

# FLEUR DE LIS FISHERIES

US Fish and Wildlife Service



Endangered Pick Mucket Mussels cultured at Dale Hollow Lake.

Photo by: Tennessee Cooperative Fishery Research Unit

# Dale Hollow Mussel Culture Project a Success

By: Tony Brady

This story begins back in January 2012, when I gave a presentation to Allan Brown (Warmwater Program Supervisor) and Deborah Burger (Coldwater Program Supervisor) on the ongoing activities of Natchitoches National Fish Hatchery as they relate to Strategic Habitat Conservation (SHC) and how we were working with the Gulf Coast Plain and Ozark Landscape Con-



Volunteers building cages.

servation Cooperative (LCC). After the presentation, Burger wanted to know if I thought that the coldwater hatcheries in Region 4 could get involved in the SHC and LCC work that was happening in the region. My belief is that the coldwater hatcheries could become active in their LCC's by engaging in mussel propagation. Burger then challenged me to engage her hatcheries and prove my statement. Having worked with Andy Currie, hatchery manager at Dale Hollow NFH, as a graduate student, I contacted him to start the first mussel program at a Region 4 coldwater facility. Our first step was securing some seed money to initiate the program. By the end of September 2012, we had secured \$5,000 to start the project. Working quickly to ensure that we were growing mussels in 2013, mussel culture cages were built in Louisiana and then delivered to Dale Hollow NFH in December 2012. Upon deliv-

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ery at the hatchery, and with help from the Friends of Dale Hollow, we attached hardware cloth on the cage frames and plywood to the cage bottoms. In April 2013, our partners at the Tennessee Wildlife Resource Agency collected Largemouth and Spotted Bass from Dale Hollow Lake to be used as host fish for two mussel species. Shortly thereafter, staff from the Tennessee Cooperative Fishery Research Unit (TCFRU), located at Tennessee Technological University, obtained gravid female Mucket and endangered Pink Mucket mussels. The mussels were taken to Dale Hollow NFH and where the TCFRU staff proceeded to collect the larval mussels, called glochidia, and infested them on the gills of the host fish. A few weeks later, in May 2013, I returned to Tennessee to deliver the floating racks that the mussel culture cages would be placed into while in Dale Hollow Lake. Our original plan was to deploy the floating racks into the back of a cove used by the US Army Corp of Engineers (USACE) to house their work barge and then tie the racks to trees on the shore line to keep them from floating away. Once everyone was gathered at the shore line ready to deploy the racks, staff from the USACE suggested placing the racks and cages in their floating boat house. The use of the boat house not only saved an incredible amount of time deploying the racks but also gave us a great platform



Help from USACE, TWRA, Friends of Dale Hollow NFH, TNCFRU and Dale Hollow and Natchitoches NFH made this project a success.



Here are the resulting mussels from our initial attempt to culture mussels at Dale Hollow Lake. We placed host fish infested with two mussel species in our cages, and true to the State's nickname, the Volunteer State, we had a third species volunteer to grow in our cages as well.

Photo by: Tennessee Cooperative Fishery Research Unit

for inserting the cages into the rack. The next day the cages were attached to the bottoms, sand provided by TWRA was placed in the bottom of the cages, and then the infested host fish were enclosed in the cage before the cage was set into place in the racks. In July 2013, after the mussels had finished dropping off the fish, the fish were released from the cages. The cages were left alone in the racks until October of 2013 when staff from TCFRU removed the cages from the racks and sieved through the sand to recover any mussels. After going through the eight cages, a total of 18 Mucklets

and 8 Pink Mucklets were recovered. While the total count of mussels may have been small, the sizes of the mussels were not. The mussels collected ranged in size from 15 mm to 30 mm after only 5 months in the cages. The mussels are being held by the TCFRU staff for research and recovery programs with which they are currently involved. Plans are ongoing for year two of the program: four additional cages will be deployed in 2014 and, with an increase in host fish, I expect the mussel numbers to greatly increase.

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# Fall Harvest at Natchitoches National Fish Hatchery

By: Jan Dean

Fall harvest can mean many things. At Natchitoches National Fish Hatchery, it generally means draining fish ponds and harvesting sunfish such as bluegill and redear sunfish. It can also mean the harvest of channel catfish when those are being reared. This fall at Natchitoches, it included bluegill, redear and a trial with producing threadfin shad as a forage source in public waters. It also included some other forage for largemouth bass at Booker-Fowler Fish Hatchery, operated by the Louisiana Department of Wildlife and Fisheries (LDWF), our trusted partner of many years. All of these fish support the program to benefit anglers of Louisiana.

All of the sunfish distributed by the LDWF were stocked into Eunice City Lake in SW Louisiana. The totals were 214,322 bluegill and 235,575 redear sunfish. A few other sunfish were distributed by the Natchitoches Soil and Water Conservation District to ponds of those who have worked with the local Natural Resource Conservation Service office in building or renovating their ponds.



Using a seine, the team harvest fish from the pond kettle.

Threadfin shad are a desirable forage fish for largemouth bass and other predators in Louisiana waters because they are small enough as adults to be consumed by typical size predators. In contrast, a related species – gizzard shad, grow too large for most predators to consume. This year, the LDWF obtained adult threadfin shad which were stocked into five ponds at Natchitoches NFH, and more were stocked into LDWF hatchery ponds. This fall, 18,265 threadfin shad weighing 144 lbs were harvested from Natchitoches ponds and stocked into two Louisiana public water bodies, Ivan Lake and Lake Anacoco. The hope is that they will survive, reproduce and provide food for largemouth bass and other desirable predators in those two reservoirs for years to come. This was the first year for the LDWF to attempt the production of threadfin shad, and Natchitoches NFH personnel were pleased to assist in this effort.

Additionally, fall harvest meant the draining of other forage fish to support the maintenance of brood largemouth bass to support the overall LDWF bass production program. We at Natchitoches had stocked four ponds with adult goldfish this spring; this resulted in 2515 pounds of goldfish harvested and transported to Booker-Fowler Fish Hatchery for stocking into bass ponds there.

Fall harvest at Natchitoches normally starts the first week in October. Water temperatures are too warm to harvest ponds and move fish until about the latter two weeks of September, so early October is a convenient time for both the Natchitoches and LDWF crews. Unfortunately, this year we were in a federal government shutdown, so the harvest was delayed until the shut-down was over. Because of personnel needs after October, all of the fall fish harvest was done October 22-29. That required close coordination with, and much help from, the LDWF. Their cooperation this fall was especially appreciated by the Natchitoches staff. Thank you. The LDWF provided most of the help to harvest the ponds, and they did almost all of the fish hauling and helped weigh the fish, make counts per pound and record the data. Good job, team.

# Endangered Winged Mapleleaf Mussel Propagation Underway at Natchitoches NFH

By: Tony Brady

After a year's absence from working with the Winged Mapleleaf Mussel, Natchitoches National Fish Hatchery has teamed up again with the Arkansas Ecological Services Field Office to undergo the year long process to culture these federally endangered mussels. On 22 October, Chris Davidson (ARESFO) and I met on the Saline River where we were able to find about a dozen Winged Mapleleaf Mussels, and six were transported to the hatchery. Anticipating the harvest of mussels, I had made arrangement with Ricky Campbell at Private John Allen NFH to pick up Channel Catfish on 24 October to be used as host for the parasitic mussel larval called glochidia. Upon my return from Private John Allen NFH, one of the six mussels was displaying, which is a sure sign that the mussel was gravid. On 26 October, glochidia were released by the female mussel, collected and then used to infest about 40 Channel Catfish. To my surprise, a second mussel

was displaying on 28 October and by that afternoon had released her glochidia. With this second batch of glochidia, the remaining 60 Channel Catfish were infested. Four days after the second infestation, the gills of Channel Catfish from both infestations were examined under the microscope to determine the success of the glochidial attachment. Glochidia were clearly seen on the gills of both groups of catfish proving that both infestations were successful. These catfish will remain at Natchitoches NFH on a chilled, recirculating water tank system until April of 2014 when they will be warmed up to allow the glochidia to complete their metamorphosis. The newly transformed mussels will be reared in a variety of culture systems to determine which system is most successful. The end goal for these mussels is to reintroduce them into the Duck River in Tennessee.



At the top of this Winged Mapleleaf mussel, you can see the fish attracting display it uses to get its glochidia on the gills of a Channel Catfish.

# My Trip Down Under

By: Jan Dean

It is an impossible task to distill my trip to Australia in a few words and a couple of pictures. Alan Temple of NCTC and I are instructors for the FWS Electro-fishing course, and he has been to Australia multiple times to teach the course there. The New South Wales Department of Primary Industries (DPI), similar to a state department of natural resources, invited University of Alaska Professor Emeritus Jim Reynolds, Alan Temple and me to Narrandera, NSW to teach electro-fishing principles and techniques to fisheries biologists from their agency and from other parts of Australia. Some were from Victoria, Queensland and Tasmania. DPI paid for our salary, travel and per diem, so it was a win-win situation for us and for the FWS.

The DPI had two main objectives for the course: (1) Provide basic training in electrofishing theory and methods, and (2) Establish protocols for standardized sampling by electrofishing. The second objective was addressed through evaluating the results of boat and backpack performance at the workshop and providing recommendations for further steps to standardize the agencies' electrofishing boat fleets.

The opportunity to make this "once in a lifetime" trip was not taken for granted by this ol' farm boy. I grew up on a dairy farm, so our family never had a vacation. International travel as a government employee is a whole different experience which took months of learning what to do and which forms to fill out and submit. Little things like a software pushout that incapacitated my computer (had to get a new one), the switch to a new travel system and a new travel agency a couple days before the trip at the beginning of the new fiscal year made it all the more interesting. My supervisor, Allan Brown, had been to China a couple of times and had also traveled internationally personally. After jumping through all of the hoops to get approval to go and to get an official passport, it all boiled down to a passport and a ticket to get onto the plane, just as Allan said. The almost 15 hour flight from Los Angeles (the third flight of the day for me) took off on Wednesday evening and landed Friday morning in Sydney. Yes, we spent all of Halloween in the air. The return flight to Dallas was made all in one day, but that day lasted 41 hours for me.



Boat safety check during first field trip of Australian electrofishing class, Narrandera, NSW.

The class to almost 40 biologists was conducted in a bowling club (lawn bowling) and included two field trips. There was a wake (unplanned, of course) in the bowling club the first day, so we had to meet in a small room. We had to conclude the Tuesday field trip at Lake Talbot a bit early, and we knew about this in advance, because it was time for the Melbourne Cup, the “race that stops a nation.” The buildup for this famous horse race is some six weeks in the making, and the air is electric (pun intended) the week of the race.

Aussies are known to drink a bit during this event, so we knew the field trip had to end on time or there would be mutiny. We did manage to take electrical measurements of their backpack and boat electrofishers and have the class participants determine threshold power settings for successful fishing prior to the race. The big field trip day was Thursday in which boat electrofishing crews were assigned to boats and to randomly selected segments of the Murrumbidgee Northern Canal just upstream from Lake Talbot. The purpose of this designed study was to further refine the threshold power settings for standardizing sampling by electrofishing boat fleets. A report has been drafted by Dr. Reynolds and is in an editing stage by he, Alan and me. During the Tuesday field trip,

we were able to record waveforms and make some measurements of a backpack unit new to us, a NIWA backpack electrofisher made in New Zealand. After the course, we headed west and then south to Victoria, another state of Australia. There we were afforded a rare opportunity...to evaluate a unique salt-water boat electrofisher. The former head of the fisheries group in Victoria, John McKenzie, had consulted with German electrofisher manufacturer Hans Grassl to develop the prototype unit which can



Jan Dean with Murray Cod, a prize native fish of the Murray-Darling Basin of Australia.

successfully fish in even full-strength seawater if the water is cold. Conductivity, the ability of water to conduct an electric current, is a function of temperature. Warm seawater would be so conductive that it would put too much of a load on the generator and pulsator control box. The electrical current produced by the unit was so high that it exceeded the capability of our instruments to measure accurately. We saw it immobilize lots of fish in a salinity mixing zone that would overwhelm other boat electrofishers. This unit has tremendous potential for use in high-salinity areas that have been unavailable to sampling by electrofishing. It opens the possibility of sampling fish effectively in saline rivers, estuaries and coastal marshes, many of which are associated with FWS coastal refuges. I would be remiss if I didn't mention some other aspects about Australia. Before the trip, my concerns were getting there and back plus highly venomous snakes. We were warned about brown snakes and tiger snakes in the field trip area. The only snake we saw was a deadly red-bellied black snake which had been killed crossing a road. Much of the flora and fauna there was unfamiliar to this ol' Louisiana boy. There are over 100 species of eucalyptus trees in Australia, and we saw several types. We did see several species of lizards, and we heard frogs croaking and singing in marshy areas. The bird fauna was a birder's dream. Many parrots and related species were abundant and vocal. We saw king parrots, cockatoos, cockatiels, galahs, crows, magpies, pelicans, gulls, kites, emus, the lyrebird and many others including the endangered hooded plover, and we heard the distinctive call of the kookaburra. We were almost run over by a large emu which was soon followed by her young. Even the young were probably the size of our adult turkeys. Emus are fast – they reportedly can sustain 60 km per hour and can burst to 80 km per hour for a while. I found the mammals fascinating, many I had only read about or seen on TV or in books. We saw the eastern and western gray kangaroos, several types of wallabies, a platypus, echidna, several koala, and finally wombats on the last night. We went to a large whale-watching deck but were too late for right whales and too early for blue whales. The blue whales are only seen off-shore, but they do come to the area, and their water spouts can be seen for miles. We did get to an area in which penguins arrive at night, but we could not be there at the right time to see them

come ashore. Australia is a large country, not too much smaller than the US. We only saw parts of the southeast corner including the coastal area and the grasslands. We approached the desert, and it could be said that we traveled through some of the outback, though others may argue that the true outback was a bit farther west or north. I haven't even had time to review all of my photos, but some fond and rapidly fading memories are of the Blue Mountains, the Pink Lakes, Grampians National Park, the Great Ocean Road, Wilsons Promontory and others. I certainly appreciate the opportunity afforded to me by the NSW DPI and by the US DOI and FWS to make this trip. Special thanks are due to Alan Temple of NCTC who coordinated with DPI, to Rohan Rehwinkel who coordinated and facilitated the class for DPI, and to Allan Brown who kept asking what he could do to help me with all of the DOI and FWS paperwork.



A koala sitting in a eucalyptus tree on the way to the Cape Otway Lighthouse in Victoria.