers shelter and, more importantly, ambush points. Rooted plants that seem attractive to bass have a recognizable long, flexible yet firm, stem similar to water lilies. Free floating plants have roots hanging down beneath them to gather nutrients and not attach to the bottom. Submersed plants like milfoil or pondweed grows underwater and some produce flowers on the surface. Emergent plants are commonly found in shallow water or near the shoreline. Cattails or bulrushes are examples of emergent plants. Although it's not necessary to know the scientific name of every plant growing in the pond you are fishing it is important to recognize which type of aquatic vegetation you are catching bass on that day. Bass may move from one type of aquatic vegetation to another depending on time of day, season, angling pressure and water temperature.

Laydowns and Artificial Fish Attractors

Laydowns and artificial fish attractors are normally found near shallow water where bass often go to feed on frogs and other forage. These habitat elements offer bass shelter from other predators and provide an ambush point. An individual laydown can hold several bass while a large artificial fish attractor may have a whole school.

Docks

Docks provide shelter, shade and an ambush point, but unlike laydowns there is usually only one dock on each pond. Docks may have brush piles, PVC fish attractors,

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There are many choices of frogs in the marketplace.

deep water or other cover and structure close by, making it the perfect home for a bass.

Shoreline

One of the most obvious places to fish a frog is next to the shoreline. Not all shores will have bass on them. The season, time of day, food availability, angling pressure and water temperature will motivate bass to move accordingly. One key to finding a good bank to fish is checking the water depth. Good banks always seem to have a drop off close by for bass to quickly escape if necessary.

Color and Size Matters

Strangely enough color and size does matter when fishing a frog. If you are not getting a bite, change color patterns, types or size of your frog. In general, anglers should fish with smaller frogs in ponds to get more strikes or in ponds that only have small bass. In ponds or small lakes with big bass, anglers should not limit themselves to smaller baits. The old saying is big baits catch big fish. That's true.

As for what color pattern, that's harder to select than size because of the wide selection available. Some color patterns are so lifelike it's hard to believe they're really not alive. Other color patterns are wild and don't resemble anything alive, but still catch bass. Most anglers like to fish natural color patterns on bright sunny days and darker colors like black, green and brown on cloudy days or early and late in the day. The color frog you choose may also hinge on water color, just like picking any other bait, especially plastics.

Frog Gear

One of the most important parts of fishing

with a frog is the gear. Rod and reels and line size and type are important. The right gear will let an angler reel in a big bass from thick mats or around brush piles. A fishing rod for frog fishing should have a medium action fast-tip with a stiff backbone. The stiff backbone gives anglers the power to pull the bass quickly from thick cover while controlling the fish. A medium action fast tip allows an angler to make better and longer pinpoint casts; in addition to making it easier to walk the dog. A reel for frog fishing should have a high speed gear ratio and high quality drag to turn the bass since they often dive down after the hook is set.

What fishing line you use for frog fishing comes down to each individual angler. Braid fishing line definitely has its advantages over monofilament or fluorocarbon line. Its stronger, floats, has little if any stretch to it, and will cut through the grass. Anglers fishing with braid often rig up with 60- to 80-pound test because it has the same diameter of 10- to 12-pound test monofilament. Braid is normally tied directly to the frog or hook without a leader using a Palomar knot.

Setting the Hook and Landing Fish

Imagine the water's calm surface exploding as a bass violently swings its head back and forth with your frog in its mouth. That's what a frog bite looks like and few anglers can resist setting the hook too fast when this happens. Every good frog angler has their own method of waiting until the bass has taken the frog deep enough to set the hook. If you do it too quickly, the frog will merely pop out. I once knew an angler who counted to three before setting the hook and that worked for him. The key is to wait until you feel the bass trying to crush the frog in its mouth. Once you feel that, lean back and set the hook hard.

Landing bass out of cover requires just one thing for the angler to do. Keep the head up and moving towards the boat or yourself. It's all over for you if the bass can get deep into cover allowing the line to tangle.

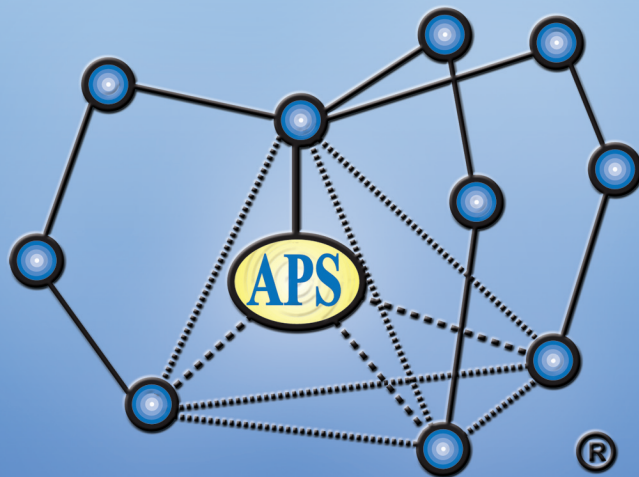
The next time you go down to the pond don't forget to take your frogs. You can fish them from shore or in a boat around all that cover in the pond. There is no more fun pond excitement than watching a bass as it explodes all over a frog and knowing you are about to do battle with such a majestic creature in its own environment.

Just remember to count to three.



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Wildlife at Large

Feeding Wildlife This Winter

by Dan VanSchaik

It is time to be planting food plots and setting up feeders for fall and winter seasons. Trouble is, input costs have risen sharply since this time last year as price of seed, fertilizer, fuel and grain feeds has doubled in many areas. Over the past 14 months, volatile U.S. commodity markets have reflected critical shortages of global food grain inventories by driving our domestic prices to all-time highs. Furthermore, record demand for new crop corn, soybeans and wheat will make agricultural products even less affordable for use in wildlife management in near future.

This means we will need to be more and more selective with supplemental feeding programs by “rationing” forages when they are most needed. It is my opinion that winter food plots and feeders are far more critical to all wildlife than their spring/summer counterparts. Throughout the more temperate months, we work very hard to encourage wildlife visitation and improve habitat on our properties but often neglect such programs throughout winter.

Fall is a season for recovering from hot summer depletion and building energy reserves for unpredictable cold months ahead. By early winter, most natural forage is long gone as agricultural crop residue, acorns and other hardwood mast have all disappeared. Dominant grasses have retreated to dormant stage and tender leaves are absent from shrubs and bushes. Nutritionally rich forbs, buds and shoots won't be back until spring. It is during this time that most wild birds and animals are approaching their highest level of stress.

Mid- to late winter should be a period of recuperation for those strong enough to survive hunting pressure, migrations, breeding behavior and extreme weather. In addition to overcoming cold season nutritional deficits, many wildlife species must now prepare for spring breeding and birthing condition by stockpiling important vitamins, minerals and micronutrients.

Upland game birds, mostly restricted to



Turkeys and other upland birds make use of spin feeders.



Oasis in the desert...green food plot in winter background.

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All wildlife utilize “green forest opening” food plots in winter.

ground travel within defined territories, will have used up most of the local forage habitat by mid-winter. Obviously, they do not have the option of flying hundreds of miles for new food sources like their migratory cousins. However, latest radio telemetry research demonstrates that ground birds do travel significant distances in search of food. That means hungry birds can and will walk off your management area and if they find a reliable food source, they won't return!

**That means hungry birds
can and will walk off your
management area and if
they find a reliable food
source, they won't return!**

To keep quail, pheasant, partridge or turkey hanging around, you need to “chum” designated travel routes and roadways with a good mix of game bird crumbles, small grains and milo. Spreading these small particle feeds with a mobile broadcaster will keep large mammal consumption (deer and hogs) to a minimum.

This method adequately reaches the natural bird distribution, but keeps predators or nuisance animals from targeting in on concentrated bird populations that are often associated with stationary feeders. Be particularly liberal with chumming during periods of extreme weather and frozen ground cover. Remember, by increasing the total population in these critical times, you will also be increasing the available breeding population for next spring/summer nesting.

Songbirds often get caught by severe weather during some portion of winter migration. Because of their small size, they need to eat high energy feed, frequently. Their accelerated digestion and metabolism also requires a constant source of freshwater. Those birds that over-winter in your area annually, will also be preparing their plumage and reproductive systems for spring breeding. In addition to traditional bird feeders placed about your property, they will make ready use of upland bird chum routes.

Migratory waterfowl in North America are particularly interested in food sources that are easily attainable from open (unfrozen) ponds or lakes. They choose over-wintering sites that are safe haven from extreme weather and predator pressure. They remain staged in areas that provide ample food and refuge. Most people don't realize that migrating ducks and

geese only travel as far south as necessary when seeking adequate provisions; they are not bound to a final destination. This is what the phenomenon “short stopping” is all about. In order to take full advantage of winter waterfowl visitation after natural vegetation and/or flooded dryland crops have died off, we need to pick up the slack by providing whole kernel corn or milo in shoreline spinners. Remember, it is not illegal to feed waterfowl; it is illegal to shoot waterfowl over feed (baiting). So if you plan on hunting ducks and geese on your ponds or lakes, you need to stop feeding before the season begins and resume as soon as it ends.

The long journey back north to nesting grounds requires extraordinary energy to maintain extended flight. Also, breeding usually occurs enroute and actual nest building begins shortly after arrival; so the birds need to be in optimum condition before departure from over-wintering areas. Available nutrition immediately preceding breeding season is imperative to hatching success. A smart duck hunter will feed well after the season has closed if he wants healthy numbers to return next fall. Historically, old market gunners knew that waterfowl returned first to the location they were fed last.

White-tailed deer have a difficult time surviving winter in many regions. By now, hunting pressure and weather conditions have

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evident in whitetails. Deer require 16% to 22% protein diet and greatest natural protein is available in developing tips of green vegetation. Obviously, this is no problem during warm growing seasons but after winter depletion, deer need supplemental dry feed and green food plots.

During mid- to late winter, commercial deer pellets mixed with up to 30% whole shelled corn in “free choice” portable bulk feeders provides balanced diet. Minimum of 1 feeder per 100 acres is needed on large ranges. On smaller acreages, put feeders where you want to consistently see deer. If you use restricted access “tube feeders”, make sure they have lower level fawn tubes. Previous fawn crop must eat, too! Fawns are future of your herd; if they are not getting improved nutrition, you’re going backwards in deer management.

It is well accepted that does consuming high energy diets in fall are more likely to breed and have more fawns than does without. Toward the latter portion of gestation, fitness of a doe about to give birth (and her unborn fawns) can be greatly enhanced by access to critical nutrients, vitamins and minerals. Good nutritional deer management in midwinter is directly related to fawning success in early summer. Likewise, when considering trophy antler production in bucks, the quantity and quality of browse available in the previous winter season is of utmost importance to new spring antler growth.

My recommendation for fall/winter food plots for deer and all wildlife is a combination of oats, winter wheat and rye planted in early fall and left to ripen in summer. These small grains all have complementary growth curves, are highly palatable and are cold weather hardy.

Along with budgeting input costs, we must also budget the use of these food sources in terms of net nutrition to the bird/animal. An affordable, but nutritionally efficient solution to maintaining wildlife through winter is providing small grain food plots along with dry feeds.

By recognizing critical importance of supplemental feed with protected refuge for all wildlife throughout fall and winter, we can better ration our year-round management practices. If you’re going to cut back, do it in spring/summer.

I view winter season as a great opportunity to attract wildlife in from adjacent properties that don’t feed.

Dan VanSchaik is a nationally known, well respected private sector wildlife biologist. He can be reached at danvtx@verizon.net.



Free choice deer feeder with fawn tubes.

probably pushed the animals well beyond their familiar home territories. Frozen ground cover in the form of ice or snow may be a daily occurrence. In northern regions, deer “yard up” after breeding season in order to conserve

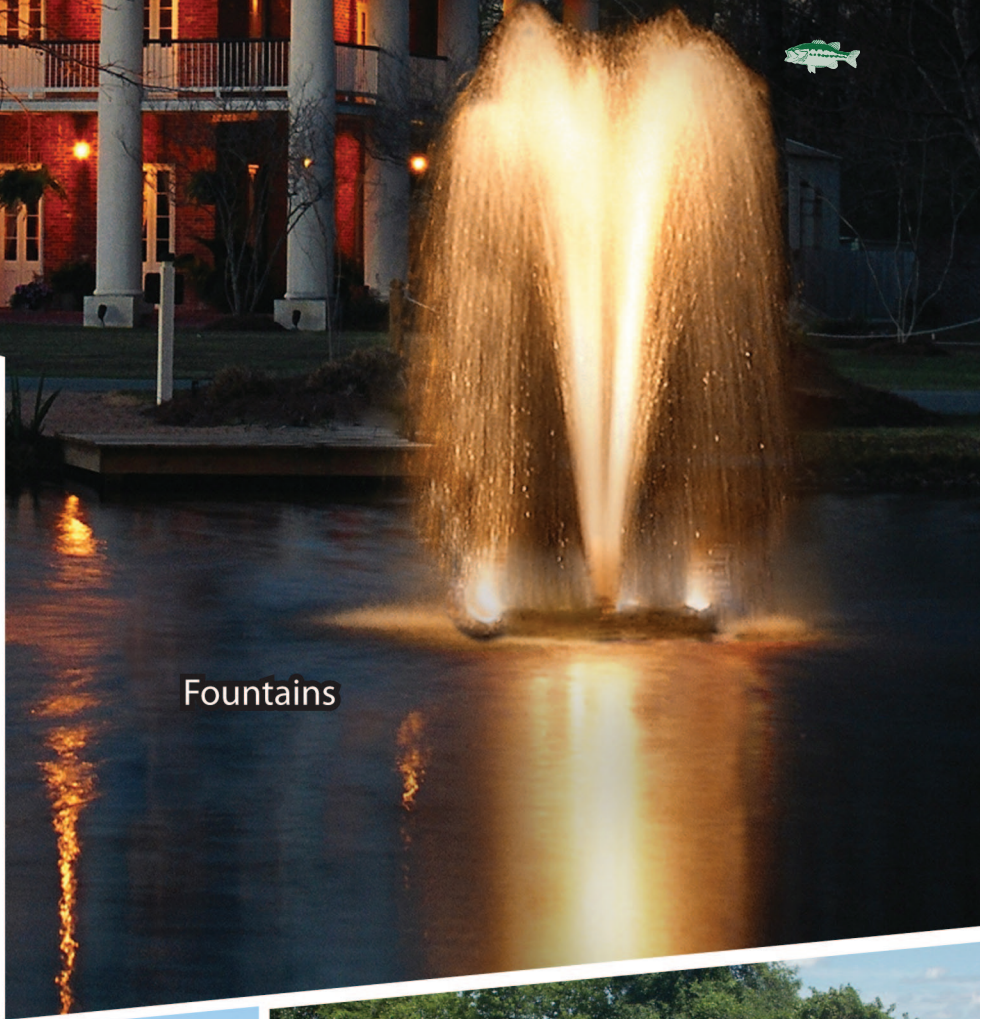
energy, reserve heat and fight off predation (safety in numbers). The downside is that the herd’s increased forage requirement within a smaller area soon leads to mass depletion.

Necessity for supplemental nutrition is most

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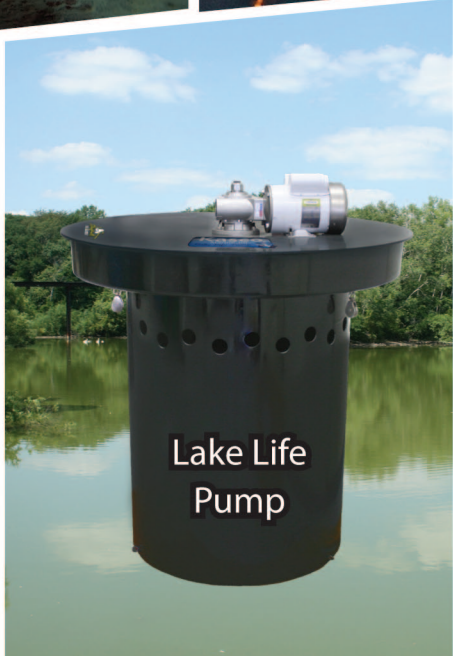
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Feature

Managing a Pond Naturally

by Bob Lusk

Aeration systems, feeders, high-quality feed, herbicides, electronic water quality monitoring devices, heavy equipment... pond management has changed over the years.

What if you don't have the budget, or desire, to intensely manage your favorite waters? Pond Boss subscriber David Van Acker, from Illinois, said so eloquently in a note to us a few

weeks ago, "I remember as a child, when my father and grandfather would take me to small farm ponds, that never had one single ounce of "management" and we would catch monster bluegills, bass and catfish."

Over a long career of studying and managing ponds, I must admit coming across some bodies of water that just had what it takes to be great.

How dare me come into those ponds and lakes and make wholesale changes? Like that great football coach Bum Phillips (even though Burt Lance coined the phrase) used to say, "If it ain't broke, don't fix it."

How in the world could this happen, especially a lake that already had 25 years under its belt?

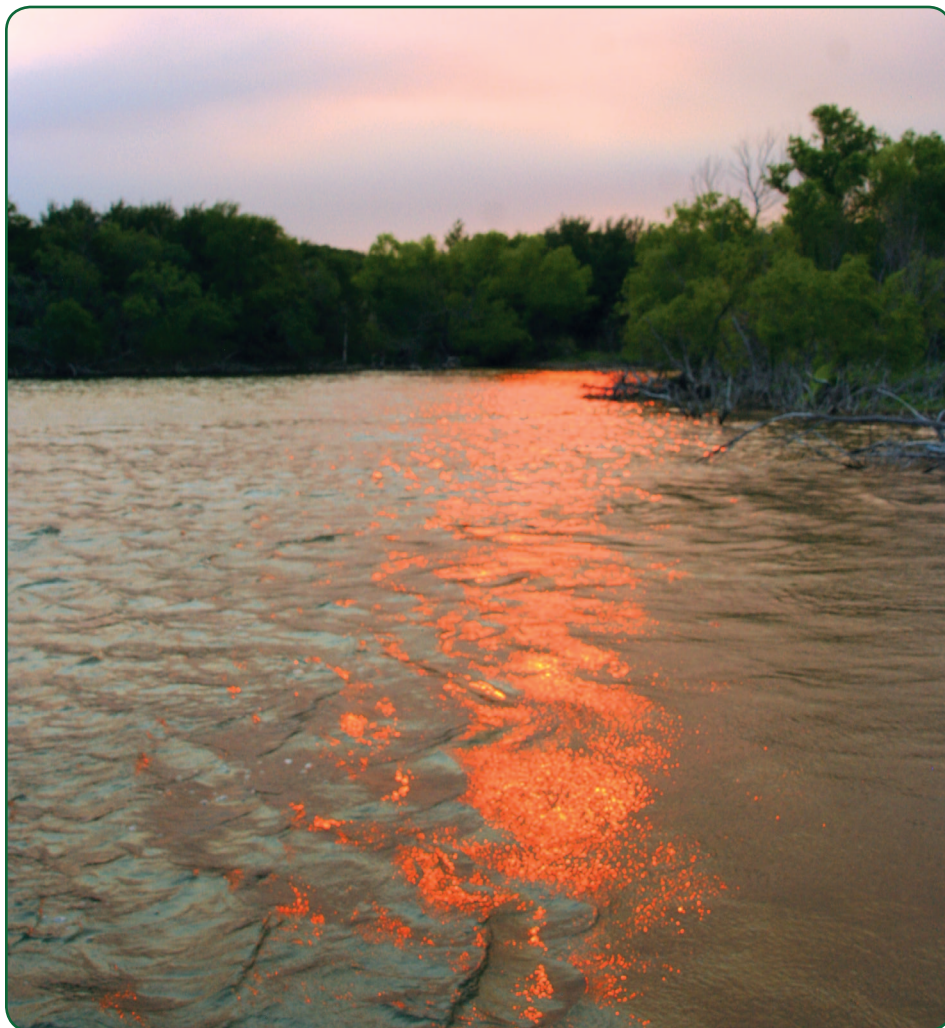
The first one I remember was a neat, older lake near Lone Oak, Texas. An attorney from Dallas was thinking about buying an old farm that had a 25 acre flood control lake on it. This was around 1986-88 and the farmer was still mad at the government for covering one of his best fields with a flood control lake back in 1960. "Dang govment. Took one of my best hayfields and stuck that giant dam there," I remember him saying with a scowl draped over his face. The lake covered every bit of 25 acres and the monumental-sized dam covered at least another 10. For a farmer, that's a lot of round bales to feed his cows...gone.

But, for an attorney with disposable income, it was a nice opportunity to buy a lake...if it could be managed. The lawyer had called us to come evaluate the lake and help him with his due diligence.

Folks, I've looked at lots and lots of old flood control lakes and there aren't many worth their salt as a potential fishery.

We launched the electrofishing boat and went to work. The farmer watched for about ten minutes, shook his head, climbed back into his pickup and went back to tending his business.

We cranked up the generator and headed toward a stand of willow trees and a stump field



The farmer's flood lake had heavy willow stands near the shore and in shallow water, like this lake.

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Bill Dance

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I'm extremely satisfied!

Bruce Condello

President/Co-creator of BigBluegill.com



in the upper end of the lake. Surprisingly, the water was fairly deep and we quickly found the old creek channel. Fish started popping up like popcorn. Lots of fish. Big fish. We saw bass from four to eight pounds and bluegills pushing a pound apiece. This wasn't anything we expected to see at all. The farmer had never laid a hand on the fishery. All he did was manage his farm. He fertilized pastures, baled hay, tended his row crops and ignored this lake.

Shoot, he was still angry about it.

How in the world could this happen, especially a lake that already had 25 years under its belt?

I'll always remember the look on the lawyer's face and the way he responded to the farmer. Since the lawyer was the client, I followed his lead.

His face looked like a little kids on Christmas morning. "Excited" doesn't do justice to the moment. Giddy is a better term. Couldn't wipe the smile off his face. As we weighed and measured those fish, it was a magical time. We wondered aloud how this lake could possibly be so good.

Then, the farmer drove up as we were loading the boat.

He looked at his prospective buyer and said, "Well, son, how is it?" The attorney put on his

courtroom face, pawed the ground, looked up and said, "Well, it could be better."

The farmer, in disgust, said, "I knew it!"

With bib overalls covered in stuff only farmers get into, he just took a few steps, asked the attorney if he wanted to buy the land and the attorney said, "Let me think about it for a day or two."

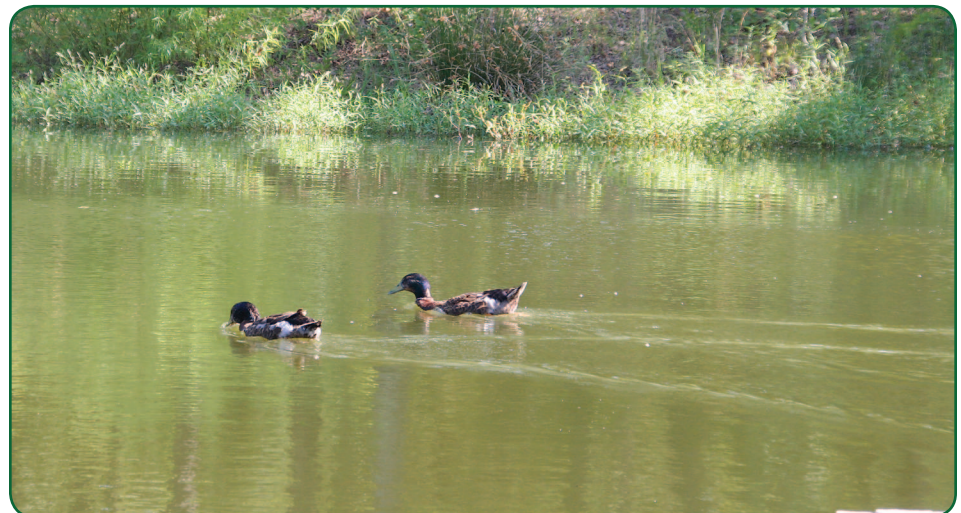
The farmer never looked at me, never asked a question...he just drew his own conclusions.

He climbed back into his old Ford truck, pushed in the clutch, pulled the gear shift into reverse, backed up and took off.

The lawyer winked and we finished loading up.

Over the years, I've seen several lakes with similar fisheries situations. And, I think of them often. They just "happened".

How do good pond things happen without management?



Fertile water, where appropriate, stimulates the base of the food chain.

Here are some fundamental tips.

First, in order for a pond to have a healthy, thriving fish population, several things must come together and work together in harmony.

It all starts with water...healthy water that provides and supports a food chain. Think about that a little more deeply. Water is dynamic, changing with conditions. It changes with temperature. Things dissolve into water. Water is constantly on the move. Fertile water grows plankton, which grows insects, which grows small fish which grows bigger fish.

The farmer faithfully fertilized his upstream hayfields every year. Not only did he help prevent erosion and siltation with lush grass pastures, he provided a basic food chain for the fundamental needs of the lake's fishery.

Habitat is as important as the water. You can have the best water on the planet, but if you don't have the best habitat to grow giant bluegills, guess what? You won't grow giant bluegills. Habitat is significant. Looking back at that lake in Texas, it had wonderful habitat. It had just the right amount of native aquatic

plants to harbor and feed a thriving food chain. It had two creek channels converging at the point of the borrow pit, where the dirt came from to build that gargantuan dam. The borrow pit was a long line where the water dropped from a few feet to fifteen feet deep. Larger bass prefer that type of habitat. There were willow trees dangling, sloughing and hanging over water about three feet deep. Then there were the stumps...stumps are lousy cover for fish, but around those stumps were remnants of trees long dead...fallen logs and timber that had been underwater for a long time.

If you want to manage your pond naturally, make sure it has the proper habitat for all those target fish. That means you need to learn about the needs of your target species...not just the adults, but how they spawn, what the babies need, what the juveniles need and what the young adults need, too.

The food chain is another key component. Managing a pond naturally means monitoring the fertility of the water and judging how well the tiny critters are doing. North of the Mason-

Dixon Line, be careful if you think about adding fertilizer. Native species of aquatic plants can be the medium to grow some microscopic food, since biofilm grows in plant stems and leaves. But, remember this. Aquatic plants, even the native ones, can become a problem, if they get out of hand. Learn about the different native plants and their habitat needs, too. Keep them where you want them. Shallow water is a no-no.

Here's the kicker for most naturally managed ponds. There is virtually no harvest. A pond is like a garden. When it's successful, there's a bounty. Take the bounty. Eat the fish. Don't overdo it, but take the extra without disrupting the dynamics of the balance of the fishery you are caring for.

How in the world did that farmer's lake produce such a bounty of huge fish? Well, it had outstanding habitat, first. Second, being a flood control lake, it was subject to fluctuating water levels during the course of a normal year. Third, the farmer inadvertently added nutrients which added the base of the food chain.

But, I kept asking myself over and over, "How did this lake keep from becoming a typical, bass-crowded fishery?" I instinctively knew there were enough large bass to feed on an expanding population of young bass and keep their numbers "just right". But, how did it get this way early on?

I learned that answer later. The farmer had told the attorney that his kids used to fish the lake many moons ago. All they caught was small bass.

Several months later, I learned the answer.

Remember those stumps? Well, there were quite a few trees and snags which stood well above the water line. It was a perfect place for double-crested cormorants to roost. That was the span of time when those birds were on the comeback trail. Numbers were escalating and guys like me didn't quite understand their significance, yet. We just knew we hadn't seen them until about three or four years earlier.

In that lake, water turkeys were harvesting the bounty. They couldn't catch the bigger fish, but they could sure eat more than their weight of youngsters.

My conclusion?

I think that lake had the best habitat for a fishery to thrive. The water was excellent. The food chain had all the elements it needed and fish were unknowingly being harvested.

The farmer hadn't spent a dime on that lake. Heck, he hadn't even enjoyed it.

Did the attorney buy it? You bet he did.

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Help! My Pond Has Leeches!

by Mark Cornwell

Mid-summer, our backyard is teeming with tired, happy kids running around after a hot summer work-day chopping wood. Barbecue is simmering, awaiting big numbers of hungry mouths. My sister, whom I love dearly, announced that it's time to stop working and running and put on the bathing suits and head down to the pond for a swim.

Great idea, Sister! The kids scream "Yeah!" and quickly shift gears and change.

This swarming sea of colorful swim-suit clad people collectively strolls down the hill to the nicely manicured lawn which lines the pond's edge here at the Cornwell compound. The floating aluminum dock, complete with a green runner, greets the kids as they fly off the end of its 40 foot length into the deep, cool, refreshing water.

What a great day. The wood shed is full; the smells of barbecue cooking wafts all over and people are swimming and kayaking in the pond. My sister is the designated lifeguard as my wife and I tend to the last minute details of the picnic and barbecue.

She takes her shoes off and dangles her lovely feet in the shallow water off the side of the dock as she watches the kids swim.

Then I hear it....

Then I hear it....

"Hey Maaaarrrrk!" That calm and slightly sarcastic tone that can only be my sister... "You have leeches in your pond and there is one stuck on my foot!"

Hmmm.....all the careful pond planning, all the consultations, dirt work, dam work, dock work, water testing, grass mowing, cattail pulling, swim platforms and the best thought out plans...and my summer swimmers are being greeted by leeches. Yup! Well that just

stinks.

So what now?

Well the first thing I had to do was to try

to pull that leech off my sister...which was not that easy! I took out a pocket knife and broke the seal of the sucker on her skin with



Leech!



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the blade...she was less than impressed.

All over the nation, leeches in ponds go together like a hand and a glove. The reality is the leeches in my pond were foreseeable. I have seen them reach almost epidemic proportions in ponds that are fairly stagnant with a low flushing rate. My pond fits into that low flushing rate category. Some leeches eat detritus, some eat invertebrates, and some

attach to fish, turtles, amphibians, or some other vertebrate like us. Some leeches are opportunists and change modes of feeding to suit the situation. In any event, you have leeches attached to you and you want to know what to do about it...and I am assuming that you want to reduce this type of encounter. Here are a few tips for dealing with the critters.

Although some leeches can swim very well, the ones in my pond do not like open water. In fact they are found in the greatest number in the very shallow water near shore in the leaf litter and plants. My test subject (my brother Scott) and I went back to the pond to do an experiment to see if the leeches would attach to us in the open water. (Actually, I needed a few leech photos for this article.) We dangled our feet in deep water, then shallower and shallower until we reached the shore. No leeches attached to us until we were very close to the shoreline. The leeches that attached did so on the exposed skin of our feet and then quickly inched their way along to anchor between our toes. Did my brother and I bleed? Well, yes we did! Leeches secrete an anti-coagulant that keeps the blood flowing. If you're a leech, blood is food. Leeches have a sucker on both ends of their body and use those suckers to inch along like an inch worm. So, swimmers...don't loiter in shallow water! Swim off the end of a dock in deep water! Better yet, swim off of a swim platform in deep water.

If you are going to be wading or swimming in near shore waters wear white socks. The fabric will keep the leeches from attaching and they are dark in color and can easily be seen on white fabric. Use finer knit material as some leeches are very small and may actually go through a coarsely woven fabric.

What else can reduce these leeches? Stock some fish! Many species of fish including bass and sunfish will be happy to eat the leeches in your pond. This is probably why most leeches prefer to hang out on plants and detritus rather than swim through open water. You can stock bluegill, pumpkinseed or better yet...redeer sunfish to put a dent in the leech population. These fish will never get them all, but you can be sure that there will be fewer leeches with increasing sunfish numbers. The added benefit is nice panfish for your swimmers to catch!

I have only trout and minnows in my pond. Out of a new necessity, that is going to change. I am going to stock some sunfish (most likely pumpkinseed, since I live in New York) very soon.

Many folks trap leeches from ponds for bait. Leeches are one of the best walleye baits that I have ever used. I used to trap them when I was in college. I had never used leeches before but my buddy Joe from Minnesota knew how to catch and use them. We would get a bloody beef bone from the butcher and put it into a closed coffee can with a bunch of holes punched into it. Then we would drive around and find a "slough" (a stagnant



Here's a microscopic image of a leeches sucker mouth.



If a leech attaches, sprinkle some salt on it. It will quickly become unattached.

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Look closely at this leech. You can see the mouth suction part. But, just behind that, is a big group of baby leeches, almost ready to release and go do what they do.

backwater or pond) to throw it in. We would come back the next day to a pile of fish bait. The leeches would be attracted to the blood and attach to the bone. The coffee can (with the holes) would trap them making it difficult for them to leave when you pulled the can from the water, just like a minnow trap.

Will draining your pond work? No, in my opinion and personal experience. I do know one pond owner who did just that...drained the pond to kill the leeches. The leeches overwintered in deep mud and were back in full force the next year. My pond is only 4 years old and I have leeches everywhere in the shallows. Leeches seem to have a very fast colonization rate.

Once they attach to your skin, how do you get them off? Well, you can pull them off, but this is hard as they are wet and a bit slippery. Plus, that sucker is strong and it is difficult to break the suction, but if you pull hard enough they will come off. The easier solution is to use a flat, thin blade (like a knife) to slide in between the sucker and your skin to break the suction. If you don't like leeches you can relieve what Humphrey Bogart and Katherine Hepburn did in the movie African Queen and douse that leech with salt. Remember that movie? Those scenes were the best! Bogart

coming out of the water just covered with giant leeches! Yuck! Does the salt work? You bet! And, fast! My brother and I tried it with attached leeches during our experiment. We shook a little table salt on them and within a few seconds they were detached and balled up. Some people really hate leeches and they burn them with a match or a lighter. I definitely do not recommend this as I know I am more likely to burn myself than that squirming leech.

So, if you have leeches do not despair. They are a natural part of the pond. Do they creep you out? Take measures to reduce them and don't linger in areas where they are most likely to be. Go ahead...Swim in that leech infested pond! Just don't loiter in shallows and on the bottom. And... if one gets one of your kin...take the salt shaker off the picnic table and play Hepburn to their Bogart.

Mark Cornwell is a fisheries professor at SUNY-Cobleskill in Cobleskill, New York. His passion is raising walleye and the I.Q. of fisheries students in the Northeast. Reach him at CORNWEMD@Cobleskill.edu.



Managing the Mini-Pond

Watch for Signs

by Bob Lusk

Here we are, the backside of summer, looking toward fall with great anticipation. What's your mini-pond doing? Shutting down, yet?

Watch for the telltale signs. Cattails have headed and now the leaves are turning brown. Lotus or lilies are showing signs of wear, turning brown and beginning to curl.

Fish, with the exception of bluegill, have long finished spawning.

Your mini-pond is staging itself for winter.

What do you need to do?

Harvest the bounty. Go ahead, take a few fish. But, don't overdo it.

Watch for cool water plants such as algae. We don't like algae in these next few months.

If you've planted ornamental plants in containers, be sure they're in deeper water to minimize freeze damage. If you've cultivated lilies, give them a few weeks and then thin the crop and transplant.

**Your mini-pond is staging
itself for winter.**

Pay attention to the landscape around the edges, too. If you've left a barrier of growth to slow down the water flow, make sure none of it can break off and flow into the pond to add to

the organic load.

Service your aeration system at the end of the September or October, once water temperatures have moderated. You're past the prime time of allowing your pond to re-stratify.

When the fish stop feeding, clean out your feeder and store it. Put the battery in the freezer. Pull out the owner's manual and do your due diligence for all your pond related equipment. Check your boat, inspect the dock and make sure all your amenities are in good shape.

But, most of all, enjoy this late summer, early fall weather...out by the pond.



Your mini-pond will soon show signs of preparing for winter. Cattails will begin to turn brown and other things will change.



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Backyard Nature Notes

Go for the Gold— “Gold Finches”

by “Bird Man” Mel Toellner
photos by Steve Maslowski

As I write this article, the American Women’s Soccer Team took one on the chin in their quest for “Gold” in the World Cup. I’m excited, however, as I look out my windows and see “Lots of Gold—Gold Finches” on a nearby feeder. Many people call what I’m looking at “wild canaries.” The male’s bright yellow body and long warbling song fit the name well. Check out your favorite field guide, and you’ll soon discover that these common familiar birds are formally called American Gold Finches.

In the spring and summer, male American

Gold Finches are recognized by their black wings and tail and black cap. Females have a greenish and a yellow front and no cap.

In early fall, gold finches molt. That is, they replace their worn, tattered feathers with a set of fresh, new feathers.

**In early fall,
gold finches molt.**

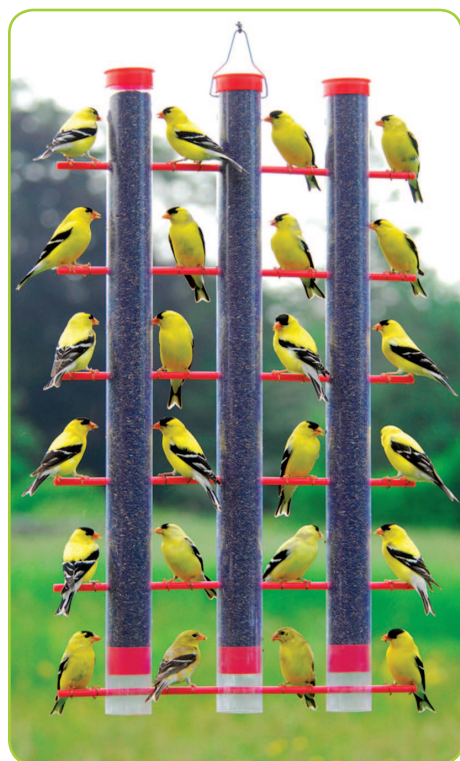
The appearance of these beautiful creatures after molting changes drastically at this time. The brilliant yellow body feathers are replaced by dull brownish plumes and the striking black cap disappears. Females also molt, but their appearance doesn’t change much. As a result, it’s harder to tell males and females apart and many folks assume their gold finches have gone away and mistake them for other birds during fall and winter.

The reality is just the opposite. Because gold finches are almost exclusively seed eaters, they often flock to winter feeders. Their favorite bird seeds are hulled sunflower seed, black oil sunflower seed, and nyjer thistle. Many people tell me “finches” don’t eat the seed at the bottom of the feeder. Here’s a tip: Switch to a feeder that allows you to open and fill from the top one time and the bottom the next (Aspects and Songbird Essentials make some great ones).

By doing this, you don’t get old packed seed accumulating in the bottom of a feeder which often results when you simply “top off feeders.” This old seed draws moisture and often even gets moldy and that’s why birds don’t like it. On feeders I utilize that don’t fill from the bottom, I make it a point each time to dump any leftover seed in the tube into a



Gold finches love sunflowers.



When they have a place to perch and fresh seed, gold finches will put on quite a show.

bucket and “mix it” with the fresh seed I’m putting out. Try this method – I guarantee it will help you attract more finches to more ports on your feeder. Another tip – only buy as much seed as you’ll use in 30 days. Fresh seed attracts more finches. One final feeding tip – Gold finches like to feed in groups so either offer a feeder with lots of perching room (my favorite and the finches’ favorite are the tubes that allow 24 finches to feed at once) or multiple feeders. You’ll be rewarded for your efforts.

Unlike my songbirds, which begin to nest in April or May, gold finches delay nesting until late June or early July. Their nesting season often extends into September. In late summer, the male defends a territory of about 1/4 acre in which a female builds a compact nest.

This delayed nesting season may be related to a dependence on thistle plants, which gold

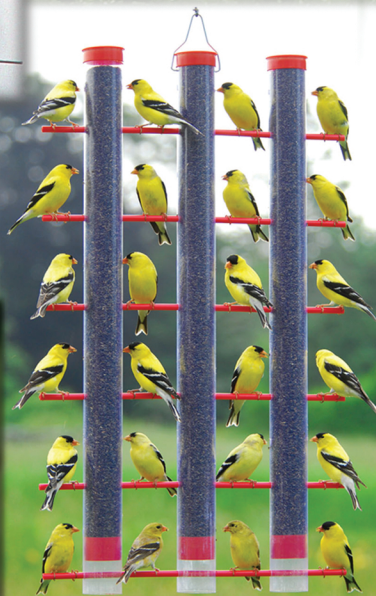
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*In winter, after gold finches molt, their color is much more bland, brownish.
Credit iStockphoto.com*



Fresh seed is important. Buy a feeder which can be alternately filled at the bottom or at the top.

finches use for both nesting material and food. Nesting seems to begin when thistle flowers mature and go to seed.

Gold finches weave thistle down, milkweed down, and other plant fibers to form a deeply cupped nest. I find they often take the cotton fibers from the hummingbird nesting material I put out for the hummers (who nest early in the season) so I leave it out all the way to September. The nest is usually anchored to three or four stems of a small tree or shrub.

Sometimes nests are attached to a cluster of thistle stems.

The nest is woven so tightly it holds water. Midsummer rains can flood nests and drown young too small to keep above the water.

The female gold finch lays four or five eggs and incubates them for twelve to fourteen days. The eggs are pale blue (almost white) and unmarked. After hatching, the young remain in the nest ten to sixteen days. When they fledge, young gold finches look like

females.

Most songbirds feed insects to their nestlings. Gold finches, however, feed their young the same seeds they eat as adults. Adults regurgitate partially digested seed into the gaping mouths of begging young. When a parent returns to feed its young, its crop is full of partially digested seed—enough to feed the whole brood. Because of the amount of food brought each time, the young are fed only twice each hour. Perched at and around feeders, gold finches eat seed after seed. This gives us a wonderful opportunity to watch them at length. Coneflowers, thistle, dandelion, goldenrod and sunflower seeds are typical natural gold finch foods. Habitat can also be a key to attracting gold finches. In this case, you do less work, not more. Don't worry about dandelions—gold finches love them. Also, don't cut off the dead head tops of your marigolds, zinnias, cosmos, or cone flowers, as again, gold finches love them.

Water is your least expensive way to attract many birds and this is partially true of gold finches. It seems that of the twenty-plus birds I regularly attract to my yard, "gold finches" are the most frequent visitors to my bird baths and water features. They drink a lot (I guess to help process all that seed) but gold finches

also seem to greatly enjoy an active splashy dip in a shallow bird bath or another water source.

Gold finches tend to wander widely to feed, so don't be surprised if their presence at your feeder is more variable than that of other species. My wife gets frustrated when they suddenly leave after robbing our feeders for weeks. I know, though, if you and I offer the right kind of fresh feed in the right kind of feeders, we will soon "Win the Gold" as gold finches return to our feeders. Enjoy the show in your backyard and remember, "Nature is God's stress reliever. Take time today to listen to the birds sing!"

"Bird Man Mel" Toellner is the owner of Songbird Station, the Largest Seller of Backyard Nature Products in North America, and Songbird Essentials, the Fastest Growing Line of Wild Bird Products for the Past Four Years in a Row! As you can see from this article, birding is a passion, and not just a business with Mel. "Bird Man Mel" has given hundreds of talks on "Attracting Backyard Birds and Butterflies" across the United States and Canada, and Mel was one of the featured speakers at our recent Pond Boss Conference.



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Down to Earth

Clay is Our Friend... If We Treat it Right

by Mike Otto

In the last article we defined clay, got a couple of ideas of what it looks like in the field and explained what the contractor will do in the field to get started, which is called the contractor field test.

Clay is like money, if it is not treated correctly, you will not have good results, no matter how much you have.

Remember, clay has small particles. The

size of material particles helps explain why, when processed properly, it slows down the seepage potential. When all those particles are squished together as close as possible, the distance between the particles is minute—the smaller the space, the least amount of water can escape. That space is called a pore.

Pore—any tiny hole admitting passage of a liquid. This is what we are really talking

about—holding the water, keeping as much of it as possible and letting as little pass through the tiny holes in the clay.

This is not only something I learned from working and playing in dirt for 30 years, this is in the books. One of the interesting things about this business is that definitions and explanations can be put into a large textbook. They are available on the internet and from



A bulldozer, although heavy, isn't as efficient in compacting soil as rubber-tired equipment or a sheepsfoot roller. A bulldozer is most efficient pushing dirt 100 feet or less.

almost every college in the country.

The more we know, the better decisions we can make, but for some reason people always seem to be in a hurry. **DON'T BE IN A HURRY. DO YOUR HOMEWORK. THE LIFE OF YOUR POND DEPENDS ON IT.**

Even when we are in the do it yourself mode, **-DO NOT BE AFRAID TO ASK FOR HELP.**

The smaller the particle size, the better it can be compacted and the better it will hold water. Clay is good.

Here's an important tip. **ALL LAKES LEAK—NO LAKES STAY FULL ALL THE TIME.** Remember this, plan on it, expect it.

The only lakes that stay full are those which have more water flowing in than what flows out.

Increasing the density of soils, along with its side effects of increased strength and decreased permeability adequately defines compaction. As an earthmover, this is what we strive toward as we build a dam, line the inside of a pond or do what we do to thoughtfully mold the earth toward the mission. The simple Otto definition of "compaction" is particles squished together as much as possible.

**The only lakes that stay full
are those which have more
water flowing in than what
flows out.**

Compaction is usually achieved with heavy machinery and some water.

I like to call this the "double w's". **WEIGHT** and **WATER**.

Before we start to compact the material, it needs to be moved to the spot we want it. The placement of the material is as important as any part of the compaction process.

People who scrape grime from under their fingernails at the end of the day, like I do, have a phrase that welders like to say –it may not look good, but by golly, it will hold. I happen to be one of those thinkers. But, in the dirt business, that is not true. The material must be layered in the dam in uniform lifts six to eight inches in depth. Never cut that corner. Dirt will not compact evenly if there are different depths. If one area is three inches deep and a few feet away the dirt is six inches deep, the machinery cannot compact it uniformly. So the first step is to lay the dirt down evenly and smooth it where machines can travel over it uniformly without any trouble. The man in the

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This double pan scraper is efficient in moving dirt a long distance, plus it has an added benefit. Look at the spacing of the tires, front to back. With the added weight of a load of dirt, this machine is excellent for compaction.



Look beneath the wheels of this heavy piece of equipment. The dirt isn't moving. It's tightly compacted.

seat of the equipment should consider this his first and most critical task.

With the material in place, go to the next step.

Look at WEIGHT, the first w of the “double w’s”.

Most people have seen a bulldozer and understand many of the manmade ponds on the planet have been built with that type equipment. The dozer is mainly designed to move dirt a short distance, a hundred feet or so. With proper care and lots of trips, this machine can do a very good job of achieving an acceptable compaction. The weight of a dozer is spread out over a long space (the tracks) and does not have a lot of weight in one spot. This makes a dozer a medium of art, sort of. With proper mixing and cutting of the dirt and lots of trips back and forth with the dozer a masterpiece in dirt can be created.

But, the operator must know what he/she’s doing. Here’s a word of caution. Just because someone knows how to operate a bulldozer doesn’t mean they can build a pond and properly compact soil.

Any kind of rubber tire machine with its lesser weight in a more concentrated area can do a good job of compaction as well. A wheel loader with a bucket full of dirt will compact a



This picture shows a core trench for a fairly large dam, tightly compacted and ready for the dam to be built upward.

dam about as good as any piece of machinery. In this business, a pan scraper is also used a lot, it moves fast, can carry a lot of weight and if it is being used on the job it only makes sense to put it to work as a packer, also. Dump trucks,

water wagons, anything with weight will work to assist the mission of compaction.

By design, a piece of equipment called the sheep’s foot roller is especially designed for the job of compaction. There are as many



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styles of rollers as there are brands but they all do basically the same thing. SQUEEZE ALL OF THE PARTICLES TOGETHER AS CLOSE AS POSSIBLE.

The 'book' says to make eight passes over the area that is being worked on. Some projects that require an engineer will have a test done on the work and they will tell us what needs to be done. The test that an inspector will run is called a density test. It will tell us in about one minute how we are doing. A very interesting process, it takes the guess work out of the packing and on some jobs it will be required, especially on larger dams.

If you are doing the work yourself a good way to judge compaction is to keep an eye on how far the machinery will sink into the loose dirt. Each pass over the dirt will make the dirt look a little different and the machine should keep making passes until it does not sink into the dirt. A sheep foot roller may leave cleat marks five inches deep on the first pass, the second pass maybe half that much and the third pass there may be only a small mark, continue to roll until the machine is up out of the cleat marks. Same is true for the scraper or dump truck.

Let's look at the second w of the "double w's" which is water. The purpose of using

water when we compact dirt is to help all the particles slide together as close as possible. Water acts as a lubricant, that is all. There is nothing magical about water and dirt being mixed together. Dirt is not like cement which, when mixed with water, will harden and keep its shape. When compacting dirt, water is actually one of the tools used to fulfill the goal. The soil scientist we use will come to the job before we start, take a few samples of the dirt back to his laboratory and run his tests. The information he gets will allow him to run the density test. That will tell the man on the machine the amount of water that is needed and how many times a machine will need to roll over the layered material.

Think about it this way. Clay is a fine particle material, not unlike what you'll see in a box of Jell-O pudding. Open it, pour it out, and it's the consistency of flour, powdery. Dry clay, pulverized, is powdery. But, when wet, it becomes sticky. With proper moisture, it can stick and becomes compactible. Without water, clay can't compact. Water is good.

All of this may sound complicated, but it's really not. Here's a tip. The material is never perfect and we will talk about that some other time. But the way we process the material we have can be controlled. The best material

on the planet will do us no good if it is not worked, pulverized, moved, and moist enough, compacted properly and treated properly. Even some material that is less than desirable can work if it is compacted properly. We work with what the good Lord gives us and make the best of it. Regardless of the soil we have, all of our lakes will be below the full mark if the hot temperatures continue. The sun is coming up, the day will be beautiful...a little hot, but beautiful, the dirt moving process will start in a few minutes.

Today, on a project not far from home, we are processing dirt, laying it in a dam in six inch lifts, hauling lots of water and I mean lots of water (two water trucks not just one) and packing it so it will hold water.

So, as you venture into the unknowns of pond building, know this. Find clay, mix, pulverize and use enough moisture and weight to compact it.

Then, when the neighbor's pond is leakier than yours, you'll raise a toast to the time you knew what to do to pack that dirt.

Earthmover Mike Otto can be reached at mikeotto@ottosdirtservice.com or via the magazine at pondboss@texoma.net



Efficiency in action. Moving lots of dirt, good lifts and great compaction.



In the background, a scraper rolls over and over clay soils to compact. In the foreground, topsoil is being removed for later use. Topsoil is not good material to place in a dam. It's good for the top of the dam, to grow grass.

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E-mail: support@klmsolutions.com

www.pondalgaesolutions.com

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Contact: Cary Martin

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E-mail: info@aquaccontrol.com

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www.aquadocinc.com

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(407) 886-3939 - Fax: (407) 886-6787

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E-mail: matt@aquaticceco.com

www.aquaticceco.com

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Interactions Between Channel Catfish, Largemouth Bass and Bluegill in Ponds

by Eric West



A recent study of interest to pond owners entitled *Investigating Interactions Between Channel Catfish and Other Sport Fishes in Small Impoundments* by D. Michael Leonard, Dennis R. Devries and Russell A. Wright in *North American Journal of Fisheries Management* 30:732–741, 2010 by the American Fisheries Society contains some noteworthy information about interactions between channel catfish, largemouth bass and bluegill in ponds. Some of the findings are similar to points made by pond owners about those three species on the Pond Boss Forum. Other findings were quite different from those most would expect.

First, keep in mind the impoundments in this study are managed as public fishing lakes and are larger than most ponds, but are not big lakes. Here are some of the basic background considerations.

Catfishes are popular sport fishes throughout North America. Prior studies found more than 60% of surveyed agencies in the United States and Canada rated catfish as being moderately or highly important to anglers. In a survey of Alabama anglers, catfish were rated as one of the top four targeted species as well as the favorite fish to eat. As popularity of catfish among anglers has increased, so has a desire to stock catfish in small (i.e., less than 100-ha) impoundments. Many states offered specific recommendations for stocking channel catfish in small impoundments. Nearly all young-of-the-year channel catfish in small impoundments are susceptible to predation. Therefore, restocking is often necessary to maintain populations. Typically, channel catfish 200-mm total length

(TL) or larger are stocked into systems with established populations of largemouth bass because fish of this size are large enough to avoid predation.

Channel catfish growth in small impoundments can be negatively related to their density and, therefore, stocking rates which yield intraspecific competition are important to avoid. Both channel catfish and bluegills feed heavily on macroinvertebrates and at high abundances channel catfish can reduce macroinvertebrate abundance. Studies have suggested that if food resources become limiting, channel catfish may compete with bluegills.

Largemouth bass and channel catfish diets were generally dissimilar within each lake across all seasons.

As channel catfish grow, they become increasingly piscivorous (fish eating), leading to competition between channel catfish and largemouth bass, which typically are highly piscivorous in small impoundments. In addition, as many as 30–40% of channel catfish stocked in sportfishing ponds can become uncatchable by anglers, or “hook shy”. As a result, a portion of the population may be large, piscivorous individuals that contribute little to the fishery

and can have significant negative impacts on other fish populations.

Managers need to assess costs and benefits of stocking channel catfish into small impoundments if their population levels could result in consumptive demand negatively influencing bluegill populations. Further, there is a trend of declining fishing mortality of largemouth bass due to both reduced angler visits (U.S. Fish and Wildlife Service and U.S. Bureau of the Census 2006) and increased catch and release which is causing overpopulation in many small impoundments. Dense populations of largemouth bass combined with catfish overabundance in these systems may result in a demand for forage species that exceeds capacity.

These are the points most pond owners posting on the Pond Boss Forum would agree with and have discussed at length. The following are some eye openers. Keep in mind, however, that these are managed public fishing lakes and as such some of the problem factors noted above are managed out or greatly reduced.

Mean relative weights of bluegills, channel catfish and largemouth bass were not related. Channel catfish became increasingly piscivorous with size in three of the four lakes, but still primarily consumed insects throughout all sizes (from 85% to 99% insects). Of the 11 individual fish found in channel catfish diets, nine were either bluegills or unidentifiable *Lepomis* spp., and one was a largemouth bass. As bluegills increased in size, they consumed a smaller proportion of zooplankton (from 20% in bluegills, 75 mm to 6% in bluegills, 175 mm) and higher quantities of insects (from

73% in bluegills, 75 mm to 85% in bluegills, 175 mm). Largemouth bass across all sizes primarily consumed fish (from 54% to 67% fish), and their diets within size-groups were more variable among lakes than were bluegills or channel catfish.

Bluegill diets were highly similar among the four lakes. Largemouth bass diets also were highly similar among the four lakes. Channel catfish diet similarities were more variable between lakes and among lake comparisons. Largemouth bass and channel catfish diets were generally dissimilar within each lake across all seasons. Bluegill and channel catfish diets within lakes were moderately similar and showed no seasonal trends in similarity.

We found no evidence of intraspecific competition in channel catfish at densities currently maintained in study lakes. No evidence was found to suggest that channel catfish and bluegills were competing in focused sampling study lakes. The moderate overlap in diet between these species indicated that if prey resources were limiting, there was at least a possibility that these two species could compete.

No evidence was found to suggest that channel catfish and largemouth bass were competing in any but one of our study lakes (25% of the study). Current channel catfish stocking rates in most of these lakes appear to be maintaining densities below a level at which they would negatively affect bluegill and largemouth bass populations. If improved angler catch rates are desired, channel catfish stocking rates could be marginally increased to improve angling success without causing any significant negative effects on other sport fish.

There is much more data in this study to contemplate but my take is if you keep the channel catfish population low and their size small (under 5 lbs) you should be able to successfully include channel catfish as one of your pond species without negatively affecting your largemouth bass and bluegill populations. In doing so keep in mind that the biggest factor that limits the growth, condition and size of fish in most waters is insufficient food. So feed those bluegill and channel cats (bass also if you can) and enjoy eating those catfish before they get big.



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From Pond to Plate

Bluegill au Modica

by Bob Lusk



Dr. Dave Willis, holds the “perfect” size bluegill for this recipe. Photo courtesy TJ Stallings, TTI-Blakemore.



Green sunfish are a good choice for this recipe, also. Most any sunfish will work.

There are quite a few bluegill fanatics out there. Bill “Musky” Modica, from Antioch, Illinois, happens to be one of them. When I saw this recipe, I knew our brethren in Pond Boss would love a taste. Harvest a few bluegills from your pond. It won’t hurt a thing! Remember this, though. Don’t take the largest bluegills. Take the next size smaller. Leave the biggest ones in the pond. They are the fish which will protect the nests and force smaller bluegills to grow to larger sizes. Bluegill, or any sunfish fillets, for that matter, make excellent morsels and are healthy, white, flaky meat.

Modica’s recipe is a simple, healthy, alternative to deep or pan frying.

Ingredients

- 6-8 Bluegill fillets skinned
- 1 large clove of garlic minced
- 2 tablespoons olive oil
- Lemon Pepper
- 6-8 Asparagus spears

Asparagus

Pre-heat oven to 400°

Place asparagus spears in a small oven pan or cookie sheet, brush with olive oil, sprinkle with kosher salt and pepper. Roast asparagus for 20-25 min. depending on stalk thickness.

Bluegills

In a large teflon pan, lightly brown minced garlic in 2 tablespoons olive oil on low heat. Remove from flame. Spread garlic bits evenly across cooking surface. Add and arrange bluegill fillets to the pan, cavity side down. Lightly season fillets with lemon pepper and cook fillets on high heat until fillets are opaque in color from the top, and lightly browned on the bottom (approx 1-2 min.). Carefully turn fillets and cook an additional 45 seconds before plating.

Serves 1



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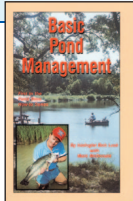
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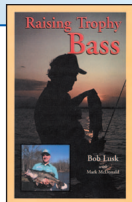
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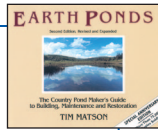
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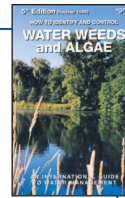
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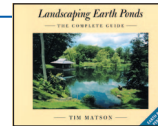
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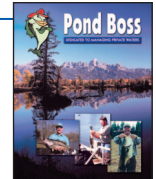
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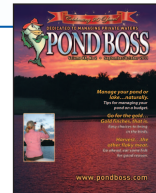
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