



ASNHC ANGELO STATE NATURAL HISTORY COLLECTIONS



Introducing...

THE LIVING COLLECTIONS

The ASU Biology Greenhouse – or what is becoming known as the ‘Living Collections’ – is complete!

Dr. Bonnie Amos, curator of the Herbarium and director of the new greenhouse, and David Sullivan, greenhouse manager, have been working hard with a team of students to establish different rooms, or biomes, within the greenhouse. Each is rapidly filling with plants for education and research.

The greenhouse is divided into four spaces, three of which provide environmental conditions similar to temperate, desert and tropical climates. At the far north end of the greenhouse, the head house acts as a place to pot plants, construct soils from parent and organic material, and filter rainwater through reverse osmosis to use on the plants.

Heading south, the first biome is the **Temperate Room**. The tabletops are covered with a variety of species, including medicinal plants (e.g., rosemary, lavender, evening primrose, chamomile, peppermint, ginseng,) economic plants (e.g., black cotton, pineapple) and plants comprising the sensory garden (e.g., mint, basil, geraniums, lamb’s ear, sensitive plant, chocolate daisy). A variety of plant families are available to provide flowers for the upcoming spring 2020 plant taxonomy course. Introductory biology student labs use several tables to grow fast plants in fall and spring semesters.



Temperate Room medicinal and sensory plants.

Research Highlight:

Drs. Aldo Piñón-Villarreal and Cody Scott and a team from ASU’s Department of Agriculture and David L. Hirschfeld Department of Engineering are conducting research in the Temperate Room. They are investigating the effects of adding clinoptilolite zeolite (a porous, absorbent mineral) and growing salt-tolerant grasses in brine-contaminated areas to remove salts and reclaim healthy soil.

(continued from cover)



Cacti and euphorbs in the Desert Room.

Further south, as the air shifts from moist and cool to warm and dry, the **Desert Room** is next. The plants in this room display a variety of adaptations to a low-water existence. Convergent evolution is obvious in plants in the Cactaceae and Euphorbiaceae families – both of which have adapted to hot, dry conditions on separate continents – by the fleshy stems and many spines seen in each group. Cacti and other spiny curiosities invite one in for a closer (but not too close!) look.

Research Highlight:

Nearly 400 threatened Tobusch fishhook cacti (*Sclerocactus breviphamatus* ssp. *tobuschii*) plants reside in the Desert Room from salvage operations as mitigation for gas and oil pipeline construction. Many will be used in a five-year translocation project. The remaining plants will be part of two research projects; an investigation of potential ant attractants for seed dispersal, and a study of how the number of stigma lobes correlate with plant size and number of seeds.

Finally, the southern-most **Tropical Room** is a humid home to plants adapted to an abundance of moisture. An epiphyte wall shows how orchids and bromeliads live without being anchored in soil, and an aquatic tank shows how plants like frogbit, lemon bacopa, and pennywort live in standing water. A bog, mimicking the nutrient-poor soils of many tropical areas, houses a variety of carnivorous plants. Three corpse flower plants (*Amorphophallus titanum*) and three voodoo lily plants (*Amorphophallus konjac*), are new additions, all of which came to us through generous transfer agreements with other greenhouses. The white bat and black bat flowers, black pepper vine, and cycads are fantastic educational displays. The Tropical Room is the most challenging to manage as greenhouse staff battle intense Texas sunlight, high summer temperatures and low humidity – but the plants survived their first summer, and plants and staff alike are enjoying the cooler temperatures this fall and winter! Despite being up and running for less than a year, the greenhouse is taking shape and offering visitors a unique opportunity to see a wide variety of plants.



Plants in an aquatic tank in the Tropical Room.

The ASU Greenhouse will have a Grand Opening in the spring of 2020!

An announcement will be made soon for the public grand opening. Future greenhouse events will be scheduled as certain plants complete their life cycles—voodoo lilies and the corpse flower should bloom in four and 10 years, respectively. The flowering of these magnificent plants will be a sight (and smell) to behold!

CURATOR PROFILE: BONNIE B. AMOS



This past year marked 30 years of service to Angelo State University and its students by Dr. Bonnie Amos.

A native of the Concho Valley, Amos earned her Bachelor of Science from Angelo State then earned a Master of Science studying *Penstemon*, plants of the Beardtongue genus. After earning her doctorate from the University of Oklahoma, she taught at Baylor University before returning to ASU.

Forever changed by an undergraduate field trip to the Chihuahuan Desert, Amos has devoted much of her research career to the conservation of plants endemic to the Big Bend region of Texas. Her research of Big Bend flora covers a wide variety of plants and diverse habitats.

Her studies have ranged from surveys for cacti endemic to the sunbaked flats of Big Bend National Park to many hikes up the Chisos Mountains in search of Chisos pinweed.

Closer to home, Amos' research has focused on rare and poorly known plants of the Concho Valley. Recent studies focus on distribution of the endangered Texas poppy mallow, pollination biology of the Irion County buckwheat, and seed dispersal and pollination biology of the elusive Tobusch fishhook cactus. In 2018, she received a grant to conduct reintroduction experiments of the Tobusch fishhook cactus – a project that will add much to our understanding of this species' natural history.

Aside from research, Amos continues to teach botany, plant taxonomy and medical botany in

addition to a graduate-level seminar in plant-animal interactions. She also serves as curator of the ASNHC Herbarium. In that capacity, she recently joined the Texas-Oklahoma Consortium of Herbaria (TORCH), a regional group that advocates for herbaria. Along with joining TORCH, Amos and ASNHC Collections Manager Dianna Krejsa are now migrating the Herbarium's database from Specify to Symbiota to simplify data management and bring it into alignment with other regional herbaria. Going forward, Amos will be busy populating the new greenhouse and setting up numerous studies in this long-awaited facility.

As busy as she is, Amos still travels internationally. Most recently, she achieved a lifelong goal of traveling to Kenya. She experienced some of the magnificent wildlife (including lions, cheetahs, elephants and giraffes) and many spectacular plants. Along with umbrella thorn – the iconic tree of the East African savanna – Amos experienced firsthand the ethnobotanical uses of shepherd's tree and unique properties of burning bush. Any discussion of this trip ends with, "I'm going back! And next time to the Cape!" Africa, it seems, has had the same effect on Amos that the Chihuahuan Desert did years ago: one visit surely isn't enough!



BIO BLITZ



This year the Biology Department implemented a biannual BioBlitz (spring and fall) to survey seasonal changes, migration and timing of floral and faunal abundances. Students visited two different ranches; the first a chilly day at Knickerbocker Ranch (far above) and the second featuring sun and many snakes (here, a Great Plains rat snake) at Rocker b Ranch.

In the spring of 2019, faculty from the Biology Department, ASU's Tri-Beta honor society, and biology graduate and undergraduate students traveled to Knickerbocker Ranch to conduct a BioBlitz – a one-day survey of all living things in a given area. Within the riparian forest running along Dove Creek and into the brushy uplands, students searched for every plant, animal and fungus they could find. Traps were set for mammals, mist nets were hung to catch birds and bats, and rocks and logs were overturned in search of reptiles and arthropods. Plants were collected in abundance and, with the aid of Dr. Bonnie Amos, identified and prepared for the ASNHC Herbarium. This spring marked the first use of iNaturalist – a smartphone app used to document the occurrence of species. Now, when students document a species during BioBlitz, they can submit a photo and species identification to a shared database. Use of iNaturalist will track distribution and abundance as well as aid in the identification of unknown species through scientists participating all over the world.

In the fall of 2019, ASU BioBlitzers brought their field sampling gear and smartphones to the Rocker b Ranch to document flora and fauna. Undergraduates, staff and faculty joined Dr. Robert Dowler's Mammalogy class to search for mammals, birds, amphibians, reptiles and arthropods. Led by Dowler and Dr. Ben Skipper, students documented 36 species of birds and 12 species of mammals on the ranch. Dr. Mike Dixon led teams searching for herptiles and caught several species of snakes, frogs and toads. Several dozen species of beetles, moths, wasps, spiders and scorpions represented arthropods well. To Dr. Ned Strenth's delight, a vinegaroon was also captured. Everyone enjoyed a weekend immersed in their subject matter and, as always, were amazed at what can be found under a rock or just over a hill.

COLLECTIONS BY THE NUMBERS:

Sept. 2018 - Sept. 2019

PUBLICATIONS AND CITATIONS

- 12 publications and 282 citations

LOANS

There have been **39 loan requests** and more than **863 loaned specimens!** Some highlights of loaned materials include:

- Texas Department of State Health Services borrowed rodent skins to train their personal.
- Researchers studying oncogenes, or genes that have the potential to cause cancer, requested bat tissues. Bats have very long lives for their body size and low rates of cancer, so studying their oncogenes may lend health insights for humans.
- Rare, endemic rodent species from the Galapagos Islands are being studied for their genetic divergence.

OUTREACH

- **Tours:** More than 19 groups and 700 visitors!
- **Events:** 11 community events, exhibits, and talks with more than 3,342 people!
- **Classrooms:** 13 classroom and laboratory settings have used specimens for education (nine external to ASU)!

Look for an **Open House** special event celebrating the **20,000th ASNHC Mammal Specimen in 2020!**

SPECIMEN TOTALS

Herbarium: 60,450

Tissues: 26,487 samples from 14,500 unique specimens

Mammalogy: 19,775

Herpetology: 15,165

Ornithology: 2,775

NEW FREEZER ALARM SYSTEM

THE ASNHC has more than a dozen freezers at various temperatures housing hundreds of specimens and thousands of DNA extractions and cryogenically frozen samples. It is important to keep these materials at set low temperatures (from 4 degrees Fahrenheit to as cold as -112F in some units), or the quality of the specimens or samples will degrade and not be usable as a skin preparation and to gather genomic data. Through inter-departmental collaboration and funding, a new freezer monitoring system has been implemented, including temperature probes in 20 different freezers on four floors of two buildings. The system notifies a customizable list of faculty and staff if a given unit is approaching an unsafe temperature threshold. Thanks to the College of Science and Engineering for your support on this project! The frozen collections are much safer from freezer malfunctions with this new system.

BATS OF WEST TEXAS

ANALYSIS OF BAT MILK

BATTERY WARRIORS



Stephanie Martinez and Steven Gould hauled car batteries up to Emory Cave in June 2019 with Dr. Loren Ammerman. Everyone was completely soaked on an unusually foggy, cloudy day with a cool drizzling rain. The batteries are used to run a monitoring system for the endangered Mexican long-nosed bats (*Leptonycteris nivalis*) that live in the cave.



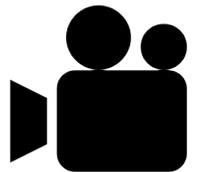
Graduate student Miranda Perry worked late into the night and into early morning calculating the amount of oxytocin to be administered to the next bat milk donor.



Antrozous pallidus, the pallid bat.

THIS past summer, graduate student Miranda Perry spent 13 days in Big Bend National Park collecting samples of milk from the pallid bat (*Antrozous pallidus*) that will be used to describe the composition of macronutrients present in this species' milk for the first time. With the help of some wonderful volunteers, she was able to catch many lactating pallid bats, but discovered very quickly that milking a bat is much easier said than done. They spent those nights working into the early morning hours as each bat was required to be held for two hours post-capture to ensure the bat had plenty of milk to express. Now that her field season is complete, the samples have been sent to the Smithsonian National Zoological Park, which is home to the largest exotic animal milk repository in the United States, where they are being analyzed by Perry and Dr. Michael Power, the curator of the repository. Perry also traveled to Washington, D.C., to help with analysis of some of these samples.

BAT WRANGLERS FOR WILDLIFE DOCUMENTARY



At left, Virginia Jaquish checks on the captive pallid bats inside a flight tent erected to film pallid bat hunting behavior. Along with Sydney Decker and Dr. Loren Ammerman, Jaquish worked with wildlife cinematographer Skip Hobbie to film this species as it searched for prey while inside a flight tent as part of a wildlife documentary. As a bonus, they obtained footage of the pallid bats as they took nectar from *Agave lechuguilla* flowers, the subject of Jaquish's master's thesis.

The award for strangest specimen acquisition this year goes to...the pallid bat (*Antrozous pallidus*) removed from the mouth of this bullfrog. A mist net over a pool of water caught bats, but subsequently attracted hungry bullfrogs!



30 years of student-produced Mammalogy skeletal preps.



ASNHC MAMMALOGY COLLECTION RANKS HIGH IN TEXAS AND U.S.

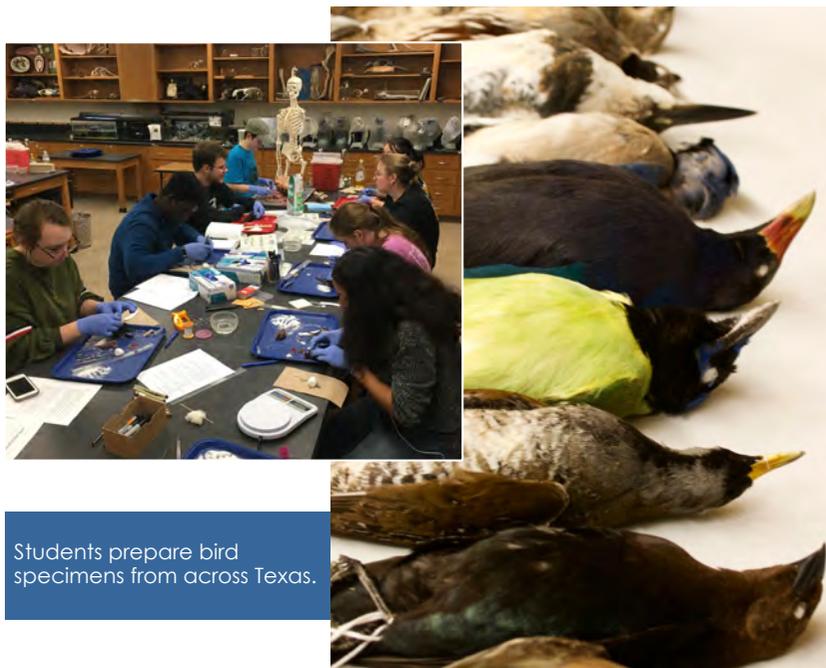
A recent publication in the *Journal of Mammalogy* reported results of the survey of mammal collections of the Western Hemisphere (Dunnum et al. 2018. *Mammal Collections of the Western Hemisphere: a survey and directory of collections*. *J. Mamm.* 99:1307-1322). At the time of the survey, the ASNHC had 18,050 cataloged specimens, which ranked **fourth out of 23 mammal collections in Texas**. We are behind Texas Tech University (138,689), the Biodiversity Research and Teaching Collection at Texas A&M University (64,500) and Midwestern State University (23,321). The ASNHC also ranks 60th out of 395 collections surveyed in the Western Hemisphere.

More surprisingly, our Frozen Tissues Collection, begun in the 1980s by Dr. Mark Engstrom, now ranks as the **ninth-largest tissue collection in the Western Hemisphere**, with tissues from over 14,000 mammals. The ASNHC Mammalogy Collection was accredited by the American Society of Mammalogists in 1992, and ASU will be seeking reaccreditation of the collection in 2020.

THANK YOU to all who support the ASNHC in all the ways that you do! Your support is vital to the growth and maintenance of the Angelo State Natural History Collections.

Thanks to Ms. Jacklin R. Allison, Dr. Loren K. Ammerman, Dr. Bonnie B. Amos, Mr. and Mrs. Maurice A. Archer, Mr. James M. Atcheson, Ms. Carisia G. Banda, Mr. Robert Blankenship, Mr. Richard W. Brown, Ms. Danna Kay Brownlow, Dr. Bonnie C. Carter, Ms. Bethany G. Chapman, Dr. and Mrs. Ross C. Dawkins Jr., Ms. Sydney K. Decker, Ms. Kristian Dehoyos, Mr. Greg Detweiler, Col. and Mrs. John R. Diggins III, Dr. Michael T. Dixon, Mr. and Mrs. Thomas Dixon, Dr. Robert C. Dowler, Ms. Carla E. Ebeling, Dr. and Mrs. Charles A. Endress, Mr. Mark D. Engstrom, Mr. David R. Etheredge, Dr. Adam W. Ferguson, Dr. Laurel E. Fohn and Dr. Christopher Peterson, Dr. Patricia Freeman, Mr. and Mrs. James J. Fulgham, Mr. R. Max Goodwin, Mr. Jeff Gore, Ms. Bethany S. Guajardo, Mr. Matt H. Hamilton, Dr. John D. Hanson, Dr. Connie Heimann, Mr. James C. Henderson, Ms. Heather R. Hillert, Dr. and Mrs. E. James Hindman, Ms. A. "Blue" Hinton, Dr. and Mrs. E. James Holland, Dr. Mark R. Hutchinson, Ms. Samantha A. Jackson, Mr. Jarret Jaklewicz, Ms. Virginia G. Jaquish, Ms. Kamren P. Jefferson, Ms. Hannah L. Jones, Mr. and Mrs. John Jones, Ms. Ashlyn Kildow, Ms. Ashley Kingsley, Ms. Kristen L. Kothmann and Mr. Sean M. Young, Ms. Beverly B. Krejsa, Dianna M. Krejsa, Dr. Hans Landel, Mr. Zane J. Laws, Ms. Elizanette V. Lopez, Mr. Andrew S. MacPhie, Dr. Robert E. Martin, Ms. Stephanie G. Martinez, Ms. Megan N. May, Mr. and Mrs. Steve Mayer, Ms. Jeanette McWilliams, Mr. Gus Montalvo, Ms. M'Kayla G. Motley, Dr. Sean A. Neiswenter, Mr. Michael W. Nickell, Dr. Elisabeth L. Noelke, Mr. J. Clint Perkins, Ms. Miranda Perry, Ms. Marcy A. Revelez, Mr. Raymond R. Robbins, Ms. Angela M. Rollins, Mr. Kellen M. Rowe, Ms. Margaret G. Schwab, Dr. Ben R. Skipper, Ms. Tori K. Solis, Ms. Amanda M. Starr, Ms. Kaycie M. Sullivan, Mr. Drew Sykes, Ms. T. Marie Tipps, Ms. Janet Trethavens, Dr. and Mrs. Caleb Vosburg, Mr. Jeffrey Wemmer, Mr. Brent Wesley, Ms. Rose K. Wilhoyt, Mr. Michael Wolfson, Dr. Audie Wooley – and to the San Antonio Zoo, Animal Rescue Keep, and Field Museum of Natural History for donations to the ASNHC.

Thank you to several key departments across campus for your support of the ASNHC in media efforts (Communications and Marketing Office), limitless problem-solving in database support (Information Technology Office) and creative solutions for the maintenance of our facilities (Facilities Management and Materials Management Office). Finally, we thank all the student workers and volunteers who help our collections function and grow! You are how we get things done!



Students prepare bird specimens from across Texas.

A renewed relationship with the Animal Rescue Keep in Port Aransas (established by the late Anthony F. Amos) has resulted in salvaged birds from the Texas coast becoming part of ASNHC holdings. Specimen donations continue to be received from local zoos, nature centers and rehabilitation clinics, which means important data collection and sampling from these birds and other organisms. It also means students get to prepare and handle **bird specimens** that they never would have seen otherwise.

MAMMALOLOGY

FALL 2019



The Mammalogy class at Rocker b Ranch in Mertzon, Texas. Photo by Stephanie Martinez.



Mammalogy students prepping in the field.

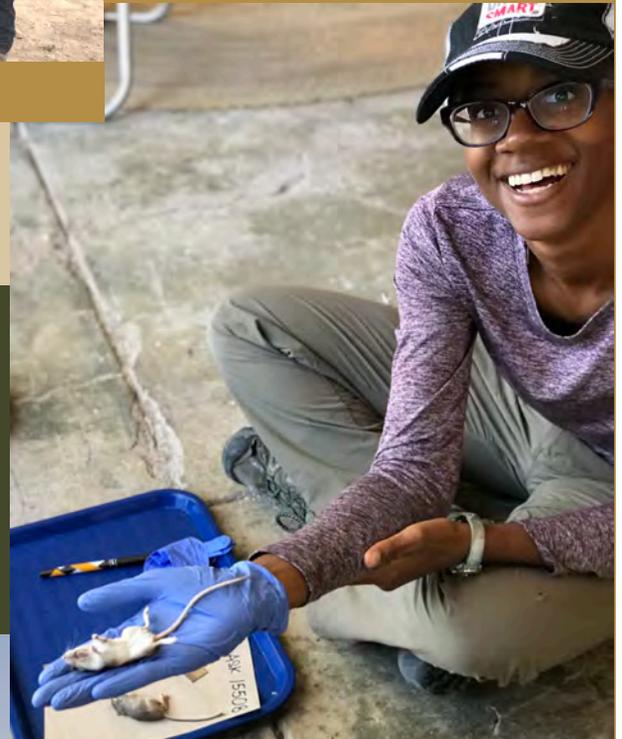
Dr. Robert Dowler brought 21 students into the field during the Mammalogy course this fall. Students got to try their hand at trapping small mammals of West Texas. They also practiced their natural history skills by making mammal specimens in the field.



PARASITOLOGY

Graduate and undergraduate honors students working on parasite identification with Dr. Nick Negovetich have found and are identifying nematodes and cestodes in bobcat, gray fox, armadillo, raccoon and spotted skunk hosts. Pictured is an Acanthocephala worm found in the intestine of a spotted skunk. Photo by Hannah Jones.

Dr. Dowler, Collections Manager Dianna Krejsa, and Mammalogy students finish their traplines at dusk at Rancho Pensado in Candelaria, Texas. Photo by Sebastian Schreiber-Pan.



Graduate student and member of the Mammalogy class Kamren Jefferson holds a pocket mouse.



KATY PRAIRIE

Through a contract with the Texas Comptroller's Office, work on the spatial ecology of the plains spotted skunk, *Spilogale putorius*, progresses this year in East Texas with Dr. Robert Dowler's students. Graduate students on the project have caught 15 skunks since January, and data collection on several other species of the area will help inform the ecology of this skunk of conservation concern.



Major sampling localities in Texas this year.

AROUND THE COLLECTIONS & DEPARTMENT OF BIOLOGY

PUBLICATIONS - STUDENTS AND FACULTY

Ammerman, L. K. 2019. *Leptonycteris nivalis*, pages 101-105 in *Texans on the Brink* (B. R. Chapman and W. I. Lutterschmidt, eds.) Texas A&M University Press, College Station.

Ammerman, L. K., C. M. Brown, R. A. Medellin, A. Moreno-Valdez, R. S. Pfau, R. Lesagonicz, and A. L. Russell. 2019. Genetic variation and structure in the endangered Mexican long-nosed bat (*Leptonycteris nivalis*): mitochondrial and nuclear perspectives. Pp. 169-185 in *From field to laboratory: a memorial volume in honor of Robert J. Baker* (R. D. Bradley, H. H. Genoways, D. J. Schmidly, and L. C. Bradley, eds.). Special Publications, Museum of Texas Tech University 71: xi+1-911.

Ammerman, L. K., D. N. Lee, B. A. Jones, M. P. Holt, S. J. Harrison, and S. K. Decker. 2019. High frequency of multiple paternity in Eastern red bats, *Lasiurus borealis*, based on microsatellite analysis. *Journal of Heredity* 110:675-683.

Bradley, R. D. and **R. C. Dowler.** 2019. A century of mammal research: changes in research paradigms and emphases. *Journal of Mammalogy* 100:719-732.

Castaneda-Rico, S., S. A. Johnson, S. A. Clement, **R. C. Dowler**, J. E. Maldonado, and **Cody W. Edwards.** 2019. Insights into the evolutionary and demographic history of the extant endemic rodents of the Galapagos Islands. *Therya* 10:213-228.

Chodacki, G. and B. Skipper. 2019. Partitioning of foraging habitat by three kingfisher species (Alcedinidae: Cerylinae) along the South Llano River, Texas, USA. *Waterbirds* 42:231-236.

Dunnum, J. L., B. S. McLean, **R. C. Dowler** and the Systematic Collections Committee of the American Society of Mammalogists. 2018. Mammal collections of the Western Hemisphere: a survey and directory of collections. *Journal of Mammalogy* 99:1307-1322.

Dowler, R. C. 2019. Just what is a naturalist? Pp. 861-871 in *From field to laboratory: a memorial volume in honor of Robert J. Baker* (R. D. Bradley, H. H. Genoways, D. J. Schmidly, and L. C. Bradley, eds.). Special Publications, Museum of Texas Tech University 71: xi+1-911.

Gordon, R., S. Ivens, **L. K. Ammerman**, M. B. Fenton, J. E. Littlefair, J. M. Ratcliffe, and E. L. Clare. 2018. Molecular diet analysis finds an insectivorous desert bat community dominated by resource sharing despite diverse echolocation and foraging strategies. *Ecology and Evolution* 2019: 1-13. DOI: 10.1002/ece3.4896.

Morgan, C. N., L. K. Ammerman, K. D. Demere, J. B. Doty, Y. J. Nakazawa, and M. R. Mauldin. 2019. Field identification key and guide for bats of the United States of America. *Occasional Papers*, Museum of Texas Tech University 360: 1-25.

Phillips, C. D., J. L. Dunnum, **R. C. Dowler**, L. C. Bradley, H. J. Garner, K. A. MacDonald, B. K. Lim, **M. A. Revelez**, M. L. Campbell, H. L. Lutz, N. Ordonez Garza, J. A. Cook, R. D. Bradley, and the Systematic Collections

Committee of the American Society of Mammalogists. 2019. Curatorial guidelines and standards of the American Society of Mammalogists for collections of genetic resources. *Journal of Mammalogy* XX:1-5.

Skipper, B. and C. Boal. 2019. Nest-defense behavior of Mississippi kites in urban and exurban areas. *Human-Wildlife Interactions* 13:142-149.

Welch-Acosta, B., **B. Skipper**, and C. W. Boal. 2019. Comparative breeding ecology of Mississippi kites in urban and exurban areas of west Texas. In Press, *Journal of Field Ornithology*.

PRESENTATIONS - STUDENTS AND FACULTY

Ammerman, L. K., D. N. Lee, B. A. Jones, M. P. Holt, S. J. Harrison, and S. K. Decker. 2018. Multiple paternity is common in litters of *Lasiurus borealis* based on microsatellite analysis. North American Symposium on Bat Research, Puerto Vallarta, Mexico.

Decker, S. K. and L. K. Ammerman. 2018. Investigation of the phylogeographic structure of the subspecies of northern yellow bats (*Dasypterus intermedius*) by molecular analysis. North American Symposium on Bat Research, Puerto Vallarta, Mexico.

Ferguson, A. W., M. M. McDonough, R. C. Dowler, M. Gompper, and J. Maldonado. 2019. Phylogenomic estimation of species boundaries in the spotted skunks (Carnivora, Mephitidae, *Spilogale*). Annual meeting of the American Society of Mammalogists, Washington, D.C.

Jaquish, V. G. and L. K. Ammerman. 2018. Pollen identification provides evidence that pallid bats visit agave species in the Chihuahuan Desert. Poster presentation, North American Symposium on Bat Research, Puerto Vallarta, Mexico (and oral presentation at Texas Society of Mammalogists, 2019).

Jones, H. L., B. Skipper, T. C. Maxwell, A. W. Ferguson, and R. C. Dowler. 2019. Factors affecting frequency of road-killed mammals in West Central Texas. Angelo State University Research Symposium, San Angelo, Texas.

Mayfield-Meyer, T. J., K. E. Galbreath, **D. M. Krejsa**, M. B. Prondzinski, and D. Perriguy. 2019. *Arctos: A Tool to Help Small Collections Make Their Case*. Society for the Preservation of Natural History Conference, Chicago, Illinois.

Perkins, J. C., K. Jefferson, M. Hamilton, R. Dowler, and R. Stevens. 2019. Preliminary assessment: spatial ecology of the plains spotted skunk (*Spilogale putorius interrupta*) in southeastern Texas. Annual meeting of the American Society of Mammalogists, Washington, D.C.

Pourshoushtari, R. D. and L. K. Ammerman. 2018. Assessment of the genetic variability of the Mexican long-nosed bat (*Leptonycteris nivalis*) using microsatellite markers. Poster presentation, North American Symposium on Bat Research, Puerto Vallarta, Mexico (and oral presentation at Texas Society of Mammalogists, 2019).

Revelez, M. A., D. M. Krejsa, and R. C. Dowler. 2019. Small mammal collections in the 21st century: Impacts on research require growing genomic resources and establishing data availability. Society for the Preservation of Natural History Conference, Chicago, Illinois.

Wesley, B., L. K. Ammerman, and B. Amos. 2019. Genetic barcoding analysis of Agave. TriBeta Regional Convention, Cedar Hill, Texas.

Wilke, R. R. 2019. Misinformation and Disinformation in the Applications Process (Part II-Applicants). Invited Applicant Seminar Series hosted by Texas Tech Health Sciences Center School of Medicine. March 15th - Lubbock, Texas.

Wilke, R. R. 2019. Misinformation and Disinformation in Health Professions Advising (Part I-Advisors). Texas Association of Advisors of Health Professions, annual meeting. Feb. 8th - Lubbock, Texas.

FACULTY/STAFF GRANTS

Loren K. Ammerman. 2019. *PIT tag monitoring of Mexican Long-nosed Bats*. Bat Conservation International Gift.

Loren K. Ammerman. 2018. *Genetic Analysis of Multiple Paternity in Red Bats*. ASU Faculty Research Enhancement Program Grant.

Dianna M. Krejsa. 2018. Grant from the Concho Valley Workforce Development Board to create natural history loan kits to enrich local K-12 STEM education opportunities.

STUDENT GRANTS

Sydney Decker. 2018. Investigation of the phylogeographic structure of the subspecies of Northern yellow bats (*Dasypterus intermedius*) by molecular analysis. Faculty Mentored Research Grant. Faculty mentor, Loren K. Ammerman.

Brent Wesley. 2018. Identifying barcoding gene sequences to distinguish species of century plants (Agave). Faculty Mentored Research Grant. Faculty mentor, Loren K. Ammerman.

Brent Wesley. Identifying barcoding gene sequences to distinguish species of century plants (Agave). Tri-Beta Research Grant.

AWARDS

Loren K. Ammerman was awarded the C. J. "Red" Davidson Endowed Professorship at Angelo State University in October 2019.

Loren K. Ammerman was recognized as an Honorary Member of the Texas Society of Mammalogists in February 2019.

Virginia Jaquish was recognized by the Texas Society of Mammalogists with the Robert L. Packard Award given by the for best overall oral research presentation in 2019.

Roxanne Pourshoushtari was recognized as the Outstanding Graduate Student in the Department of Biology.



ASNH

ANGELO STATE
NATURAL HISTORY COLLECTIONS

ASNH SHIRT AROUND THE WORLD

IF you missed getting your ASNH shirt last year, we still have some available! Just contact Dianna Krejsa at dkrejsa@angelo.edu for sizes and how to donate.

If you already have one, send a picture of you wearing it out on the town or out on an adventure. We will share the photo on our Facebook page, and you will be entered into a raffle to win a prize...the 2020 ASNH shirt featuring the ASU Rambouillet ram!



ASNH

ANGELO STATE
NATURAL HISTORY COLLECTIONS

SCIENCE EDUCATION LOAN BOXES



Some of the materials available in the ASNH Loan Boxes.

Science loan boxes are available now to local K-12 school districts. Teachers may request and borrow these educational box sets with modules that satisfy Texas Educational Knowledge and Skills requirements regarding science and biology. These materials include skull casts, casts of primate hands and feet to compare to our own, life cycle models, and wildlife track casts and track molds. Materials can be used to study dichotomous keys, metamorphosis, adaptations to habitat, physical characters, and food webs and energy flow, and to practice measuring and data collection. This project was made possible through collaboration with the Concho Valley Workforce Development Board. Contact Dianna Krejsa for more information at dkrejsa@angelo.edu.



SAXICOLOUS!

saxicolous

\sak-'si-kə-ləs\ adj
: inhabiting or growing among rocks

"The white-ankled mouse is a saxicolous (rock-loving) species that favors limestone slopes." —TERRY MAXWELL, SAN ANGELO STANDARD-TIMES, JULY 24, 2016 →

A QUOTE from the late Dr. Terry Maxwell was featured in a nationally distributed daily calendar, "365 New Words-A-Year, 2019." Maxwell is quoted from an edition of the San Angelo Standard-Times (July 24, 2016) using the word **saxicolous** (rock-loving) to describe the white-ankled mouse.

TERRY C. MAXWELL CALENDAR FUNDRAISER

To help support the ASNH and to get Dr. Terry Maxwell's artwork in the hands of his friends, we are producing a calendar that features his art. For a donation of \$20, we will send you a spiral-bound, 12-month calendar with artwork of organisms of the Concho Valley. Go to angelo.edu/maxwell or contact Dianna Krejsa at dkrejsa@angelo.edu.

2020 ASNH CALENDAR

Native Species of the Concho Valley Illustrations by Terry C. Maxwell



Also known as a Hudsonian curlew, the long limbed whimbrel (*Numenius phaeopus*) is an occasional migrant to the Concho Valley and a rare treat to see.

If you are still interested in **original artwork** by Dr. Terry Maxwell, please go to the site above to view drawings available for a donation of \$100 or more. In addition, **please let us know** if you have any of his originals at home that you would be interested in scanning or allowing us to scan to provide an archival digital record of his work.

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