2018–2019 Report: Trapping surveys for Suwannee Alligator Snapping Turtles (*Macrochelys suwanniensis*) on the Suwannee, Alapaha, and Withlacoochee Rivers in Georgia

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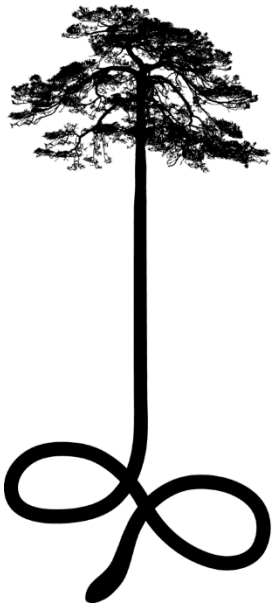

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Executive Summary

To survey for Suwannee Alligator Snapping Turtles (*Macrochelys suwanniensis*), we trapped five sections of river from 13 August 2018 to 31 August 2018 and then again from 4 September 2019 to 27 September 2019. Sites were located on three river mainstems in southern Georgia: the Suwannee, Alapaha, and Withlacoochee Rivers. Each site was trapped for 2–3 consecutive nights with 10–13 baited hoop traps, totaling 15–32 trap nights per site per survey effort. Suwannee Alligator Snapping Turtles were captured at 3 of 5 survey sites, with a total of 11 individuals captured. No turtles were captured at either site on the Suwannee River, and multiple trapping efforts have now been completed along this stretch with no evidence of an extant alligator snapping turtle population.

Background

The Suwannee Alligator Snapping Turtle (*Macrochelys suwanniensis*) (Figure 1) is listed as Threatened in the State of Georgia and is currently a candidate species for listing under the United States Endangered Species Act. It was not recognized as a distinct species until 2014 when an analysis of scute morphology and genetics resulted in the split of *Macrochelys temminckii* into three species: *M. temminckii, M. apalachicolae,* and *M. suwanniensis* (Thomas et al. 2014). This split decreased the range of *M. temminckii* and left the other two species with even more restricted ranges. Even before the revised taxonomy, there were already conservation concerns surrounding these turtles throughout their range, however, the discovery of multiple species heightens these concerns. Alligator snapping turtles experienced drastic declines in the 1970s and 1980s, and much of this was due to unregulated commercial harvest (Pritchard 2006). Although, protected from harvest in many portions of their range, alligator snapping turtles may still face threats from illegal harvest, habitat degradation, bush hooks, and trot lines.

The status of *M. suwanniensis* throughout its range in Georgia is largely unknown. Jensen and Birkhead (2003) surveyed portions of the Suwannee River drainage, however, there are still sections of their Georgia range that remain unsurveyed. Furthermore, the published data for the Suwannee River drainage shows a much lower catch-per-unit effort (0.05 turtles/trap-night) when compared to surveys in the Apalachicola River drainage (0.45 turtles/trap-night) (Jensen and Birkhead 2003). This indicates a need for further surveys within the range of *M. suwanniensis* to determine its status in Georgia.

Figure 1. Suwannee Alligator Snapping Turtle (*Macrochelys suwanniensis*) captured on a survey in the Suwannee River drainage in southern Georgia.

Methods

From August 13 – September 1, 2018 The Orianne Society conducted its first series of trapping surveys for *M. suwanniensis* in river mainstems within the Suwannee River drainage. We resurveyed the same locations the following year from September 4 – September 27, 2019. Sites were located on the Alapaha, Suwannee, and Withlacoochee Rivers and selected based on accessibility by boat and a lack of previous survey data. Five sites were selected with one located on the Withlacoochee and two on both the Alapaha and Suwannee Rivers (Figures 2–6). On rivers with multiple survey sites, the sites were adjacent and designated as north or south by their relation to our river access point.

During each survey we set 10–13 single-entrance, 1.2 m (4 ft) diameter hoop traps baited with cut fish (tilapia, catfish, gar, and/or sunfish) and sardines along the edge of each river channel. Traps were set in the afternoon or evening and checked in the morning or early afternoon the following day. The number of traps set varied on trap availability and access to trappable habitat. Traps were placed upstream of microhabitat features presumed to be selected by *M. suwanniensis*, such as log jams and undercut banks. The traps were oriented as close to parallel to the river banks as possible, with the funnel opening pointed downstream (Figure 7). Water depth at the mouth of the trap varied from 0.75–2.5 m, but the traps were always secured to the bank in a manner that kept the back of the trap from being completely submerged. Traps were left for 1–3 nights and checked each of the following days. Water and air temperature, canopy cover, river width, bank disturbance, and microhabitat features were recorded for each trap location when the traps were set.

In 2018, we navigated the rivers in a boat powered by an outboard motor. Boat motor issues reduced the number of traps set at one of the Alapaha River sites during 2018. In 2019, low river levels prevented the use of a gas powered boat and we were forced to conduct all trapping by canoe. While the canoe did not limit the number of traps we were able to set, it did limit the length of river we were able to trap. As a result, the trap locations for 2019 were more concentrated and located closer to each river's access point. Due to reduced availability of suitable habitat from low water and boat limitations, we set a small number of traps in the Little River just north of the Withlacoochee/Little River confluence during our 2019 survey effort.

For each *M. suwanniensis* captured, we measured straight-line carapace length (SCL) with Haglof aluminum tree calipers and pre-cloacal tail length (PCL) with a tailor's tape. We weighed each turtle using a Modern Step 300 kg crane scale or a 5 kg Pesola spring scale. Each turtle was then marked by drilling a unique series of holes in the posterior marginal scutes of its carapace (Cagle 1939; following the code in Appendices). All turtles also received a Biomark PIT (passive integrated transponder) tag in the side of the muscle at the base of tail prior to release. The number of carapacial scutes (marginal, supramarginals, costals, and vertebrals) was recorded along with any notable shell damage or injuries. Sex was determined for each turtle following Enge et al. (2014). Individuals with a SCL > 370 mm and a PCL > 115 mm were recorded as males, and turtles with a SCL > 330 mm and a PCL < 115 were recorded as females. Any turtles with a SCL < 330 mm were considered juveniles and too small to confidently determine sex. A small tissue sample was also taken from each turtle from the webbing of a hind foot or from tubercles on the ventral surface of the legs and immediately placed in 95% ethanol. Samples were then sent to Kevin Enge of the Florida Fish and Wildlife Conservation Commission for genetic analysis.

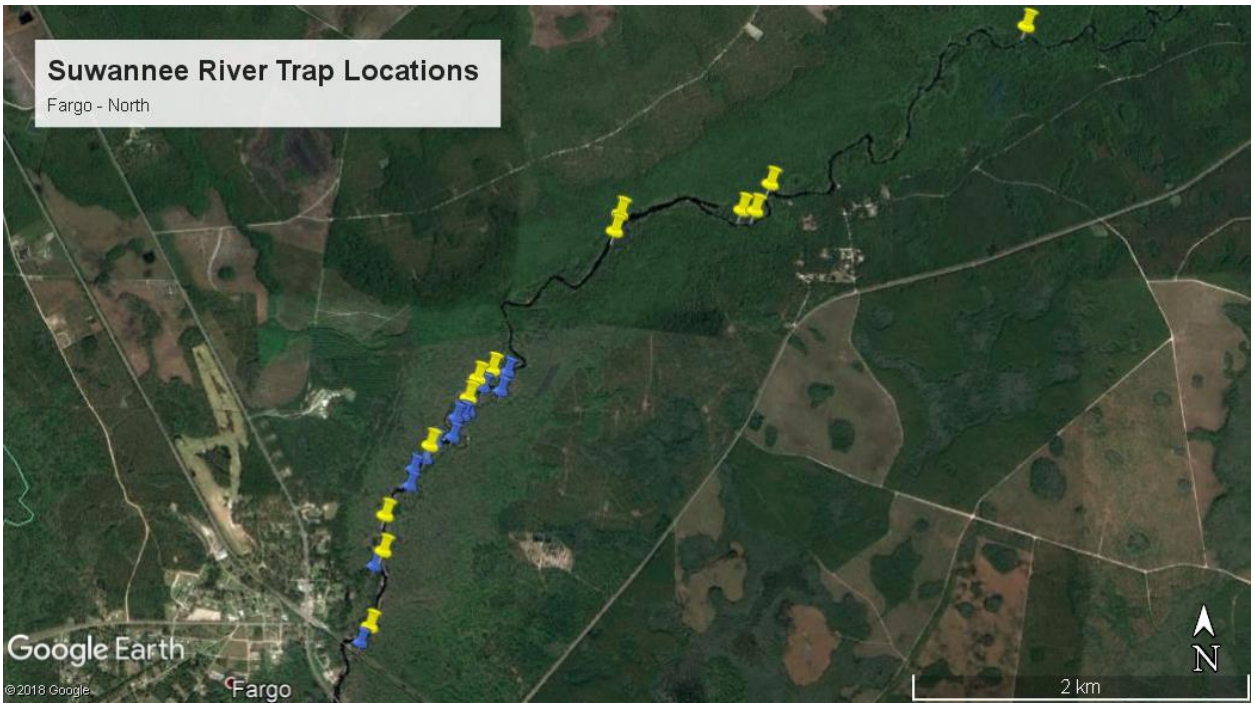

Figure 2. Hoop trap locations on the Suwannee River at the Fargo – North site from 2018 (yellow) and 2019 (blue) surveys.

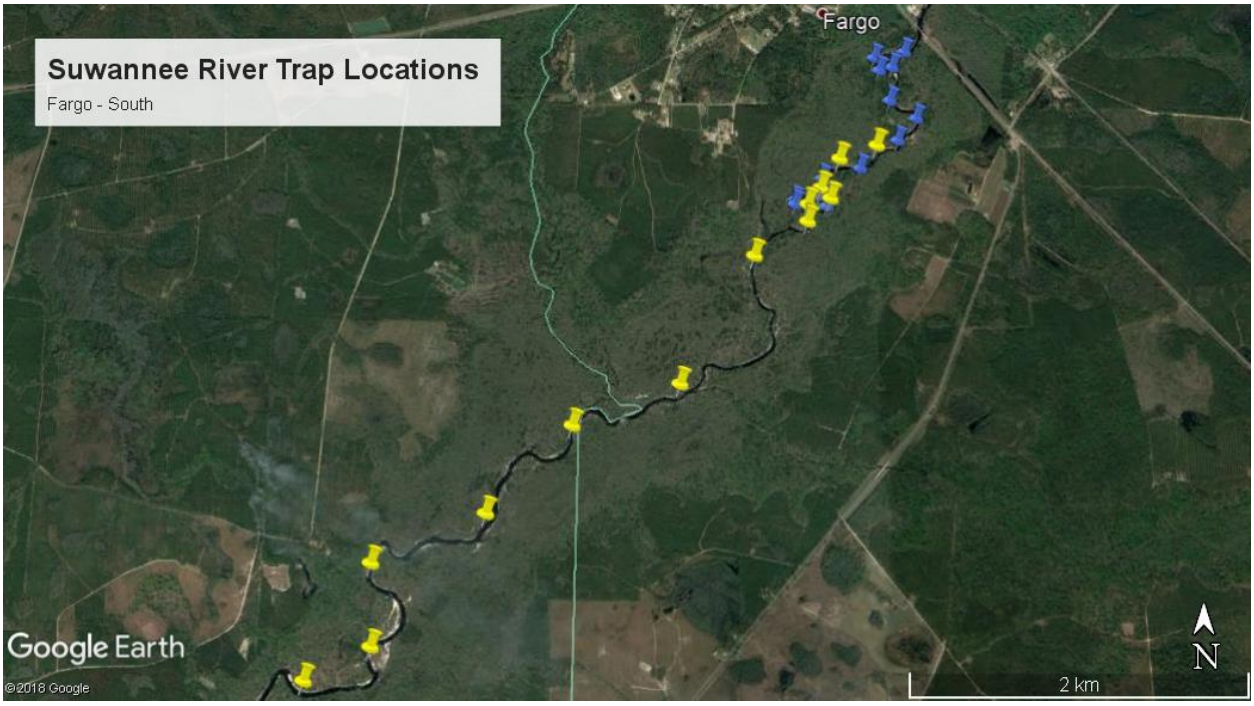

Figure 3. Hoop trap locations on the Suwannee River at the Fargo – South site from 2018 (yellow) and 2019 (blue) surveys.

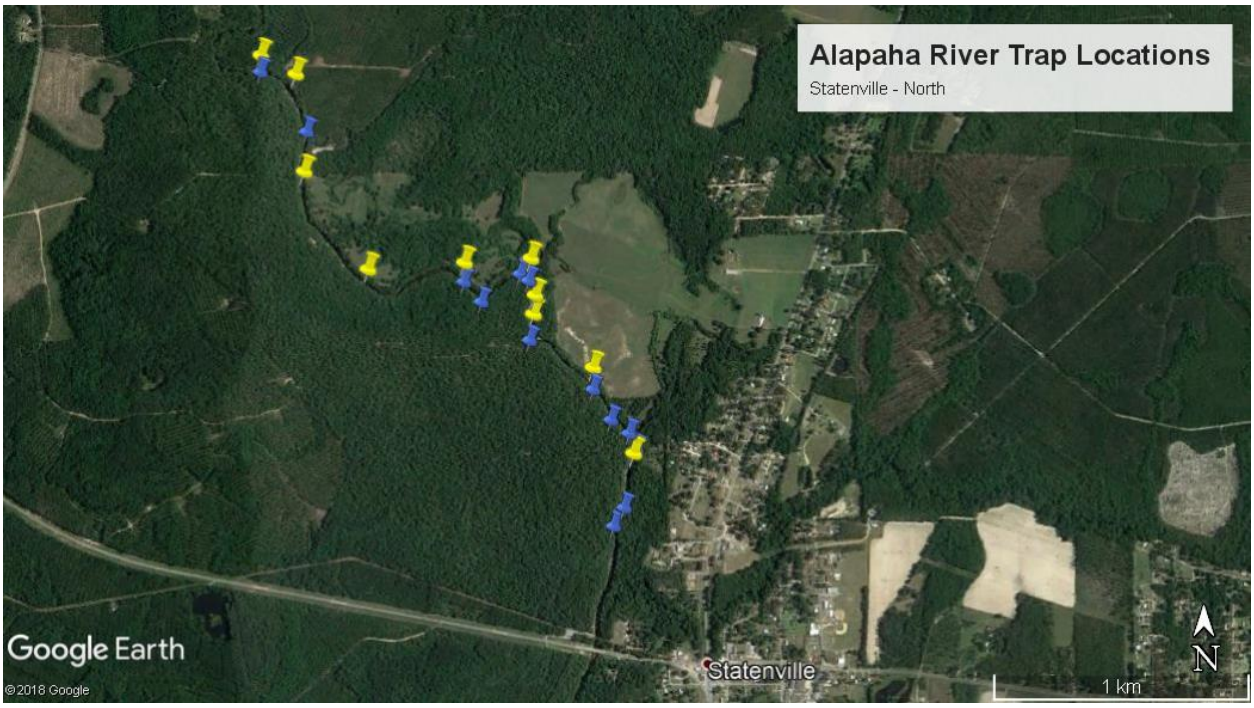

Figure 4. Hoop trap locations on the Alapaha River at the Statenville – North site from 2018 (yellow) and 2019 (blue) surveys.

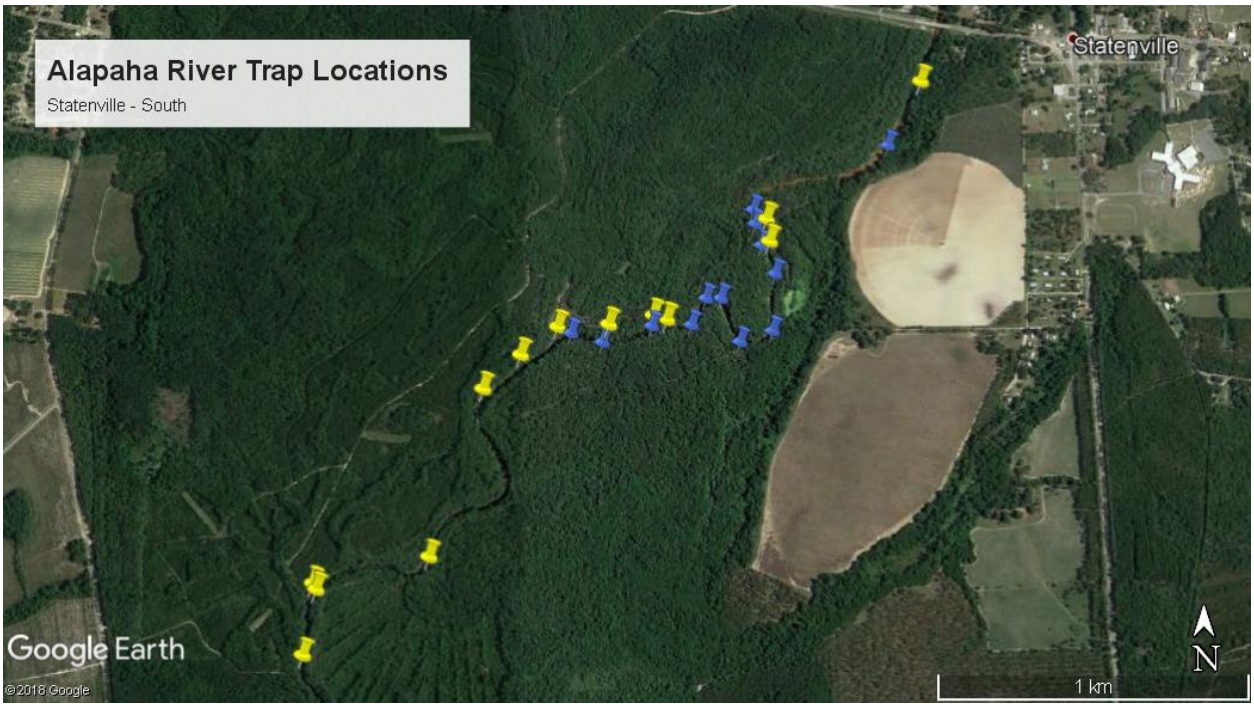

Figure 5. Hoop trap locations on the Alapaha River at the Statenville – South site from 2018 (yellow) and 2019 (blue) surveys.

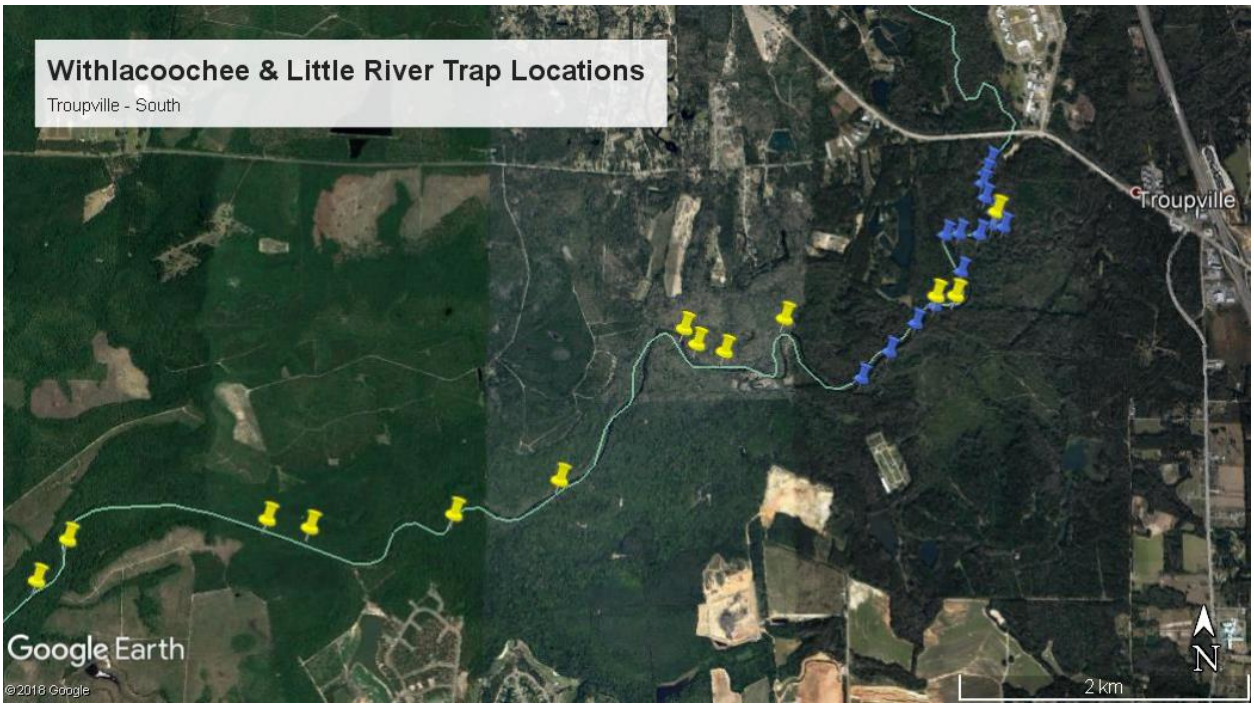

Figure 6. Hoop trap locations on the Withlacoochee River at the Troupville – South site from 2018 (yellow) and 2019 (blue) surveys.

Results and Discussion

We logged a total of 299 trap nights (143 in 2018 and 156 in 2019), and captured *M. suwanniensis* 15 times, giving us a CPUE (catch-per-unit effort) of 0.05 turtles/trap night (2018 = 0.03, 2019 = 0.06). CPUE values for each River mainstem were: Alapaha (0.14), Withlacoochee (0.02), and Suwannee (0.0). In those 15 capture events (2018 = 5, 2019 = 10), we captured 11 individual *M. suwanniensis* (5 males, 3 females, and 3 juveniles) (Figures 8–10). Males ranged in SCL from 375–480 mm and in mass from 10.9–24.8 kg. Females ranged in SCL from 340–353 mm and in mass from 8.3–10.1 kg. Juveniles ranged in SCL from 199–265 mm and in mass from 1.0–4.6 kg (Table 1). In the Alapaha River during 2019, we captured 2 juveniles twice during the same survey and also recaptured 2 turtles previously marked in 2018. One of those turtles was recaptured 1.2 km upstream in a different survey site. When examining that turtle's initial capture site, it became apparent why the turtle moved so far. The low river level left that section very shallow and sandy with all woody and limestone structure above the water line. Interestingly, we never captured exceptionally large turtles during our surveys. Most adults appeared young, (just large enough to determine sex) and 27% of individuals captured were juveniles. While the lack of old individuals raises concerns about the impact of historic harvest, the presence of young turtles indicates successful reproduction and recruitment in recent years. It is possible that larger turtles may be selecting habitat in smaller tributaries or turtles in those tributaries may have been shielded from intense harvest by the semi-unnavigable nature of the smaller streams.

In 2018, we documented *M. suwanniensis* in the Alapaha and the Withlacoochee Rivers, but in 2019 we only caught them in the Alapaha River. Although we failed to capture *M. suwanniensis* on the Withlacoochee River in 2019, we did have a damaged bait bottle in a Withlacoochee trap with beak shaped punctures, leading us to believe a large *M. suwanniensis* had entered and then escaped that trap before it was checked. We failed to catch any *M. suwanniensis* in the Suwannee River in either year. Other recent surveys of the Suwannee River

in Georgia also failed to detect *M. suwanniensis* (Jensen and Birkhead 2003), suggesting they have either been locally extirpated or occur at such low densities that they are incredibly difficult to detect. During periods of high water, portions of the main channel of the Suwannee near the Okefenokee Swamp become wide, reaching into dense stands of trees on either side. This could also make detection difficult, if remaining turtles are selecting habitat difficult to reach by boat. Overall habitat quality may also be lower for *M. suwanniensis* in the headwaters of the Suwannee, as it is more acidic and lower in nutrients and biomass than the Florida portion. Snails and mussels, which have been documented as important prey items for *Macrochelys* in other drainages (Elsey 2006), do not occur in the headwaters of the Suwannee River (William et al. 2014). Thus, in addition to possibility of historic overharvest (Pritchard 2006), the lower abundance of available prey may also play a role in the scarcity of *M. suwanniensis* in the northern extent of the Suwannee River (Jensen and Birkhead 2003). All of the sites we surveyed were easily accessible by boat during for at least part of the sampling period and could have been historically impacted by harvest of alligator snapping turtles.

Figure 7. Hoop trap set above a log jam and limestone structure during a survey on the Alapaha River.

Figure 8. Measuring a Suwannee Alligator Snapping Turtle (*Macrochelys suwanniensis*) captured on the Alapaha River.

Figure 9. One of three juvenile Suwannee Alligator Snapping Turtles (*Macrochelys suwanniensis*) caught on the Alapaha River.

Figure 10. The largest Suwannee Alligator Snapping Turtle (*Macrochelys suwanniensis*) captured during our survey efforts. This turtle was captured on the Withlacoochee River and weighed 24.8 kg.

Acknowledgements

John Jensen offered his expertise, fielded questions, and assisted in the field. The Georgia Department of Natural Resources provided a boat, canoe, and extra trapping equipment. Dustin Exum of Grand Bay WMA and the staff of Stephen C. Foster State Park provided lodging. Paradise PFA provided a second boat when our first boat broke down. Dirk Stevenson generously provided his knowledge and resources, and Andy Day offered valuable information on navigating survey sites. Kevin Enge of Florida Fish and Wildlife Conservation Commission answered questions and offered valuable insight into trapping. I would like to especially thank everyone who helped in the field, often putting in long hours to smell like fish and untangle gators: Jonathon Bolton, Bronc Rice, Houston Chandler, Dustin Piontek of the Cincinnati Zoo, Jacob Barrett, and Tucker Ennis.

Table 1. Reptile captures from the 2018–2019 Suwannee Alligator Snapping Turtle (*Macrochelys suwanniensis*) trapping surveys at 5 sites on 3 rivers in southern Georgia. The numbers in parentheses represent the number of individuals captured each day.

Species	Site	Date	Sex	ID #	SCL (mm)	PCL (mm)	Mass (kg)
Alligator mississippiensis	Alapaha River – Statenville North	8/14/2018					
Sternotherus minor	Alapaha River – Statenville North	8/14/2018					
Trachemys scripta	Alapaha River – Statenville North	8/14/2018					
Apalone ferox	Alapaha River – Statenville North	8/15/2018					
Trachemys scripta (2)	Alapaha River – Statenville North	8/15/2018					
Apalone ferox (3)	Alapaha River – Statenville South	8/21/2018					
Macrochelys suwanniensis	Alapaha River – Statenville South	8/21/2018	F	A2	343	87	8.3
Macrochelys suwanniensis	Alapaha River – Statenville South	8/21/2018	Unk	A3	237	61	2.5
Macrochelys suwanniensis	Alapaha River – Statenville South	8/21/2018	M	A4	375	138	10.9
Sternotherus minor	Alapaha River – Statenville South	8/21/2018					
Trachemys scripta	Alapaha River – Statenville South	8/21/2018					
Apalone ferox (4)	Alapaha River – Statenville South	8/22/2018					
Trachemys scripta (3)	Alapaha River – Statenville South	8/22/2018					
Alligator mississippiensis	Withlacoochee River – Troupville South	8/23/2018					
Apalone ferox	Withlacoochee River – Troupville South	8/23/2018					
Pseudemys suwanniensis	Withlacoochee River – Troupville South	8/23/2018					
Trachemys scripta	Withlacoochee River – Troupville South	8/23/2018					
Alligator mississippiensis	Withlacoochee River – Troupville South	8/24/2018					
Apalone ferox	Withlacoochee River – Troupville South	8/24/2018					
Macrochelys suwanniensis	Withlacoochee River – Troupville South	8/24/2018	M	W6	409	123	14
Macrochelys suwannienis	Withlacoochee River – Troupville South	8/24/2018	M	W7	480	125	24.8
Sternotherus minor	Withlacoochee River – Troupville South	8/24/2018					
Apalone ferox	Suwannee River – Fargo South	8/29/2018					
Trachemys scripta	Suwannee River – Fargo South	8/29/2018					
Apalone ferox (2)	Suwannee River – Fargo South	8/30/2018					
Trachemys scripta	Suwannee River – Fargo South	8/30/2018					
Apalone ferox (2)	Suwannee River – Fargo North	9/1/2018					
Trachemys scripta (3)	Withlacoochee River – Troupville South	9/5/2019					
Trachemys scripta	Withlacoochee River – Troupville South	9/6/2019					
Apalone ferox (4)	Suwannee River – Fargo South	9/10/2019					
Trachemys scripta (6)	Suwannee River – Fargo South	9/10/2019					
Apalone ferox	Suwannee River – Fargo South	9/11/2019					
Apalone ferox (3)	Suwannee River – Fargo North	9/12/2019					
Trachemys scripta (6)	Suwannee River – Fargo North	9/12/2019					
Apalone ferox (3)	Suwannee River – Fargo North	9/13/2019					
Trachemys scripta (2)	Suwannee River – Fargo North	9/13/2019					
Apalone ferox	Alapaha River – Statenville North	9/24/2019					
Macrochelys suwanniensis	Alapaha River – Statenville North	9/24/2019	Unk	A5	199	42.2	1.9
Macrochelys suwanniensis	Alapaha River – Statenville North	9/24/2019	F	A6	340	90.2	8.5
Trachemys scripta (4)	Alapaha River – Statenville North	9/24/2019					
Apalone ferox (2)	Alapaha River – Statenville North	9/25/2019					
Macrochelys suwanniensis	Alapaha River – Statenville North	9/25/2019	M	A4	386	146.4	12.5
Macrochelys suwanniensis	Alapaha River – Statenville North	9/25/2019	M	A7	405	115.5	15.8

Table 1 (cont.). Reptile captures from the 2018–2019 Suwannee Alligator Snapping Turtle (*Macrochelys suwanniensis*) trapping surveys at 5 sites on 3 rivers in southern Georgia. The numbers in parentheses represent the number of individuals captured each day.

Species	Site	Date	Sex	ID #	SCL (mm)	PCL (mm)	Mass (kg)
Macrochelys suwanniensis	Alapaha River – Statenville North	9/25/2019	F	A8	353	96.2	10.1
Alligator mississippiensis	Alapaha River – Statenville South	9/26/2019					
Apalone ferox (4)	Alapaha River – Statenville South	9/26/2019					
Macrochelys suwanniensis	Alapaha River – Statenville North	9/26/2019	Unk	A9	157	34.2	1.02
Macrochelys suwanniensis	Alapaha River – Statenville North	9/26/2019	Unk	A5	199	42.2	1.9
Macrochelys suwanniensis	Alapaha River – Statenville South	9/26/2019	Unk	A3	265	56.1	4.6
Macrochelys suwanniensis	Alapaha River – Statenville South	9/26/2019	M	A10	379	116.9	13.4
Sternotherus minor	Alapaha River – Statenville South	9/26/2019					
Trachemys scripta (2)	Alapaha River – Statenville South	9/26/2019					
Alligator mississippiensis	Alapaha River – Statenville South	9/27/2019					
Apalone ferox (2)	Alapaha River – Statenville South	9/27/2019					
Macrochelys suwanniensis	Alapaha River – Statenville South	9/27/2019	Unk	A3	265	56.1	4.6
Trachemys scripta	Alapaha River – Statenville South	9/27/2019					

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