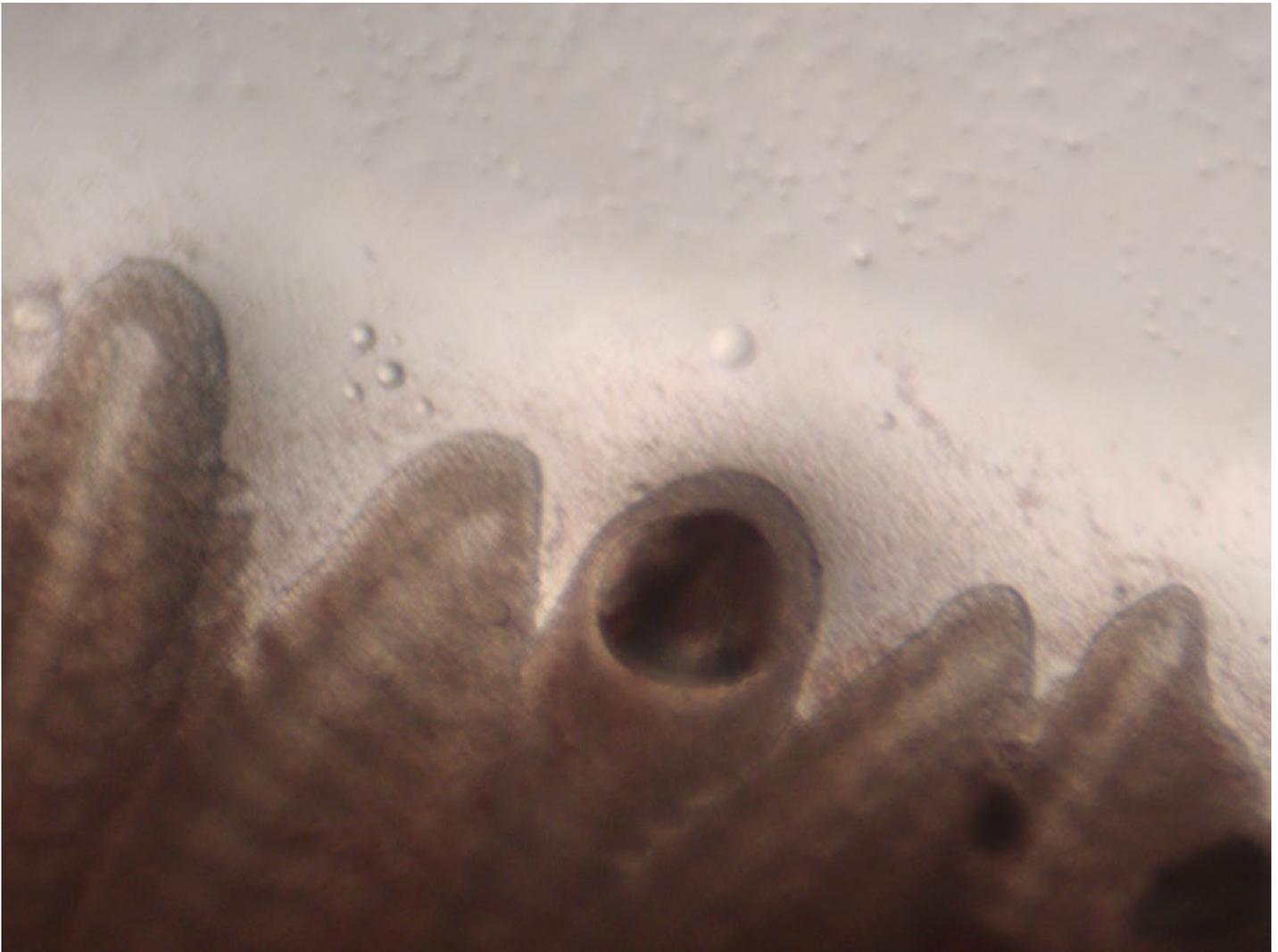


# FLEUR DE LIS FISHERIES

US Fish and Wildlife Service



Endangered Winged Mapleleaf Mussel attached to the gills of a Channel Catfish. These inoculated catfish were placed in mussel propagation cages in a pond at Natchitoches NFH.

# Mussel Propagation and Research in Region 4 Hatcheries

By: Tony Brady

Freshwater mussels are currently one of the largest faunal groups listed under the Endangered Species Act (ESA), and Region 4's hatchery system is becoming more involved in the recovery of these aquatic organisms. As of May 2014, Natchitoches National Fish Hatchery assisted two federal hatcheries in their attempts to propagate freshwater mussels. Natchitoches National Fish Hatchery's (NNFH) mussel biologist, Tony Brady, is currently working with Dale Hollow and Private John Allen National Fish Hatcheries as well as attempting to culture mussels at Natchitoches NFH using extensive mussel culture cages that have proven successful in Region 3.

At NNFH, Brady is attempting to culture the federally endangered Winged Mapleleaf from Arkansas in floating cages in one of the hatchery ponds. If successful, Winged Mapleleaf produced will be used by the Arkansas and Tennessee Ecological Services Offices to be reintroduced into the Duck River in Tennessee. Natchitoches NFH is also trying to culture the Plain Pocketbook as a surrogate species for the federally endangered Arkansas Fatmucket.

Private John Allen NFH (PJANFH) is attempting to culture the Southern Pocketbook in cages in one of



Brady inoculating Largemouth Bass with Plain Pocketbook mussel glochidia.



With help from his daughter, Brady places inoculated Channel Catfish into mussel culture cages that will be floated in a hatchery pond.

their ponds as well. The Southern Pocketbook females were collected from the Buttahatchee River located in Eastern Mississippi. The Buttahatchee River is home to four listed species under the ESA. The Southern Pocketbook was selected due to the ease of finding



Larval mussels being harvested from a Black Sandshell Mussel.

gravid females and to the availability of host fish in May. Largemouth Bass are needed for the glochidia of the Southern Pocketbook to complete their life cycle. On 12 May, Brady stopped by on his way to Dale Hollow NFH and inoculated 25 Largemouth with the glochidia. Brady again visited PJANFH on his return trip from Tennessee and checked on the fish and verified a successful inoculation by observing the glochidia on the gills of the fish.

Success at PJANFH will open up doors for further propagation efforts for listed mussels of the Buttahatchee and other river in Mississippi.

Dale Hollow NFH is in its second year of mussel production using floating cages. Last year, DHNFH and NNFH worked together with Tennessee Wildlife Resource Agency (TWRA), Tennessee Cooperative Fishery Research Unit (TCFRU), the Tennessee Ecological Service Field Office, the Friends of Dale Hollow NFH, and the US Army Corps of Engineers (USACE) to test if Dale Hollow Lake would support a mussel culture program. The answer was “YES it can”. So this year the team ramped up their efforts to help Region 5 meet restoration goals for a Natural Resource Damage Assessment (NRDA) for the Ohio River Islands National Wildlife Refuge. The fine folks at TWRA helped Dale Hollow NFH secure 16 Walleye and 20 Largemouth Bass to be used as host for two different mussel species. The staff at the TCFRU obtained mussels both from TWRA and from joint Dive Team Members of the Ohio River Islands NWR and West Virginia DNR. The TCFRU staff then inoculated the Walleye with Black Sandshell glochidia and the Largemouth Bass with glochidia from the federally endangered Pink Mucket. On 13 May, Brady lead the effort to place the inoculated fish in mussel culture cages and then placed the cages in floating racks that are being housed in a boat house owned by the USACE. The

use of this boat house is a double blessing: it gives us a floating platform from which to work, and it protects the floating cages from possible vandalism. Everyone involved cannot THANK the USACE enough for their assistance in this project.

In addition to the folks mentioned above, we also had help this year from the staff at Wolf Creek NFH as they came to observe the mussel program first hand. We hope to begin a similar mussel propagation program in Kentucky next spring.

In addition to the work at these three hatcheries, Sara Seagraves at Mammoth Spring NFH will be attempting to replicate her host fish study for recently listed Spectaclecase mussel. The Spectaclecase is a species that has been giving researcher fits for years. Last year, Seagraves observed some transformation for her initial host study, but the number of transformed mussels was not sufficient to verify them as Spectaclecase. However, to our knowledge, this was the first time that anyone has been able to report any transformation from a host study done on Spectaclecase.

In May of this year, Bill Bouthillier (Warm Spring NFH) and Andy Hartzog (Panama City Fish and Wildlife Conservation Office) made several trips to the Flint River below the dam in Albany, Georgia to find gravid Purple Bankclimber for propagation work. They were planning on inoculating Largemouth Bass and Lake Sturgeon and then releasing them in cages in a pond Warm Springs NFH has designated for mussel work. However, all three trips were a bust for finding gravid Purple Bankclimbers so the plan now is to use other gravid mussels to inoculate fish to test the cages in their pond, in addition to using their Aquatic Habitat system in the mussel building.



The Dale Hollow mussel team places cages in the floating rack with help from the staff at Wolf Creek NFH.

# B2 or not B2, that is the question -- or Alligator Gar at Natchitoches NFH 2014

By: Jan Dean

My apologies to The Bard of Avon for a spin-off of Hamlet Act III, Scene 1. Most folks I know are likely more familiar with Shakespeare for fishing tackle; and that company began as the William Shakespeare, Jr. Company in Kalamazoo, Michigan in 1897, but that is another story. I'll get to the B2 part in a bit.

As we have done for a few years now, we drove to Pvt. John Allen National Fish Hatchery in Tupelo, Mississippi to pick up gar fry in early May for rearing here at Natchitoches National Fish Hatchery. Upon arrival, they were separated into tanks and offered both brine shrimp, *Artemia*, and a special marine fish larval and weaning feed called Otohime. It contains at least 51% protein and is available in various sizes to match the young fish as they grow. The progression usually goes from size B1 to B2 to C2 in Otohime, thus the

title above. After that, the fish are fed increasing sizes of floating feed such as 0.8, 1.5, 2.2, 3.2 and 4.8 mm diameter. The actual sizes vary according to which manufacturer makes the feed. We are not endorsing or even recommending any brand, but Cargill AquaFeed floats well, and that is important for gar culture.

On 5 May, there were 4072 gar fry which averaged 0.26 grams each. By 23 June, there were 2905 which averaged 16.26 grams, so they grow fast. That is an increase of some 63 times in 35 days, for an average growth rate of 12.6 % per day! I started in fish culture and fisheries in 1974, and these are the fastest growing fish I know. We have been feeding them at 10% or less of their body weight per day; at the rate they grow, the same amount of feed is quite a bit less percent of body weight at the end of the week versus the beginning of



Alligator gar as they arrived at Natchitoches National Fish Hatchery 7 May 2014, eight days old

the week. In the past, we have found them to eat 15% of their body weight per day. They are simply amazing. Why are we rearing alligator gar in the state with perhaps the highest concentration in the nation? We get that question a lot; I was even asked it about an hour ago from someone visiting the hatchery. Louisiana and Texas produce some large gar and have some pretty healthy populations, but it is not the case everywhere. Tennessee saw the need to develop an alligator gar management plan years ago, and they have been stocking their waters for several years. We have been rearing gar here, from Pvt. John Allen NFH, for a few years now to aid the conservation effort in Western Tennessee. These fish are to help restore the historical natural range of gar and to act as the top predator in those river systems. Our gar have now been moved from an in-door recirculating water tank system to an 8,000 gallon in-pond raceway for grow-out to final size before transport to a Tennessee hatchery for tagging and release in their rivers. We are pleased to be a part of the restoration team for these amazing fish.



Alligator gar at Natchitoches NFH 24 May 2014, seventeen days after stocking and 25 days old.



Otohime marine fish larval and weaning feed for the young alligator gar. Size B2 on the left.



Alligator gar being weighed at harvest from in-door system at Natchitoches NFH 23 June 2014 at age 55 days post hatch.

# Natchitoches National Fish Hatchery Celebrates Earth Day at the Alexandria Zoo

By: Tony Brady

The Alexandria Zoo in Louisiana celebrates Earth Day by putting on their annual Party for the Planet event, and Natchitoches National Fish Hatchery (NNFH) has proudly been a part of Party for the Planet for the past three years. The organizers for Party for the Planet ask that participants provide some sort of hands on activity or educational material for the kids visiting the zoo. On April 12th the NNFH set up a tent to allow the kids to get artistic with fish. Gyotaku, which is Japanese for Fish Printing, traditionally involves painting a fresh fish and then pressing the fish onto a piece of paper thus creating the image of the fish. As you may have guessed, fish do not stay fresh in the warmth of our Louisiana weather, so to keep the experience pleasant for all involved, the hatchery uses rubber fish that were molded from the real thing. Kids paint the rubber fish and then press a piece of paper on top of the fish to transfer the



The young men from the Louisiana National Guard Youth Challenge were again a huge help with our booth.



My daughter Jordan assists this young man with his fish art.

image. After the event, the Zoo reported that about 2000 people (adults and children) attended Party for the Planet. Judging by the amount of paper that remained from the ream used for the fish prints, the hatchery booth was visited by over 350 kids. Natchitoches NFH would like to thank the volunteers from the Louisiana National Guard Youth Challenge and Hicks High School for their help running the hatchery booth to keep things swimming along. We would also like to thank the Alexandria Zoo for inviting the hatchery back to participate in their event, and also for supporting the hatchery during our Open House and Kids Fishing Derby.

# Bass Production and Harvest, Spring 2014

By: Jan Dean

The Natchitoches National Fish Hatchery has been partnering with the Louisiana Department of Wildlife and Fisheries for several years under a signed Memorandum of Understanding between the two agencies. The latest version of the MOU was signed in early 2012. We rear sport fish in Natchitoches NFH ponds in return for assistance with the conservation of other aquatic species of interest to the Fish and Wildlife Service. Probably next month, we will report on the extensive assistance the LDWF, specifically Booker-Fowler Fish Hatchery, provided this spring in our conservation efforts for the threatened Louisiana Pearlshell Mussel. For now, I will report on our cooperative efforts for Florida Largemouth Bass culture and harvest this spring at Natchitoches NFH.

Last year, the LDWF asked us to participate in a study at Natchitoches and at Booker-Fowler for the production of three-inch Largemouth Bass. That is a completely different management goal and approach from rearing smaller bass on the order of two inches or less. Rearing bass beyond about two inches in total length is much less likely because the pond plankton populations crash by this time, and the fingerlings must rely upon aquatic invertebrates, and upon each other, for food. Cannibalism and other forms of mortality in a pond take their toll such that the numbers produced are substantially reduced. Therefore, as expected, the fish were larger but fewer were produced. This

year, the production request was for two-inch bass, generally a much more likely production goal here at Natchitoches.

Planned bass fry stocking rates for forty ponds at Natchitoches were 65, 70, 75 and 80 thousand fry per acre. In the recent past, the stocking rate to produce 1½ inch or slightly larger bass fingerlings has been 80,000 per acre, so these stocking rates seemed reasonable. Ponds must be prepared by filling with water at the proper time before stocking to ensure the correct types, abundance and sizes of zooplankton as initial food for the recently-hatched bass fry. As usual, we added high-protein cottonseed meal to each pond to stimulate a zooplankton bloom and then lower-protein alfalfa weekly to sustain the bloom as food for the growing bass. We added a total of 3550 lbs of cottonseed meal and 4100 lbs of alfalfa pellets to the ponds this spring. This involved hip boots and a little sweat to distribute the organic fertilizer in the ponds one 50-lb sack at a time.

This year, Louisiana experienced a late spring. Meteorologists kept teaching us about the Polar Vortex, a new term for me. I only remember two snows in Louisiana from youth through undergraduate school. It snowed four times here last winter. Unprecedented! The cool water temps delayed bass spawning at Booker-Fowler, so stocking was also delayed somewhat; we received bass fry for stocking April 1 to April 17. Fish were in the ponds for 36-47 days before harvest; the average was about 44 days.

Approximately 920 thousand bass fingerlings weighing 1616 pounds were harvested from ponds at Natchitoches this spring. Thus, the overall count of fingerlings was 569 per pound. The overall return was estimated at 39 percent, including ponds with substantial crawfish and tadpole populations which hampered harvest, and there was one pond with so much filamentous algae that no bass were harvested. A standard number of bass fry per gram is used for calculating stocking densities, so actual stocking numbers may not be too accurate, but it is a good working number of fry from Booker-Fowler for us each



Largemouth Bass size check in Natchitoches National Fish Hatchery ponds 29 April 2014. Fish are seined to evaluate size, growth and body condition.



Louisiana Department of Wildlife and Fisheries biologist Chase Chatelain checking zooplankton in a pond at Natchitoches National Fish Hatchery prior to stocking Largemouth Bass fry.

year. What is more important is the actual number and sizes of fingerlings produced and harvested. The fingerlings averaged 43 mm or 1.7 inches total length; the range in average size per pond was 37-50 mm or 1.5-2.0 inches. The original goal was to produce two-inch bass this year, and the fish harvest sizes were a bit less than desired. The late stocking date did not allow enough growth before the plankton crash after which the fish growth slowed or stopped. Stocking rate had no significant effect on total length, survival, harvest number or harvest total weight. We suspect that a lower stocking density may have led to increased fish size at harvest, especially in this year with its shortened growing season. Results from a single season can be too variable to use for strong conclusions. Such studies may require about three years of results before conclusions are drawn, and a wider range of stocking rates may be needed to produce significant differences in size and number harvested.

Let me mention here the contribution by the LDWF towards the production of some 920 thousand bass fingerlings this year. Booker-Fowler Fish Hatchery biologist Chase Chatelain came to Natchitoches NFH on a weekly basis, and sometimes daily, for pond preparation, organic fertilizer addition and plankton checks, stocking fry, during the production period for more fertilizer addition, water quality checking and fish

size checks, and at harvest, both at the ponds and the extensive work in the holding house tanks once the fish were harvested. His extensive efforts and record keeping helped tremendously. Other personnel from the LDWF Booker-Fowler and Beechwood fish hatcheries helped by bringing organic fertilizer, which the LDWF purchased for us, by bringing the bass fry and assisting with stocking, by sending multiple personnel and trucks to assist harvesting the bass and working in the holding house obtaining fish counts and weights. Then the LDWF transported the bass fingerlings to public waters in the state based upon their prioritized list of needs identified by their fish surveys. A few bass were stocked into ponds and a lake by the Forest Service, and a small number was stocked by the Soil and Water Conservation District into ponds engineered by the Natural Resource Conservation Service. It was truly a team effort, and the LDWF was a major part of the team. They always lend a helping hand, but this year and last were special efforts in our partnership to fulfill our Memorandum of Understanding and to benefit the public we serve.



Zooplankton sample taken by LDWF biologist Chase Chatelain at Natchitoches NFH to assist in determining pond readiness for Largemouth Bass stocking.

# Annual Fishing Expo Held in Natchitoches

By: Tony Brady

On May 3rd fishing fanatics converged on Natchitoches for the annual Fishing Expo that was held on the campus of Northwestern State University in Prather Coliseum and hosted by the Cane Country Fly Casters (CCFC). This annual event allowed folks to come and learn about all the different types of fishing available in Louisiana and the surrounding states. At the Expo, visitors could take fly casting lessons, watch incredible fly tying demonstrations or they could sit in on classes that covered bass fishing, crappie fishing and even saltwater fishing. Kayaking and canoeing lessons were also held across from the coliseum on

Chaplin Lake. Natchitoches National Fish Hatchery and the Friends in Support of the Hatchery (FISH) were asked again to be a part of the Expo to talk about the Hatchery's fish and habitat conservation work and outreach efforts that take place between the Hatchery and FISH. An estimated 600 people attended the Expo and, while they were there, were able to check out the latest and greatest in fishing gear, guided trips and fish related home décor. The folks with Cane Country Fly Casters were very happy with the turnout and hope that next year will bring even more folks to Natchitoches.



Brady with F.I.S.H. member John Mathews greet folks at the Fishing Expo.