MP447

Recreational Fishing in Small Impoundments:

Alternative Management Options

Cooperative Extension Program,
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Recreational Fishing in Small Impoundments: Alternative Management Options

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Cover: (clockwise from upper left) Largemouth Bass, Hybrid Bream, Black Crappie, Channel Catfish, Hybrid Striped Bass; (center) Bluegill.

Table of Contents

Alternative Management Options: Pros and Cons 1

Big Bass Option 1

Big Bream Option 2

Hybrid Bream Option 3

Channel Catfish Option 4

Black Crapple Option 4

Hybrid Striped Bass Option 5

Alternative Management Options Literature 6

Alternative Management Options: Pros and Cons

Stocking and management of small impoundments in the southeastern United States has traditionally focused on largemouth bass and bluegill. The bluegill feed the bass and the bass prevent the bluegill from becoming overpopulated. It is a simple and well studied system that can produce good fishing for many years as long as basic rules of pond management and fish harvest are followed. Extension publication MP360, *Farm Pond Management for Recreational Fishing*, describes these simple plans and includes some variations like the addition of channel catfish, redear sunfish and grass carp. These strategies are all well understood and successful, but there are alternatives that may be attractive to pond owners who are more adventurous, who are interested in other game fish species or who have the financial means to adopt a more aggressive management plan. This manual describes six other strategies:

1. **Big Bass Option:** Increase bass production by increasing the food supply.
2. **Big Bream Option:** Produce large bream by keeping bass sizes small.
3. **Hybrid Bream Option:** Produce large hybrid bream on feed.
4. **Channel Catfish Option:** The highest possible catfish production per acre.
5. **Black Crappie Option:** Producing good black crappie by overcrowding bass.
6. **Hybrid Striped Bass Option:** A great sportfish for larger reservoirs and on feed.

When choosing an alternative pond management strategy, keep in mind that you must pick just one of the six different options. For example, production of good black crappie fishing requires crowding of the largemouth bass. The crappie plan is designed to produce good crappie fishing, but the bass must be kept small and overcrowded to control crappie reproduction. In pond management, it's simply not possible to have outstanding fishing for every species in a single pond.

The alternative stocking and management strategies described in this manual are based on science and the practical experience of sportfish managers. It is sometimes difficult to successfully manage even traditional bass/bluegill ponds, and there is no reason to expect that the alternative strategies in this manual will be successful less often that those outlined in the MP360. Nevertheless, pond owners should be aware that management of these alternative species is not as well understood as management of traditional bass/bluegill ponds and that there will sometimes be problems. The big bass and big bream options represent extremes in the range of balanced bass/bream populations. Ponds will need to be monitored frequently to make sure that they do not get out of balance. If, for example, a pond managed for either of these options becomes weedy, problems will result. In contrast, the typical bass/bream option, as outlined in MP360, is simpler and has a wider safety range, so ponds are likely to stay in balance for longer periods if harvest recommendations are followed. Because management of these alternatives is generally more demanding, pond owners may wish to contract with a private pond consultant to manage their pond. Arkansas Game and Fish Commission personnel simply do not have the time to assist private pond owners with these alternative species, given the intensive management required.

Big Bass Option

The largemouth bass is often the most popular fish to catch in farm ponds. Its large mouth, long body and dark blotches along its side easily identify this species. Bass spawn once each year between April and June when the water temperature reaches at least 65ºF. Young bass feed on microscopic animals (zooplankton) and insects. Fish, crayfish, frogs and larger insects replace these food items as bass become larger. The primary food for bass in farm ponds is bream. Growth rates are variable, but bass can reach a harvestable size (12 inches or more) in two years when food is abundant. It generally takes at least five years to produce large bass.

In order for the big bass plan to be successful, it is critical to follow the water quality, fertilization and aquatic weed management programs that are addressed in detail in MP360, *Farm Pond Management for Recreational Fishing*. Fertile ponds produce two to three times more fish per acre than infertile waters and, with proper management, the additional pounds of fish production can be channeled into growing bigger bass.

A key to producing big bass is to provide them with an ample food supply. In the traditional bass/bluegill pond, the bluegill are the primary food source for the bass. In the big bass strategy, additional fish species are stocked to provide more food to support more pounds of bass per acre. This option is best suited for new or renovated ponds greater than one acre in size. Ponds with existing fish populations can be managed for big bass, but the results will be less certain.

An important consideration is whether to stock the Northern or the Florida subspecies of largemouth bass. The Florida subspecies has received much attention due to its potential to reach large sizes in reservoirs and, as a result, it has been stocked throughout the country. However, as the name implies, the Florida bass is not very tolerant of cold, and there are concerns that they may not survive the winter in years with severe cold spells. For this reason, the Florida subspecies is not recommended for stocking north of Interstate 40 in Arkansas.

The big bass option starts out with a traditional bass/bluegill stocking (Table 1). Then one or more of the additional fish species listed below are added. These fish will provide more food for the bass. These species will be especially useful if prepared feeds are used. The feeding program will help these species to produce more forage fish for the bass.

Table 1. Species selection and stocking rates (fingerlings/acre) for the big bass option.

Pond Type	Large-mouth Bass	Bluegill	Redear Sunfish	Grass Carp
Unfertilized	50	400	100	5
Fertilized	100	800	200	5
Fed	100	800	200	5

Fathead Minnows: These are small slow-swimming minnows that stick their eggs on the undersides of hard surfaces. They are excellent food for bass. Stock two to three pounds of fathead minnows per acre during the initial fall bluegill and redear stocking. These fish will be consumed by the spring-stocked largemouth bass during the first summer and are usually eliminated from the pond within a year. Fathead minnow reproduction will not be able to sustain the population and yearly stocking might be helpful.

Golden Shiners: Stock two to three pounds per acre of golden shiners. Golden shiners reproduce in farm ponds and provide excellent bass forage. They lay their eggs on submerged grass and weeds in the spring and spawn before the bluegill. However, they are egg eaters and may reduce the reproduction of newly-stocked game fish. For this reason, they should not be stocked in new ponds during the first year.

Tilapia: These are exotic African fish that produce a lot of young and are even good to eat. They build nests like bluegill, but the adult fish carry the eggs and young in their mouths, protecting them until they get too big to fit. Tilapia feed directly on plankton (microscopic plants and animals) and will reproduce every four to eight weeks through the summer. Some of the fish may get large enough to catch. The most important thing about tilapia is that they are a tropical fish and cannot survive water temperatures below 55ºF. If tilapia is selected, stock 10 to 20 large fish (5 inches or more) or 200 three- to five-inch fish per acre every spring. Be prepared to see some dead tilapia in the winter when temperatures get low. However, they will get sluggish before it gets cold enough to kill them, and the larger fish can be scooped out and eaten. Small and medium fish will end up on the pond bank but, since the tilapia die during the coldest part of the winter, most pond owners will probably not even visit their ponds to witness this event.

Threadfin Shad: These are excellent forage fish, but like the tilapia they are cold sensitive. In many parts of Arkansas, it will be difficult to grow enough of these fish to have an impact on bass populations. It is also important not to accidentally stock the larger gizzard shad (below) in your pond.

Gizzard Shad: Avoid stocking gizzard shad in farm ponds. They tend to become too big for bass to eat, then overpopulate and compete with other fish for oxygen and nutrients.

In addition to proper stocking, the production of large bass is dependent on removing the correct number and size of bass and bluegills when you go fishing. During the first three years after stocking, all bass should be released back to the pond so that they can grow to large sizes and reproduce. It is important to allow the initial stocking of bass to spawn and establish the bass population before harvesting takes place. After the third year, catch and remove 10 to 15 pounds of bass per acre each year that are less than 12 inches in length. Removal of these small bass helps reduce competition and allows for faster growth of the remaining fish. You should also remove five to 10 pounds of bass per acre that are between 12 and 15 inches in length each year. All fish over 15 inches should be released unless harvested as a trophy. Managing for big bass will result in larger but fewer bass and increase smaller bream numbers.

Big Bream Option

Bluegill, the most common bream species, is a sunfish with a small mouth, a black spot located at the base of the soft dorsal fin and dark vertical bands on its sides. Its underside is yellow to reddish orange and its chin is often blue. Young bluegill feed on microscopic plants and animals, and adults feed primarily on insects. Bluegill will spawn multiple times throughout the spring and summer. They make

an ideal food for bass because young bluegill are available through much of the year. In ponds without good bass populations, bluegill will become overcrowded. This will limit their food supply and cause them to quit growing before they reach the sizes that most fishermen prefer.

Redear sunfish, also known as shellcrackers, are another member of the bream family that can be stocked in combination with bluegill to provide additional bass food and recreational fishing. This species can be identified apart from the bluegill by its red-orange marking on the earflap and lack of vertical bars along its side or black spot on its dorsal fin. Redear sunfish reach a larger size than bluegill, but do not by themselves produce enough young to feed a hungry bass population. They feed primarily on the bottom-eating insects and snails. They do not eat floating fish feed. Spawning occurs from April through August in Arkansas. Like the bluegill, redears are fun to catch and eat and may reach over a pound in size.

If you primarily are interested in harvesting large bluegills and redear, modify your management strategy. Stock the pond as shown in Table 1, then after the initial 2 to 3 year period of bass catch and release, harvest all bass over 16 inches in length. High densities of 13- to 16-inch bass will eat a lot of the small bream, leaving the remaining bluegill and redear to grow fast and large. This strategy will produce fewer but larger bream (eight inches or longer) for you to catch and harvest, but will not produce large bass. A general recommendation is to harvest a minimum of 10 pounds of bream for every pound of bass in your pond. Bass are relatively easy to catch, and this big bream strategy will not work if a pond cannot be protected from poaching. As with the big bass option, in order for this plan to be successful, it is critical to follow the water quality, fertilization and aquatic weed management programs that are addressed in detail in MP360, *Farm Pond Management for Recreational Fishing*.

A supplemental feeding program during the summer months can also help produce larger bluegill. Bluegill will do well on floating catfish feed, and feeding will result in more and bigger fish. For best results, feed fish at least four times a week. Automatic feeders, although expensive, are a good option for pond owners who desire larger fish but who do not have the time to feed on a daily basis.

Hybrid Bream Option

When bass/bream ponds are not carefully managed, there may not be enough larger bass in the pond to control the bluegills and redear sunfish populations. When this happens, the bream get overcrowded and don't grow to catchable sizes. An alternative is to slow bream reproduction by stocking hybrid sunfish. Since they are crosses of two different species, hybrids typically have physical characteristics of both parents. Other desirable features of hybrids include fast growth, reduced reproduction, a willingness to eat floating fish feed and an aggressive feeding style that makes them easy to catch. Hybrid sunfish cannot be used to replace bluegill in a traditional bass/bream pond because the hybrids do not raise enough young to adequately feed the bass.

The most common hybrid sunfish in the Southeast are the bluegill or redear crossed with green sunfish. These fish are not sterile, but 85 to 95 percent are male, so reproduction is decreased and overcrowding is less likely. Since there is still a small amount of reproduction, largemouth bass should be stocked along with hybrid sunfish (see Table 2). To get the best hybrid sunfish growth, stock 750 hybrid sunfish and 25 largemouth bass per acre. Higher stocking rates will make them easier to catch, but will slow their growth. Channel catfish can also be stocked together with the hybrid bream, if desired. Hybrid bream fisheries should only be started in new ponds or ponds that have been renovated. Stocking hybrid bream into ponds with existing fish populations is basically a waste of money. The hybrids will have to compete with the existing bream population for food, which means that they will not grow very quickly. In addition, bass may eat the hybrid fingerlings that you stock.

Table 2. Species selection and stocking rates per acre for hybrid bream ponds.

Species Combination Option	Hybrid Bream	Large-mouth Bass	Channel Catfish	Grass Carp
Unfertilized	400	25-50	0-75	5
Fertilized	750	25-50	0-150	5
Fed	1500	25-50	0-300	5

To make sure that the hybrid sunfish don't get overpopulated, you should release all bass that are caught. When hybrid bream are stocked correctly and fed, they will weigh an average of 4/10 pound after two years. If fish are not fed, the hybrids will weigh only 1/4 pound. A commercially prepared floating catfish feed is recommended if you plan on feeding your fish. An automatic fish feeder can also be considered and will save you time. The feed should be small enough for the fish to easily consume. Additional information on feeding your fish or a fertilization program for your pond can be found in MP360, *Farm Pond Management for Recreational Fishing*.

Like other hybrid plants and animals, reproduction of hybrid sunfish in your pond will not produce more of the same fast-growing fish. The second generation hybrids may be more like the original bream species, and they will be able to reproduce. Therefore, in order to maintain a quality hybrid sunfish fishery, the pond will need to be restocked when harvest has removed most of the original hybrids and fishing becomes poor. This usually occurs after four to six years. Keep in mind that it is not advisable to stock additional small hybrid sunfish fingerlings into a pond that also contains large bass. Bass would quickly consume most of these bream before they reach a harvestable size. Therefore, when restocking hybrid bream you will need to remove the bass or stock larger (four inches or greater) hybrid bream. If your pond can be drained, this is often the best option when needing to restock since it ensures that you are completely starting over. Regardless of the specific management details that you choose, hybrid bream ponds are an excellent choice for small ponds or ponds where you are interested in fast action and loads of fun.

Channel Catfish Option

Another popular option is to stocking channel catfish alone. Channel catfish consume a variety of foods that include insects, crayfish, mollusks, small fish and commercial catfish feed. They grow fast in ponds and provide excellent recreation for all ages. This management option works well in ponds of all sizes including small ponds (less than 0.5 acre) and even muddy ponds that are unsuitable for bass and bream (see the section in MP360 on dealing with muddy ponds).

Catfish stocking rates will vary depending on if you plan to feed your fish or not (see Table 3, below). Remember that the more fish you stock the more you will have to feed. Before stocking, you should decide on how much money and time you are willing to spend on feeding your fish. At the highest stocking rates, fish will need to be fed several times per week during warm weather. When calculating the cost of fish feeding, consider that it takes about two pounds of feed to produce a pound of catfish, and be sure to pick a good quality 28 to 32 percent protein floating catfish feed. Do not use feeds designed for other animals. Your goal is to feed the catfish all that they want to consume in five or 10 minutes. You might consider an automatic fish feeder that can be placed close to shore or off a fishing dock. Fish should be of harvestable size (3/4 pound) within a year of stocking if you feed your fish. Additional information on feeding your fish and pond management can be found in MP360, *Farm Pond Management for Recreational Fishing*. Pond owners who stock and feed fish at higher rates should consider purchasing an aerator for their pond.

Table 3. Stocking rates for ponds with channel catfish option.

Pond Type	Fingerlings Per Acre
Unfertilized	100
Fertilized	200
Fed	up to 1000

It is important to keep in mind that channel catfish are not likely to reproduce successfully in your pond. As you catch them out, you will need to purchase new fingerlings to replace the fish that you eat. The frequency and number of fingerling channel catfish that you will have to restock will depend on how many fish you harvest. It is important to remember that while a pond might support 1,000 3/4-pound catfish, oxygen and water quality problems would probably result if all of those fish were allowed to attain sizes of two or three pounds. It is important to start removing fish as they reach harvestable sizes.

It is not a good idea to try to encourage catfish spawning by providing spawning cans or other nesting sites. If spawning were to occur, it would likely lead to an overpopulation of small fish that would be too crowded to grow. In ponds where catfish reproduction becomes a problem, an option is to stock 20 to 30 largemouth bass fingerlings per acre. The bass will prey on the young catfish and will also eat other unwanted species that may be present. Be sure to return all bass to the pond that you might catch, and remember that any future catfish stockings will need to be with fish too large for the bass to eat (at least eight inches long).

Black Crappie Option

The black crappie is a deep-bodied compressed fish with a small head and large mouth. It is silver with black speckles and blotches scattered on its sides. Spawning occurs in the spring when water temperatures reach 64 to 68ºF. Black crappie adults feed primarily on fish and aquatic insects. The young feed on microscopic plants and animals and on small insects. Crappie will not eat floating fish feeds. The diets of black crappie and largemouth bass are very similar. Even worse, crappie have a tendency to produce inconsistent but sometimes extremely large numbers of young. Crappie ponds get out of balance very easily and frequently the crappie are either very rare or the pond is overcrowded with small crappie

that don't grow very well and that also compete with the largemouth bass. Crappie can be frustrating but, especially in larger ponds, there are some things that you can do to increase your chance of success.

In general, crappie should only be stocked in ponds of at least 25 acres in size. However, under the right set of conditions, crappie can be raised successfully in smaller ponds. The key to raising large crappie is to increase the density of predators by overcrowding the pond with largemouth bass. Large numbers of small, hungry largemouth bass will crop off crappie reproduction even in boom years in the crappie cycle. If poaching is a problem in your pond, this can result in over-fishing of the largemouth bass and ruin the crappie fishery. A poacher can remove enough bass in a single afternoon to upset this management scheme. It should also be noted that correctly managed crappie ponds usually will not have big largemouth bass to catch. If you desire big bass, then you should try the big bass management option outlined above.

There are two species of crappie, but black crappie are best suited for stocking in ponds. Stock 15 adult black crappie per acre in an established balanced or bass crowded bass and bluegill pond (be sure that the crappie fingerlings are large enough to be safe from the bass). Catch and remove largemouth bass when they are longer than 15 inches. This will create a crowd of smaller bass to control the crappie population and allow the remaining fish to grow faster.

Good crappie fishing in farm ponds is difficult to maintain for long periods of time. If the pond does get out of balance and overpopulated with small crappie, stock 30 to 50 adult largemouth bass (10 to 12 inches long) per acre. This will increase predation on the small crappie and help reduce the population size. If stocking does not seem to help, the pond should be drawn down to half its normal surface area in late summer or early in the fall. Bass harvest should stop during this time. The drawdown makes it easier for bass to find and eat the crappie. Let the pond refill during the winter and spring. Repeat the drawdown in the next fall if needed.

Hybrid Striped Bass Option

Hybrid striped bass are a cross between two species, the white bass and the striped bass. They are large fish-eating predators that specialize in hunting open water fish like shad. Unlike largemouth bass, hybrid striped bass eat floating fish food and do very well on it, commonly reaching three to seven pounds within three years. They are excellent to eat and provide great sportfishing during the cooler months. They do not reproduce and will have to be restocked as they are harvested.

In a typical bass/bream pond, hybrid striped bass would compete with largemouth bass for food, especially if they were not fed a fish feed. The best place to stock hybrid striped bass is in ponds that are overcrowded with small bream, gizzard shad or other "trash" fish. The bass have been shown to help reduce sunfish populations, and gizzard shad (while not a great food source for largemouth bass) are a favorite food of hybrid stripers.

Hybrid striped bass do very well in larger reservoirs and are best suited for ponds of at least five acres. They are an excellent choice for large irrigation reservoirs where they will help to control gizzard shad and other undesirable "rough" fish. The hybrid striped bass may also be a suitable addition to catfish only or hybrid sunfish ponds, especially where the fish are fed floating feeds.

Stock up to 25 hybrid stripers per surface acre. Be sure to stock larger fish (at least six inches long) so that they are not eaten by fish already in the lake. Smaller two- to three-inch fish are fine for new ponds or ponds free of large fish predators. Similar rates may be appropriate if you would like to experiment with this species in smaller ponds with feeding programs.

Hybrid striped bass have not been widely used in private ponds, but fingerlings are commercially available, and these fish are excellent sport and table fish. They should not be overlooked, especially in reservoirs full of gizzard shad or in ponds where the fish are fed. If after a few years you decide that these fish are not right for your pond, just catch them out and don't replace them. Since they will not reproduce in ponds, stocking hybrid stripers is not a lifelong commitment.

Partial List of Alternative Management Options Literature

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