

Spawning and Raising the Greenside Darter, *Etheostoma blennioides*, with a Note on the Eggs of the Rainbow Darter, *E. caeruleum*

Bob Muller

625 S. Altadena, Royal Oak, MI 48067
Michiganfish@aol.com

Five years ago, I got back into keeping fish after a 15-year hiatus. I joined the Greater Detroit Aquarium Society and, with my one aquarium, sat back to enjoy the hobby. An old friend, knowing I used to keep native fishes, asked if I would give a talk for the club. I dusted off my 20-year-old slides and was severely disappointed. Living fish would be necessary for the talk, so out came the collecting gear. I returned to my old collecting sites and, luckily, time had been kind to them. In a short time, I had blackstripe topminnows, hogsuckers, mottled sculpins, blacknose dace, and fantail, rainbow, and greenside darters (Fig. 1). The talk went well. Most of the fish were given away. Some came home with me. And that was the end of having only one aquarium.

The blackstripe topminnows and greenside darters went into a 20-gallon high aquarium. This seemed to work well—topminnows at the top, darters on the bottom, lots of empty space in between. I hadn't bred fish in years, so I decided to start with the topminnows. I placed a floating yarn mop in the tank and within a few days I was gathering eggs. Some of the eggs, however, were odd-looking with yellow centers. They were darter eggs! The greensides had been fighting their way to the floating mops to spawn. The following spring, I decided to concentrate on spawning and raising the greenside darters.

I collected more greensides as well as some rainbows from a tributary of the Clinton River, which flows through the northern suburbs of Detroit. The stream is 6-12 feet wide, and varies from six inches to three-feet deep. In the shallow areas, water flows over gravel and rocks, providing a great

habitat for darters. When I returned home, I placed several rainbows and greensides into a 30-gallon tank equipped with an undergravel filter and a powerhead to provide current. I also added a number of rocks and pieces of wood to give the darters some hiding places. Since the tank is located in a basement room with an uninsulated cement ceiling that was directly under my front porch, its temperature stayed around 45°F (7°C) for most of the winter. And since there are no windows in this room, I created a photoperiod with lights and a timer to match the conditions outside.

By early April, the light was on 12-1/2 hours a day and the temperature was 60°F (15.5°C). I removed the rainbows, leaving one male and two female greensides in the tank. I then added a weighted yarn mop and waited.

I wanted to watch the greensides spawn, but every time I approached the tank they detected my presence and stopped. Even at 10 feet away in a dark room with only the tank light on, the darters would stop to watch me watching them. I finally resorted to sitting in the dark 20 feet away watching through a pair of binoculars! (At this point, my wife came gave me some very strange looks.) I saw the female and male chase each other around the tank. Then the female would perch on top of the mop. As the male approached, she would burrow into the mop at the knotted end. The male soon followed and in a few seconds they would be back to chasing each other again.

Since I enjoy watching eggs develop, I always harvest them. After several days, I checked the mop and found 207 eggs. Amazing! The following table lists the dates and quantities of eggs gathered:

DATE	NUMBER
April 12	207
April 15	65
April 16	46
April 19	14
April 20	23
April 21	52
April 29	31
April 30	5
May 4	9
May 5	9
May 14	5
Total	466

I placed the eggs into small glass bowls with a few drops of MarOxy to help prevent fungus. I covered each bowl with plastic wrap and wrote the date on each bowl. The following table lists my observations on their development:

DAY	OBSERVATION
2	Tubular body forming
4	Head and eyes visible
5	Tail movement
7	Pupils formed on the eyes
8	Beating heart seen
10	Small amount of pigment on the tail

The fry are pelagic, totally transparent, and too small to eat brine shrimp nauplii. At first, I tried a commercial fry food from the local aquarium shop. It had a tendency to foul the water, causing all the fry to die in a matter of days. I then tried APR (artificial protozoa and rotifers) from Wet Thumb Aquatics and that worked. After about five days of eating APR, the fry were big enough to eat the nauplii. This has an added benefit in that the nauplii in the fry's guts make the fry easier to see.

When the fry were two weeks old they would occasionally go to the bottom of the tank and act like adults. I also found that when I was away and missed even a day's feeding, the fry would die. Greenside darter fry are very delicate and even the slightest change in feeding or water quality causes mortality. By the time the fry were 10-15 mm long, I had no more trouble with die-offs. (In contrast, rainbow darter fry I was raising at the same time were very hardy and showed no noticeable mortality.)

This greenside darter spawning occurred in the spring of 1998. At one year of age they were 25-35 mm long. I did not attempt to spawn them at that size. As of January 2000, they are 50-65 mm long. I plan to spawn them this spring.



Fig. 1.

Greenside darter, *Etheostoma blennioides*. Photograph © William Roston.

Egg Counts in Spawning Rainbow Darters

As some additional information for darter enthusiasts, I am including my records on rainbow darter eggs.

I placed six females and one male into a bare 30-gallon tank. I then added a 4" x 18" x 2" container filled with standard aquarium gravel. I regularly worked through the gravel and removed clusters of eggs and gravel that were stuck together. I then carefully separated the eggs from the gravel and placed the eggs in glass bowls until they hatched. I kept track of the amount of eggs gathered each day. For a 5-day period during the spawning, I also counted the number of eggs in each cluster from each spawning act. The following table lists my results.

DATE	EGGS	PER CLUSTER
April 12	98	—
April 14	89	—
April 16	93	6, 6, 8, 9, 10, 10, 14, 14, 16
April 19	35	—
April 21	113	5, 6, 7, 7, 8, 9, 11, 15, 18, 27
April 23	80	8, 8, 9, 10, 12, 14, 19
April 26	73	7, 10, 12, 14, 14, 16
April 28	117	5, 10, 12, 13, 13, 13, 15, 17, 19
May 3	132	—
May 5	5	—
May 8	41	—
May 12	53	—
May 14	45	—
Total	974	

Addenda: Using the accelerated photo period method described by Clifford Zoller in *American Currents* (Fall 1998 and Fall 1999), my F-1 rainbow darters started spawning February 10, 2000, which is about six weeks earlier than normal. I've also since learned that a finer aquarium gravel (2-3 mm) makes it easier for the eggs to form clusters. When I used a coarser grade gravel (4-5 mm), it was almost impossible to find the eggs in the gravel.