Bluegill are considered the backbone of the food chain for largemouth bass. There are a few misconceptions about these colorful, saucer-shaped sunfish, especially when it comes to frequency and success of spawning.

There has been quite a bit of discussion on the Pond Boss Forum and in the magazine regarding some of the interesting new work on bluegill reproductive biology. However, I thought it might be interesting to go back and fill in a few holes. Perhaps not everyone is familiar with basic strategy for reproduction by bluegills.

By nature, bluegills are multiple spawners. Each spring, female bluegills contain more than one size egg in their ovaries. Not all those eggs mature at the same time. Once females spawn ripe eggs, the next batch begins to ripen and she spawns again. Although this process has not been thoroughly researched, it appears southern bluegill populations can spawn as many as 4-5 times per year. In northern populations, I'm starting to believe we get no more than 2 spawns, and the second one often is quite limited compared to the first.

Bluegills are colonial nesters. They excavate dish-shaped nests in firm substrate, many nests in a colony, in shallow water. These nests are quite visible as a series of closely-spaced excavations. Male bluegills in the center of the colony have the most desirable territories. Central males tend to be larger in body size than peripheral males that nest on the edge of the colony. An interesting study by Mart Gross indicated brood loss at peripheral nests was at least three times that of central nests, so it's certainly a reproductive advantage to be in the middle of the colony.

This will be a surprise to some people and even some biologists, but not all bluegills are colonial nesters. Bryan Neff closely studied bluegill reproduction in Lake Opinicon, Ontario. He found solitary nesting males made up about 4.5% of all spawning males. The solitary males were the same age, but in better condition (plumper) and with smaller ear tabs than central and peripheral males. Perhaps most interesting, the solitary and central males had more eggs in their nests than peripheral males. So, females apparently like solitary males as much as the central males. However, brood loss for solitary males was more similar to that for peripheral males than for central males in the study by Dr. Gross.

We just completed a study on bluegill nest site selection in a 330-acre South Dakota lake, and had a few surprises here as well. We found 15 bluegill spawning colonies at the lake in late June, and water depth averaged just under 3 feet for the 15 colonies. Next, we measured several physical characteristics at the 15 colonies, and compared those with the same measurements at 75 locations around the lake at the same depth (just under 3 feet).

The study was set up to ask questions such as: what substrates did bluegills select to build their nests compared to the proportions of substrate types available at the 75 random locations? The answer to this first question really surprised me. In Figure 1, look at the number of sites with muck (fine sediment and decaying plants), sand, gravel, or rock substrates. All four types were represented at our 75 random locations. However, all 15 colonies were built on gravel substrate. I had not expected this, given what people write and believe about bluegills.

You have to watch out for scientists. We never want to make a mistake, so we are always leery of applying our results too broadly. We always seem to have disclaimers: we believe that bluegills selected gravel substrate for spawning in our study lake, but can't be certain they would make the same selection in other lakes and ponds. We know for a fact that bluegills will spawn in mud-bottomed ponds. However, they certainly chose the gravel bottom when they had a choice!

There were a few other results of interest. First, our bluegills only nested in locations with low vegetation density. We found no nests in locations without vegetation, and no nests in locations that we had categorized as medium or high

Bluegill nest in colonies, by sweeping dirt and silt off a solid substrate, shaping nests like a crater.
Of course, we can't be certain which is the cart and which is the horse. Did the fish choose the sites because vegetation density was low, or was vegetation density low after the bluegills finished building their nests? However, all 15 colonies were in muskgrass (Chara). We found no nests in denser types of submergent aquatic vegetation. Again, I'd be leery of applying this finding too broadly to other ponds and lakes with different environmental conditions.

Finally, this lake has one large, shallow bay with a bottom that is almost entirely covered by submergent aquatic vegetation. I had expected to find colonies there, as this is one of the better largemouth bass and bluegill angling locations on the lake at many times of the year. Again, I was wrong! We found no bluegill nests in the shallow water. All nests were built shallow, on shores with a steeper gradient close to deep water. We don't know why they chose these sites, but the selection sure could affect fishing success during spawning time.

I know some Pond Boss readers are extremely interested in bluegill biology. Thus, I included the following two references that provide much more in-depth information than I have presented.


Both of these journals are published by Springer-Verlag [www.springeronline.com].