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Stocking Gizzard Shad In Ponds

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In the world of private ponds and pond management, consistently producing trophy bass is the ultimate goal of many pond owners. For the sake of argument, I will define 'trophy' bass as in excess of 10 pounds. Of course, 'trophy' is in the eye of the beholder, but that's another story.

As with management of deer for trophy bucks, the key factors for producing trophy bass are well known: age, genetics and nutrition. This has become a well known mantra for land owners and deer hunters. It should be as well known to bass fishermen.

For a pond owner or pond manager, the tricky part of that equation is the nutrition component. We can easily acquire a stock of bass with the desired genetics and given them adequate time to reach trophy size. All it takes is employing the too popular practice of catch-and-release fishing. This is one advantage fishing has over hunting: you can't practice catch-and-release hunting.

But how can an owner of a 10 acre pond, for example, insure that his bass have enough food on a daily basis? Unfortunately, Florida and Florida X Northern bass do not eat fish feed. And, it is extremely expensive to purchase truck loads of forage fish to directly feed bass on a regular basis.

Therefore, it falls to the pond owner or manager to manipulate the predator

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Gizzard shad can grow very large.

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and prey populations to insure the bass always have adequate food. Obviously, this is not as easy as ordering a pallet of deer chow and filling feed troughs.

However, it is not enough to provide abundance of food. For bass in a pond, which must chase down and capture their food – not gingerly walk up to a feed trough, we must insure that bass have appropriate size food as they grow larger. For the energy a bass expends chasing down and capturing a prey item, it must receive a large enough return on it's investment. Otherwise, there is no energetic 'profit'. To grow at an exceptionally high rate, this energetic profit must be exceptionally high.

This concept is referred to as maximum foraging efficiency. It is a common sense, easy to understand idea. Simply put, a large bass needs a correspondingly large prey to continue growing well.

Imagine a 6 or 8 pound bass living in a pond. Most of the time, this bass is loafing around, hiding and waiting for food or digesting a recent meal. The largemouth bass is a 'hide-and-wait'

predator, not an open water, cruising predator such as striped bass or tuna. It is easy to understand that this bass will spend the same amount of energy to chase down and eat a 3 inch prey fish as a 10 inch prey fish. However, that 6 pound bass receives much less return from the 3 inch prey compared to the 10 inch prey. In fact, if your 6 pound bass does not have an ample supply of large prey, but must rely on 3 inch prey, it may in fact run an energetic deficit and actually lose weight.

Most pond owners and pond fishermen have seen the result of this inefficient foraging: long, large framed, big headed, skinny bass which don't weigh anywhere near what it could or should.

In a well managed, ideal pond, that 6 or 8 pound bass would have an abundance of large prey fish on which to regularly feed. In such case, the fish would operate at a high energetic profit. Such a fish would be chunky, above average condition and growing at an exceptional rate. If those conditions could be maintained year after year, then that bass



Gizzard shad commonly reach 8 to 12 inches.

would have the opportunity to realize it's full genetic potential. Maybe it would break 10 pounds, maybe not. That all would depend on the roll of the genetic dice. But if not that fish, perhaps it's sister. Either way, the pond owner has at least set the table.

The next obvious question is how does a pond owner provide correspondingly large prey fish for large bass – 8 pounds, 10 pounds, 12 pounds? Prey species selection is the key. This points out the big shortcoming of threadfin shad – they just don't grow large enough. Threadfin shad regularly grow to lengths of 4 to 5 inches as adults. That just isn't big enough for big bass.

Bluegill can grow quite large, but not typically in large number. Large bluegill are normally

found in bass crowded situations. Well balanced ponds and lakes produce good numbers of average size adult bluegill, in the 8 inch range.

In addition, bluegill are not the easiest of prey for bass to gulp down. Bluegill have sharp, bony spines in their fins which can be locked in an erect position. This increases their effective girth and can cause a bass to fail in the attempt to eat a large bluegill. I suspect many of you have, at least once in your life, found a dead bass floating with a large bluegill stuck in it's throat. Therefore, a large bass may not be able to feed on the largest bluegill present.

What fish species, you ask, fits the bill? The answer to this question is the slimy old gizzard shad. The gizzard shad (*Dorosoma cepedianum*) is a member of the herring family – Clupeidae – which grows much larger than the threadfin shad. Adults commonly grow to lengths of 8 to 14 inches. In private ponds where gizzard shad have been established, we typically see that the majority of the gizzard shad are 12 inches and smaller. However, individual gizzard shad can grow larger.

The slimy gizzard shad is just that – slimy. It has fins which are composed of soft rays, not sharp, bony spines. Although it is thicker and deeper bodied than the threadfin shad, which is quite thin and skinny, the gizzard shad is not as deep bodied as bluegill. These characteristics make it easy for bass to gulp down very large gizzard shad.

'Large' is, of course, relative to the size of the bass eating the shad. Again, because of the body form of gizzard shad, bass can easily eat a much longer gizzard shad than bluegill. Research has shown that a largemouth bass can eat a bluegill about 1/3 of it's length. Therefore, a 12 inch bass can eat a 4 inch bluegill. However, a bass can eat a gizzard shad more than 50% of it's body length. My colleagues and I have seen bass with recently swallowed gizzard well over 1/2 it's body length. Usually, we first notice a forked tail extending from the bass' mouth.

Based on these aspects of fish morphology, it is easy to understand this concept of maxi-



**Are gizzard shad good for bass?
This 12 pounder shows they are.**

mum foraging efficiency. It should also be obvious that large gizzard shad allow large bass to achieve greater feeding efficiency than bluegill. Therefore, large bass will maintain high growth rates and have a higher probability of realizing their genetic potential if provided with an adequate supply of gizzard shad.

Well, if we understand and agree with this explanation, it begs the question, "Why would any pond owner not stock gizzard shad?" Other than additional expense, the short answer is a belief that gizzard shad would harm the bass and bluegill populations in a pond.

For many years, there has been, and continues to be, the widely held belief that gizzard shad are harmful to the sport fish populations in ponds and lakes. This belief was held by the public and disseminated as scientific fact by state fisheries agencies. It was also taught as scientific fact at major universities across the country. As with all things scientific, progress is made, technology advances, old dogmas are challenged and things once considered as fact are found to be false and baseless. Such is the case with stocking gizzard shad in ponds.

The old dogma regarding gizzard shad (and threadfin shad for that matter) was based on an expectation of severe competition for food between shad and sport fish species, primarily with bluegill. The logic went something like this: shad feed primarily on zooplankton, which is the primary food of bluegill. Therefore, gizzard and threadfin shad, being filter feeders, would out compete bluegill for food, causing a decline in the bluegill population, both in number and quality, and a corresponding decline in the bass population.

I have long disputed this argument based on the assumption that bluegill primarily feed on zooplankton. Research I personally conducted for my Master of Science degree at Auburn University directly examined the feeding habits of small bluegill in ponds. My research showed that small bluegill rely very little on zooplankton. The primary food of bluegill, I found, is aquatic insects which live on and in the pond bottom. Specifically, the main food



A hawg bass raised on gizzard shad.

is the larval stage of flies called midges in the family Chironomidae. These fly larvae are commonly referred to as 'blood worms' because some species are blood red due to the presence of hemoglobin. Particularly in well fertilized ponds, small bluegill fed almost exclusively on these midge larvae.

The conclusion, based on this faulty logic, was stocking gizzard or threadfin shad in a sport fish pond would simply ruin the bass and bluegill populations. The popular statement regarding shad in ponds was that shad would 'take over a pond'.

What is the reality? It simply is not true. Our experience over many years of stocking threadfin and gizzard shad in ponds and lakes with a wide variety of population structure has

proven to us and our clients that shad are not harmful but only beneficial to sport fish populations.

Fortunately, there is enough scientific research to back up our experience and show proof that there is no downside to stocking shad.

Let us begin with looking at some recent research. Dr. Dennis DeVries, a fisheries professor in the Department of Fisheries at Auburn University, directed research on the effects of gizzard shad on sport fish populations on Walker County public lake in Alabama. Results were published recently in the November 2003 issue of the North American Journal of Fisheries Management, a peer reviewed scientific journal published by the American Fisheries Society.

Gizzard shad were established in this lake many years ago. The research involved performing a partial rotenone treatment to selectively kill much of the gizzard shad and then monitoring the response of the sport fish populations. So, the rotenone treatment was made, many thousands of gizzard shad were killed and the abundance, growth and reproduction of the sport fish species (bluegill, bass) were monitored and measured over the next four years.

Based on the old belief about gizzard competitive effects on sport fish species, the expectation was that the bluegill and bass would show significant improvement in growth, reproduction, etc. in the years following the gizzard shad reduction.

And what was the result of this research? The researchers found no improvement, no change in the sport fish populations after the gizzard shad were reduced. In addition, in the following years as the gizzard shad population recovered to the pre-treatment levels, when you would expect to see the negative effect of gizzard competition, there was still no change in the sport fish populations.

This was completely contrary to expectations based on the long held beliefs based on the old assumptions about gizzard shad. The conclusion drawn from this research was –

what else could it have been – that gizzard shad do not compete with bluegill, bass, etc. to a measurable or significant degree.

In discussing this research, Dr. DeVries identified an effective fertilization program as the reason for the absence of harmful gizzard shad food competition. In simple terms, this means a good, effective pond fertilization program provides enough food for all the fish species.

This supports what we regularly preach and teach our clients: the old reliable pond fertilization program allows you to grow more and bigger fish. It insures you can provide adequate food for all of your fish population.

One aspect of regular pond management not discussed or considered in this discussion is the wide practice of directly feeding bluegill. Assume for the sake of argument that gizzard and/or threadfin shad do significantly compete for food with bluegill. That could easily be taken care of with a regular bluegill feeding program, which many pond owners already have in place.

Another factor apparently not taken into account is something we observe and struggle with on a daily basis: the amazing predatory power of the largemouth bass. Even in ponds where we have established populations of threadfin and gizzard shad, we still must regularly harvest bass to prevent bass overcrowding. We have not seen a case where threadfin and/or gizzard shad could produce enough food to keep up with or outproduce the predation ability of the largemouth bass. It simply does not happen.

Of course, this points out a major difference in private ponds and public lakes and rivers: fishing pressure and bass harvest rate. Private ponds receive very little bass harvest. Public waters historically have received high rates of harvest on bass and other sport fish species. Without question, this significantly affects the structure of the fish populations and makes it more difficult to determine the cause of any change in the fish population.

Let us look back into the past for research

on the effects of shad on bass/bluegill ponds. The founder of the fisheries program at Auburn University, Dr. Homer S. Swingle, published research on stocking gizzard shad in bass/bluegill ponds. He found no difference in the total production of bass and bluegill (lbs per acre) in ponds with gizzard shad versus ponds without gizzard shad (Swingle and Swingle, 1968). There was also no reduction in bluegill reproduction and survival of small bluegill to the adult population.

That research also showed the high productive potential of gizzard shad. The gizzard shad populations in the research ponds were, on average, nearly 600 pounds per acre. Standing stocks of as much as 800 lbs/acre have been reported in other research.

In addition, research showed a dramatic improvement in sport fish populations after establishment of threadfin shad in Lake Martin, Alabama. Contrary to the old assumptions and teachings, sport fish populations more than doubled (in terms of lbs/acre) after threadfin shad became established.

Examining this published scientific research truly makes one wonder where these widely held ideas come from. Unfortunately, there is much misinformation, misunderstanding, folklore, old wives' tales, etc. about pond management, much like wildlife management. Everybody is an expert. In this case, even supposedly educated professionals have helped spread the misconceptions about the effect of shad in ponds.

To be fair, some past research and literature has shown varying and inconsistent results of shad on sport fish populations. However, Dr. DeVries points out that the results are so highly variable and inconsistent that assessments and conclusions are difficult to make. It could not be concluded that the shad were the cause of any change in the fish population. Conducting 'scientific' experiments on fish populations on large lakes and rivers introduces many variables (species composition, complex species interactions, predator:prey ratio, fertility level, weather conditions, etc.) that are beyond the

control and understanding of the researchers. It is certainly not the same as small pond experiments where species composition and other variables could be more controlled.

I hope this article has illustrated the facts about stocking gizzard shad in ponds. By examining research and our direct experience, I hope this has convinced you that stocking gizzard has a place in pond management and is only beneficial to sport fish populations. If producing truly trophy bass is part of your management goal, gizzard shad will help you get there. What you should take from this article is that a good population of gizzard shad and an effective fertilization program can help your bass realize their full genetic potential.

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