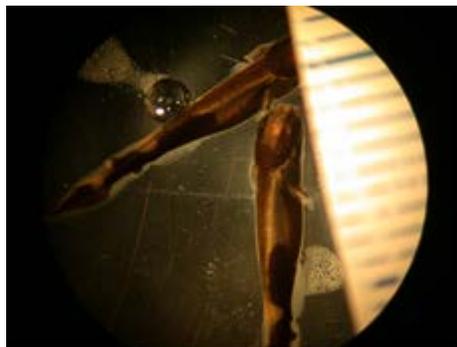


## Alligator Gar FY 2014 Production

Alligator Gar (*Atractosteus spatula*) is listed as a species-in-need-of-management by Tennessee. Working under the 2004 Tennessee Alligator Management Plan, the Warm Springs NFH alligator gar program is an important part of the restoration efforts covering the Mobile and Mississippi river drainage basins. In close cooperation with Private John Allen NFH (source of our fry) along with other state and federal agencies, WSNFH is developing and trying new culturing techniques to meet management objectives for this top-level predator. This is a summary report highlighting work during FY 2013.

Building upon lessons learned during 2013, WSNFH staff focused on reducing handling and transportation mortalities of fry incurred at the onset and during the first two weeks of the production season. Going into our 8<sup>th</sup> production year, instead of transporting 5 day old fry (which may not be mobile and have not started to feed) we moved to older fry (8 – 12 days old), Bill Bouthillier transported 12 day old fry via shipping boxes from Private John Allan NFH on May 9<sup>th</sup> 2014. Fry received this year were free swimming in the water column and were already starting to be weaned from brine shrimp to pellet food. We obtained approximately 4,800 fry (12 days post-hatch) in excellent condition. These fry ranged in length between 19-21 mm long, were tempered, counted and transferred into rearing tanks at the hatchery with very few hauling mortalities observed.



**Alligator gar fry**

Both filtered pond water and treated spring water sources were used for culture of alligator gar during the year. The constant temperature spring water was buffered to an alkalinity and hardness level of at least 51 and 83 ppm throughout the program. Our buffering system utilizes fluidized high calcium content limestone which also helped maintain pH values between 6.5 and 7 through the year. Filtered pond water was utilized to provide warmer water beneficial for rapid growth of the gar. When necessary, spring and pond water were blended to provide temperature control through the production season. Water temperatures were gradually increased through the production season in line with ambient temperatures, increasing from approximately 21 degrees C in May to near 28 C in July. Water temperatures were lowered to 23 C periodically while grading or when treating the fish for bacterial infections using oxytetracycline (35 ppm treatments for a minimum of three consecutive days).

Upon arrival at Warm Springs they were tempered and counted into our tank culture system. One of the twelve two foot diameter tanks is pictured below left. As the fish grew through the production season they are graded and moved to progressively larger tanks, some of which are pictured at right. Multiple layers of containment screens are used to prevent escapement. All waters are discharged into a containment pond adjacent to the building that is dedicated for use with holding of out of basin species.



Keeping with the protocol used over the past several years, we continued offering the fish a high quality commercial ration called Otohime, along with live brine shrimp on first arrival. The gar quickly took to this commercial ration and feeding of live brine shrimp was discontinued within the third day of culture at WSNFH.

Once the fish were trained to take the commercial ration, they were fed at least 4 times a day by hand and continuously through use of belt feeders. This effort helps ensure the fish do not resort to picking at each other and thus setting up conditions favorable to disease outbreaks. Fish were also graded frequently and feed pellet sizes were adjusted at least weekly in order to optimize growth rates and survival. Gar exhibited fairly uniform growth with little evidence of cannibalism throughout the program. Larger pellet sizes available from Silver Cup steelhead rations were introduced gradually into the feeding schedule. Pellets in the 1.5 to 2.5 mm size range do not readily float so extra care with feeding and tank cleaning was required while feeding these pellet sizes. This year we started using brine shrimp for the 1<sup>st</sup> two days of arrival and moved to Otohime A1 and brine shrimp. Within the third day we moved to Otohime B1 and B2. Overnight feedings (through use of belt feeders) were also utilized during 2014 in an attempt to increase fish growth.

We added small feeder goldfish 2 weeks prior to tagging and distributing alligator gar, allowing unlimited feeding opportunities on natural forage and also to condition the fish to feeding on their own when released.



**Young alligator gar hunting for food**

The table below provides a schedule of feeds used through the 2014 program. Days of culture is based on time at Warm Springs, not the age of the fry.

FEED	Size	Days of Culture
<b>Brine Shrimp</b>	n/a	1 to 3
<b>Otohime A1</b>	75-150 um	1 to 7
<b>Otohime B1</b>	250 – 360 u	2 to 14
<b>Otohime B2</b>	360 – 650 u	5 to 30
<b>Otohime C1</b>	580 – 840 u	13 to 43
<b>Otohime C2</b>	840 – 1410 u	30 to 47
<b>Otohime EP1</b>	1.7 mm	45 to 52
<b>Silver Cup Steelhead</b>	1.5 mm	47 to 54
<b>Silver Cup Steelhead</b>	2.5 mm	48 to 59
<b>Silver Cup Steelhead</b>	3.5 mm	51 to 67
<b>Silver Cup Steelhead</b>	4.5 mm	59 to 87

Under these intensive culture conditions and based on prior experience, we were on guard for Columnaris outbreaks. As needed, individual fish were examined by fish health biologists throughout the program to verify if bacterial infections were an issue. Most of the mortalities observed this year were attributed to fungal infections occurring during a

cold snap in late spring (around May 16<sup>th</sup> and 17<sup>th</sup>). We lost approximately 1,000 fry that weekend. This year we used oxytetracycline bath treatments at 35 ppm to treat infections when they occurred. Water temperatures were dropped below 25 C throughout the days in which fish were under treatment.

Overall, growth rates and survival were a little lower in 2014 as compared to 2013. By June, survival averaged 61.4% compared to 62.6% at the same time in 2013. On July 30<sup>th</sup>, 2,390 gar averaging 8.793 inches in length and weighing 295.63 lbs. were tagged with coded wire and distributed to the Hatchie River in TN.



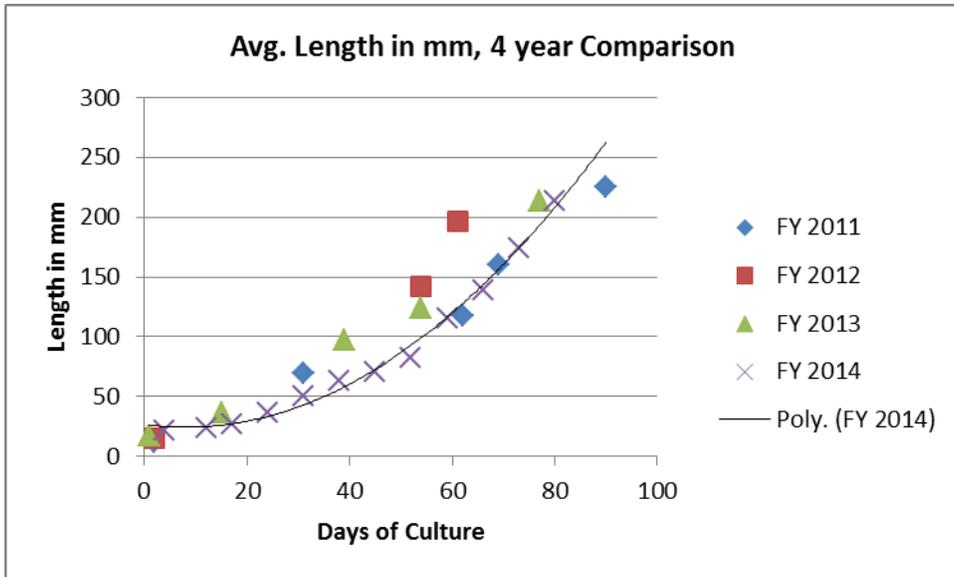
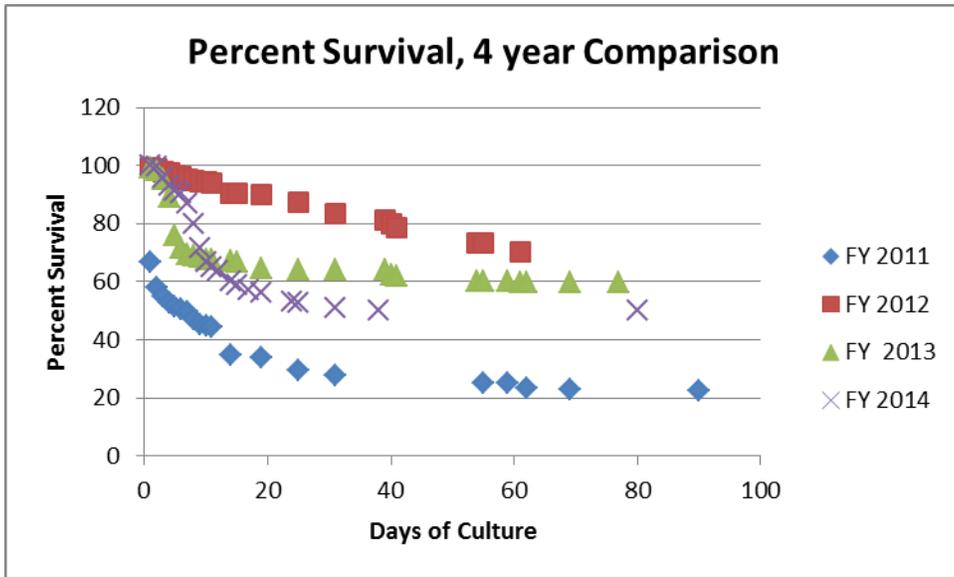
**Alligator gar being coded wire tagged**

Two additional transfers were made: First - June 6<sup>th</sup> to Auburn University (USGS) 10 fish average length 2.8 inches for studies related to the fish's physiology and genetics and Second – August 8<sup>th</sup> to University of Chicago 17 fish average length 7.5 inches for predator – prey and feeding techniques studies.

Columbus State University student Alex Edwards worked extensively with our alligator gar program this year. Working alongside our staff, Alex is conducting a study related to gar production techniques.



**Alex learning to wire tag alligator gar**



For further information on Alligator gar, visit the website:  
<http://www.sdafs.org/alligar/index.html>