LAKE STURGEON EGG COLLECTION

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Though I've worked with TNACI's sturgeon reintroduction program for several years, I hadn't yet had the chance to see where this program starts in Wisconsin. In April 2014, I joined our partners to collect eggs from Lake Sturgeon (*Acipenser fulvescens*) spawning in the Wolf River. As I walked up to the river at the base of the Shawano Dam, I was taken by the fact that the water was the color of sweet tea. The leaves and rotting logs in the surrounding forests give this water that dark "tannic" color, but that made it extremely difficult to see any fish. Because it was several days before "peak" spawning at this site, we stood on the shore for several minutes before anyone saw a Lake Sturgeon. Finally someone exclaimed that they had seen a tail fin. I scanned the water looking for the fish, but still was taken by surprise when an enormous Lake Sturgeon porpoised out of the water right in front of me! It was so close that I could have touched it, and my only response was to squeal. I had no words for the feelings that were in my heart at that moment. This fish was at least 4 feet long and 100 pounds—so much larger than any Lake Sturgeon I had ever seen! Did we use to have Lake Surgeon like this in Tennessee? Could we again? Suddenly the conservation project that I had been working on was more real and important than ever.

Lake Sturgeon were once abundant in the Tennessee, Cumberland, and Coosa rivers in the Southeast (Figure 1). Overfishing, construction of dams on major waterways, and water pollution all played a role in their decline. By the 1960s, Lake Sturgeon had completely vanished from the region. In 2000, the Tennessee Aquarium helped start the Tennessee Lake Sturgeon Working Group to begin a restoration program for the species in the Tennessee and Cumberland rivers. By raising Lake Sturgeon from eggs collected in Wisconsin, our group has returned over 150,000 Lake Sturgeon juveniles to Tennessee (Figure 6).

My adventure to Wisconsin was part of the annual trip to bring fertilized sturgeon eggs back to Warm Springs National Fish Hatchery (WSNFH) in Georgia for hatching. Since 1998, WSNFH has partnered with Wisconsin Department of Natural Resources (DNR) to collect these eggs. Just like salmon, Lake Sturgeon make spawning runs from larger lakes and rivers upstream to smaller tributaries and creeks. Lake Sturgeon start their spawning run in early April as temperatures begin to rise. Huge numbers of fish work their way upstream as far as they can go. In the Wolf River, the farthest point they can travel is the Shawano Dam, just downstream of the Menominee Indian Reservation.

All along the riverbank, for dozens of river miles, large Lake Sturgeon can be seen spawning in the rocky shallow

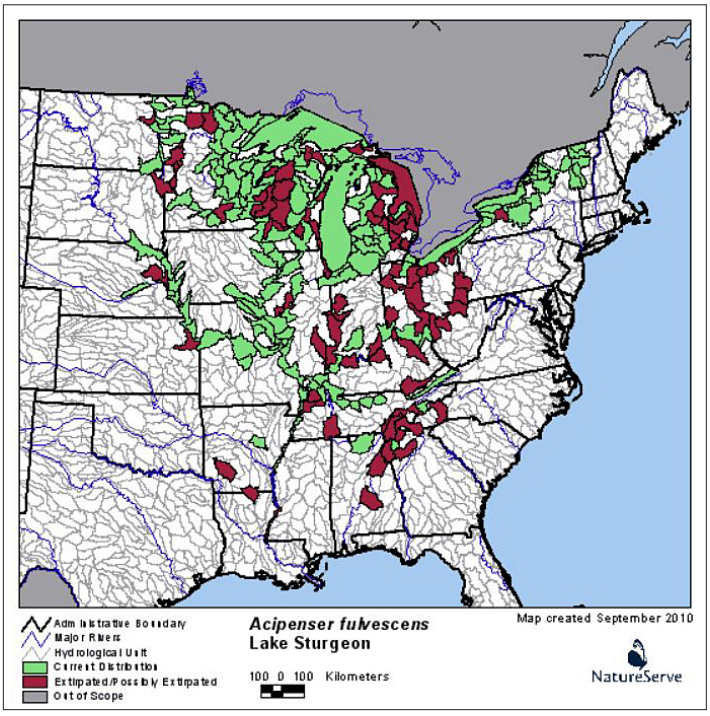

Figure 1. Lake Sturgeon Range in U. S. (excludes distribution in Canada).

Photos by the author unless otherwise indicated.

Kathlina Alford began working as an Aquarist at the Tennessee Aquarium in 2004 and joined TNACI as a Conservation Associate in September, 2011. She oversees husbandry and captive propagation programs at TNACI as well as doing work in the genetics laboratory. She holds a B.S. in Biology from Tennessee Tech University and a M.S. in Environmental Science from the University of Tennessee at Chattanooga. For her M.S. research, Kathlina examined the population genetics of the Flame Chub (*Hemitremia flammea*) an imperiled freshwater minnow.

Figure 2. Top: Lake Sturgeon spawning in the Wolf River. Bottom: Eggs scattered along the rocky shoreline.

Figure 3. Historic Lake Sturgeon spawning habitat above the Shawano Dam.

Figure 4. From top: Measuring sturgeon. Harvesting eggs. Fertilizing eggs.

edges in pods of 5 to 15 fish (Figure 2). At the center of each pod is a large female. The males surround the female and try to line up exactly with her body. As they swim in synchrony, the males use their powerful tails to beat on the sides of her body and stimulate her to release eggs. The spawn is a dramatic series of courtship behaviors that culminates with a lot of splashing as the males and female release their eggs and milt at the same time in a visible underwater cloud. The fertilized eggs are then scattered all along the submerged rocks and find their way into crevices and under rocks where they will be protected until they hatch in 9 to 11 days. A mature female will produce over 1 million eggs during a spawning season, and she can spawn continuously for several days. This egg production requires a lot of energy, so female Lake Sturgeon only spawn every 2 to 5 years, unlike the males who make the spawning run annually.

Later that day, we took a drive onto the Menominee Indian Reservation just upstream of the Shawano Dam.

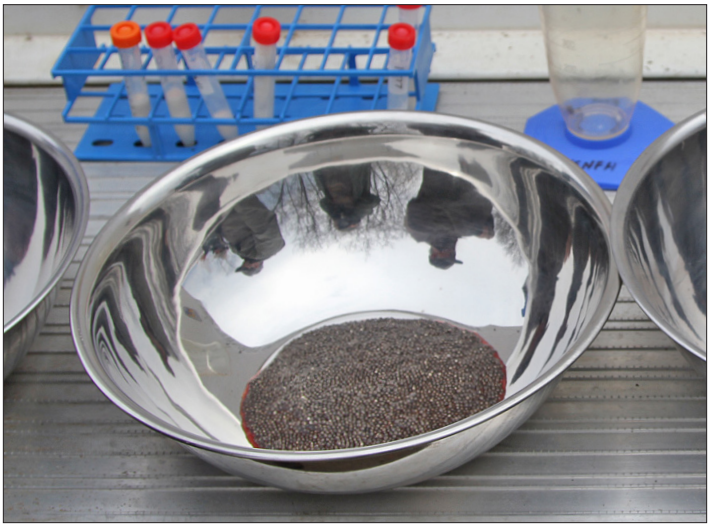

Figure 5. Sturgeon eggs.

Figure 6. Lake Sturgeon release sites in Tennessee.

The reservation is 358 square miles of land with the Wolf River running through it. The water on the reservation is also dark brown in color. Unlike downstream, however, the bedrock under the river in these uppermost sections is a beautiful pink limestone (Figure 3). The limestone river bottom is the reason for the relatively high pH in this river system (8.0+). Historically, Lake Sturgeon were abundant in these upper portions of the river, and I couldn't help but think how amazing it would have been to see the spawning run as Lake Sturgeon swam in huge numbers up and over the pink limestone (Figure 3). Wisconsin DNR is partnering with Menominee biologists to help restore Lake Sturgeon to tribal waters by moving adult fish, as well as raising juvenile fish for release from fertilized eggs collected at the Shawano Dam during the spawning run each year. We're grateful for the many sturgeon restoration efforts around the country because we all learn from each other.

We worked for three days with Wisconsin DNR to help them catch, measure, tag, and artificially spawn Lake Sturgeon for captive breeding programs (Figures 4 and 5). The sturgeon are so preoccupied with breeding that we were able to stand on the bank with large dip nets and scoop them up. It's the easiest collecting I've ever done! At most sites, the measuring board was at the water's edge so that the fish was never very far out of the water while it was being measured and tagged. At other sites, the bank was steep so the measuring team was at the top of the hill and a sturgeon slide was constructed to get the fish back into the water quickly. During three days of sampling we collected data from over 200 huge Lake Sturgeon!

The public was very excited and involved during this process. Crowds of hundreds of people gathered at city parks along the river and at the Shawano Dam to watch the Lake Sturgeon spawning pods and to ask questions as we conducted our research. There was also a large team of volunteers called the Sturgeon Guard. These volunteers stand guard 24 hours a day to watch for spawning behavior at historically popular spawning sites, to protect Lake Sturgeon from potential poachers, and to educate the public as they come to watch the show. The partnership between Wisconsin DNR, U.S. Fish and Wildlife Service, Sturgeon Guard, and the Menominee Indian Tribe is a hugely successful effort to protect and expand the population of Lake Sturgeon in the Wolf River. It is a pleasure to be a part of the Lake Sturgeon team in the Southeast, and I can't wait to see a spawning run return to Tennessee!