

WSNFH Alligator Gar FY 2013 Production

Alligator Gar are an important native species capable of consuming non-native and invasive fish species throughout their range. Warm Springs NFH works with alligator gar in a cooperative restoration program covering the Mobile and Mississippi river drainage basins. Private John Allen NFH (source of our fry) along with our state and federal agency partners undertakes management objectives for this top-level predator. This is our summary report highlighting alligator gar culture undertaken at Warm Springs NFH during FY 2013.

Going into our 7th production year and following observations from recent production years, older fry (typically 8 -12 days old) are obtained from Private John Allen NFH. Fry at this stage are freely swimming in the water column and ready to start feeding.

On May 9th, we obtained 5,033 fry (8-9 days post-hatch) in excellent condition from Private John Allan NFH. These fry ranging 15-20 mm long, were tempered, counted and transferred into rearing tanks at the hatchery with very few hauling mortalities observed.

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 58 ppm throughout the program. Our buffering system utilizes fluidized high calcium content limestone which also helped maintain pH values between 7 and 8 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 22 degrees C in May to near 28 C in July. Water temperatures were lowered to 25 C periodically while grading or when treating the fish for bacterial infections using oxytetracycline (35 ppm treatments for a minimum of three consecutive days).

Multiple layers of containment screens are used on tank outflows and drains to prevent fish escapement. All waters are discharged into a containment pond adjacent to the building that is dedicated for use with holding 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 first week of culture.

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 bypassed using the Otohime B1 and Silvercup 1.5 mm feeds; using instead the smaller Otohime A1 to start with (along with brine shrimp) and later prolonging use of Otohime C2 to limit use of sinking Otohime EP1 and Silvercup 1.5 mm rations. Overnight feedings (through use of belt feeders) were also reduced during 2013 in an attempt to limit over feeding the gar. We observed some fish in 2012 exhibiting symptoms of suspected nutritional issues late in the program.

We added fathead minnows and small feeder goldfish a week 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.

The table below provides a schedule of feeds used through the 2013 program. Days of culture is based on time at Warm Springs, not the age of the fry.

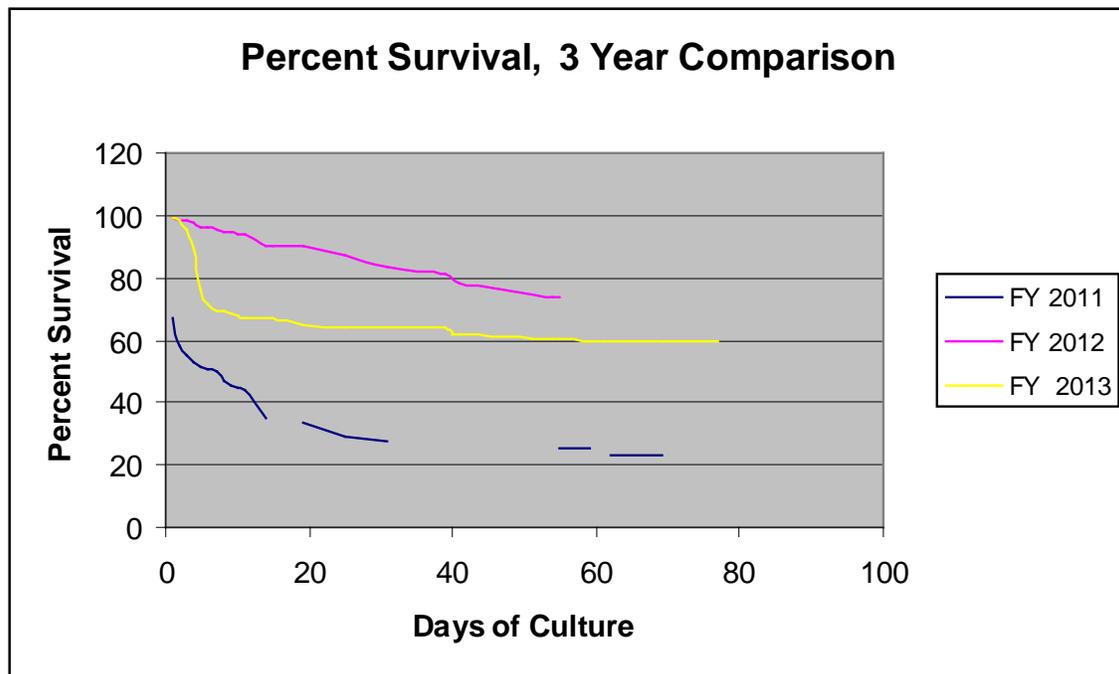
FEED	Size	Days of Culture
Brine Shrimp	n/a	1 to 6
Otohime A1	75-150 um	1 to 8
Otohime B1	250 – 360 u	Not used 2013
Otohime B2	360 – 650 u	3 to 28
Otohime C1	580 – 840 u	11 to 30
Otohime C2	840 – 1410 u	22 to 40
Otohime EP1	1.7 mm	26 to 47
Silver Cup Steelhead	1.5 mm	Not used 2013
Silver Cup Steelhead	2.5 mm	34 to 64
Silver Cup Steelhead	3.5 mm	43 > 76
Silver Cup Steelhead	4.5 mm	54 to 76
Fathead minnows & goldfish		69 to 77

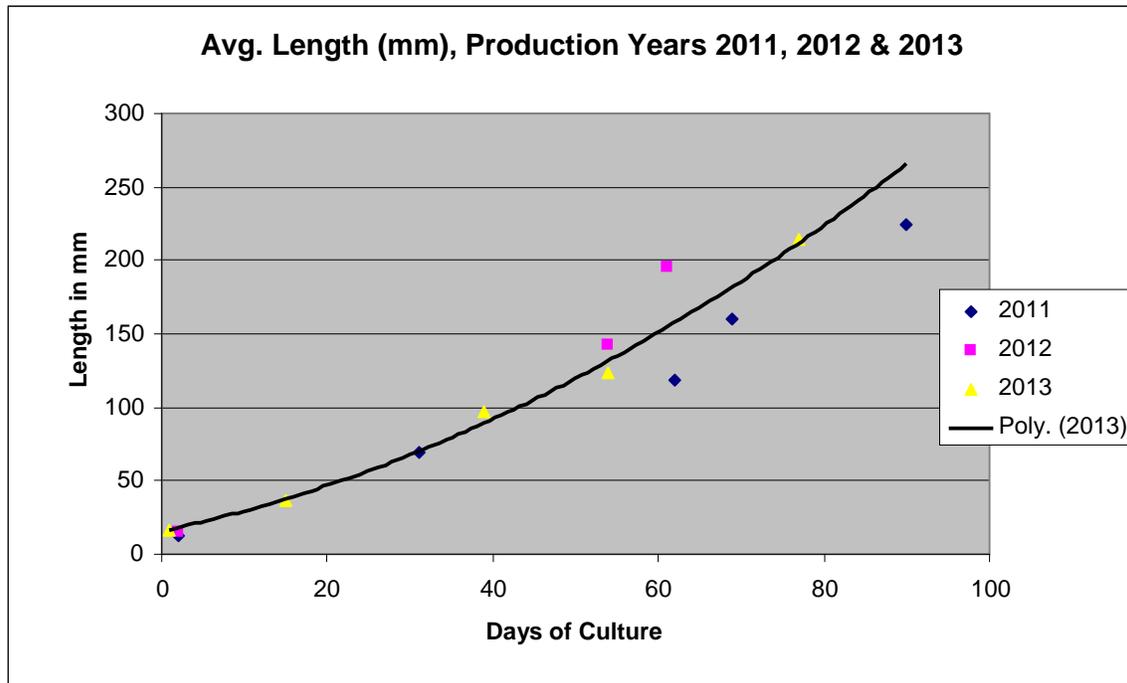


Young alligator gar hunting for food

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. Relatively few fish were lost to bacterial infections this year and were typically observed after handling during the grading process. Most of the mortalities observed this year were attributed to fungal infections occurring during a cold snap in late spring. We limited handling to what was necessary in order to grade fish. This included reducing sampling as a means to avoid setting fish up for infections.

On July 25th, at 77 days of culture, all gar were marked with coded wire tags and distributed to the Hatchie River (tributary of the Mississippi River) in west Tennessee. A total of 2,996 alligator gar (averaging 8.44 inches long) and a total weight of 310 lbs. were stocked. The overall survival rate for this production season was 60%.





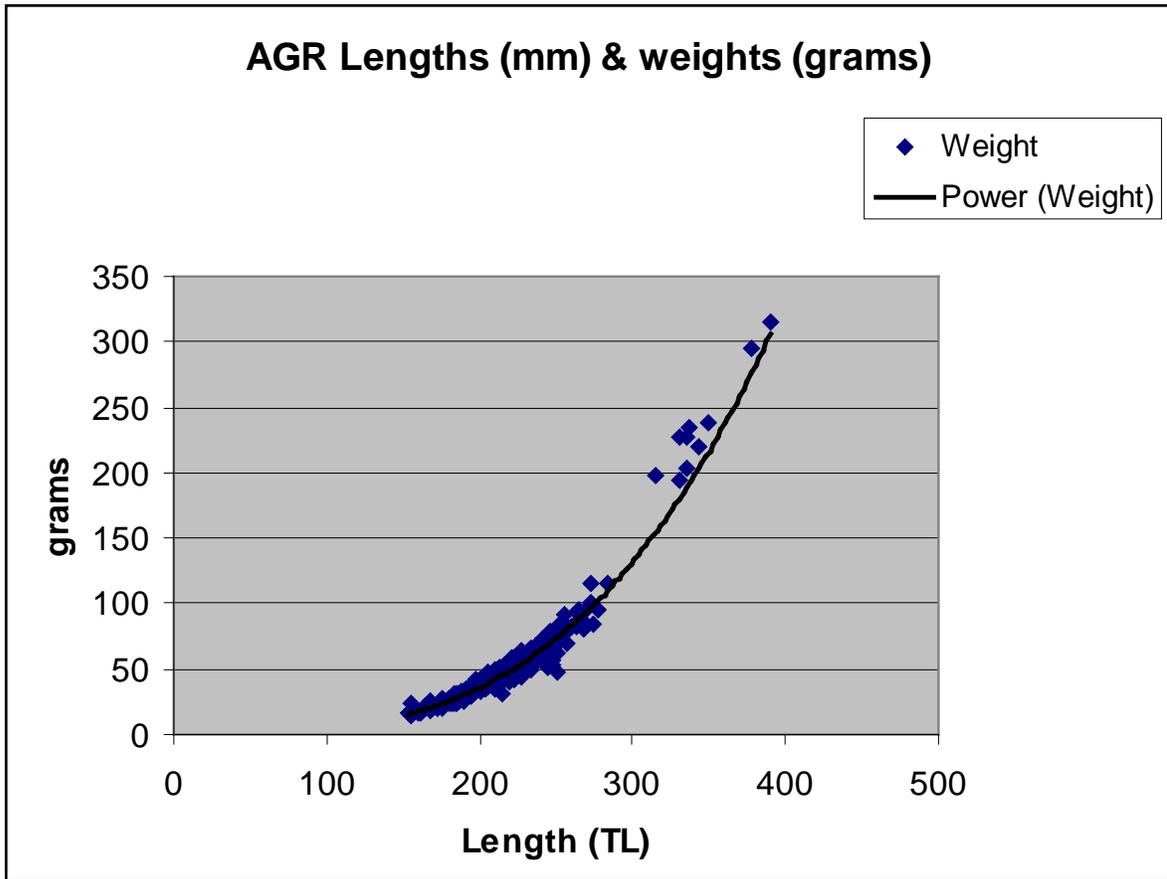
Additionally, 71 2012 year-class fish were also tagged and distributed to the Hatchie River. They averaged 13.6 inches and weighed a total of 37 lbs. These fish were initially held back in 2012 for research but were not needed for that purpose. Sample data for distributed 2012 and 2013 year class fish is shown in the last graph.



Coded wire tagging of alligator gar on July 24th, 2013.



Tank-reared alligator gar.



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