

NSRL NEWS

Volume 13, Spring 2026



**NATURAL SCIENCE
RESEARCH LABORATORY**
TEXAS TECH



Research Highlight: African Baobabs and Bats

by Macy Krishnamoorthy, PhD

I recently graduated from Texas Tech University, having earned my PhD working with Drs. Richard Stevens and Robert Bradley. My dissertation took me halfway around the world to rural South Africa and Kenya, where I studied African bats and baobab reproductive ecology, and I utilized museum collections to understand how bat assemblages change over an elevation gradient in eastern Africa.



Macy Krishnamoorthy holding an Egyptian fruit bat (*Rousettus aegyptiacus*)

Baobabs (*Adansonia digitata*) are large, iconic, and long-lived fruiting trees that occur in arid and semi-arid regions across sub-Saharan Africa, and they are primarily bat-pollinated trees. However, various species of hawkmoths (family Sphingidae) also are known to play a substantive pollinating role.

During the planning stages of my first field season, I collaborated with Dr. Sarah Venter, a baobab reproductive ecologist. Her research had suggested that bats did not visit baobabs in South Africa. To test this hypothesis, a citizen-

science project was organized to assess what animals were visiting baobab trees. The results demonstrated that not a single bat visited baobabs in South Africa during the study, although they were present in the area. So our next question was, why don't bats visit baobab trees in the study area? Subsequent to my field season, Dr. Venter's research showed that the scents emitted by flowers of southern baobabs attract hawkmoths, whereas flowers of baobabs in Tanzania emit compounds that attract fruit bats. Although baobabs in southern Africa appear to be pollinated only by hawkmoths,



Baobab Blitz



Hosted by:



What is pollinating baobab flowers?

Bet you thought it was bats, but did you know that scientists have never seen bats visiting baobab flowers in Southern Africa?

We need your help to find out!

If you have a baobab tree on your farm or in your garden, please register and help us find out.

Baobabs have flowers that are big, white and open at night. They can either be pollinated by bats or hawk-moths. Bats have been seen pollinating baobab flowers in East and West Africa, but never been seen pollinating baobab flowers in Southern Africa.

Baobab trees in our area flower from October to December each year. The peak flowering season is in November.

Do you have a favourite baobab tree?

How about spending a fun evening (with friends and family), watching its flowers open and at the same time help us collect information on what is visiting the flowers.



What you need to do:

When: 18 and 19 November 2016 (do one or both nights).

Where: Any baobab tree in Limpopo (Allday's, Vivo, Waterpoort, Mopani, Musina, Tshipise, Pafuri).

How: Sit under one baobab tree from 6pm to 12pm and record what is coming to the flowers.

Register: Send us an e-mail, WhatsApp, Facebook message or SMS so that we can send you a registration and information pack.

Contact details:

Email: cath@vhembecosphere.org WhatsApp/SMS: 071 116 6967

Facebook: Baobab Blitz Website: www.vhembecosphere.org

More information can be found on our website and facebook site



Poster soliciting volunteers to document wildlife visits to baobabs.

both hawkmoths and fruit bats occur throughout the entire range of baobabs. And in fact, in eastern and western Africa where bats are the primary pollinators, hawkmoths also may visit flowers of baobabs. The question I set out to address was “what characteristics make a more effective (i.e., ‘better’) pollinator?”

The first chapter of my dissertation examined some of the functional differences between fruit bats and hawkmoths in their roles as pollinators and their impacts on plant reproductive success. Baobab reproductive success is the term used for quantifying whether or not a tree produces fruit and if so, how much fruit it produces. Fruit bats are larger than hawkmoths, so they should be able to fly greater distances each night while they forage, and they have more surface area on their body to carry pollen. Further, because fruit bats can fly greater distances, they can connect more distant—and perhaps genetically dissimilar—baobabs and potentially visit more baobabs in one night than a hawkmoth. Starting in December 2016, I spent a month and a half in northern Limpopo Province in South Africa, performing a series of hand-pollination experiments that manipulated how much pollen was applied to each flower, the number of pollen donors (how many individual baobabs contributed pollen to one flower), and the distance between pollen donors and specific baobabs. The results showed that the amount of pollen deposited was important, where an increased number of pollen grains increased the number of seeds per fruit and overall fruit size. This suggested that baobabs are pollen-limited and would rely on pollinators that are able to carry and deposit adequate amounts of pollen.

In my second dissertation chapter, my study of baobab reproductive success expanded from pollen manipulations to investigating optimal foraging theory, specifically in the context of how fruit bats might perceive their landscapes. This project took place in south-central Kenya with Dr. Paul Webala. Although all baobabs have monoecious flowers, meaning that each flower is composed of both male (anthers)

and female (stigma and ovules) portions, not all baobabs produce fruit. There is often a marked disparity in reproductive success, so much so that baobabs are categorized as either ‘good producers’ or ‘poor producers.’ It has not been readily clear why some baobabs are good producers and why others are poor producers, especially since both types are intermixed in the landscape. Soil characteristics nor climate nor flower morphology explain differences in fruiting success, but pollinator foraging behavior might. This research was published in the journal *Landscape Ecology* (Krishnamoorthy, MA, Webala, PW, and Kingston, T. 2022. Baobab fruiting is driven by scale-dependent mediation of plant size and landscape features. *Landscape Ecology* 37:1615–1631. <https://doi.org/10.1007/s10980-022-01435-7>).

How fruit bats perceive their landscape and make decisions about their nightly movements may be characterized by Circe’s Principle, where human-introduced food sources that do not naturally occur on the landscape can interfere with pollinating interactions between native species. Alternatively, fruit bats might be attracted to particular areas because of human-introduced food resources rather than spend time visiting baobab flowers. My research showed that intrinsic tree characteristics, such as girth at breast height or overall tree height, were most important in predicting whether a baobab would produce fruit at all. However, baobabs that were closer to human-introduced fruit trees (e.g., pawpaw) also were more likely to produce fruit, presumably because bats were more attracted to the area. Further, whether or not a baobab produced few or many fruits was dependent primarily on land use surrounding the tree, where baobabs in areas cleared of other vegetation, on farmland, or along a roadway were more likely to produce many fruits. This is likely due to an increase in nutrients on farms where fertilization occurs or along roadways in farming areas, where fertilizers are spread by run-off during wet seasons. Total height also was an important factor in baobab fruit production, where taller trees produced more fruit. Thus, there is likely a maturity threshold in baobabs, where larger trees are more likely both to produce fruit and to produce a larger number of fruits.



An open baobab flower with tree tag to mark the flower from a hand pollination experiment in South Africa.

The third research project that stemmed from my dissertation examined the structure of bat assemblages along an elevation gradient in western Kenya and eastern Uganda. This project was made possible using voucher specimens from museums worldwide, including the NSRL Mammal Collection. Ecosystem resilience can be evaluated in terms of taxonomic, functional, and/or phylogenetic diversities. These three measures of diversity were assessed along the elevation gradient for taxonomic levels of increasing scope (e.g., species, genera, and families, altogether referred to as ‘taxonomic units’). At broader taxonomic levels (i.e., moving from species to family), overall metrics of diversity decreased, emphasizing the need for taxonomic accuracy in African bat lineages. The effect of losing taxonomic clarity

is evident because diversity—whether taxonomic, functional, or phylogenetic—became increasingly driven by nestedness (i.e., as elevation increases, taxa are filtered out from the landscape). Although the number of taxonomic units linearly decreased as elevation increased, phylogenetic and functional diversity were maintained across the elevation gradient. However, phylogenetic diversity and functional diversity are maintained by different mechanisms; phylogenetic diversity is maintained by turnover (as elevation increases, taxa are replaced by other, similar, taxa), whereas functional diversity is maintained by nestedness, so all metrics of diversity remain important to consider.

In the face of changing climates, it is important to sample natural areas and to create a record of what is present. For many bat species, insufficient genetic data are available and taxonomic clarity is often lacking. Natural history collections are vital to preserving a record of the natural world as well as serving as repositories for specimens to be used in taxonomic resolution.



A Wahlberg's Epuletted Fruit Bat (Epomophorus wahlbergi), one of the pollinators of baobabs.

NSRL Travel Trunk Visits Area Schools

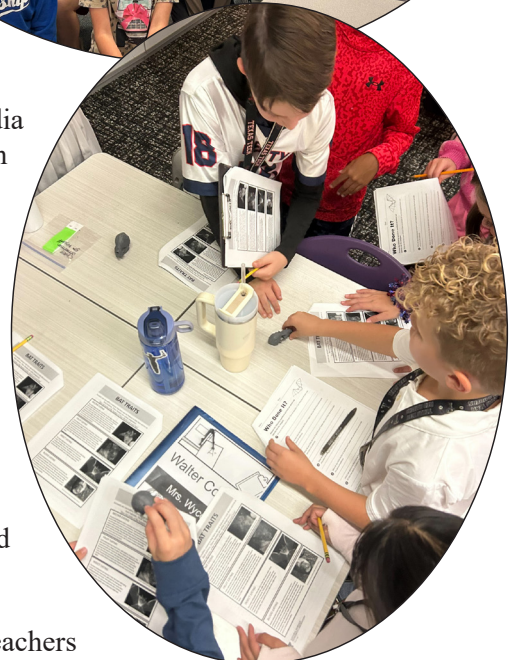
As part of the NSRL's Outreach and Engagement efforts, an educational "Travel Trunk" focusing on animal adaptations, with bats as an example, recently was created. The materials in the trunk include a 60-minute Lesson Plan based on several TEKS (Texas Essential Knowledge and Skills) science standards for Grades 3 through 6, as well as SEP (Science and Engineering Practice) and CCC (Common Core State Standard) criteria.

The lesson is designed to help students recognize variation in skull morphology of various bat species and the correlation with their unique feeding strategies (insectivorous, nectar-feeding, fruit-eating, and blood-eating). The trunk includes 3D-printed bat skulls at life-size and at 3x size that the students can handle and closely examine.

Undergraduate student Emmalee Balch, who handles the NSRL's social media accounts, was instrumental in creating the Travel Trunk, which was based on an earlier concept drafted by Robert Bradley and Lisa Bradley. Upon completing the Trunk, Emmalee contacted STEM teachers across Lubbock and Frenship ISDs about visiting their classrooms to demonstrate the Trunk lesson. In the Fall of 2025, Emmalee presented the trunk to a total of 15 classes (4th and 5th grade) at five schools, reaching about 350 students. For this effort, Emmalee received credit for her required undergraduate internship hours in Natural Resources Management.

The Bat Travel Trunk was very well-received in classes by both the teachers and the students. Teachers consistently noted its value in supplementing their lessons on animal adaptations. The hands-on components sparked curiosity and engagement among students as they explored biological concepts.

The NSRL is excited about the prospect of making this trunk available to teachers for use in their classrooms.

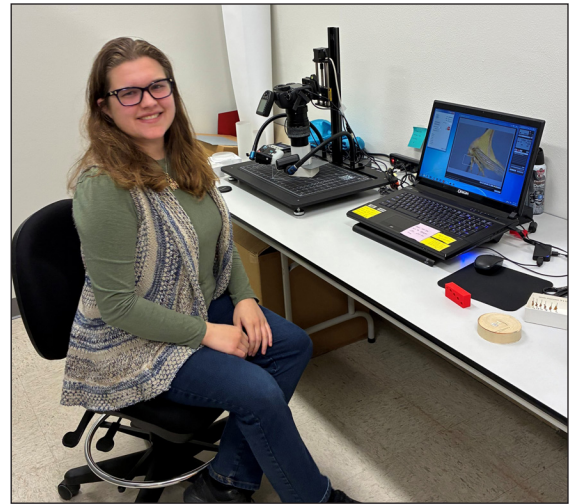


Digitization of the Treehopper Collection

by Elizabeth Carlson, Master's Student, Heritage and Museum Sciences

In the fall semester of 2025, I began my Master's at Texas Tech in the Heritage and Museum Sciences Program. During this time, I started volunteering within the Invertebrate Zoology Collection (ICZ) of the NSRL to digitize the treehopper (Membracidae) collection. Treehoppers are an extremely diverse group of tiny true bugs, some of which are known for having an enlarged and exaggerated prothorax, which helps them blend into their surroundings. Some treehoppers mimic thorns, twigs, ants, and even beetles. I chose this group to work on because of an internship I had as an undergraduate at the American Museum of Natural History. For a whole summer, I was mesmerized by these insects and I was excited to be able to continue working with them in Lubbock.

When I first started working on the collection, most of the individuals had not been touched since the 1970s and needed to be digitized. Three out of the four drawers had been identified to the species or genus level, but they were out of alphabetical order and needed to be rearranged. Also, the miscellaneous drawer needed to be organized by grouping similar morpho-species together instead of having them all spread randomly throughout the drawer. Last fall, I spent much of my free time outside of class entering the treehoppers' collecting information into [Ecdysis](#), the platform we use for managing the IZC's data. For each specimen, I recorded its locality information, date of collection, and collector, in addition to adding a label with a catalog number. Each of the collecting localities was georeferenced using Google Maps to approximate the GPS coordinates of each site. I also took time to check any previously databased specimens, making sure that the information was complete and accurate. In total, the IZC now has 1,588 databased individuals in the treehopper collection, and all the associated information is openly available online.



Elizabeth Carlson with the IZC's imaging equipment as she photographs a treehopper specimen.

After I finished entering data into Ecdysis, I began imaging specimens, one from each identified species or genus, so that photographs of representative specimens also can be publicly available online. For each representative specimen, I took images from three different views (dorsal, lateral, and head), using the macro photography equipment in the IZC. We use the photo-stacking technique, in which for each view multiple images are taken at different focal distances. Then focus stacking software is used to compile all the images into a single crisp, high-quality image. Finally, I uploaded these images to their corresponding records in Ecdysis so the collection can have at least one representative specimen imaged per species. I printed and placed new header labels for the previously identified species and genera to finish the recuration process.

Volunteering in the collection has taught me many new and important skills in collections management. By georeferencing localities, I learned more about the geography of Texas and Mexico, where most treehoppers were collected. I also learned how to work with a specialized databasing system for natural history collections, which I had never used before. A third important skill I learned is how to use macrophotography equipment and photo stacking software to create high-resolution images of tiny specimens. This work was presented at the Southwestern Branch meeting of the Entomological Society of America in March, where I placed third in the Masters Poster Competition.



*High-resolution photographs of the head (frontal view) and body (lateral view) of a treehopper specimen of the genus *Cyphonia* from Ecuador (TTU-Z_364883, Invertebrate Zoology Collection).*

NSRL Launches New Undergraduate Training Pilot Program

The NSRL is excited to announce the launch of a new program designed to train undergraduate students in natural history collection management. In partnership with the Department of Natural Resources Management, this program allows students to fulfill their internship credit requirements while gaining meaningful, hands-on experience in both fieldwork and museum practices.

The curriculum introduces students to the full spectrum of natural history collection work. Participants prepare field supplies, collect and record field data, acquire specimens from the wild, and prepare those specimens as scientific vouchers. Students learn multiple preparation techniques—including skinning, skeletonizing, and preserving tissue

samples for genetic research—ensuring they understand each step of the scientific collection process.

Beyond field and lab work, students also explore what happens after specimens arrive at the NSRL. They gain exposure to essential collection management concepts such as preventive conservation, record keeping, the extended specimen framework, and the core qualities of museum data: accuracy, consistency, and completeness.

Everyone at the NSRL is enthusiastic about this new initiative. The first group of interns, pictured below, completed their internships in Spring 2026, and everyone agrees it was a great success that benefited both the students and the NSRL.



Intern Grace Wagner



Intern Savannah Davidson



Intern Xavier Hutson

Graduate Student Highlight

Lee Harris is a master's student in the Heritage and Museum Sciences (HMS) Program at the Museum at Texas Tech. Lee started the HMS program in the fall of 2024 and has now completed most of his coursework and has passed his comprehensive exam. During his time in the program, Lee has been working in the Invertebrate Zoology Collection (IZC) at the NSRL, in charge of digitizing (entering data as well as taking high-resolution photographs) the voucher specimens that the IZC has been receiving from the Arthropod Biodiversity of the Davis Mountains Preserve project. With most coursework completed, as part of his academic program, Lee is now the first natural history intern of the NSRL from the Museum Science program. This one-year-long, hands-on experience will allow Lee to further develop skills for his professional career.

Lee attributes his interest in entomology to his involvement in the Texas FFA (Future Farmers of America), where learning to distinguish the subtle differences in insects for the identification portion of the [Entomology Career Development Event](#) contest first sparked his fascination. He earned his undergraduate degree in Wildlife Sustainability at Tarleton State University. Through his experiences, he has come to recognize the role museums can play in bridging the gap between the public and important conversations on environmental conservation. During his internship, he hopes to apply this perspective by showcasing the importance of insect diversity through an exhibit accompanied by educational content.



NSRL CURATORS



richard.stevens@ttu.edu

Dr. Richard D. Stevens is Interim Director of the NSRL, Curator of Mammals, and Professor of Natural Resources Management. He is a bat and rodent community ecologist, macroecologist, and biogeographer. His lab conducts collections-based ecological work in Paraguay, Colombia, Mojave Desert, and Texas. He currently is advising 7 PhD students and 3 MS students.



caleb.phillips@ttu.edu

Dr. Caleb D. Phillips is Interim Assistant Director of the NSRL, Curator of Genetic Resources, and Associate Professor of Biological Sciences. His lab studies how people's genetic uniqueness influences the composition of their chronic wound microbiomes and determines healing outcomes. This research utilizes the Wolcott Wound Care Research Collection, a part of the NSRL GRC. He currently is advising 2 PhD students.



nancy.mcintyre@ttu.edu

Dr. Nancy McIntyre is the Curator of Birds and Professor of Biological Sciences. She is a landscape ecologist whose research focuses on how land conversion and climate change are fragmenting migratory habitats for wildlife in the Great Plains of North America. She currently is advising 1 PhD and 1 MS student.



jennifer.giron@ttu.edu

Dr. Jennifer Girón is the Curator of Invertebrate Zoology. She handles loan and data requests, organizes and processes incoming specimens, and manages the specimen database hosted in the Symbiota ecdysis portal. She also trains and supervises students and volunteers working in the collection, performs outreach and engagement activities, and conducts research on beetle biodiversity.



j.salazar-bravo@ttu.edu

Dr. Jorge Salazar-Bravo is an Assistant Curator of Mammals and Professor of Biological Sciences. He is an organismal biologist interested in understanding the origins, maintenance, and current threats to biological diversity in various groups of mammals. He currently is advising 3 PhD students and 1 MS student.



heath.garner@ttu.edu

Heath Garner is the Curator of Collections. His role is to facilitate the daily operations and maintenance of the NSRL collections. His duties include processing, tracking, and cataloging specimens, processing loans, training and supervising student workers and volunteers, documentation of data and collection activities, and preventative conservation of the collections.

NSRL CURATORS (CONT.)



joseph.manthey@ttu.edu

Dr. Joseph D. Manthey is an Assistant Curator of Birds and Associate Professor of Biological Sciences. His research group uses a combination of fieldwork, specimens, ecological data, genomics, and bioinformatics to study how organisms (mostly birds) evolve across both geographic and genomic landscapes.



robert.bradley@ttu.edu

Dr. Robert D. Bradley is Director Emeritus of the NSRL, Curator Emeritus of Mammals, and Professor Emeritus of Biological Sciences. He is also currently serving as Special Assistant to the President of TTU. Dr. Bradley's research foci are systematics and molecular evolution of New World rodents; hybridization; infectious zoonotic diseases; and natural history of mammals. He currently is advising 2 MS students.

NSRL STAFF



kathy.macdonald@ttu.edu

Kathy MacDonald is the Collections Manager for the Genetic Resources Collection. Her primary duties include the organization and processing of incoming samples and the subsampling and processing of loans. Other duties include assisting with specimen tracking in the collections and data management and design.



heidi.stevens@ttu.edu

Heidi Amarilla-Stevens is the Collections Manager for the Mammal Collection. Her duties include assisting in all aspects of the specimen curation process, as well as preparing loans, student training, and databasing. She also conducts research on improving curatorial practices for the long-term care of collections of natural history specimens and tissues.



lisa.bradley@ttu.edu

Lisa Bradley is the Production Editor for Occasional Papers and Special Publications. Her duties include coordinating the review and revision process, copy editing, and final layout and design. She also assists in the writing and editing of scientific articles and books by NSRL staff, preparation of grant proposals, development of NSRL exhibits for the Museum, and maintenance of the NSRL website.



hendra.sihaloho@ttu.edu

Dr. Hendra F. Sihaloho is the NSRL Outreach and Engagement Coordinator. He develops outreach materials for high school students and teachers, using data from the NSRL's collections to promote learning and scientific inquiry. Through these initiatives, he will bridge museum research and classroom learning, enabling students to engage directly with primary data and experience the practices of real-world science.

FACULTY AND STAFF GRANTS (active 2025)

Boal, C. W., R. D. Stevens, and C. Villalobos. Assessing Texas Kangaroo Rat habitat connectivity, management, and monitoring protocols. Texas Parks and Wildlife Department.

Dowler, R. C., and R. D. Stevens. Survey of the hooded skunk in the Chihuahuan Desert ecoregion of Texas. Texas Comptroller's Office.

Griffis-Kyle, K., and N. McIntyre. Tinajas: Wildlife connectivity in a changing environment. Department of Interior – National Park Service Southwest Border Resource Protection Program.

Hardy, D., and R. D. Bradley. Geographic distribution of prion disease infection and susceptibility in North American deer species. The CH Foundation.

Karamysheva, Z., and J. Salazar-Bravo. Ribosome remodeling as a mechanism of translational control during stress. National Institutes of Health.

Kingston, T. (subaward). PiPP (Predictive Intelligence for Pandemic Prevention) Phase II. National Science Foundation.

Kingston, T. Protecting cave roosting bats in Southeast Asia – SEABCRU Workshop. Bat Conservation International.

Kingston, T. Scholar Rescue Fund, Hosting Agreement Support for Dr. Moe Moe Aung. Institute of International Education.

Kingston, T., L. Dávalos, A. Rasmussen, and S. Anthony. Collaborative Research: Integrated mechanisms of environment host-virome interactions. National Science Foundation.

Kingston, T., L. Dávalos, N. Simmons, and S. Tsang. Collaborative: AccelNet: The Global Union of Bat Diversity Networks (GBatNet): Bats as a model for understanding global vertebrate diversification and sustainability. National Science Foundation.

Longing, S., B. Kelly, N. E. McIntyre, A. Laubmeier, and A. Pan. Advancing biodiversity research to support transdisciplinary conservation innovation

in Texas' ecosystems. Texas Tech University, Grand Challenge Catalyst Grant Program.

Manthey, J. Landscape genomics of co-evolution: a test in carpenter ants (genus *Camponotus*) and their microbial symbionts. National Science Foundation.

Manthey, J., C. D. Phillips, and R. D. Bradley. Morphology, landscape genomics and effective population size of the Palo Duro Mouse, *Peromyscus truei comanche*. USFWS and Texas Parks and Wildlife Department.

McIntyre, N. E. Incorporating environmental data to refine the classification and understanding of the mechanisms behind encroachment of a woody species in the Southern Great Plains (USA). TTU Office of Research Development and Communications

Ray, D. A. Ecuadorian bats: A key to investigating aging and metabolic trade-offs based on feeding habits and transposable element evolution. Paratus Sciences Corporation.

Stevens, R. D. Anthropogenic risk assessment of bat species of greatest conservation need in Texas. Texas Comptroller's Office.

Stevens, R. D. Conservation management of bat Species of Greatest Conservation Need in the Trans-Pecos of Texas. Texas Comptroller of Public Accounts.

Stevens, R. D. Use of highway structures by bats in East Texas: Inventory of bats and assessment of relative contributions of characteristics of landscape, habitat and highway structures in determining day-roost utilization. Texas Department of Transportation.

Stevens, R. D., and R. D. Bradley. Digitization PEN: BatPEN!-A partnership to facilitate scientific inquiry into the vast functional trait diversity of phyllostomid bats. National Science Foundation.

Stevens, R. D., others, and R. D. Bradley. Collaborative Research: Ranges: Building capacity to extend mammal specimens from Western North America. National Science Foundation.

NSRL COLLECTIONS - SUMMARY AND STATISTICS

The Natural Science Research Laboratory (NSRL) is a division of the Museum of Texas Tech University that archives biological samples and their associated data. These collections serve as a library of our natural heritage for education and research purposes. Natural history collections provide the foundation for our understanding of biodiversity. They serve as a historical reference for documenting changes in our environment and the effects of those changes on wildlife and, ultimately, on humans.

The collections maintained by the NSRL are available to researchers at academic, scientific, and government institutions around the world for scientific investigation, discovery, and problem-solving in the natural sciences. The causes and/or effects of animal-borne diseases, environmental pollutants, parasites, climate change, habitat loss, geographic isolation, and natural evolutionary processes and speciation are just a few examples of the investigations that can be conducted utilizing specimens and tissues archived in a natural history collection. Further, the resources of the NSRL are utilized by the academic and scientific communities to train and educate students at the undergraduate and graduate levels for careers in the natural sciences as well as museum science.

Mammal Collection



The Mammal Collection currently contains 160,718 cataloged specimens of an estimated 1,442 species. Specimen preparation types include preserved skins, skeletal materials, alcohol-preserved specimens, and taxidermy mounts. In 2025, the Mammal Collection cataloged 1,587 specimens and granted 1 loan of 10 specimens.

Bird Collection



The Bird Collection currently contains 6,107 cataloged specimens, as well as eggs and nests, of 858 species. In 2025, the Bird Collection cataloged 6 newly acquired specimens and granted 5 loans totaling 74 specimens.

Invertebrate Zoology Collection



The Invertebrate Zoology Collection contains an estimated 4.6 million specimens. These include insects, crustacea, endo- and ectoparasites, arachnids, and other groups. Specimen preservation methods include dried, fluid, slide-mounted, and frozen. In 2025, the collection cataloged 9,575 specimens and granted 3 loans totaling 42 specimens.

Genetic Resources Collection



The Genetic Resources Collection contains ~478,000 samples of tissues, blood, and extracted DNA from >100,000 specimens of mammals and other taxa. In 2025, the GRC granted 18 loans totaling 112 samples. The Collection incorporated 4,908 new samples obtained from 1,204 individuals.

As a whole, the NSRL hosted 190 visitors and volunteers in 2025, including researchers utilizing the collections, students taking classes, individuals and groups on tours, and volunteers assisting in the collections. The NSRL also filled 91 information requests. The NSRL employed 18 TTU students (5 graduate, 13 undergraduate) and 1 high school student during 2025.

OUTREACH AND ENGAGEMENT

Below are a few examples of the numerous events hosted or attended, presentations and tours given, and other opportunities during which the NSRL engaged with the public and the scientific community last year.

March — Dr. Jennifer Girón was a guest speaker at the March meeting of the Texas Master Naturalist Program, South Plains Chapter, where she presented a general introduction to invertebrates, particularly insects, of the region.

March — Dr. Richard Stevens presented a talk entitled "Diversidad y composición de murciélagos de la Reserva Natural Limoy (Diversity and composition of bats in the Limoy Natural Reserve)" at the Second Paraguayan Congress of Zoology in Asuncion, Paraguay.

April — Dr. Caleb Phillips was invited to present a talk at the Savannah River Ecology Lab Seminar, entitled "Patient genomic determinants of chronic wound microbiome composition and healing."

May — Heath Garner, Heidi Stevens, and Dr. Jennifer Girón attended the annual meeting of the Society for the Preservation of Natural History Collections, where Heath presented a talk, co-authored by Sally Shelton of the Museum, entitled "The Heritage and Museum Sciences Graduate Program at Texas Tech University: A Natural History Museum Professional Training Network." The presentation highlighted the success of graduates throughout the years of the Museum's MS program in Heritage and Museum Sciences in natural science careers (mammalogy, ornithology, herpetology, invertebrate biology, vertebrate paleontology, geosciences, anthropology, and archaeology/zooarchaeology).

June — Dr. Scott Longing and Dr. Jennifer Girón led a workshop for FFA Entomology teachers at the TTU Junction campus; Dr. Girón also instructed students of Zapata ISD during their Entomology Summer Camp.

June — Dr. Jorge Salazar-Bravo presented 2 papers on behalf of his students at the meeting of the American Society of Mammalogists, entitled "Patterns of



Dr. Jennifer Girón delivering a talk remotely about insects to 5th graders at Zapata ISD

diversity and distribution of non-volant small mammal communities in the Andean páramos" (Susana Revlollo-Cadima) and "Disparate diversification patterns in two genera of co-distributed South American grassland rodents" (Ariel Bellatin).

July — Dr. Girón was an instructor of a weevil course at the Southwestern Research Station in Portal, Arizona, that trained 17 students on weevil anatomy and identification.



Group of instructors and students of the Weevil Course 2025 at the Southwestern Research Station, Portal, AZ.

OUTREACH AND ENGAGEMENT (CONT.)

September — Md Ashraf Ul Hasan, PhD student of Dr. Tigga Kingston, led a team in running a booth at an interdisciplinary conference in Bangladesh aimed at understanding how university students, faculty members, and researchers from diverse backgrounds perceived bats and their role in ecosystems. Through guided conversations and pre- and post-surveys, the team engaged more than 100 participants, addressed persistent myths, improved basic knowledge about bats, and distributed over 100 native tree saplings to promote future roosting habitats. The results demonstrate that well-designed science communication efforts can improve understanding of bats and contribute to long-term bat conservation by promoting positive attitudes and local stewardship.



NSRL tables at Dino Day 2025



October — Dr. Jennifer Girón organized the Annual Weevil Workers Meeting, bringing together about 70 people from all over the world to hear about weevil research.

November — Dr. Jennifer Girón gave an oral presentation at the Annual Meeting of the Entomological Collections Network in Portland, Oregon, entitled "Bridging the gap between current imaging practices and computational analysis needs". She also gave an oral presentation at the Annual Meeting of the Entomological Society of America, "Using collections for student professional development: Examples from Texas Tech University", and presented a poster, "From tradition to precision: Revising Coleoptera anatomy terminology." During November, Dr. Girón also served as an Instructor for a Weevil course in Colombia.



Md Ashraf Ul Hasan and his team educate students and others about bats in Bangladesh

September — The NSRL joined the Paleontology Division in hosting tables at the Museum's annual Dino Day event. The NSRL had tables of fossil and Recent mammals, birds, and invertebrates of Texas on display for visitors to view and learn about. Jennifer Girón, Lisa Bradley, and Emmalee Balch of the NSRL manned the tables and engaged with the attendees. More than 2,000 visitors came through the Museum during the event.

December — Dr. Jennifer Girón was an organizer of the Annual (Virtual) Symposium and General Meeting of The Coleopterists Society, as she serves as secretary of that academic organization.

THE COLEOPTERISTS SOCIETY
AN INTERNATIONAL SOCIETY
DEVOTED TO THE STUDY OF BEETLES

Three Years of Gathering Data on Native Bees in the High Plains Region of West Texas

by Jennifer C. Girón, Curator of Invertebrate Zoology

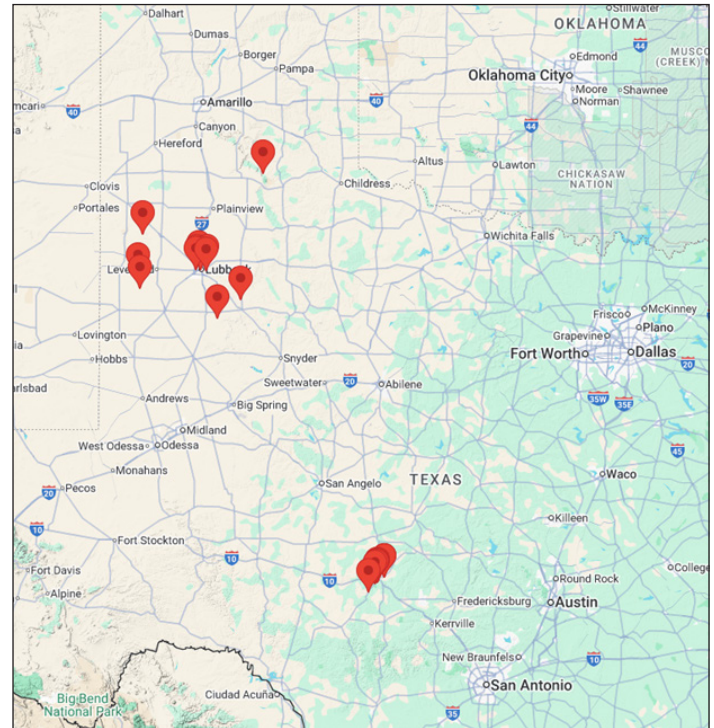
Native bees are essential pollinators of a multitude of wild plants and crops alike. They have a role in maintaining healthy natural plant communities, which in turn supports other wildlife, including multiple vertebrate species that depend on those plants, such as birds, deer, and rabbits. There are over 1,400 native bee species in Texas, but our knowledge about this vast variety of organisms is limited, particularly regarding distributional information and ecological associations.

In 2022, we submitted a proposal to Texas Parks and Wildlife to gather and openly share bee locality data. The primary goal was to mount, label, identify, and database thousands of bees that Dr. Scott Longing, from the TTU Plant and Sciences Department, had been collecting across agricultural landscapes in the High Plains region of West Texas. In addition, we aimed to generate DNA barcode data for native bees, with particular emphasis on [Species of Greatest Conservation Need for Texas](#).

In three years, the project resulted not only in over [13,000 records of bees](#), but also in the training of six undergraduate students in aspects of bee identification, specimen processing, and data management, as well as several opportunities for the students to present their work at local and national scientific events.

The project was developed, for the most part, at the Longing lab, where the specimens were housed, and where the students processed them. Shelby Hernandez, who was trained at the NSRL on aspects of specimen curation and data transcription, trained other undergraduate students in these skills. She also coordinated transferring the specimens to the NSRL for them to be frozen, as a treatment to prevent collection pests, and then accessioned into the Invertebrate Zoology Collection.

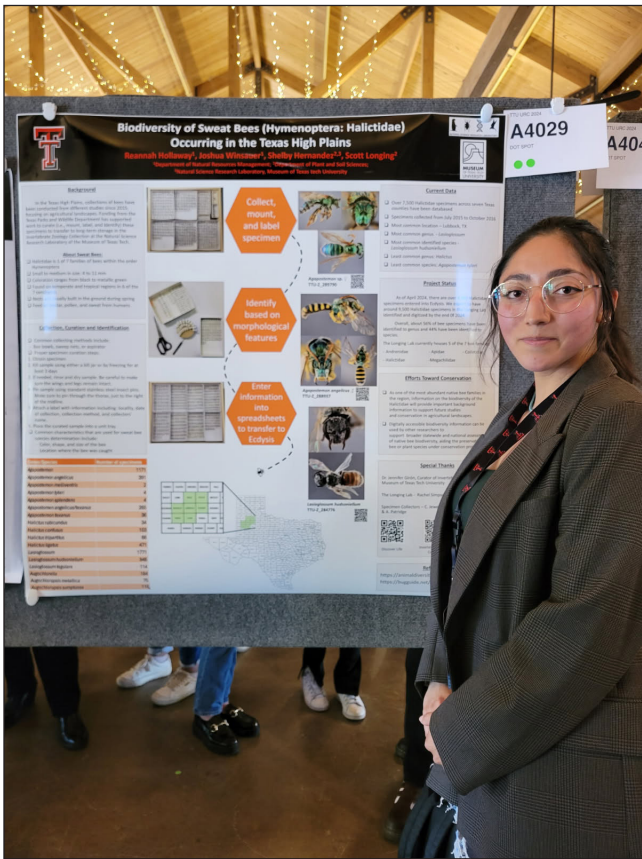
In terms of the bees, our efforts resulted in 13,122 records representing 115 bee taxa in six families. Sweat bees (family Halictidae) represented the highest number of records with 9,325, corresponding to eight genera, of which *Lasioglossum* (4,931 records) and *Agapostemon* (2,494 records) comprised the most records. The family Apidae, which includes honeybees, bumble bees, carpenter bees, long-horned bees, squash bees, digger bees, cuckoo bees, stingless bees, and orchid bees, was represented by 2,153 records in 20 genera, primarily *Melissodes* (874 records) and *Diadasia* (542 records). Interestingly, out of the entirety of bee records on this project, only 207 cor-



Distribution map of the DNA barcoded bee specimens.

responded to *Apis mellifera*, the non-native Western Honey Bee, demonstrating that even though this is the most recognizable bee species, they represent only a small number when compared to the large variety of native bees in agricultural landscapes of this region of Texas. For leafcutter bees (family Megachilidae), we logged 914 records in 10 genera, 874 of which correspond to the genus *Melissodes*, whereas the 578 records (seven genera) of mining bees in the family Andrenidae were mostly represented by the genus *Perdita* (451 records). The family Colletidae, known as plasterer bees, was the least represented family with 101 records in two genera: *Colletes* (33) and *Hylaeus* (68).

For the DNA barcoding data, we generated [DNA barcodes for 92 specimens](#) from the Lubbock and Junction areas. In an exploration of the data, it appears we might have generated the first DNA barcodes for some bee species of these regions. One of the limitations is that some of the vouchers are only identified to the genus level. The next step would be to send the voucher specimens to a specialist for species determination, so that we can confidently assign species names to our DNA barcodes. Each DNA barcoded specimen was imaged, and all this information —DNA barcodes, images, localities, and identification data—is publicly available via the [Barcode of Life Database](#).



Shelby Hernandez presenting a poster on sweat bees at the 2024 TTU Undergraduate Research Conference.

As for the students, Shelby Hernandez (Department of Plant and Soil Science) and Joshua Winsauer (Department of Natural Resources Management) presented posters at the 2024 Texas Tech University Undergraduate Research Conference. Shelby also presented results of the digitization project at the annual meeting of the Entomological Society of America in November 2024. Daniel Ozlowski (Department of Natural Resources Management), who participated in digitization and preparation of the DNA barcode voucher specimens, refined his attention to detail and reinforced his decision to pursue a master's degree in Museology at the University of Washington.

With the experience she gained during her work at the NSRL, Shelby secured a position as the [Collection Manager of Recent Invertebrates at the Sam Noble Museum in Oklahoma](#), demonstrating that student experiences at the NSRL, the skills they gain, and the opportunities they take for professional development, can really turn into a career.



Photo of a pinned specimen of a male Agapostemon angelicus. Photograph by Shelby Hernandez.



Daniel Ozlowski preparing specimens to be sent out for DNA barcoding.



A drawer of cataloged and pinned bee specimens from the project.

2025 PUBLICATIONS BY NSRL FACULTY, STAFF, AND STUDENTS

- Ahmed, T., A. Ahsan, M. A. Shahzad, et al. (Kingston) 2025. Environmental factors driving antimicrobial resistance in Indian flying foxes (*Pteropus medius*): one health implications. *Sci Rep* 15, 35991 (2025). <https://doi.org/10.1038/s41598-025-19738-5>.
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- Ancira, J., R. Gabriliska, C. Tipton, C. Miller, Z. Stickley, K. Omeir, C. Wakeman, T. Little, J. Wolcott, and C. D. Phillips. 2025. A structural equation model predicts chronic wound healing time using patient characteristics and wound microbiome composition. *Wound Repair and Regeneration*. 2025 Jan–Feb; 33(1):e70004. doi: 10.1111/wrr.70004.
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- Dawsey, J., N. E. McIntyre, and B. A. Grisham. 2025. Using multiscale graph theoretic methods to understand spatial patterns of decline: A case study with lesser prairie-chickens. *Landscape Ecology* 40:187.
- East, A., E. G. Campolongo, L. Meyers, S. M. Rayeed, S. Stevens, I. Zarubiieva, I. E. Fluck, J. C. Girón, M. Jousse, S. Lowe, K. I. Perry, I. Betancourt, N. Charney, C. Donoso, N. Fox, K. J. Landsbergen, E. Nepovinskyh, M. Ramirez, P. Singh, K. Thapa-Magar, M. Thompson, E. Waite, T. Berger-Wolf, H. Lapp, P. Mabee, C. Stewart, G. Taylor, and S. Record. 2025. Optimizing image capture for computer vision-powered taxonomic identification and trait recognition of biodiversity specimens. *Methods in Ecology and Evolution* 16(10):2260–2275. <https://doi.org/10.1111/2041-210X.70140>.
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- Manthey, J. D., and M. B. Robbins. 2025. Hybridization and genome-wide introgression in sympatric populations of North American wood-pewees (*Contopus sordidulus* + *C. virens*). *Ibis* 167:750–764.
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- McDonald, P., K. Demere, R. Martin, J. Evans, R. D. Bradley, R. D. Stevens, M. Fokar, H. Sihaloho, and C. D. Phillips. 2025. Status, distribution, morphology and genetics of *Sigmodon fulviventer dalquesti* in the Chihuahuan Desert Ecoregion. *Occasional Papers, Museum of Texas Tech University* 392:1–21.
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- Neha, S. A., J. D. Hanson, J. E. Wilkinson, R. D. Bradley, and C. D. Phillips. 2025. Impacts of host phylogeny, diet, and geography on the gut microbiome of rodents. *PLoS One* 20(1):e0316101. <https://doi.org/10.1371/journal.pone.0316101>
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- Schmidly, D. J., and R. D. Bradley. 2025. Type localities of Texas' native terrestrial mammals with comments on the taxonomic status and distribution of species and subspecies. *Special Publications, Museum of Texas Tech University* 82:1–46.
- Stevens, R. D. 2025. Efficacy of acoustic devices to estimate bat species composition and a preliminary assessment of community structure in the Sierra del Carmen Mountains of Texas. *The Southwestern Naturalist* 69(3):1–9. <https://doi.org/10.1894/0038-4909-69.3.10>.
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UNDERGRADUATE RESEARCH 2025

During 2025, at least 29 undergraduate TTU students conducted research under the direction of 8 NSRL faculty and staff associates.

STUDENT SCHOLARSHIPS, GRANTS, AND RESEARCH AWARDS 2025

Touseef Ahmed, Ph.D. Chair: Tigga Kingston. Travel Award to attend 8th World One Health Congress (WOHC) in South Africa.

Angela Alviz, Ph.D. Chair: Jorge Salazar-Bravo. J. Knox Jones Jr. Memorial Scholarship, Department of Biological Sciences, TTU.

Nuria Cecilia Bernal-Hoverud, Ph.D. Chair: Jorge Salazar-Bravo. Rene Fonseca Memorial Scholarship, Department of Biological Sciences, TTU.

Julia Bullock, undergraduate. Advisor: Nancy McIntyre. Honors College Undergraduate Research Fellowship, TTU.

Nana-Esi Hanson, Ph.D. Chair: Nancy McIntyre. TTU Distinguished Graduate Student Assistantship; NASA DEVELOP Program.

Benneth C. Obitte, Ph.D. Chair: Tigga Kingston. West Africa Mammal Partnership Circle grant, Conservation Connect.

Susana Revollo-Cadima, Ph.D. Chair: Jorge Salazar-Bravo. Fonseca Leadership Program Fellowship, World Wildlife Fund.

Ari Rice, Ph.D. Chair: Joe Manthey. Wilson Ornithological Society Louis Agassiz Fuertes Grant; American Ornithological Society Student Research Grant; Southwestern Association of Naturalists Student Research Award; Western Field Ornithologists Research Grant Award; American Museum of Natural History Chapman Award.

Abigail L. Rutrough, Ph.D. Chair: Tigga Kingston. Student Scholar, Conservation International; Graduate Research Fellowship, National Science Foundation; Kate Barlow Award, Bat Conservation Trust; TTU Graduate Student Research Support Program.

Md Ashraf Ul Hasa, Ph.D. Chair: Tigga Kingston. Brandon A. Gross Research Endowment Scholarship, Department of Biological Sciences, TTU; Lewis and Clark Fund for Exploration and Field Research; Grants-in-aid, Department of Biological Sciences, TTU.

Devenny Widmer, MS. Chair: Nancy McIntyre. TTU Graduate Recruitment Fellowship.

STUDENT PRESENTATIONS 2025

During 2025, 18 graduate students gave 30 presentations, 6 undergraduate students gave 10 presentations, and 1 postdoc gave 1 presentation (23 oral and 18 poster) of their research at 5 local, 4 state or regional, 7 national, and 3 international conferences and society meetings.

NSRL Continues to Grow Social Media Presence

In 2025, the Natural Science Research Laboratory continued its social media presence on Facebook and also launched its official Instagram account. These digital platforms have opened the door between the NSRL and the public community, allowing the NSRL to highlight its work, collections, and passion for natural history and biodiversity. Interactive posts such as polls, quizzes, “Wildlife Wednesday”, and “Guess That Specimen” encourage followers to actively participate in posts and engage with the NSRL. Since its launch, NSRL’s social media has received 250+ views on each post across platforms, and it continues to grow each day.



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STUDENT PRESENTATION AWARDS 2025

Jacob Ancira, graduate student. SAWC Scholar, Society for the Advancement of Wound Care annual meeting.

Ari Rice, graduate student. Best student presentation, oral. Texas Genetics Society Annual Meeting.

Maria Tocora, visiting scholar. Best oral graduate presentation in biology, Texas Tech Annual Biological Sciences Symposium..

Justin Dawsey, graduate student. Best oral graduate student presentation in ecology, Texas Tech Annual Biological Sciences Symposium.

Sean Sutor, graduate student. First Place (co-winner), student paper competition (oral), 50th Annual Desert Tortoise Council Symposium; Best Overall Graduate Student Presentation (co-winner), Texas Tech Annual Biological Sciences Symposium.

Jayme Czap, graduate student. First Place 3-Minute Thesis Contest - Masters division, Texas Tech Graduate College; People's Choice Award, Texas Tech Graduate College.

Amanda Newman, graduate student. First place, Faculty Award for Best Graduate Research Poster, TTU Cross Disciplinary Research Graduate and Post-Doc Poster Event; First Place in Sustainable Ecosystems & Landscapes category, TTU Davis College Graduate Student Poster Presentation.

2025 GRADUATES

Touseef Ahmed, PhD. Chairs: Tigga Kingston and Nancy McIntyre. Dissertation title: The impact of extreme heat on *Pteropus medius* (Indian flying fox) and their potential role in antimicrobial resistance propagation. Current Position: Supervisory Public Health Veterinarian, USDA.

Justin Dawsey, MS. Chair: Nancy McIntyre. Thesis title: Methods for quantifying changes to Lesser Prairie-Chicken lek connectivity and habitat." Current position: Wiser Imagery.

Rebecca Gabriliska, PhD. Chairs: Dr. Kendra Rumbaugh (TTUHSC) and Caleb D. Phillips. Dissertation title: Human genetic and microbial influences on wound microbiomes and healing. Current affiliation: Resident Physician, Baylor Scott & White Health Family Medicine Residency, Temple, Texas.

Jenna Grimshaw, PhD. Chairs: Richard D. Stevens and David A. Ray. Dissertation title: Macroecology of the genome and co-occurrence patterns in genomic communities. Current position: Visiting Instructor, Department of Biological Sciences, Tarleton State University.

Macy Krishnamoorthy, PhD. Chairs: Richard D. Stevens and Robert D. Bradley. Dissertation title: Biodiversity of bats in Africa: Baobab (*Adansonia digitata*) reproductive success with focus on fruit bat pollination services and multidimensionality of bat assemblage along an elevational gradient. Current position: Research Associate, North Carolina Museum of Natural Sciences.

Abby Rutrough, PhD. Chair: Tigga Kingston and Nancy McIntyre. Dissertation title: Where and why do people hunt bats? Predicting the drivers and distribution of a conservation-relevant human behavior using spatially explicit latent variable models. Current Position: Postdoctoral Research Scholar, Central Arizona-Phoenix Long-Term Ecological Research program, Arizona State University.

Hendra Sihaloho, PhD. Chair: Caleb D. Phillips. Dissertation title: Microbiome community assembly across a habitat degradation landscape. Current position: NSRL O&E Coordinator.

Sean Sutor, PhD. Chairs: Nancy McIntyre and Kerry Griffis-Kyle, NRM. Dissertation title: Factors affecting space use, habitat use, and landscape connectivity for Sonoran Desert Tortoises (*Gopherus morafkai*) in southern Arizona. Current position: Postdoctoral research associate, Tennessee Tech University.

TTU FACULTY ASSOCIATES OF THE NSRL

The following faculty at Texas Tech University have research programs that both contribute to and benefit from a working relationship with the Natural Science Research Laboratory. Graduate and undergraduate students of these faculty members, as well as those of the faculty Curators of the NSRL, conduct field-based research studies that result in growth of the NSRL collections and conduct laboratory-based research utilizing the resources of the NSRL to advance the sciences of mammalogy, ornithology, invertebrate zoology, wildlife ecology, and many other disciplines. The NSRL's strong history of field-based and organismal research, and continued commitment to such endeavors, set us apart from many other natural history programs.



Dr. Tigga Kingston is a Professor of Biological Sciences. Her research and activities are dedicated to the conservation ecology of Paleotropical bats. She has been working on the conservation ecology of bats of Southeast Asia for more than 20 years, with projects in Malaysia, Indonesia, Myanmar, Philippines, and Vietnam. More recently, she has student projects and collaborations in Africa, specifically Nigeria, Kenya, and South Africa.

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Update: *Congratulations to Dr. Tigga Kingston, who has joined the faculty of the Department of Evolution, Ecology, and Behavior at the University of Illinois at Urbana-Champaign as a Shelford-Pitelka-Batzli Professor in Mammalian Ecology. We wish her the best!*



Dr. David A. Ray is a Professor of Biological Sciences. The Ray laboratory focuses on the study of genomes and genome evolution with an emphasis on transposable elements and their role in the diversification of species. Model organisms include bats, several other mammals, and crocodilians.

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Undergraduate Student Highlight



Undergraduate student Jennifer Smith joined the Invertebrate Zoology Collection in Spring 2025. She is currently working on digitizing and sorting the confiscated butterfly collection. Her work involves sorting, organizing, and photographing specimens.

Notably, Jennifer developed a web tool using Google Apps Script to streamline the cataloging of the collection. By using filters based on custom tags, the tool improves efficiency and transforms outdated processes accelerating the production of more accessible data for biodiversity research. She presented this project during the Transformative Undergraduate Experiences Symposium and at the annual meeting of the Entomological Collections Network in the fall of 2025.

Graduate Student Highlight



In the fall of 2025, Susana Revollo-Cadima, PhD student of Dr. Jorge Salazar-Bravo, received the prestigious Fonseca Leadership Program Fellowship from the World Wildlife Fund based on her reesearch proposal entitled "From Genes to Ecosystems: Biodiversity and Adaptation Patterns for Conservation in the Puna Salt Flats Using Small Non-Flying Mammals as Model Systems." The salt flat ecosystems of Bolivia are characterized by extreme environmental conditions, which create a unique habitat that supports species with remarkable physiological adaptations. Susana's reserach focuses on the small mammals of the salt flats. By conducting genomic and microbiome analyses, based on ear tissue and fecal samples, respectively, and examining habitat characteristics, Susana's research will determine the ecological and genetic adaptations of small

mammal communities to extreme environments. These findings will inform conservation strategies, providing key data on island mammal diversity for local communities to incorporate into tourism, balancing biodiversity conservation with socio-economic needs. Tissue samples resulting from this research will be deposited in the NSRL. Susana and Dr. Salazar-Bravo hope to continue their work in Bolivia and to bring voucher specimens to the NSRL, as well.



OCCASIONAL PAPERS AND SPECIAL PUBLICATIONS OF THE MUSEUM OF TEXAS TECH UNIVERSITY

The NSRL produces two peer-reviewed publication series, Occasional Papers and Special Publications, both of which are edited by Dr. Caleb Phillips, Interim Assistant Director of the NSRL. These series provide outlets for scholarly works resulting from museum-based natural history research. Relevant topics include, but are not limited to, taxonomic studies, faunal lists, species descriptions, zoonoses research, distributional records, and field and museum techniques and methodology, including molecular methods that are applicable to field or museum research. Publication in these series is available to all authors without regard to their association with Texas Tech University. Authors who plan to submit manuscripts to these series should refer to the Museum Publications Policies, Procedures, and Guidelines for Authors, available at www.depts.ttu.edu/nsrl/publications/authors.php, for more information.

Lisa Bradley serves as the Production Editor for both series. Feel free to contact Lisa, lisa.bradley@ttu.edu, if you are interested in submitting manuscripts or monographs to the Occasional Papers or Special Publications series.

Publications produced in 2025:

Occasional Paper 391. Morphological measurements are insufficient to differentiate *Mustela richardsonii* and *Neogale frenata*: Implications for documenting possible range expansion. James J. Krupa and Kathryn M. Everson.

Occasional Paper 392. Status, distribution, morphology, and genetics of *Sigmodon fulviventer dalquesti* in the Chihuahuan Desert Ecoregion. Preston J. McDonald, Krysta Demere, Russell Martin, Jonah Evans, Robert D. Bradley, Richard D. Stevens, Mohamed Fokar, Hendra Sihalo, and Caleb D. Phillips.

Special Publication 81. Natural Science Research Laboratory, 1973–2023: A 50-year history and report of contributions to natural science research, education, scholarship, collections stewardship, and public engagement. Lisa C. Bradley, Heath J. Garner, Jennifer C. Girón, Kathryn A. MacDonald, Caleb D. Phillips, Nancy E. McIntyre, Heidi N. Amarilla-Stevens, Richard D. Stevens, and Robert D. Bradley.

Special Publication 82. Type localities of Texas' native terrestrial mammals with comments on the taxonomic status and distribution of species and subspecies. David J. Schmidly and Robert D. Bradley.

View and download Occasional Papers and Special Publications at the NSRL website:

www.depts.ttu.edu/nsrl/publications

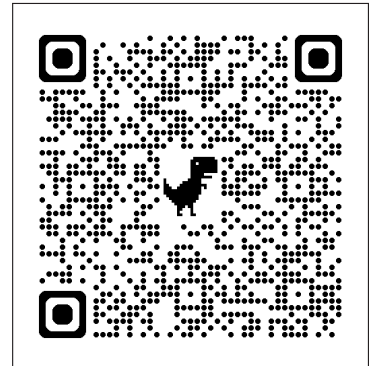
Support Natural Science Research and Education!

The Natural Science Research Laboratory of the Museum at Texas Tech University is a global leader in biodiversity collections, research, and education. It can be proud of the following:

- The NSRL has enabled and facilitated a multitude of research projects and the education of more than 250 TTU graduate students and more than 500 undergraduate students.
- The faculty, staff, and students of the NSRL have generated more than 2,200 peer reviewed scholarly publications while directly affiliated with the NSRL.
- The NSRL is recognized, nationally and internationally, as a leader in curatorial science and collections management practices.
- The NSRL houses the largest total biological collection in Texas, 2nd largest natural history collection in Texas, 2nd largest mammalian genetic resources collection in the western hemisphere, 3rd largest invertebrate collection in Texas, and 4th largest mammal collection in an academic institution in the US.
- The NSRL, throughout its history, has been comprised of a significant scientific community of curators, faculty, and students who have engaged in major research endeavors bringing in more than \$25 million in external research awards and endowments.

As our growth continues and momentum builds, we are always looking to cultivate additional partnerships that will help to build the connections between conservation, biodiversity, research, education, and stewardship. Preservation and knowledge of this great State of Texas is vital, and the biodiversity, essential beauty, and iconic wildlife it provides us should be cared for and used to educate and enrich future generations.

We sincerely thank you for your past support of the NSRL. And we welcome the opportunity for you to join us in making a difference as we build our future! The NSRL Fund for Excellence has been established to accept general donations in support of the NSRL. Use the QR code to donate online. You can also choose to donate to a specific area of interest, or to establish an endowment for scientific research or student scholarships. For more information, contact the NSRL Interim Director, Dr. Richard Stevens, richard.stevens@ttu.edu.



Your support is appreciated! Thank you!

