



Farm Fish Pond Management

South Carolina Department of Natural Resources

Partial Poisoning

To Restore Fish Population Balance in Farm Ponds

Balanced fish populations are those that provide quality fishing year after year. They produce the food and prey necessary for young fish to survive and grow to a harvestable size. Balance is best achieved by properly stocking the pond with the correct number of largemouth bass and bream (See SCDNR [Fish Pond Management Guide](#)). Balance is maintained by managing water quality and by annually harvesting adequate numbers of bass and bream.

Farm ponds become imbalanced for a number of reasons, two of the most common being improper harvest and the presence of undesirable fish species. Improper harvest often involves harvesting too many bass which leads to bream overcrowding and stunting. This leads to increased predation on bass eggs by bream, which can completely prevent successful bass reproduction. Under harvest of bass can lead to the opposite extreme, where no young bream survive an overly abundant number of hungry young bass. Under this condition, few bass grow larger than 14". Undesirable fish species such as golden shiners, bullhead catfish, and shad compete with bream for food and can disrupt spawning of both bass and bream.

In most instances, a complete fish kill and proper restocking is the best remedy for poor fishing that results from imbalance. However, in a limited number of cases, balance can be restored by restructuring the fish population or eliminating shad with small treatments of the fish toxicant rotenone. This is known as partial poisoning, which if successful, can improve fishing quality more rapidly than a complete fish kill and restocking.

Methods

Rotenone is the most effective means of controlling fish in farm ponds. **Rotenone is a restricted use pesticide in South Carolina and a Category 5, S.C. certified applicator license is required for its purchase and/or use.** Therefore it is necessary to obtain the assistance of a certified applicator when using rotenone. Your district biologist can provide further details on the application and use of rotenone.

Partial poisoning of stunted bream populations should be conducted in the fall (usually October) after water temperatures have dropped below 70 F, but are still above 55 F. The rotenone is best applied during the middle of a clear, sunny day when the larger fish and bass tend to be in deeper water and away from the pond's bank. Never apply rotenone on a cloudy or windy day as cloud cover will lower oxygen levels and wind will disperse the rotenone across the entire pond. Either 5% powdered rotenone (sometimes called Derris cube) or 5% liquid rotenone (emulsifiable rotenone) may be used.

The actual procedure for partial poisoning stunted bream is called *marginal poisoning*. The objective of this procedure is to remove a majority of the small bream population, which restores optional food levels for the remaining bream, while bringing the predator:prey (bream and bass) relationship back into balance. One pound of powdered rotenone should be mixed with water in a tub, just enough water to make a watery mixture. Either by wading or from a boat, the rotenone should be poured evenly between a marked 300 linear feet transect within 25'-30'

Partial Poisoning

of the bank. This line of rotenone should run parallel to the bank and should be applied along a shallow shoreline if possible. If liquid rotenone is used, dilute 1 pint with water and pour evenly along the 300' segment 20'-30' from the shoreline.

The number of segments to treat in a particular pond will depend on the degree of overcrowding, and the size of the pond. If the pond is severely overcrowded, multiple treatments may be necessary if complete renovation is not an option. These factors should be discussed with your district biologist to determine the optimum treatment for your pond.

Selective poisoning of threadfin and gizzard shad makes use of the fact that they are more sensitive to rotenone than bass or bream. The lethal concentration for shad is 1/10 (.1ppm) the concentration necessary to kill bass and bream. Selective poisonings have been successfully conducted in the late Fall and in the late Spring. Shad removal with rotenone is accomplished by treating the entire pond with a light dose of rotenone based on an accurate estimate of the pond's volume. To minimize the killing of non-targeted fish, the rotenone must be spread evenly to avoid pockets of high concentration. Grass carp are also more sensitive to rotenone (.3ppm) and some will be killed by this procedure. However, if stressed fish are quickly moved to clean water, most can be revived.

Improper harvest and the introduction of competitive species were mentioned earlier as causes of imbalance and poor fishing. It is important to follow the harvest guidelines outlined in the *Fish Pond Management Guide* distributed by the SCDNR Fisheries Section. Just as important is preventing the introduction

of competitive fish species. Bullhead catfish occur in our lakes and rivers and pond owners often take them home to stock in their pond to "grow", where they compete with bream and quickly overpopulate. Never use shiners to fish in your pond as some will inevitably get loose and reproduce. Shiners compete with small bass and bream for food and eat fish eggs, sometimes completely preventing bass reproduction. Other competitive species migrate into ponds through ditches and creeks and upstream over spillways during flooding. Connection with other surface waters should be avoided and small streams entering the pond should be rotenoned before the pond is first impounded.

Partial poisoning has its limitations and caution is always warranted when applying a toxicant to your pond. Never double the application rates unless you are advised to do so. Some loss of the adult fish is to be expected. Fish such as bass will occasionally move in to the treatment area to feed on the distressed fish as the small fish tend to be affected more rapidly by rotenone. With this in mind, it is important to be conservative when utilizing partial poisoning to control an overpopulated fish population. Sometimes a particular harvest procedure can be used to bring about the desired results. Again it is important to work with your district biologist on what will work for your particular situation. When utilized correctly, partial poisoning can help correct problems with overcrowding or abundant competitive fish species without having to completely renovate and start over again.



South Carolina Dept. of Natural Resources
Freshwater Fisheries Section

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