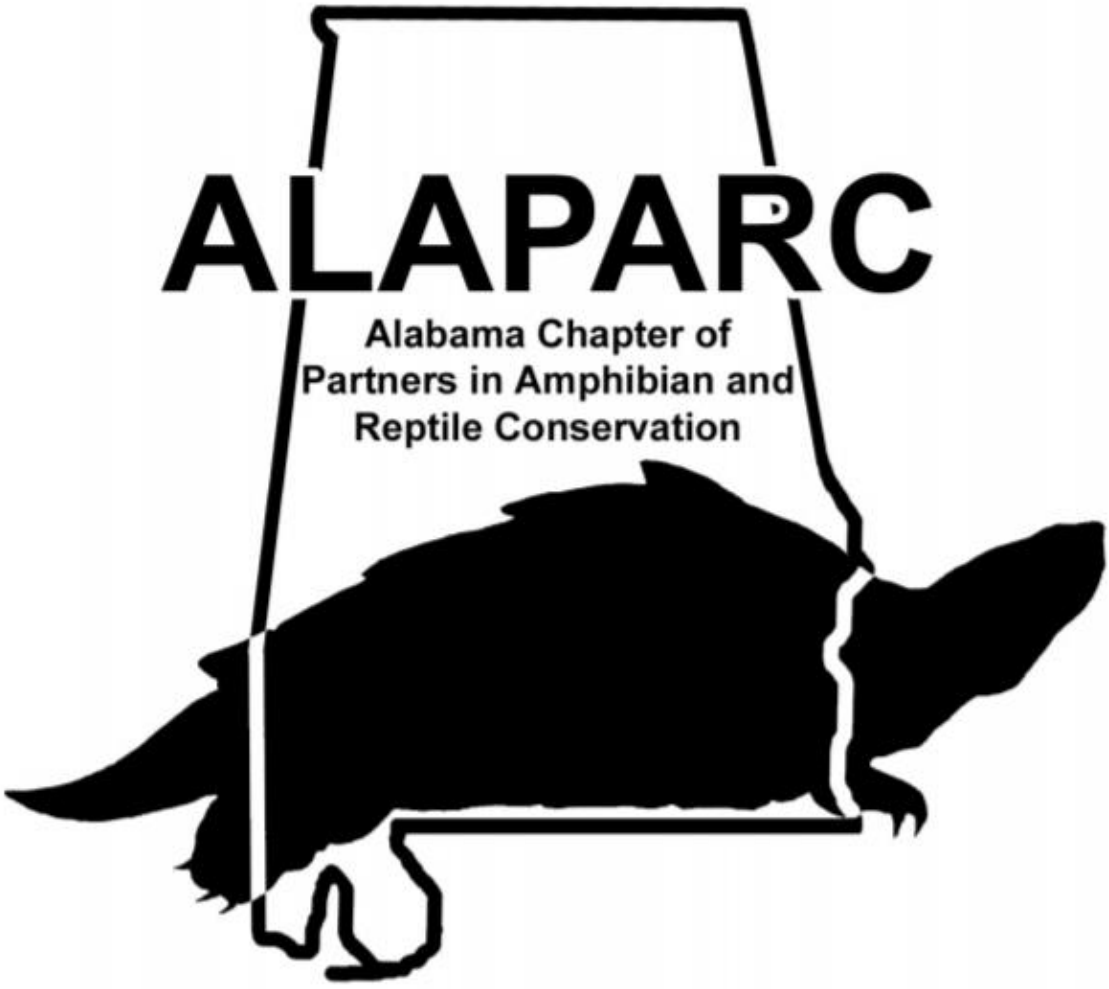

13th Annual Meeting

October 4th- 6th 2024
Wehle Land Conservation Center, Midway, AL

PARC
PARTNERS IN
AMPHIBIAN AND REPTILE CONSERVATION

About Our Meeting

Welcome to the thirteenth annual meeting of the Alabama Chapter of Partners in Amphibian and Reptile Conservation (ALAPARC) at Wehle Land Conservation Center (WLCC) in Midway, Alabama.

Accommodations
Please check in at WLCC dining hall (see map). Linens, blankets, and pillows are **NOT** provided for bunk-style housing. Camping is allowed in permitted areas.

Meals
All meals will be served at WLLC dining hall. Instead of having food cooked for us this year, we have several volunteers who have stepped up to prepare meals for Fri. night and breakfast, lunch, and dinner on Saturday, and breakfast Sunday. Registrants will also have access to refrigerator and kitchen area so please bring your own snacks and/or meals if you have any dietary restrictions that we might not be able to accommodate.

Internet Access
WLLC does have wireless internet for most buildings.

Sustainability
Please consider bringing your own coffee mugs and beer steins to our meeting so that use of disposable cups will be minimized.

Website
For more information about Wehle LCC, please visit
https://www.alabamaforeverwild.com/wehle-tract

Field Outings
Field outings will be planned but are contingent on weather. Please make sure to bring a flashlight/headlamp. Decontaminated equipment is mandatory for outings in/near aquatic habitats. Please adhere to ethical herping etiquette and return all items to their original location.

Socials
All those consuming adult beverages must have age verified and wear a provided wristband.

Check-Out
Please help us by cleaning up after yourself.

SCHEDULE

Friday October 4th

Time	Event
11:00	Alabama Herp Working Group (Invitation only; Nature Center)
3:00	Check-in (WLCC Dining Hall)
5:00	Dinner (WLCC Dining Hall)
6:15-6:30	Introductions & Housekeeping (TBD; Nature Center or WLCC Dining Hall)
6:30-6:45	Update on Conservation Initiatives, Policies, and Growth of Southeast Partners in Amphibian and Reptile Conservation (SEPARC). **Ericha S Nix**
6:45-7:00	Update on Alabama Partners in Amphibian and Reptiles Conservation (ALAPARC). **Andrew Cantrell**
7:00	*Wehle Land Conservation Center: A state-owned facility supporting public recreation, education, and applied conservation*. **Eric Soehren**
8:00	Poster Viewing/Social (WLCC Dining Hall)

Saturday October 5th

Time	Event
8:00	Breakfast (WLCC Dining Hall)
9:30-9:40	Re-introductions/Housekeeping (Nature Center)
9:40-10:10	Threats, challenges, and updates on status of Alabama herps. **Andrew Cantrell**
10:10-10:25	*Deep in the heart of depressus, a bright spot in a depressus landscape*. **Seamus O'Brien**
10:25-10:40	*The Status of the Flattened Musk Turtle and Black Warrior Waterdog in Bankhead National Forest.* **A. Joseph Jenkins**
10:40-10:55	*There's Something in the Water: eDNA surveys for Alabama's rarest herps.* **Kevin Hutcheson**
10:55-11:10	Break

11:10-11:30	*"Ouacha" doin' here? Distribution and Abundance of the Invasive Ouachita Map Turtle (*Graptemys ouachitensis*) in the Coosa River.* **Grover Brown**
11:30-11:50	*Clarifying the Murky Evolutionary History of Southeastern Mud Turtles (Genus Kinosternon) Using a Phylogenomic Approach.* **Grover Brown**
12:00	Lunch (WLCC Dining Hall)
1:15-1:35	*Digging Up the Past: Modernization and Digitization of the University of Alabama Herpetological Collection.* **M. Worth Pugh**
1:35-1:55	*Estimating population size and mating system dynamics of diamond-backed terrapins on Dauphin Island, Alabama.* **Iwo Gross**
1:55-2:15	*Conecuh National Forest Eastern Indigo Snake Monitoring Update*. **Francesca Erickson**
2:15-2:45	*More Than Just Dropping Matches, The Nature Conservancy's Fire Program in AL*. **Geoffrey Sorrell**
2:45-3:00	ALAPARC housekeeping: next year's meeting and selection of new co-chair. **Andrew Cantrell**
3:15-5:30	Field Outings: Outing with Eric Soehren
6:00	Dinner (WLCC Dining Hall)
7:00	Poster Viewing/Social (WLCC Dining Hall)
9:00	Silent Auction Benefitting ALAPARC Ends (**Debit/Credit Cards Only**)

Sunday October 6th

Time	**Event**
8:00	Breakfast (WLCC Dining Hall)
9:00	Check-Out

Abstracts

Oral Presentations

Eric Soehren, Wehle Land Conservation Center, State Lands Division, Alabama Dept. of Conservation and Natural Resources. *Wehle Land Conservation Center: A state-owned facility supporting public recreation, education, and applied conservation*

The Forever Wild Land Trust Wehle Tract is located in Bullock County and consists of 1,505 acres. Of this total acreage, 640 acres are included in the adjacent Barbour County Wildlife Management Area. The remaining acreage serves as a recreation area, nature preserve, and educational outreach complex managed in conjunction with the State Lands Division's (SLD) Wehle Land Conservation Center (WLCC), which was established in 2004. The WLCC is nestled within the Forever Wild property and utilizes approximately 70 additional acres owned by the SLD. All of the day-to-day educational, recreational, and habitat management activities that take place are administered by the SLD. Both the Elhew Field Station program (which provides technical assistance for wildlife research, on-site conservation, and environmental outreach) and the Wehle Nature Center (which provides space for educational program offerings) are also administered by SLD staff based on the WLCC. In addition to SLD funding, the WLCC is supported in part through the Robert G. Wehle Charitable Trust, the Forever Wild Land Trust, and periodically competitive grant awarded funding. The WLCC is dedicated to fostering sound land stewardship principles and promoting the understanding and appreciation of Alabama's natural heritage through educational outreach, conservation, and research. Intense comprehensive inventory over many years have yielded a wealth of information regarding the tract's biodiversity. Additional discussion will focus on gopher tortoise establishment and more recent gopher frog head-starting efforts.

Seamus C. O'Brien (sobrien1@stu.jsu.edu) and **Grover J. Brown**, Jacksonville State University. *Deep in the heart of depressus, a bright spot in a depressus landscape.*

Flattened musk turtles (FMT), *Sternotherus depressus*, have seen drastic population declines across their range since the 1980s. Coal mining, wastewater pollution, collection for the pet trade, habitat degradation, and potentially disease have diminished what was once an abundant turtle within the Black Warrior Drainage to being listed as Critically Endangered under the IUCN. Arguably the sub-drainage within the Black Warrior that has seen the greatest decline is the Locust Fork of the Black Warrior. Reacent studies in the early to mid-20s yielded only a handful of individuals causing researchers to theorize that the populations of FMTs in Locust Fork were all but extirpated from 1/3rd of their range. Despite a bleak outlook for the species in this region, recent surveys and detections are cause for cautious optimism in this drainage.

Recent efforts have produced 4 known populations with documented recruitment, a first from the Locust Fork in several decades.

A. Joseph Jenkins (ajj0012@auburn.edu) and **James Godwin**, Alabama Natural Heritage Program. *The Status of the Flattened Musk Turtle and Black Warrior Waterdog in Bankhead National Forest.*

Monitoring populations of imperiled species is critical for understanding population dynamics and prompt detection of impacts to populations. The flattened musk turtle (*Sternotherus depressus*) and the Black Warrior waterdog (*Necturus alabamensis*) are two federally listed aquatic species endemic to the upper Black Warrior River watershed in Alabama. The last known viable populations for either species occur within the Bankhead National Forest (BNF). We conducted surveys in BNF to capture and release flattened musk turtles and Black Warrior waterdogs to collect data for demographic and mark-recapture analyses. Surveys occurred over 500 m sections of stream in Bankhead National Forest at 4 sites for flattened musk turtles and 2 sites for Black Warrior waterdogs. Surveys resulted in 223 captures and 144 recaptures of flattened musk turtles and 34 captures of Black Warrior waterdogs including 12 recaptures. Flattened musk turtle populations exhibited healthy demographic structures with distributions of sizes classes that included many younger turtles and fairly even sex ratios. Population estimates of flattened musk turtles indicated that declines have slowed and populations may be stabilizing. High capture rates (0.043 captures per trap-night) compared to historic surveys indicate that waterdog populations remain stable. However, population estimates indicate Black Warrior waterdogs persist in low numbers. We recommend continued monitoring of populations and establishment of captive assurance colonies to prevent extinction from stochastic events.

Kevin G. Hutcheson (khutcheson@arcprotects.org), Amphibian and Reptile Conservancy, Clemson University. **JJ Apodaca**, **José Garrido**, Amphibian and Reptile Conservancy, **James Godwin** and **Joe Jenkins**, Alabama Natural Heritage Program. *There's Something in the Water: eDNA surveys for Alabama's rarest herps.*

Having recent occupancy data for an imperiled species is a first step in remediating habitat in the hopes of recovering the species. However, this can be difficult data to collect when a species has declined extensively. This is only compounded when they are cryptic in nature, like many aquatic herpetofauna species. eDNA is a developing tool to help combat these limitations in surveying. In this study, we collected 384 environmental DNA (eDNA) sampling for the Flattened Musk Turtle (*Sternotherus depressus*) and the Black Warrior Waterdog (*Necturus alabamanensis*) at 110 sites across the Sipsey, Mulberry, and Black Warrior drainages. Through qPCR and metabarcoding analyses our results show that Bankhead National Forest remains a

stronghold for the two species while outside of the Forest we had little success detecting them. We also were able to detect 267 taxa through metabarcoding, which included several other imperiled and listed species such as the federally endangered Rush Darter (*Etheostoma phytophilum*) and 18 other vertebrates listed as S1-S3 by the state, including even some terrestrial species. Overall, our results showed the need to analyze eDNA samples on both a fine and broad scale to maximize detections. It also supported previous work highlighting how samples taken outside of seasonal activity periods can report false negatives. From these results we can identify and target areas of high priority for conservation as well as potential threats to these imperiled species, like invasive species or point source pollution from concentrated animal feeding operations (CAFOs) both of which appeared extensively across our samples. Further work will continue to confirm positive detections in new streams and to assess long-term distribution changes in response to habitat connectivity and restoration efforts.

Abigail Wilkins and **Grover J. Brown,** Jacksonville State University. *"Ouacha" doin' here? Distribution and Abundance of the Invasive Ouachita Map Turtle (*Graptemys ouachitensis*) in the Coosa River*.

The genus *Graptemys* is composed of 14 species of map turtles, making the group the most speciose group in the United States. Most of these species are isolated to just a single river drainage. The Mobile River system is unique in that it has 3 species of map turtle: the Alabama map turtle (*Graptemys pulchra*), Northern map turtle (*G. geographica*), and black-knobbed sawback (*G. nigrinoda*). While the black-knobbed sawback and Northern map turtles are mostly allopatric, the Alabama map turtle can be found throughout most of the drainage. The species is undergoing evaluation for federal listing by the Endangered Species Act due to its similarity of appearance to the Pearl River map turtle. During surveys for this species in the upper Coosa watershed, we discovered a reproductive population of Ouachita map turtles, a species native to the Tennessee River drainage of Alabama, but not the to the Coosa River Drainage. We used capture-mark-resight surveys to estimate abundance and distribution of this species in the Coosa River drainage in Alabama. While the population seems confined between Weiss and Neely Henry reservoirs, we saw turtles of all age classes, and we recommend continued monitoring of this population.

Grover J. Brown, Jacksonville State University. **Todd W. Pierson,** Kennesaw State University. and **Peter A. Scott**, Eckerd College. *Clarifying the Murky Evolutionary History of Southeastern Mud Turtles (Genus Kinosternon) Using a Phylogenomic Approach*

The Southeastern United States is a well-known biodiversity hotspot for turtles. With the advances and affordability of high-throughput sequencing over the past 10 years, herpetologists

have discovered or described cryptic species and lineages of reptiles and amphibians in the Southeastern US, suggesting there is still much to learn in the region. Within turtles, the literature has demonstrated there are discrepancies in our understanding of turtle species in the US, with smaller turtle species often having larger gaps in their study. A case and point of this trend are exemplified by the mud turtles of the genus *Kinosternon*. These turtles are marked by their diminutive stature, and the genus is considered one of the top three least studied in North America. What's more is that the taxonomy of the group has been in flux for over forty years. We employed robust phylogenomic methods coupled with Bayesian analyses and species delimitation approaches to disentangle the evolutionary history of this group. We collected tissue from nearly 260 *Kinosternon* from all recognized taxa and subtaxa from Texas to the Florida Keys and up the Atlantic seaboard to Delaware to determine evolutionary relationships of these taxa. Our results found hidden lineages of some species across several states in the Southeastern US.

M. Worth Pugh (mwpugh@ua.edu), University of Alabama. *Digging Up the Past: Modernization and Digitization of the University of Alabama Herpetological Collection.*

Natural history collections are invaluable resources that scientists have used to describe the biodiversity, ecology and evolutionary biology of organisms. Museum specimens also serve as a set of permanent records that scientists can employ to infer historical distribution, occupancy/abundance and demography of declining or even relict populations of species. These data have proven integral to conservation management for a variety of taxa. The University of Alabama Herpetological Collection (UAHC) was created in the late 1940s by Ralph L. Chermock. Despite the significance and legacy of this collection, previous efforts to ensure the security of specimens and digitize their associated collection data have fallen short meaning obscure or erroneous collection data, misidentifications and outdated taxonomy are still common issues. Moreover, UAHC specimen data are not publicly available meaning it is difficult for interested parties (i.e., researchers, educators, natural history enthusiasts) to access this information. The UAHC received a collections improvement grant in 2023 to completely re-curate the collection as well as digitize and upload all collection data to biodiversity data aggregators (i.e., GBIF, iDigBio, VertNet). To date, we have quality checked and labeled >16,000 physical specimens (~90% of all holdings), georeferenced all collection localities and updated taxonomy. We have also uncovered novel records for a few Alabama species, a dense collection of material from field trips to Costa Rica in the early 1960s and some of the oldest Alabama specimens collected by H. P. Löding in the 1910s. The UAHC and other herpetological collections will be essential to future studies regarding the natural history of these organisms as well as efforts to effectively manage populations of vulnerable or rare taxa in a world of rapid environmental change. Although not often considered a priority, securing museum specimens and making their collection data available for use improves our ability to make informed

management decisions. Thus, it is important to continue to support natural history collections (e.g., time, expertise, funding) as we continue to expand our knowledge of the natural world.

Iwo P. Gross (ipg0004@auburn.edu) and **Matthew E. Wolak**, Auburn University. *Estimating population size and mating system dynamics of diamond-backed terrapins on Dauphin Island, Alabama*

Near-shore barrier island ecosystems are host to a unique and productive biodiversity that is nevertheless threatened by global change and human encroachment. It is crucial to periodically assess estuarine ecosystem health and function through regular monitoring of known keystone and sentinel estuary endemic species. Here, we summarize findings from a 5-year mark-recapture study of a diamond-backed terrapin population on Dauphin Island, AL. We sampled adult terrapins from May-August in 2019-2021 and again in September 2024 using modified aquatic fyke trap arrays. Population estimates using the Schnabel method indicate a small but stable terrapin population of 230 (95% CL: 196.2 to 278) adults on the island, with only a single confirmed mainland migrant captured across all years of study. We further discuss the necessity for continued monitoring of this population, in particular to quantify the effect of a recent 24-ha marshland restoration project on local and regional terrapin meta-population dynamics. Finally, we highlight our research group's study aims for this population, namely the assessment of mating system dynamics through the reconstruction of parent-offspring relationships based on whole-genome sequence data extracted from hatchling terrapins collected from natural nests. Considering recent evidence of how sexual conflict and skewed operational sex-ratios can shape mating systems and ultimately influence population extinction risk, quantification of mating system dynamics should be a priority when assessing the viability of depleted populations.

Francesca Erickson (fte0001@auburn.edu) and **James Godwin** Auburn University. *Conecuh National Forest Eastern Indigo Snake Monitoring Update*

The Eastern Indigo Snake was extirpated from Alabama in the late 1950's and was added to the Endangered Species List in 1978. A reintroduction program spearheaded by Auburn University began in 2010 and to date 284 individuals have been released into Conecuh National Forest (CNF). Systematic monitoring has been ongoing since 2019 in an effort to understand the status of the population, as monitoring is a crucial element of determining the success of reintroduction programs. In March 2022, 57 trail cameras with drift fences were deployed in CNF to increase monitoring efforts. In 2023, an additional ten cameras were deployed at four more sites throughout CNF. We will present preliminary data on this project, giving an overview of the approximately 580 indigo snake observations gathered so far, as well as a general summary of the observations of herptile species in CNF. We will use these data for future analysis in

abundance estimates, occupancy, and detection probability of the indigo snake population in CNF. Prior occupancy analyses indicate that low canopy cover and gopher tortoise burrows located on south-facing slopes influence gopher tortoise burrow use by indigo snakes in the winter, and with these new data we will be able to evaluate occupancy of microhabitats used by indigo snakes year-round. With these analyses we will be able to pinpoint areas of importance throughout CNF to further monitor for indigo snakes, as well as identify key habitat characteristics to manage for the indigo snake population's success.

Geoffrey Sorrell, Alabama Chapter of The Nature Conservancy. *More Than Just Dropping Matches, The Nature Conservancy's Fire Program in AL.*

The Nature Conservancy in AL prioritizes ecologically driven fire management as one of the principal activities required to maintain functional forest ecosystems across the state. While implementation is the most visible portion of a fire program, there are a variety of critical activities that support our programmatic goals. These include land protection, partnership building, training/education, and research facilitation. This talk will draw connections among these topics and how they result in a robust fire program.

Poster Presentations

Shelby F. Davis (sfd0019@auburn.edu) and **Wesley M. Anderson**, Auburn University. *Public Knowledge of and Interactions with the Alligator Snapping Turtle (Macrochelys temminckii)*

Public education about the alligator snapping turtle (*Macrochelys temminckii*) is instrumental to the conservation of the species. Public knowledge of *M. temminckii* is often limited, and the similarities between *M. temminckii* and the common snapping turtle (*Chelydra serpentina*) may make identification difficult to the untrained eye. In order to assess current knowledge and recent interactions with *M. temminckii*, we plan to administer two survey instruments to Alabamians. Residents of Alabama who participate in aquatic recreation will be surveyed on their previous knowledge of *M. temminckii*, as well as their interactions, if any, with the species. Participants will be asked to provide details of their experience with an alligator snapping turtle, including the condition of the turtle, the location where it was found, and how the participant chose to interact with the individual. Additionally, a separate survey will be administered to Alabama residents evaluating their ability to differentiate *M. temminckii* and the common snapping turtle (*Chelydra serpentina*) before and after viewing an identification information sheet. The sheet will include a comparison of the two species and close-ups of distinct features that differ between species. This will allow us to both assess public identification skills at large while also allowing us to examine the efficacy of our educational product. The surveys will be active from Fall 2024 to Winter 2025. The data collected from these surveys will be used to further develop educational resources on *M. temminckii* and help to inform educational efforts in general.

Fisher Parrish, **Ethan Jones** (ejones215184@troy.edu), and **Dr. Alvin Diamond**, Troy University. *Talking Turtles*

We initiated a mark–recapture survey of freshwater turtles in an isolated urban pond on the campus of Troy University in Pike County to establish a long-term monitoring program. Mullis Pond is a 1 ha man-made impoundment constructed in the 1950's that is spring fed and receives significant urban runoff. It drains into an unnamed tributary of Walnut Creek, the westernmost tributary within the upper Pea-Choctawhatchee River drainage system and lies adjacent to the Conecuh River watershed. We sampled from April 2024-September 2024 using funnel traps baited with cat food and peanut butter as well as basking floating traps. We documented two species of turtles: 28 individual Pond Sliders (Trachemys scripta) and 3 individuals of Common Snapping Turtles (Chelydra serpentina). Turtles were weighed, measured, marked by carapace notching, and photographed before being released back into the pond. A total of 47 turtles were captured over a span of 20 trap days. 14 were recaptures and 2 introduced from a nearby drained pond. The highest success was from hoop traps using peanut butter as bait. The sex ratio was 34 male/12 female with 1 juvenile that we could not determine. Mean carapace length was 6.87in for males and 8.47in for females. Weights ranged from 10oz-4lbs 8oz for males (mean 1.83lbs) and 1lb 13oz-20lbs 13oz for females (mean 4.71lbs).

McKae Sarkowski, **Iwo Gross,** Auburn University (ipg0004@auburn.edu), **Matthew Wolak,** Auburn University (mew0099@auburn.edu). *Sexual selection in the wild inferred using 3-D printed decoys and PIT-tags: male mate choice in yellow-bellied slider turtles (Trachemys scripta)*

Mate choice is central to sexual selection, and there is a lack of knowledge regarding male mate choice specifically, despite it being a driver of adaptive evolution and speciation. Mate choice studies have scarcely been conducted in turtles because of the difficulty of observing mating behaviors occurring in water. With developments in technology, observing potential patterns in male mate choice in freshwater turtles has become increasingly feasible. We hypothesize that male mate choice occurs due to female body size being associated with reproductive success. To reflect this, we are testing whether male yellow-bellied slider turtles (*Trachemys scripta*) prefer to interact with females of larger sizes when presented with two 3-D-printed female decoys of differing sizes. Each decoy is fixed with a passive integrated transponder (PIT) tag reader that records when previously PIT-tagged males approach either decoy within close range (<40cm). We predict that males will approach the larger decoy more frequently than the smaller decoy. By choosing a female of larger size, males should increase their reproductive success due to increased fitness being associated with body size. This novel approach to mate choice study offers a realistic context in which observing mating behaviors in the wild is feasible with conditions that are not traditionally ideal.

About Our Chapter

Alabama PARC, co-chaired by Andrew Cantrell and Derek Hauffe, is a chapter within Southeast PARC (SEPARC), co-chaired by Ericha Nix and Matthew Atkinson. For more information about SEPARC visit www.separc.org. ALAPARC's website is www.alaparc.org. National PARC's website is https://parcplace.org.

Thanks to Our Donors and Sponsors

Wehle Land Conservation Center Map

Please note the main areas for this meeting are denoted as the WLCC facilities area and the nature center/campground on the map.