

# Hatchery Highlights

U.S. Fish & Wildlife Service  
Warm Springs NFH  
News and Updates



July - September 2019

## Aquatic At-Risk Species Recovery:

### Gopher Tortoise

*Gopherus polyphemus* is a federally listed “candidate species” for populations east of the Mobile and Tombigbee Rivers; they are also state listed by Georgia as “threatened.” Gopher tortoises are an indicator of longleaf pine ecosystem health; their burrows provide vital habitat and shelter to other imperiled species such as gopher frogs and indigo snakes.



Left: Gopher tortoise emerging from its shell. Right: Newly hatched gopher tortoises stretch their legs.

**Credit: Jessica Radich/USFWS**

Gopher tortoise eggs received on June 3<sup>rd</sup> from Crawford County, GA by GADNR biologists were incubated at 84.9°F while maintaining a high humidity until hatching after 85-92 days. Four of the six eggs in the clutch hatched in late August. These four hatchlings are our first successfully hatched tortoises incubated on station and are being held in the newly renovated Reptile and Amphibian Culture Building.

### Freshwater Mussels Research

Biologist Jessica Radich partnered with biologists from Panama City Field Office (PCFO), FL to collect broodstock chipola slabshell mussels (*Elliptio chipolaensis*) on July 25<sup>th</sup> from the Chipola River, FL and winged spike mussels (*Elliptio nigella*) on August 5<sup>th</sup> from the Flint River, GA. These two threatened mussel species were used in a host fish trial utilizing largemouth bass, bluegill, and redbreast sunfish. The broodstock mussels were placed in trough systems with flow through pond water and allowed to naturally release conglomerates. Conglomerates are packets of unfertilized eggs mixed with juvenile mussels (also known as glochidia). The conglomerates were observed and photographed under microscopes before being broken apart to collect the glochidia. Glochidia were used to inoculate each species of host fish in bath treatments. Inoculated hosts were then placed in individual aquariums and monitored for juvenile mussel drop off. Juvenile mussels began dropping off

after 10-20 days post inoculation. The mussels were enumerated for each host and placed in grow-out systems where they are fed algae paste and monitored for growth.

Jessica also collected southern fatmucket mussel (*Lampsilis straminea*) broodstock females with Andy Hartzog (PCFO) on August 5<sup>th</sup>. These mussels are a common species that will be used to test and refine propagation techniques at the hatchery. Propagation techniques to be tested include pond culture and grow-out, juvenile culture systems using pond water vs spring water supplemented with algae paste, and growout systems testing sand substrates vs screen lined chambers.



Left: Mussels collected from the Flint River separated by species. Right: Gravid female mussel releasing conglomerates.  
Credit: Jessica Radich/USFWS



Top Left: Glochidia awaiting inoculation onto a host fish. Bottom Left: Individual host fish aquariums. Top Right: Glochidia attached to the gill filament of a host fish. Credit: Jessica Radich/USFWS

## Shortnose sturgeon

Endangered shortnose sturgeon historically ranged along Atlantic Basin Rivers southward from Saint Johns River in FL, north into Canada. WSNFH accepted shortnose sturgeon from the University of Georgia June 2018 for continued culture and possible future work with the species. Staff monitored culture conditions for the fish daily and fed them a commercial diet specially formulated for sturgeon.



Shortnose sturgeon at Warm Springs NFH. Credit: Haile Macurdy/USFWS

## Pollinator and Native Plants Habitat Project

Staff and volunteers continued watering established plants within the landscaped area and weeded the area in July and September to remove grass that would otherwise crowd out beneficial plants. Good stands of wildflowers are now blooming in the remainder of the habitat area and monarch butterflies along with other pollinators have been observed utilizing the flora\_\_



Landscaped portion of the pollinator habitat area with flowers in full bloom. Credit: Jessica Radich/USFWS

## **Sicklefin Redhorse**

Warm Springs NFH staff work in cooperation with state, private, and tribal partners to meet conservation goals established by the Sicklefin Redhorse Conservation Committee. Sicklefin Redhorse are a candidate species whose range is limited to watersheds of the Hiwassee and Little Tennessee River.

WSNFH cultured 2018 and 2019 sicklefin redhorse (SFRH) for use with an upcoming diet study and alternative tagging studies. Staff sampled the 2019 SFRH each month, collecting length and weight data while feeding them up to three times per day. We continue to see skeletal deformities developing during the first year of intensive sicklefin culture. We suspect a dietary deficiency in the prepared feed rations currently in use as a contributing factor. On Sept. 16<sup>th</sup> staff began preparations to find an optimal diet for sicklefin redhorse. The June sucker, silvery minnow and Abernethy diets are specialty feeds we will evaluate through the course of the feed trial beginning later this year.



Ian Paige sampling 2019 year class sicklefin redhorse.

**Credit: Jessica Radich/USFWS**

Staff sampled, inventoried, and transferred the 2019-year class fish into replicated culture tanks in the new holding house. Approximately 2,100 sicklefin redhorse averaging 1.6 inches in length were on hand through September.

## **Aquatic Species Restoration Programs:**

### **Gulf Coast Striped Bass Restoration**

Staff managed production ponds typically utilized for striped bass production to prevent soil erosion and weed growth. Some ponds were restocked with brood goldfish in order to produce forage goldfish for eventual use with our smallmouth bass broodstock and feeding fish in the display pool and aquarium building.

## Lake Sturgeon Restoration

Warm Springs NFH participates with other agency partners and FWS hatcheries in a long-standing regional effort to restore lake sturgeon in the southern watersheds of its historical range. We fed a combination of natural feeds and commercial rations to the lake sturgeon three times a day and provided feed at night through use of belt feeders. We monitored water quality daily to ensure conditions for optimal growth continued. We blend cool spring water with pond water to maintain temperatures generally under 24°C and provide supplemental oxygen to maintain saturation levels at or slightly above 100%.

We graded the fish on a weekly basis to manage tank densities and reduce the effects of overcrowding as they grew; moving larger fish into less crowded tanks reduces the competition for feeding space. Once lake sturgeon reach a minimum of six inches in total length, they are sampled, marked by scute removal, and stocked in rivers.



WSNFH staff marking anesthetized lake sturgeon by scute removal.

**Credit: Carlos Echevarria/USFWS**

On September 12<sup>th</sup>, staff sampled and marked 1,325 lake sturgeon by removal of the fifth and sixth lateral scute (counting back from the head) on the fish's right side. We mark different scutes each year to distinguish year classes. This differential marking provides a means to identify not only individual year classes of recaptured fish during population assessment work, but also distinguishes the fish from any naturally reproduced sturgeon.

Josh Simmons distributed lake sturgeon on Sept. 14<sup>th</sup>, to the Seven Branches Access Area on the Lower French Broad River in TN. This distribution is coordinated with an outreach event highlighting restoration efforts known

as SturgeonFest. The Tennessee Clean Water Network in partnership with the Tennessee Valley Authority and the Tennessee Wildlife Resource Agency hosts the event. Each child attending the event release some of the fish themselves.



Marked lake sturgeon with the 5<sup>th</sup> and 6<sup>th</sup> scute removed. Credit: Jessica Radich/USFWS

Staff met with Dr. Janet Genz, University of West Georgia, Carrollton, GA and a graduate student on September 16<sup>th</sup> to discuss a pending study involving lake sturgeon. We will assist in collecting fish for the proposed study this fall and provide limited numbers of cultured fish for use with their study.

Lake sturgeon remain at WSNFH for eventual distribution in FY 2020 as they grow past a six-inch average. We have 3,380 lake sturgeon remaining for distribution and research use through October.

Date	Location	Number	Length	Wt. (lbs.)
Sept. 14 <sup>th</sup> , 2019	Lower French Broad River	1,325	8.97"	138.60
<b>Totals:</b>		<b>1,325</b>	<b>8.97"</b>	<b>138.60 lbs.</b>

### **Smallmouth Bass Restoration Program in Georgia**

We are into our 4<sup>th</sup> year working with Georgia and Tennessee producing and stocking 1.5-2.0" fingerlings for distribution into Blue Ridge and Chatuge reservoirs. Augmenting existing populations is a tool to aid in offsetting the impact introduced spotted bass throughout the region.

Georgia DNR biologists picked up 18,014 smallmouth bass produced at WSNFH and distributed them into Blue Ridge Reservoir, an impoundment of the Toccoa River in northern Georgia. Blue Ridge Reservoir received 19,743 smallmouth bass in FY 2019 and Georgia's Go Fish Center received 20,099 for continued culture and distribution.



Josh Simmons happy to see his babies on their way to a new home. Credit: Jessica Radich/USFWS

Date	Location	Number	Length	Wt. (lbs.)
Aug. 1st, 2019	Blue Ridge Reservoir	12,159	2.07"	47.83
Aug. 29 <sup>th</sup> , 2019	Blue Ridge Reservoir	5,855	2.67"	40.56
<b>Totals:</b>		<b>18,014</b>		<b>88.39</b>

### Recreational Fishing and Public Use:

Warm Springs currently maintains two ponds of channel catfish for use with kids fishing rodeos. One pond contains smaller fish for eventual transfer to other public fishing locations and/or used in our primary fishing pond once they are large enough.

Haile submitted information in July for WSNFH on a national hunting and fishing assessment for all FWS facilities.



Feeding floating feed to catfish is a popular activity of visitors to the hatchery. Credit: Haile Macurdy/USFWS

## Educate and Engage Public & Partners:




### HATCHERY PROGRAMS

Gopher Tortoise	SICKLEFIN REDHORSE	FISH PASSAGE
 <ul style="list-style-type: none"> <li>The official state reptile of Georgia that can grow up to 15 inches in length and is generally associated with the longleaf pine ecosystem.</li> <li>Only tortoise naturally found east of the Mississippi River.</li> <li>Juveniles are yellow-orange and brown in color while the shell of an adult gopher tortoise is generally tan, brown, or gray in coloration.</li> <li>Big underground burrows up to 33 feet long or greater.</li> <li>Known as a keystone species, which means many other wildlife species benefit from its presence and abundance within the ecosystem. More than 300 other species have been known to use gopher tortoise burrows, including snakes, foxes, frogs, and lizards.</li> <li>The current federal status of the gopher tortoise is "Threatened" for populations west of the Mobile and Tombigbee Rivers in Alabama, Mississippi, and Louisiana. It is a "Candidate" for listing for populations east of the Mobile and Tombigbee Rivers in Alabama, Georgia, Florida, and South Carolina.</li> <li>There are about 122 viable populations in Georgia, of which roughly 38 are permanently protected.</li> </ul>  <ul style="list-style-type: none"> <li>WSNFH works with Georgia DNR, University of Georgia, and The Jones Center at Edgewater to recover efforts for the gopher tortoise.</li> <li>Eggs are brought to WSNFH for incubation, hatching, and growing for one to two years before release into the wild.</li> </ul>	 <ul style="list-style-type: none"> <li>First collected in 1937 in Forney Creek near its confluence with the Tuckahoe River in North Carolina. It was not recognized as a distinct species until 1992.</li> <li>It is a medium-sized sucker, with a curved dorsal fin and bright red tail.</li> <li>It is found primarily in the Hiwassee and Little Tennessee Rivers in Cherokee, Clay, Swain, Macon, and Jackson counties.</li> <li>The population is limited by the presence of dams and impoundments in the rivers and faces threats in the form of habitat loss and pollutants such as sediment.</li> </ul>  <ul style="list-style-type: none"> <li>WSNFH is working with Conservation Fisheries Inc. (CFI), the NCEM, Tennessee Valley Authority (TVA), USFWS, Ecological Services, and the Eastern Band of the Cherokee Indians to propagate and reintroduce the species into currently unoccupied habitat within the species' historic range.</li> <li>Here at WSNFH, tank culture techniques are utilized to raise fish to stockable size.</li> <li>In addition to assisting with propagation and reintroduction efforts, we are assisting with population monitoring and studies of movement patterns, habitat use, and water quality requirements.</li> </ul> 	 <p>What is a barrier to aquatic species movement? These are obstacles that prevent fish or other aquatic organisms from moving up or downstream. They can be both natural or man-made. Some of these barriers may be less obvious, allowing passage of some species while preventing others. Stream conditions may be different up and down stream from these barriers, especially during times of low and high flows.</p> <p>Types of barriers to aquatic species movement: Natural barriers (waterfalls and beaver dams) Dams Weirs Road and rail Crossings (culverts, causeways and roads) Dike Approach</p> <ul style="list-style-type: none"> <li>Identify, map and collect relevant information on as many potential fish passage barriers as practical and identify the most ecologically significant barriers in the Southeast Region.</li> <li>Examine the feasibility and risks associated with a removal or modification program for priority fish barriers.</li> <li>Determine the efficacy of removal or modification of the priority barriers for the protection of native aquatic species within their natural range.</li> <li>Prioritize fish barriers for removal or modification and establish planning level cost estimates.</li> <li>Methods used to identify and assess potential barriers</li> <li>Literature review</li> <li>Examination of topographic maps and field assessment.</li> <li>Stakeholder advice on best location and characteristics.</li> <li>Compilation of data in a Geographic Information System (GIS)</li> </ul> 

We provided pond management information and online education resources as the requests came in to area landowners and youth leaders. Preparations got underway for the annual open house at WSNFH in October. We also provided several station tours highlighting the conservation programs and facilities at Warm Springs.

In September, we installed a replacement computer for one of our interactive displays in the Aquarium building.

We updated our Hatchery Programs Posters to reflect current program and priority species work, including new sections for sicklefin redhorse, smallmouth bass, gopher frogs and tortoises.

## Volunteers:

Friends of Warm Springs National Fish Hatchery members met at Okefenokee NWR July 12-14 to acknowledge the great help and insights gained from Okefenokee's friends group over the years. To that end, they presented two awards, one to Gracie Gooch for her valued help through the years and one to Okefenokee's Friends Group. Vince Mudrak, Mike and Rosla Plant traveled from Warm Springs to participate in the gathering.



Left: Friends of WSNFH and Okefenokee NWR Friend group meeting. Right: Pablo Miranda and Amanda Laboy volunteering at the hatchery. **Credit: Carlos Echevarria/USFWS**

Pablo Miranda and Amanda LaBoy worked with us for a week this July, getting a chance to help with current programs at Warm Springs NFH. They provided excellent assistance during this time, helping feed fish on station, assisting with fish sampling and data collection, grading forage fish, and cleaning purple martin houses after the birds left following the end of nesting season.

Staff participated in the annual Feds Feed Families Food (FFF) drive, a voluntary effort by federal employees to collect and donate food for those in need. Staff donated over 75 pounds of canned and non-perishable foods to the Feeding the Valley Food Bank in Columbus, GA.

## General Maintenance and Operations:

The existing metal building formally used for lake sturgeon culture now features improvements that include a poured concrete floor, added walls and service doors to enclose the entire work area, and spray foam insulation on the ceiling and walls (pictured right; Credit: Jessica Radich/USFWS). Work continues on adding utilities and heavy-duty shelving needed for amphibian and reptile culture.

Staff completed EEO / Diversity and No FEAR Act training during the quarter. Staff also participated in webinars providing training on inputting data into the reformatted online database Fisheries Information Systems (FIS).

Staff completed FIS 2019 distribution and accomplishment reporting in August. Work also began on inputting the FY 2020 planning documents into FIS.

Staff participated in monthly Project Leader conference calls, assorted fiscal year end administrative, budgeting, and purchasing activities.

Initial planning and site evaluation for a new shop building began as funding for this project was assigned to the station. Work on the new shop is expected to get underway in FY 2020.



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