

# COCAHOE POND SPAWNING

Pond aquaculture is one of the oldest methods of growing fishes. Pond culture has been used successfully in raising cocahoe minnow in several southern coastal states. Growth of cocahoies is inversely related to stocking density; hence juvenile minnows (0.3 g to 0.5 g each) have been grown at 50,000 to 200,000 fish per acre in grow-out ponds depending on how soon they are needed on the market. Generally, the lower the stocking density, the faster the growth will be.

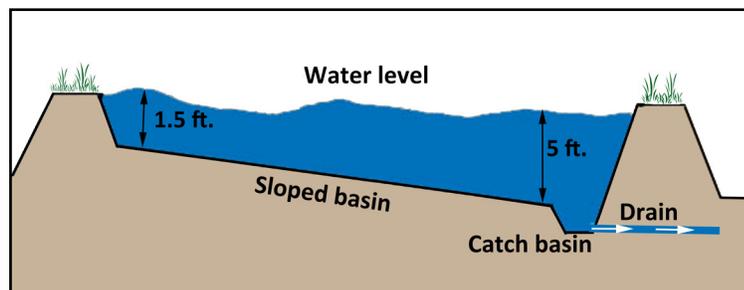


Figure 1. Lateral diagram of ideal pond form.

The optimum pond size has not been evaluated because most of the experimental studies have used smaller ponds (about 0.2 to 1 acre surface area). Natural productivity is critical to the successful culture of cocahoe minnows in ponds hence water should be fertilized to stimulate production of natural foods. Pond bottoms should be smooth and well graded to allow easy drainage. Culture ponds should have catch basins to assist in harvesting fish (Figure 1). Ponds of approximately 3-4 feet average depth having about 1.5 feet at the shallow and 5 feet at drainage end are good for minnow culture. All ponds should be filled with water that is passed through a fine cloth filter, about 800 microns or 0.03 inch is recommended, to eliminate wild fish that could compete for food or eat the cocahoies.



Figure 2. Cocahoe minnows; female (top) olive drab coloration and male (bottom) vibrant coloration, silver flecking and visible stripes. Photo: Craig Gothreaux

Production of cocahoe minnow eggs outdoors is achievable through the spring, summer, and fall months. Utilizing fertilized ponds has been successful in several southern coastal states. Pond spawning requires an ample supply of brackish water with a salinity between 5-15 parts per thousand (ppt) and a substantial amount of land. To prevent wild fish from entering the pond, the water source should be covered with a fine mesh. The three-phase system is the most popular system used for pond spawning and production and the one that will be explored in this fact sheet.

**Phase-1:** Phase-1 ponds are the spawning ponds strictly used for egg production and collection. Adult cocahoies that are 0.45 ounces or larger should be stocked at 10,000/acre with a 2:1 female to male ratio. Fish should be placed in ponds in mid-January to early February before water temperatures reach 59 °F. The fish should receive a feed with 28-40 percent protein at a ration of about 3 percent body weight twice a day.

As water temperatures reach 68 °F, place synthetic substrates or mats (Spawntex®) around the shallow edge of the pond for the females to lay their eggs on. Mats are about 2 inches thick and made of coconut fibers with a latex binder. This material is generally purchased by the roll and will need to be cut into smaller sections, about 3 feet by 2 feet is recommended. Attach the cut sections to a wire frame, and then suspend the sections below the water surface. This can be done using floats as in the picture shown but other methods will work as well (Figure 3). The mat material is too dense to allow fish to pass through,



Figure 3. Spawntex® mat with PVC floats. Photo: Craig Gothreaux

but each mat has sufficient void spaces to allow eggs to be trapped and retained. The mats should be left in the pond 3-7 days depending on the rate of egg deposition and temperature. Mats should be checked on a regular basis and transferred into the Phase-2 pond all at the same time. For more information on hatching different batches of eggs at the same time, see our Air Incubation Fact Sheet. This helps to prevent erratic hatching dates and variable sized fish that will lead to larger fish eating the smaller younger fish. When the mats are removed they should be replaced with new mats.

Peak egg production in the spring occurs between April and mid-May, and again in the fall in September and October, when weekly water temperatures range from 75 °F to 83 °F in the Baton Rouge, LA area. Your local temperatures may shift these peaks earlier or later.

**Phase-2:** Phase-2 ponds are hatching ponds used for eggs and growing fry. Hatching ponds are prepared in advance by filling to 1/3 capacity and fertilizing with organic and inorganic fertilizers two weeks prior to stocking to promote plankton blooms. This will establish a first food for newly hatched fish. Treatments should be administered to kill predaceous insects, and wild fish should be excluded. As the fry hatch in the pond, they are fed a finely ground minnow meal, 28-30 percent protein, at 5 pounds per acre a day. Fry and fingerlings are cultured in the Phase-2 ponds for 60-80 days.

**Phase-3:** The young fish are then transferred into a prepared Phase-3 pond for grow out to market-size minnows. Procedures and practices for grow out and ponds are available from previous extension and research documents. Please refer to:

SRAC: Growing Bull Minnows for Bait. (<http://www.msstate.edu/dept/srac/>)

Tatum, W M., J. P Hawke, R. V Minton, and W C. Trimble, 1982. Production of bull minnows (*Fundulus grandis*) for the live bait market in coastal Alabama. Alabama Marine Resources Bull. No. 13 Alabama Marine Resources Laboratory. Dauphin Island, AL 36528.

Strawn, K., P. W. Perschbacher, R. Nailon and G. Chamberlain. 1986. Raising Mudminnows. Texas A&M University Sea Grant College Program. TAMUSG-86-506R.

Waas, B. P., and K. Strawn, 1983. Seasonal and lunar cycles in gonadosomatic indices and spawning readiness of *Fundulus grandis*. Contributions in Marine Science Vol. 26:127-141.

**Note:**

The amount and type of fertilizer to use will depend on the size and condition of your pond. Please look into the Southern Region Aquaculture Center (SRAC) articles and other references listed below for more information about fertilizing ponds. You may also contact your local extension agent for this information.

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