

Removal of Undesirable Fishes from Warmwater Ponds

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Ponds and lakes often contain species of unwanted fish. Frequently introduced by well intended individuals, these fish can ruin a pond or lake environment for gamefish. Problems associated with the stocking of undesirable fishes may include: overpopulation, habitat destruction, competition for food and nesting space, and the small size attained by the introduced fish. Additionally, these fishes may also consume the young of gamefish. Fishes which should not be stocked into warmwater ponds are listed by common name in Table 1.

TABLE 1.

Undesireable Fish Species for Stocking in Warmwater Ponds	
Green Sunfish	Bullhead Catfish *
Common Carp	Crappie (ponds less than 100 acres)
Gizzard Shad	Pumpkinseed Sunfish
Rockbass	Warmouth
Longear Sunfish	Suckers
Flathead Catfish *	Golden Shiners

Partial removal of unwanted fish can be accomplished by physical techniques such as water level drawdown to increase

Undesireable Fish Species for Stocking in Warmwater Ponds	
Gars *	Buffalos
Carp suckers	Yellow Perch
Redhorse	Bowfin *
Grass Pickerel	Bluegill +
Goldfish *	Hybrid Sunfish -

+ Bluegill should not be stocked without largemouth bass as predators.

- Hybrid sunfish should not be stocked when bluegill and other sunfish are present.

*** These fishes are least sensitive to antimycin A.**

Warmwater ponds should only contain largemouth bass, bluegill, red ear sunfish (shellcrackers), and channel catfish. If young of the year largemouth bass and bluegill are present, and few bluegill 3-5 inches long are caught by seining, the fish population is likely to be balanced. Limited numbers of largemouth bass should be taken from ponds since they control bluegill populations through predation.

predation or limit spawning habitat, shoreline seining, the addition of more predator fish, and electrofishing.

Drawdown and seining may be effective in temporarily reducing populations of small, undesirable fish. Stocking 15 - 20 adult largemouth bass (at least 12 inches in length) per surface acre may also reduce populations of small, undesirable fish. Electrofishing is most effective in capturing large fish due to their greater surface area which is exposed to more electrical current.

When stunned, larger fish are also easier to locate and capture by dipnet. Proper electrofishing equipment is expensive. Even with trained personnel using the appropriate equipment, electrofishing is extremely dangerous and should be done only by professionals.

Pond renovation techniques using chemicals, may target all fishes, a particular species, or certain types of fishes. Before a pond is reclaimed, its volume (in acre feet) must be calculated. The average depth can be determined by taking depth measurements, every 10 to 20 feet across the long and short axis of the pond with a weighted tape or calibrated pole. The total sum of the measurements (Example: 100 feet) is divided by the number of measurements (Example: 25 measurements) to obtain the average depth (Example: 100 feet/25 measurements = 4 feet).

The area of a large pond or lake may be estimated by aerial photographs located at county Agricultural Stabilization and Conservation Service (ASCS) offices. More accurately, the surface area can be determined by surveying. The area of a small circular pond may be measured by tape along the shoreline and calculated by using the following equation:

$$\frac{(\text{Distance around shoreline in feet})^2}{546,906} = \text{Number of Acres}$$

Example:

Pond A is round and measures 425 feet around its shoreline. How many surface acres is pond A?

Solution:

$$\frac{(425 \text{ feet})^2}{546,906} = \frac{425 \text{ feet} \times 425 \text{ feet}}{546,906} = \frac{180,625 \text{ feet}}{546,906}$$

0.33 acres, or one third acre

NOTE: 546,906 is the circumference (in feet) of a 1-acre, circular-shaped pond, squared.

The surface area of a rectangular pond is calculated by multiplying the pond length by the pond width in feet, which determines the area in square feet. Dividing the area by 43,560 (square feet in an acre) will determine the size in acres.

Example:

A rectangular pond measures 300 feet by 290 feet. How many acres is this pond?

Solution:

$$\frac{(300 \text{ feet} \times 290 \text{ feet})}{43,560 \text{ square feet}} = \frac{87,000 \text{ square feet}}{43,560 \text{ square feet}} = 2 \text{ acres}$$

A triangular pond's surface area is determined by multiplying the base and height shoreline measurements, and then multiplying by 0.5. Pond measurements can be obtained by "pacing" around the pond. For example: if each step or stride is about 3 feet long, 100 steps would

approximate 300 feet.

Rotenone concentrations of 1-2 mg/l are typically used to reclaim ponds. For a 2 mg/l rotenone treatment, 0.65 gallons of 5% liquid, or 5 lbs of 5% powder is enough chemical to treat 1 acre foot of water. Liquid rotenone should be diluted in water at a ratio of 10:1 before application. Similarly, five pounds of rotenone powder should be mixed with 10 gallons of water before application. Pond water levels should be lowered as much as possible to reduce the amount of chemical needed, and to insure a complete kill. Rotenone should be distributed throughout the entire water column and over the entire pond surface. The diluted chemical can be distributed through the prop-wash of an outboard motor in large ponds, or by a small pump or pressure sprayer in small ponds.

Rotenone works most effectively in water which has reached 70 degrees F and will detoxify in 10 days. Livestock should not be watered from a reclaimed pond for 10 days after treatment, at water temperatures of 70 degrees F. Water should not be released from the pond for two weeks after treatment at these water temperatures. After two weeks the pond will be suitable for restocking. The Food and Drug Administration has not approved the consumption of fish killed by rotenone for humans or livestock.

Populations of crowded bluegill may be reduced by the use of rotenone around the shoreline during spawning (water temperatures of approximately 75 degrees F). However, complete pond renovation may be the only effective method of removing a stunted bluegill population. Gizzard shad are extremely sensitive to rotenone. A treatment of 0.1 mg/l (ppm) can be used to selectively kill these fish. However, in most instances, ponds which contain undesirable fish populations must

be completely drained or reclaimed with rotenone, and then restocked.

The Kentucky Department of Fish and Wildlife Resources (KDFWR) requires pond owners to get permission to reclaim their ponds. The proper forms must be submitted to your conservation officer before September 1. KDFWR sells the rotenone. Rotenone should be used during September - October after the bluegill spawning season.

Antimycin A (Fintrol) is primarily used to remove unwanted scaled fishes (ie green sunfish) from channel catfish production ponds. Table 1. lists (with an asterisk) the fishes which are the least sensitive to antimycin A. The target fish species, the pond's water volume, water temperature and pH at the time of treatment must be known to conduct a selective fish kill. A bioassay should be conducted on the target species to reach the proper chemical concentration and to avoid killing the catfish. Antimycin is expensive and should be applied when water temperatures are 60 degrees F, or greater. Fish killed by antimycin A are not FDA approved for human or livestock consumption.

Contact your district's Fisheries Biologist, local Conservation Officer, County Extension Agent or Extension Aquaculture Specialist before reclaiming a pond. These offices may also be able to provide a list of fish suppliers for restocking. KDFWR has two guides titled "A Guide to the Management of Farm Ponds in Kentucky," and a color picture guide titled "Kentucky Fishes." These guides would be useful for any pond owner and are available from the KYDFWR.