INSTITUTIONAL PROFILE

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Herpetology at Stephen F. Austin State University

Stephen F. Austin State University (SFASU) is located in the city of Nacogdoches, Texas, USA, a rural college town of approximately 34,000 residents. Nacogdoches is the oldest town in the state and the "Garden Capitol of Texas" with the state's largest azalea garden, and considered the Top Small City in Texas according to *Cities Journal*. The city also has a variety of restaurants, shops, and a microbrewery in a pedestrian-friendly downtown. Outside of town are access to lakes available for swimming, fishing and boating activities. Nacogdoches is only a 90-minute drive to Shreveport, Louisiana, and two hours to Houston, Texas, the fourth largest city in the U.S., and a major center for commerce and entertainment.

SFASU is a residential campus that enrolls ~13,000 students each semester, and is notable for being the only university in Texas to have a College of Forestry. SFASU is also home to multiple natural areas and has nearly 28 ha of on-campus forest including the Pineywoods Native Plant Center, Ruby M. Mize Azalea Garden, and Tucker Woods. Nacogdoches is also a short to moderate drive to many state and national forests, which have or currently serve as study sites for SFASU faculty and students. These forested tracks include the Angelina National Forest, Davy Crockett National Forest, Sabine National Forest, and Big Thicket National Preserve, that amount to over 250,000 ha of quality habitat (Figs. 1 and 2). The Stephen F. Austin Experimental Forest (SFAEF; 1036 ha) and Alazan Bayou Wildlife Management Area (835 ha) are adjacent to one another and approximately 15 minutes from SFASU's campus. For those students interested in field-based research questions, the proximity of these latter two field sites to SFASU's campus are ideal. The SFAEF is under the jurisdiction of the U.S. Forest Service (USFS) with a cooperative agreement with SFASU in forestry experimentation, and is a protected parcel for experimental and field studies. All of these natural areas represent the western-most extent of the Gulf Coastal Plain, a unique ecosystem that has historically been comprised of a mix of fire maintained pine systems and hardwood forests in more mesic sites.

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The habitat within the West Gulf Coastal Plain has a diverse herpetofauna with 19 anuran species, 11 salamander species, one crocodilian species, 16 turtle species, 14 lizard species, and 34 snake species (Figs. 3 and 4). This includes a handful of state or federally protected species, including iconic species such as Alligator Snapping Turtles, Timber Rattlesnakes, and Louisiana Pine Snakes.

History of Herpetology at Stephen F. Austin State University

Stephen F. Austin State University was founded in 1923 and has had a number of faculty members with research foci on the biology of amphibians and reptiles. Harold McDonald was a physiologist primarily studying snakes in the 1970s. Frederick Rainwater and Robert Fleet also began their careers in the mid-1970s and focused on the ecology and natural history of reptiles and amphibians. More recent past faculty included Lance McBrayer (lizard functional morphology and physiology), Terry Jones (paleontology and ecology), Michael Keck (snake ecology), and D. Craig Rudolph (snake ecology and conservation).

SFASU Facilities

The resources available at Stephen F. Austin State University are attractive to students who are interested in herpetology. Facilities include greenhouses, an electron microscope suite, a soil, plant and water analysis lab, molecular genetics laboratories, a stable isotope sample preparation lab, Geographic Information Systems (GIS) Laboratories, as well as field and laboratory space to set up experimental ponds/mesocosms or conduct laboratory experiments. The herpetology collection at the Stephen F. Austin Vertebrate Natural History Museum maintains over 5,000 accessioned specimens with strong regional representation from East Texas, as well as separate teaching collections.

Research and Academic Programs

The Department of Biology offers B.S. degrees with tracks in Botany, Cellular & Molecular Biology, and Ecology & Evolutionary Biology. Graduate students in the biology department can pursue M.S. degrees in either Biology or Biotechnology. The

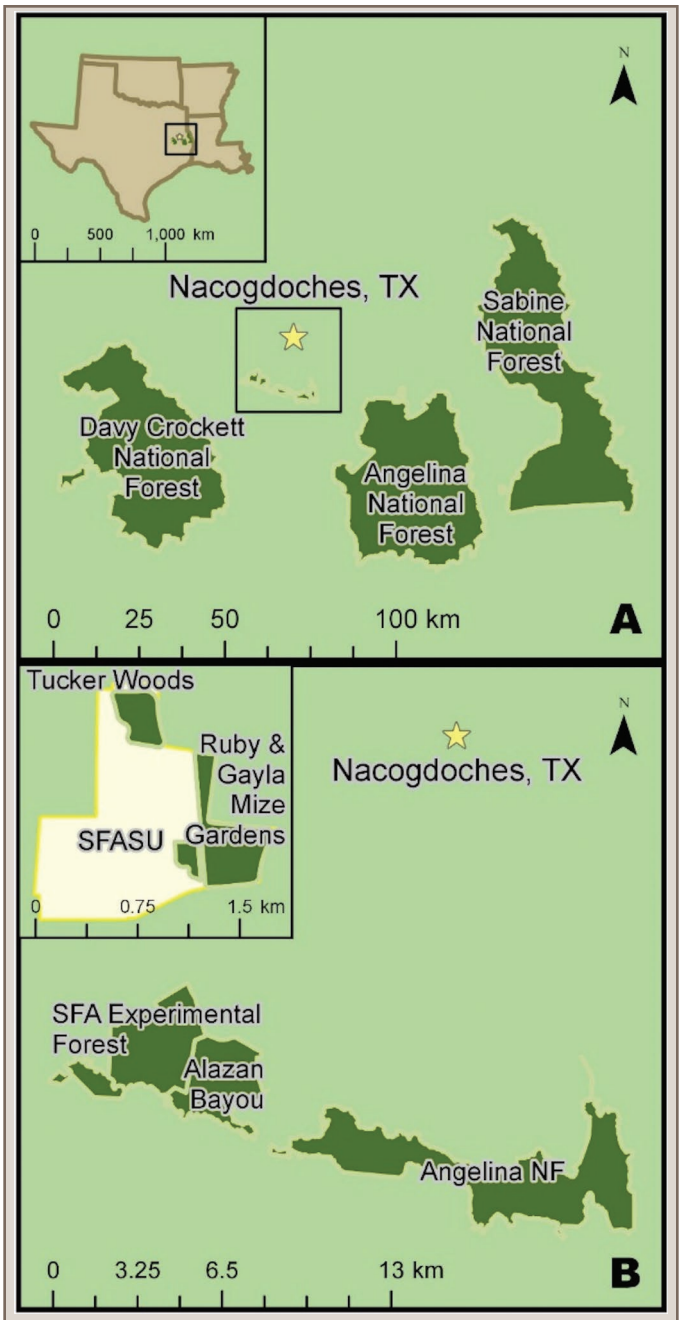

Fig. 1. Stephen F. Austin State University (SFASU), located Nacogdoches, Texas, is close to a number of natural areas that serve as study sites for faculty and students. Panel A indicates the boundaries of the Davy Crockett, Angelina, and Sabine national forests. Panel B (enlargement of inset in [A]) indicates the Stephen F. Austin Experimental Forest, Alazan Bayou, and Angelina National Forest, with the detailed inset showing Tucker Woods and the Ruby and Gayla Mize Gardens as part of SFASU's campus.

PHOTO BY C. S. ADAMS

Fig. 2. A box trap array used to survey for snakes in a forest savannah.

Arthur Temple College of Forestry and Agriculture (ATCOFA) offers B.S. degrees in Forestry with concentrations in Forest Wildlife Management, Forest Management, Agroforestry, Fire Management, Urban Forestry, and Human Dimensions of Forestry, as well as B.S. degrees in Environmental Science, Spatial Science, and Animal Science. Graduate students in ATCOFA can pursue M.S. degrees in Forestry or Environmental Science, and a Ph.D. in Forestry. As illustrated in the following descriptions of specific lab groups, researchers and students have interests that range across population and community ecology, conservation biology, freshwater ecology, forest ecology and forestry, animal behavior, wildlife ecology and management, and spatial sciences.

Associated with SFA's campus is the Research Work Unit of the Southern Research Station (SRS-4159 — Ecology and Management of Southern Pines) is located in the Wildlife Habitat and Silviculture Laboratory of the USFS. The unit focuses on the development of management guidelines for the production of both timber and wildlife in upland and riparian forests. Research topics of special interest to SRS-4159 include the following: (1) improving the understanding of the ecology of southern pine-dominated forest ecosystems; (2) the evaluation and synthesis of the influence of regional, continental, and global forcing factors on pine-dominated forest ecosystems in the South; and (3) the development of knowledge about the effects of forest management, insect pests, and climate change on wildlife and wildlife habitat in southern pine-dominated ecosystems.

Faculty Research Programs

Matthew A. Kwiatkowski (Professor, Department of Biology)—Matt's research focuses on conservation and behavioral ecology, and sexual selection of reptiles and amphibians. Spatial ecology is often incorporated, such as work addressing translocation of herpetofauna and the effects of anthropogenic changes to streams on movement in Razorback Musk Turtles. Research in Matt's lab often involves collaboration with the USFS to investigate conservation concerns among amphibians in the region, and phenotypically plastic responses to potential predators. Matt continues work on the evolution of potential visual signals, with projects concerning facial stripes in snakes and color patterns in anurans. The most recent work in Matt's lab bridges conservation ecology and sexual selection, investigating effects of anthropogenic light and noise on anuran mating behavior. (website: https://kwiatlab.weebly.com/)

Stephen J. Mullin (Professor and Chair, Department of Biology)—Questions addressed by members of Steve's lab group tend to draw on concepts in behavioral and community ecology. Steve is particularly interested in predator-prey relationships, especially those involving some sort of novelty (i.e., a species

PHOTO BY J. D. CHILDRESS

Fig. 3. A Gulf Coast Toad (*Incilius nebulifer*) from East Texas.

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Fig. 4. A Western Mud Snake (*Farancia abacura*) from East Texas.

introduction or removal, or a behavioral response to habitat alteration). Although he has worked with amphibians and turtles, most of his research projects involve at least one species of snake. Currently, Steve is also the Editor of *Herpetologica*. (website: https://mullinlab.weebly.com/)

Daniel Saenz (Research Wildlife Biologist, Southern Research Station U.S. Forest Service and Adjunct Faculty, Department of Biology and ATCOFA)—Dan's research program fits into three main categories: 1) Factors contributing to amphibian decline, including land-use dynamics and forest management practices, invasive species, climate change, and disease; 2) Effects of forest management on animal communities; and 3) Ecology and conservation of threatened and endangered species. Dan is the Scientist in Charge of SFAEF and is an Associate Editor for *Herpetological Review*.

Christopher M. Schalk (Assistant Professor, ATCOFA)—Questions of a fundamental nature addressed by Chris and his lab group tend to draw on concepts in community ecology. He is particularly interested in understanding the underlying mechanisms of community assembly using functional traits, stable isotopes and experiments, particularly in organisms with complex life cycles. Applied questions in Chris' lab focus on road ecology, such as identifying correlates of road crossing activity or designing mitigation strategies. Chris has primarily worked with amphibians, although past and current projects also involve(d) snakes, lizards, and fishes. Currently, Chris is also an Associate Editor of *Herpetological Review*. (e-mail: schalkc@sfasu.edu; website: https://cmschalk.weebly.com/)

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