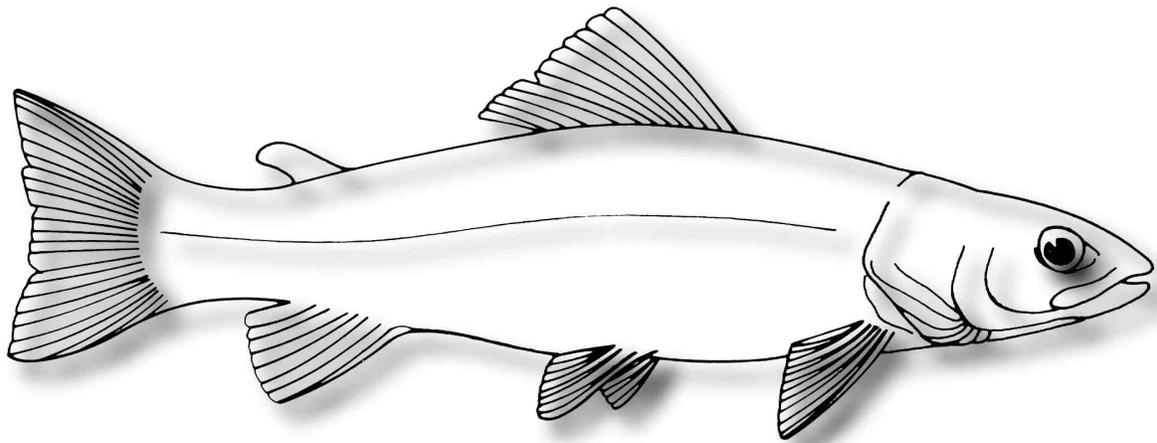
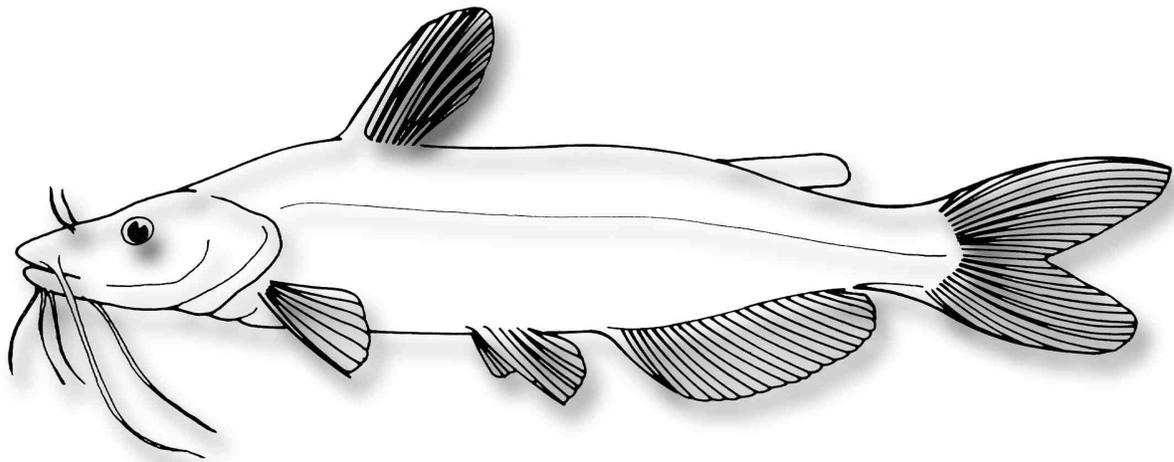


# Homegrown Catfish and Trout

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Almost any of Georgia's 100,000 farm ponds can be used to produce channel catfish for the family table. A well-managed pond can produce from 300 to 1,000 pounds of edible catfish per surface acre each year. Catfish production can be used as a valuable supplement to the family food budget.

Higher production rates are possible. But increased production will increase costs, labor, the need for management expertise and the likelihood of water quality problems such as oxygen depletion. There is also the question of what to do with the excess catfish produced.

In many areas it is possible to sell fish and defray costs. However, most markets require either processing or live transport for stocking in another pond. Most pond owners are not equipped to do this. Before producing any excess fish, be certain fish can be sold in the local area at a profit. Feeding surplus fish is expensive because large fish require more feed, and the feed-to-fish ratio for large fish is less efficient than for smaller fish.

Two basic methods exist for the production of homegrown catfish: open water culture and cage culture. Each culture method has advantages and disadvantages.

## Open-Water Culture vs. Cage Culture

Select the right culture method based on the type and size of the pond and how it is used. Also consider your available time, expertise, and production goals.

**First**, consider how you plan to harvest the catfish. If you are not interested in the recreational benefit of catfish production and prefer an easy and quick way to harvest fish, then cage culture may be for you. If you desire a recreational fishery, consider the open-water method of culture. You can also harvest catfish in open-water by various methods of trapping, trot lining, seining or draining. These methods, however, require more effort and are not as dependable as dip-netting catfish from a cage.

**Second**, consider the type of pond you have. Ponds with uneven bottoms or that contain obstructions are difficult, if not impossible, to seine. It is possible to clear a harvesting area in some ponds and trap seine the fish (see section on harvesting). Deep ponds or ponds with chronic weed problems are also difficult to harvest by seining.

Can the pond be drained? If not, can you pump or siphon most of the water out of the pond? In open-water culture, pond draining is one method of harvesting. Draining will also help when you prepare a pond for stocking (see section on preparing a pond for stocking). If a pond cannot be drained, you may want to consider cage culture.

**Third**, consider your goals and the amount of time and money you want to invest in production. Cage culture is usually more expensive and time consuming. Because caged fish do not have access to natural food, they must be fed daily. The feed must contain all of the essential nutrients and is more expensive than feeds used to supplement natural diets of fish raised in open water. Depending on the stocking rate, fish raised in open water may or may not need supplemental feeding (see section on feeding catfish). Also, caged fish are more susceptible to diseases.

## Open-Water Culture

There are two options in open-water culture:

1. raise catfish in combination with largemouth bass and bream, or
2. raise catfish as the only species of fish in the pond.

Catfish in combination with bass and bream is a standard stocking recommendation for Georgia sportfishing ponds. It offers a diversity of recreational fishing to the pond owner. A properly stocked, fertilized and managed catfish-bass-bream pond can produce annually 150 to 160 pounds of bream per acre, 30 to 35 pounds of bass and 50 to 75 pounds of catfish. This is about 300 pounds of edible fish per acre.

Catfish in open water with bass and bream must be restocked periodically. Channel catfish will reproduce in ponds if a dark hole — a log or muskrat hole — is available; fingerlings, faced with an established bass population, rarely survive predation in numbers sufficient to replace adults. For that reason, channel catfish should be at least 10 inches when stocked into an established bass population. Catfish of this size will have to be purchased from a private source. They are expensive and are sometimes difficult to obtain. It is possible to purchase smaller catfish and raise them to 10 inches in cages before they are released (see section on cage culture). A supplemental stocking rate of 50 channel catfish in a fertilized pond or 25 per surface acre in an unfertilized pond is recommended at two- to three-year intervals.

For more specific information concerning the management of a bass-bream-catfish pond, refer to Georgia Cooperative Extension Bulletin 732, *Management of Georgia Sportfishing Ponds*.

The bass-bream-catfish combination should not be used in ponds 1 surface acre or smaller in size. These small ponds are better suited for production of channel catfish only.

Stocking channel catfish only, in any size pond, can produce from 400 to 1,000 pounds of fish per acre per year. The production can provide a valuable recreation area and an economic food resource for the family.

## Stocking Preparations

You must remove the existing fish in a pond. Adult bass and bream will readily eat young channel catfish. Bream will compete with catfish for both natural and pelleted feeds. Eliminating predation and competition from other fish species will increase the poundage of catfish that can be produced in the pond. Remove unwanted fish by poisoning with rotenone.

It is important to apply rotenone to all of the water in a pond and, if possible, all streams in the watershed. Apply rotenone in the fall, when water temperatures are between 65° and 75°F. To reduce the amount of rotenone required, drain the pond just before application. Apply the toxicant immediately after closing the drain at the rate of 2 to 3 pints of 5 percent liquid rotenone per acre-foot, or 5 pounds of 5 percent emulsifiable rotenone powder per acre-foot, of water remaining in the pond. An acre-foot of water is 1 surface acre 1 foot deep. For example, a 2 surface acre pond with an average depth of 4 feet has 8 acre-feet of water. Treat the entire length of small streams with 1 quart of 5 percent liquid rotenone per 300 linear feet of stream. Before using rotenone, read and follow label recommendations.

Rotenone-treated water is detoxified after three to five days at water temperatures above 70°F. It takes longer at cooler temperatures. Place a small cage with a few fish inside it in the pond for at least 24 hours to determine if the water is still toxic to fish.

Rotenone can be applied to water less than 6 feet deep by pouring it into the prop-wash of an outboard or siphoning it from a container with a boat bailer. Organic material decreases effectiveness of rotenone, so be careful not to disturb bottom muds in shallow areas. In deep water, apply liquid rotenone with a pump. Rotenone-treated fish swim to the surface then sink to the bot-

tom within a few hours. A day or two later they float to the surface. Repeat treatment every three days until fish no longer come to the surface.

## Stocking Channel Catfish Into a Pond

Channel catfish should be the only species stocked into the pond. The number of catfish to stock is based upon the surface acreage and the amount of management time and money you wish to invest. Stocking rates shown in Table 1 are recommended for most Georgia ponds. Fingerlings 5 to 7 inches long will reach 1 pound within 160 days during the growing season. Smaller fingerlings will take longer. The growing season in Georgia is from April to October.

**Table 1.** Stocking Rates for Catfish at Various Management Levels

Management Level	Maximum Stocking Rate (Fish per Acre)
Unfertilized Pond	100
Fertilized Pond	200
Occasional Feeding	300
Every Other Day Feeding	500
Daily Feeding or Use of Demand Feeder	1,000

Channel catfish fingerlings can be stocked at any time during the year. An early spring stocking is preferred because catfish will reach a harvestable size in one growing season. Avoid stocking in hot summer months because high temperatures and low oxygen increase the likelihood of stress and mortality during shipment.

Obtaining healthy fish from a hatchery is of prime importance. Most private hatcheries advertise either parasite- and disease-free fish or fish treated for parasites and diseases. Some even advertise lab-tested fish. Actually, parasite and disease free, treated or tested does not guarantee delivery of healthy fish. Preventive treatments by the hatchery are highly recommended practices. No matter how intensive the treatments, none can guarantee eliminating every potential disease-causing agent. More important, the treatments do not prevent the stress of handling and transportation. There are some considerations and precautions you should know when purchasing fish from a private source.

**First**, locate a reputable private hatchery. Most hatcheries provide quality fish for stocking. It does not hurt, however, to check with friends or neighbors who have purchased fish from a private hatchery and get their opinions.

**Second**, select a hatchery that offers some form of guarantee concerning the health of their fish. That is, will the hatchery compensate you if the fish die or become diseased shortly after stocking?

**Third**, be at the pond the day the fish are delivered. Inspect the fish before they are stocked. Reject the shipment if a number of fish are dead or showing signs of stress, or if the fish have cuts, abrasions, hemorrhages, abnormal growths, or other disease symptoms.

Depending on the source of the catfish and the quantity obtained, it may be necessary for you to transport the fish to your pond. As mentioned previously, it is important not to stress fish during handling and transportation. You should be thoroughly prepared before picking your fish up at the hatchery.

Containers should be of adequate size for transporting the size and quantity of fish obtained. No set rule applies for container size. A safe container should be large enough to prevent suffo-

cation of the fish. It should contain clean, well-aerated water, at about the same temperature as the hatchery water. A small battery-operated aerator is helpful in maintaining water oxygen levels.

Check water temperatures of the transport container and the pond prior to stocking. If the temperature difference is 10°F or more, the fish should be tempered before stocking. To temper fish, slowly add pond water to the container. No more than one-third of the volume of the container should be added at a time. Wait several minutes, then add more water until the temperature in the container and pond are the same.

## Pond Fertilization

If fish are not fed, the use of inorganic fertilizer will more than double the amount of fish production. Fertilizer will increase the amount of natural fish food in the pond. **Fertilizer should not be used if fish are fed.** The increased waste products from fed fish plus the fertilizer will enrich the pond too much and may cause a fish kill. Begin fertilizing with 40 pounds of 20-20-5 per surface acre in late February or early March, when temperature stabilizes above 60°F. If after two weeks you can see a bright object more than 18 inches beneath the water surface, proper color from the plankton algae growth has not developed. Fertilize again at the same rate. If proper color does not develop after the third application, test the pond for lime requirements.

Proper color can be maintained by fertilizing with 40 pounds of 20-20-5 per surface acre when a bright object can be seen for more than 18 inches into the water. Fertilization will probably be necessary about once a month. Stop fertilization when water temperature stabilizes below 65°F — usually in October or November.

## Liming

Most Georgia ponds have soft and slightly acidic water. The addition of agricultural (dolomitic) lime to these ponds increases water hardness and alkalinity. Periodic applications of lime are necessary for a successful fertilization program. Even if the fish are being fed and inorganic fertilizer is not used, most ponds should be limed. Many ponds should be limed every two to four years. Your county Extension agent, Soil Conservation Service technician or state fisheries biologist can determine liming requirements.

## Feeding Catfish in Ponds

Floating food pellets and sinking food pellets formulated for catfish are available. Catfish feed should contain from 28 to 36 percent crude protein and the required vitamins and minerals. Use a feed containing 32 to 36 percent crude protein if you stocked your pond at a rate of 1,000 fish or more per acre.

Floating feeds are more expensive. The advantages, however, of a floating feed far outweigh the cost:

1. You can adjust the amount of feed per day and avoid wasted feed and pond pollution problems.
2. You can observe your fish each day, which helps in monitoring their health and vigor. You can reduce feed costs and still have the advantage of observing your fish by mixing 15 percent floating feed with 85 percent sinking feed.

There are various sizes of fish feeds. Feed crumbles (crushed pellets) when fingerlings are less than 3 inches long. Feed  $\frac{3}{16}$ -inch pellets to fish larger than 3 inches until they weigh 1 pound. Fish can be switched to a  $\frac{1}{4}$ - or  $\frac{3}{8}$ -inch pellet when they reach  $\frac{1}{2}$

pound. Feed fish larger than 1 pound a  $\frac{3}{8}$ -inch pellet.

For maximum growth, feed your fish once a day. The correct amount of feed per day is the amount they will eat in a 15- to 20-minute period. Never exceed 35 pounds of feed per acre a day. If sinking feed is used, calculate the initial weight of the fish in the pond and feed approximately 3 percent of that weight each day for a two-week period. During warm weather months, the weight gain should be estimated every two weeks and the ration adjusted. The daily feeding rate for fish weighing  $\frac{3}{4}$ -pound can be reduced to about 2 percent body weight.

Feed catfish in winter. Winter feeding will minimize weight loss and improve resistance to spring diseases. Use floating feed for winter feeding. When water temperatures are below 65°F, feed every other day at 1 percent of the fishes' body weight. When water temperatures are below 55°F, feed only on the warmer winter days.

Demand feeders of various designs can be used. However, you lose the advantage of observing your fish every day, and other animals, such as rats and waterfowl, will also feed from the feeder. Most demand feeders have a device that extends into the water. Fish push on this device, activating a lever that causes a small portion of feed to be dropped into the water.

Catfish can be fed at any time of the day, but they become accustomed to regularity. Establish a feeding time and maintain it. You should also feed in the same location each day.

Wind and wave action can rapidly push floating feed into the pond bank and make it inaccessible to catfish. Prevent this by constructing a 12-foot diameter feeding circle (Figure 1). The feeding circle can be made from  $1\frac{1}{2}$ - to 2-inch flexible black plastic pipe. The two ends of the pipe are coupled to form a circle and anchored near the pond bank.

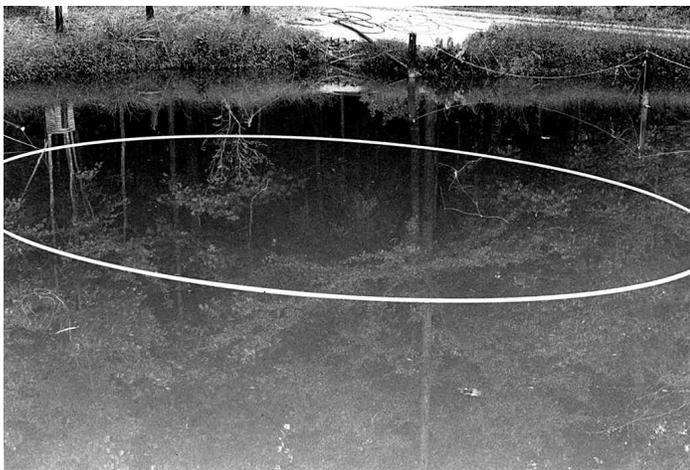


Figure 1.

## Harvesting

In open water culture, various methods of harvesting can be used. Fish can be seined, trapped, trot lined or hook-and-lined, or caught by a combination of these methods.

### Seining

Seines can be used for a complete harvest (when all fish are harvested) or for a partial harvest.

A complete harvest is accomplished by draining the water from a pond. As the water is draining, the whole pond is seined to reduce the numbers of fish. The remaining fish are concentrated in a small remaining pool and either dip netted or seined from the pond. If you use this method of harvest, be sure you are

prepared to handle the large number of fish. Even more preparation is needed if the fish are to be stocked to another pond or kept alive for later processing.

Seining the entire pond and complete harvest of fish is not practical in most Georgia ponds. Most ponds are too deep or uneven to seine. Stumps or other obstructions can also make seining difficult. However, many of these ponds can be harvested using a method called trap-seining.

Periodic use of a trap-seine will harvest most of the fish from a pond. Generally, a seine 150 to 200 feet long and 6 to 8 feet deep is used for trapping. Set the seine in the water in a location with a smooth bottom 50 feet from shore in an area no deeper than 3 to 4 feet (Figure 2). Stretch out the middle third of the seine and coil the remaining sections of the seine at each end. Connect a rope from each coiled end to the shore.

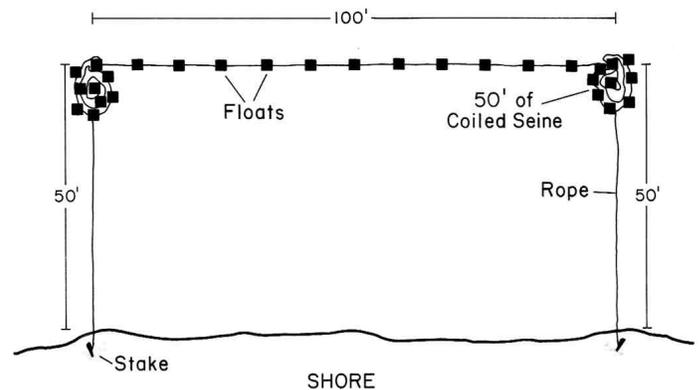


Figure 2.

After the seine is set, feed daily between the seine and the pond bank. Sometimes feed must spread on the water outside the catch area to lead fish into the trap. It may take several days, but when the fish are accustomed to feeding between the seine and the pond bank, they are ready to trap. On the day you plan to harvest, feed the fish within the trap area and pull the seine ends to shore.

The trap-seine method cannot be used more than once every seven days. Fish that escape harvest become wary of the net and take a while before they will come back to the area. Also, remember that catfish are creatures of habit and you should consistently feed at the same time of day, including the day of harvest.

The type and size of seine to use depends upon the pond size and whether you use the seine for a complete or partial harvest.

Three feet of seine length is needed for every 2 feet of pond width to be seined. The same ratio applies to pond depth: 3 feet of seine for every 2 feet of maximum pond depth to be seined. Floats can be made of polystyrene foam or plastic attached on 18-inch centers.

Use a mud line instead of a lead line on the bottom of the net. A mud line is made of many strands of rope bound together. As the seine is drawn across the bottom, the mud line stays on top of the mud and eliminates the digging effect of lead-weighted lines.

Seine material should be of polyethylene or nylon. Catfish spines will not catch in polyethylene netting. Nylon netting requires a net treatment to prevent spines from catching.

The mesh size varies according to the minimum size fish you wish to harvest. Buying the proper mesh seine allows you to harvest fish large enough for your purposes.

Use Table 2 as a guide in selecting seine mesh size.

**Table 2.** Seine Mesh Size and Minimum Size Catfish It Will Harvest.

Mesh Size*	Minimum Fish Size
1 inch	8 ounces
1 <sup>1</sup> / <sub>4</sub> inch	10 ounces
1 <sup>1</sup> / <sub>2</sub> inch	12 ounces
1 <sup>3</sup> / <sub>4</sub> inch	14 ounces
1 <sup>1</sup> / <sub>2</sub> inch	1 <sup>1</sup> / <sub>4</sub> pounds
1 <sup>3</sup> / <sub>4</sub> inch	1 <sup>1</sup> / <sub>2</sub> pounds

\*Mesh sizes are given as bar mesh, which is the smallest distance between knots.

### Other Methods of Harvest

Several designs of funnel-throated traps can be used for partially harvesting catfish. Wooden slat traps, nylon hoop nets and wire mesh are suitable. The wooden slat trap seems to be the most effective for catfish (Figure 3). Traps can be constructed or purchased from fish farm supply firms. Traps are usually successful for a few weeks and then fail to capture fish.

Catching catfish hook-and-line is perhaps the most popular method of harvesting. Rods and reels, cane poles and trotlines are commonly used. Even in a heavily stocked catfish pond, fish will not bite all of the time. Skipping a feeding day in anticipation of hungry catfish more readily biting the hook does not work. However, if a floating feed is used, fishing with a float with the bait about 1 to 1½ feet deep in the feeding area is usually successful.

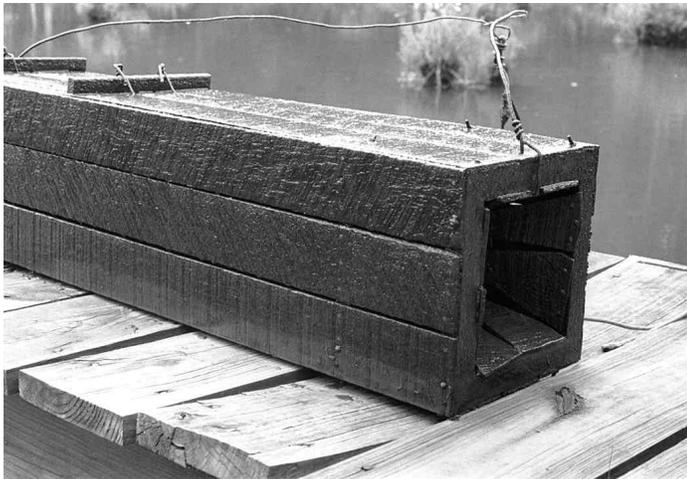


Figure 3.

### Cage Culture

You can produce up to 2,000 pounds of catfish per acre in cages and also have fish loose in the pond. This level of production is not recommended because it will increase management problems and the likelihood of water quality problems. For production of fish for home uses, a safer limit is 1,000 pounds of catfish in cages per acre.

### Cage Construction

Various materials and designs can be used to construct cages, but be sure the materials resist deterioration. Hardware cloth and metal screens rust quickly. Plastic coated wire screen is satisfactory. Plastic screen is preferred and nylon and polyethylene net can also be used. Use the largest mesh size that will contain

the size fish you plan to stock while allowing sufficient water circulation through the cage. One-half-inch mesh or larger is preferred.

You can buy ready-made cages, or you can build a cage with a minimum of effort and materials. For home uses, a cylindrical cage 4 feet high and 4 feet in diameter is a good size (Figure 4).



Figure 4.

Build a cylindrical cage by forming the screening material into a cylinder and fastening metal or fiberglass hoops to both ends (Figure 5). Cut out a circular piece of screen and attach it to the bottom. Attach another piece to a third hoop for a lid. Lace the screen to the hoops with a light electrical wire, such as 18-gauge bell wire. Be sure to run the wire through each mesh. This adds strength and seals gaps where fish might escape.

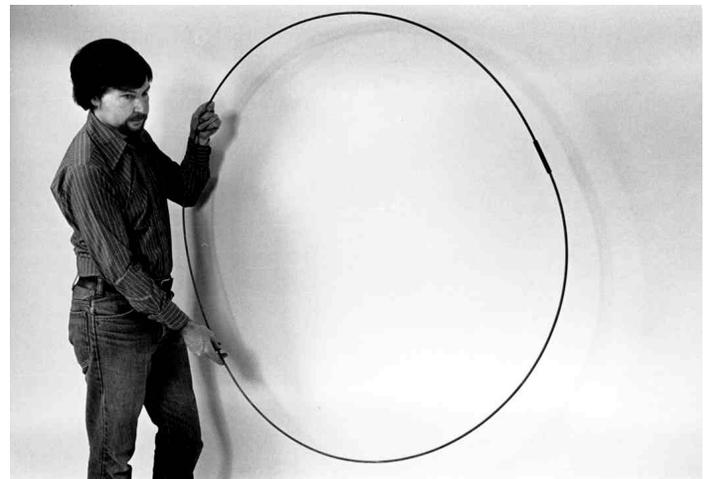


Figure 5.

A feeding ring is essential. Without it, water will carry feed out of the cage before the fish consumes it. A feeding ring can be made of screen with a mesh size small enough to prevent feed pellets from passing through it. It should extend from the cage lid to about 8 inches below the water surface. A 3-foot diameter feeding ring can be fastened to the cage lid with monofilament line or a 4-foot diameter feeding ring can be fastened to the interior upper portion of the cage (Figure 6).

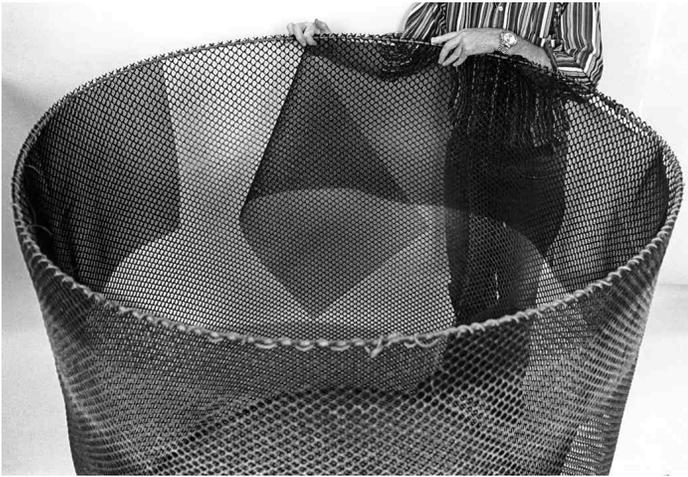


Figure 6.

The cage should float so the lid is 3 to 6 inches above the water. Any method of flotation can be used. Polystyrene foam blocks are best; even plastic bottles can be used. Plastic bottles such as milk or antifreeze jugs will deteriorate in one or two seasons (Figure 7).



Figure 7.

### Cage Placement

Select an area where there will be at least a foot between the cage and pond bottom. Also, select an area where water will circulate freely through the cage. The end of a dock or pier is usually a good location. If a dock is unavailable, the cage can be attached to a metal or wooden pipe driven into the pond bottom. More than one cage can be attached to a durable nylon rope or cable strung across the pond. In selecting an area also consider how easy it will be to feed and observe the fish.

### Stocking the Cage

Except for stocking rates, all other factors discussed in the section "Stocking Channel Catfish Into a Pond" apply to cages.

A 4-by-4-foot cylindrical cage will hold about 500 fish grown to an average size of 1 pound each. The total weight of fish in cages cannot exceed the weight the entire body of water would support if the fish were loose. A safe level is about 1,000 pounds of catfish per acre of water, including fish in cages and those that may be loose in the pond.

### Feeding Catfish in Cages

Feed caged catfish daily, because they do not have access to natural food in the pond. Use a commercial floating catfish feed that contains at least 32 percent protein plus essential vitamins and minerals. Use  $\frac{1}{4}$ - or  $\frac{3}{16}$ -inch pellets. Feed only what the fish will consume in a 15- to 20-minute period, and never exceed 35 pounds of feed per acre a day. Feed at the same time each day. When the water temperature is below 65°F, follow guidelines for winter feeding described in the section "Feeding Catfish in Ponds."

### Raising Rainbow Trout in Cages

With some exceptions, rainbow trout can be raised in cages during the winter months in most Georgia ponds. In most areas the growing season is about four months. Rainbow trout must be stocked when water temperatures are below 70°F and harvested in the spring before the water reaches 70°F.

Seven-inch long fingerlings should be stocked so they will reach  $\frac{1}{2}$  to  $\frac{3}{4}$  pound at harvest. Stock no more than 300 fish in a 4-foot diameter, 4-foot cage.

Trout should be fed a commercial floating trout feed that has at least 40 percent crude protein and all essential vitamins and minerals. If possible, feed twice a day. Trout will consume about 2 percent of their body weight per day when water temperatures are above 50°F. When water temperatures are below 50°F, feed 1 percent of their body weight daily. Or, as a general rule, feed what the fish will eat in a 30-minute period.

Remember that rainbow trout are more sensitive than channel catfish to handling, low oxygen and high temperatures.

### Acknowledgments

Some information contained in this booklet was adapted from the following publications:

Jensen, J. 1981. *Channel Catfish Production in Ponds*. Alabama Co operative Extension Service, Auburn University. 15 pages.

Jensen, J. 1981. *Home-Grown Fish From Cages*. Alabama Cooperative Extension Service, Auburn University. Circular ANR-269, 4 pages.

Lewis, G.W. 1981. *Management of Georgia Sportfishing Ponds*. Georgia Cooperative Extension Service, The University of Georgia. Bulletin 732, 23 pages.

Lock, J.T., and D. Steinbach. 1978. *Catfish in Farm Ponds - For Food and Recreation*. Texas Agricultural Extension Service, Texas A&M University. MP-1142, 10 pages.



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