



How Many Fish Do I Have?

A Landowner's Guide to Determine the Fish Community Status in Their Pond

What kinds of fish are in my pond? How many fish are in my pond? What sizes of fish are in my pond? What can I do to make the fishing better? These are all questions that are common among pondowners in Missouri.

The first three questions can be grouped together and rephrased as, "What is the status of my pond?" The fourth question cannot be answered until after the status of your pond is known. This *Aquaguide* will assist you in determining the status of your pond. First, there are a few terms to learn that will aid you in your quest for better fishing.

Population - *all the individual fish of a particular species.* For example, all the bass in your pond make up the bass population, whereas all the bluegill make up the bluegill population.

Community - *all the various populations that exist together.* The most typical farm pond fish community consists of bluegill, largemouth bass, and channel catfish. This fish combination provides good fishing opportunities, and achievable management goals. When other species such as carp, bullhead, crappie, etc. are introduced, management becomes much more difficult and unpredictable.

Sample - *a small quantity of each fish population that is used to determine the status of the entire fish community.* Ideally, a sample should be made with enough effort to capture as many fish as possible. A good sample can yield information such as:

- Number of species present
- The abundance of each species
- Size ranges for each species
- Fish weights
- A general idea of fish health

Fisheries biologists use specialized equipment to obtain a good fish sample and, thus, a "snapshot" of the community.

There are thousands of farm ponds in Missouri. The Missouri Department of Conservation cannot sample every pond. However, there is a relatively easy method for you, a pondowner, to find out the status of your fish community without specialized equipment.

Collecting Your Data

You can determine the status of your pond by keeping a record of the fish you catch. This way of looking at your fish community is a lot of fun, but in order to get enough information, you will need to make several fishing trips. The best time to collect your sample is during spring. It is important to record the number, length, and species of each fish caught. For your convenience, blank data sheets for largemouth bass and bluegill are provided (Appendix A & B). An example of a completed data sheet is also provided (Figure 1). This method will allow you to observe trends in fish harvest over time and provide information necessary for making management decisions. The key is to catch fish in near proportion to the different sizes that exist in the pond. Here is how to do it:

Largemouth Bass

1. Use artificial lures like crankbait, spinners, and plastic worms in three length categories: 1-2 inches, 2- 4 inches, and 4-8 inches. The different lure sizes will allow you to target all sizes of bass in the pond.
2. Fish each lure for 30-minute intervals until you have caught at least 20 bass **8 inches or larger**. Do not record bass less than 8 inches. Each lure size must be fished for an equal amount of time before you stop fishing. This may take several trips to the pond to catch the desired number.
3. Fish all areas of the pond.
4. While bass fishing, you **should not** collect data on bluegill.

Bluegill

1. Use worms, crickets, or some type of small artificial lure. Very light line (2-6 lb test), small hooks (#6 or smaller) and light split shot work best.
2. Fish until you collect at least 50 bluegill **3 inches or larger**. Do **not** record fish less than 3 inches. If you use different lures, be sure to fish each for an equal amount of time. Again, it may take several trips to the pond to catch the desired number of fish.
3. Fish all areas of the pond.
4. While bluegill fishing, you **should not** collect data on bass.

Channel Catfish

Successful channel catfish reproduction in ponds containing largemouth bass is rare. As such, stocked individuals are typically the only catfish present, and supplemental stocking of fish ≥ 8 inches is required to maintain the population after periodic harvest. Restocking should cover the number harvested plus an additional 10% to account for natural mortality. Note the body condition of your catfish. If the catfish are overstocked, or if the food supply is limited, the fish will appear skinny. Removing some fish and discontinuing stocking will allow others to grow faster.

Making Sense of Your Data

After your sample has been collected you can determine the status of your fish community with some simple calculations. One calculation that biologists commonly use to determine the size distribution of bass and bluegill populations is called **Proportional Stock Density (PSD)**. Although the term “PSD” may sound intimidating, it is very easy to calculate.

- **Bass PSD:** Divide the total number of quality bass (12 inches and larger) by the total number of all bass caught (8 inches and larger) and then multiply by 100.
- **Bluegill PSD:** Divide the total number of quality bluegill (6 inches and larger) by the total number of all bluegill caught (3 inches and larger) and then multiply by 100.

The PSD numbers you get will allow you and/or a fisheries biologist to get a good idea of your pond’s status.

Figure 1: Example of how to calculate the PSD for largemouth bass. The same procedure is used for bluegill except that the length classification changes (see "Making Sense of Your Data" on previous page for correct sizes to use for bluegill). Once the PSD's are calculated for both bass and bluegill, use Figure 2 to properly assess your fishery.

Largemouth Bass Data Sheet					
Length (in.)	# Caught	Total # of all fish caught	Total # of fish ≥ 12"		
8	0				
9	2				
10	3				
11	5				
12	1				
13	1				
14	5				
15	3				
16	3				
17	0				
18	0				
19	0				
20	0				
21	0				
22	0				
23	0				
24	0				
				23	
				A	
					13
					B

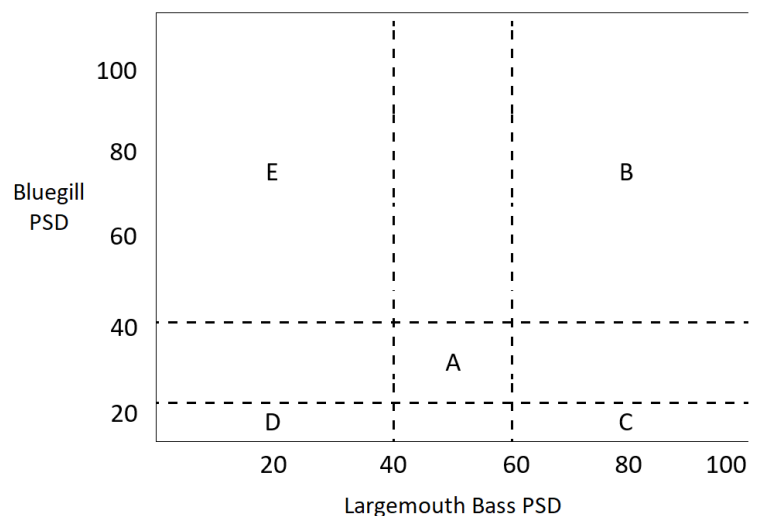
Here is how you calculate the PSD for largemouth bass $(B \div A) \times 100$.
 The answer is 56.5. In other words, nearly 57% of the bass in your pond are 12 inches or greater in length.

What Do These Numbers Mean?

Now that you have PSDs for bass and bluegill, it is time to interpret the results. Simply use your PSD's and the grid (see Figure 2) to find out the status of your fish community. If, for example, your bass PSD was 20 and your bluegill PSD was 55, then your community is in grid "E". In this example, your bass population is overcrowded but you have a quality bluegill population.

Figure 2: Grid comparing PSDs of largemouth bass and bluegill. Parallel lines outline the desired PSD ranges:

- A. Mutual balance of satisfactory fishing (bass PSD between 40-60, bluegill PSD between 20-40)
- B. Community consisting of large, old specimens which indicates unfished population (bass PSD > 60, bluegill PSD > 40)
- C. Numerous stunted bluegill interfering with bass reproduction (bass PSD > 60, bluegill PSD < 20)
- D. Overfishing of bass and stunted bluegill (bass PSD < 40, bluegill PSD < 20)
- E. High population of small bass overeating young bluegill. (bass PSD < 40, bluegills PSD > 40)



The last step to quality fishing is to decide on a management plan. It is up to you to decide what type of fishing you want your pond to provide. Do you want big bass? How about big bluegill? What about a pond that offers bluegill and bass in a variety of sizes? Several *Aquaguides* are available to assist you with different management options. Call your local MDC office and ask to speak with a fisheries management biologist to ensure that the management option you seek is feasible. Be sure to have your data handy!



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FIS022 10/2021

Appendix A. Blank data sheet for largemouth bass. Use tally marks each time you catch a fish within a given length category. PSD for largemouth bass = $(B \div A) \times 100$.

Largemouth Bass Data Sheet					
Length (in.)	# Caught		Total of all fish caught	Total # of fish > 12"	
8					
9					
10					
11					
12					
13					
14					
15					
16				A	
17					
18					B
19					
20					
21					
22					
23					
24					

Appendix B: Blank data sheet for bluegill. Use tally marks each time you catch a fish within a given length category. PSD for bluegill = $(A \div B) \times 100$.

Bluegill Data Sheet					
Length (in.)	# Caught		Total of all fish caught	Total # of fish > 6"	
3					
4					
5					
6					
7					
8				A	
9					
10					B
11					
12					