

FLEUR DE LIS FISHERIES

US Fish and Wildlife Service



Largemouth bass larvae (fry) ready to be stocked into study ponds at Natchitoches National Fish Hatchery March 2013.

State-Federal Pond Fish Production Study Is Underway

By: Jan Dean

As reported in the December-January edition of this newsletter, the Louisiana Department of Wildlife and Fisheries (LDWF) fisheries management biologists have changed their stocking requests for largemouth bass. They have asked for fish of three inches total length versus the typical 1½ to 2 inch size. Whereas this may seem a minor request change, hatchery personnel realize that this requires a major shift in fish production protocol. We can fill, fertilize and manage ponds to produce suitable zooplankton populations to feed bass larvae (fry), and then ponds produce insect nymphs and

other food for the growing bass. All of that is required to rear largemouth to 1½ to 2 inches, at which point they are normally harvested for distribution to and stocking into various water bodies as determined from prior fish surveys across the state.

The request this year is new to us, and it will require a different pond management strategy. We think that bass larger than about two inches long will begin to eat fish. Thus, producing three inch bass likely will result in a substantial increase in cannibalism and thus a much reduced survival rate from the initial stock-



Stocking largemouth bass fry into study ponds at Natchitoches National Fish Hatchery March 2013.

ing. For a given amount of primary (plant-like, phytoplankton) and secondary (animal-like, zooplankton and insects, etc.) production in the pond, fish harvest size is affected by the initial stocking rate and how long they remain in the pond. An analogy is cattle ranching. If you put too many calves in the pasture, each will have less to eat, and their growth will be less than desired. They may even become ill, and some may die. A big difference between calves and predatory fish is that the calves will not be eating other calves; largemouth bass will gladly dine on their smaller siblings. It's a tough life in the pond. If one doesn't eat and grow, then it is subject to being eaten.

This is a new request, and the optimum pond management scenario to produce larger bass is unknown. Larger bass, those six to eight inch fish called phase II, can be produced by offering artificial feed to smaller, one to two inch size called phase I, bass fingerlings. Some proportion of those will accept feed and grow without significant cannibalism, especially if they are graded to the same size first. This management protocol requires more effort, and the proportion of fish which will eat feed is variable and generally fairly low. The desire by the LDWF and by the Natchitoches National Fish Hatchery (NNFH) is to keep effort low and yet produce the three inch bass requested without adding artificial feed. Because of the unknowns, the LDWF Booker-Fowler Fish Hatchery and the NNFH have joined forces to conduct a study which involves lower stocking rates and which keeps the fish in the ponds longer to allow for growth to the desired size.

Sixteen ponds at each hatchery have been stocked for this study. Four ponds each were stocked at one of four reduced stocking rates: 40, 30, 20 and 10 thousand fry per acre versus the typical 75 thousand per acre. The ponds at NNFH were filled with filtered Cane River water and initially fertilized with cottonseed meal and then weekly with alfalfa pellets. These organic meals are used to produce zooplankton as the first food for the young fish. Each pond was checked for zooplankton abundance and size before stocking with bass. We use an ocular, or eyeball,

measure of zooplankton abundance and size classification. The sizes are related to the type of zooplankton in the samples. Small plankton generally are rotifers, medium-sized plankton typically are copepods and small cladocerans, whereas large plankton generally are larger cladocerans. It usually takes one week after filling and fertilizing ponds to develop zooplankton abundance beyond the low classification. Often the plankton populations are high within two weeks of filling and adding organic meals. Then they are ready to stock with bass fry. All of the ponds had abundant populations of various size zooplankton before stocking with fish this spring. The fry were stocked into the sixteen study ponds on March 25, so the study is underway. Because this fits better in this article, let me also say that another fourteen ponds were stocked with bass fry at the normal rate of 75 thousand per acre. We expect considerable cannibalism and lower survival in the study ponds this spring, so the other ponds will help meet the fish stocking needs this year. We look forward to seeing the study results. Warmwater fish culture in ponds is quite different from coldwater fish production in tanks and raceways where the fish can be seen each day. We have to wait to see the results...sorta like the proverbial Forrest Gump "box of chocolates." It makes life interesting, and we enjoy the intrigue.



Largemouth bass fry are being acclimated before being released into the hatchery pond

Louisiana Pearlshell Mussels May Be Part of Paradigm Shift in Mussel World

By: Tony Brady

For the past three years, Natchitoches National Fish Hatchery (NNFH) has been conducting research on the Threatened Louisiana Pearlshell Mussel (LPM) *Margaritifera hembeli*. The first part of this research was to determine when these mussels, which are endemic to Louisiana, develop their larval stage. After a six month study in 2010-2011, it was determined that the LPM spawned and developed their larva from late February through March. This initial study also showed that in addition to the larval stage the female mussels also produce a reddish material in their gills, and the amount of this reddish material has a positive correlation to the development of the larval stage. As the amount of the reddish material increases in the gill, the closer the larval stage is to moving on to its next life stage. By going out several times this March and monitoring the development of the larval stage in the LPM, the staff at NNFH was able to share timely information to Dr. Paul Johnson at the Alabama Aquatic Biodiversity Center (AABC) in Marion, AL. The staff at the AABC is currently working to learn the life cycle of the Alabama Pearlshell Mussel (APM) *Margaritifera marrianae* which was recently listed as Endangered under the Endangered Species Act. By sharing this information with the AABC, they were able to go and find gravid female APM which also contained the reddish material in their gills. Working together, the two facilities will begin studying the next life stage of these two mussel species.

The LPM and APM are two of five species of mussel found in North America that belong to the family Margaritiferidae. The remaining 290 plus mussels in North America are in the family Unionidae. Until recently, malacologists believed that the two families were similar in their larval development. This larval stage has long been called glochidia, and they are parasitic on the gills and fins of fish. The glochidia is comprised of a thin microscopic calcium-based shell, an abductor mussel, and stem cells that develop into the body and organs of the mussel while attached to fish host. Ongoing research, presented by

Dr. Chris Barnhart from Missouri State University, on the Western Pearlshell Mussel (WPM) *Margaritifera falcata* indicates that the larval stage of the family Margaritiferidae may develop differently than those of the family Unionidae. Glochidia of Unionidae species grow their glochidial shell by laying down layers of new shell material like the way a tree grows in rings. Barnhart has observed WPM larva developing while attached on the fish host by inflating two lobes as the initial shell is absorbed. As the staffs at NNFH and AABC work to determine the host fish for the LPM and APM, they will be on the lookout for this new form of larval development that is causing a paradigm shift in what we know about Margaritiferidae. While the fish host for the WPM is known (Pacific salmon and Rainbow trout), the host for the LPM and APM are still unknown. The staffs at NNFH and AABC are currently working to determine the host fish for these two southern *Margaritifera* species.



The larval for of *Margaritifera falcata* growing via the two lobes in the gills of its host fish.

Photo: Dr. Chris Barnhart

Another Electrofishing Class in South Florida

By: Jan Dean

Alan Temple of the FWS National Conservation Training Center (NCTC) and I enjoyed teaching another Fish and Wildlife Service Electrofishing class at the Arthur R. Marshall Loxahatchee National Wildlife Refuge at Boynton Beach, Florida in early March. It had been almost exactly two years since the last class there. A calendar reminder for me is that my wife and I had a granddaughter born while I was there, and she just turned two years old February 28. She was born a little early and seems to do most things early – climbing over sofa at six months, walking at nine months, climbing a rock wall a short time later – and she just

learned to verbally spell her name, Riley. Well, I digress...and brag a bit.

The class at Loxahatchee attracted class participants from other locations around the country, and that is expected for sunny South Florida when some other parts of the country are still experiencing winter. Usually, class participants bring boat and backpack electrofishers to use in the field trip and for us to assess. No one brought a boat to this class, but one member from Missouri brought a brand new push barge electrofisher. Normally these are called tow barges, but this one had handle bars in the rear and



National Park Service biologist Raul Urgelles explaining spherical electrodes to electrofishing class members at Loxahatchee National Wildlife Refuge March 2013.



Electrofishing with new push barge at Loxahatchee NWR March 2013. Proud “owner” is USGS biologist Karl Anderson in center of photo. Course Leader Alan Temple is operating the barge.

could be pushed along, so I’m calling it a push barge. The USGS office in Columbia, Missouri is the first owner of the new barge which was designed and built by Midwest Lake Electrofishing Systems (MLES) in Polo, Missouri. Their boat electrofisher pulsator units are called the Infinity, and this barge uses the same Infinity pulsator. We made some resistance and power measurements on the unit in a canal at Loxahatchee, and class members used it to sample fish. The “owner” and biologist Karl Anderson seemed pretty pleased
March 2013

with the unit and its performance. Because it appeared that no one would be bringing a boat electrofisher, Alan Temple contacted a class participant from two years ago, Dr. John Galvez of the FWS, who graciously brought his boat and helped us collect fish one evening and let us use the boat for electrofishing and for teaching how to perform resistance measurements during the class field trip. Many thanks to John for helping the class to be successful. Another former class member, Raul Urgelles of the National Park Service, also brought a boat for the class field trip. Raul obtained sophisticated electrical test equipment since the last class and has made numerous measurements on his boat and on other boats using both spheres and typical cable droppers as anode electrodes. Raul assembled his findings into an excellent slide show which he presented to this class. Rarely, a class member has or acquires the equipment, ability and desire to pursue such activity beyond what we can do in class. Raul is a shining example of such interest and drive. His presentation had a special impact on the class, and we encouraged him to pursue publishing his findings.

Many thanks to Raul, as well, for his contributions to this class.

One last thing. Loxahatchee NWR is a special place on the North side of the Everglades. Alan and I got to see young great horned owls in their nest while there. We owe Project

Leader Sylvia Pelizza and Deputy Project Leader Rolf Olson a debt of gratitude for allowing us to once again use the excellent facilities and grounds at the Arthur R. Marshall Loxahatchee NWR.

Louisiana's mArch Madness

By: Tony Brady

The phase "March Madness" invokes vivid images of brackets and basketball tournaments. In Louisiana, there were two other tournaments taking place, and instead of basketballs these tournaments used bows and arrows. The staff at Natchitoches National Fish Hatchery (NNFH) was invited to help assist with the Archery in Louisiana Schools Program (ALAS) State tournament. On March 2nd 480 students from all over the state of Louisiana met at the campus of Louisiana State University in Alexandria to take part in the state tournament. The ALAS is Louisiana's participation in the National Archery in the Schools

Program (NASP). Thanks to training provided by the US. Fish and Wildlife Service's National Conservation Training Center, NNFH staff member Tony Brady is certified as a NASP Basic Archery Instructor Trainer or BAIT for short. Being BAIT certified, and having worked with the Louisiana Department of Wildlife and Fisheries (LDWF) to train teachers to bring ALAS into their schools, LDWF state coordinator for ALAS Robert Stroede invited Brady to assist the participants in scoring their shots at the tournament. The winning teams in each division (elementary, middle school, and high school) and top individual archers



Archers from across the state line up to shoot in the Archery in Louisiana Schools State Tournament
Photo: Louisiana Department of Wildlife and Fisheries

won the opportunity to go the NASP National tournament in Louisville, KY in May. In the ALAS tournament – as in the big basketball tournament -- there are always some surprises; and this year's ALAS tournament surprise was that a team from Benton Elementary School outscored all the other school teams in all the divisions.

On March 16th with his Natchitoches Parish 4-H archery coach's hat on, Brady took seven Natchitoches Parish 4-H archers to Shreveport, LA for the 4-H North Regional tournament. The seven archers constitute the largest team from Natchitoches Parish to ever compete in the 4-H archery North Regional tournament. Steve Roberts, the 4-H Assistant Extension Agent, credits this surge in archers to the willingness of Natchitoches National Fish Hatchery to act as a practice location for the archers and for Brady's willingness to be their coach. Of these seven archers, three scored well enough to advance to the State tournament which will take place May 26th in Lake Charles. While the qualifying ar-

chers look forward to the State tournament, Brady is already looking to next year by having the hatchery's Friends Group apply for grants. The Friends in Support of the Hatchery (F.I.S.H.) will use any grant money or donation to purchase some competition 3-D targets for the kids to use in practice. All but one of the current 4-H archers are at the Junior level, but as they move into high school, they will shoot in the Senior division and will have the opportunity to qualify for the 4-H National tournament. To qualify for the National tournament, the archers will have three rounds of archery to shoot, and one of these rounds involves 3-D targets. By having 3-D targets for them to begin shooting at now, the archers will begin building up their confidence and their skill ahead of entering the Senior division. If you or someone you know is interested in providing a donation to F.I.S.H. for the purchase of these 3-D targets, please contact the hatchery at (318) 352-5324 and we will connect you with F.I.S.H.



These young ladies take aim during the 4-H North Regional Archery Tournament that was held in Shreveport, LA