

# How to Survey the Fish in Your Pond

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Many pond owners think surveying fish populations in a pond is something only a professional fisheries biologist can do. Determining the fish species present, their size distribution and relative abundance in a pond is not as hard as it may seem. Most pond owners who have spent time seining or fishing are already familiar with the two most common techniques used to monitor pond fish populations. Using these two techniques consistently over time and maintaining records from the surveys can provide useful information. A pond manager needs to know the fish species present and have an understanding of their size distribution and relative abundance before making management decisions such as stocking additional fish, removing a specific number or size of fish, or restricting the harvest of a species. This fact sheet describes two common methods, seine surveys and hook and line surveys, as well as how to use the techniques to determine species present, their size distribution and relative abundance in a pond. This information gives a pond owner some of the tools necessary to become a pond manager.

## Seine survey

Seine surveys are primarily used to monitor the reproductive success of largemouth bass, bluegill and some other members of the sunfish family by capturing young fish that are young-of-the-year or possibly from the previous year. Seine surveys are also useful in monitoring the presence and relative abundance of minnow species, mosquito fish, aquatic



invertebrates and amphibians. This survey method is best conducted between mid-June to mid-September because this is when most young fish are present. Seine surveys are conducted with a 15- to 50-foot long and 3- to 6-foot tall mesh net that is pushed through the water. The mesh size should be 1/8- to 1/4-inch square. Handles are typically wooden poles, or PVC or metal pipes with capped ends. For most farm pond surveys, a 20-foot by 4-foot seine with a 1/8-inch mesh is sufficient.

Select areas that are shallower than the seine height on the deep end and free of obstructions such as rocks, stumps, logs, sticks, wire and excessive aquatic vegetation. Each pond seine survey typically covers a quadrant area, meaning the area surveyed resembles a quarter of a circle. This is accomplished by one person

standing on the shoreline holding one end of the seine while another person takes the opposite end of the seine into the water perpendicular to the shoreline until the seine is tight. The person in the water then pushes the bottom of the seine back towards the shoreline while keeping the seine tight. Each time the seine is pushed through the water making a quadrant is called a seine haul. Attempt to conduct at least four seine hauls in ponds that are 1 acre or larger without sampling the same area twice. Additional seine hauls are necessary for diverse fisheries or large ponds.

Survey results from a pond with a balanced largemouth bass and bluegill fishery would reveal a mixture of fingerling (young fish 1 to 3 inches long) largemouth bass and bluegill as well as a few aquatic invertebrates. If survey results indicate abundant ►

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aquatic invertebrates (hundreds), largemouth bass and bluegill may be absent or their abundance is limited. Dozens of crawfish, tadpoles or salamander larvae per seine haul indicate few or no largemouth bass present. Seine surveys are not an effective method to monitor species such as crappie or catfish. Information to record during seine surveys includes fish species, measurement of each fish species in half-inch or centimeter increments, and species and numbers of aquatic invertebrates and amphibians.

Another article about seine surveys is available at [www.noble.org/Ag/Wildlife/SeineSamplingPond](http://www.noble.org/Ag/Wildlife/SeineSamplingPond).

## Hook and line

Hook and line surveys are primarily used to determine the presence, size distribution and relative abundance of adult fish. Hook and line surveys are basically structured fishing trips where records such as time spent fishing, fish species caught, and weight and length of every fish caught are recorded. In addition to these records, types of terminal tackle (lure) used and length of time each was used also should be written down. Typically, when a fish is caught, it is placed in a live well or fish basket, then every couple of hours, the species, weight and length of the fish are recorded and the fish are released back into the pond. Using catch per man-hour of effort, and fish weight and length measurements, a pond manager can learn the quality of a fishery. Weight information is usually analyzed by calculating relative weight per size class. Relative weight (actual weight divided by an optimum weight

per fish length) is used to determine whether a fish species tends to have healthy weights for various lengths. Length information is usually analyzed by plotting length frequency per size class in diagrams and by calculating proportional stock density. Proportional stock density indicates the relative abundance of a species. To determine proportional stock density, a pond



manager divides the number of quality fish (e.g., bass larger than 12 inches) by the total number of adult fish (e.g., bass larger than 8 inches). For more information on proportional stock density, please refer to *Monitoring Bass and Bluegill Populations in Ponds* in the June 2010 issue of *Ag News and Views* at [www.noble.org/Ag/Wildlife/Pond-Populations](http://www.noble.org/Ag/Wildlife/Pond-Populations). Another reference article, *Hook and Line Fish Sampling*, is avail-

able at [www.noble.org/Ag/Wildlife/HookAndLineFishSampling](http://www.noble.org/Ag/Wildlife/HookAndLineFishSampling).

Conduct hook and line surveys during the same time frame each year. When surveying largemouth bass and bluegill fisheries, attempt to conduct the surveys during months when the fish are more likely to be caught, such as late March, April, May, early June, October and early November. Try to avoid conducting a survey for three days after a cold front moves through the area. Necessary equipment includes rods, reels, artificial lures and/or live bait. When surveying for largemouth bass, use a variety of different sized lures ranging from 1/32 ounce to large hard and plastic baits. When surveying for bluegill, use a number 8 hook baited with earthworms. Attempt to annually collect at least 50 of each species of interest. If it is not possible to collect 50 fish of a specific species, conduct surveys on three separate days during the same season. Ideally, a manager wants a wide range of sizes of each species to be present.

Monitoring fish in a pond can be done by any pond owner using these techniques. Consistently using these methods through the years and during the same time period provide a better understanding about the fisheries in a pond. Using these techniques individually only answers one piece of the puzzle. However, when combined, they address many questions about fisheries in a pond.

For more general information about fisheries and pond management, visit <http://www.noble.org/Ag/Keywords/fish.html> and <http://www.noble.org/Ag/Keywords/ponds.html>. ■