

OBSERVATION ON THE PROPAGATION OF FLATHEAD CATFISH IN THE SAN MARCOS STATE FISH HATCHERY, TEXAS

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ABSTRACT

Although flathead catfish were very popular fish with the anglers of Texas, very little effort was made in the hatchery system to propagate these fish until about ten years ago. First, flatheads taken from lakes and rivers were used for brood fish. Repeated failures to get these fish to spawn, however, prompted hatchery personnel to rear offspring from some of the few spawns obtained from the feral fish so that hatchery-reared flatheads could be used for brood fish. This proved to be successful since eight pairs of hatchery-reared brood fish produced seven spawns the first year they were used and 11 spawns out of 12 pairs of these fish were obtained the next year. Hormone injections were not required to obtain these spawns. The hatchery-reared brood fish couldn't be sexed successfully until the fourth year, and no spawns were obtained until the fourth year, indicating this might be the time that sexual maturity is reached. Flatheads spawn during the month of May, at the San Marcos, Texas, hatchery. Water temperature is usually about 72 to 75 degrees Fahrenheit at this time of year. The pens and spawning jars used for channel catfish culture are used for spawning flatheads. Jars were checked every two days for spawns, and when a spawn was found, the jar wasn't checked again for six or seven days. After the eggs hatched, the jar was removed to a holding vat and left there until the yolk sacs of the fry were absorbed. The fry were then placed in one-half-acre rearing ponds. It was discovered that female brood fish should be removed immediately after spawning to keep them from being killed. The rearing ponds were fertilized with 50 per cent protein meat and bone meal before introduction of the fry, to produce food for them. It was discovered that vegetation and crayfish should be eliminated from rearing ponds to obtain maximum recovery. The three types of fish used for forage were gambusia, fathead minnows, and goldfish. Ponds without crayfish produced as many as 2,865 fingerlings that measured from three and one-half to four inches in length and weighed 10 ounces to the hundred. Future plans call for an attempt to eliminate all crayfish from the rearing ponds and to again use gambusia, fathead minnows, and goldfish as forage. Artificial hatching of eggs will also be attempted.

INTRODUCTION

The flathead catfish is a very popular fish in Texas, not only as a food fish but also as a sportfish; almost any fisherman will get a thrill that he will not soon forget when he catches a flathead that might weight from 30 to 80 pounds. Many requests are received each year for flatheads to stock small lakes and ponds. Although the flathead has always been a very popular fish with the anglers of Texas, very little work on propagation of these fish was done by the State hatcheries until about ten years ago. Several State hatcheries tried, on a small scale, to get these fish to spawn in the hatcheries, but they had very little success. The Medina Lake State Hatchery has had fair luck with spawning feral flathead catfish. This hatchery has one pair of brood fish that have spawned each year for the past six years and now weigh about 18 pounds each. The Fort Worth hatchery has also had limited success with spawning feral flatheads.

The Brood Fish

Until the last five years, all the brood fish that were used were wild

fish, either seined from rivers or lakes or caught in nets or on lines. As a rule, these fish proved to be poor brood fish and very few spawns were received from them. After many failures at getting the flathead to spawn in our hatcheries, fisheries personnel decided to try raising brood fish from fry that had been spawned, hatched, and reared in the hatchery. By doing this, the hatchery-reared adult fish would know nothing but the hatchery ponds. The fingerlings that were kept at the hatchery to raise for brood fish did not grow as rapidly as the fish in our rivers or lakes since much of their natural food was missing. When these fish were three years old, personnel had difficulty in sexing them because the females were not ripe. The following year when the brooders were four years old, very little difficulty was encountered in sexing them. Eight pairs of brood fish were placed in hatching pens. Seven of the eight females spawned, and it was found later that one of the brood fish was missing in the pen from which a spawn was not obtained. All of these fish spawned naturally without being injected with hormones. At this time the brood fish weighed from three to six pounds each. The spawns were small, numbering from three to five thousand eggs per female. Evidently, hatchery-reared flatheads do not reach sexual maturity until their fourth year of life. The following year 12 pairs of these domesticated flatheads were placed in hatching pens and 11 spawns were obtained. Nine spawned in the spawning jars and two spawned in open water in the pens. The spawns deposited outside the spawning jars were lost. The spawns obtained during that year were slightly larger than those of the previous year, since the spawns contained from five to eight thousand eggs per female.

Spawning Methods

The catfish in the San Marcos Hatchery are usually paired off and placed in hatching pens about the first day of May. At that time the temperature of the water is usually about 72 to 75 degrees Fahrenheit. It has been found that channel, blue, and flathead catfish will spawn at this temperature. Most of our catfish spawn during the month of May.

The same hatching pens (Figure 1) and spawning jars were used in

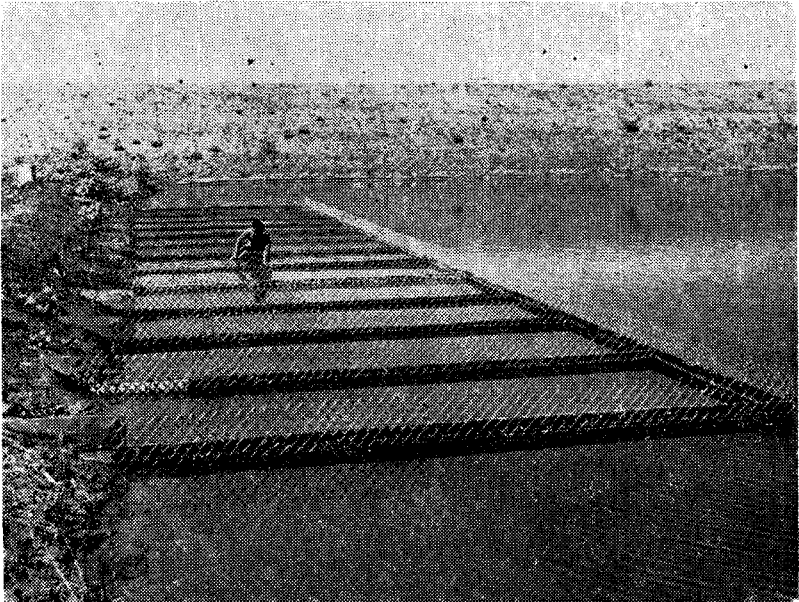


Figure 1. Catfish spawning pens at the San Marcos hatchery showing one of the hatching jars being run.

spawning the flathead that were used to spawn the channel and blue catfish. The brood fish pens are four feet wide and extend ten feet out in the pond. A crock spawning jar was placed in each pen. These jars are slightly larger than a ten-gallon milk can and are made to the following specifications: height, 22 inches; diameter, 9½ inches through the body; diameter of the mouth opening, 8 inches. Holes for handles are placed near the jar top (Figure 2). The spawning jars are embedded in the back side of the pens with the top side of the jar about nine inches under water.

After the brooders were placed in the hatching pens, the jars were checked every two days for spawns. We placed our hands in the spawning jars to check for spawns, although the male is vicious when

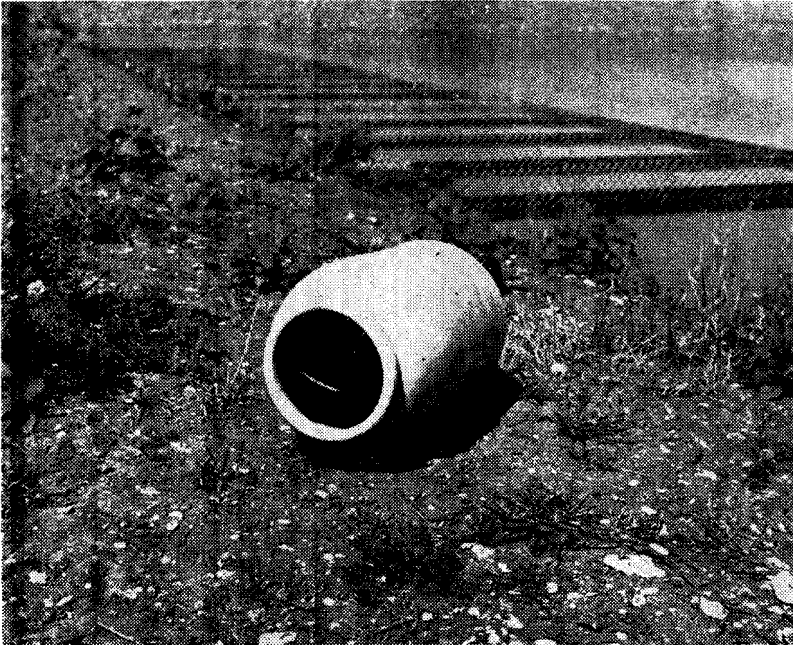


Figure 2. Crock jars used in the Texas hatchery system for spawning flathead, blue, and channel catfish.

he is guarding eggs and will tear the female to pieces if she attempts to enter the spawning jar where the eggs are. No attempt has been made by the male to attack or bite our hands while checking the spawn. To prevent unnecessary disturbance, when a spawn was found, that particular jar was not checked again for six or seven days, depending on the temperature of the water. On the sixth or seventh day when the eggs had hatched, the jar still containing the flathead fry was removed from the pond and carried to a cement holding vat. The jar was placed in the holding vat and left for three or four days, or until they absorbed their egg sac and got their natural color (Figure 3). A stream of water flowed through the vat at all times. After they absorbed their yolk sac the fry were placed in one-half-acre rearing ponds.

A word of caution should be interposed relative to the protection of the female of the species. After the female flathead catfish has deposited her eggs, she should be removed at once from the spawning pen. Last year, four of the seven females that spawned were killed by the male, even though we tried to remove the female as soon as possible. This year we lost some females, but not so many. In pairing

all our catfish, we try to pick a male that is a little larger than the female. In the last two years only one of the sixteen spawns that we have had in the hatchery has been eaten.

Rearing the Young

The rearing ponds were filled with water approximately fifteen days before the flatheads were released in the pond. These ponds were heavily fertilized with 50 percent protein meat and bone meal at first and a small amount added each day. The analysis specification for the 50 percent protein meat and bone meal we use reads that the meal shall have crude protein not less than 50 percent, crude fat not less than 6 percent and crude fiber not more than 3 percent. By the time that fry were released in the ponds immediately there was sufficient food available for them to start feeding. It has been found that we have an excellent growth in our flatheads until they reach the point

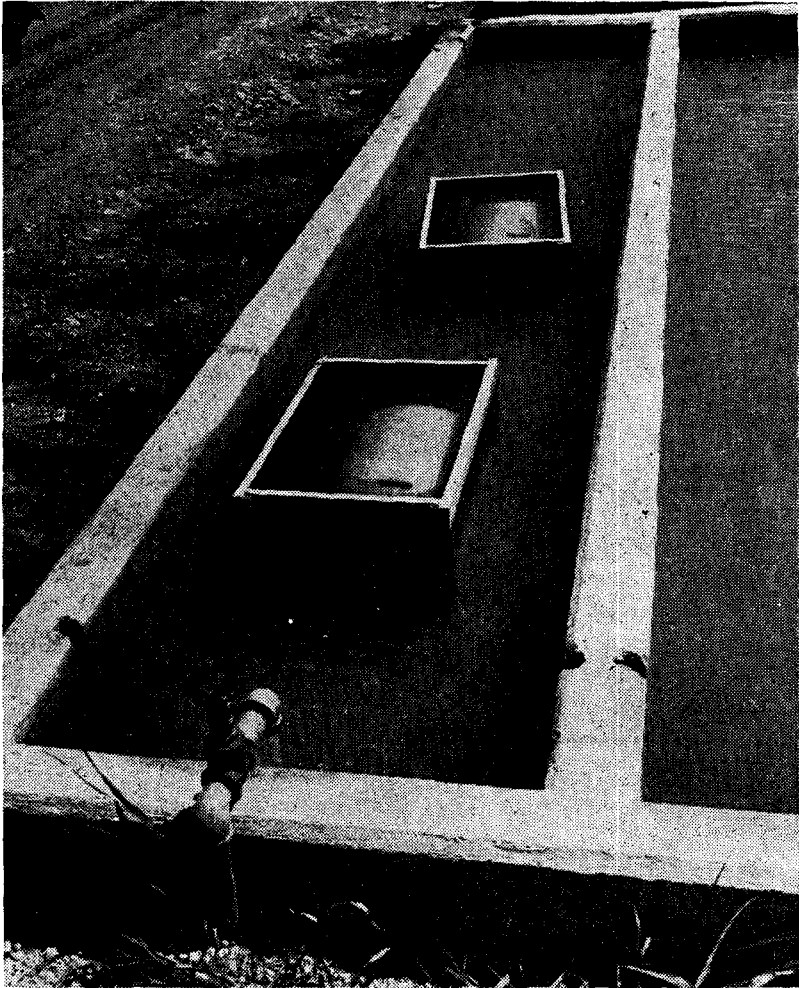


Figure 3. Hatchery holding trough showing two jars containing catfish fry placed in them. The jars and catfish fry are not removed until the yolk sac of the fry are absorbed.

where they require larger live food; they are from one to two inches long when this happens.

It has been found that it is best to keep all vegetation out of the rearing ponds because it presents quite a problem when draining the pond. Unlike the channel or blue catfish, the flathead will not school and will not follow the water down to the drain box when the pond is drained. In the spring of 1962, we were caught unprepared when the flatheads began to spawn. Ponds that had been stocked with other fish had to be drained to make room for the flathead fry. Three ponds were stocked with flathead fry. The ponds were one-half acre in size. Meat and bone meal was fed six days a week, not so much to feed the fish directly, but to fertilize the ponds and thus create food. These fry were released in the ponds in June. The ponds were drained and fish removed in October. Draining of the first pond was discouraging since only 56 fingerlings were removed. The production in the other two ponds was much better, with 2,926 fingerlings removed from one pond and 3,996 fingerlings taken from the other pond. Vegetation was heavy in all three ponds and moss had to be raked in piles and wind rows in order to remove all fish. No doubt many fingerlings were lost in the heavy moss. As of September 24, 1963, three San Marcos hatchery ponds stocked with flathead catfish fry, have been drained. One of the ponds had been stocked with gambusia minnows to furnish forage food for the flatheads. This pond was drained and only eight flatheads were found, but thousands of crayfish were removed from the pond. The eight flatheads taken from the pond were three months old and weighed one-half pound each and had gained more than three inches in length per month. Another pond was stocked with fathead minnows for forage before being stocked with flatheads. When this pond was drained only two flatheads were recovered, but again, thousands of crayfish were removed from the pond. The last two years have shown that where crayfish are present in large numbers in the rearing ponds, the flathead fry or fingerlings simply disappear from the pond. The other flathead pond that was drained was a .15-acre pond; 2,865 fingerlings were taken. No crayfish were present in this pond. When the flathead fry were fifteen days old, three pairs of adult goldfish were released in this pond, to spawn so their progeny could be utilized as forage by the flatheads. On draining, thousands of goldfish of various sizes were recovered with the catfish. The fingerling catfish that were taken, measured from three and one-half to four inches in length and weighed 10 ounces to the hundred.

Where Do We Go From Here?

Although it is felt that a breakthrough has been made in the spawning of the flathead by using hatchery-reared fish, there is still the problem of what is the best forage fish for the flathead when they reach the age where they will require such live food. Plans are being made to eliminate all crayfish from the rearing ponds and to try again the use of gambusia, fathead minnow, and adult goldfish next year as forage fish.

Next year we are going to take the eggs from the spawning jar as soon as the female deposits them and place the eggs in a small tray and use a mechanical device to hatch them. By doing this we hope to save many of the females.